Appointment

From: Do, Bebhinn [do.bebhinn@epa.gov]
Sent: 1/24/2020 2:38:54 PM
To: Do, Bebhinn [do.bebhinn@epa.gov]; Crowley, Kate [crowley.kate@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Rumsey, Ian [rumsey.ian@epa.gov]; Sullivan, Tim [Sullivan.Tim@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]; RTP-OAQPS-Personal Privacy / Ex. 6 PPD/Phone-Line/RTP-OAQPS-BLDG-C [RTP-OAQPS-Personal Privacy / Ex. 6 SPPD@epa.gov]
CC: Costa, Allison [Costa.Allison@epa.gov]; Croghan, Carry [Croghan.Carry@epa.gov]; Hassett-Sipple, Beth [Hassett-Sipple.Beth@epa.gov]; Lowe, Theresa [Lowe.Theresa@epa.gov]; Nash, Maliha [Nash.Maliha@epa.gov]; Nunez, Carlos [Nunez.Carlos@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Thompson, Rhonda [Thompson.Rhonda@epa.gov]; Walker, JohnT [Walker.Johnt@epa.gov]; Dietrich, Yijia [Dietrich.Yijia@epa.gov]; Banner, Shannon [banner.shannon@epa.gov]

Subject: NAEMS Coordination Meeting
Attachments: NAEMS coordination meeting 01.28.2020.docx
Location: RTP-E101-Max40/RTP-Bldg-E-Restricted

Start: 1/28/2020 7:00:00 PM
End: 1/28/2020 8:00:00 PM
Show Time As: Tentative

Just following up with notes from the meeting, just in case you couldn't join us.
BD

Monthly Coordination Meeting
Call-in number: Personal Privacy / Ex. 6

Agenda

1. EEM update from Ian
2. USDA Workgroup
3. Schedule update

I'll send out a summary after the meeting, if you are unable to attend.

BD

Appointment

From: Do, Bebhinn [do.bebhinn@epa.gov]
Sent: 2/4/2020 5:47:50 PM
To: Crowley, Kate [crowley.kate@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Rumsey, Ian [rumsey.ian@epa.gov]; Sullivan, Tim [Sullivan.Tim@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]; RTP-OAQPS Personal Privacy / Ex. 6 SPPD/Phone-Line/RTP-OAQPS-BLDG-C [RTP-OAQPS Personal Privacy / Ex. 6 -SPPD@epa.gov]
CC: Costa, Allison [Costa.Allison@epa.gov]; Croghan, Carry [Croghan.Carry@epa.gov]; Hassett-Sipple, Beth [Hassett-Sipple.Beth@epa.gov]; Lowe, Theresa [Lowe.Theresa@epa.gov]; Nash, Maliha [Nash.Maliha@epa.gov]; Nunez, Carlos [Nunez.Carlos@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Thompson, Rhonda [Thompson.Rhonda@epa.gov]; Walker, JohnT [Walker.Johnt@epa.gov]; Dietrich, Yijia [Dietrich.Yijia@epa.gov]; Banner, Shannon [banner.shannon@epa.gov]

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Call-in number: Personal Privacy / Ex. 6

Agenda

1. EEM update from Ian
2. USDA Workgroup
3. Schedule update

I'll send out a summary after the meeting, if you are unable to attend.

BD

Message

From: Kabler, Lauren [Kabler.Lauren@epa.gov]
Sent: 4/11/2019 12:55:03 PM
To: Theis, Joseph [Theis.Joseph@epa.gov]; Brooks, Phillip [Brooks.Phillip@epa.gov]; Chapman, Apple [Chapman.Apple@epa.gov]; Belser, Evan [Belser.Evan@epa.gov]; Pollins, Mark [Pollins.Mark@epa.gov]; Saenz, Diana [Saenz.Diana@epa.gov]; Miles, James [miles.james@epa.gov]; Vizard, Elizabeth [Vizard.Elizabeth@epa.gov]
CC: Porter, Amy [Porter.Amy@epa.gov]
Subject: UPDATE - additional information/material provided RE: OIG Request to meet with AED, WED and WCED managers re: OIG Study: Enforcement Activities/Results
Attachments: OIG Interview Questions for OECA-OCE 12-18-18_with_links.docx

I'm attaching the list of topics Amy and I discussed with the OIG. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202.564.4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Theis, Joseph
Sent: Thursday, April 11, 2019 8:31 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>; Brooks, Phillip <Brooks.Phillip@epa.gov>; Chapman, Apple <Chapman.Apple@epa.gov>; Belser, Evan <Belser.Evan@epa.gov>; Pollins, Mark <Pollins.Mark@epa.gov>; Saenz, Diana <Saenz.Diana@epa.gov>; Miles, James <miles.james@epa.gov>; Vizard, Elizabeth <Vizard.Elizabeth@epa.gov>
Cc: Porter, Amy <Porter.Amy@epa.gov>
Subject: RE: OIG Request to meet with AED, WED and WCED managers re: OIG Study: Enforcement Activities/Results and some background/prep material

Lauren,
It would be helpful to see the list of topics for discussion the OIG had sent to you for the December meeting. I'll get back with you with proposed dates/times that would work.
- Joe

Joseph G. Theis
Associate Director
Water Enforcement Division
Office of Enforcement and Compliance Assurance

U.S. EPA (2243A)
1200 Pennsylvania Ave, NW
Washington, D.C. 20460
(202)564-4053

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From: Kabler, Lauren
Sent: Thursday, April 11, 2019 8:13 AM
To: Brooks, Phillip <Brooks.Phillip@epa.gov>; Chapman, Apple <Chapman.Apple@epa.gov>; Belser, Evan <Belser.Evan@epa.gov>; Pollins, Mark <Pollins.Mark@epa.gov>; Theis, Joseph <Theis.Joseph@epa.gov>; Saenz, Diana <Saenz.Diana@epa.gov>; Miles, James <miles.james@epa.gov>; Vizard, Elizabeth <Vizard.Elizabeth@epa.gov>
Cc: Porter, Amy <Porter.Amy@epa.gov>
Subject: OIG Request to meet with AED, WED and WCED managers re: OIG Study: Enforcement Activities/Results and some background/prep material

All - the OIG has asked to meet with the OCE Division managers (BCs optional) regarding their study on Enforcement Activities/Results (*see*, attached and below email chain). Note that OIG will also meet with Rosemarie and OSRE managers – all separate meetings. Note also that OIG will provide a list of topics for discussion prior to the meeting – the questions will be tailored to your Division. Note also that Amy and I met with OIG in late December regarding this study – if you are interested in seeing the list of topics for discussion sent to us by OIG please let me know and I will send.

Please send me, by **Friday COB**, two **two dates/times during the weeks of April 22nd and April 29th** that work for the managers in your Division. Thanks!

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Spriggs, Gwendolyn
Sent: Wednesday, April 10, 2019 10:47 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>; Keim, Stephen <Keim.Stephen@epa.gov>
Subject: RE: OIG Study: Enforcement Activities/Results

OK…

Here's what the OIG is requesting…all separate meetings:

OCE
Office Directors (1 hour)
Air Enforcement (1.5 hours)
Water Enforcement (1.5 hours)
Waste & Chemical Enforcement (1.5 hours)
No need to talk to crosscutting policy again

OSRE
Office Directors (1 hour)
Enforcement Division for Superfund (1.5 hours)
Enforcement Division for RCRA (1.5 hours)

If possible, pls provide two meeting time options for each meeting. That will help significantly with planning.

Thanks, GJS 56-2439

From: Kabler, Lauren
Sent: Wednesday, April 10, 2019 8:56 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>; Keim, Stephen <Keim.Stephen@epa.gov>
Subject: RE: OIG Study: Enforcement Activities/Results

Gwen – need some additional clarification from OIG in order to schedule. We have three Divisions – air, waste/chem and water – does OIG want separate meetings with each Division or just one meeting? Also, please confirm that OIG does not need to meet with our Crosscutting Policy office again (we met with Katie late 2018). Thanks!

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Spriggs, Gwendolyn
Sent: Wednesday, April 10, 2019 8:47 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>; Keim, Stephen <Keim.Stephen@epa.gov>
Subject: OIG Study: Enforcement Activities/Results

Lauren and Stephen,

OIG would like to schedule separate meetings with your offices. They're interested in discussing enforcement trends and the factors contributing to those trends. They specifically requested to meet with Division Directors, the branch chiefs are welcome and optional. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

They'd like to schedule these 90 minute meetings during the weeks of April 22nd or April 29th. The OIG will provide a list of topics for the discussion prior to the meeting.

Pls share at least two meeting times per office no later than Friday (4/12) before noon. If you have any questions…let me know.

GJS 564-2439

Message

From: Starfield, Lawrence [Starfield.Lawrence@epa.gov]
Sent: 9/16/2019 4:58:04 PM
To: Bodine, Susan [bodine.susan@epa.gov]
Subject: Fwd: NAEMS briefings
Attachments: Idsal Meeting Request: NAEMS and CAA Requirements ; ATT00001.htm

FYI.

Sent from my iPhone

Begin forwarded message:

> **From:** "Starfield, Lawrence" <Starfield.Lawrence@epa.gov>
> **Date:** September 16, 2019 at 11:53:57 AM EDT
> **To:** "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>, "Koslow, Karin" <Koslow.Karin@epa.gov>
> **Cc:** "Cari Shiffman (Shiffman.Cari@epa.gov)" <Shiffman.Cari@epa.gov>
> **Subject: NAEMS briefings**
>
> Rosemarie,
>
> Susan had two meetings on "CAA requirements for livestock and poultry operations and implications of the NAEMS project" on her calendar for this Thursday – one at 11 am and one at 4:30 pm.
>
>> -----Original Appointment-----
>> **From:** Idsal, Anne <idsal.anne@epa.gov>
>> **Sent:** Thursday, September 12, 2019 3:22 PM
>> **To:** Idsal, Anne; Harlow, David; Woods, Clint; Campbell, Ann; Tsirigotis, Peter; Koerber, Mike; Lassiter, Penny; Dunkins, Robin; Costa, Allison; Schrock, Bill; Leopold, Matt (OGC); Schwab, Justin; Marks, Matthew; Doster, Brian; Jordan, Scott; Bianco, Karen; Bodine, Susan; Kelley, Rosemarie; Sullivan, Tim; Smith, Darcie; South, Peter; Cozzie, David; Crowley, Kate; McKinney, Voronina; Joseph, Wanda; Hunt, Virginia; Eck, Janet
>> **Cc:** Srinivasan, Gautam; Lee, Michael
>> **Subject:** NAEMS and CAA Requirements
>> **When:** Thursday, September 19, 2019 4:30 PM-5:15 PM (UTC-05:00) Eastern Time (US & Canada).
>> **Where:** WJC - N 5400
>
> We are no longer seeing the 11 am meeting on her calendar, **Ex. 5 Deliberative Process (DP)**
>
> **Ex. 5 Deliberative Process (DP)**
>
> Also, if you receive briefing materials or otherwise have an update on whether OAR is ready to publish final emission estimating methodologies (triggering an end to OECA's Animal Feeding Operations Air Compliance Agreement), please let us know.
>
> Thanks.
>
> Larry

Message

From: McKinney, Voronina [mckinney.voronina@epa.gov]
Sent: 9/11/2019 1:51:38 PM
To: Rakosnik, Delaney [rakosnik.delaney@epa.gov]
CC: Jacks, Susan [Jacks.Susan@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Smith, Darcie [Smith.Darcie@epa.gov]; Joseph, Wanda [joseph.wanda@epa.gov]; Eck, Janet [Eck.Janet@epa.gov]
Subject: Idsal Meeting Request: NAEMS and CAA Requirements
Attachments: NAEMS CAA meeting request.docx

Good morning Delaney,

Idsal Meeting Request: *Please schedule this meeting with Anne re: NAEMS CAA meeting. Meeting request attached. Thank you, Nina*

From: Joseph, Wanda <joseph.wanda@epa.gov>
Sent: Wednesday, September 11, 2019 9:44 AM
To: Smith, Darcie <Smith.Darcie@epa.gov>; McKinney, Voronina <mckinney.voronina@epa.gov>
Cc: Dunkins, Robin <Dunkins.Robin@epa.gov>; Cozzie, David <Cozzie.David@epa.gov>; South, Peter <South.Peter@epa.gov>
Subject: NAEMS and CAA Requirements

Darcie

Attached is an OAR Meeting request for NAEMS and CAA Requirements. Please review and submit for scheduling.

Thanks,

Wanda Joseph
Administrative Specialist
Sector Policies and Programs Division
109 T.W. Alexander Drive, MC: D205-01
Research Triangle Park, NC 27711
(919) 541-3114

Message

Sent: 11/13/2019 12:07:31 PM
To: Starfield, Lawrence [Starfield.Lawrence@epa.gov]
CC: Patrick Traylor (traylor.patrick@epa.gov) [traylor.patrick@epa.gov]
Subject: RE: Quick Ag/NAEMS Update
Attachments: NAEMS Overview_090319_final.docx; AFO Air Compliance Agreement - Background Info_01.19.2018.docx; NAEMS Schedule_6.8.18_v3.docx

Looks like Patrick is invited to the 11:00 on Thursday. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Tuesday, September 17, 2019 4:16 PM
To: Bodine, Susan <bodine.susan@epa.gov>
Subject: Fwd: Quick Ag/NAEMS Update

Susan,

As further background for the NAEMS meeting(s), here's an email from Tim Sullivan with some additional thoughts.

Larry

Sent from my iPhone

Begin forwarded message:

> **From:** "Sullivan, Tim" <Sullivan.Tim@epa.gov>
> **Date:** September 16, 2019 at 7:46:54 PM EDT
> **To:** "Starfield, Lawrence" <Starfield.Lawrence@epa.gov>
> **Cc:** "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>, "Buterbaugh, Kristin" <Buterbaugh.Kristin@epa.gov>, "Sullivan, Tim" <Sullivan.Tim@epa.gov>
> **Subject: RE: Quick Ag/NAEMS Update**
>
> Larry:

Ex. 5 AC/DP

I only have the 4:30 pm eastern meeting on my calendar – I have not seen or heard anything about an 11 am eastern meeting.

Finally, I have attached the standard Air Compliance Agreement template and my notes on the Agreement's compliance requirements for reference. I am happy to discuss any of these issues ahead of Thursday's meeting.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Monday, September 16, 2019 12:12 PM
To: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: RE: Quick Ag/NAEMS Update

Thank you – this is very helpful.

Ex. 5 AC/DP

Larry

From: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Sent: Monday, September 16, 2019 12:31 PM
To: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: FW: Quick Ag/NAEMS Update
Importance: High

Larry—

On September 5, Tim Sullivan participated in an informational briefing for Anne Idsal on the Animal Feeding Operations (AFO) National Air Emissions Monitoring Study (NAEMS) and the Air Compliance Agreement. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

I only see a 4:30 meeting on the calendar for Thursday. Tim and I plan to participate. I do not know about the 11 am meeting that is referenced in the email you sent.

Rosemarie

From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Thursday, September 5, 2019 1:03 PM
To: Bianco, Karen <Bianco.Karen@epa.gov>; Jordan, Scott <Jordan.Scott@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Quick Ag/NAEMS Update

Hi Karen and Scott,

Anne Idsal requested a briefing on NAEMS (our ongoing project to characterize emissions from livestock/poultry farms), which we held today. Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP Robin gave Matt Marks a brief call as a heads up and I said I would follow up with you as well.

Matt said we should invite the two of you, as well as Brian Doster and another staff person who works on related permitting topics. Do either of you know offhand who that is or could you ask him? (Robin didn't write the name down.)

Tim/Bill – Ex. 5 AC/DP

Ex. 5 AC/DP

Tim – can you give me a list of names to include on the invite for OECA?

From all – any input you have on how to frame the agenda questions would be much appreciated.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

Message

From: bodine.susan@epa.gov [bodine.susan@epa.gov]
Sent: 9/19/2019 12:01:08 AM
To: Starfield, Lawrence [Starfield.Lawrence@epa.gov]
Subject: Re: NAEMS Update: VOC Call for Info Signed

Both meetings were canceled

Sent from my iPhone

On Sep 18, 2019, at 6:41 PM, Starfield, Lawrence <Starfield.Lawrence@epa.gov> wrote:

FYI.

Sent from my iPhone

Begin forwarded message:

From: "Sullivan, Tim" <Sullivan.Tim@epa.gov>
Date: September 18, 2019 at 3:18:16 PM EDT
To: "Starfield, Lawrence" <Starfield.Lawrence@epa.gov>, "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>
Cc: "Buterbaugh, Kristin" <Buterbaugh.Kristin@epa.gov>, "Sullivan, Tim" <Sullivan.Tim@epa.gov>
Subject: FW: NAEMS Update: VOC Call for Info Signed

Larry and Rosemarie:

Tomorrow's 4:30 pm eastern meeting with OAR, OGC, and OECA on AFO air issues has been cancelled. Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP)
However, Anne signed the Call for Information Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP) Additional information on the Call for Information can be found in the email below. Please contact me with any questions.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Wednesday, September 18, 2019 12:36 PM
To: Schrock, Bill <Schrock.Bill@epa.gov>; Do, Bebhinn <do.bebhinn@epa.gov>; Dunkins, Robin <Dunkins.Robin@epa.gov>; Crowley, Kate <crowley.kate@epa.gov>; Lowe, Theresa <Lowe.Theresa@epa.gov>; Thompson, Rhonda <Thompson.Rhonda@epa.gov>; Rumsey, Ian <rumsey.ian@epa.gov>; Yelverton, William <Yelverton.William@epa.gov>; Walker, JohnT <Walker.Johnt@epa.gov>; Nash, Maliha <Nash.Maliha@epa.gov>; Croghan, Carry <Croghan.Carry@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: NAEMS Update: VOC Call for Info Signed

Hi all,

Good news! The NAEMS Call for Information for additional VOC data was signed today. We've posted the pre-publication version on our website and will update that with the official Federal Register notice when that is available.

Direct link: https://www.epa.gov/afos-air/naems-call-information-information-related-development-emission-estimating-methodologies
NAEMS webpage: https://www.epa.gov/afos-air/national-air-emissions-monitoring-study#naems-status

It usually takes a couple of weeks for a notice to get through all of the process steps and be published, so it's likely that it will publish in early October. Then, we asked for public submissions of information within 60 days. Feel free to give me a call if you have any questions.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

Message

From: Starfield, Lawrence [Starfield.Lawrence@epa.gov]
Sent: 9/17/2019 8:15:34 PM
To: Bodine, Susan [bodine.susan@epa.gov]
Subject: Fwd: Quick Ag/NAEMS Update
Attachments: NAEMS Overview_090319_final.docx; ATT00001.htm; AFO CAFO - Standard Agreement.pdf; ATT00002.htm; AFO CAFO - Compliance Req Notes.docx; ATT00003.htm

Susan,

As further background for the NAEMS meeting(s), here's an email from Tim Sullivan with some additional thoughts.

Larry

Sent from my iPhone

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> **Subject: RE: Quick Ag/NAEMS Update**
>
> Larry:
>
> Ex. 5 AC/DP
>
> I only have the 4:30 pm eastern meeting on my calendar – I have not seen or heard anything about an 11 am eastern meeting.
>
> Finally, I have attached the standard Air Compliance Agreement template and my notes on the Agreement's compliance requirements for reference. I am happy to discuss any of these issues ahead of Thursday's meeting.
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> Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
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1595 Wynkoop Street (MC 8MSU)
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Sent: Monday, September 16, 2019 12:12 PM
To: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: RE: Quick Ag/NAEMS Update

Thank you – this is very helpful.

Ex. 5 AC/DP

Larry

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Sent: Monday, September 16, 2019 12:31 PM
To: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: FW: Quick Ag/NAEMS Update
Importance: High

Larry—

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Ex. 5 Deliberative Process (DP)

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Sent: Thursday, September 5, 2019 1:03 PM
To: Bianco, Karen <Bianco.Karen@epa.gov>; Jordan, Scott <Jordan.Scott@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Quick Ag/NAEMS Update

Hi Karen and Scott,

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Ex. 5 AC/DP

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Tim/Bill – Ex. 5 AC/DP

Ex. 5 AC/DP

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Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

IN THE MATTER OF	)	
[Participating Company]	)	CONSENT AGREEMENT AND
	)	FINAL ORDER
	)	CAA-HQ-2005-XX
	)	CERCLA-HQ-2005-XX
	)	EPCRA-HQ-2005-XX

I. Preliminary Statement

1. The United States Environmental Protection Agency (EPA) and [Participating Company] (Respondent) voluntarily enter into this Consent Agreement and Final Order (Agreement) to address emissions of air pollutants and hazardous substances from certain animal feeding operation(s) that may be subject to requirements of the Clean Air Act, the hazardous substance release notification provisions of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the emergency notification provisions of the Emergency Planning and Community Right-to-Know Act (EPCRA).

2. The purpose of this Agreement is to ensure that

[Participating Company] complies with applicable requirements of the Clean Air Act and applicable release notification provisions of CERCLA and EPCRA. To that end, this Agreement requires [Participating Company], among other things, to be responsible for the payment of funds towards a two-year national air emissions monitoring study that will lead to the development of Emissions-Estimating Methodologies that will help animal feeding operations determine and comply with their regulatory responsibilities under the Clean Air Act, CERCLA and EPCRA.

3. This Agreement is issued pursuant to section 113 of the Clean Air Act, 42 U.S.C. §7413 (federal enforcement of the Clean Air Act); sections 103 and 109 of CERCLA, 42 U.S.C. §§9603 and 9609 (federal enforcement of notification provisions); section 325 of EPCRA, 42 U.S.C. §11045 (federal enforcement of EPCRA notification provisions); and 40 CFR 22.13(b) and 22.18(b)(2) and (3) (procedural requirements for the quick resolution and settlement of matters before the filing of an administrative complaint). Respondent's participation in this Agreement is not an admission of liability. At this time, Respondent neither admits nor denies that any of its Farms is subject to CERCLA or EPCRA reporting or Clean Air Act permitting requirements, or is in violation of any provision of CERCLA, EPCRA or the Clean Air Act. The execution of this Agreement by Respondent is not an admission that any of its agricultural operations has been

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operated negligently or improperly, or that any such operation is or was in violation of any federal, state or local law or regulation.

4. As described more specifically in paragraphs 26 and 35 below, this Agreement resolves Respondent's civil liability for certain potential violations of the Clean Air Act, CERCLA and/or EPCRA at [Participating Company's] Farm(s) listed in Attachment A. The release and covenant not to sue found in paragraph 26 resolves only violations identified and quantified by applying the Emissions-Estimating Methodologies developed using data from the national air emissions monitoring study described herein.

5. This Agreement is one of numerous identical agreements between EPA and animal feeding operations across the nation. Through these agreements, EPA and participating animal feeding operations aim to assist in the development of improved Emissions-Estimating Methodologies for air emissions from animal feeding operations and to ensure that all animal feeding operations are in compliance with applicable Clean Air Act, CERCLA and EPCRA requirements. Notwithstanding any other provision, this Agreement shall not delay or interfere with the implementation or enforcement of State statutes that eliminate exemptions to Clean Air Act requirements for agricultural sources of air pollution.

6. EPA may decline to enter into this Agreement with animal

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feeding operations (and their successors and assigns) that have been notified by EPA or a State that they currently may be subject to a Federal or State Clean Air Act, CERCLA section 103 or EPCRA section 304(a) enforcement action.

II. Definitions

7. Unless otherwise defined herein, terms used in this Agreement shall have the same meaning given to those terms in the Clean Air Act, 42 U.S.C. §7401 et seq.; the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §9601 et seq.; the Emergency Planning and Community Right-to-Know Act, 42 U.S.C. §11001 et seq., and the implementing regulations promulgated thereunder. For purposes of this Agreement only, the following terms shall have the following meanings.

8. The term "Agricultural Waste" or "Agricultural Livestock Waste" means Livestock manure, wastewater, litter including bedding material for the disposition of manure, and egg washing or milking center waste treatment and storage. "Agricultural Livestock" or "Livestock" include dairy cattle, swine and/or poultry among others.

9. The term "Contract Grower" means the owner or operator of a Farm that raises Livestock or produces milk or eggs under a contract with Respondent.

10. The term "Emissions-Estimating Methodologies" means

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those procedures that will be developed by EPA, based on data from the national air emissions monitoring study and any other relevant data and information, to estimate daily and total annual emissions from individual Emission Units and/or Sources. These methodologies will be published on EPA's website (www.epa.gov).

11. The term "Emission Unit" means any part of a Farm that emits or may emit Volatile Organic Compounds (VOCs), Hydrogen Sulfide (H2S), Ammonia (NH3), or Particulate Matter (TSP, PM10 and PM2.5) and is either: (a) a building, enclosure, or structure that permanently or temporarily houses Agricultural Livestock; or (b) a lagoon or installation that is used for storage and/or treatment of Agricultural Waste.

12. The term "Environmental Appeals Board" or "EAB" means the permanent body with continuing functions designated by the Administrator of EPA under 40 CFR 1.25(e) whose responsibilities include approving administrative settlements commenced at EPA Headquarters.

13. The term "Facility" shall mean "CERCLA Facility and/or EPCRA Facility." The term "CERCLA Facility" shall have the meaning given that term under section 101(9) of CERCLA, 42 U.S.C. §9601(9). The term "EPCRA Facility" shall have the meaning given that term under section 329(4) of EPCRA, 42 U.S.C. §11049(4).

14. The term "Farm" shall mean the production area(s) of an animal feeding operation, adjacent and under common ownership,

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where animals are confined, including animal lots, houses or barns; and Agricultural Waste handling and storage facilities. "Farm" does not include land application sites for Agricultural Waste. This definition is limited exclusively to this Agreement and establishes no precedent for the interpretation of any statute, regulation or guidance.

15. The term "Nuisance" is defined according to State and local common law, statutes, regulations, ordinances or usage.

16. The term "Permitting Authority" means the local, State or Federal government entity with jurisdiction to require compliance with the permitting requirements of the Clean Air Act.

17. The term "Independent Monitoring Contractor" means a person or entity that is not affiliated with Respondent or any other animal feeding operation, that has sufficient experience and expertise to fully implement the national air emissions monitoring study described herein, that meets the qualifications set forth in Attachment B to this Agreement, and that is approved by EPA.

18. The term "Qualifying Release" means a release that triggers a reporting requirement under section 103 of CERCLA or section 304 of EPCRA.

19. The term "Respondent" means [Participating Company].

20. The term "Source" shall have the meaning given to the term "stationary source" in the implementing regulations of the

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Clean Air Act at 40 CFR 52.21(b)(5) through (6), as interpreted by applicable guidance issued by EPA.

21. The term "State or Local Authority" means a state or local government entity with jurisdiction over Respondent's Farm(s).

III. Consent Agreement

22. EPA and Respondent have agreed to resolve this matter by executing this Agreement, as further set forth herein.

23. Respondent asserts that it either owns, operates or otherwise controls, or contracts with Contract Growers who own, operate or otherwise control, the Farm(s) listed in Attachment A to this Agreement. Respondent agrees that this Agreement applies only to the Farm(s) that are listed in Attachment A and contain one or more Emission Unit(s) as defined in paragraph 11 and described in Attachment A.

24. For the purpose of this proceeding, Respondent does not contest the jurisdiction of the Environmental Appeals Board.

25. As specified more fully below, Respondent consents to pay a civil penalty, to be responsible for the payment of funds to the national air emissions monitoring study, and to facilitate implementation of the monitoring study, including making certain Farms available for monitoring.

26. In consideration of Respondent's obligations under this Agreement and subject to the limitations and conditions set forth

ED_004549_00002822-00007

in paragraphs 27-30, 33, 34, 36, 37 and 43, EPA releases and covenants not to sue Respondent, with respect to the listed Emission Units located at the Farm(s) in Attachment A, for:

(A) civil violations of the permitting requirements contained in Title I, Parts C and D, and Title V of the Clean Air Act, and any other federally enforceable State implementation plan (SIP) requirements for major or minor sources based on quantities, rates, or concentrations of air emissions of pollutants that will be monitored under this Agreement, namely Volatile Organic Compounds (VOCs), Hydrogen Sulfide (H2S), Particulate Matter (TSP, PM10 and PM2.5), and Ammonia (NH3); and

(B) civil violations of CERCLA section 103 or EPCRA section 304 from air emissions of Hydrogen Sulfide (H2S) or Ammonia (NH3) that are not singular unexpected or accidental releases such as those caused by an explosion, fire or other abnormal occurrence.

27. (a) The releases and covenants not to sue described in paragraphs 26 and 35 extend only to violations of the requirements identified in those paragraphs and apply only to emissions from Agricultural Waste at Emission Units (as defined in paragraph 11). They do not extend to any other requirements including but not limited to: (i) any possible requirements that relate to emissions generated by other equipment or activities co-located at the Farm, including waste-to-energy systems; (ii)

ED_004549_00002822-00008

activities at open cattle feedlots for beef production; (iii) Clean Air Act permitting requirements triggered by an expansion of a Farm beyond its design capacity as of the date this Agreement is executed; or (iv) requirements that are not triggered by the quantity, concentration or rate of emission of Volatile Organic Compounds (VOCs), Hydrogen Sulfide (H2S), Particulate Matter (TSP, PM10 and PM2.5) or Ammonia (NH3), including work practice requirements and equipment specifications.

(b) The release and covenants not to sue in paragraphs 26 and 35 shall apply to the liability of a Contract Grower with respect to a Farm if and only if the Contract Grower executes an Agreement with EPA covering that Farm.

28. The release and covenant not to sue described in paragraph 26 covers Respondent's liability for violations with respect to an Emission Unit located at a Farm listed in Attachment A if and only if Respondent complies with all applicable requirements of this Agreement and, with respect to that Emission Unit:

(A) Within 120 days after receiving an executed copy of this Agreement, for any Farm that confines more than 10 times the "large Concentrated Animal Feeding Operation" threshold of an

animal species[1], the animal feeding operation provides to the National Response Center (NRC) and to the relevant local and state emergency response authorities written notice describing its location and stating substantially as follows:

> This operation raises [species] and may generate routine air emissions of Ammonia in excess of the reportable quantity of 100 pounds per 24 hours. A rough estimate of those emissions is [__] pounds per 24 hours, but this estimate could be substantially above or below the actual emission rate, which is being determined through an ongoing monitoring study in cooperation with the U.S. Environmental Protection Agency. When that emission rate has been determined by this study, we will notify you of any reportable releases pursuant to CERCLA section 103 or EPCRA section 304. In the interim, further information can be obtained by contacting [insert contact information for a person in charge of the operation].

Respondent shall provide to EPA, at the address in paragraph 64, a copy of any written notice given pursuant to this subparagraph. This interim notice shall be provided to satisfy the terms of this Agreement only and is not intended to establish a precedent or standard for reporting under CERCLA or EPCRA.

(B) Where application of the Emissions-Estimating Methodologies establishes that no Clean Air Act requirements or

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[1] This definition is being used in this Agreement solely for the purpose of determining the penalty assessed, and for certain limited reporting purposes. "Large Concentrated Animal Feeding Operation" is defined as: (a) 2,500 swine weighing more than 55 pounds; (b) 10,000 swine weighing less than 55 pounds; (c) 82,000 laying hens; (d) 125,000 broilers; (e) 55,000 turkeys; or (f) 700 mature dairy cows or 1000 dairy heifers.

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that no CERCLA or EPCRA notifications are required for a Source or Facility, Respondent shall so certify to EPA in writing within 60 days after EPA publishes Emissions-Estimating Methodologies applicable to the Emission Units at the Source or Facility. Any such certification shall identify each Source or Facility covered by the certification and the Emissions-Estimating Methodology used to calculate its emissions. If EPA notifies Respondent that this certification is not correct because application of the Emissions-Estimating Methodologies indicates that the Source or Facility is subject to such requirements, Respondent shall have 90 days from notification by EPA to comply with the provisions in paragraph 28(C) or submit, in writing, clear and convincing proof to EPA that Respondent's certification is correct.

(C) Respondent complies with all of the applicable requirements set forth below:

(i) Within 120 days after EPA has published Emissions-Estimating Methodologies applicable to the Emission Units at Respondent's Source, Respondent submits all Clean Air Act permit applications required by the Permitting Authority for the Source, based on application of those Emissions-Estimating Methodologies.

(a) For a Source whose emissions exceed the major source threshold in Title I, Part C or D, based on the area's attainment status (e.g., in an attainment area, more than

250 tons per year of a regulated pollutant), this requirement includes:

(1) applying for and ultimately obtaining a permit that contains a federally enforceable limitation or condition that limits the potential to emit of the Source to less than the applicable major source threshold for the area where the Source is located; or,

(2) installing best available control technology (BACT) in an attainment area, or technology meeting the lowest achievable emission rate (LAER) if the Source is located in a nonattainment area, as determined by and in accordance with the schedule provided by the Permitting Authority for the Source, and obtaining a federally enforceable permit that incorporates an appropriate BACT or LAER limit. For the purposes of this Agreement, compliance with the requirements found in 40 CFR 52.21(k) through (p) is not a condition of the release and covenant not to sue described in paragraph 26. Nothing in this paragraph is intended to limit a state or local government's authority to impose applicable permitting requirements. Emission reductions that result from installing BACT or LAER may not be used in netting calculations to offset emissions from a future modification to the Source.

(b) The annual emissions from a particular Source shall be determined based on Respondent's current

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operating methods and on the maximum number of animals housed at the Source at any time over the 24 months prior to EPA's publication of the applicable Emissions-Estimating Methodologies.

(c) Respondent promptly and fully responds to any notices of deficiency (or other equivalent notification that the permit application is incomplete or incorrect) issued by the Permitting Authority with respect to the permit application(s).

(d) As described in paragraph 34, below, Farms installing waste-to-energy systems will have an additional 180 days to submit the above-referenced permit applications.

(ii) Within 120 days after EPA has published Emissions-Estimating Methodologies applicable to Emission Units at Respondent's Facility, Respondent reports all Qualifying Releases of Hydrogen Sulfide (H2S) and Ammonia (NH3) in accordance with section 103 of CERCLA and section 304 of EPCRA.

(iii) Respondent timely installs all emission control equipment and implements all practices required by this Agreement or contained in the Clean Air Act permits issued in response to the applications submitted in accordance with subparagraph (i) of this paragraph.

(iv) Respondent provides EPA with written certification that it has timely installed all emission control equipment and implemented all practices required by this

Agreement or contained in the Clean Air Act permits issued in response to the applications submitted in accordance with subparagraph (i) of this paragraph, within 30 days of meeting those requirements or within 30 days of acknowledgment of compliance by the Permitting Authority if such acknowledgment is required.

(D) Respondent's failure to comply with any of the above requirements in this paragraph at any particular Source shall affect the release and covenant not to sue for the noncompliant Source only and shall not affect the release and covenant not to sue for Respondent's complying Sources. In addition, Respondent’s failure to comply with any of the above requirements in this paragraph at any particular Facility shall affect the release and covenant not to sue for the noncompliant Facility only and shall not affect the release and covenant not to sue for Respondent’s complying Facilities.

29. For any Farm listed in Attachment A that is owned and operated by a Contract Grower, Respondent is not responsible for complying with paragraphs 28, 30 and 60. However, the release and covenant not to sue described in paragraph 26 covers Respondent's liability for violations with respect to the Emission Units located at such Farm if, and only if, the Contract Grower complies with all the requirements of paragraph 28. The Contract Grower's liability for violations with respect to the

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Emission Units located at that Farm is not covered by any of the releases and covenants not to sue set forth in this Agreement. However, the Contract Grower may enter its own agreement with EPA (thus becoming a respondent in its own agreement) and obtain similar conditional releases and covenants not to sue with respect to the emission units at its farm.

30. In addition, the release and covenant not to sue described in paragraph 26 covers violations with respect to the Emission Units located at a Farm listed in Attachment A if, and only if, Respondent complies with the following requirements, with respect to that Farm:

(A) During the period in which potential violations at the Farm are covered by the release and covenant not to sue as described in paragraph 26, Respondent complies with all final actions and final orders issued by the State or Local Authority that address a Nuisance arising from air emissions at the Farm and that are:

(i) issued after Respondent has been given notice and opportunity to be heard (including any available judicial review) as required by applicable state or local law; and,

(ii) issued during the time period in which potential violations at the Farm are covered by the release and covenant not to sue as described in paragraph 26.

(B) Within 60 days of coming into compliance with the

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final action or order of the State or Local Authority, Respondent provides EPA with written certification that Respondent has complied with the final action or final order and within the time schedule approved by the State or Local Authority.

31. Respondent agrees that the statute of limitations for all claims covered by the release and covenant not to sue in paragraph 26 will be tolled from the date this Agreement is approved by the EAB and until the earlier of: (a) 120 days after Respondent files the required certifications in accordance with paragraph 28(B) or paragraph 28(C)(iv), or (b) December 31, 2011. This time period can be extended by written agreement of both parties.

32. EPA will publish Emissions-Estimating Methodologies within 18 months of the conclusion of the monitoring period and will publish such Methodologies on a rolling basis as soon as they are developed. If EPA's Science Advisory Board determines that EPA is unable to publish Emissions-Estimating Methodologies applicable to a particular type of Emission Unit in Attachment A within 18 months of the conclusion of the monitoring period because of inadequate data, EPA will attempt to resolve such data problems as soon as possible. EPA's inability to publish an Emissions-Estimating Methodology for a particular type of Emission Unit in Attachment A within 18 months shall have no effect on any other deadline or provision of this Agreement for

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any other type of Emission Unit listed in Attachment A.

33. As a condition of its participation in this Agreement, Respondent agrees to accept, regardless of any collateral proceeding, the study protocols employed in and the emissions data developed by, the national air emissions monitoring study conducted under the plan described in paragraphs 53 through 63 below. If Respondent challenges the protocols employed or the data developed, the release and covenant not to sue described in paragraph 26 of this Agreement will become null and void and will have no effect on Respondent's past or future liability.

34. Respondent may choose to install and operate one or more systems that process Agricultural Livestock Waste to produce electricity (a waste-to-energy system). If Respondent selects this option, it will have, with respect to a Farm at which such a system will be installed, an additional 180 days to comply with the requirements of paragraph 28 provided the following requirements are met, with respect to that Farm:

(A) Within 120 days after EPA has published Emissions-Estimating Methodologies applicable to the Emission Units at Respondent's Source, Respondent provides EPA with a written certification that it intends to install a waste-to-energy system, identifies each Farm at which such a system is or will be installed, and describes the type of waste-to-energy system installed and the percentage by volume of

Agricultural Waste processed by the system at each Farm.

(B) The waste-to-energy system processes at least 50 percent of the Agricultural Waste by volume produced at the Farm.

(C) Respondent makes each Farm at which a waste-to-energy system is installed available for inspection by EPA.

(D) Respondent agrees to operate the waste-to-energy system for 24 months from the first date of operation or the date EPA publishes Emissions-Estimating Methodologies for the Emission Units at Respondent's Source, whichever is later. If during that 24-month period Respondent has to shut down the waste-to-energy system, the benefits of this paragraph will still be applicable if Respondent has made all reasonable efforts to maintain and operate the system.

(E) Respondent obtains, within applicable time limits, all required federal and state permits needed to construct and operate the waste-to-energy system at the Farm.

35. Subject to paragraphs 27, 37 and 43, if during the pendency of the nationwide monitoring study, Respondent promptly reports and corrects a civil violation of a federally approved SIP or an approved Federal implementation plan (FIP) resulting from emissions of Volatile Organic Compounds (VOCs), Hydrogen Sulfide (H2S), Ammonia (NH3), or Particulate Matter (TSP, PM10, and PM2.5) from a Farm listed in Attachment A that causes or

ED_004549_00002822-00018

contributes to a violation of any provision of the federally approved SIP that requires compliance with an ambient air quality standard at the Farm's property line, EPA releases and covenants not to sue Respondent for the reported and corrected violation if, and only if, the conditions set forth below are met:

(A) Unless Respondent first learned of the violation through a notice from EPA, Respondent provides notice of the violation to EPA and the applicable Permitting Authority within 21 days of Respondent's discovery of the violation or the final order of the EAB approving this Agreement, whichever is later;

(B) Respondent corrects the violation, including making any necessary adjustments to its operations at the Farm to prevent the violation from happening again, within 60 days after notice is given by Respondent or EPA as described in subparagraph (A) above. If the violation cannot reasonably be corrected within 60 days, Respondent must, before the end of the 60-day time period, submit a plan that is ultimately approved by EPA and the applicable Permitting Authority to correct the violation and must comply with the approved plan in accordance with the specified schedule. Within 30 days of correcting the violation, Respondent shall submit a written certification to EPA indicating that it has corrected the violation in accordance with the approved plan; and,

(C) The violation is not a repeated violation that

Respondent previously reported to EPA pursuant to this paragraph. Respondent may rectify the loss of the above release and covenant not to sue for the first instance of a repeat violation; however, if it pays a stipulated penalty of $500 a day for each day that the Farm exceeds the ambient air quality standard, and it meets the requirements of subparagraphs (A) and (B), except that the time to correct the violation shall be 30 days instead of 60 days.

36. All certifications that Respondent must submit to comply with this Agreement shall include the following statement:

> I certify under penalty of law that the information contained in this submittal to EPA is accurate, true, and complete. I understand that there are significant civil and criminal penalties for making false or misleading statements to the United States government.

The above statement shall be signed by a responsible official for the Respondent (i.e., the owner if Respondent is a sole proprietorship, the managing partner if Respondent is a partnership, or a responsible corporate official if Respondent is an incorporated entity).

37. The releases and covenants not to sue described in paragraphs 26 and 35 do not cover Respondent's liability for any violation with respect to an Emission Unit located at a Farm if Respondent fails to comply with any of the applicable requirements of this Agreement with respect to that Emission Unit, including the limitations and conditions in paragraphs

ED_004549_00002822-00020

26-29 and 33-34 above. The releases and covenants not to sue described in paragraphs 26 and 35 cover only violations with respect to the Emission Units located at the Farm that occur before the earlier of: (a) the date Respondent submits the last required certification covering those Emission Units; or (b) 2 years after Respondent submits any permit applications pursuant to paragraph 28(C)(i). This time period can be extended by a period not to exceed 6 months upon written agreement of both parties provided the Respondent's action or inaction is not the cause of any delay in obtaining a permit.

38. EPA will notify Respondent if EPA has determined that it cannot develop Emissions-Estimating Methodologies for any Emission Units listed in Attachment A.

(A) This notice shall identify (individually or by category) Emission Units, Sources and/or Facilities for which Emissions-Estimating Methodologies cannot be developed.

(B) For the Emission Units identified in such a notice:

(i) no certification under paragraph 28 shall be required for those Emission Units and any other related Emission Units that comprise the Source or Facility; and,

(ii) the releases and covenants not to sue described in paragraphs 26 and 35 shall cover potential violations that occur on or before 120 days after the date the

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notice is mailed, but shall not cover potential violations that occur more than 120 days after that date.

(C) Notice required under this paragraph will be deemed proper if sent via U.S. mail postage prepaid to the address listed in Attachment A.

39. The execution of this Agreement is not an admission of liability by Respondent, and Respondent neither admits nor denies that it has violated any provisions of the Clean Air Act, CERCLA or EPCRA.

40. Respondent waives its right to request an adjudicatory hearing on this Agreement, and its right, created by Clean Air Act section 113(a)(4), to confer with the Administrator before this Agreement takes effect. Respondent further waives its right to seek judicial review of the penalty assessed in paragraph 48.

41. Respondent and EPA represent that they are duly authorized to execute this Agreement, and that the persons signing this Agreement on their behalf are duly authorized to bind Respondent and EPA, respectively, to the terms of this Agreement.

42. Respondent agrees not to claim or attempt to claim a federal income tax deduction or credit covering all or any part of the civil penalty paid to the United States Treasurer. Any payments made in connection with the national air emissions monitoring study do not constitute a fine or penalty and are not

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paid in settlement of any actual or potential liability for a fine or penalty.

43. This Agreement is without prejudice to all rights of EPA against Respondent with respect to any claims not expressly covered by the releases and covenants not to sue contained in paragraphs 26 and 35. This Agreement does not limit in any way EPA's authority to restrain Respondent or otherwise act in any situations that may present an imminent and substantial endangerment to public health, welfare or the environment. In addition, the releases and covenants not to sue in paragraphs 26 and 35 do not cover any criminal liability.

44. With respect to any claims not expressly released herein, in any subsequent administrative or judicial proceeding initiated by the United States for injunctive relief, penalties, recovery of response costs or other relief relating to a Farm listed in Attachment A, Respondent shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting or other defenses based upon any contention that the claims raised by the United States in the subsequent proceeding were or should have been brought in the instant proceeding.

45. Respondent recognizes that EPA may not execute this Agreement if EPA determines that there will be inadequate funding

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for the national air emissions monitoring study or if EPA determines that there is inadequate representation of eligible animal groups and types of Farms, Facilities or Emission Units.

46. Respondent and EPA stipulate to the issuance of the proposed Final Order below.

[Participating Company], Respondent

By:_____

(Print Name):_____

Title:_____

Dated:_____

U.S. Environmental Protection Agency, Complainant

By:_____

Title:_____

Dated:_____

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IV. Final Order

It is hereby ordered and adjudged as follows:

Compliance

47. Respondent shall comply with all terms of this Agreement.

Penalty

48. Respondent is hereby assessed a penalty based on the number and size of the Farms listed in Attachment A as follows:

(A) If Respondent has only one Farm and that Farm is below the "large Concentrated Animal Feeding Operation" threshold for that animal species[2], Respondent is assessed a penalty of $200.

(B) All other Respondents are assessed a penalty of $500 per Farm, unless the Farm contains more than 10 times the total number of animals that defines the "large Concentrated Animal Feeding Operation" threshold. For those Farms, Respondent is assessed a penalty of $1,000 per Farm.

(C) The total penalty paid by Respondent shall not exceed:

$10,000 if Attachment A lists 1-10 Farms
$30,000 if Attachment A lists 11-50 Farms
$60,000 if Attachment A lists 51-100 Farms
$80,000 if Attachment A lists 101-150 Farms
$90,000 if Attachment A lists 151-200 Farms

[2] Ibid.

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$100,000 if Attachment A lists more than 200 Farms.

49. Respondent shall pay the assessed penalty no later than 30 calendar days from the date an executed copy of this Agreement is received by Respondent (hereinafter referred to as the "Agreement Date").

50. All penalty assessment monies under this Agreement shall be paid by certified check or money order, payable to the United States Treasurer, and mailed to: U.S. Environmental Protection Agency (Washington, D.C. Hearing Clerk), P.O. Box 360277, Pittsburgh, Pennsylvania 15251-6277. A transmittal letter, indicating Respondent's name, complete address, and this case docket number must accompany the payment. Respondent shall file a copy of the check and of the transmittal letter by mailing it to:

Headquarters Hearing Clerk
US EPA
1921 Jefferson Davis Hwy
Crystal Mall #2, Room 104
Arlington, VA 22202.

51. Failure to pay the penalty assessed under this Agreement may subject Respondent to a civil action pursuant to section 113(d)(5) of the Clean Air Act, 42 U.S.C. §7413(d)(5), to collect any unpaid portion of the monies owed, together with interest, handling charges, enforcement expenses, including attorney fees and nonpayment penalties. In any such collection action, the validity, amount or appropriateness of this Order or

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the penalty assessed hereunder is not subject to review.

52. Pursuant to 42 U.S.C. §7413(d)(5) and 31 U.S.C. §3717, Respondent shall pay the following amounts:

(A) Interest. Any unpaid portion of the assessed penalty shall bear interest at the rate established pursuant to 26 U.S.C. §6621(a)(2) from the date an executed copy of this Agreement is received by Respondent; provided, however, that no interest shall be payable on any portion of the assessed penalty that is paid within 30 days of the Agreement Date.

(B) Attorney Fees, Collection Cost, Nonpayment Penalty. Should Respondent fail to pay on a timely basis the amount of the assessed penalty, Respondent shall be required to pay, in addition to such penalty and interest, the United States' enforcement expenses, including but not limited to attorney fees and costs incurred by the United States for collection proceedings, and a quarterly nonpayment penalty for each quarter during which such failure to pay persists. Such nonpayment penalty shall be 10 percent of the aggregate amount of Respondent's outstanding penalties and nonpayment penalties accrued from the beginning of such quarter.

(C) Payment. Interest, attorney fees, collection costs, and nonpayment penalties related to Respondent's failure to timely pay the assessed penalty shall be made in accordance with subparagraphs (A) and (B) of this paragraph.

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Monitoring Fund

53. Respondent has a shared responsibility for funding and implementing the national air emissions monitoring study described in paragraphs 53 through 63.

(A) Respondent individually shall be responsible for paying the lesser of: (a) $2,500 for each Farm listed in Attachment A to this Agreement; or (b) Respondent's pro rata share of the amount needed to fully fund the monitoring study ("Full Funding Level"), including any unfunded balance of the monitoring study, consistent with the provisions of paragraph 62. Respondent's pro rata share shall be based on the number of Farms listed in Attachment A divided by the total number of discrete Farms of the same species that share responsibility for funding the national monitoring study. The Full Funding Level is the amount of money actually needed to fully and adequately fund the monitoring study described in this Agreement. The Full Funding Level shall be initially estimated within 60 days of the Agreement date and shall be included as part of the proposed plan to conduct the monitoring described in paragraph 55. The estimated Full Funding Level shall be used to determine the pro rata share of the monitoring fund payment for which Respondent is initially responsible. Any shortfalls that occur because the estimated Full Funding Level was less than the actual Full Funding Level shall be handled in accordance with this paragraph

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and paragraph 62.

(B) Respondent shall have no obligation to contribute money to the national monitoring study on behalf of a Farm listed in Attachment A if: (a) that Farm has been listed as a contract farm in another agreement that is identical to this agreement except for the respondent involved, and (b) the respondent to the other Agreement has agreed to be responsible for the payment of monies into the monitoring study for that Farm.

54. Respondent shall have met its shared responsibility for funding and implementing the national air emissions monitoring study, including any individual payments by Respondent under paragraph 53 or 62 if, and only if: (a) a nonprofit entity is established for the purposes set forth below; (b) the monitoring fund obligations to the nonprofit entity are fully satisfied; (c) the nonprofit entity enters into a contract with an Independent Monitoring Contractor (the "IMC") that obligates the IMC to fulfill the requirements set forth in paragraphs 55 through 59 and 62 of this Agreement; and, (d) Respondent grants access to Farms listed in Attachment A in accordance with paragraphs 60 and 61. The purposes of the nonprofit entity shall include: collecting and holding Respondent's contributions to the national air emissions monitoring study, purchasing and holding title to research equipment, contracting with an IMC to conduct the monitoring study, and other responsibilities.

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55. The contract identified in paragraph 54 shall require the IMC to submit to EPA, within 60 days of the Agreement date, a detailed plan to conduct the nationwide monitoring study set forth in Attachment B. The proposed plan shall:

(A) Identify the IMC and its qualifications, including the qualifications of any subcontracted science advisors, for implementing the national air emissions monitoring study;

(B) Be consistent with, expand the explanation of, and include all of the elements of the monitoring study outline set forth in Attachment B to this Agreement, including the requirements that: (1) all monitoring be completed within 2 years of EPA's approval of the monitoring study; (2) a comprehensive quality assurance program be implemented as part of the study; and (3) the emissions to be monitored will be Particulate Matter (TSP, PM10, and PM2.5), Hydrogen Sulfide (H2S), Ammonia (NH3), and Volatile Organic Compounds (VOCs);

(C) Identify the Farms to be monitored and the justification for including those Farms based on the specifications for the monitoring set forth in Attachment B; and,

(D) Require the IMC to submit detailed quarterly reports to EPA and to the entity described in paragraph 54. Those reports shall discuss the IMC's progress in implementing the approved monitoring plan, including what it did during the

ED_004549_00002822-00030

previous 3 months and what it intends to do during the next three months. The IMC shall submit quarterly reports starting with the end of the first calendar quarter (i.e., March 31, June 30, September 30 or December 31) after the proposed monitoring plan is approved by EPA, unless the plan is approved by EPA with less than 30 days left in the current calendar quarter. If that occurs, the IMC shall submit the first quarterly report at the end of the next calendar quarter. The quarterly reports shall continue through the end of the calendar quarter during which the national monitoring study is completed.

56. EPA will review and approve or disapprove the proposed plan within 30 days of receiving it from the IMC. If the proposed plan is disapproved, EPA will specifically state why it is being disapproved and what changes need to be made. The IMC shall then have 30 days from the date EPA disapproves the proposed plan to modify it and to submit the modified plan to EPA for review and approval. If the IMC does not submit a plan that is ultimately approved by EPA, the releases and covenants not to sue set forth in paragraphs 26 and 35 of this Agreement shall be null and void.

57. Once the plan is approved, the contract between the nonprofit entity identified in paragraph 54 and the IMC shall require the IMC to fully implement the approved plan in accordance with the approved schedule. Failure of the IMC to

implement the approved plan in accordance with the approved schedule, unless specifically excused by EPA in writing, shall nullify the releases and covenants not to sue set forth in paragraphs 26 and 35 of the Agreement. The estimated Full Funding Level monies shall be transferred to the nonprofit entity described in paragraph 54 within 60 days of EPA's approval of the monitoring plan.

58. The contract identified in paragraph 54 shall require the IMC to schedule periodic meetings (either by phone or in person) with EPA, and additional meetings upon request by EPA or the IMC, to discuss progress in implementing the approved plan. The IMC shall be required to promptly inform EPA of any problems in implementing the approved plan that have occurred or are anticipated to occur or of any adjustments that may be needed. No changes may be made to the approved plan without the written consent of EPA.

59. All emissions data generated and all analyses of the data made by the IMC during the nationwide monitoring study shall be provided to EPA as soon as possible in a form and through means acceptable to EPA. The parties agree that all emissions data will be fully available to the public, and that Respondent waives any right to claim any privilege with respect to such data.

60. Respondent agrees to make the Farms listed in

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Attachment A available for emissions monitoring under the national air emissions monitoring study if the Farm is chosen as a monitoring site under the approved plan. As stated in paragraph 29, if the Farm is owned by a Contract Grower, this requirement does not apply. However, a Contract Grower who enters into its own agreement with EPA (thus becoming a respondent in its own agreement) is subject to this requirement.

61. Respondent also agrees to give EPA or its representative access to those Farms for the purpose of verifying their suitability for monitoring or to observe monitoring conducted under the approved nationwide monitoring plan. EPA agrees that prior to entering a Farm, it will comply with proper biosecurity measures as are normal and customary. Nothing in this Agreement is intended in any way to limit EPA's inspection, monitoring, and information collection authorities under the Clean Air Act, CERCLA or EPCRA.

62. If, prior to completion of the national air emissions monitoring study, it appears that there will be insufficient funds to complete the study, the IMC shall notify EPA of this problem within 30 days of making this determination. The notice shall contain a detailed explanation of why there are insufficient funds, account for all money spent, and identify how much more money is needed to complete the monitoring study. If Respondent is not required under paragraph 53 to contribute or

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secure the contribution of additional money to the national monitoring study that will be sufficient to complete the monitoring study, the IMC or the nonprofit entity described in paragraph 54 shall make all reasonable efforts to find additional funding to complete the monitoring study. The IMC or the nonprofit entity described in paragraph 54 shall advise EPA of the efforts to locate additional funding and shall not commit to the use of additional funding sources without the prior approval of EPA. If, despite the best efforts of Respondent or its representative, the IMC, or the nonprofit entity described in paragraph 54, the national monitoring study cannot be completed due to lack of funding, then the releases and covenants not to sue set forth in paragraphs 26 and 35 of this Agreement will no longer be in effect. For Farms with animal types for which sufficient funds were provided to fully and adequately fund their portion of the national monitoring study, EPA shall make reasonable efforts to avoid terminating the releases and covenants not to sue set forth in paragraphs 26 and 35.

63. If, after completion of the national monitoring study, there is unspent money in the national monitoring fund, the IMC shall notify EPA within 90 days of completion of the monitoring study. The notice shall contain a detailed explanation of why there are unspent funds, including an accounting of all money spent to implement the national monitoring study and how much is

left unspent. The notice shall also include a proposed plan for distribution of the leftover money.

64. All certifications required by this Agreement shall be submitted to:

Special Litigation and Projects Division (2248A)
Attn: AFO/CAFO certifications
Office of Regulatory Enforcement
1200 Pennsylvania Ave., NW
Washington, DC 20460

65. Except for a Farm for which Respondent, or the Contract Grower, is able to certify under paragraph 27(B), this document constitutes an "enforcement response" as that term is used in the Clean Air Act Penalty Policy and an "enforcement action" as that term is used in the EPCRA/CERCLA Penalty Policy.

66. Each party shall bear its own costs, fees, and disbursements in this action, except where explicitly stated as otherwise in this Agreement.

67. The provisions of this Agreement shall be binding on Respondent, its officers, directors, employees, agents, successors and assigns.

68. This Agreement is not binding and without legal effect unless and until approved by the Environmental Appeals Board. It is so ordered.

Dated this _____ day of _____, 2005.

_____

Environmental Appeals Judge

ED_004549_00002822-00035

Environmental Appeals Board
U.S. Environmental Protection Agency

ED_004549_00002822-00036

ATTACHMENT A TO THE CONSENT AGREEMENT

This Attachment identifies and describes the Farms and Emission Units covered by this Agreement. This Agreement has no effect on any Farm or Emission Unit not specifically listed on this Attachment. The terms used in this Attachment shall have the meaning given to those terms in the Agreement.

The attached Farm Information Sheets and Emission Unit Information Sheets provide information about each Farm and Emission Unit(s) to be covered by this Agreement. A separate form for each Farm and each Emission Unit covered by the Agreement is attached below and as such is an integral part of this Attachment. By identifying a Farm for coverage under the Agreement, Respondent is asserting that the Farm meets the definition of a Farm in the Agreement and contains at least one Emission Unit as defined in the Agreement. Also by identifying an Emission Unit at a Farm for coverage under the Agreement, Respondent is asserting that the Emission Unit meets the definition of an Emission Unit in the Agreement. Unless Respondent identifies a Contract Grower for a Farm, Respondent is also asserting it owns, operates or otherwise controls the Farm.

I certify under penalty of law that the information contained in this submittal to EPA is accurate, true, and complete. I understand that there are significant civil and criminal penalties for making false or misleading statements to the United States Government.

[Signature]_____

[Name] [Title] [Date]
[Participating Company]
[Participating Company's Address]

FARM INFORMATION SHEET (FILL OUT ONE SHEET FOR EACH FARM)

Name of Farm:_____

Is the Farm owned and operated by a Contract Grower or is otherwise a contract farm?

____ yes ____ no

Name of Contract Grower (if applicable):_____

Location:_____

_____
(street address, city, county, state)

Animal Type (check all that apply):
___ Poultry (layers)
___ Poultry (broilers)
___ Poultry (turkeys)
___ Dairy Cattle (heifers or milking cattle)
___ Swine (nursery, sow or finisher)
___ Other (please identify)

For all Farms that Respondent owns and/or operates, provide a Farm sketch/diagram that numbers or otherwise identifies all Emission Units listed on this Farm Information Sheet.

EMISSION UNIT INFORMATION SHEET (FILL OUT ONE SHEET FOR EACH EMISSION UNIT)

Name of Farm where Emission Unit is located:_____

Unit name and/or number: _____

Date placed in service:_____

Design capacity (No. of animals or No. of gallons):_____

If the Emission Unit is a manure storage and treatment system in use at the Farm, check all that apply:

___ pull plug/flush/in-ground manure storage basin (if lagoon, specify type)

___ deep pit/in-ground manure storage basin (if lagoon specify type)

___ shallow pit/open manure storage

___ shallow pit/closed manure storage

___ deep pit/open manure storage

___ deep pit/closed manure storage

___ manure belt/closed manure storage

___ manure belt/open manure storage

___ flush/open manure storage

___ flush/closed manure storage

___ scrape/open manure storage

___ scrape/closed manure storage

___ other (briefly describe)

If the Emission Unit is a building, enclosure, or structure that permanently or temporarily houses Agricultural Livestock, check all that apply with respect to the ventilation type:

___ natural

___ mechanical

___ other (please describe)

Emission Control Technology (please list type and briefly describe if applicable):

Message

From: Bodine, Susan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8C2CC6086FCC44C3BE6B5D32B262D983-BODINE, SUS]
Sent: 9/19/2019 12:01:08 AM
To: Starfield, Lawrence [Starfield.Lawrence@epa.gov]
Subject: Re: NAEMS Update: VOC Call for Info Signed

Both meetings were canceled

Sent from my iPhone

On Sep 18, 2019, at 6:41 PM, Starfield, Lawrence <Starfield.Lawrence@epa.gov> wrote:

FYI.

Sent from my iPhone

Begin forwarded message:

From: "Sullivan, Tim" <Sullivan.Tim@epa.gov>
Date: September 18, 2019 at 3:18:16 PM EDT
To: "Starfield, Lawrence" <Starfield.Lawrence@epa.gov>, "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>
Cc: "Buterbaugh, Kristin" <Buterbaugh.Kristin@epa.gov>, "Sullivan, Tim" <Sullivan.Tim@epa.gov>
Subject: FW: NAEMS Update: VOC Call for Info Signed

Larry and Rosemarie:

Tomorrow's 4:30 pm eastern meeting with OAR, OGC, and OECA on AFO air issues has been cancelled. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP) Additional information on the Call for Information can be found in the email below. Please contact me with any questions.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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http://www.epa.gov/compliance/complaints/index.html

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From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Wednesday, September 18, 2019 12:36 PM
To: Schrock, Bill <Schrock.Bill@epa.gov>; Do, Bebhinn <do.bebhinn@epa.gov>; Dunkins, Robin <Dunkins.Robin@epa.gov>; Crowley, Kate <crowley.kate@epa.gov>; Lowe, Theresa <Lowe.Theresa@epa.gov>; Thompson, Rhonda <Thompson.Rhonda@epa.gov>; Rumsey, Ian <rumsey.ian@epa.gov>; Yelverton, William <Yelverton.William@epa.gov>; Walker, JohnT <Walker.Johnt@epa.gov>; Nash, Maliha <Nash.Maliha@epa.gov>; Croghan, Carry <Croghan.Carry@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: NAEMS Update: VOC Call for Info Signed

Hi all,

Good news! The NAEMS Call for Information for additional VOC data was signed today. We've posted the pre-publication version on our website and will update that with the official Federal Register notice when that is available.

Direct link: https://www.epa.gov/afos-air/naems-call-information-information-related-development-emission-estimating-methodologies
NAEMS webpage: https://www.epa.gov/afos-air/national-air-emissions-monitoring-study#naems-status

It usually takes a couple of weeks for a notice to get through all of the process steps and be published, so it's likely that it will publish in early October. Then, we asked for public submissions of information within 60 days. Feel free to give me a call if you have any questions.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

Message

From: Bodine, Susan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8C2CC6086FCC44C3BE6B5D32B262D983-BODINE, SUS]
Sent: 9/18/2019 5:59:39 PM
To: Starfield, Lawrence [Starfield.Lawrence@epa.gov]
CC: Patrick Traylor (traylor.patrick@epa.gov) [traylor.patrick@epa.gov]
Subject: RE: Quick Ag/NAEMS Update
Attachments: NAEMS Overview_090319_final.docx; AFO Air Compliance Agreement - Background Info_01.19.2018.docx; NAEMS Schedule_6.8.18_v3.docx

Ex. 5 Deliberative Process (DP)

Patrick, I think you attended the meeting on June 8, 2018 with OAR on this issue. Can you attend the meeting on Thursday? You are invited.

Susan

From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Tuesday, September 17, 2019 4:16 PM
To: Bodine, Susan <bodine.susan@epa.gov>
Subject: Fwd: Quick Ag/NAEMS Update

Susan,

As further background for the NAEMS meeting(s), here's an email from Tim Sullivan with some additional thoughts.

Larry

Sent from my iPhone

Begin forwarded message:

> **From:** "Sullivan, Tim" <Sullivan.Tim@epa.gov>
> **Date:** September 16, 2019 at 7:46:54 PM EDT
> **To:** "Starfield, Lawrence" <Starfield.Lawrence@epa.gov>
> **Cc:** "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>, "Buterbaugh, Kristin" <Buterbaugh.Kristin@epa.gov>, "Sullivan, Tim" <Sullivan.Tim@epa.gov>
> **Subject: RE: Quick Ag/NAEMS Update**
>
> Larry:

Ex. 5 AC/DP

Ex. 5 AC/DP

I only have the 4:30 pm eastern meeting on my calendar – I have not seen or heard anything about an 11 am eastern meeting.

Finally, I have attached the standard Air Compliance Agreement template and my notes on the Agreement's compliance requirements for reference. I am happy to discuss any of these issues ahead of Thursday's meeting.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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http://www.epa.gov/compliance/complaints/index.html

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From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Monday, September 16, 2019 12:12 PM
To: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: RE: Quick Ag/NAEMS Update

Thank you – this is very helpful.

Ex. 5 AC/DP

Larry

From: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Sent: Monday, September 16, 2019 12:31 PM
To: Starfield, Lawrence <Starfield.Lawrence@epa.gov>

Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: FW: Quick Ag/NAEMS Update
Importance: High

Larry—

On September 5, Tim Sullivan participated in an informational briefing for Anne Idsal on the Animal Feeding Operations (AFO) National Air Emissions Monitoring Study (NAEMS) and the Air Compliance Agreement. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

I only see a 4:30 meeting on the calendar for Thursday. Tim and I plan to participate. I do not know about the 11 am meeting that is referenced in the email you sent.

Rosemarie

From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Thursday, September 5, 2019 1:03 PM
To: Bianco, Karen <Bianco.Karen@epa.gov>; Jordan, Scott <Jordan.Scott@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Quick Ag/NAEMS Update

Hi Karen and Scott,

Anne Idsal requested a briefing on NAEMS (our ongoing project to characterize emissions from livestock/poultry farms), which we held today. Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP Robin gave Matt Marks a brief call as a heads up and I said I would follow up with you as well.

Matt said we should invite the two of you, as well as Brian Doster and another staff person who works on related permitting topics. Do either of you know offhand who that is or could you ask him? (Robin didn't write the name down.)

Tim/Bill – Ex. 5 AC/DP

Ex. 5 AC/DP

Tim – can you give me a list of names to include on the invite for OECA?

From all – any input you have on how to frame the agenda questions would be much appreciated.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

Message

From: Bodine, Susan [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8C2CC6086FCC44C3BE6B5D32B262D983-BODINE, SUS]
Sent: 9/16/2019 7:17:22 PM
To: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: FW: Quick Ag/NAEMS Update
Attachments: NAEMS Overview_090319_final.docx

Importance: High

For Thursday

From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Monday, September 16, 2019 2:10 PM
To: Bodine, Susan <bodine.susan@epa.gov>
Subject: FW: Quick Ag/NAEMS Update
Importance: High

Susan,

Here's additional information on NAEMS briefing on Thursday. Ex. 5 AC/DP
Ex. 5 AC/DP

Larry

From: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Sent: Monday, September 16, 2019 12:31 PM
To: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: FW: Quick Ag/NAEMS Update
Importance: High

Larry—

On September 5, Tim Sullivan participated in an informational briefing for Anne Idsal on the Animal Feeding Operations (AFO) National Air Emissions Monitoring Study (NAEMS) and the Air Compliance Agreement. A Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

I only see a 4:30 meeting on the calendar for Thursday. Tim and I plan to participate. I do not know about the 11 am meeting that is referenced in the email you sent.

Rosemarie

From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Thursday, September 5, 2019 1:03 PM
To: Bianco, Karen <Bianco.Karen@epa.gov>; Jordan, Scott <Jordan.Scott@epa.gov>

Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Quick Ag/NAEMS Update

Hi Karen and Scott,

Anne Idsal requested a briefing on NAEMS (our ongoing project to characterize emissions from livestock/poultry farms), which we held today. Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP Robin gave Matt Marks a brief call as a heads up and I said I would follow up with you as well.

Matt said we should invite the two of you, as well as Brian Doster and another staff person who works on related permitting topics. Do either of you know offhand who that is or could you ask him? (Robin didn't write the name down.)

Tim/Bill – Ex. 5 AC/DP
Ex. 5 AC/DP

Tim – can you give me a list of names to include on the invite for OECA?

From all – any input you have on how to frame the agenda questions would be much appreciated.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

Message

From: Hull, George [Hull.George@epa.gov]
Sent: 10/16/2019 9:21:34 PM
To: Sullivan, Tim [Sullivan.Tim@epa.gov]
CC: Egan, Patrick [egan.patrick@epa.gov]; Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]; Koslow, Karin [Koslow.Karin@epa.gov]; Chapman, Apple [Chapman.Apple@epa.gov]; Brooks, Phillip [Brooks.Phillip@epa.gov]
Subject: RE: Inquiry on OIG Report on CAFOs

Thanks, Tim. Ex. 5 AC/DP - George

From: Sullivan, Tim <Sullivan.Tim@epa.gov>
Sent: Wednesday, October 16, 2019 4:47 PM
To: Hull, George <Hull.George@epa.gov>
Cc: Egan, Patrick <egan.patrick@epa.gov>; Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Koslow, Karin <Koslow.Karin@epa.gov>; Chapman, Apple <Chapman.Apple@epa.gov>; Brooks, Phillip <Brooks.Phillip@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: Inquiry on OIG Report on CAFOs

George:

OAR is addressing these questions – please see the attached email chain. Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP)

Ex. 5 AC/DP

Please let me know if you have any additional questions.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Chapman, Apple <Chapman.Apple@epa.gov>
Sent: Wednesday, October 16, 2019 2:17 PM
To: Hull, George <Hull.George@epa.gov>; Brooks, Phillip <Brooks.Phillip@epa.gov>
Cc: Egan, Patrick <egan.patrick@epa.gov>; Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Koslow, Karin <Koslow.Karin@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: Inquiry on OIG Report on CAFOs

Tim (copied) is the lead on this. He has been reporting directly to Rosemarie on this.
I will let him respond.

Apple Chapman
Deputy Director, Air Enforcement Division
Office of Civil Enforcement
(202) 564-5666 or (202) 841-6076

From: Hull, George <Hull.George@epa.gov>
Sent: Wednesday, October 16, 2019 4:11 PM
To: Brooks, Phillip <Brooks.Phillip@epa.gov>; Chapman, Apple <Chapman.Apple@epa.gov>
Cc: Egan, Patrick <egan.patrick@epa.gov>; Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Koslow, Karin <Koslow.Karin@epa.gov>
Subject: Inquiry on OIG Report on CAFOs

Phil and Apple,
OPA sent us and OAR an inquiry from a reporter with Center for Public Integrity, who is inquiring about follow-up actions stemming from a 2017 OIG report on air emissions from CAFOs. Here are the reporter's questions. I looked at the report and seemed that OECA only had one action item, which I've pasted below, so perhaps the bulk of the response needs to come from OAR. **Ex. 5 AC/DP** Thanks, George

From the reporter:

I'm working on a story and had a few questions. I've read through the proposed rule/call for information posted on 10/01/2019, but wanted more info related to some points raised by the OIG in the 2017 report about emission estimates from animal feeding operations.

1. The report says EPA provided planned corrective actions in response to the OIG recommendations, but I can't find any documentation beyond this notification letter. Are there any reports/documents detailing how EPA addressed the concerns detailed in this report? If so, can you point me to/send me a copy?

According to that OIG report, as of May 2017:

EPA has not finalized any emissions estimating methodologies for animal feeding operations

- EPA has not finalized its workplan or established timeframes for completing EEMs
- EPA has not developed any additional draft EEMs

2. Has the status on any of those changed since the OIG report was published?

From OECA's response to the OIG:

No.	Recommendation	High-Level Intended Corrective Action	Planned Completion Date

4		For any emission source and pollutant combinations for which the Office of Air and Radiation determines it cannot develop emission estimating methodologies, notify Air Compliance Agreement participants of this determination and that the release and covenant not to sue for those emission sources and pollutant types will expire in accordance with paragraph 38 of the 2005 Air Compliance Agreement.	If the EPA determines it cannot develop emission estimating methodologies for any emission source and pollutant combinations, OECA will notify Agreement participants in writing that the EPA has made such a determination and that the release and covenant not to sue will expire in accordance with paragraph 38 of the Agreement.	If necessary, OECA will complete the intended corrective action within 60 days of OAR finalizing its determination.

Message

From: Sullivan, Tim [Sullivan.Tim@epa.gov]
Sent: 9/5/2019 7:50:41 PM
To: Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]
CC: Koslow, Karin [Koslow.Karin@epa.gov]; Brooks, Phillip [Brooks.Phillip@epa.gov]; Chapman, Apple [Chapman.Apple@epa.gov]; Fried, Gregory [Fried.Gregory@epa.gov]; Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: FW: Quick Ag/NAEMS Update
Attachments: NAEMS Overview_090319_final.docx

Importance: High

Rosemarie:

This morning, I participated in an informational briefing for Anne Idsal on the Animal Feeding Operations (AFO) National Air Emissions Monitoring Study (NAEMS) and the Air Compliance Agreement. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 AC/DP

I will keep you all apprised of any developments on this matter. In the meantime, please contact me with any questions. And, I hope this finds things well with you all in DC!

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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http://www.epa.gov/compliance/complaints/index.html

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From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Thursday, September 5, 2019 1:03 PM
To: Bianco, Karen <Bianco.Karen@epa.gov>; Jordan, Scott <Jordan.Scott@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Quick Ag/NAEMS Update

Hi Karen and Scott,

Anne Idsal requested a briefing on NAEMS (our ongoing project to characterize emissions from livestock/poultry farms), which we held today. Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP Robin gave Matt Marks a brief call as a heads up and I said I would follow up with you as well.

Matt said we should invite the two of you, as well as Brian Doster and another staff person who works on related permitting topics. Do either of you know offhand who that is or could you ask him? (Robin didn't write the name down.)

Tim/Bill – Ex. 5 AC/DP

Ex. 5 AC/DP

Tim – can you give me a list of names to include on the invite for OECA?

From all – any input you have on how to frame the agenda questions would be much appreciated.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

Message

From: Sullivan, Tim [Sullivan.Tim@epa.gov]
Sent: 10/16/2019 8:47:19 PM
To: Hull, George [Hull.George@epa.gov]
CC: Egan, Patrick [egan.patrick@epa.gov]; Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]; Koslow, Karin [Koslow.Karin@epa.gov]; Chapman, Apple [Chapman.Apple@epa.gov]; Brooks, Phillip [Brooks.Phillip@epa.gov]; Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: RE: Inquiry on OIG Report on CAFOs
Attachments: RE: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

George:

OAR is addressing these questions – please see the attached email chain. Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP)

Ex. 5 AC/DP

Please let me know if you have any additional questions.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Chapman, Apple <Chapman.Apple@epa.gov>
Sent: Wednesday, October 16, 2019 2:17 PM
To: Hull, George <Hull.George@epa.gov>; Brooks, Phillip <Brooks.Phillip@epa.gov>
Cc: Egan, Patrick <egan.patrick@epa.gov>; Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Koslow, Karin <Koslow.Karin@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: Inquiry on OIG Report on CAFOs

Tim (copied) is the lead on this. He has been reporting directly to Rosemarie on this.
I will let him respond.

Apple Chapman
Deputy Director, Air Enforcement Division
Office of Civil Enforcement
(202) 564-5666 or (202) 841-6076

From: Hull, George <Hull.George@epa.gov>
Sent: Wednesday, October 16, 2019 4:11 PM
To: Brooks, Phillip <Brooks.Phillip@epa.gov>; Chapman, Apple <Chapman.Apple@epa.gov>
Cc: Egan, Patrick <egan.patrick@epa.gov>; Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Koslow, Karin <Koslow.Karin@epa.gov>
Subject: Inquiry on OIG Report on CAFOs

Phil and Apple,
OPA sent us and OAR an inquiry from a reporter with Center for Public Integrity, who is inquiring about follow-up actions stemming from a 2017 OIG report on air emissions from CAFOs. Here are the reporter's questions. I looked at the report and seemed that OECA only had one action item, which I've pasted below, so perhaps the bulk of the response needs to come from OAR. **Ex. 5 AC/DP** Thanks, George

From the reporter:

I'm working on a story and had a few questions. I've read through the proposed rule/call for information posted on 10/01/2019, but wanted more info related to some points raised by the OIG in the 2017 report about emission estimates from animal feeding operations.

1. The report says EPA provided planned corrective actions in response to the OIG recommendations, but I can't find any documentation beyond this notification letter. Are there any reports/documents detailing how EPA addressed the concerns detailed in this report? If so, can you point me to/send me a copy?

According to that OIG report, as of May 2017:

EPA has not finalized any emissions estimating methodologies for animal feeding operations

- EPA has not finalized its workplan or established timeframes for completing EEMs
- EPA has not developed any additional draft EEMs

2. Has the status on any of those changed since the OIG report was published?

From OECA's response to the OIG:

No.	Recommendation	High-Level Intended Corrective Action	Planned Completion Date
4	For any emission source and pollutant combinations for which the Office of Air and Radiation determines it cannot develop emission estimating methodologies, notify Air Compliance Agreement participants of	If the EPA determines it cannot develop emission estimating methodologies for any emission source and pollutant combinations, OECA will notify Agreement participants in writing that the EPA has made such a	If necessary, OECA will complete the intended corrective action within 60 days of OAR finalizing its determination.

this determination and that the release and covenant not to sue for those emission sources and pollutant types will expire in accordance with paragraph 38 of the 2005 Air Compliance Agreement.	determination and that the release and covenant not to sue will expire in accordance with paragraph 38 of the Agreement.

Message

From: Sullivan, Tim [Sullivan.Tim@epa.gov]
Sent: 10/16/2019 8:34:41 PM
To: Bremer, Kristen [Bremer.Kristen@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Mills, Kathy [Mills.Kathy@epa.gov]
CC: Schrock, Bill [Schrock.Bill@epa.gov]; Do, Bebhinn [do.bebhinn@epa.gov]; Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: RE: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

Thanks for looping me in, Allison. Ex. 5 Deliberative Process (DP)

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Bremer, Kristen <Bremer.Kristen@epa.gov>
Sent: Wednesday, October 16, 2019 2:24 PM
To: Costa, Allison <Costa.Allison@epa.gov>; Dunkins, Robin <Dunkins.Robin@epa.gov>; Mills, Kathy <Mills.Kathy@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Do, Bebhinn <do.bebhinn@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

Ex. 5 Deliberative Process (DP) Thanks for the quick turnaround!

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: Ex. 6 Personal Privacy (PP)

From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Wednesday, October 16, 2019 4:20 PM
To: Dunkins, Robin <Dunkins.Robin@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Mills, Kathy

<Mills.Kathy@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Do, Bebhinn <do.bebhinn@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

Hi Kristin,

I believe we can answer all of these questions, but I did copy our technical contact at OECA in case he wants to add anything.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP) Mike is gone for the day, but let me know if you want me to follow up with him in the morning.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

From: Dunkins, Robin <Dunkins.Robin@epa.gov>
Sent: Wednesday, October 16, 2019 4:03 PM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>; Mills, Kathy <Mills.Kathy@epa.gov>
Cc: Costa, Allison <Costa.Allison@epa.gov>
Subject: RE: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

We have the schedule posted on our website. We update as needed. I would direct them to that page

Robin Dunkins, Group Leader
Natural Resources Group
OAR/OAQPS/SPPD Mail Code: E143-03
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711
919-541-5335 office
Ex. 6 Personal Privacy (PP) mobile
dunkins.robin@epa.gov

From: Bremer, Kristen <Bremer.Kristen@epa.gov>
Sent: Wednesday, October 16, 2019 3:59 PM
To: Mills, Kathy <Mills.Kathy@epa.gov>
Cc: Dunkins, Robin <Dunkins.Robin@epa.gov>; Costa, Allison <Costa.Allison@epa.gov>
Subject: FW: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

We received the following press inquiry regarding emissions from CAFOs (see below). Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP)

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: Ex. 6 Personal Privacy (PP)

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Wednesday, October 16, 2019 3:57 PM
To: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Ashley, Jackie <Ashley.Jackie@epa.gov>
Cc: Jones, Enesta <Jones.Enesta@epa.gov>
Subject: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

Hi All. Please see the inquiry below. I believe this overlaps OAR & OECA. DDL is 10/18. Tnx.

I'm working on a story and had a few questions. I've read through the proposed rule/call for information posted on 10/01/2019, but wanted more info related to some points raised by the OIG in the 2017 report about emission estimates from animal feeding operations.

1. The report says EPA provided planned corrective actions in response to the OIG recommendations, but I can't find any documentation beyond this notification letter. Are there any reports/documents detailing how EPA addressed the concerns detailed in this report? If so, can you point me to/send me a copy?

According to that OIG report, as of May 2017:

- EPA has not finalized any emissions estimating methodologies for animal feeding operations
- EPA has not finalized its workplan or established timeframes for completing EEMs
- EPA has not developed any additional draft EEMs

2. Has the status on any of those changed since the OIG report was published?

Thanks for your help,

Joe

Joe Wertz

Senior Environment Reporter

The Center for Public Integrity

@joewertz

publicintegrity.org

Office: 202-481-1262

Mobile: Ex. 6 Personal Privacy (PP)

Signal: 4

PGP: BBE7 2478 6820 3E3B 51EE
5BFB 3BF8 A51A 5BC9 5CD9

Message

From: Hull, George [Hull.George@epa.gov]
Sent: 10/16/2019 8:11:11 PM
To: Brooks, Phillip [Brooks.Phillip@epa.gov]; Chapman, Apple [Chapman.Apple@epa.gov]
CC: Egan, Patrick [egan.patrick@epa.gov]; Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]; Koslow, Karin [Koslow.Karin@epa.gov]
Subject: Inquiry on OIG Report on CAFOs

Phil and Apple,
OPA sent us and OAR an inquiry from a reporter with Center for Public Integrity, who is inquiring about follow-up actions stemming from a 2017 OIG report on air emissions from CAFOs. Here are the reporter's questions. I looked at the report and seemed that OECA only had one action item, which I've pasted below, so perhaps the bulk of the response needs to come from OAR. **Ex. 5 AC/DP** Thanks, George

From the reporter:

I'm working on a story and had a few questions. I've read through the proposed rule/call for information posted on 10/01/2019, but wanted more info related to some points raised by the OIG in the 2017 report about emission estimates from animal feeding operations.

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- EPA has not developed any additional draft EEMs

2. Has the status on any of those changed since the OIG report was published?

From OECA's response to the OIG:

No.	Recommendation	High-Level Intended Corrective Action	Planned Completion Date
4	For any emission source and pollutant combinations for which the Office of Air and Radiation determines it cannot develop emission estimating methodologies, notify Air Compliance Agreement participants of this determination and that the release and covenant not to sue for those emission sources and pollutant types will expire in accordance with	If the EPA determines it cannot develop emission estimating methodologies for any emission source and pollutant combinations, OECA will notify Agreement participants in writing that the EPA has made such a determination and that the release and covenant not to sue will expire in accordance with paragraph 38 of the Agreement.	If necessary, OECA will complete the intended corrective action within 60 days of OAR finalizing its determination.

paragraph 38 of the 2005
Air Compliance
Agreement.

Message

From: Brooks, Phillip [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E89130D467DF414390F076286D938815-BROOKS, PHILLIP]
Sent: 6/26/2019 1:40:35 PM
To: Egan, Patrick [egan.patrick@epa.gov]
CC: Chapman, Apple [Chapman.Apple@epa.gov]; Hull, George [Hull.George@epa.gov]
Subject: Re: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

Pat

This refers to work done by what was formerly called the Special Litigation and Projects Division, now the Cross-cutting Policy Division. Amy Porter is the Division Director.

Sent from my iPhone

On Jun 26, 2019, at 9:30 AM, Egan, Patrick <egan.patrick@epa.gov> wrote:

> Below are Q & A's that were developed by OAQPS with input from AED technical staff. Please let us know if you have any comments or edits.
>
> Thanks,
>
> Pat
>
> Patrick J. Egan, M.P.A.
> Deputy Director of Communications
> Office of Enforcement and Compliance Assurance
> U.S. Environmental Protection Agency
> 1200 Pennsylvania Avenue NW (MC: 2201A)
> Washington, DC 20460
> Office: 202-564-4059 | Cell: Ex. 6 Personal Privacy (PP)
>
> ---
>
> **From:** Jones, Enesta
> **Sent:** Wednesday, June 26, 2019 9:10 AM
> **To:** Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>
> **Cc:** Jones, Enesta <Jones.Enesta@epa.gov>
> **Subject:** Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS
>
> George/Pat, any issues on your end? OAQPS engaged OECA technical staff on this directly.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Message

From: Brooks, Phillip [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=E89130D467DF414390F076286D938815-BROOKS, PHILLIP]
Sent: 8/8/2019 7:33:23 PM
To: Egan, Patrick [egan.patrick@epa.gov]
CC: Chapman, Apple [Chapman.Apple@epa.gov]; Hull, George [Hull.George@epa.gov]
Subject: Re: OECA Review: Reporter seeking interview re: status of EEMs/NAEMS

That is Amy Porter's group.

Sent from my iPhone

On Aug 8, 2019, at 3:20 PM, Egan, Patrick <egan.patrick@epa.gov> wrote:

Phil,

Since this is air emissions related – would this be your group? If so, do you have any comments?

Thanks,

Pat

Patrick J. Egan, M.P.A.
Deputy Director of Communications
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW (MC: 2201A)
Washington, DC 20460
Office: 202-564-4059 | Cell: Ex. 6 Personal Privacy (PP)

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Thursday, August 8, 2019 2:57 PM
To: Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>
Cc: Jones, Enesta <Jones.Enesta@epa.gov>
Subject: OECA Review: Reporter seeking interview re: status of EEMs/NAEMS

Any edits/suggestions, George & Patrick?

On Aug 8, 2019, at 1:00 PM, Bremer, Kristen <Bremer.Kristen@epa.gov> wrote:

Here's our proposed response. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: Ex. 6 Personal Privacy (PP)

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Tuesday, August 06, 2019 9:29 PM
To: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>
Cc: Jones, Enesta <Jones.Enesta@epa.gov>
Subject: OAR & OECA: Reporter seeking interview re: status of EEMs/NAEMS

Hello all, looking back at my notes, this is an OAQPS & OECA issue. Please see her follow-up below. Her ddl is 8/9. Tnx.

Hi Enesta,

Thanks for your response to my questions back in June. I presume that EPA has no comment on whether the NAEMS study is still on track for its 2020 deadline and other specifics that I asked about. **I'm following up with one more question for now.**

The story will discuss the timeline of EPA's creation of a methodology to estimate farm air emissions, including findings from the 2017 EPA OIG report that remarks that "NAEMS monitoring was completed more than 7 years ago at a cost of about $15 million, but the EPA had not finalized any emission estimating methodologies for animal feeding operations" despite its estimate that such work would be underway in 2009. Would EPA like to comment on this delayed timeline?

Thanks much,
Leah Douglas

On Wed, Jun 26, 2019 at 5:19 PM Jones, Enesta <Jones.Enesta@epa.gov> wrote:

> Hello Leah,
>
> **Please note**: The questions you are asking involve both the **National Air Emissions Monitoring Study (NAEMS)** and the **Air Quality Compliance Agreement(s)**. They are related, but they are not the same thing.
>
> **Attributable to an EPA Spokesperson**
>
> IN 2005, EPA developed the **Air Compliance Agreement** to:

- o Reduce air pollution;
- o Ensure AFOs' compliance with applicable Clean Air Act, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and Emergency Planning and Community Right-to-Know Act (EPCRA) requirements;
- o Monitor and evaluate AFO emissions in a national monitoring study; and
- o Promote a national consensus on AFO emissions estimating methodologies.

As part of the Air Compliance Agreement, participating AFO owners and operators:

- o Paid a civil penalty of $200 to $100,000 based on the size and number of AFOs covered by their respective Air Compliance Agreements;
- o Agreed to make their AFOs available as potential monitoring sites for the NAEMS;
- o Were responsible for contributing to a fund covering the costs of NAEMS; and
- o Must comply with applicable Clean Air Act, CERCLA, and EPCRA requirements after EPA publishes the final emissions estimating methodologies.

Approximately 2,600 AFO owners and operators signed the voluntary Air Compliance Agreements with EPA to resolve liability for potential past and ongoing violations of the Clean Air Act, CERCLA, and EPCRA resulting from air emission from their AFOs. Those approximately 2,600 Agreements covered approximately 14,000 AFOs.

For more information, refer to the Air Compliance Agreement *Federal Register* notice: https://www.federalregister.gov/documents/2005/01/31/05-1536/animal-feeding-operations-consent-agreement-and-final-order

On Jun 20, 2019, at 12:03 PM, Leah Douglas <leah@thefern.org> wrote:

Hi Enesta,

Sure. A few questions are below. Next Wednesday (6/26) would work as a deadline. Next week is also very open for interviews if EPA prefers to comment that way.

- The material on EPA's website related to NAEMS states January 2020 as the soonest timeline for the first draft models to emerge from the study. Is the project still on track to meet that timeline?
- Does EPA have a current estimate for the finalization of all emission estimating technologies?
- Can EPA provide a list of the farm operators, by name of facility and/or name of parent company, who participated in the NAEMS study?
- If just 24 sites were used to collect data for NAEMS, why did EPA sign on 14,000 facilities to participate in the study? Did the remaining facilities participate in NAEMS in other ways?
- How much was the civil penalty that farm operators paid to participate in NAEMS and receive protection from civil enforcement under the Clean Air Act?
- When was the last occurrence of EPA taking civil enforcement action against an AFO under the Clean Air Act?

Thanks much,
Leah Douglas

On Wed, Jun 19, 2019 at 1:06 PM Jones, Enesta <Jones.Enesta@epa.gov> wrote:

> Hi Leah, thanks for reaching out. Can you please share your specific questions and deadline? I'm not sure that we can provide an interview, but we should, at a minimum, be able to provide written responses.

From: Leah Douglas <leah@thefern.org>
Sent: Friday, June 14, 2019 11:25 AM
To: Rumsey, Ian <rumsey.ian@epa.gov>
Subject: Reporter seeking interview re: status of EEMs/NAEMS

Hi Mr. Rumsey,

I'm a reporter with the Food and Environment Reporting Network, where I cover agribusiness and its regulation. I'm working on a story about CAFO odors and air emissions, which will discuss EPA's ongoing work to develop EEMs with the data collected during the NAEMS.

I'm hoping to speak with you about the current status of that project, so I can be sure I have the most up-to-date information as I move forward with my reporting. Can we find a few minutes to talk on the phone next week or the following? Next week, Wednesday, Thursday, and Friday are all flexible for me, and the week of the 24th is quite flexible as well.

Thanks much, and talk soon,
Leah Douglas

--
Leah Douglas
(917) 972-3479

--
Leah Douglas
(917) 972-3479

Message

From: Starfield, Lawrence [Starfield.Lawrence@epa.gov]
Sent: 9/19/2019 11:42:43 AM
To: Sullivan, Tim [Sullivan.Tim@epa.gov]
CC: Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]; Buterbaugh, Kristin [Buterbaugh.Kristin@epa.gov]
Subject: Re: NAEMS Update: VOC Call for Info Signed

Tim,

Susan tells me that both the 11 am and 4:30 pm meetings have been cancelled.

Larry

Sent from my iPhone

On Sep 18, 2019, at 3:18 PM, Sullivan, Tim <Sullivan.Tim@epa.gov> wrote:

> Larry and Rosemarie:
>
> Tomorrow's 4:30 pm eastern meeting with OAR, OGC, and OECA on AFO air issues has been cancelled. Ex. 5 Deliberative Process (DP)
>
> Ex. 5 Deliberative Process (DP) Additional information on the Call for Information can be found in the email below. Please contact me with any questions.
>
> Thanks –
>
> Tim
>
> ---
>
> Timothy J. Sullivan
> Air Enforcement Division
> Office of Civil Enforcement
> Office of Enforcement and Compliance Assurance
> U.S. Environmental Protection Agency
> 1595 Wynkoop Street (MC 8MSU)
> Denver, Colorado 80202
>
> Phone: 303.312.6196 | Email: sullivan.tim@epa.gov
>
> Help eliminate environmental violations - report tips and complaints at:
> http://www.epa.gov/compliance/complaints/index.html
>
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From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Wednesday, September 18, 2019 12:36 PM
To: Schrock, Bill <Schrock.Bill@epa.gov>; Do, Bebhinn <do.bebhinn@epa.gov>; Dunkins, Robin

<Dunkins.Robin@epa.gov>; Crowley, Kate <crowley.kate@epa.gov>; Lowe, Theresa <Lowe.Theresa@epa.gov>; Thompson, Rhonda <Thompson.Rhonda@epa.gov>; Rumsey, Ian <rumsey.ian@epa.gov>; Yelverton, William <Yelverton.William@epa.gov>; Walker, JohnT <Walker.Johnt@epa.gov>; Nash, Maliha <Nash.Maliha@epa.gov>; Croghan, Carry <Croghan.Carry@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: NAEMS Update: VOC Call for Info Signed

Hi all,

Good news! The NAEMS Call for Information for additional VOC data was signed today. We've posted the pre-publication version on our website and will update that with the official Federal Register notice when that is available.

Direct link: https://www.epa.gov/afos-air/naems-call-information-information-related-development-emission-estimating-methodologies
NAEMS webpage: https://www.epa.gov/afos-air/national-air-emissions-monitoring-study#naems-status

It usually takes a couple of weeks for a notice to get through all of the process steps and be published, so it's likely that it will publish in early October. Then, we asked for public submissions of information within 60 days. Feel free to give me a call if you have any questions.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

Message

From: Kabler, Lauren [Kabler.Lauren@epa.gov]
Sent: 4/11/2019 12:03:55 PM
To: Buterbaugh, Kristin [Buterbaugh.Kristin@epa.gov]; Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]
CC: Porter, Amy [Porter.Amy@epa.gov]; Koslow, Karin [Koslow.Karin@epa.gov]; Sullivan, Greg [Sullivan.Greg@epa.gov]
Subject: OIG Request to meet with OCE OD re: OIG Study: Enforcement Activities/Results and some background/prep material
Attachments: Notification Memo for OAE-FY19-0030 on EPA Enforcement Results-signed.pdf; OIG Interview Questions for OECA-OCE 12-18-18_with_links.docx; OIG Interview Questions for OECA-OCE 12-18-18_TALKING POINTS.docx

Flag: Follow up

Kristin – the OIG would like to meet with Rosemarie regarding their study on Enforcement Activities/Results (*see*, document beginning with NOTIFICATION and below email chain – note that OIG will also meet with each OCE Division and OSRE – all separate meetings). **Can you send me two dates/times during the weeks of April 22nd and April 29th** that work for Rosemarie. Thanks!

Rosemarie – Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP)

As ***background***, Amy and I met with the OIG on this study in December. Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP) In addition, we provided background information to OIG after our meeting, also attached, (*see*, document ending in LINKS). OIG will provide a similar list of questions/topics prior to the meeting which I will share as soon as I receive.

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Spriggs, Gwendolyn
Sent: Wednesday, April 10, 2019 10:47 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>; Keim, Stephen <Keim.Stephen@epa.gov>
Subject: RE: OIG Study: Enforcement Activities/Results

OK…

Here's what the OIG is requesting…all separate meetings:

OCE
Office Directors (1 hour)
Air Enforcement (1.5 hours)
Water Enforcement (1.5 hours)
Waste & Chemical Enforcement (1.5 hours)
No need to talk to crosscutting policy again

OSRE
Office Directors (1 hour)
Enforcement Division for Superfund (1.5 hours)
Enforcement Division for RCRA (1.5 hours)

If possible, pls provide two meeting time options for each meeting. That will help significantly with planning.

Thanks, GJS 56-2439

From: Kabler, Lauren
Sent: Wednesday, April 10, 2019 8:56 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>; Keim, Stephen <Keim.Stephen@epa.gov>
Subject: RE: OIG Study: Enforcement Activities/Results

Gwen – need some additional clarification from OIG in order to schedule. We have three Divisions – air, waste/chem and water – does OIG want separate meetings with each Division or just one meeting? Also, please confirm that OIG does not need to meet with our Crosscutting Policy office again (we met with Katie late 2018). Thanks!

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Spriggs, Gwendolyn
Sent: Wednesday, April 10, 2019 8:47 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>; Keim, Stephen <Keim.Stephen@epa.gov>
Subject: OIG Study: Enforcement Activities/Results

Lauren and Stephen,

OIG would like to schedule separate meetings with your offices. They're interested in discussing enforcement trends and the factors contributing to those trends. They specifically requested to meet with Division Directors, the branch chiefs are welcome and optional. I've asked whether ODs should be included in this invitation. I'm waiting for their response and will update you when I have more info. However, I request that you plan around your ODs availability just in case they're expected to participate.

They'd like to schedule these 90 minute meetings during the weeks of April 22nd or April 29th. The OIG will provide a list of topics for the discussion prior to the meeting.

Pls share at least two meeting times per office no later than Friday (4/12) before noon. If you have any questions…let me know.

GJS 564-2439

Message

From: Chapman.Apple@epa.gov [Chapman.Apple@epa.gov]
Sent: 8/22/2019 7:47:42 PM
To: Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: Re: FOIA Assignment for EPA-HQ-2019-008108 Davidson

Ugh.

Sent from my iPhone

On Aug 22, 2019, at 3:44 PM, Sullivan, Tim <Sullivan.Tim@epa.gov> wrote:

> Awesome – thanks!
>
> I am breathing a sigh of relief because in addition to doc review for KP Kauffman, I now have to do doc review for a FOIA request about the Agency's response to the OIG report on the Animal Feeding Operation Air Compliance Agreement and the National Air Emissions Monitoring Study. Ex. 5 Deliberative Process (DP)
>
> Ex. 5 Deliberative Process (DP)
>
> Timothy J. Sullivan
> Air Enforcement Division
> Office of Civil Enforcement
> Office of Enforcement and Compliance Assurance
> U.S. Environmental Protection Agency
> 1595 Wynkoop Street (MC 8MSU)
> Denver, Colorado 80202
>
> Phone: 303.312.6196 | Email: sullivan.tim@epa.gov
>
> Help eliminate environmental violations - report tips and complaints at:
> http://www.epa.gov/compliance/complaints/index.html
>
> NOTICE: This message may contain deliberative, attorney-client, attorney work product, or otherwise privileged material. Do not release this message under FOIA without appropriate review. If you are not the intended recipient, please advise the sender immediately by reply e-mail and delete this message and any attachments from your machine and all storage media whether in electronic or hard copy. Thank you.
>
> **From:** Chapman, Apple <Chapman.Apple@epa.gov>
> **Sent:** Thursday, August 22, 2019 1:36 PM
> **To:** Sullivan, Tim <Sullivan.Tim@epa.gov>
> **Subject:** Re: FOIA Assignment for EPA-HQ-2019-008108 Davidson
>
> Yes and she already did.
>
> Sent from my iPhone
>
> On Aug 22, 2019, at 3:32 PM, Sullivan, Tim <Sullivan.Tim@epa.gov> wrote:
>
> > Was this directed to Cassandra?

Thanks –

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
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From: Chapman, Apple <Chapman.Apple@epa.gov>
Sent: Thursday, August 22, 2019 10:39 AM
To: Barnes, Cassandra <Barnes.Cassandra@epa.gov>; Fried, Gregory <Fried.Gregory@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: FOIA Assignment for EPA-HQ-2019-008108 Davidson

Ex. 5 Deliberative Process (DP) Can you put a response letter together to that effect?

Apple Chapman
Deputy Director, Air Enforcement Division
Office of Civil Enforcement
(202) 564-5666 or (202) 841-6076

From: Barnes, Cassandra <Barnes.Cassandra@epa.gov>
Sent: Thursday, August 22, 2019 12:33 PM
To: Fried, Gregory <Fried.Gregory@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>; Chapman, Apple <Chapman.Apple@epa.gov>
Subject: FOIA Assignment for EPA-HQ-2019-008108 Davidson

Tim/Apple

This FOIA is being assigned to SSEB for a response. The due date is September 12, 2019. If you need any assistance, please let me know.

Cassandra

From: admin@foiaonline.gov <admin@foiaonline.gov>
Sent: Thursday, August 22, 2019 10:49 AM

To: Barnes, Cassandra <Barnes.Cassandra@epa.gov>
Subject: FOIA Assignment for EPA-HQ-2019-008108

You have been assigned to the FOIA request - EPA-HQ-2019-008108. Additional details for this item are as follows:

- Tracking Number: EPA-HQ-2019-008108
- Requester: Mr. Carrick Brooke-Davidson
- Request Track: Simple
- Submitted Date: 08/14/2019
- Due Date: 09/12/2019
- Short Description: N/A
- Description: On March 29, 2019, EPA finalized a New Owner Clean Air Act Audit Program tailored for the oil and natural gas sector. Please provide copies of all agreements undertaken under this program.
- Assigned Comments:

Message

From: Chapman, Apple [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C52A18BCF6164B6D9F04545DB694CAC1-ACHAPMAN]
Sent: 8/22/2019 7:47:45 PM
To: Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: Re: FOIA Assignment for EPA-HQ-2019-008108 Davidson

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Sent: Thursday, August 22, 2019 10:49 AM
To: Barnes, Cassandra <Barnes.Cassandra@epa.gov>
Subject: FOIA Assignment for EPA-HQ-2019-008108

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- Tracking Number: EPA-HQ-2019-008108
- Requester: Mr. Carrick Brooke-Davidson
- Request Track: Simple
- Submitted Date: 08/14/2019
- Due Date: 09/12/2019
- Short Description: N/A
- Description: On March 29, 2019, EPA finalized a New Owner Clean Air Act Audit Program tailored for the oil and natural gas sector. Please provide copies of all agreements undertaken under this program.
- Assigned Comments:

The Center for Public Integrity

910 17th Street N.W., 7th Floor
Washington, DC 20006-2606

FOIA officer
U.S. Environmental Protection Agency
1200 Pennsylvania Ave NW
Washington, DC 20460

Dear EPA FOIA Officer:

This is a request under the Freedom of Information Act.

On behalf of the Center for Public Integrity and myself, jointly, I request that you provide us copies of the records identified and described below – or of records containing the information identified and described below:

- Emails and attachments, electronic calendar entries or invites, electronic meeting notes or summaries, reports, studies, analyses, datasets, talking points created by, sent to or received by staff of the Office of the Administrator, Office of Air and Radiation, Office of Enforcement and Compliance Assurance or the Office of Research and Development containing the following search terms or keywords:

  AFO
  animal feeding operation
  Agricultural Air Research Council
  air compliance agreement
  animal waste
  CAFO
  concentrated animal feeding operation
  EEM
  emissions estimating methodology
  EPA-HQ-OAR-2010-0960
  feedlot
  lagoon
  manure
  NAEMS
  national air emissions modeling study
  national monitoring study
  OPE-FY16-0018
  process-based

  - The date range for this request is January 1, 2019, and the date you conduct the search for responsive records.

Format: We prefer to receive records in the following formats, listed in order of preference:

(1) word processing file, text-based PDF, or similar;
(2) other non-proprietary electronic format;
(3) paper copies.

Please also provide any and all documentation related to such electronic records, including but not limited to data dictionaries, database documentation, record layouts, code sheets, data entry instructions, and similar printed or electronic documentation materials.

We specifically request all portions of any record responsive to the description above. If you withhold any record or any portion of a record as exempt, we specifically request the release of all segregable non-exempt portions, including but not limited to email header information (e.g., sender, recipients, date, subject) and analogous information in non-email documents.

If you withhold any record or portion of a record, please specify which statutory exemptions are claimed for each withholding. Please separately state how disclosure would harm an interest protected by the cited exemption. Please describe each record withheld, including its date and size (e.g., amount of electronic memory or number of paper pages).

Please also produce the records on a rolling basis; at no point should EPA's search for, or deliberations concerning, certain records delay the production of others that EPA has already retrieved and elected to produce.

Please respond within 20 working days, as the Act provides, or notify me if "unusual" or "exceptional" circumstances apply (as the Act uses those terms).

Request for fee reduction as a representative of the news media

The Center for Public Integrity is a news media organization, and therefore this request should be exempt from all fees for search and review. This request is being made in connection with the Center's newsgathering functions and not for any other commercial purpose. The Center intends to produce one or more original investigative reports based on analysis of the requested information. The Center's work has won the Pulitzer Prize in 2014 and 2017 and numerous other journalism awards (see http://www.publicintegrity.org/about/our-work/awards).

The only federal court to consider the issue has held that the Center "is entitled to treatment as a representative of the news media for purposes of FOIA." Center for Public Integrity v. HHS, Civil Case No. 06-1818, 2007 U.S. Dist. LEXIS 56172 (D.D.C. Aug. 3, 2007), https://ecf.dcd.uscourts.gov/cgi-bin/show_public_doc?2006cv1818-15. In addition, our reporters covering Congress and congressional committees are credentialed by the Standing Committee of Correspondents of the Congressional Daily Press Gallery.

We expect that duplication fees for producing electronic records will be minimal. If there are processing fees greater than $25, inform me before you fill the request, and I will provide additional information in support of a public interest fee waiver.

Please feel free to contact me about any aspect of this request. In principle, the Center is willing to consider ways in which the request might reasonably be narrowed.

I certify that the information I have provided is true and correct. Thank you for your attention to this request.

Sincerely,

Joe Wertz

Center for Public Integrity
910 17th Street N.W., 7th Floor
Washington, DC 20006-2606
202-481-1262
jwertz@publicintegrity.org

Appointment

From: Idsal, Anne [idsal.anne@epa.gov]
Sent: 8/29/2019 5:07:47 PM
To: Idsal, Anne [idsal.anne@epa.gov]; Harlow, David [harlow.david@epa.gov]; Woods, Clint [woods.clint@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]; Lassiter, Penny [Lassiter.Penny@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]; Smith, Darcie [Smith.Darcie@epa.gov]; South, Peter [South.Peter@epa.gov]; Cozzie, David [Cozzie.David@epa.gov]; Crowley, Kate [crowley.kate@epa.gov]; McKinney, Voronina [mckinney.voronina@epa.gov]; Joseph, Wanda [joseph.wanda@epa.gov]; Hunt, Virginia [Hunt.Virginia@epa.gov]; Eck, Janet [Eck.Janet@epa.gov]; Sullivan, Tim [Sullivan.Tim@epa.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]

Subject: Call for Information: Information Related to the Development of Emissions Estimating Methodologies for Animal Feeding Operations
Attachments: Idsal Mtg Rqst: Call for Information: Information Related to the Development of Emission Estimating Methodologies for Animal Feeding Operations
Location: WJC - N 5400 + Video with RTP + Personal Privacy / Ex. 6

Start: 9/5/2019 3:00:00 PM
End: 9/5/2019 4:00:00 PM
Show Time As: Busy

Idsal Mtg Rqst: Call for Informati...

ENVIRONMENTAL INTEGRITY PROJECT

1000 Vermont Avenue, NW
Suite 1100
Washington, DC 20005
Main: 202-296-8800
Fax: 202-296-8822
www.environmentalintegrity.org

May 21, 2019

Via FOIAonline submission.

National Freedom of Information Officer
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (2822T)
Washington, DC 20460

Re: Freedom of Information Act request for Records Relating to EPA's National Air Emissions Monitoring Study

Dear FOIA Officer:

Pursuant to the Freedom of Information Act (FOIA), 5 U.S.C. § 552, the Environmental Integrity Project requests records held by the U.S. Environmental Protection Agency (EPA) relating to EPA's recent efforts to complete its National Air Emissions Monitoring Study (NAEMS) as described in a 2017 report from the EPA Office of Inspector General (OIG):

> U.S. EPA Office of Inspector General, *Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes*, Report No. 17-P-0396 (Sep. 19, 2017) (hereinafter "OIG report").

More specifically, the Environmental Integrity Project requests, for the time period beginning on January 1, 2017, the following records:

1. "Quality Assurance Project Plan (QAPP) for evaluation of NAEMS data and completion of EEMs." *See* OIG report at 29.

2. Documents related to EPA Office of Air and Radiation (OAR) and/or EPA Office of Research and Development (ORD) determinations "about which EEMs can be completed and the appropriate schedule for their completion." *See* OIG report at 29.

3. All notifications from OAR to the EPA Office of Enforcement and Compliance Assurance (OECA) stating that it "cannot develop scientifically and statistically sound EEMs." *See* OIG report at 30.

4. All documents related to OECA notifying participants in the Animal Feeding operations Air Compliance Agreement that "it cannot develop EEMs for any emission source and pollutant combination." *See* OIG report at 32.

ED_004549_00015445-00001

5. All documents related to the schedule for completing draft or final Emission Estimation Methodologies. *See* OIG report at 1 and 30.

6. All documents related to the "updated Call for Information requesting additional relevant VOC data" as described on EPA's website at https://www.epa.gov/afos-air/national-air-emissions-monitoring-study#naems-status.

Format of Records

For purposes of this request, the term "records" means information of any kind, including, but not limited to, documents (handwritten, typed, electronic of otherwise produced, reproduced, or stored), letter, e-mails, facsimiles, memoranda, correspondence, notes, databases, drawings, graphs, photographs, minutes of meetings, electronic records of meetings, and any other compilation of data from which information can be obtained.

Claims of Exemption from Disclosure

If you regard any documents as exempt from required disclosure under FOIA, please exercise your discretion to disclose them nevertheless, keeping in mind that FOIA "is the most prominent expression of a profound national commitment to ensuring an open Government" and that "[a]ll agencies should adopt a presumption in favor of disclosure." President Barack Obama, Memorandum For the Heads of Executive Departments and Agencies: Freedom of Information Act, 74 Fed. Reg. 4, 863 (Jan. 26, 2009).

In the alternative, after careful review for the purpose of determining whether any of the information is exempt from disclosure, please provide all reasonably non-exempt portions of records and communications as required by FOIA.

Should you elect to invoke an exemption, please provide the required full or partial denial letter and sufficient information to determine whether or not there may be grounds to appeal EPA's decision. In accordance with the minimum requirements and regulations of due process, this information should include:

- Basic factual material, including the originator, date, length, and addresses of the withheld items.
- Explanations and justifications for denial, including the identification of the exemption applicable to the withheld information or portions of the information found to be subject to exemption, and how each exemption applies to the withheld material.

Waiving Request for Fee Waiver

This FOIA request meets the case-by-case requirements for a fee waiver, by satisfying each of the six factors which must be met to qualify for a fee waiver under EPA regulations

found at 40 C.F.R. § 2.107. However, although we are entitled to a fee waiver, we are waiving any request for a waiver of fees.

Opportunity to Provide Clarification

If I can provide any additional information or answer any questions that can help to clarify or limit this request, please do not hesitate to contact me at PHONE or via email at EMAIL.

Thank you for your assistance with this FOIA request, and I look forward to hearing from you.

Sincerely,

s/Abel Russ
Senior Attorney
Environmental Integrity Project
1000 Vermont Avenue NW, Suite 1100
Washington, DC 20005
802-482-5379
aruss@environmentalintegrity.org

ED_004549_00015445-00003

Canada as a power marketer. That Order will expire on August 19, 2005.

On June 7, 2005, NSP filed an application with DOE for renewal of the export authority contained in Order No. EA–282 for a five-year term. NSP proposes to export electric energy to Canada and to arrange for the delivery of those exports over the international transmission facilities presently owned by Basin Electric Power Cooperative, Bonneville Power Administration, Eastern Maine Electric Cooperative, International Transmission Company, Joint Owners of the Highgate Project, Long Sault, Inc., Maine Electric Power Company, Maine Public Service Company, Minnesota Power Inc., Minnkota Power Cooperative, New York Power Authority, Niagara Mohawk Power Corporation, Northern States Power, Vermont Electric Power Company, Inc. and Vermont Electric Transmission Company.

The construction, operation, maintenance, and connection of each of the international transmission facilities to be utilized by NSP, as more fully described in the application, has previously been authorized by a Presidential permit issued pursuant to Executive Order 10485, as amended.

Procedural Matters: Any person desiring to become a party to this proceeding or to be heard by filing comments or protests to this application should file a petition to intervene, comment or protest at the address provided above in accordance with §§385.211 or 385.214 of the FERC's Rules of Practice and Procedures (18 CFR 385.211, 385.214). Fifteen copies of each petition and protest should be filed with DOE on or before the date listed above.

Comments on the NSP application to export electric energy to Canada should be clearly marked with Docket EA–282–A. Additional copies are to be filed directly with Manager, Contract Administration, Northern States Power Company, 1099 18th Street, Suite 3000, Denver, CO 80202.

A final decision will be made on this application after the environmental impacts have been evaluated pursuant to the National Environmental Policy Act of 1969, and a determination is made by the DOE that the proposed action will not adversely impact on the reliability of the U.S. electric power supply system.

Copies of this application will be made available, upon request, for public inspection and copying at the address provided above or by accessing the program's Home Page at *http://www.fe.doe.gov.* Upon reaching the Home page, select "Electricity Regulation," and then "Pending Proceedings" from the options menus.

Issued in Washington, DC, on July 6, 2005.

Anthony J. Como,

Director, Permitting and Siting, Office of Electricity Delivery and Energy Reliability.

[FR Doc. 05–13633 Filed 7–11–05; 8:45 am]

BILLING CODE 6450–01–P

ENVIRONMENTAL PROTECTION AGENCY

[OAR–2004–0237; FRL–7936–5]

Animal Feeding Operations Consent Agreement and Final Order

AGENCY: Environmental Protection Agency (EPA).

ACTION: Supplemental notice; reopening of signup period for consent agreement and final order.

SUMMARY: On January 31, 2005 (70 FR 4958), EPA announced an opportunity for animal feeding operations (AFO) to sign a voluntary consent agreement and final order (air compliance agreement). This supplemental notice announces an extension to the signup period for the consent agreement and final order.

DATES: The signup period is extended to July 29, 2005.

ADDRESSES: EPA has established a docket for this action under Docket ID No. OAR–2004–0237. All documents in the docket are listed in the index at *http://www.epa.gov/edocket.* Although listed in the index, some information is not publicly available, *i.e.*, CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically in EDOCKET or in hard copy at: Air and Radiation Docket, EPA/DC, EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Air Docket is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: For information on the air compliance agreement, contact Mr. Bruce Fergusson, Special Litigation and Projects Division, Office of Enforcement and Compliance Assurance, U.S. EPA, Ariel Rios Building, Washington, DC 20460, telephone number (202) 564–1261, fax number (202) 564–0010, and electronic mail: *fergusson.bruce@epa.gov.*

For information on the monitoring study, contact Ms. Sharon Nizich, Organic Chemicals Group, Emission Standards Division, Office of Air Quality Planning and Standards, U.S. EPA, Research Triangle Park, NC 27711, telephone number (919) 541–2825, fax number (919) 541–3470, and electronic mail: *nizich.sharon@epa.gov.*

SUPPLEMENTARY INFORMATION: In order to provide more time for operators of animal feeding facilities to make informed decisions about participation, EPA is extending the sign-up period for the Animal Feeding Operation Air Compliance Agreement until July 29, 2005. The Agreement addresses emissions from certain animal feeding operations, also known as AFO. EPA will continue to reach out to the agricultural community during this time.

The response to comments document is published in a separate **Federal Register** notice and can also be found on the Agency's Web site at *http://www.epa.gov/compliance/resources/agreements/caa/cafo-agr-response-com.html.*

Dated: June 30, 2005.

Sally Shaver,

Director, Emission Standards Division, Office of Air Quality Planning and Standards.

Dated: July 5, 2005.

Robert A. Kaplan,

Director, Special Litigation and Projects Division, Office of Civil Enforcement and Compliance Assurance.

[FR Doc. 05–13671 Filed 7–11–05; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[OAR–2004–0237; FRL–7936–4]

Animal Feeding Operations Consent Agreement and Final Order

AGENCY: Environmental Protection Agency (EPA).

ACTION: Supplemental notice; response to comments on consent agreement and final order.

SUMMARY: On January 31, 2005 (70 FR 4958), EPA announced an opportunity for animal feeding operations (AFO) to sign a voluntary consent agreement and final order (air compliance agreement).

The comment period ended May 2, 2005. This supplemental notice publishes the Agency's response to comments.

ADDRESSES: Comments are posted on Docket ID No. OAR–2004–0237 at the Agency Web site: *http://www.epa.gov/edocket.*

Docket: All documents in the docket are listed in the EDOCKET index at *http://www.epa.gov/edocket.* Although listed in the index, some information is not publicly available, *i.e.*, CBI or other information whose disclosure is restricted by statute. Certain other information, such as copyrighted materials, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically in EDOCKET or in hard copy form at Docket ID No. OAR–2004–0237, EPA/DC, EPA West, Room B102, 1301 Constitution Ave., NW, Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Air Docket is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: For information on the air compliance agreement, contact Mr. Bruce Fergusson, Special Litigation and Projects Division, Office of Enforcement and Compliance Assurance, U.S. EPA, Ariel Rios Building, Washington, DC 20460, telephone number (202) 564–1261, fax number (202) 564–0010, and electronic mail: *fergusson.bruce@epa.gov.*

For information on the monitoring study, contact Ms. Sharon Nizich, Organic Chemicals Group, Emission Standards Division, Office of Air Quality Planning and Standards, U.S. EPA, Research Triangle Park NC 27711, telephone number (919) 541–2825, fax number (919) 541–3470, and electronic mail: *nizich.sharon@epa.gov.*

SUPPLEMENTARY INFORMATION: On January 31, 2005, EPA published a notice in the **Federal Register** announcing an Air Compliance Agreement (the Agreement) AFO, and requested public comment on the Agreement. The original comment period ran until March 2, 2005. The comment period was subsequently reopened on April 1, 2005, and ran until May 2, 2005. EPA received approximately 800 separate sets of comments.

The development of the Agreement was an open and extensive process, both before and after the January 31, 2005, publication in the **Federal Register**. Prior to that announcement, EPA worked with numerous stakeholders for 3 years to develop the Agreement. Agency officials met and received input from representatives from all the relevant AFO industry groups, State officials, national and local environmental groups, and local citizen groups. EPA provided copies of prior drafts of the Agreement to these groups, and received comments. EPA made changes to the draft Agreement in response to concerns raised during the development of the Agreement. The vast majority of comments received during the public comment periods were ones that had been previously expressed to EPA, and they had already been considered in the development of the Agreement.

After the Agreement was published in the **Federal Register**, EPA continued to meet with various stakeholders from the AFO industry, States, environmental groups, and local citizen groups regarding the Agreement. Many informative meetings were held around the Nation to discuss the Agreement with stakeholders. EPA has reviewed all comments and has determined that no changes are needed to the current version of the Agreement. The two most frequent concerns raised were the need for more time to provide comments and for more time to consider whether to sign the Agreement. These two concerns were addressed with the reopening of the comment period and the extension of the signup period by 60 days until July 1, 2005. In addition, EPA is now extending the signup period a final time until July 29, 2005.

EPA has identified a number of common concerns in the comments and responds to each below. Additional information can be found on EPA's website in documents including the "Fact Sheet," "Frequently Asked Questions," and the "Agreement Sign-Up Instructions."

Comment: Emergency Planning Community Right-to-Know Act/ Comprehensive Environmental Response, Compensation and Liability Act (EPCRA/CERCLA) Applicability.

Many commenters from the poultry industry suggested that EPCRA and CERCLA were not intended to regulate the agriculture industry, and that the Agency should exempt these sources from reporting. Other commenters claimed that, to the contrary, it was essential for these emissions to be reported to the National Response Center and local emergency response centers in order to provide the public with information regarding quantities of ammonia emissions released from nearby agricultural operations.

Response: AFO may be subject to the notification requirements of CERCLA for releases of hazardous substances from their facilities. Generally, CERCLA section 103 requires a person in charge of a "facility" to report any release, including air emissions, of a hazardous substance from the facility if the release exceeds the reportable quantity (RQ) for that substance. Section 101(9) of CERCLA defines a facility to include: "(A) any building, structure, installation, equipment, pipe or pipeline * * * well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft, or, (B) any structure, installation * * *. ditch, landfill (or) site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located." CERCLA hazardous substances of particular concern to the AFO industry typically are ammonia and hydrogen sulfide. Both of these hazardous substances have a reportable quantity of 100 pounds. CERCLA 103 requires any person in charge of a facility, as soon as they have knowledge of a release in an amount equal to or greater than the RQ from their facility, to immediately notify the National Response Center of such a release. EPCRA section 304 requires the same notification to State emergency response commissions and local emergency planning committees when CERCLA 103 is triggered in order to protect and expand public right-to-know interests.

To date, AFO that have reported to the National Response Center generally have reported estimated emissions coming from their barns and lagoons. In addition, AFO have the option of submitting a single, written report that characterizes continuous release reporting from their facilities. This "continuous release report" is the least burdensome form of reporting.

The Agency is aware of the concerns expressed and is committed to streamline the notifications so that they impose the least amount of burden for the reporting entities. EPA is particularly sensitive to the need for more specific triggering thresholds for CERCLA. One of the goals of the Agreement's 2-year monitoring study is to determine a more specific range of operations/species-specific release sizes that would trigger CERCLA and EPCRA.

In addition, the Agency has not received a formal request to consider a CERCLA administrative reporting exemption specifically for AFO for ammonia and/or hydrogen sulfide reporting.

Comment: Impact on State Actions.

Commenters noted that the Agency should clarify whether respondents will be shielded from future State lawsuits by signing this Agreement. A number of State commenters voiced concerns about the effect of the Agreement on State efforts to enforce against AFO. The primary objection was that the Agreement may undercut action of State, local, or tribal authorities

attempting to enforce their own authorities against AFO.

Response: The Agreement has no impact on the most important State enforcement tools to protect local residents from AFO emissions. These include zoning classification, State (non-Federally enforceable) permits, nuisance actions, workplace regulations and health and safety laws. Further, the Agreement does not impact any actions to abate odors because there are no Federal Clean Air Act (CAA) odor control regulations. The Agreement does not and is no way intended to undermine the State, local or tribal enforcement authorities. The Agreement does not affect any requirements that do not arise under CERCLA, EPCRA, or a federally-approved CAA State implementation plan. Prior to the Agreement, very few actions were brought against AFO for air emissions under the authorities set out in the Agreement. The great majority of enforcement came about under regulations that are not impacted by the Agreement. Concerns that the Agreement could affect the ability of regulators to protect the health and safety of local residents are unfounded. The Agreement does not affect the ability of any regulator to bring an action under the emergency provisions of the CAA and other statutes to prevent an imminent and substantial endangerment to public health, welfare or the environment.

The Agreement augments and improves State and local control in several respects. First, emissions data generated by the nationwide emissions study will be available to the public during the study. EPA's publication of emissions—estimating methodologies will also assist and guide State, local and tribal efforts. In December 2002, the National Academy of Sciences released a report concluding that scientifically sound and practical protocols for measuring air concentrations and emissions rates were needed to guide regulatory and enforcement decisions. The data collected by this study, along with EPA's analyses, will be a helpful step for all in answering the concerns of the National Academy of Sciences. Second, participating farms which need to obtain Prevention of Significant Deterioration/New Source Review (PSD/NSR) permits at the conclusion of the study will submit applications to the States. The Agreement explicitly does not limit a State or local government's authority to impose applicable permitting requirements. In addition, the covenant not to sue will be nullified if AFO fail to comply with State nuisance final orders arising from air emissions. Finally, a number of States are undertaking their own programs to address air emissions from AFO. These efforts range from mandatory permit programs to voluntary, cooperative approaches with industry. The Agreement is not intended to preempt or otherwise interfere with these efforts. Nothing in the Agreement absolves a failure to comply with non-federally enforceable State law, nor prohibits participation in other compliance programs.

Comment: Length of Implementation Schedule.

Several commenters expressed concern that major agricultural sources of air pollution may not be required to install emission control technology until 2010 or later under the Agreement. These commenters claim that such facilities are already having a significant negative impact on nearby residents and on local and regional air quality and, therefore, they should take immediate steps to reduce their emissions.

Response: Under the Agreement, the national air emissions monitoring study will be conducted for 2 years, most likely starting in early 2006. At the end of the monitoring study in early 2008, EPA will have eighteen months to develop and publish emissions-estimating methodologies for AFO. Within 120 days after EPA has published an emissions-estimating methodology for a particular farm, the farm will have to submit all required CAA permit applications. Installation of controls required by any permits will be in accordance with the deadlines established by the relevant State permitting authority.

EPA believes that the above schedule represents the most aggressive schedule that is reasonably possible. EPA and the group of experts on AFO air emissions that developed the monitoring study protocol concluded that 2 years of monitoring were needed to conduct a study that will yield data adequate to allow EPA to develop reasonably accurate emissions-estimating methodologies. While much has to be done once the monitoring study is completed to develop the emissions-estimating methodologies, such as analysis of data and review by EPA's Science Advisory Board, EPA will not wait until the end of the 2-year monitoring study before beginning the process of developing the Emissions-Estimating Methodologies, but rather will do so as soon as data become available. Moreover, EPA has agreed to publish the emissions-estimating methodologies on a rolling basis as they are developed. For those reasons, EPA is hopeful that it will be able to publish emissions-estimating methodologies for large segments of the AFO industry before the 18-month deadline, and that any required controls will subsequently be installed before 2010.

EPA believes that the alternative to the Agreement suggested by several commenters—using enforcement authority to order AFO to measure their emissions and to comply with all applicable environmental requirements would take much longer. In addition to the above steps related to emissions monitoring and developing emissions-estimating methodologies for the AFO industry, which would take just as long if not longer under this scenario, there would also potentially be several years of litigation added to the timeline as AFO contested EPA's orders and emissions-estimating methodologies. By avoiding lengthy litigation, the Agreement provides the shortest timeframe possible to obtain the necessary data and to bring AFO into compliance with all applicable regulatory requirements pertaining to air emissions.

Comment: BACT/LAER.

Several commenters noted that it is not clear what types of control strategies/techniques respondents will be committing to install, since best available control technology (BACT)/lowest achievable emission limitations (LAER) determinations have not been made for agriculture sources. The commenters expressed concern that implementation of BACT/LAER could force closure of farms.

Response: The selection of both BACT and LAER are site-specific determinations that consider the achievability of controls. A BACT analysis requires the local permitting authority to consider the economic, energy, and environmental impacts in determining the degree of emissions reductions that are achievable for new or modified major sources in attainment areas. EPA does not envision significant burdens associated with the application of BACT. Although a LAER determination does not consider economic, energy, or environmental factors, a LAER limit also is not intended to impose costs that would prevent successful economic operation of a source. LAER is defined as the most stringent emission limitation that is either: (1) Contained in a State implementation plan, or (2) achieved in practice by a source in the same class or category. If a control technology is in use at another facility in the same class or category of farm, then this is evidence that the costs of that control are not prohibitive and would not cause a competitive disadvantage. EPA will be

issuing guidance in the future that will specify the conditions that constitute the same class or category of farm. Relative to non-attainment and attainment areas under the CAA, BACT is applicable when a major source applies for a PSD permit, and is only applicable in attainment areas. LAER is applicable when a major source applies for a New Source Review (NSR) permit in a non-attainment area. Until emission estimates are developed for farm operations, it is not known whether BACT or LAER would be required. If they are needed, EPA will work with the U.S. Department of Agriculture (USDA) to determine the most effective BACT and LAER alternatives for the least cost. EPA will issue guidance addressing this along with methodologies for determining emission estimates at the conclusion of the study.

Comment: Civil Penalty Payment.

EPA received several comments suggesting that the civil penalty provision and the monitoring fund fees under the Agreement are inappropriate for various reasons. Commenters noted that the Agreement does not follow the penalty assessment criteria established by CERCLA, EPCRA and the CAA. Commenters also claimed that the EPA failed to adhere to its policies governing the assessment of penalties, known as Enforcement Response Policies (ERPs), in administrative enforcement proceedings which provide guidance in establishing penalties.

Commenters argued that the penalties under the Agreement were either too low or too high. Those who thought that the penalties under the Agreement were too low referenced the criteria set forth in the statutes and in the ERPs. Those who thought that the penalties under the Agreement were too high commented that small farmers would have to pay a disproportionate amount of their total revenue where they are unlikely to trigger CERCLA, EPCRA or CAA reporting thresholds. Lastly, some commenters noted that the monitoring fund fees would impose a financial hardship.

EPA also received several comments suggesting that the Agreement requires an admission of liability and that the term "civil penalty" carries negative connotations that imply guilt. Furthermore, companies should not have to pay to resolve unproven violations.

Response: The Agreement is a voluntary settlement between the EPA and participating farmers. There is no obligation to participate. The penalty assessment criteria contained in CERCLA, EPCRA, and the CAA serve as guidance in establishing the penalty provision under the Agreement. The Agreement use a pro-rata determination based on the size of business in calculating the amount of the penalty. For example, the Agreement considers the number of facilities in making the penalty determination. Under the Agreement, some small farmers may pay as little as $200 in order to participate. The monitoring fund fees will be used to support monitoring activities to determine emissions from various types of operations across geographic regions and species. Given the lack of established emissions factors, participating facilities both large and small will benefit from increased certainty—both in knowing their obligations and resolving possible current and past liability.

By signing the Agreement, farmers are not admitting any liability or any sort of wrongdoing. The Agreement makes clear that signing is not an "admission that any of its agricultural operations has been operated negligently or improperly or that any such operation is or was in violation of any Federal, State, or local law or regulation." The civil penalty provision is not intended to be used for any other purposes other than this Agreement. Rather, payment of a penalty is part of the process to obtain a release from liability for possible violations. If the participant pays the penalty and complies with all the terms of the Agreement, the Federal Government cannot sue later for the violations covered by the Agreement. Payment provides participants with the full protections of the settlement.

A primary focus of the national air emissions study is to determine how much air pollution farms emit. The type and quantity of emissions depend on many factors such as species, number of animals, type of operation, and location. Until the monitoring study is complete and more data are available, it would be difficult to say what requirements may apply to which particular size and type of operations, and whether these farms emit enough pollutants to trigger regulatory requirements. In fact, the study is designed to answer this question: what size and types of farms may have regulatory responsibilities? Therefore, the results of the study will be used to determine compliance status.

Comment: Payment Responsibility for Monitoring.

EPA received a number of comments relating to funding of the monitoring study. Some commenters noted that farms should not have to pay to monitor their facilities; EPA and/or USDA should pay for the monitoring or offer grants to help farms pay for the monitoring. Some commenters also noted possible inequities in the funding obligations across animal species because dairy and poultry cannot use check-off funds to pay for monitoring.

Response: Every source is obligated to determine if it is in compliance with applicable Federal environmental laws. EPA recognizes it may be difficult for certain farms to determine their compliance responsibilities with respect to air emissions. The emissions monitoring study in the Agreement will help provide the scientific data needed to help farmers and EPA determine the compliance status of AFO. The Agreement is the quickest and most effective way to address current uncertainty regarding emissions from AFO and to bring all AFO into compliance with all applicable regulatory requirements pertaining to air emissions.

EPA is offering the Agreement to AFO in the egg, broiler chicken, turkey, dairy and swine industries. The Agreement ensures that responsibility for funding the emissions monitoring study will be shared among the AFO that choose to sign the Agreement. Moreover, the Agreement should reduce the cost of measuring emissions for individual facilities by combining participants' resources.

The Agreement also ensures participating farms are treated fairly and consistently across animal sectors. Under the Agreement, EPA will not sue any participant for certain past violations; in return, participants agree to pay a small civil penalty and contribute to the emissions monitoring study. The Agreement is designed to provide flexibility for the industry to generate or pool resources to cover the costs of the study.

Comment: Immunity.

Several commenters stated EPA should not give "immunity" as part of the Agreement, or at least not to the farms that are not monitored as part of the emissions monitoring study.

Response: A release and covenant not to sue is a common provision of settlements and is consistent with the procedural requirements for the settlement of matters before filing an administrative complaint contained in 40 CFR part 22. In the Agreement, EPA agrees not to sue participating AFO for violations of certain federal environmental laws provided participants comply with specific conditions of the Agreement. This limited conditional release and covenant not to sue is offered to participating AFO that pay a small penalty and contribute to the monitoring study fund. Payment

provides participants with the full protections of a settlement.

Comment: Monitoring Protocol—Outside Peer Review/Stakeholder Involvement.

EPA received several comments suggesting that the monitoring protocol should be reviewed by groups outside the EPA, and that EPA should provide greater stakeholder participation. Commenters suggested that the monitoring protocol should undergo peer review by independent experts that were not involved in formulating the protocol. Also, some State and local agencies requested that they be allowed to participate with EPA in the periodic technical review of progress of the study.

Response: The monitoring protocol was developed over a period of approximately 12 months by a group of thirty experts in the area of AFO air emissions. This group of experts included scientists from both USDA and EPA, the AFO industry, environmental groups, and academia. EPA is evaluating whether and how to conduct additional review.

Comment: Monitoring Site Selection/Statistical Representation.

EPA received many comments related to the selection of monitoring sites. Commenters stated that the number of monitoring sites is too small to provide scientifically defensible emission estimates. Commenters also noted that the number of sites is too limited to account for all of the differences in types of manure management systems, building types, ventilation rates, feeding practices, animal type/age, animal management practices, geography, and climate. Even for the types of farms monitored, commenters said that there may not be a sufficient number of samples to establish a statistically-valid standard deviation to account for random variability from a single farm type.

Response: EPA recognizes that there is a wide variety of AFO processes used in the industry and that the mechanisms that generate emissions from the AFO industry are highly complex. EPA recognizes that it is impractical to expect that sufficient data could be collected in a timely manner to accurately characterize every different type of operation and practice used in the AFO industry. Technical experts on emission monitoring at EPA and a number of universities have concluded that monitoring the farms described in the protocol will provide sufficient data to get a valid sample that is representative of the vast majority of participating AFO. At the time the agreement was announced, EPA estimated that approximately 28 farms would be selected to represent the major animal groups (*e.g.*, swine, dairy, and poultry), different types of operations, and different geographic regions. Twenty-eight farms represent EPA's estimate of the minimum number of farms that are expected to participate in the Agreement, based on the resources available. If more farms decide to participate, then resources will be available to monitor additional sites. Whatever number of sites are ultimately selected, EPA will choose farms that are representative of the broadest population of participating animal feeding operations. Moreover, in developing the methodologies for estimating AFO emissions, EPA will not be limited to using only the data collected under the Agreement. As stated in the **Federal Register** notice, EPA intends to aggregate the data collected under the Agreement with existing emissions data. Currently, substantial research on AFO emissions is being conducted by states, universities, and the USDA. For example, the USDA funded a project through the Initiative for Future Agriculture and Food Systems in early 2000. This emissions measurement project at livestock and poultry buildings is being conducted in six States: Indiana, Iowa, Illinois, Minnesota, North Carolina, and Texas. Mobile laboratories are being used by each State to collect aerial pollutant emissions from the barns of six different animal types, one type per each participating State. EPA will evaluate the results of the research and all other relevant studies and will incorporate the findings of any substantially similar studies that can meet quality assurance tests and other validity tests into the emissions-estimating methodologies.

Comment: Use of a Single Nonprofit Organization/Independent Monitoring Contractor.

Some commenters asserted that using a single nonprofit organization (NPO) and single independent monitoring contractor (IMC) to conduct the monitoring is inappropriate. Commenters stated that a separate NPO should be established for each animal sector to ensure the credibility and success of the monitoring results. In this manner, the monitoring study would be conducted by individuals who are most knowledgeable about each animal sector. A primary concern of the commenters was that the emission results will not be valid because the monitoring study will not be tailored to the needs of each animal species and study location.

Response: The Agreement provides for individuals who are most knowledgeable to be responsible for planning and implementing the study. The use of a single NPO and IMC does not limit the scientific expertise that will be incorporated into planning and implementation. The NPO will be primarily responsible for administration of the study and communicating progress, but will not be involved in the technical aspects of the testing and monitoring program. The IMC and Science Advisor will be responsible for developing the monitoring plan; ensuring the consistency of the quality assurance objectives, test methods, and monitoring protocols that will be used at the various sites; and selection, hiring, and oversight of the Principal Investigators for each site, who will be responsible for conducting the monitoring at each site. The Principal Investigators will be selected based on the unique scientific expertise required for each animal species and farm operating practice.

The Principal Investigators will be regional or local experts (*e.g.*, nearby university researchers) who are familiar with local animal agricultural practices and the topographic and meteorological factors that influence emissions. Under the direction and approval of the Science Advisor, the Principal Investigators may participate in site selection and development of the site-specific monitoring plans and will be able to alter their plans due to interim findings as the study progresses. Hence, the study methodology is anticipated to allow sector experts to oversee the implementation of the plans and tailor the monitoring protocols as needed to address site-specific conditions.

Comment: Testing and Monitoring Methods and Data Availability.

EPA received a number of technical comments related to testing and monitoring methodologies. These comments addressed limitations and difficulties of applying specific sampling methods to barns and manure storage facilities (*e.g.*, maintenance and operating procedures, the citing of samplers, sampling procedures, sampling frequency, method selection, and others).

Several commenters stated that real-time monitoring data should be made available online to the public. Other commenters said that the industry participants and independent researchers that conduct the monitoring should have access to the data and be encouraged to publish the data.

Response: The comments EPA received on testing and monitoring-related issues came primarily from

researchers with experience in evaluating and monitoring emissions from the processes and animal groups addressed by the Agreement. These comments contain useful advice on the application of testing and monitoring methods, sampling locations, equipment selection, and maintenance as well as suggestions for avoiding potential pitfalls. These comments will be passed to the Science Advisor for consideration in developing site-specific testing and monitoring plans. As stated in the Agreement, all the emissions data collected will be made available to the public. Throughout the course of the study, the IMC will submit quarterly progress reports to EPA and provide all emissions data and analysis to the EPA as soon as possible. The EPA will review the data to validate the suitability for use in developing emission estimation tools. As the study progresses, EPA will periodically release interim findings to the public. At this time, the schedule for release and the format of the data have not been determined.

Comment: Industry-Sponsored Study.

A number of commenters stated that industry should not be responsible for the monitoring study because the results of the study could not be accepted as unbiased, especially since there is no outside oversight of the monitoring by EPA or anyone else not connected with the industry.

Response: Throughout the study, the activities of the Principal Investigators will be subject to review and approval by EPA. The IMC must submit to EPA a proposed monitoring plan (including selection of the farms to be tested) for review and approval. The Agreement also requires the IMC to submit quarterly progress reports to EPA and schedule periodic meetings with EPA (additional meetings can be scheduled at the request of EPA). The IMC must notify EPA promptly of any problems or adjustments made to the approved plan. The EPA also will have access to the farms participating in the study to verify or observe the conduct of the monitoring. All emissions data generated and all analyses of the data made by the IMC during the monitoring study will be provided to EPA as soon as possible. EPA will review and analyze the data to verify credibility for use in developing the emissions-estimation methodologies. The emissions data also will be made available to the public.

Since the inception of the CAA, most emissions data that have been used for regulatory applicability determinations and environmental rulemaking have been developed by industry. EPA policy requires that the data be collected using federally approved test methods. EPA reviews the final test reports and is the final authority on the acceptability of the data. The monitoring protocol for AFO differs only in the scope of the monitoring study and the additional degree of EPA involvement in the up-front planning of the study.

Comment: Process-Based Models.

Several commenters stated that the emissions-estimating methodologies developed by EPA should be process-based models as suggested by the National Academy of Sciences. In addition, development of the emissions-estimating methodologies should be an open process, with citizen and State involvement and peer review.

Response: In the short-term, the monitoring study is designed to produce scientifically sound emissions-estimating methodologies for making regulatory applicability decisions for AFO. Our longer-term strategy involves development of process-based models that consider the entire animal production process, consistent with the recommendations from the National Academy of Sciences. The data collected in the monitoring study, along with other valid scientific studies that are available will be used to develop the process-based models. EPA has not determined the process by which emissions-estimating methodologies will be developed. EPA anticipates that the process will provide the opportunity for public input and review. However, the timing and extent of review have not been determined.

Comment: Claim that Agreement is a Rule.

Several commenters expressed the opinion that the Agreement was a rule, not an adjudication, and was, therefore, subject to the Administrative Procedure Act's procedures for rulemaking. Commenters expressed two concerns. First was a belief that the Agreement will excuse a large part of the industry from compliance with the CAA, CERCLA, and EPCRA for several years. Second, commenters expressed concern that binding emission evaluating protocols would be established without adequate public input.

Response: Each Agreement that will be entered into by EPA is a settlement of potential civil violations under the Clean Air Act, CERCLA, and EPCRA and, therefore, clearly the result of an adjudication. It contains all the classic elements of an adjudicatory settlement, including an allegation of potential violations, a civil penalty, a resolution of liability, and a requirement that the participating farms come into compliance with all applicable regulatory requirements. While the commenters object that the Agreement does not require immediate compliance, it is common for settlements to establish a compliance schedule. Here, the Agreement requires that the participating company must first determine the amount of their emissions and which regulatory requirements apply, and then is required come into compliance expeditiously once that determination is made. The fact that EPA has chosen to exercise its enforcement discretion to enter into essentially the same settlement agreement with a class of facilities that may have the same potential violations does not convert the adjudicatory process into a rulemaking one.

With regard to commenters' second concern, EPA has not determined the process by which emissions-estimating methodologies will be developed and anticipates that the process will provide the opportunity for public input and review. Because neither the final form of the emissions-estimating methodologies nor the process by which they will be developed has yet been determined, commenters' claim that EPA has failed to comply with procedural requirements is premature.

Comment: Liability Impacts in Other Areas.

EPA received a number of comments on potential adverse consequences of "admitting liability" by participation in the Agreement, with payment of a penalty pursuant to Paragraph 48 of the Final Order. Some farmers raised concerns that participation could affect their credit, immigration status, and ability to participate in other government programs.

Response: As noted earlier, participation in the Agreement is not an admission of liability. Paragraph 3 of the Agreement makes clear that execution of the Agreement is "not an admission that any of its agricultural operations has been operated negligently or improperly, or that any such operation is or was in violation of any Federal, State, or local law or regulation." Consistent with EPA's practice in settling both civil judicial and administrative matters, the Agreement states that, "participation in this Agreement is not an admission of liability." Concerns that signing the Agreement may serve as an admission are addressed in the Agreement. No further clarification is necessary. Second, as set out in Paragraph 2 of the Agreement, the purpose of the Agreement is to ensure that participants comply with applicable requirements of the CAA and applicable reporting provisions of CERCLA and EPCRA.

Participation should not give rise to any inference of wrongdoing. To the contrary, EPA deems those who choose to participate to be cooperatively addressing an industry-wide problem, acting responsibly and proactively.

Further, until the results of the study are published and EPA determines emissions factors, it can be difficult for participants to determine their compliance status. The Agreement provides a mechanism for resolution of civil liability, as set out in the Agreement, that is designed to achieve compliance for large segments of the industry as rapidly as possible. For all of these reasons, participants should not suffer adverse consequences in any other public or private application, program, or proceeding for voluntarily undertaking this action.

Conclusion

Interested parties should refer to the January 31, 2005, **Federal Register** notice (70 FR 4958) to view the consent agreement and final order at Appendix 1, Attachment A—Farm Information Sheet, and Attachment B—National Air Emissions Monitoring Study Protocol.

Dated: June 30, 2005.

Sally L. Shaver,

Director, Emission Standards Division, Office of Air Quality Planning and Standards.

Dated: July 5, 2005.

Robert A. Kaplan,

Director, Special Litigation and Projects Division, Office of Civil Enforcement and Compliance Assurance.

[FR Doc. 05–13672 Filed 7–11–05; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[FRL–7936–6]

Announcement of the Board of Trustees for the National Environmental Education and Training Foundation, Inc.

SUMMARY: The National Environmental Education and Training Foundation was created by Section 10 of Public Law #101–619, the National Environmental Education Act of 1990. It is a private 501(c)(3) non-profit organization established to promote and support education and training as necessary tools to further environmental protection and sustainable, environmentally sound development. It provides the common ground upon which leaders from business and industry, all levels of government, public interest groups, and others can work cooperatively to expand the reach of environmental education and training programs beyond the traditional classroom. The Foundation supports a grant program that promotes innovative environmental education and training programs; it also develops partnerships with government and other organizations to administer projects that promote the development of an environmentally literal public.

The Administrator of the U.S. Environmental Protection Agency, as required by the terms of the Act, announces the following appointment to the National Environmental Education and Training Foundation, Inc. Board of Trustees. The appointee is J.L. Armstrong, National Manager, Diversity, Development—Community, Toyota Sales, USA, Inc. The appointee will join the current Board members which include:

- Braden Allenby, Vice President, Environment, Health and Safety, AT&T
- Richard Bartlett, (NEETF Chairman) Vice Chairman, Mary Kay Holding Corporation
- Dorothy Jacobson, Consultant
- Karen Bates Kress, President, KBK Consulting, Inc.
- Dorothy McSweeny, (NEETF Vice Chair), Chair, DC Commission on the Arts and Humanities
- Honorable William Sessions, former Director of the Federal Bureau of Investigation.

Additional Considerations: Great care has been taken to assure that this new appointee not only has the highest degree of expertise and commitment, but also brings to the Board diverse points of view relating to environmental education and training. This appointment shall be for two consecutive four year terms.

FOR FURTHER INFORMATION CONTACT: C. Michael Baker, (202) 564–0446, Acting Director, Office of Environmental Education, Office of Public Affairs (1704A) U.S. EPA 1200 Pennsylvania Ave., NW., Washington, DC 20460.

Dated: July 6, 2005.

Stephen L. Johnson,

Administrator.

BIO of New Member

J. L. Armstrong, National Manager, Diversity Development—Community, Toyota Motor Sales, U.S.A., Inc.

J.L. Armstrong is national manager diversity development, community for Toyota Motor Sales (TMS), U.S.A., Inc.

In support of Toyota's 21st Century Diversity Strategy, he has corporate liaison responsibility for minority advertising and marketing promotions, supplier diversity, community relations, and field operations. He is charged with developing a strategic diversity plan and is responsible for monitoring, augmenting, tracking, and supporting those processes that result in the organization's ability to sustain a competitive advantage by leveraging diversity.

Armstrong began his career with Toyota in 1992 as merchandising manager and was responsible for developing and implementing marketing programs targeting special markets based upon ethnicity, gender, and educational background. Armstrong developed and implemented sports, motorsports, media merchandising, auto show, and promotional clothing/specialty merchandising marketing programs.

In 1998 he was appointed supplier development manager and promoted to national manager supplier development January 2002. Armstrong developed the Supplier Development Department at TMS, which included developing an electronic supplier database accessible to all TMS associates in the interest of increasing the utilization of minority and woman-owned businesses. He developed a Second Tier Supplier Program to ensure that TMS majority-owned suppliers utilize minority and woman-owned businesses, and developed metrics and quarterly reporting systems to ensure that TMS is able to monitor its spending with minority and woman-owned business enterprises. Armstrong was instrumental in taking TMS from $44 million in minority/woman-owned business procurement spend in 1998 to over $83 million in 2001.

Prior to Toyota, Armstrong worked as director of business affairs for Universal Television, MCA, Inc., negotiating deals for the services of writers, directors, and producers in connection with television development and production.

Armstrong graduated with a Bachelor of Science degree in business from Indiana University in Bloomington, Ind. He is an ordained minister with the African Methodist Episcopal Church, and serves on the ministerial staff of Rev. Dr. Cecil Murray at First AME Church, Los Angeles, Calif.

Armstrong is past Vice Chair External Affairs of the Southern California Regional Purchasing Council board of directors, and served on the senior corporate executive advisory board of the United States Hispanic Chamber of Commerce in Washington, DC.

Armstrong resides in West Los Angeles, Calif.

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Appointment

From: Rakosnik, Delaney [rakosnik.delaney@epa.gov]
Sent: 9/3/2019 6:30:39 PM
To: Harlow, David [harlow.david@epa.gov]; Woods, Clint [woods.clint@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]; Lassiter, Penny [Lassiter.Penny@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]; Smith, Darcie [Smith.Darcie@epa.gov]; South, Peter [South.Peter@epa.gov]; Cozzie, David [Cozzie.David@epa.gov]; Crowley, Kate [crowley.kate@epa.gov]; McKinney, Voronina [mckinney.voronina@epa.gov]; Joseph, Wanda [joseph.wanda@epa.gov]; Hunt, Virginia [Hunt.Virginia@epa.gov]; Eck, Janet [Eck.Janet@epa.gov]

Subject: Call for Information: Information Related to the Development of Emissions Estimating Methodologies for Animal Feeding Operations
Attachments: Idsal Mtg Rqst: Call for Information: Information Related to the Development of Emission Estimating Methodologies for Animal Feeding Operations
Location: WJC - N 5400 + Video with RTP + Personal Privacy / Ex. 6

Start: 9/5/2019 3:00:00 PM
End: 9/5/2019 4:00:00 PM
Show Time As: Tentative

Idsal Mtg Rqst: Call for Informati...

Appointment

From: Rakosnik, Delaney [rakosnik.delaney@epa.gov]
Sent: 9/3/2019 5:16:30 PM
To: Harlow, David [harlow.david@epa.gov]; Woods, Clint [woods.clint@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]; Lassiter, Penny [Lassiter.Penny@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]; Smith, Darcie [Smith.Darcie@epa.gov]; South, Peter [South.Peter@epa.gov]; Cozzie, David [Cozzie.David@epa.gov]; Crowley, Kate [crowley.kate@epa.gov]; McKinney, Voronina [mckinney.voronina@epa.gov]; Joseph, Wanda [joseph.wanda@epa.gov]; Hunt, Virginia [Hunt.Virginia@epa.gov]; Eck, Janet [Eck.Janet@epa.gov]

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Location: WJC - N 5400 + Video with RTP + Personal Privacy / Ex. 6

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End: 9/3/2019 8:30:00 PM
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Appointment

From: Rakosnik, Delaney [rakosnik.delaney@epa.gov]
Sent: 8/29/2019 5:07:44 PM
To: Harlow, David [harlow.david@epa.gov]; Woods, Clint [woods.clint@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]; Lassiter, Penny [Lassiter.Penny@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]; Smith, Darcie [Smith.Darcie@epa.gov]; South, Peter [South.Peter@epa.gov]; Cozzie, David [Cozzie.David@epa.gov]; Crowley, Kate [crowley.kate@epa.gov]; McKinney, Voronina [mckinney.voronina@epa.gov]; Joseph, Wanda [joseph.wanda@epa.gov]; Hunt, Virginia [Hunt.Virginia@epa.gov]; Eck, Janet [Eck.Janet@epa.gov]

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US EPA ARCHIVE DOCUMENT

UNITED EGG PRODUCERS

FINAL PROJECT AGREEMENT

PROJECT XL

US EPA ARCHIVE DOCUMENT

I. INTRODUCTION . . . 5
A. What is Project XL? . . . 5
B. Purpose of this Final Project Agreement . . . 5
C. Project Description and Purpose . . . 6
D. Description of UEP . . . 7
E. Description of Egg Producing Facilities . . . 8
F. List of Parties that Will Sign the Agreement . . . 9
G. List of Project Contacts . . . 9

II. DETAILED DESCRIPTION OF THE PROJECT . . . 9
A. Description of the Specific Project Elements . . . 10
1. Model General Permit . . . 10
2. EMS Program . . . 11

III. HOW WILL THE PROJECT MEET THE PROJECT XL ACCEPTANCE CRITERIA? . . . 13
A. Anticipated Superior Environmental Performance . . . 14
B. Anticipated Benefits . . . 15
C. Stakeholder Involvement/Public Participation . . . 15
D. Innovative Approach and Multi-Media Pollution Prevention . . . 15
E. Transferability . . . 16
F. Feasibility . . . 16
G. Evaluation, Monitoring and Accountability . . . 16
H. Shifting of Risk Burden . . . 17

IV. DESCRIPTION OF THE REQUESTED FLEXIBILITY AND THE IMPLEMENTING MECHANISMS . . . 17
A. Requested Flexibility . . . 17
B. Legal Implementation Mechanism . . . 17
C. Compliance/Enforcement Screening . . . 18

V. DISCUSSION OF INTENTIONS AND COMMITMENTS FOR IMPLEMENTING THE PROJECT . . . 18
A. UEP and Egg Producer Intentions . . . 18
B. EPA Intentions . . . 19
C. State Intentions . . . 19
D. Performance Targets/Tracking, Reporting and Evaluation . . . 19
E. Project Implementation . . . 21
F. Periodic Review by the Parties to the Agreement . . . 22
G. Duration of the Project . . . 23

VI. LEGAL BASIS FOR THE PROJECT . . . 23
A. Authority to Enter into the Agreement . . . 23
B. Legal Effect of the Agreement . . . 23

US EPA ARCHIVE DOCUMENT

C. Applicability of Other Laws or Regulations 24
D. Retention of Rights to Other Legal Remedies 24

VII. UNAVOIDABLE DELAY DURING PROJECT IMPLEMENTATION 24

VIII. AMENDMENTS OR MODIFICATIONS TO THE AGREEMENT 24

IX. TRANSFER OF PROJECT BENEFITS AND RESPONSIBILITIES TO NEW EGG PRODUCER OWNERS 25

X. PROCESS FOR RESOLVING DISPUTES 25

XI. WITHDRAWAL FROM OR TERMINATION OF THE AGREEMENT 26
A. Expectations 26
B. Procedures 26

XII. COMPLIANCE AFTER THE PROJECT IS OVER 27

XII. SIGNATORIES AND EFFECTIVE DATE 27

APPENDIX A - List of Workgroup Members 29

APPENDIX B - NPDES GENERAL PERMIT 30

APPENDIX D - Code of Good Environmental Practice 63

APPENDIX E - Critical Management Programs 64

APPENDIX F - Stakeholder Involvement 65

US EPA ARCHIVE DOCUMENT

I. INTRODUCTION

A. What is Project XL?

The U.S. Environmental Protection Agency (EPA) created Project XL, which stands for *eXcellence and Leadership,* to give companies, communities, state and local agencies, federal facilities, and industrial sectors, the opportunity to propose cleaner, cheaper, and smarter ways of protecting the environment. Project XL provides real world tests of these innovative strategies. Project XL also provides a vehicle for EPA to consider and, after careful evaluation of the project, replace or modify regulatory requirements, policies or procedures if it is determined that the innovative strategy piloted in this XL project will produce Superior Environmental Performance (SEP) and promote accountability to the public.

Project XL was identified as the best mechanism for developing an innovative Project involving EPA and the United Egg Producers (UEP). Project XL provides a mechanism for the Parties to explore flexibility for selected facilities through EPA s National Pollutant Discharge Elimination System (NPDES) permits, while also ensuring a superior environmental outcome through the use of an environmental management system (EMS) that addresses a full range of significant environmental impacts, including those not subject to regulation.

B. Purpose of this Final Project Agreement

This Final Project Agreement (Agreement) sets forth the plans of the signatories and represents the firm commitment of each signatory to support the XL process, the elements of the model general permit, and the implementation and oversight of EMS by each participating facility based on the program developed by the workgroup.

The Agreement is not, however, intended to create legal rights or obligations and is not a contract, a final agency action, or a regulatory action such as a rule. The Agreement does not give anyone a right to sue the Project Signatories for any alleged failure to implement its terms, either to compel implementation or to recover damages.

This Agreement was available for a fourteen-day (14) public comment period. Additionally, this Agreement will allow EPA to gather data and evaluate experiences that will inform Agency decision making as we consider ways to improve the current regulatory system. As with all XL Projects, the opportunities granted in connection with this Agreement, in and of itself, establish no precedent with regard to other projects.

C. Project Description and Purpose

This innovative Project is expected to help selected egg producing facilities achieve superior environmental results beyond those that could be achieved under

US EPA ARCHIVE DOCUMENT

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conventional NPDES general permits. This innovative and more comprehensive approach will require qualified facilities to 1) comply with the terms of an NPDES general permit; and 2) develop and implement a multi-media environmental management system (EMS) that addresses a full range of significant environmental impacts, including those not subject to regulation.

Participation in this project will be strictly limited to those that can continue to meet these stringent requirements. Each facility will also need to pass an independent 3rd party audit confirming compliance with an NPDES general permit and the fact that an EMS was in place and been developed with input from stakeholders before it could even apply for coverage under a general permit. Based on information submitted by the facility, including audit results, states would then have up to 30 days to evaluate this information and make a final decision on whether to grant coverage under an NPDES general permit. This information would also be available to local stakeholders. Each facility will also need to successfully complete regular follow-up audits and continue to work with stakeholders as the EMS is implemented. Information on the results of these follow-up audits will also be publicly available. Each facility s EMS will also help ensure that on-farm management practices most likely to result in superior environmental performance will be used. Based on EMS audit results or inspections carried out by regulatory authorities, facilities could be required to apply for individual NPDES permits.

Facilities that wish to participate in this program will be subject to a two stage compliance screening process, using EPA s Project XL screening criteria. First, following the signing of this agreement, EPA would conduct a national screening, using EPA s Project XL compliance screening criteria. UEP would provide information, as necessary, to facilitate this screening. Facilities that did not pass this screen would not eligible to participate.

The second screening will occur at the time a state, as part of this XL project, decides to develop an NPDES general permit. EPA and the state will work together at that time to do another screen, again using the XL screening criteria and any other compliance screening criteria the state felt were appropriate for specific egg producing facilities located in that state. At either step, a facility that did not initially meet the screening criteria could be eligible to reapply once the noncompliance issues had been satisfactorily resolved.

Finally, this project involves significantly greater local participation than is currently available under EPA s existing NPDES general permitting regulations. Stakeholders will be given the opportunity to work with individual facilities throughout the entire process of developing and implementing the EMS and will have access to important facility information, including EMS audit results, throughout the life of project.

US EPA ARCHIVE DOCUMENT

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This Project includes a model NPDES general permit and a description of EMS guidelines for states and egg producing facilities. These two documents were developed by a workgroup consisting of EPA, UEP members, several States, non-governmental organizations, and a representative from the U. S. Department of Agriculture (USDA). A list of the workgroup members is attached in Appendix A. To supplement the EMS requirements contained in this FPA, UEP will develop more detailed guidance and training to assist individual facilities adopt EMSs and will also develop an independent 3rd party auditing program. UEP will also expand its outreach and education program in order to assist egg producers develop EMSs and educate users of manure on ways to properly apply and manage this manure. Facilities will not be able to consider applying for this program until these steps are completed and individual states decide to develop general permits. As the project sponsor, UEP will also have the primary responsibility for tracking progress under the project and providing information to various stakeholders on its success.

As described in more detail in Section IV, EPA is not proposing a site-specific rule to implement this project. Individual states may choose to use the model general permit developed as part of this project or could develop their own general permit.

D. Description of UEP

UEP is a farmer cooperative representing more than 300 egg producers in more than 20 states across the nation, most of whom own their own flocks and do not contract out egg production. Most UEP members are large enough (>100,000 birds) to be defined as Concentrated Animal Feeding Operations (CAFOs) and thus likely to be subject to individual NPDES permits, but could be covered under general permits if they are able to meet the requirements of this program, which are described later in this Agreement.

E. Description of Egg Producing Facilities

Egg producing facilities are generally owned and operated by producers that own their own flocks and do not contract out their operations, as do other parts of the poultry industry like broiler production facilities. Most farms are integrated from the point of production through the final marketing of the eggs. In recent years, there has been rapid consolidation of the industry into fewer, but much larger farms that nonetheless are generally still operated as family farms. Smaller farms do exist (<200,000 birds), but the economics of egg production, collection, cleaning, processing, and shipping generally dictates large operations (500,000 to five million birds).

Most UEP operations are solely dry litter operations, in which chicken litter is collected and stored in watertight cement pits below the bird cages, dried for several months, removed for sale, and then spread on nearby farmland or composted/pelletized for sale to nursery or retail garden markets. Most UEP

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operations are large enough (>100,000 birds) to be defined as CAFOs. However, at this point, only about 12% operate under federal NPDES permits, and between 50% and 60% operate under State permits or regulations that are independent of the federal permitting program.

It is UEP s understanding that most UEP members, due to their size, would be required under EPA regulations now under development to obtain individual NPDES permits. In light of this, UEP has now proposed to implement a program designed to achieve superior environmental results at participating facilities in exchange for coverage under general permits. The facilities will also benefit from a streamlined process for obtaining permits. EPA and states will benefit because facilities that meet the stringent requirements of this program will come under NPDES permits more quickly than would occur under EPA s regulations under development since these regulations will not be promulgated until 2003 at the earliest. SEP will be achieved because, in addition to complying with the terms of the NPDES general permit, each facility s EMS will need to address a full range of environmental impacts, both regulated and unregulated, not just those regulated under the NPDES program. Each facility s EMS would also have to pass an audit conducted by an independent 3rd party in order for the facility to be eligible to apply for a general permit. Information from a successful audit would be publicly available and provided to the state or federal permit writer at the time the facility applies for coverage under a general permit. Follow up audits to ensure that the facility continues to successfully implement its EMS will take place and the results of these audits will be publicly available. Facilities that fail to remain in compliance with the general permit and/or fail to adequately implement their EMS could be required to obtain individual permits by the permitting authority.

F. List of Parties that Will Sign the Agreement

This Agreement is entered into by the U.S. Environmental Protection Agency and United Egg Producers. It will guide the working relationship of all Parties in fulfilling the promise of this XL Project.

G. List of Project Contacts

Each party has designated a representative to serve as its contact person for inquiries concerning the Project. These representatives are as follows:

1. For EPA:
   Jim Horne
   Office of Water
   Ariel Rios Building
   1200 Pennsylvania Ave, NW,
   Mail Code 4201
   Washington, D.C. 20460

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Phone: 202-260-5802
Fax: 202-260-1040
Email: horne.james@epa.gov

2. For UEP:
John Thorne
Capitolink, LLC
United Egg Producers
1156 15th Street, N.W., Suite 400
Washington, D.C. 20005
Phone: 202-872-3865
Fax: 202-296-0833
E-Mail: jthorne@capitolink.com

II. DETAILED DESCRIPTION OF THE PROJECT

A. Description of the Specific Project Elements

There are two major elements of this project the model NPDES general permit and the EMS program, including 3rd party audits, that each facility will need to conform to before applying for an NPDES general permit. Another important component of this Project is an expanded industry education and training program that UEP will implement. The expanded industry education and training program is designed to assist individual egg producers develop effective EMSs, effectively manage nutrients, and effective management of litter generated by UEP facilities by 3rd party users.

1. Model NPDES General Permit

The model NPDES general permit, which is included in Appendix B, is offered as guidance to States that may wish to participate in this program. The provisions contained in the model NPDES general permit are quite similar to the requirements that are expected to be required in the future for facilities subject to individual NPDES permits. The model NPDES general permit for egg producing operations (EPO) contained in this Agreement contains the following major parts:

Part I Permit Area and Coverage
This part contains basic information on which types of facilities are covered, what types of discharges are covered, who is eligible for coverage, and how to apply for coverage.

Part II Permit Requirements
This part describes the two basic categories of pollutant discharge limitations for facilities seeking coverage, technology-based effluent limitations, and any other limitations, such as requirements to develop comprehensive nutrient

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management plans.

Part III Special Conditions
This section describes a number of special conditions such as (1) minimum standards to protect water quality, (2) comprehensive nutrient management plans, (3) management practices, (4) land application activities not under the control of the EPO, and (5) the environmental management system each facility must have in place.

Part IV Discharge Monitoring and Notification Requirements
This section describes monitoring requirements for each covered operation and requirements for notifying state or federal regulatory agencies when a discharge has occurred.

Part V Standard Permit Conditions
This section contains certain general conditions such as duty to provide information to regulatory authorities, as well as a number of more substantive conditions dealing with operation and maintenance, record keeping, and reporting.

Part VI Definitions
This section contains a set of basic definitions that pertain to the permit such as the definition of an animal feeding operation, rainfall event, and animal unit.

Part VII Permitting Authority Specific Permit Conditions
This final section allows the permitting authority to include any other specific conditions that it may wish to include for all EPOs in its jurisdiction.

2. **EMS Program**
As indicated, each facility, in addition to meeting all requirements of the NPDES general permit, will be required to have an acceptable EMS in place, as determined by an independent 3rd party audit, before the facility can apply for coverage under the NPDES general permit. For the purposes of this Agreement, the workgroup has developed a series of documents which outline a series of EMS requirements that will pertain to individual facilities. UEP will also be developing additional more detailed guidance that will assist individual facilities develop EMSs consistent with the requirements agreed to by the workgroup. The documents included in this FPA include:

A set of **EMS Elements** that describe a series of procedural and process steps each facility will need to use as it develops its EMS, including communications with the local community. The EMS Elements are modeled

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after the standard Plan-Do-Check-Act EMS framework, but tailored to meet the needs of the egg producing industry. A copy of the EMS Elements is located in Appendix C.

An industry **Code of Good Practice** which describes a number of overall commitments each facility will make through its EMS. The Code is designed to assure that facilities address a full range of potential environmental impacts (regulated and unregulated) and adopt best management practices (BMPs) designed to achieve superior environmental performance. A copy of this Code is in located in Appendix D.

A series of **Critical Management Programs** that facilities would need to implement as part of their EMS. Critical Management Programs define the broad areas of management that every facility will need to address like odor control and pest control. Properly addressing these areas will also help address other environmental impacts, like air quality, that would not be addressed under NPDES permits. UEP will also develop a list of individual best management programs (BMPs) to help ensure effective ongoing implementation of each critical management program. If a facility was not successfully addressing each critical management program, it would not pass the audit. A list of these critical management programs is located in Appendix E

The EMS components listed above have been developed by the workgroup led by UEP. Taken together, they define what an individual egg producing facility will need to do to participate in the XL program. However, they do not provide detailed guidance for facilities on how to develop an EMS, nor do they describe how UEP will educate and train facilities interested in participating in this XL Project. These components also do not describe exactly how the 3rd party EMS auditing program will operate.

Therefore, as part of its commitment under this Agreement, UEP commits to fully develop these remaining elements, in conjunction with the project workgroup, by a specific date agreed to by EPA and UEP. Specifically, UEP agrees to the following actions:

1. To develop more detailed guidance to assist individual facilities develop all the elements of an acceptable EMS. The key element of this more detailed guidance will be a Model EMS Template for Egg Producers (Model). The model will be organized around the EMS Elements Document and list of Critical Management Programs. It will not only describe the objective of each EMS element but provide relevant examples of ways in which a facility could satisfy each element. The model will also give guidance on how to implement

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each of the Critical Management Programs, including recommended BMPs for each one.

2. Develop an EMS Training and Technical Assistance Action Plan. This strategy will be designed to assist, over time, all egg producers that wish to develop an EMS that will enable them to seek coverage under a general permit. The Action Plan will describe what type of training and assistance will be provided, what materials will be used, and over what time frame the training and technical assistance will be provided. The Action Plan will cover training and assistance necessary both for initial coverage under a general permit and, as necessary, ongoing assistance to help facilities maintain their EMS and implement critical management programs.

3. Develop a 3rd Party EMS Auditing Program. At a minimum, this program will include (1) necessary qualifications of auditors, (2) training to assure auditor competency, (3) protocols and other written tools used to conduct the audits, (4) sample audit findings reports to be used when sharing information with regulatory agencies and local stakeholders, and (5) the way in which UEP will oversee the operation of the auditing program. UEP may wish to work with other organizations with similar programs in place, like America s Clean Water Foundation, or others.

4. Develop an outreach program designed to help off-site users of manure from egg producers manage this manure in an environmentally responsible manner. This program will focus over time on providing the most current information to off-site manure users on:
   - suggested application rates for various crops,
   - warnings about potential impacts from over application of manure,
   - suggestions on appropriate BMPs to use, and
   - ways to develop Comprehensive Nutrient Management Plans (CNMPs) over time.

Egg producers will not responsible for actually writing CNMPs for third-party manure users, but, as indicated, will provide information designed to help these users develop their own CNMPs.

III. HOW WILL THE PROJECT MEET THE PROJECT XL ACCEPTANCE CRITERIA?

The UEP Project, described in this Agreement, meets EPA's Project XL criteria. See 60 Fed. Reg. 27, 282, et seq. (May 23, 1995). The criteria and the basis for stating that they are met are summarized below.

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A. Anticipated Superior Environmental Performance

It is anticipated that the Superior Environmental Performance (SEP) from this project will result from egg producing facilities participating in a more comprehensive program that is based not only on: 1) compliance with an NPDES general permit, including appropriate land application of manure; 2) voluntary development and implementation of a multi-media EMS that helps reduce environmental impacts from regulated activities and activities that are not regulated under conventional NPDES permits; and 3) ongoing audits of EMSs by an independent third party, in addition to routine NPDES compliance inspections.

The third party auditing/ EMS requirements of this project will help egg-laying facilities remain in compliance and improve on areas of their production that need attention. It will also help to ensure that well-functioning facilities continue to perform at high levels and continue to address environmental issues of concern to their neighbors, not just those related to water quality. By utilizing the services of trained independent auditors, more oversight of egg producing facilities can take place than would likely be possible with existing federal and state resources. However, States and/or EPA are not precluded in any way from continuing to perform their ongoing compliance and enforcement functions, with appropriate biosecurity considerations, nor is the right of citizens to bring lawsuits against a particular facility limited in any way under this project. Results from audits will be publicly available, and EPA or States could require facilities to obtain an individual NPDES permit at any time if they failed to remain in compliance or successfully implement their EMS.

Other benefits will be realized as well. Currently, only a portion of egg producing operations are fully inspected by regulatory agencies. Facilities participating in this program will be audited on a regular basis. The results of these audits, including areas where improvements are needed, will be shared by UEP with other smaller facilities that may fall below the regulatory threshold but nonetheless could use this information to reduce their environmental impacts. If these audits, along with inspections conducted by regulatory authorities indicate that a participating facility is not remaining in compliance with the general permit or failing to maintain its EMS, the facility could be required to apply for an individual NPDES permit.

B. Anticipated Benefits

The proposed program is ultimately expected to provide considerable cost savings to participating facilities. However, at least some facilities will need to invest in improvements to their facilities and incur design and construction expenses before they can participate. For example, operations and maintenance expenses might be increased for certain facilities. The requirements set out in the model NPDES general permit guidance are quite stringent and are similar to the requirements that facilities that operate under individual permits in the future will likely need to meet. EPA and

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UEP both believe that the proposed program will bring about greater levels of environmental protection because it will require facilities that ultimately qualify for NPDES general permits to implement EMSs that address environmental issues beyond the scope of the NPDES program.

C. Stakeholder Involvement/Public Participation

This proposal has been developed by a workgroup consisting of EPA, UEP members, several States, non-governmental organizations, and a representative from USDA. All aspects of the program have been throughly reviewed and are supported by all participants. Ultimately, however, it will be up to the individual States to support the program by making general permits available to qualifying facilities. UEP has the primary responsibility for helping to secure support from the states. UEP will work closely with states that have egg producers to educate them on the program and encourage them to participate. UEP will also work closely with the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA). The UEP Board of Directors has endorsed the project and has made resources available to facilitate its implementation. Please see Appendix F for a more detailed description of the Project s Stakeholder involvement.

This project also provides for greater local participation in the NPDES permitting process than is available under EPA s existing NPDES general permitting regulations, as well as greater public access to important information on a full range of environmental impacts that must be addressed as each qualifying facility develops and implements its EMS.

D. Innovative Approach and Multi-Media Pollution Prevention

This Project s innovation involves an entire industry sector voluntarily requesting permits and developing an industry-specific EMS and auditing program. Each EMS will be multi-media in order to address all significant environmental impacts, both regulated and unregulated, using pollution prevention approaches whenever practicable. Participating facilities will also be required to implement a series of critical management programs, and associated BMPs. If, through the 3rd party audits, it was determined that any of the critical management programs were not being adequately implemented, the facility would not initially qualify for coverage under an NPDES general permit or could not continue to be covered unless corrective actions were taken. Participating facilities will also have to develop CNMP s over time, consistent with EPA s AFO/CAFO Strategy, that also contribute to pollution prevention.

E. Transferability

This project will be transferable to any State in the future that did not initially choose to participate.

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00014

F. Feasibility

UEP has the support and resource commitment from its Board of Directors and members to implement this project. Other key stakeholders like ASIWPCA are also supporting the project. Support from the states is the main key to success for this program. Without this support, the program will not be successful. UEP has the primary responsibility for securing support from the States. EPA will encourage, but certainly not require States with egg producing facilities, to adopt this program. Additionally, the program does not have to be implemented in all States with egg producing facilities to be deemed successful. It is the hope of UEP and EPA that several States will move forward quickly to adopt the program and, as success is documented, more and more States will see the value of this innovative approach.

G. Evaluation, Monitoring and Accountability

EPA's monitoring, reporting and evaluation criteria within this Agreement articulate EPA's expectation that Project XL sponsors will make Project information available to Stakeholders in a form that is easy to understand. Information about this Project can be found on the Project XL web site, *www.epa.gov/projectxl*; and on the UEP s web site. For a more detailed description of the Project s monitoring, reporting and evaluation requirements, please see Section V. C. -- Performance Targets/Tracking, Reporting and Evaluation.

H. Shifting of Risk Burden

EPA and UEP have analyzed Executive Order No. 12898 on Environmental Justice, and do not expect the Project to result in unjust or disproportionate environmental impacts. No group of citizens or neighborhood will be subject to disproportionate environmental impacts. This proposal does not involve shifting a risk burden from one population to another or one media to another. Additionally, it should not result in any health and safety problems for farm workers or citizens.

IV. DESCRIPTION OF THE REQUESTED FLEXIBILITY AND THE IMPLEMENTING MECHANISMS

A. Requested Flexibility

Facilities that have successfully completed the EMS audit would submit a Notice of Intent (NOI), along with information on the results of the audit, to be covered under an NPDES general permit issued by either a State or EPA. Coverage under the general permit will continue as long as the facility remained in compliance with the terms of the NPDES general permit and continued to implement its EMS. Regular follow up audits will take place from independent 3rd parties, and States or EPA will continue to perform their routine compliance and enforcement activities, as necessary. No rule making is necessary to implement this project. If a facility failed to remain in compliance with the NPDES general permit or failed to adequately implement its

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00015

EMS, States or EPA could require the facility to obtain an individual, site-specific NPDES permit. States and EPA retain all compliance and enforcement authority and may bring an enforcement action at any time for violations of the NPDES general permit and in cases where the facility may be causing significant water quality problems.

B. Legal Implementation Mechanism

EPA regulations at 40 CFR 122.28 allow States and EPA to issue NPDES general permits. These regulations also set forth requirements for how general NPDES permits are to be issued and administered. For example, under these regulations, general permits are first issued in draft form so that the public may comment on the draft permit and request a public hearing before a final permit is issued. Under 40 CFR 123.25 (a), State general permit programs must conform to section 122.28 or be more stringent but a State that does not seek to implement a general permit program under Section 122.28 need not do so. EPA will support adoption of NPDES general permits for egg producers by authorized States, but the final decision on whether to do so will rest with these states. EPA will offer NPDES general permits to qualified facilities in States that are not authorized to administer the NPDES program.

C. Compliance/Enforcement Screening

Screening to ensure the likelihood of a participant s ability to achieve superior environmental results, and to ensure the appropriateness of providing a participant with the regulatory flexibility sought, is a requirement for all XL projects, and will be an integral part of this project. Compliance screening, using EPA s Project XL compliance screening criteria, will take place at two levels. Initially, following the signature of this project agreement, EPA will perform a national screen of all egg producing facilities to identify those facilities that would not be eligible at this point to participate in the program. UEP will work with EPA to provide any information needed to complete this screening. Then, as individual states choose to develop general permits for egg producers in their state, EPA and the state will work together, again using the Project XL screening criteria plus any other criteria the state deems appropriate, to identify facilities in the state that would not be eligible to participate.

In states that are not delegated the authority to issue general NPDES permits, EPA s regional offices will conduct the compliance screen using the Project XL screening criteria, and will then provide coverage under a general permit only to those facilities that meet the screening criteria and other requirements of this XL program. If a facility failed either of the screens, but was able to resolve outstanding noncompliance issues to the satisfaction of EPA and the state, the facility would be eligible to apply for inclusion into the program.

V. DISCUSSION OF INTENTIONS AND COMMITMENTS FOR IMPLEMENTING THE PROJECT

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00016

A. UEP and Egg Producer Intentions

Egg Producers that choose to participate in this project will comply with all environmental regulatory and other requirements necessary to qualify for NPDES general permits during implementation of this Project and will implement EMSs based on guidelines developed by UEP and approved by EPA.

UEP intends to continue to provide resources to achieve the objectives of this Agreement.

UEP will work with Stakeholders and the appropriate local, regional, state and federal agencies to facilitate the process.

B. EPA Intentions

EPA will facilitate, in a timely manner and through use of Project XL, the terms of this project.

EPA will work with Stakeholders and the appropriate local, regional, state and federal agencies to facilitate the process.

EPA, UEP, and other stakeholders will review the Project to determine whether it results in SEP.

EPA intends to continue to provide advice to UEP, subject to the availability of resources, to achieve the objectives of this Agreement.

C. State Intentions

The states that participate in this program will issue (subject to applicable procedures and review of public comments) an NPDES general permit under their applicable state statutes and regulations that is consistent with the model NPDES general permit contained in this agreement and will use the EMS guidance developed under this project to supplement their NPDES general permit.

D. Performance Targets/Tracking, Reporting and Evaluation

EPA, UEP, and other stakeholders will evaluate the results of this Agreement to determine performance relating to the following measures:

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00017

Indicators of Project Success

Indicator	Measure	Source(s)	Frequency
1. Extent of State participation	Number of state issuing XL general permits	ASIWPCA; Regional EPA Administrators, UEP	Annually, on anniversary of Agreement signing
2. Extent of egg producer participation	Number of egg producers granted XL NPDES general permits	ACWF**, UEP	Annually
3. Value of UEP expanded industry education program	Evidence that UEP promotion of education programs will benefit the environment: Number of fact sheets and employee training materials; Number of seminars, workshops and XL presentations; Number of newsletters and articles on key XL topics; Survey indications that third-party manure users program is perceived as valuable	UEP	Annually
4. Value of on-farm assessments	First-time audit success rate for producers who underwent pre-audit assessments vs. those who didn t	ACWF, UEP	Annually
5. Environmental improvements	Evidence that EMS systems and practices have reduced negative impacts on the environment and on enjoyment of property: Greater frequency of BMP adoption to reduce unregulated impacts vs. others More rapid adoption of CNMPs vs. others Follow-up audit evidence of continuous improvement to farms (and EMS practices) Number of closed watering	States, UEP, ACWF	Annually

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00018

Indicator	Measure	Source(s)	Frequency
	systems vs. others in industry		
6. Continued EMS implementation among XL participants	Absence of follow-up audit failures, State actions, loss of general permits	States, UEP, ACWF	Annually
7. More rapid adoption of CNMPs by participating facilities vs. others	# and percentage of UEP facilities with CNMPs and # and percentage of UEP manure/egg wash user facilities with CNMPs	UEP, ACWF	Annually
8. Regulatory compliance by XL participants	Compliance rates of XL participants	States, EPA	Annually

** ACWF stands for America s Clean Water Foundation

In addition to the indicators listed above, this Project provides a unique opportunity for all interested Parties to gain additional information and insight on the effectiveness of BMPs to help protect water quality. Accordingly, UEP, with input from EPA and States, will design and implement a water quality monitoring study at selected land application sites around the country. Egg producers will voluntarily provide data from these sites and all data will be blinded so as not to reveal the identity of the producer who provided it. Data will be maintained in a database managed by UEP and appropriate Quality Assurance/Quality Control procedures will be used. The duration of this study will be determined by a subgroup convened by UEP to design the study.

Nothing in this Agreement reduces or affects UEP s or a participating egg producer s rights to copyright, patent, or license the use of any proprietary or business confidential information or data contained in or created in the course of the implementation of this Project.

E. Project Implementation

As previously indicated, this project will be implemented over time at a large number of individual egg producing facilities. Accordingly, while some of the specific implementation actions may vary in individual states, the basic steps each facility would need to take in order to participate, once states or EPA have issued a general permit through normal notice and comment proceedings, are as follows:

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00019

1. Using the State or EPA issued NPDES general permit and the EMS guidance developed under this XL project, a facility will develop its EMS, taking input and sharing information with local stakeholders throughout this process.

2. The facility may then choose to have a preliminary assessment done for its EMS. This preliminary assessment is outside the scope of this XL project and could be a dry run for the subsequent EMS audit and could be done by an independent 3rd party or by the facility itself.

3. The facility will then contact an approved independent 3rd party organization and request an audit to confirm compliance with the NPDES general permit and its EMS for purposes of applying for coverage under a general permit.

4. If the audit is successful, the facility will submit the results of the audit to the regulatory authority (State or EPA) along with a Notice of Intent (NOI) to comply with the terms of the NPDES general permit. The facility will also place a notice in the local newspaper indicating it has passed the audit and intends to submit the NOI. This notice will also be sent directly to key local stakeholders identified by the facility, including those that have provided input to the facility as its EMS was developed. A point of contact at the facility will also be included in the notice if local stakeholders have any questions about the audit, would like to see information on audit results, or would like meet with the facility. The facility must respond to any inquiries and/or issues that arise and indicate to the regulatory authority what the response was and describe any actions they agreed to take as a result of the inquiries.

5. Once it has received the NOI, the state regulatory authority will review the information and, if satisfied, grant coverage under the NPDES general permit within 30 days, where applicable.

6. Follow-up EMS audits by the 3rd party will take place annually and the results of these audits and will also be made available to the public.

7. If, as a result of these follow-up audits or any regular compliance inspections conducted by the regulatory authority, it is determined that the facility was not adequately implementing its EMS or remaining in compliance with its NPDES general permit, EPA or the state could require the facility to apply for an individual NPDES permit.

8. Finally, throughout the process of developing and implementing its EMS, each facility will seek input from local stakeholders and respond to any issues raised by these stakeholders. Information about the EMS and its performance will be made available to the public on an ongoing basis.

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00020

F. Periodic Review by the Parties to the Agreement

The Parties to this Agreement will hold periodic performance review meetings to assess the progress in implementing the UEP XL Project. Unless they agree otherwise, the date for those conferences will be concurrent with annual workgroup meetings. No later than thirty (30) days following a periodic performance review meeting, UEP will provide a summary of the minutes and any key decisions that were made to all interested Stakeholders. Copies of any additional comments from participating Stakeholders will be forwarded onto EPA.

G. Duration of the Project

This Agreement will continue for three years. After year three, both UEP and EPA will conduct an independent program evaluation. If both UEP and EPA desire to continue the Agreement, the Agreement will be extended for a period of time mutually agreed upon by EPA and UEP, with input from interested Stakeholders. However, individual states may choose to develop NPDES general permits consistent with this project, regardless of whether the project is extended or not. If the project is terminated after three years, facilities that are currently under NPDES general permits and are meeting all of the requirements of the program, could retain this coverage. Also, EPA or a state could require an individual facility to seek coverage under an individual NPDES permit at any time if the facility was not in compliance with the terms of the general permit or had failed to adequately implement its EMS.

VI. LEGAL BASIS FOR THE PROJECT

A. Authority to Enter into the Agreement

By signing this Agreement EPA and UEP acknowledge and agree that they have the respective authorities, discretion, and resources to enter into this Agreement and to implement all applicable provisions of this Project, as described in this Agreement.

B. Legal Effect of the Agreement

This Agreement states the intentions of the Parties with respect to the UEP XL Project. The Parties have stated their intentions seriously and in good faith, and expect to carry out their stated intentions.

This Agreement does not create or modify legal rights or obligations, is not a contract or a regulatory action, such as a permit or a rule, and is not legally binding or enforceable against any Party. Rather, it expresses the plans and intentions of the Parties without making those plans and intentions binding requirements. This applies to the provisions of this Agreement that concern procedural as well as substantive matters. While all Parties fully intend to adhere to these provisions, they are not legally obligated to do so.

This Agreement is not a final agency action by EPA, because it does not create or modify legal rights or obligations and is not legally enforceable. This Agreement,

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00021

itself, is not subject to judicial review or enforcement. Nothing any Party does or does not do that deviates from a provision of this Agreement, or that is alleged to deviate from a provision of this Agreement, can serve as a basis for any claim for damages, compensation or other relief against any Party.

C. Applicability of Other Laws or Regulations

The Parties do not intend that this Agreement will modify the applicability of any existing or future laws or regulations.

D. Retention of Rights to Other Legal Remedies

Nothing in this Agreement affects or limits UEP s or EPA s legal rights. These rights may include legal, equitable, civil, criminal or administrative claims or other relief regarding the enforcement of present or future applicable federal and state laws, rules, regulations or permits with respect to the facility.

Although UEP does not intend to challenge Agency actions implementing the XL Project (including any rule amendments or adoptions, permit actions, or other action) that are consistent with this Agreement, UEP reserves any right it may have to appeal or otherwise challenge any EPA or state action to implement the Project. With regard to the legal implementing mechanisms, nothing in this Agreement is intended to limit UEP s rights to administrative or judicial appeal or review of those legal mechanisms, in accordance with the applicable procedures for such review.

VII. UNAVOIDABLE DELAY DURING PROJECT IMPLEMENTATION

Unavoidable delay" (for purposes of this Agreement) means any event beyond the control of any Party that causes delays or prevents the implementation of the Project described in this Agreement, despite the Parties best efforts to put their intentions into effect. An unavoidable delay can be caused by, for example, a fire or acts of war.

When any event occurs that may delay or prevent the implementation of this Project, whether or not it is avoidable, the Party to this Agreement who knows about it will immediately provide notice to the remaining Parties. Within ten (10) days after that initial notice, the Party should confirm the event in writing. The confirming notice should include: (1) the reason for the delay; (2) the anticipated duration; (3) all actions taken to prevent or minimize the delay; and (4) why the delay was considered unavoidable, accompanied by appropriate documentation.

This Section applies only to provisions of this Agreement that are not implemented by legal implementing mechanisms. Legal mechanisms, such as permit provisions or rules, will be subject to modification or enforcement as provided under applicable law.

VIII. AMENDMENTS OR MODIFICATIONS TO THE AGREEMENT

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00022

This Project is an experiment designed to test new approaches to environmental protection and there is a degree of uncertainty regarding the environmental benefits and costs associated with activities to be undertaken in this Project. Therefore, it may be appropriate to amend this Agreement at some point during its duration.

This Agreement may be amended by mutual agreement of all Parties at any time during the duration of the Project. The Parties recognize that amendments to this Agreement may also necessitate modification of legal implementation mechanisms or may require development of new implementation mechanisms. If the Agreement is amended, EPA and UEP expect to work together with other regulatory bodies and Stakeholders to identify and pursue any necessary modifications or additions to the implementation mechanisms in accordance with applicable procedures. If the Parties agree to make a substantial amendment to this Agreement, the general public will receive notice of the amendment and be given an opportunity to participate in the process, as appropriate.

In determining whether to amend the Agreement, the Parties will evaluate whether the proposed amendment meets Project XL acceptance criteria and any other relevant considerations agreed on by the Parties. All Parties to the Agreement will meet within ninety (90) days following submission of any amendment proposal (or within a shorter or longer period if all Parties agree) to discuss evaluation of the proposed amendment. If all Parties support the proposed amendment, the Parties will (after appropriate Stakeholder involvement) amend the Agreement.

IX. TRANSFER OF PROJECT BENEFITS AND RESPONSIBILITIES TO NEW EGG PRODUCER OWNERS

The Parties agree that the benefits of this Project will be communicated widely to all egg producing operations in the U.S. on an ongoing basis by UEP.

X. PROCESS FOR RESOLVING DISPUTES

Any dispute which arises under or with respect to this Agreement will be subject to informal negotiations between the Parties to the Agreement. The period of informal negotiations will not exceed twenty (20) calendar days from the time the dispute is first documented, unless that period is extended by a written agreement of the Parties to the dispute. The dispute will be considered documented when one party sends a written Notice of Dispute to the other Parties.

If the Parties cannot resolve a dispute through informal negotiations, the Parties may invoke non-binding mediation by describing the dispute with a proposal for resolution in a letter to the EPA Assistant Administrator for the Office of Water. The Assistant Administrator will serve as the non-binding mediator and may request an informal mediation meeting to attempt to resolve the dispute. The Assistant Administrator will then issue a written opinion that will be non-binding and does not constitute a final EPA action. If this effort is not successful, the Parties

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00023

still have the option to terminate or withdraw from the Agreement, as set forth in Section XI below.

XI. WITHDRAWAL FROM OR TERMINATION OF THE AGREEMENT

A. Expectations

Although this Agreement is not legally binding and any party may withdraw from the Agreement at any time, it is the desire of the Parties that it should remain in effect through the expected duration of three years, and be implemented as fully as possible unless one of the conditions below occurs:

1. Failure by any party to (a) comply with the provisions of the enforceable implementing mechanisms for this Project, or (b) act in accordance with the provisions of this Agreement. The assessment of the failure will take its nature and duration into account.

2. Failure of any party to disclose material facts during development of the Agreement.

3. Failure of the Project to provide SEP consistent with the provisions of this Agreement.

4. Enactment or promulgation of any environmental, health or safety law or regulation after execution of the Agreement, which renders the Project legally, technically or economically impracticable.

5. Decision by an agency to reject the transfer of the Project to a new owner or operator of the facility.

In addition, EPA does not intend to withdraw from the Agreement if UEP does not act in accordance with this Agreement or its implementation mechanisms, unless the actions constitute a substantial failure to act consistently with intentions expressed in this Agreement and its implementing mechanisms. The decision to withdraw will, of course, take the failure s nature and duration into account.

UEP will be given notice and a reasonable opportunity to remedy any substantial failure before EPA s withdrawal. If there is a disagreement between the Parties over whether a substantial failure exists, the Parties will use the dispute resolution mechanism identified in Section X of this Agreement. EPA retains its discretion to use existing enforcement authorities, including withdrawal or termination of this Project, as appropriate. UEP retains any existing rights or abilities to defend themselves against any enforcement actions, in accordance with applicable procedures.

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B. Procedures

The Parties agree that the following procedures will be used to withdraw from or terminate the Project before expiration of the Project term. They also agree that the implementing mechanism(s) will provide for withdrawal or termination consistent with these procedures.

1. Any party that wants to terminate or withdraw from the Project is expected to provide written notice to the other Parties at least sixty (60) days before the withdrawal or termination.

2. If requested by any party during the sixty (60) day period noted above, the dispute resolution proceedings described in this Agreement may be initiated to resolve any dispute relating to the intended withdrawal or termination. If, following any dispute resolution or informal discussion, a party still desires to withdraw or terminate, that party will provide written notice of final withdrawal or termination to the other Parties.

3. The procedures described in this Section apply only to the decision to withdraw or terminate participation in this Agreement. Procedures to be used in modifying or rescinding any legal implementing mechanisms will be governed by the terms of those legal mechanisms and applicable law. It may be necessary to invoke the implementing mechanism s provisions that end authorization for the Project (called sunset provisions) in the event of withdrawal or termination.

XII. COMPLIANCE AFTER THE PROJECT IS OVER

As indicated throughout this FPA, this project will be implemented not only by States and EPA, but by individual facilities that choose to participate. Ongoing compliance with the terms of NPDES general permits as well as conformance with EMS requirements, is necessary for any facility to participate in this program. Once the project term is completed, individual facilities could continue to be covered under NPDES general permits if they had remained in compliance with the permit and were continuing to adequately implement their EMS.

XII. SIGNATORIES AND EFFECTIVE DATE

We, the undersigned, pledge our support for the continued success of the UEP XL Project and the furtherance of an effective partnership between EPA and UEP.

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00025

United States Environmental Protection Agency
Office of Water

United Egg Producers

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00026

APPENDIX A

List of Workgroup Members

NAME	ORGANIZATION	PHONE	EMAIL
Gregory Beatty	U.S. EPA, Office of Water	202-260-6929	beatty.gregory@epa.gov
Bill Beranek	Indiana Environmental Institute	317-635-6018	inenviro@iquest.net
Paul Brennan	Indiana Poultry Association	765-494-8517	pbrennan@purdue.edu
Mark Gephart	Illinois Pork Council	217-529-3100	mark@ilpork.com
Marcia Damato	U.S. EPA, Region V	312-886-0266	damato.marcia@epa.gov
Chad Gregory	United Egg Producers	847-356-4401	chaduep@aol.com
Myrna Halbach	Minnesota Pollution Control Agency	320-214-3794	myrna.halbach@pca.state.mn.us
Jim Horne	U.S. EPA, Office of Water	202-260-5802	horne.james@epa.gov
Cal Jackson	Creighton Brothers Farms, IN	219-267-3101	jackson@medt.com
Steve Jann	U.S. EPA, Region V	312-886-2446	jann.stephen@epa.gov
Ron Jepson	Colorado Division of Water Quality	303-692-3520	ron.jepson@state.co.us
Roger Kanerva	Illinois Environmental Protection Agency	217-785-5735	epa8500@epa.state.il.us
John Kessler	Ohio EPA, Division of Surface Water	614-644-2020	john.kessler@epa.state.oh.us
Ken Klippen	United Egg Producers	202-842-2345	kklippen@mwmlaw.com
Arnie Ledec	Illinois Environmental Protection Agency	312-886-0133	leder.arnold@epa.gov
Linda Martin	Illinois Environmental Protection Agency	312-814-7182	epa8589@epa.state.il.us
Erik Meyers	Environmental Law Institute	202-939-3800	meyers@eli.org
Bob Newport	U.S. EPA, Region V		newport.robert@epa.gov
Bob Pike	Braswell Farms, NC	252-459-2143	BOBBMC@aol.com
Thomas Ryterske	USDA / NRCS	630-365-6550	Thomas.ryterske@il.usda.gov
Dave Staples	Creekwood Farms, WI	920-648-2377	creekwood@intaccess.com
Chuck Sutfin	U.S. EPA, Office of Water	202-260-4047	sutfin.charles@epa.gov
A.G. Taylor	Illinois Environmental Protection Agency	217-785-0830	epa8569@epa.state.il.us
Dave Thompson	Thompson s Pearl Valley Eggs, IL	815-443-2170	ewingt@aol.com
John Thorne	Capitolink, LLC	202-872-3865	jthorne@capitolink.com
Bruce Yurdin	Illinois Environmental Protection Agency	217-782-0610	epa1177@epa.state.il.us
Jack Ferguson	U.S. EPA Region VI	214-665-8118	ferguson.jack@epa.gov

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00027

APPENDIX B

NPDES GENERAL PERMIT
FOR
EGG PRODUCTION OPERATIONS (EPOs)

[INSERT - AUTHORIZED NPDES PERMITTING AUTHORITY]

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with provisions of the Clean Water Act, 33 USC 1251 et seq., the Act and the regulations found at 40 CFR §122. [INSERT STATE REGULATORY CITATION AS APPROPRIATE]

Owners and operators of egg production operations (EPOs), except those EPOs excluded from coverage in Part I of this permit, may apply for authorization to discharge under this general permit and, once authorized, must operate their EPO in accordance with the effluent limitations, monitoring requirements, and other provisions set forth herein.

This general permit covers discharges or the potential to discharge process wastewater, rainfall or snow melt runoff from the animal confinement or storage and handling areas and runoff from land application areas, under the operational control of the permittee, of manure and process wastewater. The animal type covered under this general permit are laying hens.

A copy of this permit must be kept by the permittee at the site of the permitted EPO.

This permit will become effective [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION]

This permit and the authorization to discharge under the NPDES shall expire at midnight [INSERT DATE 5 YEARS AFTER THE DATE ABOVE].

Signed this (Day) of (Month) and (Year).

_____

[Permitting Authority Official]

US EPA ARCHIVE DOCUMENT

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PART I. PERMIT AREA AND COVERAGE

A. Permit Area

[The permitting authority should insert language that identifies the geographic area covered by the permit being issued (e.g., State, watershed, etc.).]

B. Permit Coverage

1. **Who is eligible to be covered under this general permit?**
   This general permit is available for any EPO that has agreed to participate in the United Egg Producers (UEP) XL Project and has qualified for coverage by this general permit as outlined in Parts I.C., D., and E. below.

2. **What does the NPDES general permit for EPOs cover?**
   NPDES general permits issued to EPOs cover the animal confinement areas, storage facilities and unloading/handling areas of manure, or egg wash wastewater, and land application activities under the operational control of the EPO. General permit coverage is contingent upon continuing implementation of an environmental management system (EMS), consistent with the guidelines developed by UEP, as determined by audits conducted by an independent third party. EPOs that fail to comply with the terms of a general permit or fail to adequately implement their EMS could be required to apply for an individual NPDES permit by the permitting authority.

3. **What constitutes a discharge from an EPO?**
   At 40 CFR §122.2 a discharge of a pollutant means:

   (a) Any addition of any pollutant or combination of pollutants to waters of the United States from any point source, or
   (b) Any addition of any pollutant or combination of pollutants to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation.

   This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any indirect discharger.

   For example at EPOs discharges of pollutants (manure and/or process wastewater) include, but are not limited to, the following discharges that reach waters of the U.S.:

   " Contaminated runoff from stock piled manure and feed;

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- Overflow from manure storage facilities, including secondary containment;

- Discharges via ground water that has a direct hydrologic connection to surface waters,

- Discharges associated with land application of manure and/or wastewater activities under the control of the EPO operator not in compliance with Minimum Requirement 9 in Table III.A, in Part III.A, including discharges to ground water that has a direct hydrologic connection to surface waters;

- Manure and/or wastewater discharges from retention ponds, manure storage facilities, or lagoons, including secondary containment;

- Discharges of manure and/or wastewater due to pipe breakage or equipment failure;

- Leaks or seepage from retention ponds, manure storage facilities, lagoons to ground water that has a direct hydrologic connection to surface waters;

- Discharge of pollutants from dead bird or nonedible egg handling and storage; and

- Spills or leakage from the poultry houses or the pit under the poultry houses.

C. Eligibility for Coverage

Unless excluded from coverage in accordance with Paragraph D or F below, owners/operators of EPOs are eligible, under the terms and conditions of this permit, and upon the submission of a notice of intent (NOI) and a summary of the results of a successful environmental management system (EMS) audit to gain coverage under this NPDES general permit. Permittees must retain, on the site of the permitted EPO, a copy of the permit, the comprehensive nutrient management plan (CNMP) and EMS as required by this permit, and must submit a copy of the CNMP and a summary of the results of an annual EMS audit to the permitting authority upon request by the permitting authority (see Part III). In addition, the permittee must retain records indicating that it is implementing an EMS consistent with the requirements described in Section C of Part IV of this permit. At a minimum, these records must: (1) describe the EMS and (2) include all records of audits by independent 3rd parties, as well as a description of the corrective actions taken, if any, to address any major deficiencies identified in these audits.

A permittee who is authorized by this general permit may request to be excluded from coverage under this permit by: (1) submitting to the permitting authority a completed notice of termination form; or applying for an individual NPDES permit in accordance with Part I.F-(2).

D. Limitations on Coverage

The following EPOs are not eligible for coverage under this NPDES general permit, but

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must apply for an individual permit:

1. EPOs that have failed an audit by an independent third party or been notified by the **[Permitting Authority]** to apply for an individual NPDES permit in accordance with Part I.F (below) of this permit.

2. EPOs that have been notified by the **[Permitting Authority]** that they are ineligible for coverage because of a past history of non-compliance

3. New and/or significantly expanding EPOs that apply manure and/or wastewater to lands that are adjacent to or near water bodies that are listed under the CWA, section 303(d), as impaired due to inadequate oxygen, excessive nutrients, suspended solids, turbidity and/or pathogens and are notified by the [Permitting Authority] to apply for an individual NPDES permit.

E. Requirements for Obtaining Coverage

1. Owners/operators of EPOs seeking to be covered by this general permit (see Part I) must submit: (1) a notice of intent (NOI) to be covered by this permit; (2) evidence that the EPO has developed and implemented an EMS consistent with the guidelines set forth below in Part III.E; (3) the results of a successful audit conducted by an independent 3rd party for the purpose of applying for this permit [Permitting Authority to insert number of days/weeks prior to the effective date of this permit]; and (4) evidence that the EPO: has placed a notice in the local newspaper that indicates that the EPO has passed the audit and intends to submit the NOI; sent the notice directly to local stakeholders; and has established a point of contact at the facility for public inquiries. EPA s existing Project XL compliance/enforcement screening criteria should be used by the permitting authority at the time the general permit is developed. States may also wish to apply other screening criteria they feel are appropriate, including criteria by which a facility would be allowed for coverage under the general permit once compliance and enforcement issues had been satisfactorily resolved.

2. Owners/operators of new EPOs must submit an NOI, have a complete comprehensive nutrient management plan (CNMP) and an EMS 180 days prior to commencement of operation.

3. The NOI must be signed by the owner/operator or other authorized person in accordance with Part V. E. of this permit and include the name of the EPO contact person.

4. Signed copies of the NOI must be sent to:
   [Permitting Authority Address]

5. The Permitting Authority will review the information (NOI and audit) and, if satisfied, will notify the facility that it will be covered under the permit within 30

US EPA ARCHIVE DOCUMENT

days.

6. The EPO will be subject to the terms and conditions of this general permit beginning thirty (30) days from the **[Permitting Authority]** notification of coverage unless **[Permitting Authority]** fails to approve the EPO for inclusion under this general permit and requires the submission of an individual NPDES permit application (See Sections D and F).

F. Requiring an Individual Permit

1. The **[Permitting Authority]** may require any EPO authorized by this permit to apply for, and obtain, an individual NPDES permit. **[Permitting Authority]** will notify the EPO owner/operator, in writing, that an application for an individual permit is required. This notice will include a brief statement of the reasons for the decision, an application form, a statement setting a time for the owner or operator to file the application, and a statement that on the effective date of the individual NPDES permit the general permit as it applies to the individual permittee is automatically terminated.

2. Any EPO owner/operator authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual NPDES permit. The EPO owner/operator shall submit an application for an individual NPDES permit (Form 1 and Form 2B), along with any other information required by the **[Permitting Authority]**. If an individual NPDES permit is issued to an EPO owner/operator otherwise subject to this general permit, or the EPO owner/operator is approved for coverage under an alternative NPDES general permit, the applicability of this NPDES EPO general permit to the facility is automatically terminated on the effective date of the individual NPDES permit or on the date that coverage commences under the alternative NPDES general permit. Otherwise, the applicability of this general permit to the facility remains in full force and effect (for example, if an individual NPDES permit is denied to an EPO owner/operator otherwise subject to this general permit, or the EPO owner/operator is denied coverage under an alternative NPDES general permit).

G. Permit Expiration

This general permit expires five years after its effective date. If this permit is not reissued prior to its expiration date, it will be administratively continued in accordance with the Administrative Procedure Act and any EPO authorized by this permit prior to the expiration date will remain authorized under this permit (i) if it submits an NOI within 60 days of the expiration date of the permit requesting continued coverage under this general permit until; (ii) the permit is reissued; or (iii) EPA publishes a determination not to reissue this permit.

PART II. PERMIT REQUIREMENTS

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00032

A. Effluent Limitations

The following effluent limitations apply to EPOs covered under this general permit, and cover both the production and the land application areas under the control of the EPO:

1. Production Areas: There shall be no discharge of process wastewater pollutants to waters of the United States, including discharges to groundwater that has a direct hydrologic connection to waters of the United States, **except when catastrophic rainfall events** cause an overflow of process wastewater from a facility properly designed, constructed, maintained, and operated to contain:

   a. All process generated wastewater resulting from the operation of the EPO; plus,

   b. All runoff from a 25-year, 24-hour rainfall event for the location of the EPO.

2. Land Application Area: For discharges associated with land application of process wastewater and/or manure under the control of the EPO operator, including discharges to groundwater that has a direct hydrologic connection to waters of the United States, the permittee must:

   a. The EPO must ensure that such activities comply with the requirements of Minimum Requirement 9 specified in Table III.A, in Part III.A of this permit; and

3. Other requirements: the EPO must comply with other special conditions established by the permitting authority (Parts III.A and C).

B. Other Legal Requirements

No condition of this permit shall release the permittee from any responsibility or requirements under other statutes or regulations, Federal, State/Indian Tribe or Local.

PART III. SPECIAL CONDITIONS

A. Minimum Requirements to Protect Water Quality

This permit identifies (See Table III. A below) specific minimum requirements that the permittee must meet to achieve the effluent limitations in this permit, including requirements that address proper land application of manure and wastewater. The minimum requirements (or portions thereof) that must be implemented immediately upon coverage by of this permit are indicated by an asterisk (*). The permittee must comply with the remaining minimum standards (or portions thereof) in accordance with the enforceable schedule for developing and implementing a CNMP, which is established in Section III. B. of this permit. All of the requirements to protect water quality must be based on the minimum requirements of Table III.A and incorporated into the site-specific CNMP developed and implemented for the permitted EPO.

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00033

Table III. A
Minimum Requirements to Protect Water Quality in NPDES Permits for EPOs

EachEach of the following minimum standards is designed to achieve the objective of preventing dischargesdischarges of pollutants to waters of the U.S. from discharges of pollutants to waters of the U.S. fro underunder the operational control of the EPO. Minimum requirements or portions of minimum requirements that must be implemented onrequirements that must be implemented on the effective date of the pe asteriskasterisk (*). In addition to these minimum asterisk (*). In addition to these minimum requirementsasteri with water quality-based effluent limitations in Part II.A(1).

1. MINIMUM REQUIREMENT - BUFFERS OR EQUIVALENT PRACTICES Provide and maintain buffer strips or other equivalent practices near the animal confinement areas, manure storage areas, and land application areas that are sufficient to minimize the discharge of pollutants to waters of the U.S. (e.g., soil erosion and manure and wastewater). These practices may include but are not limited to: residue management, conservation crop rotation, grassed waterways, strip cropping, vegetative buffers, terracing, and diversion.
2. MINIMUM REQUIREMENT - DIVERT CLEAN WATER *Design and implement management practices to divert clean water and runoff waters from contact with the animal confinement areas; animal manure; or manure and/or process wastewater storage systems. Clean water and runoff waters includes rain falling on the roofs of facilities, runoff from adjacent land, or other sources.
3. MINIMUM REQUIREMENT - PREVENT DIRECT CONTACT OF ANIMALS WITH WATERS OF THE U.S. *Develop and implement appropriate controls to prevent direct access of animals in confinement to waters of the U.S. to protect water quality.
4. MINIMUM REQUIREMENT - ANIMAL MORTALITY *Handle and dispose of dead animals in a manner that prevents contamination of surface waters of the U.S. (including contamination of groundwater with a direct hydrological connection to surface waters).
5. MINIMUM REQUIREMENT - CHEMICAL DISPOSAL *Prevent introduction of chemicals into manure and wastewater storage structures for purposes of disposal. Examples include pesticides, hazardous and toxic chemicals, and petroleum products/by-products.
6. MINIMUM REQUIREMENT - PROPER OPERATION AND MAINTENANCE *Implement an operation and maintenance program to minimize the discharges of pollutants to surface water and groundwater that is hydrologically connected to surface water that involves periodic visual inspection and maintenance of all manure storage and handling equipment and structures and all runoff management devices (e.g., cleaning separators, barnyards, catch basins, screens, annual testing and calibration of land application equipment to ensure proper application rates and maintenance of filter strips).

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00034

7.	**MINIMUM REQUIREMENT - RECORD KEEPING AND TESTING** *Maintain a log that documents the visual inspections, findings, preventative maintenance, testing, and calibration that has been performed. *Document the date, rate, location, types of crops, and methods used for application of manure and wastewater as well as other nutrients to land under the control of the EPO operator. Where manure and wastewater are not applied on land under the operational control of the EPO operator, maintain a record of the transfer of the manure off-site. *Record the results of annual manure and wastewater testing to determine nutrient content. *Record the results of representative soil sampling and analyses conducted at least every three years to determine nutrient content.
8.	**MINIMUM REQUIREMENT - MAINTAIN PROPER STORAGE CAPACITY** *Maintain sufficient freeboard in liquid manure storage structures to assure compliance with the permit conditions. *Store dry manure in production buildings or in storage facilities or in another manner as to prevent polluted runoff, (e.g., located on relatively flat land, away from water bodies, wetlands and wells, and/or surrounded by a berm or buffer). Provide adequate storage capacity so that land application occurs only during periods when land and weather conditions are suitable for manure and wastewater application (see Minimum Standard #9, below).

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00035

9. MINIMUM REQUIREMENT - RATES AND TIMING OF LAND APPLICATION OF MANURE AND WASTEWATER

*Land apply manure and/or wastewater in accordance with proper agricultural practices.

Land apply manure and/or wastewater in accordance with land application rates developed on a site-specific basis as needed to protect water quality. At a minimum, land application rates should (1) prevent application of nutrients at rates that will exceed the capacity of the soil and the planned crops to assimilate nutrients and minimize water pollution; and (2) be quantified and based on the most limiting nutrient in the soil (e.g., phosphorus or nitrogen), type of crop, realistic crop yields, soil type, and all nutrient inputs in addition to those from manure and wastewater.

Incorporate manure applied to the bare soil surface within 24 hours after land application.

*Land application of manure and/or wastewater is prohibited on land that is flooded, saturated with water, frozen or snow covered (unless approved conservation measures of a certified CNMP are in place to prevent off-site movement of contaminated water) at the time of land application where the manure and/or wastewater may enter waters of the U.S.

*Land application of manure and/or wastewater is prohibited on land with slopes greater than 6 per cent unless approved conservation measures of a certified CNMP are in place to prevent off-site movement of contaminated water.

*Land application of manure and/or wastewater is prohibited during the period of November 15 through April 15 on land with slopes greater than 3 per cent unless approved conservation measures of a certified CNMP are in place to prevent off-site movement of contaminated water.

*Land application of manure and/or wastewater is prohibited during rainfall events and for 24 hours prior to a 60 per cent forecasted rainfall event of 1/4 inch or more.

B. Comprehensive Nutrient Management Plan (CNMP)

1. Elements of a CNMP

Each EPO covered by this permit shall develop and implement a site-specific CNMP that includes the following elements as appropriate to the needs and circumstances of the permitted facility: animal outputs; manure handling and storage; land application of manure and wastewater; site management; record keeping; and other manure and/or wastewater utilization options. The CNMP must be developed and implemented to meet all of the minimum standards identified in Section A of this Part to protect water quality that are applicable to the permitted facility. The CNMP must be approved by a certified conservation planner or certified specialist and developed and implemented to meet the requirements of the CWA, current State and U.S. Department of Agriculture-Natural Resources Conservation Service (NRCS) technical standards and NRCS s CNMP Technical Guidance.

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00036

Each CNMP shall specifically identify and describe practices that are to be implemented to assure compliance with the limitations and conditions of this permit. The CNMP shall identify a specific individual(s) at the facility responsible for its implementation. The activities and responsibilities of such personnel must be described in the CNMP. CNMPs are to be developed as a special condition of the NPDES permit, and where applicable must contain the information in (a) and (b) below:

a. Existing Facility Plans: Where a facility has previously prepared information that supports one or more of the five elements of a CNMP as outlined in the NRCS Technical Guidance for Developing CNMPs, the EPO may adopt this information for incorporation into the facility-specific CNMP.

b. Signatory Requirements: The CNMP shall be signed by the EPO owner/operator or other signatory authority in accordance with Part V.E (Signatory Requirements).

c. The **[Permitting Authority]** or authorized representative may notify the permittee, at any time, that the CNMP does not meet one or more of the minimum requirements of this Part B. The permittee shall make changes to the CNMP within 90 days after such notification unless otherwise provided by the **[Permitting Authority]**.

2. Schedule for Developing, Submitting, and Implementing a CNMP
Following the submission of the NOI, any EPO covered by this NPDES general permit shall develop and implement a CNMP **[Permitting Authority to insert schedule for developing and implementing the CNMP no later than the end of 2003 including interim milestones as determined to be appropriate.]** The permittee must notify the permitting authority in writing within thirty days following the completed development and implementation of the site-specific CNMP.

3. Certified Specialists to Develop CNMPs
The CNMP must be developed or approved (including any modifications) by a certified specialist defined by **[Permitting Authority to insert State or governmental agency]**. The **[Permitting Authority or other State agency]** will specify the requirements for certification. While the permittee may seek technical assistance from an outside source and must obtain approval from a certified specialist, it is the permittee s sole responsibility to assure that the effective implementation of the CNMP results in compliance with all permit conditions.

4. CNMP is to be Maintained On Site
A current copy of the CNMP shall be kept on the site of the permitted EPO in

accordance with Part V.C.3 (Retention of Records) of this permit and provided to the permitting authority upon request of the permitting authority.

5. Duty to Amend the CNMP
The permittee must amend the CNMP whenever: (1) the facility makes a substantive change in how it manages its operations, including the location, method, timing or frequency of land application; or (2) a discharge occurs in violation of this NPDES permit. Where the facility is located in an impaired watershed, CNMPs should also be reviewed and amended, as needed, as part of the TMDL process. The facility must complete and submit to **[Permitting Authority]** notification of any substantial changes to the CNMP and an annual certification that the CNMP has been reviewed to assess its adequacy in protecting water quality.

C. Management Practices

1. Emergency Discharge Impact Abatement: Discharges authorized by Part II.A(1) of this permit must, where practicable, be released to vegetated fields for filtering or captured in secondary containment to minimize discharge to waters of the U.S.

2. Irrigation Control: Irrigation systems shall be managed so as to reduce or minimize: (1) ponding or puddling of wastewater on land application fields; and (2) contamination of ground and surface water.

3. Spills: Appropriate measures necessary to prevent spills and to clean up spills of any toxic and other pollutants shall be taken. If possible spills are anticipated, materials handling procedures and storage must be specified in the CNMP. Procedures for cleaning up spills shall be identified, and the necessary equipment to implement clean up shall be made available to facility personnel. All spills resulting in actual or potential to discharge to waters of the U.S. must be reported to EPA and State/Indian Tribe authorities.

4. Measurement of Rainfall: A rain gauge meeting National Weather Service standards or its equivalent shall be maintained on site of all EPOs which collect egg wash wastewater in uncovered lagoons or basins, or which practice land application of manure or egg wash wastewater. A log of all measurable rainfall events shall be kept by such EPO operators/owners.

5. Liner Requirement: Where a direct hydrologic connection through ground water exists, the ponds, lagoons and basins of the retention structure must have a liner which will prevent the potential contamination of surface waters.

6. Employee Training: Where employees are responsible for work activities which relate to permit compliance, those employees must be regularly trained or informed of any

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00038

information pertinent to the proper operation and maintenance of the facility and waste disposal. Training shall include topics as appropriate such as land application of wastes, proper operation and maintenance of the facility, good housekeeping and material management practices, necessary record-keeping requirements, and spill response and clean up. The permittee is responsible for determining the appropriate training frequency for different levels of personnel and the CNMP shall identify periodic dates for such training. This training program must also be included in the EMS.

7. Chemical Handling: The owner/operator shall prevent the discharge of pesticide-contaminated waters into retention structures. All wastes from dipping vats, pest and parasite control units, and other facilities utilized for the management of potentially hazardous or toxic chemicals shall be handled and disposed of in a manner such as to prevent pollutants from entering the retention structures or waters of the United States.

8. Discharges of Chemicals to Containment Structures: All discharges to containment structures shall be composed entirely of wastewater from the proper operation and maintenance of an EPO and the precipitation runoff from the EPO areas. The disposal of any materials (other than materials and discharges associated with proper operation and maintenance of the EPO) into the containment structures is prohibited by this permit.

9. Siting and Structural Integrity: Site and construct new facilities so as to comply with applicable State and/or local requirements. In the absence of applicable State and/or local requirements, new facilities must be constructed to meet NRCS, ASCS, or equivalent engineering and construction standards. Existing facilities must be checked and maintained to ensure their structural integrity, and that they are appropriately sized for egg-producing operations.

10. Facility Closure: The following conditions shall apply to the closure of egg washing storage structures and other litter and wastewater facilities:

    a. Closure of Egg Wash Wastewater Storage Structures

    No egg wash wastewater storage structure shall be permanently abandoned without proper closure.

    Egg wash wastewater storage structures shall be maintained at all times until closed in compliance with this section.

Egg wash wastewater storage structures must be properly closed if the permittee ceases operation. In addition, any egg wash wastewater storage structure that is not in

US EPA ARCHIVE DOCUMENT

use for a period of twelve consecutive months must be properly closed unless the facility is financially viable, intends to resume use of the structure at a later date, and either: (1) maintains the structure as though it were actively in use, to prevent compromise of structural integrity; or (2) removes waste materials to a depth of one foot or less and maintain a depth of wastewater sufficient to preserve the integrity of the synthetic or earthen liner. In either case, the permittee shall notify the **[Permitting Authority]** of the action taken, and shall conduct routine inspections, maintenance, and record-keeping as though the structure were in use. Prior to restoration of use of the structure, the permittee shall notify the **[Permitting Authority]** and provide the opportunity for inspection.

All closure of lagoons and other earthen or synthetic lined basins must be consistent with NRCS standards (currently, Field Technical Guide No. 998, Interim Standard for Closure of Abandoned Waste Treatment Lagoons and Waste Storage Ponds). Consistent with NRCS standards, the permittee shall remove all waste materials to the maximum extent practicable and dispose of them in accordance with the permittee s CNMP, unless otherwise authorized by the **[Permitting Authority]**. If the permittee plans to land apply lagoon sludge, the CNMP should have special conditions for such application based on the most limiting contaminant in the waste.

Unless otherwise authorized by the **[Permitting Authority]**, completion of closure for egg wash wastewater storage structures shall occur as promptly as practicable after the permittee ceases to operate or, if the permittee has not ceased operations, 12 months from the date on which the use of the structure ceased, unless the lagoons or basins are being maintained for possible future use in accordance with the requirements above.

b. Closure Procedures for Manure and Other Wastewater Facilities

No manure or other wastewater control and retention structure shall be abandoned. Closure of all such structures shall occur as promptly as practicable after the permittee has ceased to operate, or, if the permittee has not ceased to operate, within 12 months after the date on which the use of the structure ceased. To close a manure or wastewater control and retention structure, the permittee shall remove all manure and wastewater and dispose of it in accordance with the permittee s CNMP, unless otherwise authorized by the **[Permitting Authority]**.

D. Requirements for Land Application Activities Not Under the Control of the Permitted EPO Operator.

In cases where EPO-generated manure is to be used for land application activities that are not under the operational control of the permitted EPO, such land application does not need to be addressed in the permitted EPO s CNMP. However, the EPO must comply with the following conditions:

US EPA ARCHIVE DOCUMENT

1. Maintain records showing the date and amount of manure and/or wastewater that leaves the permitted operation;

2. For quantities of greater than one metric ton per recipient per day, record the name and address of the recipient;

3. Provide the recipient(s) with representative information on the nutrient content of the manure and/or wastewater to be used in determining the appropriate land application rates;

4. Inform the recipient of his/her responsibility to properly manage the land application of the manure and/or wastewater to minimize the discharge of pollutants to waters of the U.S.; and

5. Offer technical assistance to the recipient to develop and implement a site-specific CNMP.

These records must be retained on-site, and must be submitted to the permitting authority upon request.

E. Environmental Management System (EMS)

In order to be eligible for coverage under a general permit, EPOs must have an environmental management system (EMS) in place that is consistent with EMS Elements developed by EPA, the United Egg Producers (UEP), States, and others as a part of EPA s Project XL agreement with UEP [insert date of signed agreement]. These required elements are included in Appendices C, D, and E. Throughout the process of developing the EMS, each EPO is responsible for seeking input from local stakeholders and responding to any issues raised .

In addition, prior to seeking coverage under this general permit, EPOs must successfully complete an audit of their EMS by a qualified independent 3rd party organization within [Permitting Authority to specify a date that ensure the audit is recent], again consistent with the Project XL agreement signed by EPA and the UEP. Information on the results of successful audits must be made available to the local community when the facility decides to apply for coverage under the general permit, and the facility must provide local community members with the opportunity to comment on this information. Information about the EMS and the EPO s performance will be made available to the public.

When formally submitting the notice of intent to be covered under the general permit to the permitting authority, the EPO must provide a copy of any written comments received from the community, and indicate how these and any other verbal comments were obtained and addressed. Once a facility is accepted for coverage under the general permit, annual third party audits must be conducted and the results of these audits would be available to the public.

US EPA ARCHIVE DOCUMENT

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PART IV. DISCHARGE MONITORING AND NOTIFICATION REQUIREMENTS

A. Notification of Discharges from Retention Structures and Improper Land Application

If, for any reason, there is a discharge of pollutants to a water of the U.S., the permittee is required to make immediate oral notification within 24-hours to the **[Permitting Authority (Contact Number)]** and notify the **[Permitting Authority]** in writing within five (5) working days of the discharge from the facility. In addition, the permittee shall keep a copy of the written notification submitted to the [Permitting Authority] together with the CNMP. The discharge notification shall include the following information:

1. Description of the discharge: A description of the discharge and its cause, including a description of the flow path to the receiving water body and an estimate of the flow and volume discharged.

2. Time of the discharge: The period of noncompliance, including exact dates and times, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate and prevent recurrence of the discharge.

B. Monitoring Requirements for Discharges from Retention Structures

In the event of any overflow or other discharge of pollutants to waters of the U.S. from a manure and/or wastewater storage structure, the following actions shall be taken:

1. Analysis of the discharge: All discharges shall be sampled and analyzed. Samples must, at a minimum, be analyzed for the following parameters: fecal coliform bacteria; five-day biochemical oxygen demand (BOD_5); total suspended solids (TSS); total phosphorus as phosphorus; dissolved phosphorus as phosphorus; ammonia-nitrogen as nitrogen; TKN as nitrogen; nitrate as nitrogen; pH; metals; and temperature.

2. Estimate volume of the discharge: Record an estimate of the volume of the release and the date and time.

3. Sampling procedures: Samples shall consist of grab samples collected from the over-flow or discharges from the retention structure. A minimum of one sample shall be collected from the initial discharge (within 30 minutes). The sample shall be collected and analyzed in accordance with EPA approved methods for water analysis listed in 40 CFR 136. Samples collected for the purpose of monitoring shall be representative of the monitored discharge. Monitoring results must be submitted to the permitting authority within 30 days.

4. Reasons for not sampling: If conditions are not safe for sampling, the permittee must provide documentation of why samples could not be collected. For example, the permittee may be unable to collect samples during dangerous

US EPA ARCHIVE DOCUMENT

weather conditions (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.). However, once dangerous conditions have passed, the permittee shall collect a sample from the retention structure (pond or lagoon) from which the discharge occurred.

C. General Inspection, Monitoring, and Record Keeping Requirements

The permittee shall inspect, monitor, and record the results of such inspection and monitoring in accordance with Table 4 1:

TABLE 4 1. PERIODIC INSPECTION AND MONITORING REQUIREMENTS

PARAMETER	UNITS	FREQUENCY
Facility inspection[1]		
Review all facilities and land application areas addressed in the EPO's CNMP to evaluate whether measures to reduce pollutant loadings identified in the CNMP are adequately and properly implemented in accordance with the terms of the permit or whether additional control measures are needed	NA	Annually
Egg washing storage structure monitoring and inspection		
Freeboard[2]	Feet	Weekly
Structural integrity (i.e., integrity of berms)[3]	NA	Weekly
Integrity of liners and absence of a hydrologic connection[4]	NA	Once/5 years

US EPA ARCHIVE DOCUMENT

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Sampling of manure/wastewater and land application soils[5]		
Sample manure and wastewater to determine available nutrient content (nitrogen and phosphorus).	ppm	Conduct initial sampling. Then sample at least once per year thereafter.
Sample land application soils to determine nutrient content (nitrogen and phosphorus).	Pounds per acre	Conduct initial sampling. Then sample at least once every three years thereafter.
Land application activities		
Duration of land application activities[5]	Hours/day	Daily
Quantity of manure/wastewater applied to land application fields[5]	Gallons/day or Tons/day	Daily
Application rate[5]	Tons/acre	Daily
Application area[5]	Acres	Daily
Precipitation		
Rainfall[6]	Inches	Daily

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00044

Footnotes:

[1] A complete inspection of the facility shall be done and a report made annually.

[2] For lagoons or other liquid storage basins, report the water level as feet below the emergency overflow level. For solid manure storage structures, report the percentage of remaining storage capacity.

[3] Documentation of compliance with this requirement must be compiled in an inspection report to be kept at the facility.

[4] Permittee shall document compliance with this requirement by preparing a report that must be kept at the facility.

[5] Monitor during periods of land application only. Estimate application quantity and rate from the number of truckload spread per day. Land application practices must be conducted in accordance with the permittee's CNMP.

[6] The permittee shall maintain a precipitation gauge at each permitted facility conducting land application or collecting egg wash wastewater in uncovered lagoons or berms, and record the rainfall for each 24-hour period.

US EPA ARCHIVE DOCUMENT

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D. Additional Monitoring Requirements

Additional analysis: Upon request by **[Permitting Authority]**, the permittee may be required to collect and analyze samples including but not limited to soils, surface water, ground water, and/or stored waste in a manner and frequency specified by **[Permitting Authority].**

Additional monitoring for some high risk operations: Upon notification by **[Permitting Authority],** the permittee may be required to conduct ambient monitoring of surface and/or groundwater (where there is a possible direct hydrologic connection between the ground water and surface waters). For example, facilities with significant environmental concerns, or facilities impacting impaired water bodies.

PART V. STANDARD PERMIT CONDITIONS

A. General Conditions

1. Introduction: In accordance with the provisions of 40 CFR Part 122.41, et. Seq., this permit incorporates by reference ALL conditions and requirements applicable to NPDES Permits set forth in the Clean Water Act, as amended, (hereinafter known as the Act) as well as ALL applicable regulations.

2. Duty to Comply: The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation, and reissuance; for denial of a permit renewal application; and/or for requiring a permittee to apply for and obtain an individual NPDES permit. It is expected that the EMS and independent 3rd party audits will identify minor noncompliance issues for prompt correction.

3. Toxic pollutants: The permittee shall comply with effluent standards and prohibitions established under section 307(a) of the Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

4. Permit actions: This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

5. Property rights: The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State/Tribal or local laws or regulations.

6. Duty to provide information: The permittee shall furnish to the Permitting Authority, within a reasonable time, any information which the Permitting Authority may

US EPA ARCHIVE DOCUMENT

request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Permitting Authority, upon request, copies of records required to be kept by this permit.

7. Criminal and Civil Liability: Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Any false or materially misleading representation or concealment of information required to be reported by the provisions of the permit, the Act, or applicable regulations, which avoids or effectively defeats the regulatory purpose of the Permit may subject the Permittee to criminal enforcement pursuant to 18 U.S.C. Section 1001.

8. State/Tribal Laws: Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State/Tribal law or regulation under authority preserved by Section 510 of the Act.

9. Severability: The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

10. Duty to Reapply: If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.

B. Proper Operation and Maintenance

1. Need to halt or reduce activity not a defense: It shall not be a defense for a permittee in an enforcement action to plead that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2. Duty to mitigate: The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

3. Proper operation and maintenance: The permittee shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

C. Monitoring and Records

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00047

1. Inspection and entry: The permittee shall allow the **[Permitting Authority]** or EPA, or an authorized representative of **[Permitting Authority]** or EPA, upon the presentation of credentials and other documents as may be required by law, to:

    a. Enter the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

    b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

    c. Inspect, at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, and

    d. Sample or monitor, at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

2. Representative sampling: Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

3. Retention of records: The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report, or application. This period may be extended by request of the permitting authority at any time.

4. Record content: Records of monitoring information shall include:

    a. The date, exact place, and time of sampling or measurements;

    b. The individual(s) who performed the sampling or measurements;

    c. The date(s) analyses were performed;

    d. The individual(s) who performed the analyses;

    e. The analytical techniques or methods used; and

    f. The results of such analyses.

5. Monitoring procedures:

    a. Monitoring, when necessary, must be conducted according to test procedures

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00048

approved under 40 CFR Part 136, unless other test procedures have been specified in this permit or approved by the Regional Administrator.

b. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instruments at intervals frequent enough to insure accuracy of measurements and shall maintain appropriate records of such activities.

c. An adequate analytical quality control program, including the analyses of sufficient standards, spikes, and duplicate samples to insure the accuracy of all required analytical results shall be maintained by the permittee or designated commercial laboratory.

D. Reporting Requirements

1. Physical Alterations: The permittee shall give advance notice to the **[Permitting Authority]** of any planned physical alterations or additions or changes in activity which may result in noncompliance with requirements in this permit.

2. Transfers: This permit is not transferable to any person except after notice to the **[Permitting Authority]**. The **[Permitting Authority]** may require modification or revocation and reissuance of the permit to change the name or the permittee and incorporate such other requirements as may be necessary under the CWA.

3. Twenty-four Hour Reporting: a. The permittee shall report any noncompliance that may endanger human health or the environment. Any information must be provided orally to within 24 hours from the time that the permittee becomes aware of the circumstances to **[Insert Permitting Authority contact information]**. A written submission shall also be provided to **[Permitting Authority]** within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain the following information:

   i) A description of the noncompliance and its cause;

   ii) The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and

   iii) Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

   The following shall be included as information which must be reported within 24 hours:

   i) Any unanticipated bypass which exceeds any effluent limitation in this permit.

   ii) Any upset which exceeds any effluent limitation in this permit.

US EPA ARCHIVE DOCUMENT

iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the permitting authority in this permit to be reported within 24 hours.

The permitting authority may waive the written report on a case-by-case basis for reports under this Part if the oral report has been received within 24 hours.

4. Other Noncompliance: The permittee shall report all instances of noncompliance not reported not reported under this Part at the time monitoring reports are submitted. The reports shall contain the information listed in Part V.D.

5. Other Information: Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the **[Permitting Authority]**, it shall promptly submit such facts or information to the **[Permitting Authority]**.

E. Signatory Requirements

All applications, reports, or information submitted to the **[Permitting Authority]** shall be signed and certified consistent with 40 CFR §122.22:

1. **All permit applications** shall be signed as follows:

   a. For a corporation: By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

      i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

      ii) The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures; or

   b. For a partnership or sole proprietorship: By a general partner for a partnership or the proprietor, respectively. All applications, reports, or information submitted to the **[Permitting Authority]** shall be signed and certified consistent with 40 CFR §122.22:

US EPA ARCHIVE DOCUMENT

2. **All reports** required by the permit and other information requested by the **[Permitting Authority]** shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described above;

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, position of equivalent responsibility, or any individual or position having overall responsibility for environmental matters for the company. A duly authorized representative may thus be either a named individual or an individual occupying a named position; and,

   c. The written authorization is submitted to the **[Permitting Authority]**.

F. Certification

Any person signing a document under this section shall make the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

G. Bypass

1. **Definitions**

   a. **Bypass** means the intentional diversion of waste streams from any portion of a treatment facility.

   b. **Severe property damage** means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

2. **Bypass not exceeding limitations.** The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to

US EPA ARCHIVE DOCUMENT

the provisions of Part V.G.(3) and (4).

3. **Notice.**

   a. **Anticipated bypass.** If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

   b. **Unanticipated bypass.** The permittee shall submit notice of an unanticipated bypass as required in D.3 of this Part.

4. **Prohibition of Bypass.**

   a. **Bypass is prohibited**, and the permitting authority may take enforcement action against a permittee, unless:

      i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

      ii) There were no feasible alternatives to the bypass such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

      iii) The permittee submitted notices as required under G.3 of this Part.

   b. **The permitting authority may approve** an anticipated bypass, after considering its adverse effects, if the permitting authority determines that it will meet the three conditions listed above in G.4.a of this Part.

H. Upset

1. **Definition**

   Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventive maintenance, or careless or improper operation.

2. **Effect of an upset.** An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of H.3. of this Part are met. No determination made during

US EPA ARCHIVE DOCUMENT

administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

3. **Conditions necessary for a demonstration of upset.** A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

    a. An upset occurred and that the permittee can identify the cause(s) of upset;

    b. The permitted facility was at the time being properly operated; and

    c. The permittee submitted notice of the upset as required in D. of this Part (24 hour notice).

    d. The permittee complied with any remedial measures required under B.2 of this Part.

4. **Burden of Proof.** In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

I. Penalties for Violations of Permit Conditions

A violation of the EMS could result in the EPO being required to apply for an individual NPDES permit. The Clean Water Act provides the following for any violations of the terms and conditions of this permit:

1. **Criminal Penalties**

    a. Negligent violations: The Act provides that any person who negligently violates Section 301, 302, 306, 307, 308, 318, or 405 of the Act or any condition or limitation implementing those provisions in a permit issued under Section 402 is subject to a fine of not less than $2,750 nor more than $27,500 per day of violation, or by imprisonment for not more than one year, or both.

    b. Knowing violations: The Act provides that any person who knowingly violates Sections 301, 302, 306, 307, 308, 318, or 405 of the Act or any permit conditions implementing those provisions is subject to a fine of not less than $5,500 nor more than $55,000 per day of violation, or by imprisonment for not more than three years, or both.

    c. Knowing endangerment: The Act provides that any person who knowingly violates Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act or permit conditions implementing those provisions and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than $275,000, or by imprisonment for not more than 15 years, or both.

US EPA ARCHIVE DOCUMENT

d. False statements: The Act provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine of not more than $11,000, or by imprisonment for not more than two years, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than $22,000 per day of violation, or by imprisonment of not more than four years, or by both. [See Section 309 (c) 4 of the Clean Water Act]

2. **Civil penalties**

The Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed $27,500 per day for each violation. [See Section 309(d)]

3. **Administrative penalties**

The Act provides that the Administrator may assess a Class I or Class II administrative penalty if the Administrator finds that a person has violated Sections 301, 302, 306, 307, 308, 318, or 405 of the Act or a permit condition or limitation implementing these provisions, as follows [See Section 309(g)]:

a. Class I penalty: Not to exceed $11,000 per violation nor shall the maximum amount exceed $27,500.

b. Class II penalty: Not to exceed $11,000 per day for each day during which the violation continues nor shall the maximum amount exceed $137,500.

PART VI. DEFINITIONS

25-year, 24-hour rainfall event means the maximum 24-hour precipitation event with a probable recurrence interval of once in 25 years, as defined by the National Weather Service in Technical Paper Number 40, Rainfall Frequency Atlas of the United States, May 1961, and subsequent amendments, or equivalent regional or state rainfall probability information developed therefrom.

Best Management Practices (BMPs) means those schedules of activities, maintenance procedures, and other management practices of an egg production operation that are designed to minimize or prevent pollution of the air, water, or soil to control odor or pests.

Certified Conservation Planner and Certified Specialist means a professional who is certified for CNMP development and/or approval pursuant to USDA and EPA technical guidance or

US EPA ARCHIVE DOCUMENT

CNMP development (e.g., both engineering and agronomic components of the CNMP).

Comprehensive Nutrient Management Plan (CNMP): means a group of conservation practices and management activities which, when combined into a system, will help to ensure that both production and natural resources goals are achieved. It incorporates practices to utilize animal manure and organic by-products as a beneficial resource. A CNMP addresses natural resource concerns dealing with nutrient and organic by-products and their adverse impacts on water quality.

Catastrophic rainfall event is equivalent to a 25-year, 24-hour storm event. Catastrophic events include tornadoes, hurricanes, or other catastrophic conditions that would cause an overflow from the waste retention structure that is designed, constructed, operated, and maintained to meet all the requirements of this permit.

Expanded egg production operation means an operation that adds any number of confined hens so that the manure and wastewater produced exceeds the design capacity of the existing manure and wastewater storage facility or the operation s comprehensive nutrient management plan (CNMP).

Ground water means water below the land surface in a zone of saturation (40 CFR §258.2)

Land application means the application of manure and/or wastewater onto or incorporation into the soil.

Land under the operational control of the EPO means any land owned, leased or otherwise controlled by the EPO owner/operator for the purpose of land applying manure and/or wastewater generated at the EPO.

Liner means any barrier in the form of a layer, membrane or blanket, installed to prevent discharges to waters of the U.S.

Notice of Intent (NOI) is a form submitted by the EPO owner/operator applying for coverage under a general permit. It requires the applicant to submit the information necessary for adequate program implementation, including, at a minimum, the legal name and address of the owner or operator, the facility name and address, type of facility or discharges, and the receiving stream(s). [(40 CFR §128.28(b)(2)(ii)].

Nutrient Balance means determining the proper rate and timing of nutrients required to grow the planned crop by balancing the nutrients that are already in the soil and from other sources with those that will be applied in manure, biosolids, and commercial fertilizer. At a minimum, a nutrient balance determination should be based on preventing the application of nutrients at rates that will exceed the capacity of the soil and planned crops to assimilate nutrients and prevent water pollution; and be quantified and based on the most limiting nutrient in the soil, type of crop, realistic crop yields, soil type, and all nutrient inputs in addition to those from manure and wastewater. CNMPs that establish the appropriate rate and timing for land application of manure

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00055

and wastewater should be developed for the CAFO by the USDA-NRCS or any third party vendor certification programs that may include, but are not limited to: 1) American Society of Agronomy s certification programs, including Certified Crop Advisors (CCA) and Certified Professional Agronomists (CPAg), Crop Scientists (CPCSc), and Soil Scientists (CPSSc); 2) Land Grant University certification programs; 3) National Alliance of Independent Crop Consultants (NAICC); and State certification programs.

Owner/operator means any person who owns, leases, operates, controls, or supervises a source.

Process wastewater means any process-generated wastewater and any precipitation (e.g., rain or snow) which comes into contact with any manure, litter or bedding, or any other raw material or intermediate or final material or product used in or resulting from the production of animals or poultry or direct products (e.g., milk, eggs).

Process-generated wastewater means any water directly or indirectly used in the operation of a feedlot for any of the following: spillage or overflow from animal or poultry watering systems; washing, cleaning or flushing pens, barns, manure pits, or other feedlot facilities; direct contact swimming, washing or spray cooling of animals; and dust control.

Qualified groundwater scientist means a scientist, or engineer who has received a baccalaureate or post-graduate degree in natural sciences, or engineering and has sufficient training and experience in groundwater hydrology and related fields as may be demonstrated by State registration, professional certifications, or completion of accredited university programs that enable that individual to make sound professional judgements regarding ground-water monitoring, contaminant fate and transport, and corrective action [40 CFR 258.50 (g)]

Retention facilities or retention structures means all collection ditches, conduits and swales for the collection of runoff and wastewater, and all basins, ponds and lagoons used to store wastes, wastewater and manure.

Runoff means collected or uncollected gravity flow overland of water from rain, melted snow, or agricultural or landscape irrigation.

Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

The Act means Federal Water Pollution Control Act as amended, also known as the Clean Water Act as amended, found at 33 USC 1251 et seq.

Toxic pollutants means any pollutant listed as toxic under Section 307(a)(1) of the Act.

Under the Operational Control means a person who the Director determines to be an operator on the basis that the person exercises substantial operational control of the EPO. In making this

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00056

determination, the Director shall consider whether the person:

1. Directs the activity of persons working at the EPO either through a contract or direct supervision of, or on-site participation in, activities at the facility;

2. Owns the animals;

3. Specifies how the animals are grown, fed, or medicated; or

4. Meets any other factor that the Director determines demonstrates that the person exercises substantial operational control over the EPO.

Waters of the United States means: (1) all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide; (2) all interstate waters, including interstate wetlands; (3) all other waters such as intrastate lakes, rivers, and streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (a) which are or could be used by interstate or foreign travelers for recreational or other purposes; from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or, which are or could be used for industrial purposes by industries in interstate commerce; (4) all impoundments of waters otherwise defined as waters of the U.S.; (5) tributaries of waters identified in (1) through (4) of this definition; (6) the territorial sea; and (7) wetlands adjacent to waters (other than waters that are themselves wetlands) identified in items (1) through (6) of this definition.

PART VII. PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES AND INDIAN COUNTRY LANDS

[Where Applicable When EPA is the Permitting Authority Insert Specific State Permit Conditions]

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00057

APPENDIX C

EMS Elements

Under the XL Agreement for the United Egg Producers (UEP), the U.S. Environmental Protection Agency (EPA) has developed a model NPDES general permit for states to consider as they choose to issue general permits to qualified egg production operations. The Agreement also includes other certain prerequisite conditions for developing and implementing environmental management systems (EMS) that facilities would need to meet, consistent with the guidelines described in this document.

Section I: General Information on EMS Components

This first section is designed to provide general information on egg producer environmental management systems. It is advisory only. In Section II, egg producers will find a set of actual EMS elements that UEP has developed for egg producers to use if they wish to participate in this XL project. UEP will also be developing additional guidance and training, based on a Model EMS Template, that will make it much easier for individual facilities to develop site-specific EMSs.

What Prerequisites are Necessary?

Participating states will adopt or adapt EPA's Model General NPDES Permit guidance and issue statewide general permits to qualified egg production operations (EPOs). The guidance will require that, to be eligible for coverage under a general NPDES permit, an EPO needs to be properly implementing an Environmental Management System (EMS) that meets established EMS criteria and continue to implement the EMS if general permit coverage is to continue. Audits by certified independent third parties must be successfully completed before general permit coverage is initially granted. In addition, regular follow-up audits will take place to confim that the EMS is still being implemented and that compliance with the general permit is maintained. If either of these criteria is not met, the facility may no longer qualify for a general permit and the state or EPA could require the facility to obtain an individual NPDES permit.

What is an Environmental Management System (EMS)?

Like the name suggests, an EMS is a structured system of planning, acting, checking, and communicating that will help egg producers avoid problems, strengthen relationships and protect the environment. Following the guidelines in Section II of this document, egg producers can develop an EMS that is specific to their farms and conditions. For an egg producer s EMS to be effective, it should be an ongoing part of day-to-day operations and a key part of annual planning. Egg producers must have an acceptable EMS in place, as confirmed by a certified independent third party auditor, in order to be eligible for a general permit.

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00058

What are the potential benefits of an EMS?

Potential benefits associated with an effective EMS may include:

Demonstrating reasonable care and achieving ongoing improvement of facility operations and environmental performance;

Addressing regulated and significant potential unregulated environmental impacts associated with facility operations;

Maintaining good public/community relations;

Satisfying investor criteria and improving access to capital;

Obtaining lower insurance rates;

Improving cost control and conserving input materials and energy;

Reducing incidents that could result in liability;

Fostering development and sharing of environmental solutions;

Improving industry-government relations; and

Providing confidence to external interested parties that:

a) There exists a management effort to meet objectives and environmental expectations;

b) The systems design incorporates the process of continual improvement;

c) Emphasis is placed on pollution prevention rather than corrective action; and

d) Evidence of reasonable care and regulatory compliance can be provided.

How is an EMS Organized?

Consistent with other EMS models used in both industry and the public sector, an egg producer s EMS will be organized around four major part or elements Planning, Implementing, Checking, and Acting. These elements also describe the general process by which an EMS is implemented. The following is a general overview of this organization, but refer to Section II for the specific EMS components that each egg producer EMS must include.

Planning

The purpose of this element is to ensure that the egg production operation (a) has a written Policy statement in place that is consistent with all of the commitments contained in the UEP

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00059

Code of Good Environmental Practice (Code), (b) is identifying significant environmental impacts that are or could result from its operations, and (c) has planned measurable objectives to meet the commitments in its policy statement and reduce significant environmental impacts, including those that are not regulated. The first planning step would be for the facility to develop a written policy statement.

UEP will provide egg producers with printed copies of the Code suitable for framing. Participating egg producers could sign the Code, discuss each of the commitments with employees, display the signed copy of the Code prominently in the facility, and make a copy of the policy statement available to the public. UEP s Code can be found in Appendix A of this document. If a particular producer had already made environmental commitments over and above the Code or wanted to do so, those commitments would be included in the signed policy statement.

Next the facility should formulate a plan that would ensure its operations meet its environmental policy commitments, by establishing measurable objectives and targets, including objectives on regulatory compliance. These objectives should be consistent with the commitments in the Code, address significant potential environmental impacts (including unregulated impacts) and critical management programs (identified in Appendix B), and ensure compliance with applicable environmental requirements.

An example of such a measurable objective might be to effectively manage flies and rodents. The objective could be met by identifying employee responsibilities, proper operational procedures (e.g., management of buildings, waste feed, dead birds, manure), use of appropriate pest control agents, and collecting information on the effective reduction/ongoing control of flies and rodents.

Implementing

Once the overall environmental policy (Code) and objectives are in place, the egg producer should then systematically implement needed critical management programs and related Best Management Practices (BMPs) and carry out planned tasks/activities to make the plan work. The producer should also ensure that responsibilities for implementing the EMS are clearly defined and that employees are provided with the necessary training to ensure that can carry out these responsibilities.

As part of the XL project, UEP and the other stakeholders have identified a series of critical management programs that need to be addressed by each facility. These critical management programs include such things as odor control, fly and rodent control, dead bird proposal, etc. A list of these programs is included as Appendix B. Facilities should also ensure that they are using the appropriate Best Management Practices (BMPs) to ensure the effectiveness of each critical management program. These BMPs could be based on the Model General Permit for this XL Project, state permits, or separate BMP Guidance developed by UEP. Checking

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00060

As the EMS is implemented, the facility needs to monitor and periodically audit the EMS to ensure that critical management programs and BMPs are properly implemented, and ensure that the facility is meeting or making acceptable progress toward meeting its objectives and targets, including compliance with regulatory requirements.

Egg producers should keep records to document how critical management programs and BMPs were being implemented, changes to any of these programs, and completion of planned tasks and activities necessary to implement the EMS. The facility should also carry out periodic internal audits to ensure that compliance with regulatory requirements was being maintained and performance of the EMS based on objectives and targets is satisfactory. Internal auditing could be done with facility personnel or with the assistance of outside groups.

Acting (Review and External Communication)

Each year the facility should compare the status and results of the EMS to the objectives desired, take necessary steps, as necessary, to enhance its effectiveness, and communicate with external parties about the performance of the EMS and their ideas on possible improvements

This review function should be lead by facility management and should make use of all available information from things like internal audits, critical management program and BMP implementation, changes to regulatory requirements, and any issues raised by external stakeholders since the last review. As a result of the review, the facility should make information available on the performance of the EMS against objectives and targets, any changes to the EMS agreed to, and steps the facility will take to address any significant issues identified by external stakeholders.

Section II: Necessary Components of each EMS

While Section I was a general discussion of EMS components, this Section II is a detailed description of the actual components of an EMS and has been developed by UEP for use by egg producers that wish to participate in this XL project. Although the details of each egg producer s EMS would be unique, the following components need to be included in each EMS for an egg production facility to be eligible for coverage under a general permit issued by states or EPA.

Note this list of components is not intended to prescribe **how** egg producers should organize or operate their facilities. Rather this document is intended to define the needed components of an EMS *process, including some specific procedures,* that would need to be implemented to be expected to result in effective management of the environmental aspects of facility operations.

These EMS components assume that each facility s EMS would address a number of critical

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00061

management programs, help the facility to remain in compliance with the terms of a general permit, and help reduce environmental impacts from unregulated activities. Critical management programs include (a) pest control (e.g., flies, rodents); (b) dead bird disposal; (c) an odor management program; (d) preventative maintenance; (e) emergency preparedness and response; (f) utilize closed watering systems to animals; and (g) develop and implement a comprehensive nutrient management plan (CNMP). A more complete description of critical management programs can be found in Appendix B of this document. UEP will also develop, as part of its Model EMS Template described in Section I, a list of recommended best management practices (BMPs) for each critical management program.

What EMS Components are Necessary?

Independent 3rd party auditors would use these components as the primary basis for determining if the EMS was in place and being implemented such that coverage under a general permit would be warranted.

1. **Environmental Policy/Code of Good Practice.** Egg production facilities seeking coverage under NPDES Model General NPDES Permits need to develop and implement an environmental policy statement that incorporates the commitments contained in the UEP Code of Good Environmental Practice (Code). UEP will provide egg producers with printed copies of the Code suitable for framing. Egg producers should sign the Code, talk about the commitments with all employees, and display the document prominently for public viewing. UEP s Code can be found in Appendix A of this document. Of course, if a particular producer wanted to add commitments over and above the UEP Code, he could do so.

2. **Environmental Management Planning.** To convert the environmental policy into action, the egg production facility needs to develop and continuously implement an environmental management plan to satisfy the EMS. This plan will be different for each egg production facility but needs to include the following minimum components:

    a) **Evaluate Environmental Impacts:** The plan needs to establish and maintain a procedure to identify the environmental impacts of its activities, products, and/or services over which the facility can be expected to have an influence. Generally this procedure would involve self-analysis, but it could also include assessment by consultants, or conversations with extension workers, neighbors or public officials. The producer needs to ensure that the reduction of these impacts as well as issues identified by neighbors and others are considered in establishing its EMS objectives.

    b) **Evaluate Legal Requirements.** The plan needs to establish and maintain a procedure to identify and have access to current information on all environmental requirements in laws, regulations, ordinances, and/or permits

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00062

that apply to egg-production operations (including by-products of egg-production operations). Generally this procedure would involve ongoing interaction with UEP leadership, consultants or counsel, public officials or extension workers.

c) **Set Objectives and Targets.** The plan needs to establish and maintain environmental objectives and targets that are measurable (whenever possible), and the time frame set up to achieve them. Generally this means that when setting these objectives, the facility needs to include objectives designed to assure compliance with applicable federal, state or local environmental regulations, Critical Management Programs (identified in Appendix B), potential significant environmental impacts, technological options, financial, operational, and business requirements, and the views of local stakeholders. The objectives and targets also need to be consistent with the commitments contained in the producer s environmental policy, including the commitment to comply with applicable Federal, state, and local environmental requirements.

3. **Implementing the Environmental Policy and Plan.** Implementing environmental plans is a key part of the Plan-Do-Check-Act model of management and a necessary part of the EMS. Producers wishing to gain approval of an EMS in order to gain coverage under a Model General NPDES Permit need to do the following:

a) **Establish Environmental Management Procedures.** Establish and maintain procedures for ensuring compliance with applicable environmental requirements and to achieve the EMS objectives and targets, including:

1) Designate who is responsible for compliance assurance tasks, implementing appropriate Best Management Practices (BMPs) for each Critical Management Program identified in Appendix B, and ensuring progress toward objectives and targets across the organization; and

2) Establish schedules or frequencies for compliance assurance tasks, implementation of planned Best Management Practices (BMPs) in Critical Management Programs, and ensuring progress toward objectives and targets.

b) **Align the Facility s Organizational Structure and Resources with the EMS.** Top management needs to establish and maintain an organizational structure that empowers those responsible for implementing the egg production facility s environmental policy and EMS, including:

1) Define, record, and communicate to appropriate individuals all key roles, responsibilities, and authorities needed to facilitate effective

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00063

implementation of the producer's EMS;

2) Provide resources needed to implement the EMS, including manpower, specialized training, equipment, technology, and financial resources.

3) Appoint specific management representative(s) who have defined roles, responsibilities, and authority for:

   Ensuring that environmental management system requirements are established, maintained, implemented in accordance with this EMS components document; and

   Reporting on the performance of the environmental management system to top management for review and as a basis for improvement of the system.

c) **Train Key Individuals for Proper EMS Implementation.** Effective EMS implementation and achievement of the desired objectives and targets requires the following training and communication activities on the part of the egg producer:

1) Provide job-specific training for all personnel whose work is critical to implementation of the EMS, may have a significant environmental impact, or may potentially interfere with an egg producer s compliance with environmental legal requirements. Such personnel need to be competent on the basis of education, appropriate training, and/or experience, as required.

2) Provide awareness training to employees at each relevant function and level so they are aware of:

   Their roles and responsibilities and the importance of meeting the operation s environmental policy and the requirements of the EMS, including attainment of EMS objectives and targets and emergency preparedness and response requirements; and

   The potential consequences of departure from specified operating procedures.

3) Establish and maintain procedures for ongoing internal communications of policies, programs, and responsibilities between the various levels and functions within the producer's organization.

d) **Implement Appropriate BMPs and Operational Controls.** The heart of an EMS is the individual best management practices (BMPs) that are appropriate

US EPA ARCHIVE DOCUMENT

for each egg production operation. These will vary by location, rainfall and other climatic factors, state and local requirements, management strategies, and other conditions.

1) Facilities need to identify BMPs that are appropriate for each Critical Management Program listed in Appendix B, using State BMP guidance, other BMPs identified in EPA s Model General Permit, or BMP guidance developed or approved by UEP for egg production facilities in the assessment and selection of appropriate BMPs.

2) Facilities need to establish procedures that ensure the timely and effective implementation of selected BMPs.

e) **Implement an Emergency Preparedness and Response Program**. Egg producers need to have procedures to prepare for and minimize emergencies. Among other things, such emergencies may come from storms, fires, loss of power or water, computer equipment failure or accidents while handling manure or wastewater.

1) Producers need to identify the potential for accidents and emergency situations, effectively respond to such accidents and emergency situations; and prevent and mitigate the environmental impacts that may be associated with such incidents.

2) Producers need to review and revise, where necessary, their emergency preparedness and response procedures, particularly after the occurrence of accidents or emergencies. The producer should periodically test such procedures, where practicable.

4. **Checking on the Progress and Success of the EMS.** Monitoring and evaluating the performance of the operations and activities implementing the environmental plans is a key part of the Plan-Do-Check-Act model of management and a necessary part of the EMS. Producers wishing to gain approval of an EMS in order to gain coverage under a Model General NPDES Permit need to check the following:

a) **Implement Monitoring Procedures and Corrective Actions.** To properly implement the EMS, the producer needs to regularly monitor and measure the key characteristics of facility operations and activities that could have a significant impact on the environment, evaluate compliance with relevant laws and regulations, and conduct corrective actions where appropriate. In general, this means that producers need to establish and maintain a procedure to regularly:

1) Monitor the implementation of relevant management procedures, operational controls and BMPs for each Critical Management Program

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00065

described in Appendix B;

2) Monitor the performance the EMS, based on the facility s policies, objectives and targets;

3) Monitor compliance with relevant federal, state and local environmental laws and regulations; and

4) Investigate and handle situations where it is found that the facility is not in conformance with any of the above, by implementing corrective actions, including actions to minimize any adverse environmental impacts, and actions to prevent recurrence of the concern in the future. Any such corrective or preventative actions represent changes in the procedures of the EMS to be recorded and implemented thereafter.

b) **Keep Proper Records and Documentation.** The producer needs to establish and maintain proper documentation of actions and records related to regulatory compliance requirements and implementation of the facility EMS.

1) Records need to be sufficient to demonstrate implementation of the EMS and allow for the review/verification of implementation of the EMS, particularly for critical management programs (including planned BMPs) by a third-party auditor. All appropriate observations by the producer also need to be documented.

2) Environmental records need to be maintained in such a way that:

They are readily retrievable and protected against damage, deterioration, or loss;

They are periodically reviewed, revised as necessary, and approved for adequacy by authorized personnel;

The current versions of relevant documents are available at all locations where operations essential to the effective functioning of the system are performed, especially critical management programs;

Obsolete documents are promptly removed form all points of issue and points of use, or otherwise assured against unintended use; and

Obsolete documents that need to be retained for legal reasons or for knowledge preservation are suitably identified; and

3) Environmental records need to be legible, identifiable, and traceable to the activity, product, or service involved.

c) **Conduct Internal EMS Audits/Assessments**. Facilities need to periodically

US EPA ARCHIVE DOCUMENT

assess their efforts and identify needed improvements. The information developed by such assessments is confidential to the producer, but need to be documented. The internal EMS audits/assessments should address questions such as:

1) Does the design and content of the facility's EMS conform to this EMS components document, and include appropriate best management practices?

2) Are BMPs and operational controls under each critical management program (identified in Appendix B) being correctly implemented?

3) Have the EMS objectives and targets been met, or is acceptable progress being made toward the objectives and targets and is the facility remaining in compliance with the terms of the general permit?

4) Are environmental issues of concern to the local community being addressed?

5. **Acting to Continuously Review and Improve the EMS.** Facilities need to assess the status and results of the EMS to planned objectives, take steps, as necessary, to enhance its effectiveness, and facilitate meaningful communications with external parties about the performance of the EMS and their ideas on possible improvements.

   a) **Carry Out Management Reviews.** The producer's top management needs to annually review the EMS to ensure its continuing suitability, adequacy, and effectiveness. The management review process needs to ensure that the necessary information is collected to allow management to carry out this evaluation. This review needs to be documented.

      1) The management review needs to take into account results of monitoring of EMS implementation, internal and 3rd party audit results, and progress toward planned objectives and targets; and

      2) The review needs to address the possible need for changes to the environmental policy, EMS objectives, or other components of the environmental management system, in light of the foregoing, changing circumstances, and/or the commitment to continual improvement.

   b) **External Communications.** In developing and implementing its EMS, participating egg producing facilities need to:

      1) Share information with neighbors and other interested stakeholders about their Code of Good Environmental Practice and the EMS as it is being developed;

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00067

2) Provide meaningful opportunities for input as the EMS is developed and provide feedback/responses to suggestions, issues, or concerns provided by local stakeholders regarding the EMS as it is implemented;

3) Make information available to interested stakeholders on the relative performance of the EMS, including compliance with regulatory requirements and results of 3rd party audits, and take steps to address environmental issues of concern to the community on an ongoing basis through the EMS.

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00068

APPENDIX D

Code of Good Environmental Practice

Code subscribers and EMS participants pledge to uphold the following principles of conduct:

Environmental Management System: To implement an environmental management system (EMS) consistent with the guidelines developed by the industry, EPA, States, and others, that will provide the mechanism for meeting the commitments identified below, and to make the EMS available for verification by a qualified independent third party to ensure effective ongoing operations.

Compliance: To meet or exceed all applicable federal, state, and local environmental requirements for egg production operations.

Quality Practices: To follow professional performance guidance to operate in an environmentally sound manner, and implement all applicable best management practices and good housekeeping practices for all operations and property.

Sustainable Manure Management Practices: To enhance the environment by committing to sustainable, environmentally acceptable manure and wastewater management, transportation and land application practices.

Preventative Maintenance: To prepare and implement a plan for routine inspection and preventative maintenance of facilities and equipment, including that used to store, manage, transport and land-apply manure and wastewater to ensure continuous effective operations.

Continual Improvement: To seek continual improvement of the operations to reduce negative impacts on the environment and on enjoyment of property.

Communications: To engage in regular, honest and effective communication with officials, neighbors and other stakeholders, employees, customers, and other interested citizens to respond to their concerns and the company progress to meeting the code of good practice.

US EPA ARCHIVE DOCUMENT

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APPENDIX E

Critical Management Programs

Utilization of a closed watering systems to animals

Maintain pest control programs (e.g., flies, rodents)

Maintain dead bird disposal program

Maintain odor management program

Maintain a preventative maintenance program

Maintain an emergency preparedness and response program

Develop and implement a comprehensive nutrient management plan (CNMP) that is certified by an appropriate person

* As previously noted, UEP will develop, as part of its Model EMS Template, a recommended list of best management practices (BMPs) for each of the critical management programs listed above.

US EPA ARCHIVE DOCUMENT

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APPENDIX F

Stakeholder Involvement

Overall Stakeholder Involvement

This project, if successful, will affect several hundred individual egg producing facilities around the country. The success of the project is also heavily dependent on decisions by individual States to develop general permits for this industry. EPA can and will encourage States to do so, but cannot compel them to do so. For these reasons, a traditional stakeholder involvement plan like those developed for most XL projects, is not appropriate. However, stakeholder involvement is a central tenet of the project and will be accomplished at several levels as follows:

Project Workgroup -- the workgroup, led by UEP, includes a diverse set of stakeholders. These include egg producers, UEP staff, State and federal agencies, non-governmental organizations, and others. This workgroup developed all elements of the program described in the body of this Agreement and are prepared to support its implementation. The workgroup will also review the remaining elements of the program to be developed by UEP, as described in Section II of this Agreement.

State General Permits as individual States develop general permits for egg producers, these permits will be available for public comment and input from the public before they are issued.

Local Stakeholder Involvement Most importantly, stakeholder involvement will take place at the local level as facilities develop their EMSs and undergo 3rd party audits. As described earlier, facilities will communicate and take input from local stakeholder on an ongoing basis as their EMS is developed and implemented over time. Information on the results of EMS audits will be made available to regulatory authorities and key local stakeholders as part of the process of submitting a Notice of Intent (NOI) for coverage under general permits. As EMS implementation occurs, facilities will address issues raised by local stakeholders. Finally, all information from follow-up audits to ensure continued implementation of the EMS will be publicly available.

Public Input/Access to EMS Information

Facilities developing and implementing EMSs will work closely with local stakeholders and share information with them throughout the process, consistent with the commitment each facility has made through the Code of Good Environmental Practice. Specifically, this communication will take place in the following ways:

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00071

1. Facilities will communicate, take input from, and provide feedback to local stakeholders as the EMS is developed and EMS performance objectives are established in order to ensure that concerns raised by local stakeholders are addressed.

2. Once the facility has successfully completed the 3rd party audit to qualify for coverage under the general permit, it will publish a notice in a local newspaper indicating that the audit was successful and that the facility plans to submit a Notice of Intent (NOI) to comply with the terms of the state or EPA general permit. This notice will also be provided directly to key local stakeholders and will include a point of contact at the facility that can respond to any inquiries from the local community. The facility will respond to any inquiries it receives and provide information on these inquiries and its responses to them to the regulatory authority.

3. Information on audit results will also be sent to the permitting authority (state or EPA) and posted on a web-site maintained by the permitting authority, along with the NOI.

4. As the facility implements its EMS and goes through regular follow-up audits, information about the EMS and its performance will be made available and the facility will take steps to address issues raised by local stakeholders. Information on the results of follow-up audits will also be publicly available.

US EPA ARCHIVE DOCUMENT

ED_004549_00015585-00072

review with the publication of a proposed rulemaking.

Public Comments

NOAA is interested in hearing the public's views on:

- The potential impacts of ongoing and proposed sanctuary activities discussed above, and ways to mitigate impacts to sanctuary resources.
- The preliminary priority topics discussed above, and whether these are the appropriate priority topics, or if there are additional topics NOAA should consider.
- The effectiveness of the existing management plan in meeting the mandates of the NMSA (16 U.S.C. 1431 *et seq.*) and supporting the mission and goals expressed in the current strategic plan for the National Marine Sanctuary System (available on the internet here: *https://sanctuaries.noaa.gov/about/five-year-strategy-2017-2022.html*).

Federal Consultations

This document also advises the public that NOAA will coordinate its consultation responsibilities under section 7 of the ESA, EFH under the Magnuson-Stevens Act, section 106 of the NHPA (16 U.S.C. 470), and Federal Consistency review under the CZMA. Through its ongoing NEPA process and the use of NEPA documents and public and stakeholder meetings, NOAA will also coordinate compliance with other federal laws.

In fulfilling its responsibility under the NHPA and NEPA, NOAA intends to identify consulting parties; identify historic properties and assess the effects of the undertaking on such properties; initiate formal consultation with the State Historic Preservation Officer, the Advisory Council of Historic Preservation, and other consulting parties; involve the public in accordance with NOAA's NEPA procedures; and develop in consultation with identified consulting parties alternatives and proposed measures that might avoid, minimize, or mitigate any adverse effects on historic properties and describe them in any environmental analysis.

NOAA will also initiate communications and consultation steps with relevant federally recognized tribal governments pursuant to Executive Order 13175, Department of Commerce tribal consultation policies, and NOAA procedures for government-to-government consultation with federally recognized Indian Tribes.

Authority: 16 U.S.C. 1431 *et seq.*

John Armor,

Director, Office of National Marine Sanctuaries.

[FR Doc. 2019–20247 Filed 9–30–19; 8:45 am]

BILLING CODE 3510–NK–P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

21 CFR Part 573

[Docket No. FDA–2019–F–3911]

Evonik Corp.; Filing of Food Additive Petition (Animal Use)

AGENCY: Food and Drug Administration, HHS.

ACTION: Notification; petition for rulemaking.

SUMMARY: The Food and Drug Administration (FDA or we) is announcing that Evonik Corp. has filed a petition proposing that the food additive regulations be amended to provide for the safe use of silicon dioxide as an anticaking agent, grinding aid, antifoaming agent, or carrier in animal feed components (ingredients, intermediate premixes, premixes, supplements, or concentrates).

DATES: The food additive petition was filed on July 24, 2019.

ADDRESSES: For access to the docket, go to *https://www.regulations.gov* and insert the docket number, found in brackets in the heading of this document, into the "Search" box and follow the prompts; and/or go to the Dockets Management Staff, 5630 Fishers Lane, Rm. 1061, Rockville, MD 20852.

FOR FURTHER INFORMATION CONTACT: Chelsea Cerrito, Center for Veterinary Medicine, Food and Drug Administration, 7519 Standish Pl., Rockville, MD 20855, 240–402–6729, *Chelsea.Cerrito@fda.hhs.gov.*

SUPPLEMENTARY INFORMATION: Under the Federal Food, Drug, and Cosmetic Act (section 409(b)(5) (21 U.S.C. 348(b)(5))), notice is given that a food additive petition (FAP 2308) has been filed by Evonik Corp., 1707 Barrett Lakes Blvd. NW, Suite 340, Kennesaw, GA 30144. The petition proposes to amend Title 21 of the Code of Federal Regulations (CFR) in part 573 (21 CFR part 573) *Food Additives Permitted in Feed and Drinking Water of Animals* to provide for the safe use of silicon dioxide as an anticaking agent, grinding aid, antifoaming agent, or carrier in animal feed components (ingredients, intermediate premixes, premixes, supplements, or concentrates).

The petitioner has claimed that this action is categorically excluded under 21 CFR 25.32(r) because it is of a type that does not individually or cumulatively have a significant effect on the human environment. In addition, the petitioner has stated that, to their knowledge, no extraordinary circumstances exist. If FDA determines a categorical exclusion applies, neither an environmental assessment nor an environmental impact statement is required. If FDA determines a categorical exclusion does not apply, we will request an environmental assessment and make it available for public inspection.

Dated: September 23, 2019.

Lowell J. Schiller,

Principal Associate Commissioner for Policy.

[FR Doc. 2019–20958 Filed 9–30–19; 8:45 am]

BILLING CODE 4164–01–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[EPA–HQ–OAR–2010–0960; FRL–10000–43–OAR]

Call for Information: Information Related to the Development of Emission Estimating Methodologies for Animal Feeding Operations

AGENCY: Environmental Protection Agency (EPA).

ACTION: Call for information.

SUMMARY: The U.S. Environmental Protection Agency (EPA) is soliciting quality-assured emissions and process data, and calculation models and methodologies that are relevant to developing emission estimating methodologies (EEMs) for emissions of volatile organic compounds (VOC) from animal feeding operations (AFOs). The EPA may use the data to supplement the emissions and process data collected under the National Air Emission Monitoring Study (NAEMS) for AFOs.

DATES: Information must be received on or before December 2, 2019.

ADDRESSES: You may send comments, identified by Docket ID No. EPA–HQ–OAR–2010–0960, by any of the following methods:

- *Federal eRulemaking Portal: https://www.regulations.gov/* (our preferred method). Follow the online instructions for submitting comments.
- *Email: a-and-r-docket@epa.gov.* Include Docket ID No. EPA–HQ–OAR–

2010–0960 in the subject line of the message.

• *Fax:* (202) 566–9744. Attention Docket ID No. EPA–HQ–OAR–2010–0960.

• *Mail:* U.S. Environmental Protection Agency, EPA Docket Center, Docket ID No. EPA–HQ–OAR–2010–0960, Mail Code 28221T, 1200 Pennsylvania Avenue NW, Washington, DC 20460.

• *Hand/Courier Delivery:* EPA Docket Center, WJC West Building, Room 3334, 1301 Constitution Avenue NW, Washington, DC 20004. The Docket Center's hours of operation are 8:30 a.m.–4:30 p.m., Monday–Friday (except federal holidays).

Instructions: All submissions received must include the Docket ID No. for this rulemaking. Comments received may be posted without change to *https://www.regulations.gov/,* including any personal information provided. For detailed instructions on sending comments and additional information on the rulemaking process, see the **SUPPLEMENTARY INFORMATION** section of this document.

FOR FURTHER INFORMATION CONTACT: For questions about this Call for Information, contact Mr. William Schrock, Sector Policies and Programs Division (E143–03), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541–5032; fax number: (919) 541–0516; and email address: *schrock.bill@epa.gov.*

SUPPLEMENTARY INFORMATION:

Docket. The EPA has established a docket for this rulemaking under Docket ID No. EPA–HQ–OAR–2010–0960. All documents in the docket are listed in *Regulations.gov.* Although listed, some information is not publicly available, *e.g.,* Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *Regulations.gov* or in hard copy at the EPA Docket Center, Room 3334, WJC West Building, 1301 Constitution Avenue NW, Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the EPA Docket Center is (202) 566–1742.

Instructions. Direct your comments to Docket ID No. EPA–HQ–OAR–2010–0960. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *https://www.regulations.gov/,* including any personal information provided, unless the comment includes information claimed to be CBI or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *https://www.regulations.gov/* or email. This type of information should be submitted by mail as discussed below.

The EPA may publish any comment received to its public docket. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (*i.e.,* on the Web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit *https://www.epa.gov/dockets/commenting-epa-dockets.*

The *https://www.regulations.gov/* website allows you to submit your comment anonymously, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *https://www.regulations.gov/,* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any digital storage media you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should not include special characters or any form of encryption and be free of any defects or viruses. For additional information about the EPA's public docket, visit the EPA Docket Center homepage at *https://www.epa.gov/dockets.*

Submitting CBI. Do not submit information containing CBI to the EPA through *https://www.regulations.gov/* or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information on any digital storage media that you mail to the EPA, mark the outside of the digital storage media as CBI and then identify electronically within the digital storage media the specific information that is claimed as CBI. In addition to one complete version of the comments that includes information claimed as CBI, you must submit a copy of the comments that does not contain the information claimed as CBI directly to the public docket through the procedures outlined in *Instructions* above. If you submit any digital storage media that does not contain CBI, mark the outside of the digital storage media clearly that it does not contain CBI. Information not marked as CBI will be included in the public docket and the EPA's electronic public docket without prior notice. Information marked as CBI will not be disclosed except in accordance with procedures set forth in 40 Code of Federal Regulations (CFR) part 2. Send or deliver information identified as CBI only to the following address: OAQPS Document Control Officer (C404–02), OAQPS, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, Attention Docket ID No. EPA–HQ–OAR–2010–0960.

Call for Information acronyms and abbreviations. We use multiple acronyms and terms in this Call for Information. While this list may not be exhaustive, to ease the reading of this Call for Information and for reference purposes, the EPA defines the following terms and acronyms here:

AFOs animal feeding operations
CBI Confidential Business Information
EEMs emission estimating methodologies
NAEMS National Air Emission Monitoring Study
SAB Science Advisory Board
VOC volatile organic compounds

I. General Information

A. What is the purpose of this action?

In 2005, the EPA offered AFOs an opportunity to participate in a voluntary consent agreement (70 FR 4958, January 31, 2005) referred to as the Air Compliance Agreement. Under the Air Compliance Agreement, participating AFOs were responsible for, among other things, the funding for NAEMS—a 2-year, nationwide industry-run emissions monitoring study of the broiler, egg-layer, swine, and dairy industries. Monitoring under NAEMS began in the summer of 2007 and it occurred at 25 monitoring sites located in 10 states. The study collected process and emissions data for ammonia, hydrogen sulfide, particle pollution, and VOC from a representative sample of animal

housing structures and manure storage and treatment units across the country.

The EPA plans to use these data to develop EEMs for AFOs, which will help AFOs determine and comply with any applicable regulatory responsibilities under the Clean Air Act. Additional information regarding NAEMS can be found at: *https://www.epa.gov/afos-air/national-air-emissions-monitoring-study.*

In the January 2005 **Federal Register** document, the EPA committed to using data generated from NAEMS and all other available, relevant data to develop EEMs. On January 19, 2011, the EPA published a call for information to obtain emissions and process data for animal confinement and manure storage and treatment processes at beef, broiler, dairy, egg-layer, swine, and turkey AFOs (76 FR 3060). Using the NAEMS data and the data obtained through the 2011 call for information, the EPA developed draft EEMs for broiler confinement operations and for open lagoons and basins at swine and dairy operations. In 2013, the EPA requested that the Science Advisory Board (SAB) conduct a review of these draft EEMs and provide feedback regarding the development of the methodologies. As noted by the SAB in their March 19, 2013, review summary, and reaffirmed by recent EPA data reviews, peer-reviewed data regarding VOC emissions from AFOs are limited.[1] Through the Call for Information in this document, the EPA is requesting that interested parties submit VOC emissions and process data available since 2011 that are relevant to the EPA's effort to develop EEMs for animal confinement and manure storage and treatment processes at broiler, dairy, egg-layer, and swine AFOs, particularly for open sources at dairy and swine operations (*e.g.,* lagoons and basins).

B. What specific information is the EPA seeking?

The EPA is requesting data for VOC emissions from animal confinement and manure storage and treatment processes at broiler, egg-layer, swine, and dairy AFOs and related process information. Consistent with the Air Compliance Agreement, the EPA is focusing in the near term on developing EEMs for AFOs using statistical models. However, we acknowledge the recommendation that the EPA develop a process-based modeling approach that incorporates "mass balance" constraints to determine emissions from AFOs, made by the National Academy of Sciences in its December 2002 final report titled *Air Emissions from Animal Feeding Operations: Current Knowledge, Future Needs.* In their 2013 review, the SAB also recommended that the EPA develop process-based models for estimating emissions from AFOs. As noted in the EPA's 2013 response to the SAB review, we will carefully consider its recommendations and we will review all of the information available to us in developing the AFO EEMs. To ensure compatibility with the NAEMS data, the emissions and related process data provided to the EPA should be accompanied, if possible, by documentation that contains detailed descriptions of the following parameters, as applicable.

1. General information:

- Description of AFO process measured (*e.g.,* animal confinement structure; manure storage and treatment unit; land application site).
- Location of AFO process measured (*e.g.,* physical address, latitude/longitude coordinates of facility).
- Beginning and ending dates of the monitoring period.

2. Monitoring data:

- Quality assurance and quality control plan.
- Site monitoring plan.
- Test methods, instrumentation, and standard operating procedures used to collect emissions and process data measurements.
- Results of audits conducted on instruments and procedures.
- Field notes and associated documentation collected during the monitoring.
- Emissions data (unanalyzed or analyzed) and associated process data.
- Meteorological data, including average ambient temperature, relative humidity, pressure, wind speed, wind direction, and insolation (solar radiation) for each day that the study was conducted.
- Production data (*e.g.,* number of eggs produced per day or quantity of milk produced per day).
- Calculations and assumptions used to convert concentration data (*e.g.,* parts per million by volume) into mass emissions (*e.g.,* pounds per hour).

3. Animal confinement structures:

- Dimensions of structures monitored.
- Designed and permitted animal capacity.
- Type, age, number, and weight of animals contained in the confinement structure over the duration of the monitoring period.
- Manure management system (*e.g.,* pull-plug pit, scrape).
- Dates of production and manure management activities over the duration of the monitoring period.
- Ventilation method (*i.e.,* natural or mechanical).
- Calculations and assumptions used to estimate the ventilation rate of the monitored confinement structure.
- Calibration procedures for instruments (*e.g.,* flow meters, fan relays) used to collect data for calculating ventilation rate of the monitored confinement structure.
- Data on air temperature and relative humidity within the structure for each day that the study was conducted.
- Organics content of process inputs and outputs (*e.g.,* feed, water, bedding, eggs, milk).
- Organics content of manure excreted.
- Description of any control device or work practice used in the monitored structure to reduce emissions.

4. Manure storage and treatment processes:

- Type, age, number, and weight of animals contributing manure to the storage and treatment process over the monitoring period.
- Dimensions of storage/treatment unit monitored (*e.g.,* storage pile, tank, lagoon).
- Depth of settled solids in storage/treatment unit.
- Temperature, pH, and reduction/oxidation potential of manure contained in the storage/treatment unit.
- Moisture, total solids, volatile solids, organic content, total Kjeldahl nitrogen, and ammoniacal nitrogen content and pH of manure entering storage and treatment process over the monitoring period.

With regard to the format of the information, we request that emissions, process, and production data be submitted to the EPA in Microsoft® Excel® spreadsheet or Access® database format. In cases where the emissions, process, and production data correspond to time increments shorter than 1 hour, please provide sufficient information and supporting documentation with the data to allow the EPA to develop emission estimates on a per-hour and per-day basis. For all formats, please clearly label the units of measure of emissions, process, and production data submitted.

Dated: September 18, 2019.

Anne L. Idsal,

Acting Assistant Administrator.

[FR Doc. 2019–20927 Filed 9–30–19; 8:45 am]

BILLING CODE 6560–50–P

[1] *See https://www.epa.gov/afos-air/national-air-emissions-monitoring-study#naems-sab.*

Atmospheric Pollution Research
www.atmospolres.com

Characterizing ammonia emissions from a commercial mechanically ventilated swine finishing facility and an anaerobic waste lagoon in North Carolina

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ABSTRACT

Emissions of atmospheric ammonia–nitrogen [NH_3–N, where NH_3–N = (14/17) NH_3] were measured from a commercial anaerobic swine waste treatment lagoon and from an on–site finishing swine confinement house at the same location. Continuous measurements were made at each potential NH_3–N source for ~1 week during four different seasons. Results presented here represent measurements made for the second year of a multi–year experiment. Barn emissions were estimated to be 2 604±660 g NH_3–N day^{-1}, 1 761±1 087 g NH_3–N day^{-1}, 1 657±1 506 g NH_3–N day^{-1}, and 2 659±1 194 g NH_3–N g day^{-1} in summer, fall, winter, and spring respectively. NH_3–N barn emission factors were calculated to be 1.32±0.32 kg NH_3–N animal^{-1} yr^{-1}, 0.78±0.49 kg NH^3–N animal^{-1} yr^{-1}, 1.55±1.40 kg NH_3–N animal^{-1} yr^{-1}, and 1.35±0.61 kg NH^3–N animal^{-1} yr^{-1} in summer, fall, winter, and spring respectively. Average NH_3–N flux from lagoon was greatest in the summer, >3 943 μg m^{-2} min^{-1}, and lowest in the winter, 981±210 μg m^{-2} min^{-1}. Fall and spring average NH_3–N flux values were >1 383 μg m^{-2} min^{-1} and 1 641±362 μg m^{-2} min^{-1}, respectively.

Keywords:
Ammonia emissions
Swine CAFO
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1. Introduction

Emissions of trace gases, particularly ammonia (NH_3), from concentrated animal feeding operations (CAFOs) have become a major problem in recent years in North Carolina as changes in crop and livestock production methods are in turn changing emissions of trace gases into the atmosphere (Aneja et al., 2006; US EPA, 2011). In North Carolina, the swine industry has grown significantly over the past two decades and is a major animal agricultural industry in the state, with an inventory of ~10 million animals (daily standing population). Currently, there are more than 1 400 operations with more than 1 000 head, which accounts for over 99% of the state inventory (USDA, 2008), with the majority of the pig farms in North Carolina clustered in the southeastern region of the state. Public concerns about potential environmental, ecological, and health effects of air emissions from CAFOs have increased along with the growth and consolidation of this industry (Aneja et al., 2006).

Ammonia is a by–product of microbial decomposition of the organic nitrogen compounds in manure. It also occurs as absorbed nitrogen in the form of organically bound nitrogen, and as urea in urine (Beline et al., 1998; US EPA, 2001). It is the primary gaseous base in the atmosphere influencing the acidity of precipitation, cloud water, and aerosol species. Ammonia released from near–surface sources (i.e., anaerobic waste lagoons) into the atmosphere generally has a lifetime of ~1–5 days (Warneck, 2000) and may deposit near the source through dry or wet deposition. However, ammonia readily reacts with a variety of acidic atmospheric species, forming ammonium aerosols such as ammonium sulfate, –nitrate, and –chloride, which can have longer atmospheric residence lifetimes (~1–15 days) owing to a decrease in dry deposition velocity (Aneja et al., 1998). Therefore, ammonium aerosols may be transported and deposited further downwind from the source. In eastern North Carolina, an environmental concern that has been associated with ammonium aerosols is their deposition into sensitive aquatic ecosystems, where excessive nitrogen loading may lead to soil acidification, enhanced eutrophication, and the growth of harmful algal blooms, which may cascade to upset ecosystem nutrient balances (Paerl, 1997). In addition, excess levels of ammonia in the air allows for fine particulate matter formation which can cause adverse effects on human health including respiratory problems and lung damage (WHO, 2003; Aneja et al., 2008; Aneja et al., 2009).

Concentrated Animal Feeding Operations in relatively small areas can be a significant source of gaseous NH_3 emissions. Studies on gas emissions from swine housing and manure management systems indicate that ammonia emissions are significant, especially at densely populated animal sites (Aneja et al., 2000; Aneja et al., 2001; Heber et al., 2002; Ni et al., 2002; Lim et al., 2003; Harper et al., 2004). Arogo et al. (2003) reviewed measurement techniques

and studies undertaken to estimate NH_3 emissions from both swine lagoons and animal confinement houses. Walker et al. (2000) estimated that hog operations are responsible for almost 50% of aggregate NH_3 emissions in North Carolina.

There are various factors that may affect the emissions of gases into the atmosphere from CAFOs. These include different types of animal production, farming activities, and climate. Therefore, emissions estimates for one type of CAFO may not translate readily to others. It is therefore important for comprehensive emissions measurements to be made at different types of CAFOs in order to develop accurate emission factors.

An intensive two–year field study was undertaken to investigate and evaluate the variability of ammonia emissions with respect to diurnal and seasonal variations for four seasons, as well as the influence of meteorological and physicochemical factors during each season. Measurements were made at two primary point sources, an on–site waste anaerobic swine lagoon and an animal housing structure, at a farm in eastern North Carolina. Data were collected continuously using in situ measurement techniques for a 1–week period during each season (i.e., fall, winter, spring, and summer) (Aneja et al., 2000). Results for the first year of measurements are presented in Blunden and Aneja (2008) and Blunden et al. (2008). This work presents NH_3 emission estimates for data collected during the second year of the study, thus contributing to a robust data set that provides a reliable estimate of emissions from these commercial sites and provides uncertainties associated with NH_3 emissions. This also allows for accurately quantifying NH_3 emissions and improving NH_3 emission inventories for scientific and regulatory purposes. Accurate emission estimates will allow for improved decision making with respect to improving regional air and water quality by better quantitatively understanding ammonia emissions from these environments.

2. Methods and Materials

2.1. Physiographic location and farm description

The sampling site is located in Jones County, North Carolina, in the southeastern region of the state, where the majority of hog farming operations are located. A schematic of the facility is shown in Figure 1. The site is a ~7 000–head operational commercial swine finishing farm. The on–site waste storage treatment lagoon is ~17 150 m^2, at the normal liquid level. The farm utilizes a conventional "lagoon and spray" technology as its primary means of handling the waste, which is the most widely used method in North Carolina. Waste is flushed directly from the hog barns into the anaerobic lagoon once per week and a portion of the lagoon waste is recycled to recharge the pit. During a flush, the majority of all the liquid was flushed from the building, but it was not power washed. The recharge liquid was all treated lagoon effluent. Waste from the lagoon is also periodically removed and used as spray over seasonal on–site agricultural crops as a source of nutrients. Although the hog waste is flushed into the lagoon daily, the amount entering the system over a one week period is considered insignificant compared to the content of the entire lagoon and therefore the additional waste is not expected to affect measurements. Hog waste was not flushed into the system near the experimental area. In addition, no waste was removed from the system and no mechanical mixing or stirring of the lagoon occurred during the experimental periods.

The farm had eight mechanically–ventilated confinement houses, which were aligned North–South and oriented East–West. Generally, the hogs are rotated out of each house approximately every 18 weeks, weighing ~22–24 kg upon arrival and gaining an average of 5 kg per week (Williams, 2005). The weight gain is assumed to be linear and the weekly animal mortality rate was documented and taken into account for total weight estimations. Each house is cleaned and sanitized between rotations. There are 800–900 animals housed in each barn. A full description of the hog numbers, weights, and number of weeks in rotation for each season during the sampling is provided in Table 1.

Table 1. *Sampling dates and production data for housing emissions in each season*

Season	Sample Dates	Number of Hogs	Number of Weeks in Rotation	Average Weight [a,b]	Total Weight [a,c]
Summer	June 21-27, 2007	885	8	48.7	43 049
Fall	Nov. 2-10, 2007	995	5	34.6	34 428
Winter	Feb. 9-28, 2008	476	21	116.6	55 513
Spring	Apr. 21-26, 2008	875	9	50.6	44 262

[a] *Measured in units of kg*
[b] *Weighted average for pigs brought into the barns on different dates.*
[c] *In general, it is the product of number of hogs and average weight corrected for rotation*

2.2. Barn experimental procedure

One barn, located furthest north on the property, was selected for emission measurements. Five AAA Associates Inc. Maxi–Brute™ fans with plastic shutters (Niles, MI), two 91 cm diameter direct–driven and three 122 cm diameter belt–driven, were located at the west end of the building (see Figure 1). The fans were staged to operate as temperature increased inside the building.

In order to determine fan revolutions per minute (rpm), a Mabuchi VDC motor (Santa Clara, CA) was either mounted to a stainless–steel plate configured to fit over the front the 91 cm fan plate or attached to a cylinder sleeve which fit over the fan shaft of the 122 cm fans. Single analog output wires were connected from each motor to the Campbell Scientific CR10X data logger (Logan, UT) which continuously recorded the measured voltage output every second and averaged the data over a fifteen minute timeframe. Prior to the experiment, each motor was calibrated in the laboratory to obtain voltage outputs at a specific rpm. The rpm for each fan as well as "on/off" times could then be determined and flow rates subsequently calculated. According to manufacturer specifications the direct drive motor on the 91 cm fans is rated at 850 rpm and the 122 cm fan motor is rated at 1 725 rpm. We estimated the "pulley ratio" for the 122 cm fans to be 2.9:1; therefore, the fans should be rotating at ~595 rpms. Blunden and Aneja (2008) determined that the static pressure varied from 0.22–0.32 cm water (21–31 Pa), with an average and median value of 0.28 cm water. This value was subsequently used for further emission rate calculations. The flow rates for each fan size were calculated using the following calculation;

$$FR_C = \left(\frac{FR_M}{RPM_S}\right)(RPM_{Meas}) \quad (1)$$

where FR_C is the calculated fan flow rate ($m^3\ min^{-1}$), FR_M is the manufacturers fan flow rate ($m^3\ min^{-1}$) and RPM_S and RPM_{Meas} are the specified and measured revolutions per minute (rpm), respectively. The manufacturer fan flow rate was adjusted to the average static pressure measurements. For example, given a static pressure of 0.28 cm water, manufacturer fan flow rates for the 91 cm fan with shutter and 122 cm fan are ~269 and ~640 $m^3\ min^{-1}$, respectively.

A ¼" o.d., 5/32" i.d. Teflon sample line was inserted inside the chimney of the first 91 cm fan to turn on, between the shutter and fan blade, at roughly half the fan radial distance (see Figure 1). Due

to the nature of the airflow through the building, it is assumed that the gaseous concentrations are uniformly distributed at each fan outlet. The air is drawn through the system in order to deliver the sample to the NH_3 analyzer at a flow rate of ~0.5 L min^{-1}. The barn sampling line was ~5 m in length and the residence time was ~3 seconds. Therefore we observed no condensation in the sampling lines, as the water vapor was continuously flushed out from the sampling lines. Moreover, FEP Teflon was used for the sampling lines, which is recognized to have no hysteresis or wall effects.

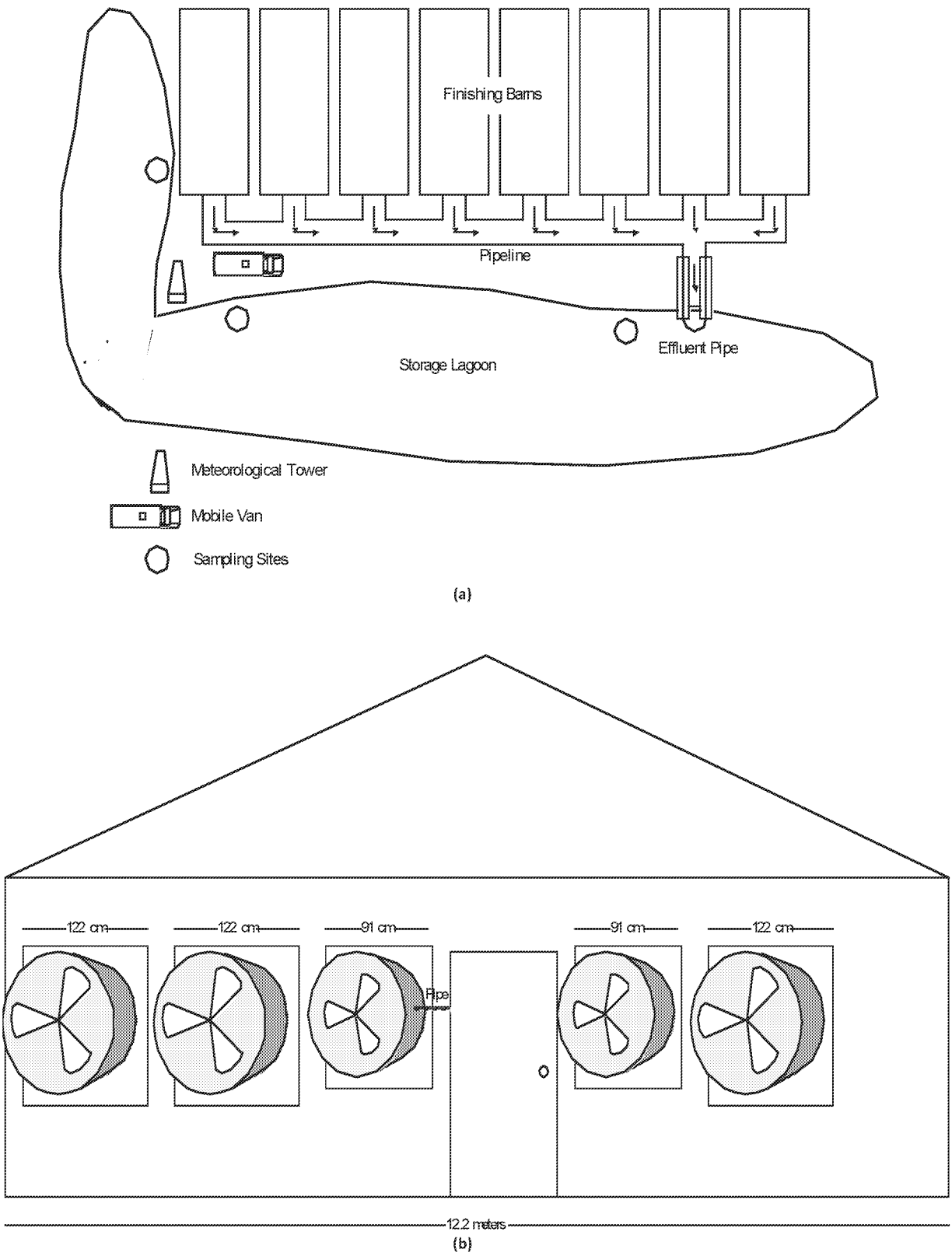

Figure 1. (a) *Aerial schematic of study site, a conventional lagoon and spray technology facility and* ***(b)*** *front view of swine confinement house. Not drawn to scale.*

Barn emission rates were calculated using the equation;

$$Emission\ rate = C \times \sum f \quad (2)$$

where C is the gas concentration (μg m^{-3}) and Σf is the sum of the calculated hourly flow rates (m^3 min^{-1}).

Five–minute integrated background samples were collected daily using 6–L electropolished stainless steel SUMMA™ canisters, evacuated to a sub–ambient pressure of <0.05 mm Hg. During sample collection, the valve on the canister was opened slowly over a timeframe of ~4 min and fully opened on the order of 1 min, thus allowing for a ~5 min point sample to be collected. Each sample was drawn through a Teflon tube and delivered to the NH_3 analyzer (temporarily disconnected from the fan outlet sample line). There was a 5–10 minute gap between the time the barn sample line was disconnected and replaced by the background sample line. Data was recorded from the background samples after three minutes, allowing the instruments to stabilize. The background samples collected were on average 0–4% of the concentration values measured for NH_3 at the fan ventilation exhaust and were therefore not considered during emission calculations.

2.3. Lagoon dynamic flow–through chamber system and ammonia analyzer

A dynamic flow–through chamber system with a variable–speed motor–driven continuous impeller stirrer (Aneja et al., 2000) was used to determine ammoniacal nitrogen (NH_3–N) emission from the anaerobic lagoon. The dynamic chamber method offers the ability to examine the flux process in more detail than micrometeorological methods by controlling mixing conditions inside the chamber, and the ability to test treatment effects. Moreover, the chamber technique allows to uniquely relate the flux to physico–chemical properties of the emission location offering the opportunity to parameterize the flux for use in air quality models. The dynamic chamber is a fluorinated ethylene propylene (FEP) Teflon–lined (2 mil thick, ~0.05 mm) open bottom cylinder (0.25 m internal diameter, 0.46 m internal height of chamber above water, 25 L volume), inserted into a floatable platform (0.61 x 0.61 m), which is supported by PVC piping (1.65 m length, 0.15 m diameter) for flotation. When placed over the lagoon, the chamber penetrated the lagoon ~7 cm, effectively forming a seal between the lagoon surface and the air within the chamber. The dynamic chamber was randomly placed on the lagoon surface. A schematic of the dynamic flow–through chamber system is shown in Figure 2.

Compressed zero–grade air (Machine and Welding Supply Company, Raleigh, NC) was used as a carrier gas and pumped through the chamber at a variable flow rate ranging from 5–13 L min^{-1}, controlled by a Model 810–S Mass Trak Flow Controller (Sierra Instruments, Monterey, CA). The air inside the chamber was ideally well–mixed by a variable–speed motor–driven Teflon impeller stirrer ranging from speeds of 40–60 revolutions per minute (rpm). Based on the impeller stirrer design, it is expected that the air flow characteristics inside the chamber at the air–water interface are similar to ambient air, i.e., flow outside the chamber, once steady–state has been reached (Aneja et al., 2000; Aneja et al., 2001). The length of the Teflon tubing (0.40 cm inner diameter) connecting the chamber to a Model 17C chemiluminescence NH_3 analyzer (Thermo Environmental Corporation, Mountain View, CA) was less than 10 m and had a residence time of ~4 seconds. The sample exiting the chamber flowed to the NH_3 analytical instrument: a Model 17C chemiluminescence NH_3 analyzer (Thermo Environmental Corporation, Mountain View, CA). Data collection was initiated once the chamber reached steady state conditions. A vent line was fitted to the exiting sample line to prevent pressurization and was periodically bubble tested to check for under pressurization and/or leaks in the enclosed system.

Multi–point calibrations (80, 60, 40, and 20% of full–range scale) for the Model 17C analyzer were conducted according to the TEI Model 17C instruction manuals prior to each sampling campaign using a TEI Model 146 dilution–titration system (Thermo Environmental Corporation, Mountain View, CA). Each instrument was zeroed and spanned daily during each measurement period.

The suitability of the chamber for measuring NH_3 flux from lagoons is supported by studies by Aneja et al. (2000) and Todd et al. (2001). These studies made NH_3 flux measurements from the same lagoon in 1997 using a chamber system (Aneja et al., 2000) and tracer gas open–path Fourier transform infrared spectroscopy (Todd et al., 2001) respectively. NH_3 flux measurements were similar with fluxes ranging from 5–123 kg NH_3–N ha^{-1} day^{-1} (Aneja et al., 2000) and 7.8–122 kg NH_3–N ha^{-1} day^{-1} (Todd et al., 2001).

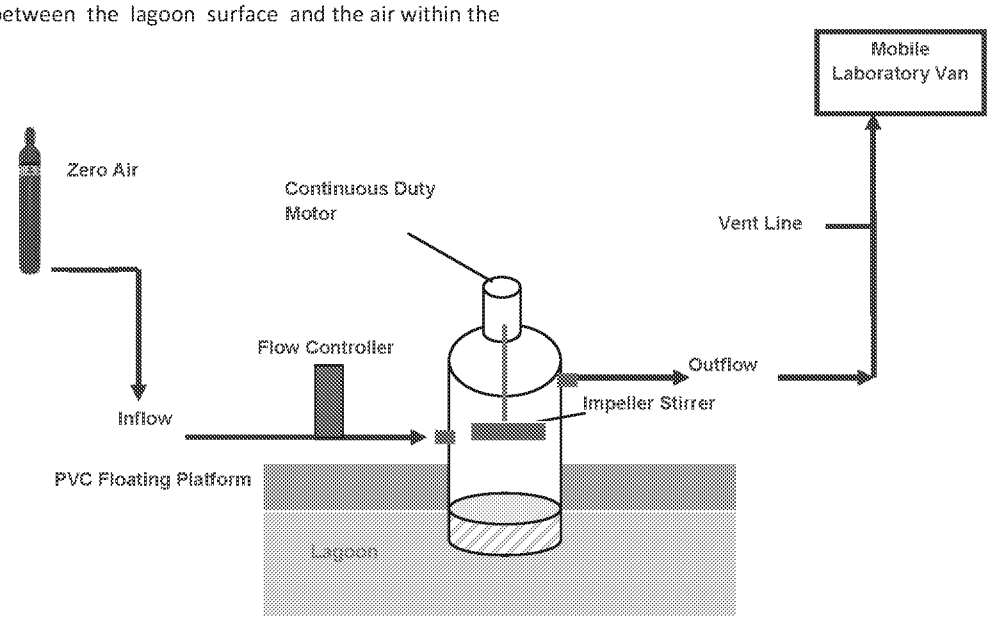

Figure 2. *Schematic of dynamic flow-through chamber system. Not drawn to scale.*

2.4. Lagoon flux calculation

The mass balance for NH_3–N in the chamber is given by;

$$\frac{dC}{dt} = \left(\frac{Q[C]_o}{V} + \frac{JA_L}{V}\right) - \left(\frac{LA_c[C]}{V} + \frac{Q[C]_f}{V}\right) - R \quad (3)$$

where A_L is the lagoon surface area covered by the chamber (m^2), A_C is the inner surface area of the chamber (m^2), V is the volume of the chamber (m^3), Q is the flow rate of carrier gas through the chamber(m^3 min^{-1}), J is the emission flux of the respective gas (μg m^{-2} min^{-1}), $[C]$ is the gas concentration in the chamber (μg m^{-3}), $[C]_f$ is the gas concentration at the outlet of the chamber (μg m^{-3}), L (m min^{-1}) is the loss term by the chamber wall per unit area assumed first order in $[C]$, and R is the chemical production rate in the chamber.

Since compressed zero–grade air was used as the carrier gas, the inlet concentration of NH_3 is $[C]_o$ = 0, and for a well mixed dynamic chamber $[C]_f$ may be assumed to be equal to the gas concentration everywhere in the chamber. The residence time in the chamber is relatively short (ranging from 2–5 minutes, depending on the carrier gas flow rate being used) and therefore no chemical reactions were expected to occur inside the chamber system (R = 0). Finally, at steady state the above equation reduces to;

$$J = [C]_f\left(\frac{LA_c}{V} + \frac{Q}{V}\right)h \quad (4)$$

where h (m) is the height of the chamber measured from the lagoon surface. The value of the total loss term for ammonia was determined by conducting surface loss experiments as proposed by Kaplan et al. (1998), who provided a detailed description of the experiment. Blunden and Aneja (2008) determined during steady–state conditions, the NH_3–N loss term associated with the internal surfaces of the chamber increases as an exponential function [Equation(5)] with ambient temperature (T, °C). This was used throughout the experiment to calculate the loss of NH_3–N to the internal chamber walls and was given by;

$$L_{NH_3-N} = 0.0355\,T - 2.5454\ m\ min^{-1} \quad (5)$$

2.5. Meteorological and lagoon parameters instrumentation

A 10 meter meteorological tower was erected to measure ambient wind speed and direction, air temperature, and relative humidity. A Met One Instruments Model 034–B Windset (Campbell Scientific, Inc., Logan, UT) with an integrated cup anemometer and wind vane mounted on a common shaft was used to measure wind speed at 10 m above the surface. Air temperature and relative humidity (RH) measurements were made at a height of 2 m with a Model CS500–L Vaisala 50Y temperature and RH probe (Campbell Scientific, Inc., Logan, UT) housed in a Model 41303 RM Young 6–plate gill solar radiation shield (Campbell Scientific, Inc., Logan, UT).

A Model CSIM11 pH probe (Campbell Scientific Inc., Logan, UT) was used to continuously monitor near–surface lagoon pH. The pH probe was periodically buffer tested to ensure accuracy and calibration curves were established. Two CS107 (Campbell Scientific Inc., Logan, UT) temperature probes simultaneously measured lagoon surface temperatures inside the chamber as well as 0.3 m outside the chamber. Blunden and Aneja (2008) determined that the difference in lagoon temperature inside and outside the flux chamber are negligible and can be considered to be the same for the purposes of this experiment. The pH and temperature probes were each submerged in the lagoon at a depth of ~6–7 cm beneath the surface.

A Model CR10X data logger equipped with a Model AM 16/32 Channel Relay Multiplexer (Campbell Scientific, Inc., Logan, UT) was used to collect all meteorological and lagoon data and a Model CR23X data logger was used to acquire all gaseous and mass flow data. Data were collected continuously, and averaged and recorded over a 15 minute timeframe. The data loggers and gas analyzers were housed inside a temperature–controlled mobile laboratory (N.C. State University Air Quality Ford Aerostar Mini–Van), maintained at ~21°C.

2.6. Lagoon sample collection

Near–surface lagoon samples (<10 cm depth) were collected daily by hand between 10:00 and 13:00 during each sampling period using sterile plastic 500 mL bottles and submitted to the North Carolina Division of Water Quality (NC DWQ) for determination of total ammoniacal nitrogen (TAN) and total klejdahl nitrogen (TKN). Lagoon samples were also collected during the early morning or late afternoon as well to check for diurnal variations in concentration levels. Samples were collected from the lagoon surface simultaneously near the chamber system and at a randomly chosen location at the lagoon. Lagoon samples collected for TAN and TKN analyses were preserved with sulfuric acid to pH<2, according to NC DWQ specifications. All samples were immediately stored on ice (<4°C) and brought to the NC DWQ laboratory within 48 hours for analysis (Greenberg et al., 1999).

3. Results and Discussion

3.1. Barn emissions

A total of about 388, 564, 496, and 440 fifteen minute averaged barn emission measurements were collected for summer, fall, winter, and spring, respectively. Ventilation rates, barn temperature, and ambient temperature all influence NH_3 emitted from swine finishing buildings (Heber et al., 2002; Arogo et al., 2003; Gay et al., 2003; Heber et al., 2005). Table 2 provides measured fan ventilation rates, temperature at the fan outlet, ambient temperature, and relative humidity. Table 3 lists simple statisitics for measured total emission rate and normalized emission rate for comparison. Emission factors are provided both as g NH_3–N day^{-1} AU^{-1}, where one AU = 500 kg, and also as kg NH_3–N $animal^{-1}$ yr^{-1}. These emission factors were determined based on the production data provided in Table 1. Both types of emissions factors are often provided in related literature e.g. (Arogo et al., 2003; Harper et al., 2004; Blunden et al., 2008).

Table 2. Average barn measurement statistics for experimental periods during all seasons

Season	Total Ventilation Rate (m^3 min^{-1}) [a]	Fan outlet temperature (°C)	Ambient temperature (°C)	Ambient relative humidity (%)
Summer 2007				
Average (St dev.)	1 683 (681)	28.0	26.0	67
Range	551-2 370	24.3-33.6	18.2-33.4	29-93
Fall 2007				
Average (St dev.)	343 (128)	20.7	10.2	63
Range	166-991	15.6-24.7	0.5-20.2	26-93
Winter 2008				
Average (St dev.)	313 (252)	18.5	11.6	70
Range	0-1 329	9.1-24.2	1.9-21.3	18-92
Spring 2008				
Average (St dev.)	502 (246)	25.5	16.0	83
Range	234-1 259	21.1-31.2	11.6-28.3	35-94

[a] *Sum of flow from two 91 cm fans and three 122 cm fans*

Table 3. *Statistical summary of total NH_3-N barn emissions, normalized emission rates, and emission factors for each season*

Season	Total emission rate (g day^{-1})	Normalized Emission Rate (g NH_3-N day^{-1} AU^{-1})[a]	Emission Factor (g NH_3-N kg^{-1} day^{-1})	Emission Factor (kg NH_3 animal^{-1} yr^{-1})
Summer 2007, Jun 13-21				
Average (St dev.)	2 604 (660)	30.2 (7.7)	0.06 (0.02)	1.32 (0.32)
Range	1 233-5 702	14.32-66.22	0.03-0.13	0.63-2.85
Fall 2007, Oct 10-20				
Average (St dev.)	1 761 (1 087)	25.6 (15.8)	0.05 (0.03)	0.78 (0.49)
Range	590-6 609	8.6-96.0	0.02- 0.19	0.26-2.95
Winter 2008, Feb 18-26				
Average (St dev.)	1 657 (1 506)	14.9 (13.6)	0.03 (0.03)	1.55 (1.40)
Range	0-8 489	0-76.6	0-0.15	0.00-7.91
Spring 2008, Apr 16-21				
Average (St dev.)	2 659 (1 194)	30.0 (13.5)	0.06 (0.03)	1.35 (0.61)
Range	1 176-9 444	13.3-106.7	0.03-0.21	0.61-4.78

NH_3-N = (14/17) NH_3

[a] AU (Animal Units) = 500 kg live animal weight

Barn air temperature measured at the fan outlet is strongly correlated with ambient air temperature (R^2=0.86, p<0.0001) for all seasons, although barn temperatures are less variable than ambient. As outside temperatures rise or fall, barn temperatures change, causing the ventilation system to respond. A positive correlation was found between barn temperature and ventilation rates (R^2=0.573, p<0.0001). Total ventilation rates increased during summer as temperatures increased and decreased during fall and winter when average barn temperatures were lower; however, it should be noted that the ventilation system was not well correlated with barn temperatures below ~20°C because the fan remains on continuously or kicks on as needed to ensure some airflow through the building at all times.

Figure 3 shows the hourly averaged diurnal emission profile for each season. Each data point has also been averaged over the number of measurements made at that time period. NH_3–N emission rates were highest in the spring and summer, 2 659±1 194 (± represents 1 standard deviation) g day^{-1} and 2 604±660 g day^{-1}, respectively. These rates are attributed to the number and average weight of the swine, and ventilation rates. Total live weight in the spring was 44 262 kg versus 43 049 kg in the summer (see Table 1). Ventilation rates were lower in the spring, averaging 501±247 m^3 min^{-1} compared to 1 683±681 m^3 min^{-1} in summer. Lower ventilation rates allow for gas build up; the build up is released when temperature–dependent fans turn on. Fall NH_3–N emissions averaged 1 761±1 087 g day^{-1} while winter NH_3–N emissions were lowest at 1 657±1 506 g day^{-1}. Although ventilation rates were lower in the fall (343±128 m^3 min^{-1}), animals were in the beginning stage of production weighing a total of 34 428 kg in week five, resulting in lower emissions. A large percentage of winter measurements ranging from 0 g NH_3–N day^{-1} when all fans were off to a short–term maximum of 10–308 g NH_3–N day^{-1} were collected when the primary fan was cycling on and off. Harper et al. (2004) found similar results at a swine finishing operation measuring 2 116 g NH_3–N d^{-1} in the winter and 5 147 g NH_3–N d^{-1} in the summer, suggesting that concentrations and emissions followed the fan cycle as long as cycling was constant. When the primary fan remained on for a longer period of time, ammonia concentrations did not decrease in the same way as when one fan was on intermittently. Turbulent mixing inside the house is likely to be larger in the winter compared to other seasons when some fans were on continously and concentrations inside the building were generally a function of the number of operating fans.

Nighttime spring and summer emissions (between 18:00 and 6:00 Eastern Standard Time (EST)) were approximately twofold higher than emissions measured in the fall and winter. NH_3–N emissions during all four seasons remained relatively constant during the late evening into the early morning hours. During all seasons, emission rates increased after sunrise as ambient and barn temperatures, and thus fan ventilation rates, increased. Spring NH_3–N emissions peaked at approximately 5 500 g NH_3 day^{-1}, just before 12:00 EST, then decreased to about 4 000 g NH_3 day^{-1} between 12:00 and 15:00 EST, when ventilation rates were highest (~1 000 m^3 min^{-1}). Summer emissions were highest about 9:00 EST (3 138±741 g day^{-1}), as emissions built up inside the structure prior to ventilation rate increase. Average temperatures and ventilation rates were substantially lower in the fall and winter; therefore, NH_3–N daytime emissions increased to levels greater than those measured during summer daytime.

Normailized emission rates of 30.2±7.7 g NH_3–N day^{-1} AU^{-1}, 26±16 g NH_3–N day^{-1} AU^{-1}, 14.9±13.6 g NH_3–N day^{-1} AU^{-1}, and 30.0±13.5 g NH_3–N day^{-1} AU^{-1} were found for the summer, fall, winter, and spring respectively. Normalizing emission rates involves removing total live mass as a variable to explain emission rates, allowing for more accurate comparison between seasons and other studies.

An often used comparison is based on emission rates per animal. Emission factors for this study were estimated to be 1.3±0.3 kg NH_3 animal^{-1} year^{-1}, 0.8±0.5 kg NH_3 animal^{-1} year^{-1}, 1.5±1.4 kg NH_3 animal^{-1} year^{-1}, and 1.4±0.6 kg NH_3 animal^{-1} year^{-1} in the summer, fall, winter, and spring, respectively. Emissions per animal were greatest in the winter when the animals were in their final week of rotation and smallest in the fall when swine were in the early stages of production. Results from this study are comparable to those presented in Blunden et al. (2008), which found finishing pigs emitted 0.8 kg NH_3 animal^{-1} year^{-1}, 0.5 kg NH_3 animal^{-1} year^{-1}, 1.7 kg NH_3 animal^{-1} year^{-1}, and 2.4 kg NH_3 animal^{-1} year^{-1} at the same facility in the summer, fall, winter, and spring of 2005, respectively.

3.2. Lagoon emissions

A total of 462 (summer), 493 (fall), 386 (winter), and 460 (spring) fifteen minute averaged lagoon flux measurements were collected for each season. Data were not collected during precipitation events.

The maximum concentration that can be detected by the NH_3 analyzer is 20 000 parts per billion (ppb). During summer, 25% of measured concentrations exceeded the limit, while 1% during fall were above this range. Only data within the range of the NH_3 analyzer was used for analysis.

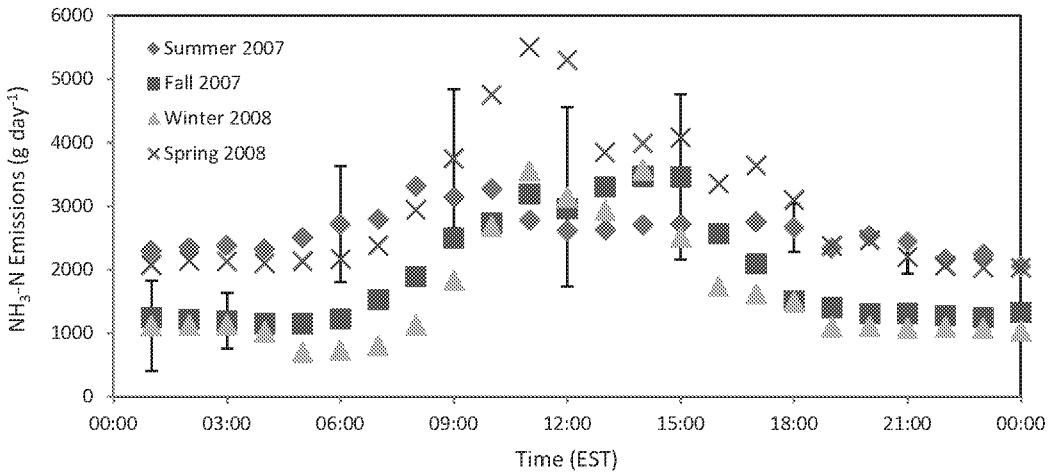

Figure 3. *Seasonally averaged diurnal variations of NH_3-N barn emissions (g day^{-1}). Randomly selected error bars represent ± one standard deviation.*

Table 4 provides statistical data for NH_3–N flux and Table 5 lists measured lagoon surface temperature, pH, TAN, TKN, ambient temperature, and wind speed for each season. Sommer et al. (1991) found lagoon temperature and pH to be the two most important factors that influence NH_3 volatilization.

Table 4. *Average NH_3-N lagoon flux statistical averages during each sampling period*

Season	Sample Dates	Mean (μg m^{-2} min^{-1})	Minimum (μg m^{-2} min^{-1})	Maximum (μg m^{-2} min^{-1})
Summer	Jun. 13-21, 2007	>3 943 [a]	1 875	NA
Fall	Oct. 10-20, 2007	>1 383 [b]	681	NA
Winter	Feb. 18-26, 2008	981 (210) [c]	501	2 818
Spring	Apr. 16-21, 2008	1 641 (362)	1 842	3 860

NH_3-N flux = (14/17) NH_3 flux

[a] NH_3 concentration was above the maximum rage on the ammonia analyzer for 25% of 15-minute averaged data during experimental period; therefore, maximum and average flux values cannot be determined.

[b] NH_3 concentration was above the maximum rage on the ammonia analyzer for 1% of 15-minute averaged data during experimental period; therefore, maximum and average flux values cannot be determined.

[c] Numbers in parenthesis represent 1 standard deviation.

NH_3–N flux. The use of a dynamic–flow through chamber system as an appropriate flux measuring technique has been corroborated by an earlier inter–comparison of NH_3 flux measurements form the same lagoon in 1997 of the chamber system (Aneja et al., 2000) and tracer gas open–path Fourier transform infrared spectroscopy (Todd et al., 2001) respectively. NH_3 flux measurements were similar with fluxes ranging from 5–123 kg NH_3–N ha^{-1} day^{-1} (Aneja et al., 2000) and 7.8–122 kg NH_3–N ha^{-1} day^{-1} (Todd et al., 2001).

Figure 4 shows the hourly averaged diurnal emissions trend for each season. Similar to Figure 3, each hourly averaged data point shown has been averaged over the number of measurement days. Average NH_3–N fluxes were highest in the summer, greater than >3 943 μg m^{-2} min^{-1}, and lowest in the winter, 981±210 μg m^{-2} min^{-1}. Fall and spring average ammonia flux values were >1 383 μg m^{-2} min^{-1} and 1 641±362 μg m^{-2} min^{-1} respectively. Results from this study are slightly lower than those found by Blunden and Aneja (2008) in each season, who determined ammonia emissions to be >4 292, 1 634, 1 290, and >2 495 μg m^{-2} min^{-1} in the summer, fall, winter and spring at the same site using the same chamber system. Lower fluxes in this study may be attributed to differences in average lagoon temperatures, pH, and TAN concentrations.

During all seasons, NH_3–N flux decreased during the night until sunrise. NH_3–N flux generally increased throughout the course of the day peaking in the mid to late afternoon before beginning to decline after sunset. Some points that fall outside the general pattern during the daytime are likely due to disruptions in data collection for routine maintenance in the field.

Table 5. *Statistical parameters for NH_3-N lagoon and ambient air parameters during each sampling period*

Season	Sample Dates	Lagoon Temperature (°C)	Lagoon pH	TAN (mg L^{-1})	TKN-N (mg L^{-1})	Ambient Temperature (°C)	Wind Speed (m s^{-1})
Summer							
Average (St dev.)		24.8 (0.9)	7.6 (0.4)	477 (35)	556 (19)	21.6 (3.5)	1.6 (1.0)
Range	Jun. 13-21, 2007	19.5-28.9	7.2-8.3	440-510	520-590	11.5-34.8	0.0-5.4
Fall							
Average (St dev.)		20.4 (1.2)	7.6 (0.2)	384 (24)	445 (25)	14.8 (5.0)	1.6 (1.5)
Range	Oct. 10-20, 2007	15.0-25.3	7.2-8.0	330-420	390-480	1.8-31.2	0.0-5.6
Winter							
Average (St dev.)		11.5 (0.7)	8.0 (0.1)	544 (11)	595 (48)	8.4 (3.8)	2.3 (1.4)
Range	Feb. 18-26, 2008	9.7-15.4	7.7-8.1	530-560	550-740	-0.6-20.9	(0.0-8.8)
Spring							
Average (St dev.)		19.9 (1.7)	8.0 (0.3)	549 (3)	616 (40)	16.2 (5.4)	2.1 (1.5)
Range	Apr. 16-21, 2008	15.7-24.0	6.1-9.2	540-550	560-690	1.6-29.5	0.0-6.9

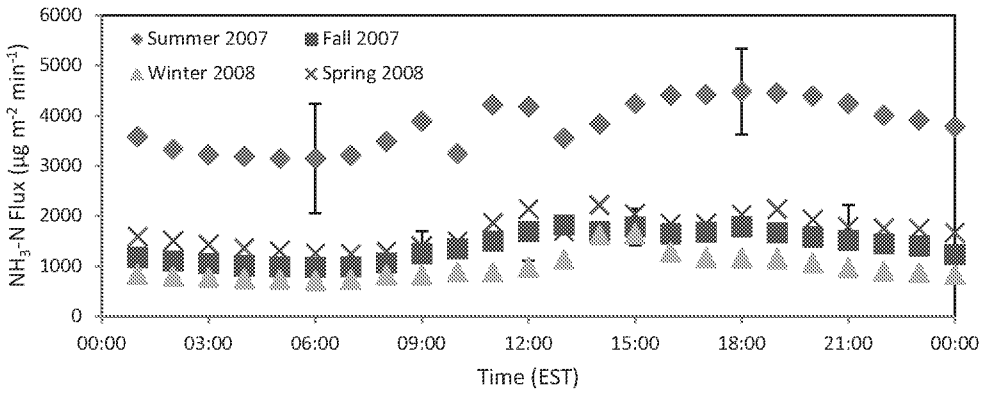

Figure 4. *Seasonally averaged diurnal variations of NH_3-N flux (µg m^{-2} min^{-1}) from the lagoon. Randomly selected error bars represent ± one standard deviation.*

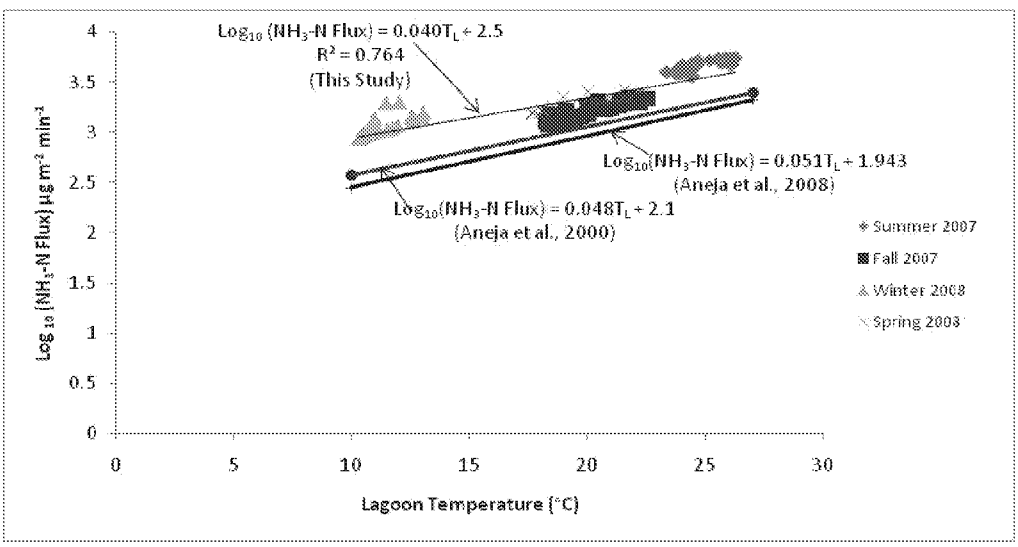

Figure 5. *Log_{10} NH_3-N Flux (µg m^{-2} min^{-1}) plotted against lagoon temperature.*

Lagoon temperature and ammonia flux. Maximum NH_3–N emissions in the summer and minimum NH_3–N emissions in the winter suggest that temperature is an important factor influencing NH_3–N flux from the lagoon into the atmosphere. Seasonally averaged lagoon temperatures measured 24.8 °C in the summer, 20.4 °C in the fall, 11.3 °C in the winter, and 19.9 °C in the spring. Figure 5 shows the exponential relationship between lagoon temperature and NH_3–N flux (R^2=0.764, p<0.0001). Each point in the figure represents an hourly–averaged NH_3–N flux plotted against the simultaneously measured hourly lagoon temperature. This compares well with Aneja et al. (2000) and Aneja et al. (2008), who found a similar relationship and developed predictive models based on lagoon temperature (Figure 5). A predictive model for this study based on observations is given as;

$$Log_{10}(NH_3\text{-}N\ flux) = 0.040T_L + 2.5 \quad (6)$$

The exponential relationship exists between NH_3–N flux and lagoon temperature because the liquid–phase mass transfer coefficients of NH_3 in water are exponential functions of temperature in a range of 5 °C to 30 °C (Ibusuki and Aneja, 1984). Higher temperatures increase NH_3 volatilization rates due to decreased solubility, in turn affecting ammonia/ammonium (NH_3/NH_4^+) equilibrium, which follows Henry's law for dilute systems (Koerkamp et al., 1998).

Because the lagoon is not forcefully mixed, ammonia's main mode of transport is through diffusion and mass transfer processes (Muck and Steenhuis, 1982). Increased NH_3 volatilization rates occur at the surface of the lagoon as temperatures rise causing decomposed NH_3 stored at the bottom of the lagoon to diffuse upward to replenish volatized NH_3. Higher temperatures increase the transfer rate of NH_3 across the liquid–gas interface through these chemical and physical processes.

Lagoon pH and ammonia flux. The pH of the slurry determines whether ammonia exists as the ammonium ion (NH_4^+) and/or unionized molecules of ammonia ($NH_{3(aq)}$). Unionized $NH_{3(aq)}$ in solution increases with pH and only the unionized fraction can volatilize.

Average pH values ranged from 7.5 in the summer to 8.0 in the spring and winter. Average fall pH values were 7.6. The stability of pH throughout the year can be explained by the high buffer capacity of slurry (Olesen and Sommer, 1993). The dissociation of NH_4^+ causes the release of the hydrogen ion (H^+) allowing unionized $NH_{3(aq)}$ to form.

$$NH_4^+ + (aq) \leftrightarrow NH_3(aq) + H^+(aq) \quad (7)$$

The logarithmic plot of hourly averaged NH_3–N flux versus pH suggests a negative relationship exists between NH_3–N flux and pH with 29% of the variation (R^2=0.29, p<0.0001) explained by pH (Figure 6). This finding is different from numerous published modeling studies that found a positive relationship between ammonia flux and pH based on the equilibrium reaction below, where the pH of the slurry controls the shift in equilibrium (Sommer et al., 1991; Olesen and Sommer, 1993; Aneja et al., 2000; Warneck, 2000):

$$NH_3(aq) + H_2O(aq) \leftrightarrow NH_4^+(aq) + OH^-(aq) \quad (8)$$

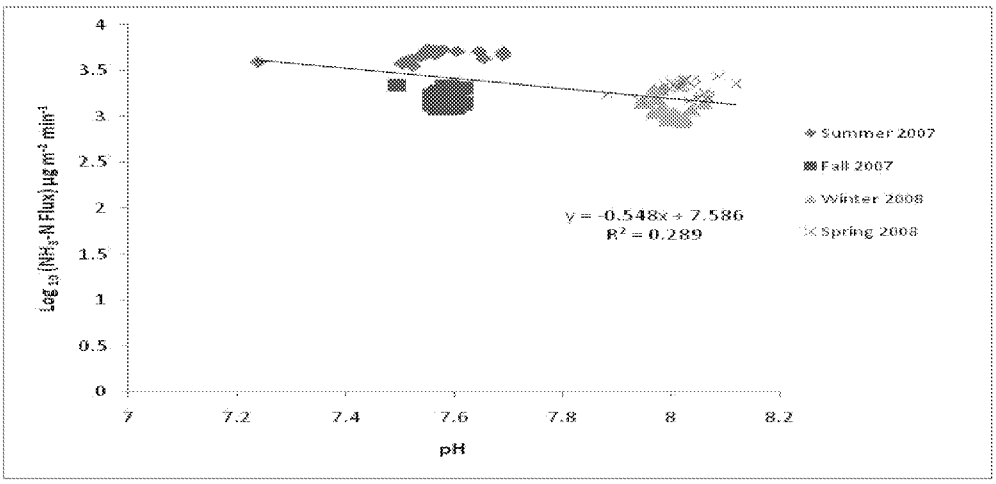

Figure 6. *Log_{10} NH_3-N Flux (µg m^{-2} min^{-1}) plotted against pH.*

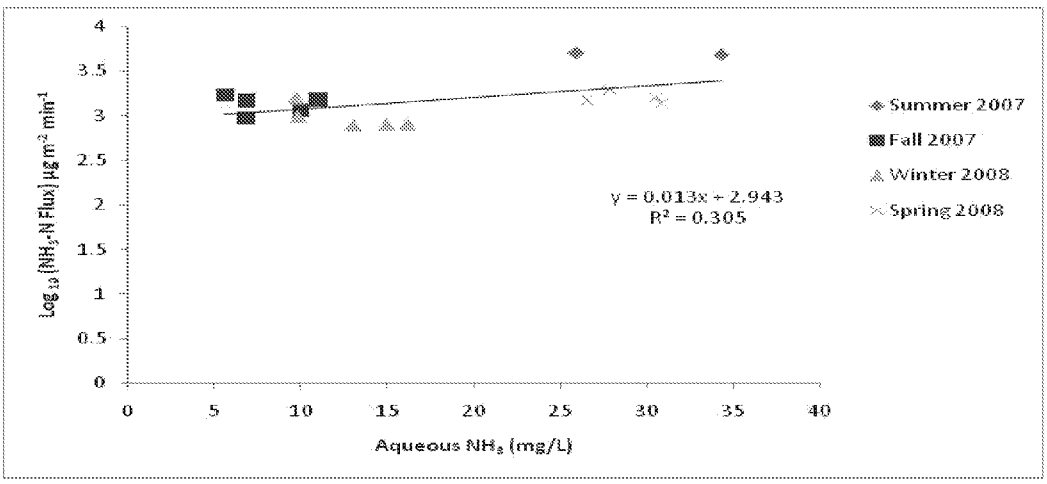

Figure 7. *Log_{10} NH_3-N Flux (µg m^{-2} min^{-1}) plotted against aqueous NH_3 based on TAN concentrations.*

A higher concentration of the hydroxyl ion (OH^-) causes pH to increase shifting the equilibrium to the left releasing more ammonia into the atmosphere. Precipitation events shift equilibrium to the right causing less ammonia to be emitted (Aneja et al., 2009). Blunden (2006) presented a similar correlation between lagoon flux and pH (R^2=0.40, p<0.0001), suggesting that other influential factors (i.e. lagoon temperature, effluent concentration) play a larger role in determining the magnitude of NH_3 flux.

TAN, TKN, and NH_3–N flux. Average concentrations of total ammoniacal nitrogen (TAN) (NH_3+ NH_4^+) were 477 mg L^{-1} as N, 384 mg L^{-1} as N, 544 mg L^{-1} as N, and 549 mg L^{-1} as N in the summer, fall, winter, and spring respectively. Levels of total Kleijdahl nitrogen (TKN) ranged from 445 mg L^{-1} as N in the fall to 616 mg L^{-1} as N in the spring. These results are comparable to those found at similar swine finishing operations e.g. Aneja et al. (2008). Measured concentrations of TAN are useful in determining the amount of unionized NH_3 aqueous concentration in the waste lagoon. Figure 7 shows a positive correlation between average daily NH_3–N flux and aqueous NH_3 concentration (R^2=0.31, p=0.03) when samples and measurements were conducted on the same day. Increasing TAN or TKN concentrations in the lagoon will increase emission of NH_3 (Aneja et al., 2000).

4. Conclusions

Ammonia emissions at a commercial swine finishing facility were measured from a confinement house and a waste storage treatment lagoon for appoximately one week during each season over a one year period to evaluate diurnal and seasonal variations, investigate the influence of meteorological parameters on emissions, and develop emissions factors for use in process based modeling. NH_3–N emissions from the barn were determined to be 2 604±660 g day^{-1}, 1 761±1 087, 1 657±1 506 g day^{-1}, and 2 659±1 194 g day^{-1} in the summer, fall, winter, and spring seasons respectively. Emission factors for swine housing were greatest in the summer and spring measuring 0.061±0.015 g NH_3–N kg^{-1} day^{-1} and 0.060±0.027 g NH_3–N kg^{-1} day^{-1} respectively. Housing emission factors were 0.051± 0.032 g NH_3–N kg^{-1} day^{-1} in the fall and 0.03±0.03 g NH_3–N kg^{-1} day^{-1} in the winter. These results are largely explained by average weights and ventilation rates during each season. A low emission factor in the winter is likely a result of the primary fan turning off and on at cold temperatures—a dynamic that has been largely ignored or disregarded in previous experiments. NH_3–N fluxes from the lagoon were generally in agreement with results found in other studies, measuring >3 943±398 µg m^{-2} min^{-1}, 1 383±283 µg m^{-2} min^{-1}, 981±210 µg m^{-2} min^{-1}, and 1 641±362 µg m^{-2} min^{-1} in the summer, fall, winter, and spring respectively. Relationships found between ammonia flux and average lagoon temperature, pH, and TAN concentrations all suggest that each parameter influences ammonia flux.

Acknowledgements

We acknowledge support from the Cooperative State Research, Education, and Extension Service (CSREES), USDA National Research Initiative Competitive Grants Program, Contracts

2004–35112–14253. We thank the assistance provided by the Air Quality Research Group, at North Carolina State University.

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The EPA Acting Assistant Administrator for Air and Radiation, Anne L. Idsal, signed the following notice on 9/18/2019, and EPA is submitting it for publication in the *Federal Register* (FR). While we have taken steps to ensure the accuracy of this Internet version of the rule, it is not the official version of the rule for purposes of compliance. Please refer to the official version in a forthcoming FR publication, which will appear on the Government Printing Office's govinfo website (https://www.govinfo.gov/app/collection/fr) and on Regulations.gov (https://www.regulations.gov) in Docket No. EPA-HQ-OAR-2010-0960. Once the official version of this document is published in the FR, this version will be removed from the Internet and replaced with a link to the official version.

6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[EPA-HQ-OAR-2010-0960; FRL-xxxx]

Call for Information: Information Related to the Development of Emission Estimating Methodologies for Animal Feeding Operations

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice; call for information.

SUMMARY: The U.S. Environmental Protection Agency (EPA) is soliciting quality-assured emissions and process data, and calculation models and methodologies that are relevant to developing emission estimating methodologies (EEMs) for emissions of volatile organic compounds (VOC) from animal feeding operations (AFOs). The EPA may use the data to supplement the emissions and process data collected under the National Air Emission Monitoring Study (NAEMS) for AFOs.

DATES: Information must be received on or before **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: You may send comments, identified by Docket ID No. EPA-HQ-OAR-2010-0960, by any of the following methods:

- Federal eRulemaking Portal: *https://www.regulations.gov/* (our preferred method). Follow the online instructions for submitting comments.

- Email: *a-and-r-docket@epa.gov*. Include Docket ID No. EPA-HQ-OAR-2010-0960 in the subject line of the message.
- Fax: (202) 566-9744. Attention Docket ID No. EPA-HQ-OAR-2010-0960.
- Mail: U.S. Environmental Protection Agency, EPA Docket Center, Docket ID No. EPA-HQ-OAR-2010-0960, Mail Code 28221T, 1200 Pennsylvania Avenue, NW, Washington, DC 20460.
- Hand/Courier Delivery: EPA Docket Center, WJC West Building, Room 3334, 1301 Constitution Avenue, NW, Washington, DC 20004. The Docket Center's hours of operation are 8:30 a.m. – 4:30 p.m., Monday – Friday (except federal holidays).

Instructions: All submissions received must include the Docket ID No. for this rulemaking. Comments received may be posted without change to *https://www.regulations.gov/*, including any personal information provided. For detailed instructions on sending comments and additional information on the rulemaking process, see the **SUPPLEMENTARY INFORMATION** section of this document.

FOR FURTHER INFORMATION CONTACT: For questions about this Call for Information, contact Mr. William Schrock, Sector Policies and Programs Division (E143-03), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541-5032; fax number: (919) 541-0516; and email address: *schrock.bill@epa.gov*.

SUPPLEMENTARY INFORMATION:

Docket. The EPA has established a docket for this rulemaking under Docket ID No. EPA-HQ-OAR-2010-0960. All documents in the docket are listed in Regulations.gov. Although listed,

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some information is not publicly available, *e.g.*, Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy. Publicly available docket materials are available either electronically in Regulations.gov or in hard copy at the EPA Docket Center, Room 3334, WJC West Building, 1301 Constitution Avenue, NW, Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the EPA Docket Center is (202) 566-1742.

Instructions. Direct your comments to Docket ID No. EPA-HQ-OAR-2010-0960. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *https://www.regulations.gov/*, including any personal information provided, unless the comment includes information claimed to be CBI or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *https://www.regulations.gov/* or email. This type of information should be submitted by mail as discussed below.

The EPA may publish any comment received to its public docket. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (*i.e.*, on the Web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia

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submissions, and general guidance on making effective comments, please visit *https://www.epa.gov/dockets/commenting-epa-dockets*.

The *https://www.regulations.gov/* website allows you to submit your comment anonymously, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *https://www.regulations.gov/*, your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any digital storage media you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should not include special characters or any form of encryption and be free of any defects or viruses. For additional information about the EPA's public docket, visit the EPA Docket Center homepage at *https://www.epa.gov/dockets*.

Submitting CBI. Do not submit information containing CBI to the EPA through *https://www.regulations.gov/* or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information on any digital storage media that you mail to the EPA, mark the outside of the digital storage media as CBI and then identify electronically within the digital storage media the specific information that is claimed as CBI. In addition to one complete version of the comments that includes information claimed as CBI, you must submit a copy of the comments that does not contain the information claimed as CBI directly to the public docket through the procedures outlined in *Instructions* above. If you submit any digital storage media that does not contain CBI, mark the outside of the digital storage media clearly that it does not

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contain CBI. Information not marked as CBI will be included in the public docket and the EPA's electronic public docket without prior notice. Information marked as CBI will not be disclosed except in accordance with procedures set forth in 40 Code of Federal Regulations (CFR) part 2. Send or deliver information identified as CBI only to the following address: OAQPS Document Control Officer (C404-02), OAQPS, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, Attention Docket ID No. EPA-HQ-OAR-2010-0960.

Call for Information acronyms and abbreviations. We use multiple acronyms and terms in this Call for Information. While this list may not be exhaustive, to ease the reading of this Call for Information and for reference purposes, the EPA defines the following terms and acronyms here:

AFOs	animal feeding operations
CBI	Confidential Business Information
EEMs	emission estimating methodologies
NAEMS	National Air Emission Monitoring Study
SAB	Science Advisory Board
VOC	volatile organic compounds

I. General Information

A. What is the purpose of this action?

In 2005, the EPA offered AFOs an opportunity to participate in a voluntary consent agreement (70 FR 4958, January 31, 2005) referred to as the Air Compliance Agreement. Under the Air Compliance Agreement, participating AFOs were responsible for, among other things, the funding for NAEMS—a 2-year, nationwide industry-run emissions monitoring study of the broiler, egg-layer, swine, and dairy industries. Monitoring under NAEMS began in the summer of 2007 and it occurred at 25 monitoring sites located in 10 states. The study collected process and emissions data for ammonia, hydrogen sulfide, particle pollution, and VOC from a

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representative sample of animal housing structures and manure storage and treatment units across the country.

The EPA plans to use these data to develop EEMs for AFOs, which will help AFOs determine and comply with any applicable regulatory responsibilities under the Clean Air Act. Additional information regarding NAEMS can be found at: *https://www.epa.gov/afos-air/national-air-emissions-monitoring-study.*

In the January 2005 **Federal Register** document, the EPA committed to using data generated from NAEMS and all other available, relevant data to develop EEMs. On January 19, 2011, the EPA published a call for information to obtain emissions and process data for animal confinement and manure storage and treatment processes at beef, broiler, dairy, egg-layer, swine, and turkey AFOs (76 FR 3060). Using the NAEMS data and the data obtained through the 2011 call for information, the EPA developed draft EEMs for broiler confinement operations and for open lagoons and basins at swine and dairy operations. In 2013, the EPA requested that the Science Advisory Board (SAB) conduct a review of these draft EEMs and provide feedback regarding the development of the methodologies. As noted by the SAB in their March 19, 2013, review summary, and reaffirmed by recent EPA data reviews, peer-reviewed data regarding VOC emissions from AFOs are limited.[1] Through the Call for Information in this document, the EPA is requesting that interested parties submit VOC emissions and process data available since 2011 that are relevant to the EPA's effort to develop EEMs for animal confinement and manure storage and treatment processes at broiler, dairy, egg-layer, and swine AFOs, particularly for open sources at dairy and swine operations (*e.g.*, lagoons and basins).

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[1] *See https://www.epa.gov/afos-air/national-air-emissions-monitoring-study#naems-sab.*

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B. What specific information is the EPA seeking?

The EPA is requesting data for VOC emissions from animal confinement and manure storage and treatment processes at broiler, egg-layer, swine, and dairy AFOs and related process information. Consistent with the Air Compliance Agreement, the EPA is focusing in the near term on developing EEMs for AFOs using statistical models. However, we acknowledge the recommendation that the EPA develop a process-based modeling approach that incorporates "mass balance" constraints to determine emissions from AFOs, made by the National Academy of Sciences in its December 2002 final report titled *Air Emissions from Animal Feeding Operations: Current Knowledge, Future Needs*. In their 2013 review, the SAB also recommended that the EPA develop process-based models for estimating emissions from AFOs. As noted in the EPA's 2013 response to the SAB review, we will carefully consider its recommendations and we will review all of the information available to us in developing the AFO EEMs. To ensure compatibility with the NAEMS data, the emissions and related process data provided to the EPA should be accompanied, if possible, by documentation that contains detailed descriptions of the following parameters, as applicable.

1. General information:

- Description of AFO process measured (*e.g.*, animal confinement structure; manure storage and treatment unit; land application site).
- Location of AFO process measured (*e.g.*, physical address, latitude/longitude coordinates of facility).
- Beginning and ending dates of the monitoring period.

2. Monitoring data:

- Quality assurance and quality control plan.

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- Site monitoring plan.
- Test methods, instrumentation, and standard operating procedures used to collect emissions and process data measurements.
- Results of audits conducted on instruments and procedures.
- Field notes and associated documentation collected during the monitoring.
- Emissions data (unanalyzed or analyzed) and associated process data.
- Meteorological data, including average ambient temperature, relative humidity, pressure, wind speed, wind direction, and insolation (solar radiation) for each day that the study was conducted.
- Production data (*e.g.*, number of eggs produced per day or quantity of milk produced per day).
- Calculations and assumptions used to convert concentration data (*e.g.*, parts per million by volume) into mass emissions (*e.g.*, pounds per hour).

3. Animal confinement structures:

- Dimensions of structures monitored.
- Designed and permitted animal capacity.
- Type, age, number, and weight of animals contained in the confinement structure over the duration of the monitoring period.
- Manure management system (*e.g.*, pull-plug pit, scrape).
- Dates of production and manure management activities over the duration of the monitoring period.
- Ventilation method (*i.e.*, natural or mechanical).

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- Calculations and assumptions used to estimate the ventilation rate of the monitored confinement structure.
- Calibration procedures for instruments (*e.g.,* flow meters, fan relays) used to collect data for calculating ventilation rate of the monitored confinement structure.
- Data on air temperature and relative humidity within the structure for each day that the study was conducted.
- Organics content of process inputs and outputs (*e.g.,* feed, water, bedding, eggs, milk).
- Organics content of manure excreted.
- Description of any control device or work practice used in the monitored structure to reduce emissions.

4. Manure storage and treatment processes:

- Type, age, number, and weight of animals contributing manure to the storage and treatment process over the monitoring period.
- Dimensions of storage/treatment unit monitored (*e.g.,* storage pile, tank, lagoon).
- Depth of settled solids in storage/treatment unit.
- Temperature, pH, and reduction/oxidation potential of manure contained in the storage/treatment unit.
- Moisture, total solids, volatile solids, organic content, total Kjeldahl nitrogen, and ammoniacal nitrogen content and pH of manure entering storage and treatment process over the monitoring period.

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With regard to the format of the information, we request that emissions, process, and production data be submitted to the EPA in Microsoft® Excel® spreadsheet or Access® database format. In cases where the emissions, process, and production data correspond to time increments shorter than 1 hour, please provide sufficient information and supporting documentation with the data to allow the EPA to develop emission estimates on a per-hour and per-day basis. For all formats, please clearly label the units of measure of emissions, process, and production data submitted.

_____.
Dated:

_____
Anne L. Idsal,

Acting Assistant Administrator.

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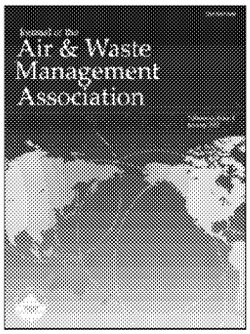

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M.S. Borhan , S. Capareda , S. Mukhtar , W.B. Faulkner , R. McGee & C.B. Parnell Jr.

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TECHNICAL PAPER

Comparison of seasonal phenol and *p*-cresol emissions from ground-level area sources in a dairy operation in central Texas

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Although there are more than 200 odor-causing volatile organic compounds (VOCs), phenol and p*-cresol are two prominent odor-causing VOCs found downwind from concentrated animal feeding operations (CAFOs). The VOC emissions from cattle and dairy production are difficult to quantify accurately because of their low concentrations, spatial variability, and limitations of available instruments. To quantify VOCs, a protocol following U.S. Environmental Protection Agency (EPA) Method TO-14A has been established based on the isolation flux chamber method and a portable gas chromatograph (GC) coupled with a purge-and-trap system. The general objective of this research was to quantify phenol and* p*-cresol emission rates (ERs) from different ground-level area sources (GLASs) in a free-stall dairy during summer and winter seasons using this protocol. Two-week-long sampling campaigns were conducted in a dairy operation in central Texas. Twenty-nine air samples were collected during winter and 37 samples were collected during summer from six specifically delineated GLASs (barn, loafing pen, lagoon, settling basin, silage pile, and walkway) at the free-stall dairy. Thirteen VOCs were identified during the sampling period and the GC was calibrated for phenol and* p*-cresol, the primary odorous VOCs identified. The overall calculated ERs for phenol and* p*-cresol were 2656 ± 728 and 763 ± 212 mg hd^{-1} day^{-1}, respectively, during winter. Overall phenol and* p*-cresol ERs were calculated to be 1183 ± 361 and 551 ± 214 mg hd^{-1} day^{-1}, respectively, during summer. In general, overall phenol and* p*-cresol ERs during winter were about 2.3 and 1.4 times, respectively, higher than those during summer.*

Implications: Concentrated animal feeding operations contribute a considerable amount of VOCs to the atmosphere. The phenol and p-cresol are two VOCs recognized as potential odor-causing compounds emitted from livestock operation. To develop effective strategies for mitigating livestock odorous VOC emissions, relative emissions from different GLAS in a livestock operation under different climate conditions should be quantified. It is also important to obtain direct estimates of VOC emissions from different GLAS in CAFOs to compile emission inventories. This research determined phenol and p-cresol emissions from different GLAS in a free-stall dairy and also identified areas in a dairy operations that have the highest phenol and p-cresol emissions.

Introduction

Poultry, swine, dairy, and cattle feedyard operations are the major stationary sources of odorous volatile organic compound (VOC) emissions from the agricultural sector causing public odor complaints (Lu et al., 2008). Volatile organic compounds also play a major role in the formation of photochemical oxidants in the atmosphere. The reaction of VOCs with nitrogen oxides (NO_x) in the presence of ultraviolet light can produce ozone (O_3), a criteria pollutant regulated under the National Ambient Air Quality Standards (NAAQS) (CFR, 2008). All VOCs are precursors to ozone formation to some extent, depending on their photochemical reactivity. Phenol is a highly reactive volatile organic compound (HRVOC) and is identified as a potential reactive organic gas (ROG) emitted from dairies (Howard et al., 2010). The *p*-cresol is exempt from the ROG list due to its low reactivity, but it is recognized as a potential odor-causing compound emitted from livestock operations. In addition to ozone formation, odors from dairies and cattle feedyards are nuisances associated with VOC emissions (Rabaud et al., 2002). Volatile fatty acids, *p*-cresol, phenol, 4-ethylphenol, indole, skatole, and sulfur-containing compounds are identified as contributors of odors from animal feeding operations (Cai et al., 2006; Koziel et al., 2006; Wright et al., 2005). Biogenic sources of VOCs, such as those contained in grass, hay, silage, and grains, are a major part of bovine diets. Volatile organic compounds are emitted from these biogenic sources during fermentation of starches, lipids, and proteins in the digestive system of cattle (enteric fermentation) and later in the feces and urine, or they are accumulated in cow's milk if they are not completely metabolized (Ciccioli et al., 1993). Previous research reported that ambient temperature, soil moisture, and manure composition are the primary factors controlling anaerobic decomposition in feedyard soils and influence the release of

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odorous compounds to the atmosphere (Miller and Varel, 2001). It was also reported that livestock odors were mostly due to VOCs and defined as a mixture of carbon-, sulfur-, and nitrogen-containing compounds produced during incomplete anaerobic fermentation of manure (Miller and Varel, 2001). Rabaud et al. (2002) observed 20 odorous and nonodorous compounds in emissions downwind of a dairy, with concentrations varying from 0.55 to 320.20 $\mu g\ m^{-3}$. Observed compounds were straight-chain and aromatic hydrocarbon, chlorinated compounds, alcohols, aldehydes, ketones, and aromatic acids. Some VOCs having strong odor intensity indicated the presence of odor-causing VOCs in high concentrations (Rabaud et al., 2003). Thirty-five reactive volatile organic compounds (RVOCs) were also measured in a dairy with concentrations varying from 0.08 to 747.76 $\mu g\ m^{-3}$. Measured compounds included acids, esters, alcohols, aldehydes, ketones, halogenates, amines, and hydrocarbons (Rabaud et al., 2003). The authors concluded that this dairy emitted a wide variety of VOCs at significant concentrations.

Previous studies reported that phenol and *p*-cresol were the most abundant odor-causing compounds found downwind from cattle feedyards and swine facilities (Parker et al., 2007; Wright et al., 2004). In contrast, McGinn et al. (2003) measured VOCs in three beef cattle feedyards in Canada (6000, 12,000, and 25,000 hd capacities) and found that acetic acid had the highest concentration downwind, followed by propionic acid and butyric acid. Although more than 200 VOCs contribute to odor from lagoons, Eniola et al. (2006) reported that *p*-cresol, *p*-ethyl phenol, and isovaleric acid have been recognized as the most persistent and significant odor contributors 1.6 km downwind from manure lagoons in concentrated animal feeding operations (CAFOs). Koziel et al. (2006) also reported that downwind odor is dominated by the relatively low volatility, high-molecular-weight, and polar compounds. The *p*-cresol alone appeared to carry much of the overall odor impact for swine and beef cattle operations (Koziel et al., 2006). Cai et al. (2010) reported that VFAs (acetic, propanoic, 2-methyl propanoic, butyric, and 3-methylbutanoic acid) and *p*-cresol showed seasonal variations in a Wisconsin dairy barn. Phenol and *p*-cresol are repeatedly used as indicators in odor studies (Auvermann et al., 2001). The compound *p*-cresol has a foul smell and phenol has a sweet and relatively pleasant odor (Bourque et al., 1987). The odor recognition thresholds of phenol and *p*-cresol are 0.059 ppmv (226.8 $\mu g\ m^{-3}$) and 0.0019 ppmv (8.4 $\mu g\ m^{-3}$), respectively (Yu et al., 1990). Odor threshold for phenol and *p*-cresol ranged from 0.0045 to 1.00 ppm (17.3 to 3845 $\mu g\ m^{-3}$) and 5×10^{-5} to 0.0079 ppm, respectively (0.24 to 38 $\mu g\ m^{-3}$) (The United State Library of Medicine, 1981). Parker et al. (2010) also reported geometric means of single-compound odor thresholds for phenol and *p*-cresol, which were 127 and 2.6 $\mu g\ m^{-3}$, respectively. The highest reported concentration of *p*-cresol measured at the property line downwind of a feedyard in the Texas Panhandle was 0.0681 ppbv compared to a commonly used published odor threshold 0.46 ppbv (Buser et al., 2007, National Oceanic and Atmospheric Administration).

Emission factors, usually expressed in kilograms VOC per head per year, are used to estimate the total production of VOCs from a given source. Currently, the U.S. Environmental Protection Agency (EPA) has not published a standard VOC emission factor for cattle in AP-42 (U.S. Environmental Protection Agency), so different VOC emission factors are being implemented in various parts of the country. In Idaho, for instance, an emission factor of 7.3 kg VOC per dairy cow per year is used, based on research done by the South Coast Air Quality Management District (Idaho Department of Environmental Quality (IDEQ), 2003). The San Joaquin Valley Air Pollution Control District (SJVAPCD) in California has used an emission factor of 9.38 kg VOC per dairy cow per year (Air Resources Board (ARB), 2005). This emission factor (kg $hd^{-1}yr^{-1}$) represents the following group of compounds: VOC from cows breath and feed (1.23), ethylamines (0.01), miscellaneous dairy processes (0.55), lagoons and ponds (0.45), and VFAs (7.05) (Air Resources Board (ARB), 2005).

Limited information is available in the literature regarding emissions of phenol and *p*-cresol from dairies. To develop effective strategies for mitigating livestock odorous VOC emissions, relative emissions from different GLASs in a livestock operation under different climatic conditions should be quantified. Thus, measurements of odorous VOC emissions data from six specifically delineated GLASs (loafing pen, walkway, barn, silage pile, settling basin, and lagoon) were performed during summer and winter from the same free-stall dairy in Central Texas. However, VOC emissions from cattle and dairy production are difficult to quantify accurately because of their low concentrations, spatial variability in emissions, and the lack of a suite of instruments that is able to identify all VOCs. Characterizing VOC emissions from anthropogenic and biogenic sources involves a series of procedures to acquire accurate results. Although there are some standardized methods (e.g., EPA TO-14A and American Society for Testing and Materials [ASTM] D5466) for determining VOC concentrations in ambient air, specific methods are still needed for uncharacterized and complex sources such as dairies (Higashi and Cassel, 2004).

EPA Compendium Method TO-14A specifies the use of initially evacuated canisters and pump-ventilated sample lines when collecting air samples from the field (U.S. Environmental Protection Agency (U.S. EPA), 1999). The gas canisters used for air sample storage must be specially treated, leak-free, stainless steel pressure vessels of desired volume, with a valve and passivated interior surfaces. After the samples have been collected, the canisters are properly labeled with a chain-of-custody (COC) form and transported to a laboratory for analysis. At the laboratory, the contents of each canister are analyzed using a high-resolution gas chromatograph (GC) coupled to one or more GC detectors. There are several problems associated with the current methods of measuring VOC concentrations. Adsorption of hydrocarbon molecules onto gas canister walls has been observed (Koziel et al., 2004; Scott Specialty Gases, 2004). Loss of gases from the canisters and reaction among gases during transport and storage is also a concern. The VOCs in ambient air of livestock operations have also been determined using sorbent tubes, referred to as EPA Method TO-17 (Cai et al., 2010; Parker, 2008; Trabue et al., 2011). In this method, air samples are pulled using a portable vacuum pump at a particular rate and time through stainless steel sorbent tubes filled with an

absorbent (commonly, Tenax TA) to trap analytes (VOCs). The tube is stored at less than 4 °C in the field and transferred to the laboratory for analysis with a GC/mass spectrometer (MS) equipped with an automatic thermal desorber (ATD).

Capareda et al. (2005) proposed a new protocol for quantifying VOC emissions from AFOs by introducing modifications to EPA Method TO-14A. This protocol (Capareda et al. 2005) included using a portable GC in the field where multiple flux measurements are made. All elements essential to Method TO-14A sample analysis (i.e., GC and GC detectors) are present except that the GC was taken to the field so that samples could be analyzed real time on site rather than storing them in gas canisters and analyzing them in a laboratory. The new protocol showed promising results for determining RVOCs fluxes from GLAS (Capareda et al., 2005a).

In this study, this protocol was used to determine odorous VOC emissions from a free-stall dairy with the following specific objectives: identify and quantify phenol and *p*-cresol concentrations from different GLAS in the dairy; estimate and compare the phenol and *p*-cresol emission rates (ERs) from different GLASs of the same dairy during summer and winter seasons; and identify areas in a dairy operations that have the greatest phenol and *p*-cresol emissions.

Materials and Methods

Air sampling and description of the dairy operation

The study was conducted in a free-stall dairy operation located in central Texas to determine emissions of the two odorous VOCs (phenol and *p*-cresol) from different GLASs (Figure 1). This facility had a naturally ventilated free-stall barn with open sides and ends. The barn was 140 m × 31 m (area about 4340 m^2) and housed about 460 and 330 milking cows during winter and summer, respectively. The barn was flushed once a day at 6:30 a.m. from a storage tank that recycled wastewater from the secondary lagoon. The flushed manure was channeled into a two-chambered gravitational settling basin for separating liquid and solids. The separated liquid was then piped into a primary anaerobic lagoon and the separated solids were applied to the pasture/crop field. During summer, the secondary lagoon was completely dry and the primary lagoon was nearly empty (the waterline surface area was 1/15 of the winter time). To excavate sludge from the primary lagoon, the wastewater was continuously pumped out to irrigate the adjacent crop field. In addition, approximately 50% reduction in silage area was noticed during the winter sampling compared to the summer as feeding progressed. The cows were kept in a loafing area for about 6 hours every day from around 12:30 to 6:30 a.m. until their first milking, and the barn was flushed. The loafing area was an unpaved, confined area with access to the barn and milking parlor including a paved walkway around the barn. Air samples were collected from six delineated GLASs, namely, the loafing pen, walkway (to and from parlor and loafing pen), barn, silage pile, settling basin, and lagoons within the dairy operation (Figure 1) during summer (August 2009) and winter (January 2010). The area of each GLAS is presented in Table 1 and its percent contribution to the total area is presented in Figure 2.

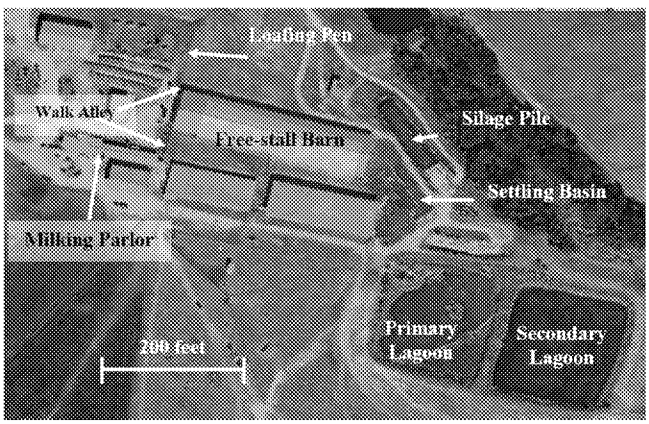

Figure 1. Aerial view of the free-stall dairy that was used in this study showing the ground-level sources (source: Google map).

Sampling was conducted for 5 consecutive days during daylight hours (9:00 a.m. to 7:00 p.m.). Size of each GLAS and accessibility of the measuring instrument to it were considered to determine the number of samples (3–10) to be taken from each GLAS (Table 1). Before sampling was initiated, an imaginary 36-cell (6 × 6) grid for each GLAS was assigned a number from 1 to 36. Randomly generated cell numbers were selected to place a flux chamber for sampling in that GLAS. Twenty-nine and 37 chromatograms of air samples were acquired from different GLASs of the dairy during a week-long sampling campaign each in the summer and winter, respectively. The ambient air temperatures were measured and recorded using HOBO sensors and data loggers (model U23-001; Onset Computer Corporation, Pocasset, MA).

Sampling protocol

Isolation flux chamber and flux generation

The protocol proposed by Capareda et al. (2005a; 1995b) for VOCs was used for quantifying phenol and *p*-cresol emissions from this dairy. A schematic of sampling system used to determine odorous VOC emissions is shown in Figure 3. This protocol consisted of a flux chamber (Figure 4) and a portable GC. The flux chamber was used to generate and collect air samples from each GLAS. The upper (hemispherical dome) portion of the flux chamber used in the field was made of Plexiglas, whereas the bottom (cylindrical skirt) was made of stainless steel. The two portions were flanged together by 6.35-mm (1/4-inch) steel bolts. The footprint area and volume of the flux chamber were 0.192 m^2 and 54.5 L, respectively. To keep sampling bias and measurement error to a minimum, recommended flux chamber operating parameters were adopted and measurements were made based on the flux chamber user guide (Gholson et al. 1989; Kienbusch, 1986). Those include gas sealing around the flux chamber bottom and placing flux chamber gently on the source to minimize soil disturbance. A sweep air flow rate of 5 L min^{-1} was maintained using a mass-flow controller to alleviate the issues associated with the creation of a

Table 1. Number of samples, GLAS area, ambient temperature (average ± standard deviation), volumetric concentrations (average ± standard deviation) during summer and winter

	Number of Samples		GLAS Area (m^2)		Ambient Temperature (°C)		Phenol (ppbv)		*p*-Cresol (ppbv)	
GLAS	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
Barn	3	9	1980	1980	0.6 ± 0.4	23.8 ± 2.1	151 ± 114^{yz}*	38 ± 12^{d}*	29 ± 29 yz	15 ± 5 cd
Manure lane	3	3	1524	1524	8.3 ± 1.1	26.6 ± 2.2	58 ± 1.4^{z}*	18 ± 7^{d}*	14 ± 5.8 z	8.4 ± 5.5 d
Bedding										
Loafing pen	6	10	22638	22638	9.4 ± 1.6	36.1 ± 2.8	209 ± 59 yz*	99 ± 29 bc*	52 ± 18 xy	42 ± 17 b
Lagoon	4	3	7525	506	7.39 ± 1.2	34.4 ± 1.9	284 ± 77 y*	74 ± 26 cd*	74 ± 13x*	30 ± 10 bc*
Primary	3	—	7027	—	8.4 ± 0.9	—	128 ± 11 yz	—	38 ± 4 yz	—
Secondary										
Settling basin	3	6	892	892	15.8 ± 1.9	31.2 ± 1.9	55 ± 9 z	127 ± 67 ab	15 ± 2 z*	24 ± 5 cd*
Silage	4	3	480	942	8.9 ± 1.3	31.3 ± 1.4	569 ± 227 x*	177 ± 54 a*	72 ± 35 x	57 ± 13 a
Walkway	3	3	739	739	12.7 ± 1.0	36.1 ± 3.1	110 ± 14 yz*	65 ± 23 cd*	19 ± 5 yz*	31 ± 6 bc*
Total	29	37	42805	29221						

Notes: The values in a column, representing average concentration for different GLAS in a particular season, followed by common letter(s) do not differ significantly at $P \leq 0.05$. The values in a row, representing average concentration for two seasons in a particular GLAS, followed by * do not differ significantly at $P \leq 0.05$.

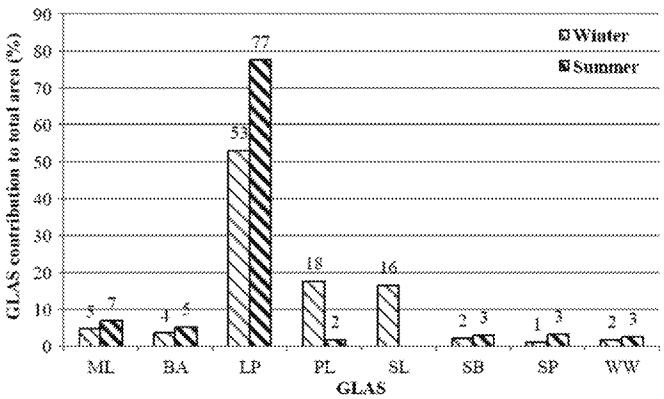

Figure 2. Seasonal contribution of the GLAS area to the total area at the free-stall dairy. ML = manure lane; BA = bedding area; LP = loafing pen; PL = primary lagoon; SL = secondary lagoon; SB = settling basin; SP = silage pile; WW = walkway.

microenvironment thereby avoiding negative bias associated with stagnant air or insufficient airflow in the chamber (Gholson et al., 1989; Kienbusch, 1986)

Before the sampling was initiated, the flux chamber was purged with zero-grade air at a flow rate of 5 L min^{-1} for about 30 min. Also, at the end of air sampling at each location in a GLAS, the air sampling tube and the flux chamber were purged when relocated. The compressed zero-grade air used for sampling had O_2 content between 19.5% and 23.5% and total hydrocarbon (THC) concentrations below 0.2 ppbv. Teflon tubing (0.635 cm inner diameter [i.d.]) was used to convey 5 L min^{-1} zero-grade air ("sweep air") to the flux chamber. Three holes on top of the chamber allowed air to escape while a fourth hole at the apex of the dome was used to convey sample air (2 L min^{-1}) back into the GC though another 45-m-long Teflon tube identical to that used to convey sweep air. The volume of air samples drawn from the flux chamber was regulated by a mass-flow controller connected to the pump. The incoming air from the flux chamber was connected to a splitter that diverts incoming air either to a greenhouse gas (GHG) GC or a VOC GC or both GCs concurrently. Of the 2 L min^{-1} of air drawn from the flux chamber, 360 mL min^{-1} was directed to the purge-and-trap system of the VOC GC for 10 min. Thus, VOCs were concentrated using two adsorbent traps (described below) connected to the GC before being injected into the GC column. Excess air was purged out of the GC while injected samples (desorbed gas from the traps after being heated) were analyzed in the system. Any moisture in air samples was filtered during sampling by a Nafion dryer placed immediately before the gas input manifolds of GCs (Figure 3).

Descriptions of VOC GC

The GC was a portable unit manufactured by SRI Instruments (model 8610C; Torrance, CA) with event (sampling duration, sample injection into GC column, temperature of the column, etc.) programming capability. Two traps satisfying EPA Method TO-14A purge-and-trap preconcentration requirements were installed in the system to concentrate VOCs in the sample air to detectable levels: a Carbosieve trap (Restek Corporation, Bellefonte, PA), which concentrated highly volatile compounds with low boiling points more readily and with higher chromatogram peaks and a chemically inert Tenax-GR trap (Restek Corporation, Bellefonte, PA), which concentrated most other hydrocarbons. After 10 min of concentrating on the traps, the VOCs were desorbed by heating to 200 °C for 5 min and then automatically injected into the GC column. No attempt was made to differentiate the compounds adsorbed onto each trap. The effect of the mass-flow controller and Teflon-coated diaphragm of the vacuum pump on gas concentrations was checked in the laboratory using calibration gases. Negligible differences in the GC responses (gas concentrations) were noted (~1.5%) between direct flow of the calibration gas to sorbent tubes and

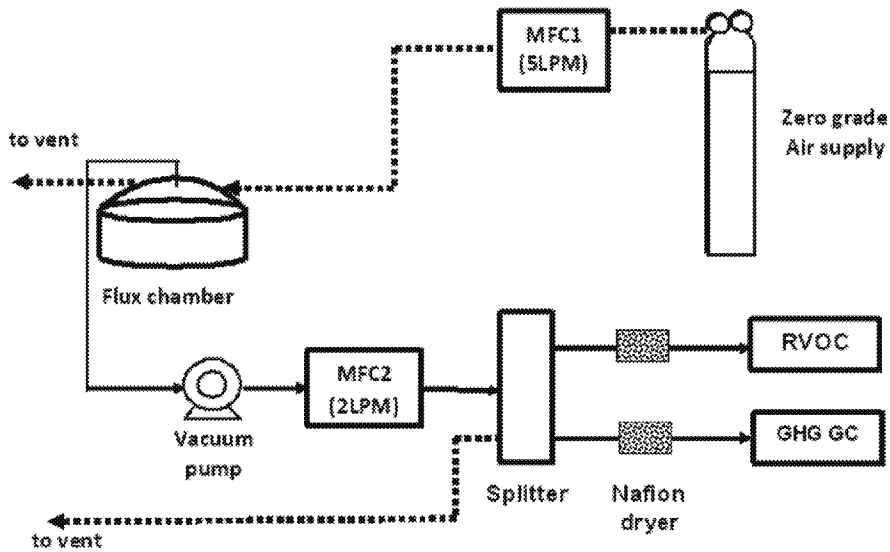

Figure 3. Schematic setup for VOC field sampling protocol (not to scale).

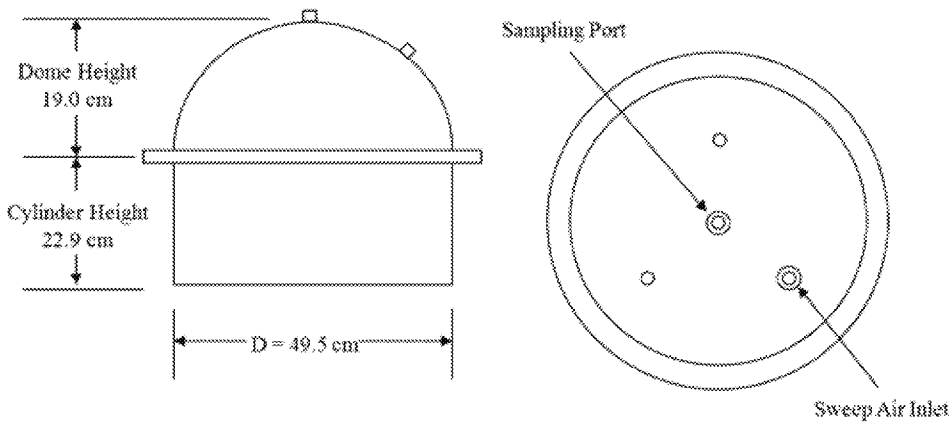

Figure 4. Flux chamber used for air sampling.

passing the gas through a pump and flow controller before it entered the sorbent traps.

The GC was equipped with two nonspecific detectors: a photoionization detector (PID), which "responds to all molecules whose potential is below 10.6 eV, including aromatics and molecules with carbon double bonds" (SRI Instruments, 2008), and a flame-ionization detector (FID), which is a mass-sensitive hydrocarbon detector with a nearly universal response to organic compounds (compounds containing CH groups). Typical sample detection limits for the FID are 10^{-14} g carbon sec^{-1}, with a linear response range of 10^6 to 10^7 orders of magnitude (Karger et al., 1973). The GC column was a nonpolar, 100% dimethylpolysiloxane phase, stainless-steel-treated capillary column (MXT-1; Restek Corporation, Bellefonte, PA) that was 60 m long with a 0.53 mm inner diameter and 5.0 μm film diameter. The carrier gas used was helium (He) at a flow rate of 100 mL min^{-1}. The compounds were detected by the FID and PID detectors with temperatures set at 150 °C. The GC column temperature was programmed to maintain an initial temperature of 40 °C for 10 min (sampling or concentrating time). The column was then programmed to heat at 10 °C min^{-1} to 210 °C, and was maintained at 210 °C for another 15 min. Compound peaks were recorded and analyzed with PeakSimple Chromatography Data System Software (Ver. 3.72; SRI Instruments). This GC measurement system was housed inside an air-conditioned trailer. Blank field samples were run before air sampling began at each location (ground-level area sources [GLAS]) to ensure the column was clean and functioning properly. At the beginning of each day field blanks were obtained by running the GC with the same method (temperature and event program) except the air mixture was not flowing through the GC systems. In this study, 1–2 blanks were found to be sufficient to produce a peak less chromatogram (showed no detectable peak).

Identification of compounds

Concurrent to in-field chromatography, air samples were also collected in cleaned and evacuated gas canisters. To fill the 6-L canisters (TO-Can Canister; Restek Corporation, Bellefonte,

PA), air from the flux chamber was drawn in using a vacuum pump (model UN035TT; KNF Neuberger, Trenton, NJ) at the rate of 2 L min^{-1} until the canister pressure reached 30 psi. The air samples collected in gas canisters were sent to the Air Quality Laboratory of West Texas A&M University in Canyon, TX, for analysis. The GC/MS (Varian 3800/Saturn 2000 GC/MS; Varian, Walnut Creek, CA) equipped with an automatic thermal desorber (Perkin-Elmer, Shelton, CT) system at West Texas A&M University was set up for identifying 13 target compounds including phenol and *p*-cresol. Air samples collected in canisters were analyzed with GC/MS to identify which compounds were contained in the sampled air chromatograms using our GC measurement systems. A total of 13 odorous VOCs (acetic acid, propionic acid, isobutyric acid, phenol, *p*-cresol, 4-ethylphenol, butyric acid, isovaleric acid, hexanoic acid, 2-aminoacetophenone, indole, and skatole) were identified using a GC/MS system. Because of the high cost of calibration gas, our initial attempt was to calibrate the GC with two VFAs (acetic and propionic acid) and two phenolic compounds (phenol and *p*-cresol). The acetic and propionic acid calibration gas was found unstable at 1 ppm concentration level. Therefore, we only proceeded with phenol and *p*-cresol. Of the 13 compounds identified by GC/MS, the identity of the two odor-causing VOCs (phenol and *p*-cresol) was confirmed by matching retention times to those of standard gases. In this study, phenol and *p*-cresol standards were used to calibrate the GC for estimating ERs of these two odorous VOCs.

Calibration, method detection limits, and percent recovery

To ensure accurate calculation of concentrations from the chromatograms acquired during field sampling, gas standards were introduced into the portable GC following the field sampling protocol. Standard gases (phenol and *p*-cresol) were procured from Scott Specialty Gases (Air Liquide America Specialty Gases, Plumsteadville, PA). Both FID and PID detectors responded well for phenol and *p*-cresol. In this study, responses from the FID were used for identification and quantification. To generate calibration equations, 1 ppmv of each standard gas balanced in nitrogen was passed through the traps at a rate of 360 mL min^{-1} for 2.5, 5, 10, 15, and 20 min to concentrate the respective analyte on the traps. For phenol and *p*-cresol, standard curves were developed from five known volumes of each standard with three to seven replicates at each volume. For field sample analysis, a linear regression (forced through the origin) was fit between the peak areas and compound weights (μg) to interpolate the total concentration of compounds in the field samples. The molecular mass and density of respective compounds used in the calculations at standard atmospheric conditions (25 °C and 1 atm.). Method detection limits (MDLs) were calculated per U.S. EPA guidelines (U.S. Environmental Protection Agency, 1995) as the product of the standard deviation of seven replicates and the Student's *t* value at the 99% confidence level. The percent recovery was calculated using the ratio of the mass of a particular compound (μg) concentrated in the trap to the mass of analyte (μg) derived from the corresponding regression equation of the compound and expressed in percent. The regression coefficients (R^2) of the standard equations, MDL, and percent recovery reflect the accuracy and reliability of the phenol and *p*-cresol measurements using the portable GC (Table 2).

Determination of breakthrough volume

The term breakthrough volume (BTV) is defined as the volume of carrier gas that will purge an analyte through 1.0 g of adsorbent resin in a desorption tube at a specific temperature (ATAS GL Science Company, 2001). The BTV of each target gas was determined by passing a range of sample volume of standard gas through desorption tubes over which the GC response was linear (Air Resources Board (ARB), 2005). For a fixed flow rate of 350–360 mL min^{-1} used during field sampling, a range of sample volumes was created by increasing sample collection times (2.5, 5, 10, 15, and 20 min) to concentrate the phenol and *p*-cresol in the adsorbent resin. As presented in Figure 5, these research data showed that after 10 min of trapping phenol and *p*-cresol (3.6 L volume), no breakthrough was observed (i.e., the plot between area counts under a peak and a range of volume up to 3.6 L was linear). To eliminate the affect of moisture on the BTV, a Nafion dryer was used downstream of the purge-and-trap system (Figure 3). The trap temperature was set at 35 °C to concentrate low-boiling-point highly volatile compounds in the Carbosieve trap.

Emission rate estimation

To compare the estimated emission rates (ER) between the summer and winter the measured volumetric concentrations of phenol and *p*-cresol were converted to a mass concentrations (μg m^{-3}) using the ideal gas law at standard temperature and pressure (25 °C and 1 atm) (eq 1). Equations 2 and 3 were used to calculate emission flux (EFlux), and emission rate (ER), respectively.

Table 2. Physical characteristics and analytical method performance

Compounds	CAS No.	MW (g mol^{-1})	MP (°C)	BP (°C)	Retention Time (min)	Standard Equations	R^2	MDL (ppbv)	Percent Recovery
Phenol (C_6H_5OH)	108-95-2	94.11	40–42	182	22.13	$y = 0.164(x)$	0.98	9.08	96.7
p-Cresol ($CH_3C_6H_4OH$)	106-44-5	108.14	34	202	24.28	$y = 0.140(x)$	0.96	8.13	95.2

Notes: CAS No. = Chemical Abstracts Service Number; MW = molecular weight; BP = boiling point; MP = melting point; MDL = method detection limit.

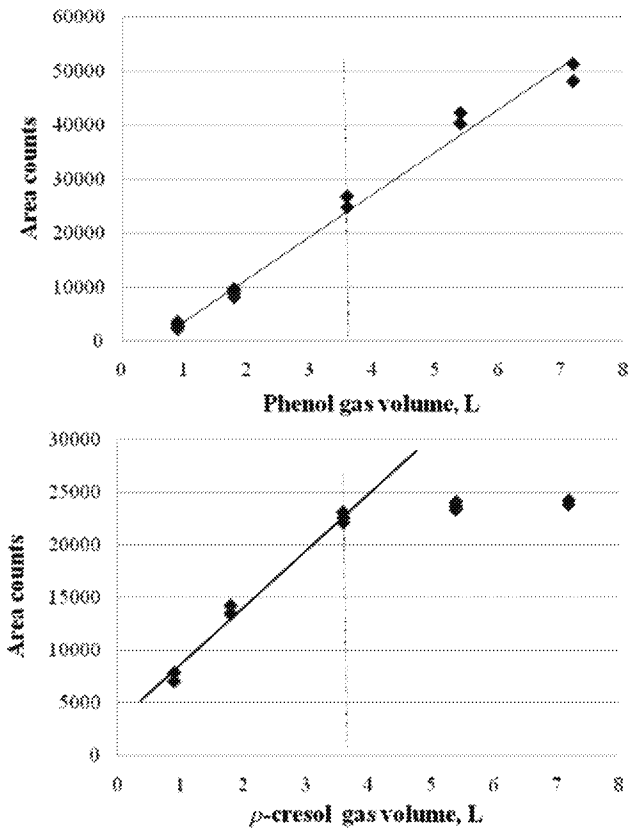

Figure 5. Breakthrough curves for phenol (top) and *p*-cresol (bottom).

$$C_{\text{mass}} = \frac{1000 \times (C_{\text{ppm}}) \times \text{MW}_{\text{p}}}{24.45} \quad (1)$$

$$\text{EFlux} = \frac{C_{\text{mass}} \times V_{\text{fc}}}{A_{\text{fc}}} \quad (2)$$

$$\text{ER} = \frac{\text{EFlux} \times 1.44}{\text{TNA}} \times A_{\text{sc}} \quad (3)$$

where C_{mass} is the concentration of a compound on a mass basis (μg m^{-3}), C_{ppmv} is the volumetric concentration of compound (ppmv), MW_{p} is the molecular weight (g mol^{-1}) of compound at standard pressure and temperature, 24.45 is the volume per mole of an ideal gas at standard temperature and pressure (L gmol^{-1}), EFlux is the gas emission flux (μg m^{-2} min^{-1}), V_{fc} is the flow rate of air supplied to the flux chamber (m^3 min^{-1}), A_{fc} is the foot print area of flux chamber (m^2), ER is the emission rate (mg hd^{-1} day^{-1}), A_{sc} is the area of source (GLAS; m^2), and TNA is the total number of animals.

Statistical analysis

The arithmetic means as measure of central tendencies were used to compare concentrations and ERs among the GLAS between seasons, and standard deviations were used to indicate the dispersion of concentrations and ERs in each GLAS. Measured gas concentrations and estimated emission rates from each GLAS in the dairy were compared. The null hypothesis tested states that mean VOCs concentrations and ERs among different GLASs and between seasons for a particular GLAS were equal. Statistical analyses of the measured VOC concentrations and estimated emission rates were carried out through analysis of variance (ANOVA) using General Linear Model function in SAS (SAS, 1999). Significance of the observed difference between any pair of GLAS VOC means (among different GLASs in a particular season, and between summer and winter for a particular GLAS) was determined by Duncan's multiple range test (Steel et al., 1997) at 5% level of significance ($P \leq 0.05$) if the main effect (GLAS/season) was significant using F test at $P \leq 0.05$.

Results and Discussion

Phenol and *p*-cresol concentrations in different GLAS

To measure GC responses for phenol and *p*-cresol at each location, the chromatogram from the blank run was subtracted from the air sample chromatogram and was used for calculating concentrations. In this study, VOC concentration values obtained from field blanks ranged from 0.5 to 2 ppbv. Concentrations from different GLAS during the winter ranged from 55 to 569 ppbv (212 to 2191 μg m^{-3}) for phenol and 15 to 74 ppbv (66 to 327 μg m^{-3}) for *p*-cresol. During summer, concentrations ranged from 18 to 177 ppbv (69 to 681 μg m^{-3}) and 8 to 57 ppbv (35 to 252 μg m^{-3}) for phenol and *p*-cresol, respectively (Table 1). The average ambient temperatures were 9.8 and 31.3 °C, in winter and summer, respectively. The measured concentrations of phenol and *p*-cresol in each GLAS varied widely as indicated by large standard deviations (Table 1). This was due to spatially variable manure loading rates, manure moisture, and manure constituents (manure, soil, urine, silage, etc.) at different GLASs in the dairy. The freshly voided manure in the concrete manure lane of the barn has the potential of carrying a higher number of bacteria to produce gaseous emissions than a recently flushed manure alley. Similarly, anaerobic liquid manure in the primary lagoon and settling basin might produce higher gaseous emissions due to anaerobic degradation than other sources. The fresh and accumulated manure with sporadic urine mixed, and minor faction of the soil, made the loafing pen a different source compared to others. Previous research reported that ambient temperature, soil moisture, and manure composition are the primary factors controlling anaerobic decomposition in feedyard soils (Miller and Varel, 2001). Mukhtar et al. (2008) also reported highly variable ammonia (NH_3) emissions from open-lot sources in a free-stall dairy in central Texas due to variable manure loading rates.

Concentrations of odorous VOCs (phenol and *p*-cresol) measured during the summer from different GLASs were higher than those measured by sampling downwind from a smaller dairy using sorbent tubes (Rabaud et al., 2002), as would be expected since sampling was conducted directly at the sources. Rabaud et al. (2002) identified and quantified odorous and nonodorous compounds downwind of a dairy farm (90 × 93 m) located at University of California campus with 120 milking cows and 100 heifers. Air sampling was performed during the summer (June to

August) on nine separate occasions. In the authors' measurements, concentrations of VOCs (20 odorous and nonodorous compounds) measured downwind of a small dairy ranged from 0.55 to 320.20 $\mu g\ m^{-3}$ (Rabaud et al., 2002). Currently, there are no other dairy operation GLAS phenol and *p*-cresol emissions studies to compare with the present study; however, three studies measuring the air quality within the dairy barns have been conducted. Sun et al. (2008) used an environmentally controlled chamber (142 m^3) with 18 cows inside to measure alcohol, VFA, phenol, and methane emissions from dairy cows and fresh manure. The air sampling point was placed at ceiling height. The VFA and phenols emitted were close to the limit of quantification (LOQ) of the measuring instrument. The LOQ for phenolic compounds ranged from 0.02 to 2.7 $\mu g\ m^{-3}$. Sunesson et al. (2001) reported detection of phenol (3–50 $\mu g\ m^{-3}$) and *p*-cresol (0.6–100 $\mu g\ m^{-3}$) from eight farms in northern Sweden where farm size ranged from 10 to 82 milking cows. Cai et al. (2010) conducted studies in two barns in Wisconsin and Indiana to quantify odor and odorous chemicals from animal buildings during four 13-week periods. Measured average concentrations for phenol and *p*-cresol varied from 2.06 to 4.56 and from 3.09 to 6.31 $\mu g\ m^{-3}$, respectively. Our values for phenol and *p*-cresol from the barn (manure lane and bedding area) were higher than those found in the literature since measurements were made directly at the emitting sources.

In this research, average concentrations of phenol and *p*-cresol measured from the primary lagoon of a dairy during summer were 74 ppbv (285 $\mu g\ m^{-3}$) and 30 ppbv (133 $\mu g\ m^{-3}$), respectively (Table 1). These concentration values were comparable to those measured using wind tunnel and GC/MS method from a dairy lagoon in the Texas Panhandle (Parker, 2008). Measured concentrations for phenol and *p*-cresol were 78.44 ppbv (302 $\mu g\ m^{-3}$) and 40.5 ppbv (179 $\mu g\ m^{-3}$), respectively (Parker, 2008). The highest phenol and *p*-cresol concentrations were measured from the silage pile in comparison to other sources during summer and winter (Table 1). Higher average phenol and *p*-cresol concentrations in this GLAS were most likely due to the fermentation of silage as this process converts sugars in the silage pile (glucose, fructose, and sucrose) into cellular energy with ethanol, VOCs (including phenols and *p*-cresol), and carbon dioxide as metabolic waste products (Ciccioli et al., 1993). Next to silage, the average phenol and *p*-cresol concentrations at the loafing pen were significantly higher than those from other GLASs during summer and winter. This was likely due to the fermentation of fresh manure with occasional urine mixed, a minor fraction of the soil giving it a greasy consistency during the winter, and a year-round compacted soil surface, producing phenol and *p*-cresol emissions. This fermentation was induced by the anaerobic environment of the loafing pen and the anaerobic condition of soil layers immediately under the pen manure's top surface (Saggar et al. 2004). This situation in the loafing pen emitted more phenol and *p*-cresol during winter than summer when it was dry. In general, average phenol concentrations measured in the winter from different GLAS were significantly higher than those measured in the summer ($P < 0.05$) with the exception of the settling basin. During winter, the prevalence of relatively high moisture conditions in the GLAS due to low temperature enhanced anaerobic degradation of the manure, which generated higher phenol emission. The average phenol concentrations measured from the barn (manure lane and bedding area combined), loafing pen, primary lagoon, silage pile, and walkway during the winter were about 4, 2, 4, 3.2, and 1.7 times significantly ($P < 0.05$) higher, respectively, than those measured in the summer (Table 1). In contrast, average phenol in the settling basin during the winter was about 2.3 times lower than those in the summer (Table 1).

In general, *p*-cresol concentrations measured in the manure lane, bedding area, loafing pen, and silage pile during the winter were higher than those measured in the summer, although those differences were not statistically significant. In the winter, excessive wet conditions of the GLAS caused by low temperatures (i.e., lower rates of evaporation) generated higher concentration of odorous VOCs (phenol and *p*-cresol). Miller and Varel (2001) reported that ambient temperature, soil moisture, and manure composition are the primary factors controlling anaerobic decomposition in feedyard soils, and are responsible for generating odorous compounds. Between summer and winter, average *p*-cresol concentrations in the primary lagoon were significantly different and higher during the winter. Average *p*-cresol concentrations between two seasons in the silage pile were statistically similar. In contrast, average *p*-cresol concentration in the settling basin during the winter was about 1.6 times lower than those measured during the summer. This was because of reduced bacterial degradation of freshly flushed manure in the settling basin, and a reduced evaporation of malodorous compounds (phenol and *p*-cresol) due to low winter temperatures. Average *p*-cresol concentrations measured at the primary lagoon and silage pile in the winter were about 2.5 and 1.3 times, respectively, higher than those in the summer. In the winter, higher phenol and *p*-cresol concentrations were measured from the barn (manure lane and bedding combined), loafing pen, primary lagoon, silage, and walk-alley, where those areas constituted about 83% of the total area (Figure 2). The loafing pen alone contributed about 53% and 77% of the total area during winter and summer, respectively (Figure 2). Therefore, mitigation strategies aimed at these areas would realize the greatest effect on overall emissions of phenol and *p*-cresol from the dairy. There are many commonly applied approaches to control odor and odorants, including low-nitrogen ration/diet, covering of manure storage tanks, lagoons, manure stockpiles, and anaerobic digesters. Others include frequent manure removal from emitting surfaces by flushing or scrapping alleys and injecting liquid manure under soil to a predetermined depth for reducing odor emissions.

Comparison of emission fluxes in different GLAS

The highest average phenol and *p*-cresol emission fluxes measured during summer and winter from the silage pile were significantly higher than those from other GLASs (Table 3). Next to the silage pile, higher phenol and *p*-cresol emission fluxes were measured from primary lagoon and loafing pen, although values between those two GLASs were not statistically different ($P > 0.05$). The average phenol emission fluxes measured in manure lane, bedding area, loafing pen, primary lagoon, silage pile, and walkway during winter were significantly higher

Table 3. Estimated average emission fluxes and rates for phenol and *p*-cresol in a free-stall dairy (mean ± standard deviation)

	Emission Flux ($\mu g\ m^{-2}\ min^{-1}$)				Emission Rates ($mg\ hd^{-1}\ day^{-1}$)			
	Phenol		*p*-Cresol		Phenol		*p*-Cresol	
GLAS	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
Barn								
Manure lane	15.1 ± 11.5^{yz}*	3.8 ± 1.2^{b}*	3.3 ± 3.4 yz	1.7 ± 0.57	94 ± 71z*	33 ± 10 b*	21 ± 21 z	15 ± 5 b
Bedding area	5.8 ± 0.14^{z}*	1.8 ± 0.8^{b}*	1.7 ± 0.6 z	0.97 ± 0.6 d	27 ± 3 z*	12 ± 5 b*	8 ± 3 z	6 ± 4 b
Loafing pen	20.9 ± 5.9 yz*	9.9 ± 2.9 bc*	6.0 ± 2.0xy	4.8 ± 1.9 b	1485 ± 422 x*	978 ± 283 a*	425 ± 137 x	473 ± 191 a
Lagoon								
Primary	26.5 ± 7.7 y*	7.4 ± 2.6 bcd*	7.9 ± 1.4 x*	3.4 ± 1.2 bc*	625 ± 171 y*	16 ± 5 b*	186 ± 31 y*	7 ± 3 b*
Secondary	12.7 ± 0.8 yz	—	4.6 ± 0.5 yz	—	298 ± 24 yz	—	101 ± 10 yz*	—
Settling basin	5.6 ± 0.9 z	13 ± 6.7 ab	1.7 ± 0.23 z*	2.7 ± 0.5 cd*	16 ± 2 z	50 ± 26 b	5 ± 2 z*	10 ± 3 b*
Silage	57.2 ± 22.7 x*	17.8 ± 5.4 a*	8.4 ± 4.0 x	6.6 ± 1.5 a	86 ± 34 z	73 ± 23 b	13 ± 6 z*	27 ± 5 b*
Walkway	11.0 ± 1.4 yz*	6.7 ± 2.3 cd*	2.2 ± 0.5 yz*	3.7 ± 0.6 bc*	25 ± 3 z	22 ± 8 b	5 ± 2 z*	12 ± 3 b*
Total					2656 ± 728	1183 ± 362	763 ± 212	551 ± 214

Notes: The values in a column, representing average flux and emission rate for different GLAS in a particular season, followed by common letter(s) do not differ significantly at $P \leq 0.05$. The values in a row, representing average flux and emission rate for two seasons in a particular GLAS, followed by * do not differ significantly at $P \leq 0.05$.

than those measured in summer ($P < 0.05$). Similarly, *p*-cresol concentrations measured in manure lane, bedding area, loafing pen, and silage pile during winter were higher than those measured in summer; however, not statistically significant.

In contrast, phenol and *p*-cresol emission fluxes measured during summer in dairy barns in colder regions (Wisconsin and Indiana) were higher than those in winter (Cai et al., 2010). This was likely due to the moderate winter of central Texas compared to Wisconsin and Indiana. The average temperatures at the study areas in Wisconsin and Indiana during winter (December and January) and summer (July to August) were approximately −2 and 19°C, respectively (US Weather; US Weather). In central Texas, winter and summer temperatures at the study area were 6.6 and 26.6 °C, respectively (US Weather). In comparison to the Wisconsin and Indiana winter, central Texas climate was moderate with an average daily temperature of 8.9 °C (range: 0.6 to 15.8 °C) during the sampling week. On the other hand, it was hotter (23.8 to 36.1 °C) in Texas than Wisconsin and Indiana in summer and the ground sources at the Texas dairy were drier in summer than in winter. The ground sources were wetter because of low evaporation during the winter that resembled nearly anaerobic condition for manure accumulated on those surfaces. Therefore, higher phenol and *p*-cresol emissions resulted at the dairy when compared to those during summer.

Emission fluxes for phenol and *p*-cresol from lagoon were also compared with those obtained using a wind tunnel (Parker, 2008). In our research, the estimated emission fluxes from the primary lagoon during summer ranged from 4.6 to 9.8 $\mu g\ m^{-2}\ min^{-1}$ (average 7.4 $\mu g\ m^{-2}\ min^{-1}$) for phenol and 2.7 to 4.8 $\mu g\ m^{-2}\ min^{-1}$ (average 3.4 $\mu g\ m^{-2}\ min^{-1}$) for *p*-cresol. These emission fluxes were lower than those measured for phenol and *p*-cresol ranging from 7 to 155 $\mu g\ m^{-2}\ min^{-1}$ and from 11 to 117 $\mu g\ m^{-2}\ min^{-1}$, respectively, using the wind tunnel and GC/MS method from a dairy lagoon in the Texas Panhandle (Parker, 2008). However, there is debate about the appropriateness and accuracies of wind tunnels and flux chambers for quantifying pollutant emissions at AFOs because of small measurement footprint relative to the size of the source (Parker et al. 2010). Hudson et al. (2009) reported that wind tunnel odor emission rates were 60 to 240 times higher than those in the U.S. EPA flux chamber.

Estimation of emission rates in different GLAS

In the winter, estimated average ERs for phenol and *p*-cresol in this study ranged from 16 to 1485 and from 5 to 425 $mg\ hd^{-1}\ day^{-1}$, respectively. Similarly, estimated ERs for phenol and *p*-cresol ranged from 12 to 978 and from 6 to 473 $mg\ hd^{-1}\ day^{-1}$, respectively, in the summer (Table 3). The estimated average ERs for phenol and *p*-cresol within the GLAS varied widely as indicated by the large standard deviations (Table 3). Variations were likely attributable to variations in the air temperature, moisture content of manure, and spatially variable manure loading rates at different GLAS areas in a dairy operation. Miller and Varel (2001) reported that air temperature, moisture, and manure composition are three primary factors controlling the rate and extent of anaerobic manure decomposition in the cattle feedyard soils that supplies the pool of odorous

compounds. Mukhtar et al. (2008) also reported variations in ammonia emissions in a dairy operation due to air temperature and manure loading rates. During winter, phenol ERs estimated from the loafing pen and the primary lagoon were significantly ($P < 0.05$) higher than those estimated from other GLASs (Table 3). The highest average phenol ERs were from the loafing pen and estimated to be 1485 and 978 mg hd^{-1} day^{-1} during winter and summer, respectively, and they were significantly different from each other GLAS ($P < 0.05$). Average phenol ER estimated at the loafing pen during winter was about 1.5 times higher than that in summer. Phenol and *p*-cresol ERs estimated from the primary lagoon were 16 and 7 mg hd^{-1} day^{-1}, respectively, and were much lower than the range reported previously (Parker, 2008). This was because the primary lagoon was almost empty during summer and its surface area at the water line was 6.73% of the winter (Table 1) surface area. To remove the sludge from the primary lagoon, the wastewater was continuously pumped out to irrigate the nearby crop field. Assuming the normal lagoon area as winter, the estimated phenol and *p*-cresol ERs during summer equate to 238 and 104 mg hd^{-1} day^{-1}, respectively. These extrapolated ER values for phenol and *p*-cresol fall within the range (Parker, 2008) estimated previously for a dairy lagoon. Parker (2008) reported that ERs for phenol and *p*-cresol were from 33 to 735 mg hd^{-1} day^{-1} and from 52 to 555 mg hd^{-1} day^{-1}, respectively, for a dairy lagoon at Texas Panhandle with 9890 m^2 surface area and 3000 dairy cows.

In this study, phenol ERs from the barn manure lane and bedding area were 121 and 45 mg hd^{-1} day^{-1}, respectively, for winter and summer. Similarly, *p*-cresol ERs estimated from manure lane and bedding area were 29 and 21 mg hd^{-1} day^{-1}, respectively, between winter and summer. The phenol and *p*-cresol ERs estimated from the barn during summer and winter were lower than those measured in the mechanically ventilated barns from Wisconsin and Indiana dairy (Cai et al. 2010). The estimated phenol ERs in a dairy barn in Wisconsin were 141 and 30 mg hd^{-1} day^{-1}, respectively, during summer and winter. Similarly, estimated *p*-cresol ERs for this dairy were 298 and 44 mg hd^{-1} day^{-1}, respectively, for the two seasons. In a dairy barn in Indiana, the estimated phenol ERs were 94 and 7 mg hd^{-1} day^{-1}, respectively, during summer and winter. Similarly, estimated *p*-cresol ERs for this dairy were 70 and 68 mg hd^{-1} day^{-1}, respectively, for the same periods (Cai et al. 2010). The ERs in enclosed Midwestern barns were higher because of greater gas buildup than those in a naturally ventilated barn with open sides and ends in central Texas.

There were no significant differences in the phenol ERs among the barn, settling basin, silage pile, and walkway during winter ($P > 0.05$). Similarly, phenol ERs among barn, settling basin, silage pile, and walkway were statistically similar during summer ($P > 0.05$). The loafing pen also showed significantly higher *p*-cresol ERs during summer and winter when compared with other GLAS. The average *p*-cresol ER in the winter and summer from the loafing pen (425 and 473 mg hd^{-1} day^{-1}, respectively) was the highest amongst the GLASs in both seasons and was significantly different from other GLASs ($P < 0.05$). There were no significant differences in *p*-cresol ERs estimated from the barn, lagoons, settling basin, silage pile, and walkway during summer ($P > 0.05$). Therefore, for reducing phenol and *p*-cresol emissions, abatement and management practices must be directed to the loafing pen and lagoons, since those emission areas constituted about 87% of the total GLAS of the dairy operation during winter (Figure 2).

Overall phenol and *p*-cresol emission rates

The overall estimated winter ERs for phenol and *p*-cresol were 2656 and 763 mg hd^{-1} day^{-1}, respectively. Similarly, the overall estimated summer ERs for phenol and *p*-cresol were 1183 and 551 mg hd^{-1} day^{-1}, respectively (Table 3). For this free-stall dairy, overall phenol and *p*-cresol ERs in winter were about 2.2 and 1.4 times higher than those in summer. The contribution of each GLAS to the overall phenol and *p*-cresol ERs during summer and winter for this free-stall dairy are presented in Figures 6 and 7, respectively. The loafing pen alone contributed about 56% of the overall phenol ERs and 55% of the overall *p*-cresol ERs during winter (Figures 6 and 7). Similarly, the loafing pen alone contributed about 82% of the overall phenol emissions and 86% of overall *p*-cresol emissions during

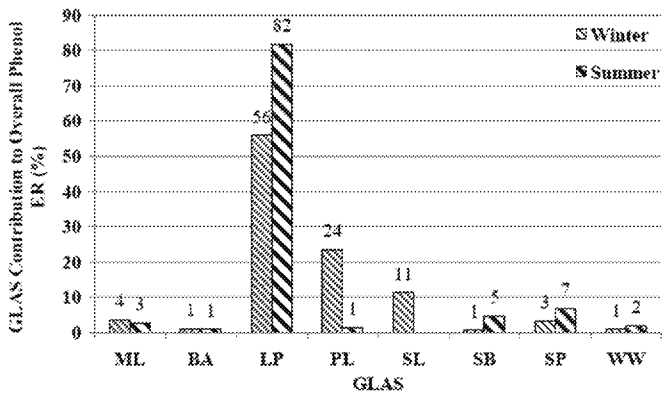

Figure 6. Seasonal GLAS contribution to overall phenol ERs at the free-stall dairy. ML = manure lane; BA = bedding area; LP = loafing pen; PL = primary lagoon; SL = secondary lagoon; SB = settling basin; SP = silage pile; WW = walkway.

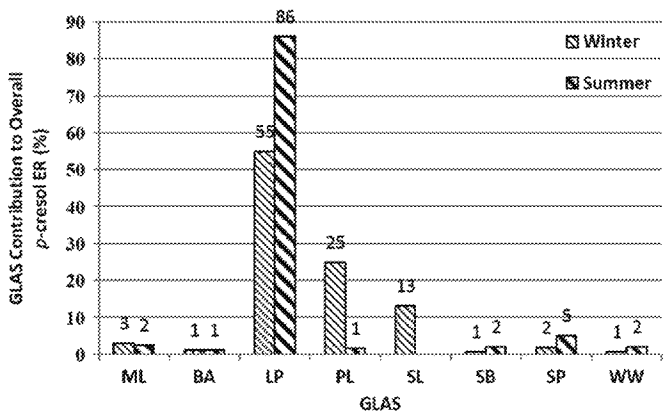

Figure 7. Seasonal GLAS contribution to overall *p*-cresol ERs at the free-stall dairy. ML = manure lane; BA = bedding area; LP = loafing pen; PL = primary lagoon; SL = secondary lagoon; SB = settling basin; SP = silage pile; WW = walkway.

summer (Figures 6 and 7). Furthermore, the loafing pen and lagoons (primary and secondary) contributed about 91% of the overall phenol ERs during winter and comprised about 87% of the total GLAS of the dairy operation (Figures 2 and 6). Therefore, abatement and management practices that address emissions from these sources that comprise about 87% of the total GLASs area will likely be most effective for reducing facility emissions.

Summary and Conclusions

A modified EPA Method TO-14A was used for determining phenol and *p*-cresol emissions from different GLASs in a free-stall dairy operation in central Texas. This protocol employed a flux chamber and a portable GC, coupled with purge-and-trap system to quantify VOCs directly in the field. The measured concentrations of phenol and *p*-cresol within and among the GLASs in this dairy operation varied widely due to spatially variable manure loading rates and manure microbial activity. The estimated ERs for phenol and *p*-cresol ranged from 16 to 1485 and from 5 to 425 mg hd^{-1} day^{-1}, respectively, during winter. In the summer, estimated average ERs for phenol and *p*-cresol ranged from 12 to 978 and from 6 to 473 mg hd^{-1} day^{-1}, respectively.

The overall calculated ERs for phenol and *p*-cresol were 2656 ± 728 and 763 ± 212 mg hd^{-1} day^{-1}, respectively, in winter. Overall calculated phenol and *p*-cresol ERs were 1183 ± 361 and 551 ± 214 mg hd^{-1} day^{-1}, respectively, in summer. In general, overall phenol and *p*-cresol ERs in the winter were about 2.2 and 1.4 times higher than those in the summer for this free-stall dairy. The loafing pen alone contributed about 82% of the overall phenol ERs and 86% of overall *p*-cresol ERs during summer. The loafing pen and lagoons (primary and secondary) contributed about 91% of the overall phenol emissions during winter and represented about 87% of the total area of GLASs at the dairy operation. Therefore, for reducing phenol and *p*-cresol emissions, abatement and management practices directed at the loafing pen and lagoons would likely be most effective for reducing facility-wide emissions.

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Ammonia Emission Model for Whole Farm Evaluation of Dairy Production Systems

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Ammonia (NH_3) emissions vary considerably among farms as influenced by climate and management. Because emission measurement is difficult and expensive, process-based models provide an alternative for estimating whole farm emissions. A model that simulates the processes of NH_3 formation, speciation, aqueous-gas partitioning, and mass transfer was developed and incorporated in a whole farm simulation model (the Integrated Farm System Model). Farm sources included manure on the floor of the housing facility, manure in storage (if used), field-applied manure, and deposits on pasture (if grazing is used). In a comprehensive evaluation of the model, simulated daily, seasonal, and annual emissions compared well with data measured over 2 yr for five free stall barns and two manure storages on dairy farms in the eastern United States. In a further comparison with published data, simulated and measured barn emissions were similar over differing barn designs, protein feeding levels, and seasons of the year. Simulated emissions from manure storage were also highly correlated with published emission data across locations, seasons, and different storage covers. For field applied manure, the range in simulated annual emissions normally bounded reported mean values for different manure dry matter contents and application methods. Emissions from pastures measured in northern Europe across seasons and fertilization levels were also represented well by the model. After this evaluation, simulations of a representative dairy farm in Pennsylvania illustrated the effects of animal housing and manure management on whole farm emissions and their interactions with greenhouse gas emissions, nitrate leaching, production costs, and farm profitability.

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Gaseous emissions from animal agriculture have become an important issue in the United States and in many other countries. Emissions include greenhouse gases, volatile organic compounds, and specific toxic compounds, of which ammonia (NH_3) is the most important. Ammonia can create human and animal health hazards when concentrations reach critical levels in confined spaces, such as enclosed manure storages or poorly ventilated barns (NRC, 2003). When large quantities of these compounds are released to the atmosphere, they contribute to poor air quality and ecosystem degradation. Atmospheric NH_3 contributes to the formation of fine particulate matter, which can cause or exacerbate human respiratory problems (Kampa and Castanas, 2008). Ammonia emission can also cause regional degradation of terrestrial and aquatic ecosystems (NRC, 2003).

Ammonia emission is regulated by the USEPA in response to the Clean Air Act (USEPA, 1990). Additionally, the Emergency Planning and Community Right-To-Know Act requires the reporting of a release that exceeds 45 kg within any 24-h period (USEPA, 2010), and daily emissions from large animal feeding operations can exceed this level. Accurate measurement and monitoring of animal feeding operations is very difficult and costly due to the many sources on farms, the large areas of exposure, and the relatively low concentrations in air. This has led to the recommendation that a process-based modeling approach be used to estimate emissions from animal feeding operations (NRC, 2003). By simulating farm systems with a comprehensive model that includes components representing the formation and emission processes and their interactions with other farm processes, individual source and total farm emissions can be estimated.

As discussed in other reviews (Ni, 1999; Montes et al., 2009), much work has been completed over the past 30 yr to model NH_3 emission processes from manure sources on farms. Most models are applied to specific emission sources, such as the housing facility, manure storage, or field-applied manure. A few models have integrated the various sources to predict emissions

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Abbreviations: bLS, backward Lagrangian Stochastic; DM, dry matter; IFSM, Integrated Farm System Model; RPM, Radial Plume Mapping; TAN, total ammoniacal nitrogen.

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at the farm level (Hutchings et al., 1996; Pinder et al., 2004; Rotz and Oenema, 2006; Li et al., 2012).

Despite the work that has been conducted, a need exists for a comprehensive farm-scale model that represents all of the major sources of NH_3 emission and their interaction with other farm processes. Some of the earliest models of NH_3 emission from manure were based on an empirical mass transfer coefficient for NH_3 derived by Haslam et al. (1924), and much of the work since has followed this approach. Although this mass transfer model did not properly represent emissions from a flat surface of manure, parameters such as the Henry's constant and dissociation coefficient were adjusted to allow models to fit empirical data. This has led to confusion, with many diverse models representing the same processes (Ni, 1999; Montes et al., 2009). Recent work has identified more fundamental and consistent relationships for representing the principal NH_3 emission processes (Montes et al., 2009; Hafner et al., 2013).

Our objective was to develop and evaluate a process-based model that predicts NH_3 emissions from all important sources in cattle production systems for use in whole farm simulation. This was accomplished by further developing and applying relationships for predicting emission processes as affected by the important farm components of animal housing, manure storage, land application of manure, and deposits by grazing animals.

Model Description

The emission model was developed for incorporation into the Integrated Farm System Model (IFSM) for use in simulating and evaluating dairy and beef production systems (USDA-ARS, 2012). This comprehensive farm model provides a framework for linking process-level simulation of emissions for each of the major farm sources. This emission component can be adapted to other farm-scale models and animal species.

Integrated Farm System Model

The IFSM is a research tool used to assess and compare the environmental and economic sustainability of farming systems. Crop production, feed use, and the return of manure nutrients back to the land are simulated for many years of weather on a crop, beef, or dairy farm (Rotz et al., 2012). Growth and development of crops are predicted for each day based on soil water and N availability, ambient temperature, and solar radiation. Simulated tillage, planting, harvest, storage, and feeding operations predict resource use, timeliness of operations, crop losses, and nutritive quality of feeds as influenced by weather. Feed allocation and animal responses are related to the nutrient contents of available feeds and the nutrient requirements of the animal groups making up the herd. The quantity and nutrient contents of the manure produced are a function of the feeds consumed and herd characteristics.

Nutrient flows are tracked through the farm to predict nutrient losses to the environment and potential accumulation in the soil (Rotz et al., 2012). Environmental losses include NH_3 volatilization, denitrification and leaching losses of N from soil, erosion of sediment across the farm boundaries, and the runoff of sediment-bound and dissolved phosphorus. Carbon dioxide, methane, and nitrous oxide emissions are tracked from crop, animal, and manure sources and sinks to predict net greenhouse gas emission. Whole-farm mass balances of N, P, K, and C are determined as the sum of nutrient imports in feed, fertilizer, deposition, and legume fixation minus the nutrient exports in milk, excess feed, animals, manure, and losses leaving the farm.

Simulated performance is used to determine production costs, incomes, and economic return for each year of weather. A whole-farm budget includes fixed and variable production costs (Rotz et al., 2012). All important production costs are subtracted from the total income received for milk, animal, and feed sales to determine a net return to management. By comparing simulation results, differences among production systems are determined, including annual resource use, production efficiency, environmental impacts, production costs, and farm profit. Simulations are conducted over a 25-yr sample of recent historical weather, so the resulting distribution of annual predictions represents the effects of varying weather.

Emission Processes

Emissions are predicted through the simulation of NH_3 formation and emission processes as influenced by farm processes (Fig. 1). Manure is a primary source of NH_3 emissions on livestock farms. Major manure sources include the housing facility, the storage (if one is used), field-applied manure, and deposits on pasture if grazing is used. The IFSM predicts the quantity and nutrient content of excreted feces and urine, which are used to establish the initial characteristics of the manure. In previous work, the IFSM-simulated dry matter (DM) and N excretions were shown to accurately represent individual cow and herd excretions (Rotz et al., 2006; Rotz et al., 1999). Losses and transformations in each stage are used to predict the manure characteristics at the succeeding stage. These conditions are then used to drive the simulation of the emission processes at each source, normally on an hourly time step throughout each day. Emission processes include the formation of ammoniacal N, the mass transfer within the manure, the speciation of NH_3, and the mass transfer to the surrounding air. Relationships used to represent these processes are provided in Supplemental Table S1. These processes are simulated for the conditions of each day, and daily emissions from all sources are summed to give annual emissions.

Total manure N consists of organic and ammoniacal N where only the ammoniacal form is readily volatilized. Depending on how the cattle are fed, 40 to 50% of this organic N is in the form of urea excreted in urine (Rotz, 2004). Excess protein N fed to cattle ends up in the urine, increasing the concentration of urea in the mixture of feces and urine (Rotz et al., 2012). After excretion, enzymatic hydrolysis quickly decomposes the urea to aqueous unionized NH_3, which exists in equilibrium with ammonium (NH_4^+), and the sum of the concentrations of NH_3 and NH_4^+ give the total ammoniacal N (TAN) content. The transformation of urea to TAN is modeled on an hourly time step as a function of temperature and the urea concentration in the manure (Supplemental Table S1). Because the pH of fresh cattle manure normally falls within an optimum range for urease activity (Sommer et al., 2006), pH effects on hydrolysis are ignored.

The distribution of TAN between NH_3 and NH_4^+ in the manure solution (i.e., TAN speciation) is modeled using thermodynamic equilibrium principles (Supplemental Table S1) (Stumm and Morgan, 1996). Below pH 8, a one-unit increase in

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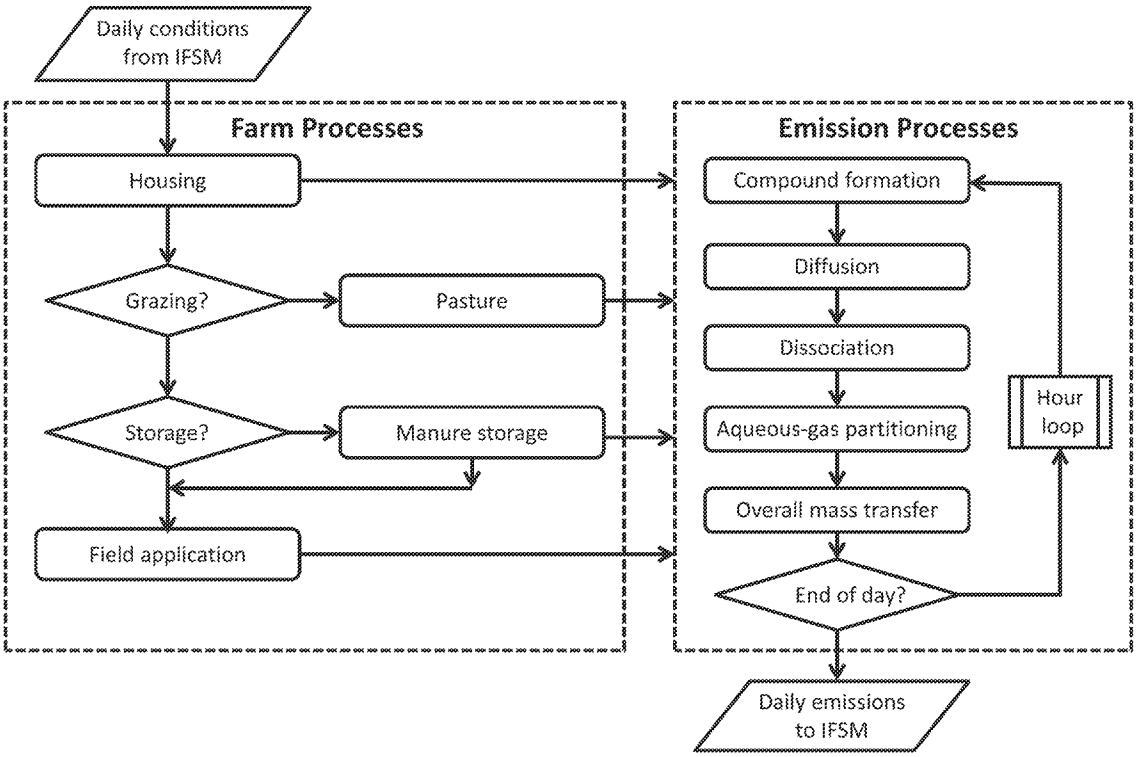

Fig. 1. Flow of information between farm and emission processes and their link to the Integrated Farm System Model (IFSM).

pH increases the NH_3 fraction by about an order of magnitude, and this fraction approximately doubles with each 10°C increase in temperature. As the NH_3 fraction in a solution increases, the potential emission rate increases.

Manure is not a dilute solution, so solute interactions are considered when predicting speciation. A fixed ionic strength is assumed and the Davies equation is used to incorporate nonideal behavior. To represent typical cattle manure, an average ionic strength of 0.35 is used (Chaoui et al., 2009), which gives an activity coefficient of 0.74 for NH_4^+ (Montes et al., 2009). Because NH_3 has no charge, its activity coefficient is close to 1.0. To include activity corrections, the dissociation constant is multiplied by 0.74 (Supplemental Table S1).

Because NH_3 concentration is sensitive to pH, knowing the pH at the surface of the manure is critical for an accurate prediction of emission rate. When manure is exposed to air, dissolved CO_2 is released more rapidly than NH_3 due to its lower solubility. The rapid loss of CO_2 leads to a 0.5- to 1.0-unit increase in manure surface pH above the manure bulk pH (Chaoui et al., 2009; Ni et al., 2009; Blanes-Vidal et al., 2009; Montes et al., 2009). The magnitude of the pH increase depends on solution chemistry, manure depth, and environmental properties (Hafner et al., 2013). On a barn floor with constant animal movement, there is continuous mixing of the manure, so the surface pH likely varies spatially across a manure-covered surface. Due to the lack of a process model and the expected variability, surface pH is modeled as a fixed amount greater than the bulk manure pH, and this amount varies among emission sources.

The movement of NH_3 away from the manure surface into the surrounding atmosphere is modeled using a mass transfer coefficient (Supplemental Table S1). A two-film interface mass transfer model is used to simulate the transfer of ammonia from the soil or manure solution through the liquid–air interface into the atmosphere. The model assumes the presence of quiescent thin films on both sides of the interface where mass transfer is dominated by molecular diffusion. Because NH_3 is very soluble, the liquid coefficient has little effect on overall mass transfer.

In a large volume of manure such as in a storage tank, aqueous phase mass transfer can become limiting. As the NH_3 is emitted, there is a drop in the concentration of TAN at the surface. This forms a gradient in concentration from the bulk material to the surface, and the TAN migrates from the high concentration at lower depths toward the lower concentration at the surface. The rate of this migration is controlled by the resistance to mass transfer (Supplemental Table S1).

The movement of NH_3 away from the manure surface into the surrounding atmosphere is modeled using a mass transfer coefficient. The hourly rate of emission is a function of this overall mass transfer coefficient and the difference in NH_3 concentration between the manure surface and surrounding atmosphere (Supplemental Table S1). Ammonia concentration in the ambient air is negligible and is thus set to zero. The NH_3 concentration in the manure is calculated from the bulk TAN concentration.

Farm Processes

By linking models for the emission processes, emission rates are predicted for each of the major farm sources. Farm processes affecting each source are modeled to determine the appropriate manure and environment characteristics, and the emission process routine described above is used to predict emissions. Farm processes are linked by accounting for losses and transformations as the manure is moved to subsequent farm processes. For example, the total quantity of manure and nutrient constituents removed from the housing facility provide the amounts

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placed into storage or that applied daily to fields when storage is not used.

Animal Housing

Housing facilities include free stall, tie stall, and bedded pack barns and open lots. Exposed manure surface areas in each are established based on typical designs for cattle housing (Penn State Extension, 2013). The soiled areas assigned to tie stall, free stall, bedded pack, and open lot facilities are 1.2, 3.5, 3.0, and 5.0 m^2 per cow, respectively. For growing animals, the areas are 1.0, 2.5, 2.0 and 3.2 m^2 per animal. Manure is represented as a thin layer with a uniform concentration of TAN below the liquid film. Urea hydrolysis is the primary source of TAN in the manure deposited over the barn floor. Diffusion processes are neglected because the layer of manure is thin.

The mass of TAN on the floor of the housing facility is a function of the time animals spend in the facility, amount excreted, manure removal rate, and rates of urea hydrolysis and NH_3 emission. These processes occur simultaneously in our model on a 1-h time step. During the day, urea N accumulates in proportion to time and excretion rate. Urine and fecal production and N excretion are functions of animal size, feed intake, protein intake, and milk production (Rotz et al., 2012). The amount of urea N excreted is set at 70% of the total urine N, with 9% of the fecal N and 1% of the urine N excreted as ammoniacal N (Bristow et al., 1992; Rotz, 2004). All remaining N is in more stable organic forms that do not contribute to emissions from the housing facility.

Manure removal rate is a function of housing type. The fraction of the manure removed each day by scraping, flushing, or infiltration into the manure pack is set to 0.98, 0.98, 0.90, 0.30, and 0.20 for tie stall, flushed free stall, scraped free stall, bedded pack, and open lot facilities, respectively. The portion not removed remains on the exposed surface where emission can continue. As the urea accumulates, the rate of urea N conversion to TAN is determined, and the ammonia emission rate is predicted. Emission rates are determined separately for the lactating cow and growing animal facilities due to differences in manure excretion, composition, and management.

When manure is removed by flushing, three changes are made to account for differences compared with scraped manure. After a scraping operation, a thin layer of manure is spread over the surface. This causes increased CO_2 loss, which increases surface pH and the resulting emission rate. After flushing, a cleaner and wetter floor surface follows, which removes this effect on surface pH. This response is modeled by setting the surface pH equal to that of the bulk manure pH for the first hour after flushing. For manure accumulated after the first hour, the surface pH is modeled the same as after scraping. The removal factor is also increased to 0.98 to represent a cleaner floor immediately after removal. The third change is that the urinary N deposited after flushing is diluted by increasing the volume of solution on the floor by 20%.

Low-emission barn floors are being developed, evaluated, and used to a limited extent to reduce NH_3 emission. Different floor designs are used where urine flows into channels and is carried to a holding area while feces remain on the barn floor. Partial separation of the urine and feces reduces hydrolysis of the urea in the barn. The urine and feces are typically combined for storage where the emission processes continue but at a much lower rate due to less exposed surface area per unit volume. This housing option is modeled by removing half of the urine and the associated TAN from the barn floor and placing it into the manure storage. The remainder enters the storage along with the feces after removal from the barn. This has been shown to appropriately represent the effect of this housing system (Rotz and Oenema, 2006).

Important parameters for predicting housing emissions are temperature, air velocity, and manure pH. For open facilities, temperature is set to that of ambient air. For enclosed, mechanically ventilated barns, air temperature in the barn is set as a function of the outside air temperature to account for increasing ventilation rates with increasing temperature (Supplemental Table S2). Air velocity is assumed to be equal to the ambient wind speed for open lots and at half the ambient wind speed for open, naturally ventilated barns. For mechanically ventilated barns, the air velocity in the barn is determined as a function of ambient temperature (Supplemental Table S2). The pH of excreted cattle manure is about 7 for feces and 8 for urine. The mixture is assumed to have a bulk pH of 7.3 to 7.5. Surface pH is most important because the NH_3 concentration at the surface controls emission rate. For manure on the floor of the housing facility, the surface pH is fixed at 0.7 units above the bulk pH of the mixture (Chaoui et al., 2009; Ni et al., 2009; Blanes-Vidal et al., 2009).

Manure Storage

The storage facility is another important emission source when long-term storage of manure is used on livestock farms. By the time manure is placed into storage, hydrolysis is assumed to be complete, and all urea is converted to TAN. On a given day, the amount of TAN in storage is that accumulated up to that day minus that lost from the storage since loading began. The incoming TAN is that removed from the barn plus a portion of the organic N that mineralizes to an ammoniacal form during long-term storage (Supplemental Table S2).

Manure is stored in a liquid, slurry, or solid form depending on the manure management strategy used. Bedding and manure solids can be separated from manure to form liquid manure (<5% DM). This liquid portion, containing most of the TAN, is typically stored in an earthen basin or tank. Due to wind-induced mixing and the mixing created when manure is pumped into the storage, this liquid portion remains relatively well mixed. When manure is stored as slurry (7–12% DM), less mixing occurs within the storage structure, so diffusion is more important. If the slurry is pumped into the bottom of the storage tank or basin, a crust can form on the manure surface. This crust provides additional resistance, further reducing the rate of migration to the surface. Manure mixed with bedding material may also be stored as semi-solid or solid manure (>12% DM). In this form, diffusion through the manure becomes a major constraint to the emission rate.

Stored manure emissions are modeled on an hourly time step as a function of exposed surface area, temperature, and pH. Slurry and liquid manures are assumed to spread across the exposed surface of the storage where the surface area is determined by the storage dimensions. Thus, in the early stages of loading, manure is in a relatively thin layer, with a large surface area per unit

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volume stored. This surface area-to-volume ratio decreases as the storage fills. The filling process is repeated after each emptying of the storage. Daily loss of NH_3–N is determined such that the cumulative loss up to a given date cannot exceed the accumulated TAN in the storage. This is particularly important in the early stages of loading when a thin layer of manure on the bottom of the storage creates maximum exposure for emission. Manure temperature in the storage is set to the average ambient temperature over the previous 10 d.

Manure pH is modeled as a function of the solids content of the manure. A relationship is used to vary the bulk pH of stored cattle manure from 7 with no manure solids (pure water) to 8.5 with a relatively high solids content (Supplemental Table S2). Carbon dioxide production in the manure is assumed to be due to decomposition of organic matter through microbial activity and therefore is associated with the solids content. With low solids, CO_2 production is low, and the effect of CO_2 emission on manure surface pH is negligible (i.e., the surface pH is the same as the bulk manure pH). With increasing solids, there is greater opportunity for microbial decomposition, formation, and emission of CO_2, and thus a greater increase in surface pH (Supplemental Table S2). For bottom-loaded storages, this surface pH effect is not included because fresh manure is not exposed at the surface.

A major difference among storage types is in the diffusion properties of the manure and the constraint they place on the movement of TAN to the surface. The overall resistance is the sum of the resistances to transport through the bulk manure and from the surface to the free atmosphere including any cover that may be used on the storage (Supplemental Table S1). The effective resistance of the manure was set using the approach of Hutchings et al. (1996) as implemented by Rotz and Oenema (2006). Assigned values are 3×10^5, 2×10^5, 33×10^5, and 0 s m^{-1} for solid, semisolid, slurry, and liquid manure types, respectively. Additional resistances for covered and enclosed manure storages are 2×10^5 and 2×10^6 s m^{-1}, respectively.

Field Application

Manure is applied to fields through daily hauling from the barn or through periodic emptying of a long-term storage. With daily hauling, manure is applied the day it is produced. With 6-mo storage, about half of the annual manure produced and stored on the farm is applied to cropland over 10-d periods in early- to mid-April and early- to mid-October. For 12-mo storage systems, all manure for the year is applied during a 10-d period in April.

Four manure application methods are modeled: broadcast spreading, spray irrigation, band spreading, and direct injection into the soil (Rotz et al., 2011). Some TAN is lost as the manure moves through the air in the application process. This loss is fixed at 1 and 10% of the applied TAN for broadcast spreading and spray irrigation with no loss for band spreading and injection (Rotz and Oenema, 2006). The manure TAN reaching the field surface is that hauled from the barn or manure storage on a given day minus this loss.

When applied to a soil surface, the manure is placed in a thin layer where remaining TAN can readily volatilize as NH_3. Emission from the manure applied on a given day is determined by integrating over the period until the manure is incorporated by a tillage operation. This provides an exponential decline in the emission rate through time as influenced by changes in manure TAN content, infiltration rate, and DM content along with the effects of rainfall and ambient air temperature (Supplemental Table S2). When manure is incorporated on the day of application, an average exposure time of 8 h is assumed. When manure is not incorporated, the remaining TAN becomes negligible after several days, and the emission rate approaches zero. Manure pH is set to increase to 8.6 immediately after application due to the rapid release of CO_2 (Sommer et al., 1991). As the manure lies in the field, the pH decreases at a rate of 0.3 units per day until it stops at a neutral pH of 7.0 (Sommer et al., 1991).

The mass of water contained in the manure on the field surface varies through time. The initial amount after application is determined from the application rate and the manure DM content. The remaining manure moisture is adjusted during each time step for infiltration, evaporation, and rainfall (Supplemental Table S2). Manure TAN on the soil surface also varies through time. The initial TAN is that reaching the soil after the application process. During each time step, NH_3 loss occurs to the atmosphere and TAN moves into the soil in proportion to the infiltration of manure solution (Supplemental Table S2).

To predict loss from manure directly injected into the soil, the process level simulation of surface emission is bypassed. Ammonia N loss is set at 5% of the TAN in manure applied through deep injection into cropland and 8% of the TAN in manure applied through shallow injection to grassland. This provides relatively small losses, similar to those measured in field experiments (Rotz et al., 2011).

Grazing Animals

The approach to modeling NH_3 emission from pastures is similar to that used for field application of manure, except for some simplifying assumptions. The N available for volatilization is the urea N and TAN excreted by grazing animals. Excreted N is determined by how animals are fed, and the portion applied is proportional to the time each animal group spends on pasture. The N in feces is primarily organic, so about 90% of the NH_3 emission occurs from the N in urine (Rotz, 2004). Some of the urine infiltrates into the soil where the urea is hydrolyzed and the resulting TAN binds to the soil. The remaining portion settles on plant and soil surfaces where it comes in contact with urease. Although hydrolysis must occur to transform the urea to TAN, this process is relatively fast compared with the time animals are on pasture. Thus, the hydrolysis process is ignored, and all urea is converted to TAN for the hourly simulation.

The daily urine mass applied is the sum of that from all animals on the pasture. A portion is assumed to immediately infiltrate into the soil and the remainder infiltrates at a slower rate (Supplemental Table S2). If rainfall occurs on a given day, the urine is diluted by the rain. This dilution reduces the concentration of the remaining TAN in the solution and increases infiltration (Supplemental Table S2).

Hourly emission rates are determined based on ambient temperature, air velocity (average daily wind speed), and pH (Supplemental Table S1). The pH is set at 8.5 to reflect the increase that occurs in urine patches after deposition (Haynes and Williams, 1992). The N available for fertilization of the pasture is the N excreted on pasture minus N losses.

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Model Evaluation

The assessment of the accuracy of a model is often called validation. However, the term "validation" implies an extensive statistical evaluation to compare model predicted and measured data to determine if the model prediction is an adequate representation of the measured data. A true validation of a farm-scale NH_3 emission model would require a massive dataset across a full range of environmental and management conditions. Because this type of dataset does not exist, a less formal evaluation is used representing the more important conditions for cattle production systems used in the eastern United States.

Animal Housing

Common cattle housing facilities in the eastern United States are tie stall, free stall, and bedded pack barns. Most reported emission measurements have been made from free stall barns with limited data from tie stall and bedded pack facilities. In the National Air Emissions Monitoring Study, five free stall dairy barns were monitored in the eastern United States, providing extensive data for model evaluation (Bogan et al., 2010; Cortus et al., 2010; Lim et al., 2010). Other published studies present more general data representing a range in barn design, animal type, feeding practices, and measurement methods. Data from all of these sources were used to evaluate model predictions of barn emissions.

National Air Emissions Monitoring Study Data

Aerial emissions from each of the five free stall barns were measured using the same equipment and operating procedure (Bogan et al., 2010; Cortus et al., 2010; Lim et al., 2010). The barns were continuously monitored over a 2-yr period beginning in the autumn of 2007. Ammonia concentrations in air entering and exiting the facilities were measured using an INNOVA 1412 Multi-gas analyzer, and barn ventilation rate was determined by monitoring speed and static pressure of fans along the barn walls. Reported uncertainties in the measured data varied among the locations from 6.6 to 11.6%.

A six-row free stall barn was monitored in Onondaga County New York (Lim et al., 2010). At the beginning of the study, the barn contained 442 stalls and a bedded pack area, but the bedded pack was replaced by free stalls about 6 mo into the monitoring period. The barn was 97.5 m long and 33.5 m wide with 4.3-m-high sidewalls and housed about 470 lactating cows. Animals were fed a total mixed ration consisting of 54% forage (corn and alfalfa silages), ground corn grain, and additional supplemental feeds. Manure was removed using automatic alley scrapers. The manure was cycled through a manure digester, and solids were separated after digestion. Some of the manure solids were used as bedding material along with wheat straw harvested on the farm.

Two barns were monitored in Saint Croix County, Wisconsin (Cortus et al., 2010). The first was 93 m long by 28 m wide with 4-m-high sidewalls containing four rows of free stalls that housed 211 cows. The second was 107 m by 30 m with five rows of free stalls housing 355 cows. Thus, the design of the second barn used about 25% less floor area per cow. Animals were fed a total mixed ration consisting of corn silage, finely ground shelled corn, ground hay, cottonseed, and other supplemental feeds. During the first year of monitoring, a flush system was used to remove manure from the barns three times per day while the cows were being milked. The manure moved through a solids separator, and the liquid effluent was recycled through the flush system. For the second year, the manure flush system was replaced with a tractor scrape system.

The final two barns were in Jasper County, Indiana (Bogan et al., 2010). Each of these was 472 m long by 29 m wide with 4.3-m-high sidewalls and housed 1600 cows. Animals were fed a total mixed ration of about 50% forage and 50% grain. Manure was removed from the barns by scraping where a tractor-mounted scraper was replaced by an automatic floor scraper in late summer of 2009. Manure passed through an anaerobic digester, and solids separated after digestion were used as bedding material.

Each barn was simulated over the monitoring period using continuous weather data collected at the nearest weather station (NOAA, 2013). These weather data were compared with those measured at the site to assure similar values. Characteristics of the herd, feeding strategy, barn, and manure storage were set to represent those of the actual facilities. In our model, parameters such as animal numbers and feeding strategy were constant throughout the simulation, whereas minor variations occurred on the actual farms. Daily emissions per cow were compared over the monitoring period using only those days when measured emissions were reported. Daily values were summarized and reported by season designated as winter (Dec.–Feb.), spring (Mar.–May), summer (June–Aug.), and autumn (Sept.–Nov.). Measured and simulated daily emissions were compared using the mean absolute error, RMSE, systematic RMSE, unsystematic RMSE, and an index of agreement determined using the relationships documented by Waldrip et al. (2013).

For most conditions, the model worked well in predicting NH_3 emissions from these barns (Table 1). The best agreement between measured and simulated data was found for the two barns in Indiana. Mean simulated emissions for each season were close to those measured, and a correlation coefficient of 0.9 and a mean absolute error of 25% were found comparing daily measured and simulated emissions across the 2-yr period. The RMSE of daily values was about 14 g d^{-1} cow^{-1} with low systematic error (Table 1). Measured and simulated daily highs and lows showed agreement (Fig. 2). For each of the barns, there were some outlying measured data. These outliers may have been due to subtle temporary measurement issues or to processes and conditions not represented by the model. Over all years and all barns using manure removal by scraping, the model predicted seasonal emissions similar to those measured with a small overprediction in the summer period and underprediction in the winter (Fig. 3). Simulated and measured daily data were highly correlated, with a mean absolute error of 35%, RMSE of 18.7 g d^{-1} cow^{-1}, and very low systematic error (Table 1).

The model did not predict daily emission rates similar to those measured during the first year for the Wisconsin barns (Table 1), and this difference cannot be fully explained. Measured data showed a similar emission rate across all seasons of the year, whereas the model predicted lower emissions in the winter and high emissions in the summer (Fig. 3). Throughout the second year and for all other barns, the simulated and measured data clearly showed seasonal changes in emission rate (Fig. 2 and 3). During this first year, a flush manure removal system was used in these barns. Compared with a scrape system,

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Table 1. Comparison of measured and simulated ammonia emissions from dairy barns for four seasons from autumn 2007 to autumn 2009.

Season†	New York	Wisconsin				Indiana		Scraped barns, average	Flushed barns, average
		Barn 1, yr 1‡	Barn 1, yr 2	Barn2, yr 1	Barn 2, yr 2	Barn 1	Barn 2		
	g d^{-1} cow^{-1}								
Winter									
Measured§	30.3	33.7	23.7	24.3	15.3	21.4	19.1	22.0	29.0
Simulated	14.9	5.2	7.2	3.7	5.0	14.2	14.6	11.2	4.5
Spring									
Measured	42.5	35.3	38.4	27.9	36.0	42.7	42.9	40.5	31.6
Simulated	40.8	35.0	37.7	32.0	36.5	46.5	49.2	42.1	33.5
Summer									
Measured	65.7	41.9	64.0	33.3	49.4	83.9	82.4	69.1	32.6
Simulated	82.1	77.9	78.5	73.6	69.0	82.0	82.0	78.7	75.8
Autumn									
Measured	48.6	33.8	49.2	26.5	34.9	50.3	47.4	46.1	30.2
Simulated	59.5	44.9	50.6	40.2	45.0	51.8	52.9	52.0	42.6
Annual									
Measured	43.2	36.3	45.3	28.1	33.2	46.9	44.7	42.7	32.2
Simulated	47.6	39.6	45.5	37.4	38.4	44.9	46.2	44.5	39.1
Correlation¶	0.68	0.44	0.88	0.60	0.92	0.88	0.90	0.79	0.46
Mean absolute error	19.1	19.8		19.5		11.5	10.2	15.0	25.4
RMSE#	22.8	23.1		22.9		14.6	12.8	18.7	28.3
Systematic error	6.7	6.4		12.6		3.1	1.5	1.0	8.2
Unsystematic error	21.8	22.2		19.2		14.2	12.7	18.7	27.1
Index of agreement††	0.75	0.73		0.68		0.93	0.95	0.87	0.45

† Winter is Dec. through Feb. spring is Mar. through May; summer is June through Aug.; autumn is Sept. through Nov.

‡ In Wisconsin during year 1, a flush system using recycled manure liquid was used to remove manure; during year 2 and in all other barns, a scrape system was used.

§ Measured data obtained from the National Air Emissions Monitoring Study (Bogan et al., 2010; Cortus et al., 2010; Lim et al., 2010).

¶ Pearson's correlation coefficient calculated using daily values.

Root mean square errors are for simulated vs. measured daily values (Waldrip et al., 2013).

†† A value of 1 indicates complete agreement, and a value of 0 indicates complete disagreement (Waldrip et al., 2013).

flushing is expected to reduce emissions (Ndegwa et al., 2008), but this does not explain the lack of variation in seasonal emission rate. The only other change noted was a change in bedding material in both barns. During the winter and spring, manure solids were used for bedding and during the summer and autumn wood shavings were used. Compared with the use of manure solids, the use of wood shaving bedding has been shown to reduce NH_3 emissions in a tie stall barn by 25% (Powell et al., 2008b). In a free stall barn where less bedding material is used, any effect obtained would not be expected to offset the increase in NH_3 emissions that occurs during the hot summer months. The correlation between simulated and measured daily values was low in these flushed barns, with a mean absolute error over 50%, RMSE of 28.3 g d^{-1} cow^{-1}, and greater systematic and unsystematic error (Table 1). Despite the differences in daily and seasonal values, predicted annual emissions were just 9 and 33% greater than measured over this first year for these two barns.

Other Published Data

Two studies have reported NH_3 emissions from tie stall facilities in Wisconsin. Powell et al. (2008a, 2008b) used four chambers constructed within a tie stall barn to measure the effect of protein feeding and bedding material on NH_3 emissions from bred dairy heifers and lactating dairy cows. Each chamber contained four animals where air flow rates and inlet and outlet gas concentrations were monitored. Emissions were measured during different seasons of the year, resulting in a wide range in barn temperatures for each

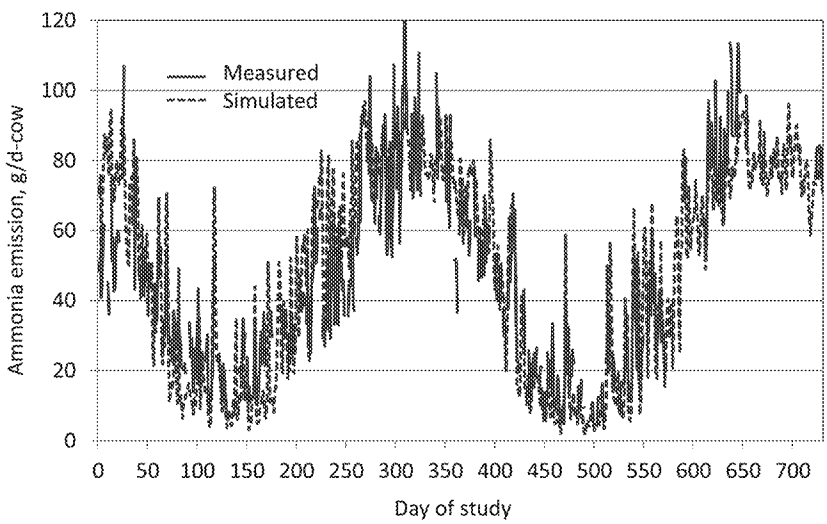

Fig. 2. Measured (Lim et al., 2010) and simulated daily ammonia emissions for a dairy barn in Indiana from September 2007 to September 2009.

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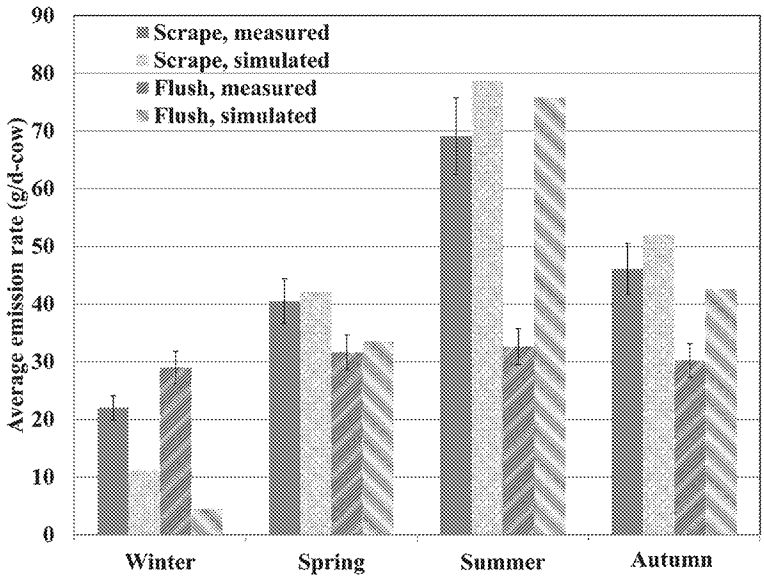

Fig. 3. Simulated ammonia emission rates from dairy barns compared with the mean and reported uncertainty of measured data for each season from autumn 2007 to autumn 2009. For the first year, two barns in Wisconsin used a flush system for manure removal; all others used a scrape system.

treatment (Table 2). Although pine shaving bedding was found to provide a small reduction in emission rate, only the overall seasonal emission data from this study (Powell et al., 2008a) were used in model evaluation. Protein feeding and seasonal effects were evaluated using the data from Powell et al. (2008b) (Table 2). For these two studies, average daily N excretion rates of 238 g per bred heifer and 420 g per cow were reported. Simulated daily N excretions compared well with 262 g per bred heifer and 469 g per cow.

Harper et al. (2009) used open path lasers and inverse-dispersion analyses to measure NH_3 emissions from commercial dairy facilities in Wisconsin. For model evaluation, two of the facilities with complete data were used representing scrape and flush manure removal systems (Table 2). These were large free stall barns housing 900 to 1700 cows. Measurements were made throughout the year, giving a wide range in ambient and barn temperatures, but actual temperatures were not reported.

Adviento-Borbe et al. (2010) measured NH_3 emissions from a naturally ventilated free stall barn in Pennsylvania. The barn housed 120 dairy cows fed precision diets at two protein levels, and manure was removed twice per day by scraping. Ammonia emission measurements were made during 18 12-h-long sampling events during spring and summer using a static flux chamber technique where 64 locations on the barn floor were sampled during each sampling day. Although the flux chamber technique was well suited for collecting many samples to evaluate differences in diet, the procedure did not represent NH_3 emission from a barn floor exposed to ambient air movement. Recognizing this limitation, the authors developed a calibration procedure to adjust NH_3 emissions measured with the static flux chamber to better represent emissions from the naturally ventilated barn. For this procedure, NH_3 emissions from manure inside a mechanically ventilated test room were measured using the flux chamber and compared with emissions determined from measured air flow

Table 2. A comparison of measured ammonia emissions reported in the literature to those simulated using similar animal and feed characteristics and climate conditions.

Reference	Location	Barn type	Animals	Diet protein	Season	Avg. inside air temp.	Emission	
							Measured	Simulated
				% of DM		°C	g d^{-1} AU^{-1}†	
Powell et al., 2008a	central Wisconsin	tie stall, gutter	16 heifers	15.6	winter	5.3	12.4	1.7
				17.1	summer	26.1	27.9	24.5
				16.2	autumn	10.1	28.9	4.3
Powell et al., 2008b	central Wisconsin	tie stall, gutter	16 cows	15.7–17.3	winter	8.7	6.1	0.9
				17.0–21.5	spring	17.5	17.6	18.5
				15.7–17.3	early autumn	21.4	8.1	27.0
Adviento-Borbe et al., 2010	central Pennsylvania	free stall, scrape	120 cows	16.4–17.3	spring	7.5	18.7	21.0
					summer	21.3	30.1	36.6
Harper et al., 2009	south-central Wisconsin	free stall, scrape	900 cows	16.5–17.8	winter	na‡	14.0	12.9
					summer	na	27.7	46.4
					autumn	na	31.1	26.0
	northeast Wisconsin	free stall, flush	1700 cows	17.3–17.8	winter	na	6.6	6.9
					summer	na	32.0	32.3
					autumn	na	19.7	14.7
Smits et al., 1995	The Netherlands	free stall, low emission floor	34 cows	14.7	–	10–24	20.2–26.0	23.5
				20.0	–	10–24	26.0–52.0	32.8
Overall mean							21.4	20.6
Mean absolute error								6.9

† An animal unit (AU) is 500 kg of body weight.

‡ Temperatures were not reported by Harper et al. (2009).

ED_004549_00015788-00008

and NH_3 concentrations at the inlet and outlet of the test room. Their data were then adjusted using the ratio of emission rates from the test room to those measured with the flux chamber. No effect on NH_3 emissions was found between diets in this study; therefore, the average over both diets was used in model evaluation (Table 2).

A final study was used where emissions were measured from a low-emission barn floor in a free stall barn housing 34 dairy cows in The Netherlands (Smits et al., 1995). To represent this barn, the option of free stalls with a low-emission floor was selected in the model as the housing type. This low-emission floor was modeled using partial separation of urine and feces on the barn floor as described above. Two animal diets were fed with very different crude protein concentrations (Table 2). Emission measurements were made over 126 d, providing a range in ambient and barn temperatures.

Each of the five systems was simulated using the facility, manure handling strategy, and type and size of animals used in the experimental study. Feed types and characteristics were set to provide similar diet protein contents as those fed. Each facility was simulated over 1 yr using historical weather data for the region of the study with temperatures similar to those measured during the measurement period. Simulated emission rates were averaged over the same dates of the experiments to compare measured and simulated daily emissions. For consistency, all emissions were expressed per animal unit, where 1 animal unit was 500 kg of body mass.

The model appropriately represented measured emissions and the influences of temperature, diet protein, and manure management strategy (Table 2). There were a few inconsistencies, primarily related to the effect of temperature or season. The largest differences between measured and simulated emissions were for the autumn measurements of the two studies by Powell et al. (2008a, 2008b). For the study using bred heifers (Powell et al., 2008a), the highest emission rate was measured in the autumn, even though the reported temperature during this period was considerably lower than that measured in the summer and only a little greater than that for the winter period (Table 2). The protein content of the diet was also less than that fed in the summer, so this high emission rate cannot be explained with the available information. For the study using lactating cows (Powell et al., 2008b), measured emissions in early autumn were unexpectedly low given that the reported temperatures during this period were greater than that of the summer period. Their measurement may have been confounded by the ventilation rate used or by an error in airflow measurement. The reported airflow rate for this measurement period was relatively low considering the high air temperature reported. Simulated emissions for these tie stall barns also showed an apparent underprediction of emissions during the winter. This underprediction may be due to the barn temperatures being greater than what our model predicted for this type of barn because of the effects of the enclosed chambers within the barn.

For the free stall barn in Pennsylvania, measured and simulated emissions responded similarly to temperature, with a small overprediction by the model (Table 2). Simulated emissions from the two larger dairy operations in Wisconsin were similar to those measured across all seasons. The model also represented a reduction in emission through the use of a flush manure removal system when compared with the scrape system (Table 2). Simulation of the facility in the Netherlands that used a low-emission barn floor produced average emissions near the median of the range measured over similar weather. For the measured and simulated data, emissions from the high-protein diet were about 40% greater than those of the low-protein diet (Table 2).

These comparisons support the effectiveness of the model in predicting NH_3 emissions from various types of dairy barns. Averaged over all comparisons, simulated NH_3 emissions were 4% less than the reported measured values, and simulated values correlated well with measured values ($r = 0.64$) despite the few inconsistencies (Table 2). The mean absolute error over all data comparisons was 33% of the predicted emission.

Manure Storage

National Air Emissions Monitoring Study Data

Emissions from manure storages in Indiana and Wisconsin were monitored over 2 yr using open-path techniques (Grant and Boehm, 2010a, 2010b). Ammonia concentrations were measured using scanning tunable diode laser absorption spectrometry along with meteorological measurements including air flow using 3-dimensional sonic anemometers. From concentration and air flow data, Radial Plume Mapping (RPM) and backward Lagrangian Stochastic (bLS) models were used to calculate emission rates. Reported uncertainties of NH_3 emission measurements were 18 and 24%, respectively, using the RPM and bLS methods. Manure pH, temperature at 0.3 m depth, and local weather conditions were also recorded. Measurements made by the two methods were found to be similar (Grant et al., 2013) and were thus combined to get the maximum number of daily measurements where a daily value required at least 25 valid 30-min measurements within the 24 h.

The manure storage in Indiana was located in Jasper County but at a different farm than the barn-monitoring site. The clay-lined lagoon was 85 m wide and 116 m long (Grant and Boehm, 2010a). At maximum capacity, the liquid depth was 5 m, with a volume of 48,000 m^3 and surface area of 9900 m^2. The lagoon received effluent from the milking parlor and holding area, which provided a more dilute solution than normally obtained from a free stall barn. The daily manure input was set to that of 161 cows, which represented the 2580-cow herd spending 1.5 h per day in the parlor and holding pen area. This storage was not emptied during the year. Emissions were monitored continuously from September 2008 through August 2009. Valid daily measurements were made for 71 d using the RPM method and for 131 d using the bLS method, giving a total of 148 valid daily emission measurements. Simulated emissions for only these days were compared with the measured values.

The manure storage in Wisconsin was on the same farm as the monitored barn (Grant and Boehm, 2010b). Emissions were measured for up to 21 d during each of four seasons over 2 yr. Valid daily NH_3 measurements were obtained for 1 d using the RPM method and for 19 d using the bLS method, for a total of 19 daily values. Most of those days were in the autumn period, providing a relatively limited and unbalanced data set. The first and second stages of a three-stage lagoon system were monitored. The first lagoon had a surface area of 4264 m^2 and a volume of 10,600 m^3 at maximum capacity. The second had a surface area

ED_004549_00015788-00009

of 2900 m^2 and a volume of 6420 m^3 at maximum capacity. The lagoons were emptied twice during the year.

For these manure storages, the model predicted daily NH_3 emission rates representative of those measured (Table 3). For the Indiana storage, a weak correlation was found between simulated and measured daily values, with a high mean absolute error of 69%. For the limited data of the Wisconsin site, a very high correlation was obtained, but the error was also high. Averaged over days, simulated NH_3 emissions were similar to those measured during each season for both manure storages. Summer emissions in Wisconsin were greater than those measured in Indiana due to a greater N concentration in this stored manure. The average simulated emission over all measurement dates was equal to that measured at the Indiana site and 14% greater at the Wisconsin site. At the Indiana site, most of the RMSE among daily values were unsystematic, but in Wisconsin the systematic and unsystematic errors were similar (Table 3).

Other Published Data

Data from four studies were used to further evaluate the manure storage component. In the first study, NH_3 emissions were measured from an earthen manure storage pond in Ohio (Zhao et al., 2007). A convective flux chamber technique was used to measure emissions for 1 d per month from April through November. The storage pond was 61 m wide, 128 m long, and 4.6 m deep with a capacity of 34,000 t of liquid manure. A settling basin was used to partially remove sand bedding and manure solids. The storage was emptied twice per year in April and September.

A dairy farm was simulated using the animal and manure storage characteristics of the monitored farm. Model inputs for feed characteristics and manure solids separation were selected to provide manure entering the storage consistent with that of the monitored farm. For a simulated year, days during each month were selected where the ambient temperature and the amount of manure in the storage were similar to that reported on the day measurements were made. Simulated daily emissions for each month were similar to those measured (Table 4). Over all measurements, the correlation between simulated and measured daily emissions was high (r = 0.97), with a relatively low error and with the mean simulated emission 10% greater than the measured emission.

A second study was used to evaluate the model's ability to represent surface covers. In an experiment conducted in Denmark, NH_3 emissions were measured over an 8-mo period (Feb.–Sept. 1990) from several small manure storage tanks with different storage covers (Sommer et al., 1993). Although the experiment included data for swine manure, only the emissions from tanks storing dairy cattle slurry manure were used for model evaluation. Cover treatments included stirred slurry with no cover, a natural crust cover, and a lid providing an enclosed structure. Other covers included oil, peat, straw, foil, and expanded clay aggregate. As long as an adequate cover was maintained, these other covers had similar effects in reducing emissions and thus were grouped for model evaluation.

A dairy farm was simulated using historical weather for this region of Denmark over the period of the study. A dairy herd and manure storage were defined in the model to represent the manure and storage characteristics of the experimental study but at a larger scale suitable for a small dairy farm in this region. Simulated average daily area-specific emissions were similar to measured emissions over the measurement period (Table 5). Seasonal effects were represented well by the model with emissions during the summer period being about double those during the winter and spring periods. The effect of the cover material also provided similar simulated emission reductions as those

Table 3. Measured and simulated ammonia emission rates from manure storages at two locations and for four seasons during the years 2008 and 2009.

Measurement period, statistical measure	Indiana					Wisconsin				
	Valid days†	Measured‡		Simulated		Valid days	Measured		Simulated	
		Mean	SD	Mean	SD		Mean	SD	Mean	SD
		μg s^{-1} m^{-2}					μg s^{-1} m^{-2}			
Spring§	47	27.1	14.9	24.1	26.7	0				
Summer	24	50.5	21.4	47.2	43.2	2	170.0	56.4	236.0	55.9
Autumn	33	22.4	9.4	21.0	15.4	14	16.8	14.6	12.4	12.2
Winter	44	2.3	6.5	8.9	15.1	3	0.0	2.3	0.6	0.3
Annual average	148	22.5	20.7	22.6	28.1	19	29.8	53.2	34.1	73.2
Daily correlation¶				0.56					0.98	
Mean absolute error				15.5					13.2	
RMSE#				23.7					25.2	
Systematic error				5.0					18.6	
Unsystematic error				23.2					17.0	
Index of agreement††				0.72					0.96	

† Emission rates were determined from open-path measurements using the radial plume mapping or backward Lagrangian Stochastic emission models. Valid daily data from each method were averaged or used where a valid daily measurement was obtained when there were at least 25 of 48 valid half-hour measurements throughout the day.

‡ Measured data were obtained from the National Air Emissions Monitoring Study (Grant and Boehm, 2010a, 2010b).

§ Winter is Dec. through Feb., spring is Mar. through May, summer is June through Aug.; autumn is Sept. through Nov.

¶ Pearson's correlation coefficient calculated using daily values.

Root mean square errors are for simulated vs. measured daily values (Waldrip et al., 2013).

†† A value of 1 indicates complete agreement, and a value of 0 indicates complete disagreement (Waldrip et al., 2013).

ED_004549_00015788-00010

Table 4. A comparison of measured ammonia emissions from a dairy manure storage pond in Ohio with emissions simulated by the Integrated Farm System Model under similar climatic conditions.†

Month	Daily ambient temp.		Ammonia emission	
	Measured	Simulated	Measured	Simulated
	°C		g d^{-1} m^{-2}	
Apr.	11	12.5	4.1	3.3
May	21	14.5	7.8	8.8
June	20	23.2	6.1	6.3
July	26	24.8	14.6	14.5
Aug.	26	24.5	9.9	13.4
Sept.	15	20.9	2.9	3.2
Oct.	4	12.8	0.8	1.1
Nov.	0	7.6	0.5	0.9
8-mo avg.	–	–	5.8	6.4
Correlation				0.97
Mean absolute error				2.4

† Measured data from Zhao et al. (2007).

measured for the natural crust (62 vs. 66%), other cover (76 vs. 77%), and enclosed storage types (94 vs. 91%) (Table 5).

In the third comparison, measured NH_3 emission data were used from a study of farm-scale tanks containing anaerobically digested manure from a biogas plant with and without surface covers (Sommer, 1997). Emissions were continuously monitored over a full year using a micrometeorological mass balance technique. The input to the digester included 75% animal slurry and 25% slaughter house and fish processing waste. A manure storage of the actual size (surface area of 519 m^2) was simulated with and without an enclosed cover using weather for this region of Denmark for the year of the study (1994). The material entering the storage was simulated as digestate, with N and DM contents similar to that of the measured material. Without a cover, simulated and measured NH_3 emissions were well correlated across seasons ($r = 0.98$), and the simulated total emission for the year was 10% greater than that measured (Table 5). Simulated emissions were a little greater than that measured in the spring and autumn and a little less during the summer period. Both the deep straw and clay bead covers used on the actual storage were very effective in reducing NH_3 emission (Sommer, 1997). This reduction was represented by the model using an enclosed manure storage, which provided a 95% reduction in NH_3 loss (Table 5).

In the final comparison, the manure storage on farm 2 of the study by Harper et al. (2009) was simulated. The manure produced was that of the northeast Wisconsin dairy farm with 1700 cows (Table 1). The manure storage consisted of two adjacent lagoons and a sand/solids separation channel, with exposed surface areas totaling 24,400 m^2. The lagoons stored cattle

Table 5. A comparison of measured ammonia emissions from cattle manure in different storages in Denmark and Wisconsin to that simulated with the Integrated Farm System Model using similar weather and manure storage conditions.

Storage type	Period of year	Emission		Emission reduction	
		Measured	Simulated	Measured	Simulated
		g d^{-1} m^{-2}		%	
		Slurry manure†			
Open	winter–spring	4.4	4.1	–	–
	summer	6.4	8.8	–	–
	both periods	4.9	5.5	–	–
Crust	summer	2.2	3.3	66	62
Cover	winter-spring	0.9	0.9	80	78
	summer	1.5	2.1	77	76
	both periods	1.1	1.3	79	76
Enclosed	winter–spring	0.5	0.2	88	95
	summer	0.2	0.5	97	94
	both periods	0.4	0.3	91	94
		Digested slurry‡			
Open	winter	4.0	4.4	–	–
	spring	5.6	8.8	–	–
	summer	26.6	24.0	–	–
	autumn	8.5	11.1	–	–
	annual	4.0 kg m^{-2}	4.4 kg m^{-2}	–	–
Cover/enclosed	annual	0.1–0.27 kg m^{-2}	0.24 kg m^{-2}	93–97%	95
		Liquid manure§			
	winter	0.0¶	0.43	–	–
	summer	4.2	5.0	–	–
	autumn	2.9	1.9	–	–
Overall mean		4.5	5.0	84.1	83.8
Overall correlation			0.98		0.96
Overall mean absolute error			1.0		3.2

† Measured data from Sommer et al. (1993).

‡ Measured data from Sommer (1997).

§ Measured data from Harper et al. (2009).

¶ Below the detection limit of the measurement procedure (Harper et al., 2009).

ED_004549_00015788-00011

manure along with runoff from the barns and parlor wash water. Ammonia emissions were measured using the same open-path lasers and inverse–dispersion analysis used to measure the barn emissions described above for this farm (Harper et al., 2009). The storage was modeled as reported with liquid manure stored at a DM content of 5%. The storage was simulated over a full year, and average emissions for December to February, June to July, and October to November were compared with those reported for winter, summer, and autumn, respectively. Simulated NH_3 emissions were well correlated with those reported across the three seasons ($r = 0.91$) (Table 5). During the winter period, emissions were below the minimum quantification limits of the monitoring equipment (Harper et al., 2009), and simulated emissions were also very low. During the summer period, simulated emissions were 19% greater than measured values; this result was within the uncertainty of the measurement procedure (Harper et al., 2009). During the autumn period, simulated emissions were slightly less than the measured value.

These comparisons across different published studies further support that the model can appropriately represent NH_3 emissions from different types of manure storages. Over all comparisons of different storage conditions, simulated emissions were well correlated ($r = 0.97$) with measured values. The average of simulated values was 10% greater than the average of measured values, with a mean absolute error of 22% (Table 5).

Field Application

Ammonia emissions from field-applied manure are related to the DM content of the manure, with greater emissions from drier manure (Sommer and Olesen, 1991). The time the manure remains on the soil surface is also a major factor, with 50 to 75% of the potential emission lost during the first day. Emissions are influenced by the weather, with greater emissions in warmer temperatures and suppressed emissions after rain. Through a comprehensive review and summary of field measured data, Meisinger and Jokela (2000) reported NH_3 losses as a function of manure DM content and time to incorporation (Table 6). For model evaluation, field application of dairy manure was simulated for 25 yr of Pennsylvania weather, and simulated annual percentages of TAN loss were compared with the reported values. The model was able to represent these major effects. The simulated 25-yr mean emissions were similar to those reported for different manure DM contents, and the range in annual predictions normally encompassed the reported mean values (Table 6). The model overpredicted the first-day emission from solid (>20% DM) manure, but the agreement was very good for all other forms of manure and periods of manure exposure.

For a second evaluation, NH_3 emissions measured over 4 yr after various application methods were compared with those simulated using the same conditions in central Pennsylvania. Emissions were measured using ventilated chambers and passive diffusion samplers (Dell et al., 2012). Two trials were conducted each year after dairy manure applications in 2006 and 2007 and swine manure applications in 2008 and 2009. Application methods included broadcast without incorporation, broadcast with tillage incorporation within an hour of application, and subsurface injection. Each application method was simulated using the actual weather data for the experimental periods from State College, Pennsylvania, about 30 km from the field site. Simulated manure DM and N contents were set to those of the manure applied in the field experiment (Table 7) (Dell et al., 2012).

For most trials, predicted total emissions after application were very similar to measured emissions (Table 7). Exceptions were that the simulated emissions after broadcast application in the 2006 trials were about 25% less than that measured, and the emission after one of the 2007 trials using incorporation was high. These differences appear to be associated with wind speed because the historical weather data indicate a relatively low wind speed during the 2006 trials, whereas, on the first day of the 2007 trial, the average wind speed was much greater. Because wind speeds at the field site were not measured, differences in reported wind conditions cannot be evaluated. The chamber method used to measure NH_3 emissions may have also protected the sampling area from the wind's effect on emission rate. Overall, predicted total emissions after the application methods and the reduced emission obtained from rapid incorporation and subsurface injection were normally within 20% and often within 10% of measured values (Table 7). Predicted emissions averaged 9% greater than measured values, with a mean absolute error of 23%.

Grazing

To evaluate NH_3 emissions from grazing animals, simulated emissions were compared with data measured over three grazing seasons in The Netherlands using a micrometeorological mass balance method (Bussink, 1992, 1994). Reported data were averaged for three periods defined as spring, summer, and

Table 6. Reported and simulated total ammonium nitrogen losses after field application of various forms of cattle manure.†

Manure	Dry matter content	Reported losses		Simulated annual losses‡			
		First day	Not incorporated	First day incorporation§		Not incorporated¶	
		Mean	Mean	Mean	Range	Mean	Range
		%					
Solid	>20	40	90	71	57–86	83	71–93
Semi-solid	12–20	60	80	54	38–67	70	56–82
Slurry	8–11	45	60	38	28–53	56	43–68
Liquid slurry	<8	30	40	25	16–36	43	31–54

† Reported losses from Meisinger and Jokela (2000).

‡ Average annual losses of ammonia-N as a fraction of available total ammoniacal N. The mean is a 25-yr average, and "range" is the range in annual values predicted for individual years.

§ Manure is incorporated the same day it is applied (within 8 h), and ammonia emission ceases after incorporation. These simulated data can be generally compared with the reported losses during the first day after field application.

¶ Manure remains on the surface until all total ammoniacal N is lost or incorporated by infiltration.

ED_004549_00015788-00012

Table 7. A comparison of measured and simulated ammonia emissions from dairy cattle and swine manure applied to crop land using different application methods.†

Application date and method	Manure DM‡ content	Manure TAN§ content	Emission		Emission reduction	
			Measured	Simulated	Measured	Simulated
	%	g L^{-1}	kg NH_3–N ha^{-1}		%	
2006 trials, dairy manure						
Broadcast	9.6	1.3	63	48.1	–	–
Broadcast and incorporated	9.6	1.3	12	12.2	82	75
Injected	9.6	1.3	5	3.6	91	93
2007 trials, dairy manure						
Broadcast	9.1	1.5	62	68.4	–	–
Broadcast and incorporated	9.1	1.5	11	33.8	82	51
Injected	9.1	1.5	1	4.2	99	94
2008 trials, swine manure						
Broadcast	3.4	1.5	51	54.4	–	–
Injected	3.4	1.5	4	4.2	93	92
2009 trials, swine manure						
Broadcast	1.7	1.7	35	35.6	–	–
Injected	1.7	1.7	2	4.8	93	87
Overall mean			24.6	26.9	90	82
Overall correlation				0.93		0.83
Overall mean absolute error				5.6		8.7

† Measured data from Dell et al. (2012).

‡ Dry matter.

§ Total ammoniacal N.

autumn (Table 8). A Dutch dairy farm, similar to that modeled by Rotz et al. (2006), was simulated over 25 yr of weather for The Netherlands using similar stocking rates and the same fertilizer application as that used in the original study. Predicted daily emissions per cow were averaged over the same periods defined by the measured data for comparison. With a moderate level of N fertilization, the model predicted greater emission rates than those measured, particularly in the spring and autumn periods (Table 8). Under heavy use of fertilizer, simulated and measured emissions were similar (mean absolute error, 5%).

A second evaluation of NH_3 emission from grazing cattle was conducted using data from a study by Lockyer and Whitehead (1990). Measurements made during different seasons of the year were compared with values predicted by the model simulating emissions from dairy cattle on pasture in the United Kingdom under similar temperature conditions. Comparisons were based on the percentage of total urine N deposited that was lost by volatilization. Simulated losses were well correlated (r = 0.91) with measured losses across seasons (Table 9). During the winter, simulated losses were considerably less than those measured. The N loss measured in the winter appears high compared with those measured in the spring and autumn considering the relatively cold winter temperature. This response in the measured data cannot be explained with the available information. The wind tunnel procedure used may have affected measured emission rates, but the wind velocity used in the simulation was that produced in the wind tunnel (normally 1 m s^{-1}). Simulated losses in the spring were a little less than that measured, but there was good agreement during the summer and autumn periods (Table 9).

Although there were some differences between measured and simulated data, these two evaluations confirm that the model can represent NH_3 emissions from grazing cattle. Over all com-

Table 8. Measured and simulated ammonia emissions from grazing Holstein dairy cattle in The Netherlands.†

Season‡	Average ammonia emission			
	Moderate fertilization§		Heavy fertilization	
	Measured	Simulated	Measured	Simulated
	kg d^{-1} cow^{-1}			
Spring	6.3	34.7	39.0	39.7
Summer	32.5	44.4	71.7	68.9
Autumn	11.8	30.7	40.4	37.6
Correlation		0.72		0.91
Mean absolute error		19.7		2.8

† Data from Bussink (1992) and Bussink (1994).

‡ Spring represents early May to mid-June, summer is mid-June to late Aug., and autumn is Sept. and Oct.

§ Moderate fertilization is 250 kg N ha^{-1} per year of inorganic nitrate fertilizer plus manure N deposited on pasture. Heavy fertilization is 400–550 kg N ha^{-1} per year plus manure N deposited on pasture.

Table 9. Measured and simulated ammonia nitrogen loss from grazing dairy cattle in England.†

Season‡	Air temp.	Ammonia N loss	
		Measured	Simulated
	°C	% applied N	
Winter	4.0	11.8	2.2
Spring	8.9	9.6	5.5
Summer	19.8	24.7	24.4
Autumn	12.7	12.0	12.1
Correlation			0.91
Mean absolute error			3.5

† Measured data from Lockyer and Whitehead (1990).

‡ Measurements made in Jan., Mar., July, and Sept., respectively.

ED_004549_00015788-00013

parisons made, simulated emissions were well correlated with measured values ($r = 0.83$), with simulated values averaging 15% greater than those measured (mean absolute error of 30%).

Potential Model Improvements

Although the model provides a useful tool in its current form, there are potential improvements that could be made to better represent system processes. The proportion of urinary N in the form of urea varies with diet. As new information comes available, this will be made to vary with the amount and form of protein intake. Better understanding is needed to predict the surface pH of manure. An improved model of the processes controlling manure pH, particularly at the surface, would be useful (Hafner et al., 2013). Considering the continuous mixing of the manure and application of fresh urine and feces on the floor of a housing facility, a process-based model of this component may be impractical. A model predicting surface pH may be more practical for simulating the effect on emissions when the manure remains undisturbed during storage and after field application.

For manure storage, a mechanistic model of the kinetics and mass transfer of the compounds within the stored manure would be useful. Our simplified approach of using a mass transfer resistance provides a model that captures the average transfer, but it does not consider effects from daily or seasonal changes in manure and environmental conditions. Despite these shortcomings, model predictions compare well with measured NH_3 emission rates from dairy farms, suggesting that the model is a reasonable representation of these processes.

Model Application

To demonstrate the use of the farm model, simulations were conducted to compare tie stall and free stall housing facilities, grazing of animals, and different manure handling strategies on a representative dairy farm in Pennsylvania. Parameters were set to represent a typical farm and the animal and manure management strategies commonly used in this region. This simulation analysis is provided as an example of further evaluation of the NH_3 emission model within a whole farm simulation and to illustrate the interactions and overall impacts of management changes. A comprehensive evaluation with complete documentation of all model parameters and assumptions is beyond the scope of the present analysis. Only important parameters are provided to support the systems compared, including the type of equipment and facilities used and their initial costs. Prices of all farm inputs and outputs were set to reflect long-term relative values in current dollars. Additional details on the farm model are provided by Rotz et al. (2012).

The farm was on 100 ha of a medium silt loam soil. Crops grown included 20 ha of alfalfa, 50 ha of corn, and 30 ha of perennial grassland. Crops were fertilized with dairy manure produced on the farm along with additional inorganic N fertilizer applied to corn and grassland at a rate of 60 kg N ha^{-1}. Alfalfa and grass were produced and fed primarily as silage and secondarily as dry hay. Corn was harvested and fed as silage and high-moisture grain. The dairy herd consisted of 100 Holstein cows plus 80 replacement heifers. Animals not on pasture were fed total mixed rations to maintain a target annual milk production of 10,000 kg per cow. Rations were prepared using the feeds produced on the farm plus purchased supplemental feeds required to meet energy, protein, and mineral requirements.

Four production strategies were compared on the representative farm. For the first two strategies, cows were housed in a tie stall barn and heifers were housed in a bedded pack barn. Manure was removed from gutters in the tie stall barn each day and broadcast onto crop or grassland without incorporation. The initial cost of the housing facility was $285,000 plus $160,000 in milking and manure handling equipment. For the first strategy, animals were housed and fed all year in barns. For the second strategy, the 30 ha of grassland was converted to pasture, and heifers and nonlactating cows were rotationally grazed from April to October. Initial costs for creating the pasture were $20,000 for the perimeter fence, $6000 for electric fencing, and $5000 for watering equipment. Labor for pasture management was set at 5 h per week. The grassland received the manure from the grazing animals plus 30% of the manure removed from the barns.

For the third and fourth strategies, all animals were housed and fed all year in free stall barns. Manure was scraped from the barn floors twice daily and pumped into the bottom of a slurry storage tank, allowing a natural crust to form on the storage. Manure was removed from the tank each April and October for broadcast application to farm land. Initial costs for the housing and manure storage facilities were $247,000 and $68,000, respectively. Investments in milking and manure handling equipment were $120,000 and $113,000, respectively. The fourth strategy was similar to the third except that an unsealed cover (initial cost of $18,500) was used on the manure storage, and injection equipment was added to the manure applicator (added initial cost of $17,000) to place the manure under the soil surface.

The use of the tie stall barn with daily hauling of manure gave an annual NH_3 emission of 56 kg per cow, with most of this emission occurring after field application (Table 10). By grazing the heifers and nonlactating cows during the growing season, NH_3 emissions from the pasture were offset by reduced emissions from the barn and field applied manure, giving an 8% reduction from the farm (Table 10). Other benefits included a 10% reduction in the carbon footprint of the milk produced and an increase in farm profit through reduced costs for bedding, labor, and fuel. The high concentration of N deposited in urine and fecal spots on pasture increased nitrate leaching and denitrification losses from the farm by 8 and 5%, respectively.

The use of free stall barns for all animals gave similar barn emissions as the combined tie stall and bedded pack barns used in the first strategy (Table 10). Combined emissions from manure storage and field application increased NH_3 emission from the farm by 18%. With greater NH_3 emission to the atmosphere, nitrate leaching and denitrification losses were reduced by 14%. Other effects included a small increase in the carbon footprint of the milk produced and an increase in farm profit. The use of a cover on the manure storage and injection of the manure during field application reduced storage emissions by about 35%, with an 85% reduction in NH_3 emission after field application. Methane emission from the manure storage was also reduced, which decreased the carbon footprint of milk by about 15%. The increased cost of the cover and injection equipment along with increased operating costs for fuel and labor reduced annual farm profit by $27 per cow.

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Table 10. Simulated annual environmental impacts and economics of using different housing facilities and manure handling methods on a representative Pennsylvania dairy farm.†

	Tie stall barn		Free stall barn	
	Daily haul‡	Daily haul, grazing§	Slurry storage¶	Covered storage, injection#
Ammonia emission, kg cow^{-1}				
Barn	19.3	15.1	18.2	18.5
Manure storage	0.0	0.0	9.3	6.0
Field application	36.8	31.7	38.7	5.8
Pasture	0.0	5.0	0.0	0.0
Total	56.1	51.8	66.1	30.3
Net greenhouse gas emission, kg CO_2e cow^{-1}				
Housing and animal	6643	5626	4668	4674
Manure storage	0	0	3085	1328
All other	3914	3878	3470	3492
Carbon footprint, kg CO_2e kg^{-1} milk	1.06	0.95	1.12	0.95
Nitrogen loss, kg ha^{-1}				
Volatilization	46.2	42.6	54.4	24.9
Leaching	25.9	28.0	22.3	31.5
Denitrification	21.8	22.9	19.0	25.8
Production costs, \$ cow^{-1}	3649	3546	3517	3565
Income, \$ cow^{-1}	4042	4029	4033	4054
Net return to management, \$ cow^{-1}	393	483	516	489

† Herd of 100 cows plus 80 replacement heifers on 100 ha of cropland (20 ha alfalfa, 50 ha corn, and 30 ha grass) annually producing 10,000 kg of milk (3.5% fat) per cow.

‡ Manure was removed from gutters each day and applied to crop or grass land.

§ Same as daily haul, except that 30 ha of grassland on the farm were converted to pasture (including fencing and watering costs) and heifers and dry cows were rotationally grazed during the growing season.

¶ Manure was scraped from barn floor twice daily and pumped into the bottom of a slurry storage tank that was emptied in April and October with broadcast application to farm land.

Same as slurry storage except that an unsealed cover was used on the manure storage and manure was injected into the soil during field application.

These simulations illustrate the ability of the farm model to capture dynamic interactions among farm processes to predict whole farm NH_3 emissions along with other environmental effects and farm economics. This also demonstrates how the model can be used to evaluate and compare the effects of mitigation strategies and other farm management changes.

Conclusions

A process model that predicts NH_3 emissions from cattle manure was incorporated in a farm simulation model (Integrated Farm System Model), where it is used to estimate daily and annual whole farm NH_3 emissions from dairy and beef cattle production systems. Performance of the emission component was evaluated through a comprehensive comparison of simulated emissions to measured and published emission data from differing barn designs, protein feeding levels, manure storage types, field application procedures, and pasture systems.

The expanded farm model provides a tool for evaluating management effects on NH_3 emissions and the interacting effects on nitrate leaching, greenhouse gas emissions, nutrient runoff losses, and farm profitability. Simulation of a representative dairy farm in Pennsylvania illustrates the benefits and costs of the use of different barn designs, use of grazing, long-term manure storage, a manure storage cover, and subsurface application of manure.

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Here you go!

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NRMRL QUALITY ASSURANCE PROJECT PLAN

Office of Research and Development (ORD)
National Risk Management Research Laboratory (NRMRL)
Air Energy and Management Division (AEMD)
Energy and Natural Systems Branch (ENSB)
Distributed Source and Buildings Branch (DSBB)

Development of Emission Estimating Methodologies for Air Emissions from Animal Feeding Operations

QA Category B: Model Application
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Research Triangle Park, NC 27711

Approvals

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Table of Contents

Approvals 2
Figures 5
Tables 5
Distribution List 6
Acknowledgments and Disclaimers 6
Acronyms and Abbreviations 7
1.0 Project Description and Objectives 10
1.1 Background 10
1.2 Project Objective 11
2.0 Project Organization and Responsibilities 11
2.1 Project Personnel 11
2.2 Project Schedule 12
3.0 Emissions Database 14
3.1 Data Sources and Quality Metrics 14
3.1.1 Changes to Data Quality Procedures 14
3.1.1.1 Inclusion of open/area source emissions determined by the BLS method 14
3.1.1.2 Revision of the data completeness criteria 15
3.2 Data Analysis, Interpretation and Management 15
3.2.1 Initial Data Analysis Techniques 15
3.2.2 Determining ES&P categories for EEM development 16
3.3 Data Storage 18
4.0 Model Development 18
4.1 Development of New Statistical Models 19
4.1.1 Conceptual Model 19
4.1.2 Model Parameters 21
4.1.3 Computer Hardware/Software 21
5.0 New Statistical Model Application 23
5.1 Use & Limitations 23
5.2 Description 23
6.0 Model Verification and Evaluation 23
6.1 Approach 23
6.2 Model Evaluation 24
6.3 Assessment Process 25
7.0 Reporting 25
7.1 Project Documentation 25
7.2 Deliverables 26

8.0 References 27

Figures

Figure 1. Organizational chart. 13

Tables

Table 1. Potential emission source categories for NAEMS AFO sites. 17
Table 2. Parameters to be investigated in the first stage of EEM development for each emission source category. 21
Table 3. Parameters measured during NAEMS for barns and lagoons 22

Distribution List

Copies of this plan and all revisions will be sent initially to the following individuals. It is the responsibility of the EPA/NRMRL/AEMD's Technical Lead Person to make copies of the plan available to all project personnel.

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Acknowledgments and Disclaimers

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Acronyms and Abbreviations

AEMD	Air and Energy Management Division (within EPA)
AFO	animal feeding operation
ATM	atmosphere(s)
β_0	intercept
β_k	regression coefficient
BLS	Backwards Lagrangian Stochastic
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CORE	Central Operations and Resources (within EPA)
DC	direct current
DSBB	Distributed Source & Buildings Branch (within EPA)
ε	error term
EEM	emission estimating methodology
ENSB	Energy & Natural Systems Branch (within EPA)
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-To-Know Act
ES&P	emission source & pollutant
FAC2	fraction of predicted values within a factor of 2 of observations
FB	fractional bias
ft^3	cubic feet
ft/sec	feet per second
gal	gallon(s)
HAP	hazardous air pollutant
H_2S	hydrogen sulfide
IFSM	Integrated Farm System Model
kg	kilogram(s)
kPA	kilopascal(s)
lb	pound(s)
m	meter(s)
MB	mean bias
M&DQ QAPP	measurement and data quality assurance project plan
ME	mean error
MG	geometric mean bias
mg/g	milligram(s) per gallon

AEMD	Air and Energy Management Division (within EPA)
mg/l	milligram(s)m per liter
min	minute
MSA	manure surface area
MV	mechanically ventilated
mv	millivolt(s)
N	nitrogen
n	number
NAEMS	National Air Emissions Monitoring Study
NAS	National Academy of Sciences
NH_3	ammonia
NH_4^+	ammonium
NMB	normalized mean bias
NME	normalized mean error
NMSE	normalized mean square error
NRG	Natural Resources Group (within EPA)
NRMSE	normalized root mean square error
NO_2^-	nitrite
NO_3^-	nitrate
NRMRL	National Risk Management Research Laboratory (within EPA)
NV	naturally ventilated
OAQPS	Office of Air Quality Planning & Standards (within EPA)
OAR	Office of Air and Radiation (within EPA)
ORAU	Oak Ridge Associated Universities (contractor)
ORD	Office of Research & Development (within EPA)
P	phosphorous
pH	Measure of hydrogen ion concentration
PI	principal investigator (of study)
PM	particulate matter
$PM_{2.5}$	particulate matter, with a diameter less than or equal to 2.5 micrometers
PM_{10}	particulate matter, with a diameter less than or equal to 10 micrometers
QA	quality assurance
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
RMSE	root mean square error

AEMD	Air and Energy Management Division (within EPA)
S	sulfur
SAB	Science Advisory Board
SAS	Statistical Analysis Software
SPPD	Sector Policies and Programs Division (within EPA)
temp	temperature
TKN	total Kjeldahl nitrogen
TLP	technical lead person
TSP	total suspended particulates
USDA	United States Department of Agriculture
VG	geometric variance
VOC	volatile organic compound
VRPM	Vertical Radial Plume Mapping model
Wt.%	weight percentage
W/m^2	watt(s) per meter squared
X_k	independent or predictor variables
Y	dependent variable
%	percentage
°	cardinal directions; degrees of a compass
°C	degrees Celsius

1.0 Project Description and Objectives

1.1 Background

Animal feeding operations (AFOs) are agricultural operations where animals are kept and raised in confined areas (U.S. Environmental Protection Agency (EPA), 2017a). For over six decades, there have been movements to improve profitability within animal agriculture, resulting in fewer, but larger AFOs that are also more geographically concentrated. For example, a study by Graham and Nachman (2010) determined that since the 1950's, production of livestock and poultry have more than doubled, while the number of operations had decreased by 80%. In a recent report, the EPA estimated using U.S. Department of Agriculture (USDA) 2007 census data that there were approximately 2.2 billion livestock and poultry producing an estimated 1.1 billion tons of manure in the United States (U.S. EPA, 2013). AFOs and the associated manure emit various pollutants into the atmosphere including ammonia (NH_3), hydrogen sulfide (H_2S), volatile organic compounds (VOCs) and particulate matter (PM) (Aneja et al., 2008). Thus, there are concerns regarding these facilities due to the potential impact these compounds can have on human health and the environment.

AFOs can directly emit a significant amount of PM into the atmosphere (Takai et al. 1998). Emissions of NH_3 from AFOs can also lead to the formation of secondary PM. Atmospheric NH_3 is the dominant alkaline gas in the atmosphere and reacts with a variety of acidic atmospheric species (i.e. sulfuric, nitric and hydrochloric acid) to form ammonium (NH_4^+) PM (Seinfield and Pandis, 2006). As a particle, the NH_4^+ aerosol impacts atmospheric visibility (Seinfield and Pandis, 2006). The NH_4^+ particle also contributes a significant fraction of total $PM_{2.5}$ mass (Adams et al., 1999). The inhalation of $PM_{2.5}$ can have a number of adverse health effects including premature mortality (Pope et al., 2002). Gaseous NH_3 and NH_4^+ PM are removed through wet and dry deposition to the earth's surface, which may result in the eutrophication of terrestrial and aquatic ecosystems (Galloway, 2003). Gaseous H_2S can contribute to the formation of $PM_{2.5}$, although its primary effect is related to its odor, and has an odor characteristic described as "rotten eggs" (Schiffman et al., 2001). In addition, some VOCs are also odorous. Emissions of odorous compounds can impact people who live nearby, as they can potentially affect human health (Schiffman and Williams, 2005) and quality of life (Wing and Wolf, 2000). Additionally, many VOCs are classified as hazardous air pollutants (HAPs). HAPs are described by the EPA as "pollutants that are known or suspected to cause cancer or other serious health effects such as reproductive effects or birth defects, or adverse environmental effects" (U.S. EPA, 2017b). VOC emissions can also have regional effects. VOCs are generally reactive, and can, through a set of reactions, form ozone. Ozone can have negative impacts on the human respiratory system, and is associated with mortality (Ito et al., 2005).

Air emissions from AFOs are not regulated by any AFO specific standards within the Clean Air Act (CAA), but AFOs could emit air pollutants in sufficient quantity to trigger certain general CAA permit requirements or emission reporting requirements under two other statutes: (1) Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and (2) Emergency Planning and Community Right-to-Know Act (EPCRA). Both CAA permitting requirements and emission reporting requirements are triggered only if a facility produces emissions over certain regulatory thresholds. In the late 1990's, the EPA recognized that they did not have adequate air emissions data from AFOs to develop reliable emission estimating

methodologies (EEMs) for determining whether individual farms are subject to CAA permit requirements or emission reporting requirements (U.S. EPA, 2017c). This lack of sufficient AFO data is partly related to the difficulty in characterizing air emissions, as there is a diversity in production, management and environmental conditions at AFO sites. In 2001, the EPA and the USDA asked the National Academy of Sciences (NAS) to evaluate the current state of the science and provide recommendations on estimating air emissions from AFOs. In their 2003 seminal report (NAS National Research Council, 2003), NAS made several recommendations including a recommendation that the "EPA and USDA should initiate and conduct a coordinated research program to produce a scientifically sound basis for measuring and estimating air emissions from AFOs". Subsequently, in 2005, a voluntary Air Compliance Agreement between the EPA and the animal industries was announced. In this agreement, the industry agreed to fund a large-scale emissions monitoring study known as the National Air Emissions Monitoring Study (NAEMS). Furthermore, as part of the Air Compliance Agreement, the EPA was to use the NAEMS emissions data and other relevant data sources to develop EEMs, while the AFO industry participants agreed to use these EEMs to estimate their emissions for purposes of complying with applicable CERCLA and EPCRA reporting requirements.

The NAEMS is the most comprehensive AFO air pollution monitoring study to date, measuring emissions from representative broiler, layer, swine and dairy AFOs in the U.S. over a monitoring period of two years. The NAEMS measured emissions of NH_3, H_2S, VOCs, and PM at 27 monitoring sites. While making emission measurements, production, management and environment conditions were also monitored and/or documented.

Air monitoring for the NAEMS began in 2007 and ended in early 2010 with the data submitted to EPA by August 2010. After organizing, documenting and analyzing the data, two draft reports containing draft EEMs for NH_3, H_2S, VOC, and PM emissions from broiler houses and NH_3 emissions from swine and dairy lagoon/basins were developed. In February 2012, the EPA submitted these draft reports to the Science Advisory Board (SAB) for review and for their recommendations, which were returned to the EPA in April 2013. The SAB identified several concerns with the draft EEMs and recommended that the EEMs should not be used to estimate air emissions from AFOs on a national scale.

Currently, per the Air Compliance Agreement, the EPA is still tasked with developing EEMs, which is the subject of this QAPP.

1.2 Project Objective

To develop EEMs for air emissions from AFOs using data from the NAEMS and other relevant data sources.

2.0 Project Organization and Responsibilities

2.1 Project Personnel

This work will be conducted under the EPA's continued effort to develop and implement approaches that can be used to quantify farm-by-farm emission estimates. Project personnel for

this effort will include multiple individuals from EPA/ORD/NRMRL and EPA/OAR/OAQPS. The primary personnel are described here with organization connection details contained in Figure 1.

Ian Rumsey (ORD/ENSB) is the project coordinator and principal investigator (PI) for this study. He is responsible for communicating the overall project technical direction to EPA ORD contractor (ORAU), Chelsey Fattal, as well as to the other project coordinators and NAEMS-EEM supporting investigators. Chelsey Fattal (ORD/DSBB) will provide assistance in the modeling of air emissions from AFOs as well as providing support in other areas of the project. John Walker (ORD/ENSB) and Eben Thoma (ORD/DSBB) are the leads in providing technical support and guidance to this project, however, William Yelverton (ORD/ENSB Chief) and Richard Shores (ORD/DSBB Chief) will also provide technical support and guidance. John Walker, Eben Thoma, William Yelverton and Richard Shores will review the QAPP and provide comments. William Schrock (OAR/NRG) and Allison Costa (OAR/NRG) are co-lead project coordinators in OAQPS and will provide support and guidance to this project. William Yelverton and Richard Shores will also perform personnel management roles for ORD and will communicate appropriately with other ORD supervisors as required. Robin Dunkins (OAR/NRG) will provide guidance to this project, perform personnel management roles for OAR and will communicate appropriately with other OAR supervisors as required. William Schrock, Allison Costa and Robin Dunkins will review the QAPP and provide comments.

Libby Nessley (ORD/NRMRL) is the QA Manager and QA lead for this project for activities performed within NRMRL. Ms. Nessley will formally review and approve this QAPP per NRMRL requirements. As needed, Ms. Nessley will review and approve project reporting as part of EPA ORD's publication clearance process to verify that the project was implemented as specified in this document. Joe Elkins (OAR/OAQPS) is the QA Manager for OAQPS. Mr. Elkins will formally review and approve this QAPP per OAQPS requirements.

2.2 Project Schedule

The overall effort for this project started in January 2017. Initial project tasks involved preparing and planning for EEM development, which included determining the status of the NAEMS data set and developing this QAPP for the development of EEMs for air emissions from AFOs. The draft QAPP was submitted in November 2017. It is currently unknown how much time will be spent developing EEMs for the various emission source and pollutant (ES&P) categories, however, the plan is to determine a schedule for EEMs development in consultation with our group members in OAQPS in the third quarter of FY 2018. A summary of the project timeline and the anticipated project schedule is as follows:

- 01/8/17-03/13/18: Project preparation and planning.
- 11/27/17: Draft QAPP submitted for QA review.
- 03/13/18: Final version of initial QAPP completed.
- 06/30/18: Determine EEMs schedule for ES&P categories.

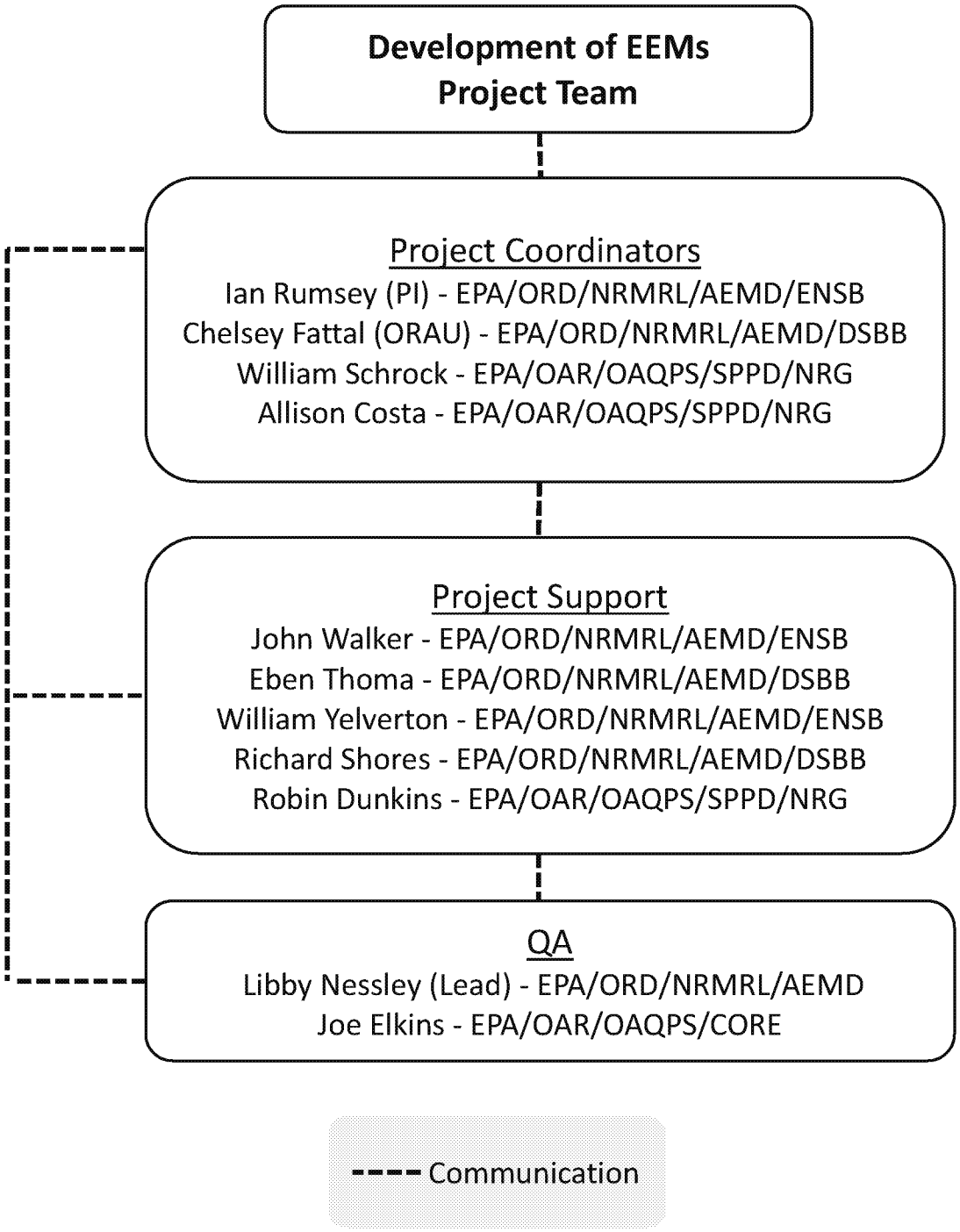

Figure 1. Organizational chart.

3.0 Emissions Database

3.1 Data Sources and Quality Metrics

EEMs will be developed using data from the NAEMS. The NAEMS data was collected under rigorous quality assurance/quality control (QA/QC) procedures that are outlined in the Measurement and Data Quality QAPPs (M&DQ QAPPs). Separate M&DQ QAPPs were developed for monitoring from barn and open/area sources associated with the project (Heber et al., 2008; Grant et al., 2008). The M&DQ QAPP was used to develop a NAEMS data set that was analyzed and used for 2012 draft EEM development reports, hereafter referred to as "2012 EEM reports". However, applying the data quality and validation procedures associated with the M&DQ QAPPs resulted in small open/area source data sets. In their review of the 2012 EEM reports, the SAB suggested two approaches that could be used to increase the amount of available data. These were to include the use of open/area source emissions determined by the Backwards Lagrangian Stochastic (BLS) method and revise the data completeness criteria. In this project, these SAB suggested changes to data quality procedures will be applied to the NAEMS dataset, thus producing a revised version of the NAEMS data set. Section 3.1.1 will discuss the rationale, methodology and application of these changes to the data quality procedures.

The potential need for additional non-NAEMS data in developing EEMs will be investigated if appropriate at a later stage of the project and addressed in a secondary data addendum to this QAPP.

3.1.1 Changes to data quality procedures

3.1.1.1 Inclusion of open/area source emissions determined by the BLS method

In the NAEMS, emissions for open/area sources could potentially have been determined using two different methodologies, the BLS method and the Vertical Radial Plume Mapping model (VRPM) method (both discussed in M&DQ QAPP (Grant et al. 2008)). However, open/area source emissions determined by the BLS method were not included in the initial NAEMS database as there were concerns with the validity of the measurement method. However, after the publication of the 2012 EEM reports, a validation study was reported by Grant et al. (2013a) (Dr. Richard Grant is the NAEMS PI for open/area sources). In the Grant et al. (2013a) study, NH_3 emissions, determined by both the BLS and VRPM methods were compared at eight NAEMS monitoring sites. In comparison, the overall BLS mean emission estimate was found to be 5% ± 25% lower than the VRPM method. Based on their findings, Grant et al. (2013a) concluded that that both the BLS and VPRM methods "can be assumed to equally represent the actual flux conditions for open waste lagoon sources". Therefore, for this project, emissions determined by the BLS method will be included in the database as suggested by the SAB, thus meaning that this project will develop EEMs using emission data determined by both the BLS and the VRPM method. The inclusion of emissions determined by the BLS method will increase the amount of data, as there were times when the BLS method produced valid emissions when the VPRM method did not. In periods, when both the BLS method and VRPM method determine valid emissions, an overall emission value will be determined based on the methodologies described in Grant et al. (2013a) and Grant et al. (2016).

3.1.1.2 Revision of the data completeness criteria

In general terms, the criteria for data completeness outlined in the M&DQ QAPPs (Heber et al. 2008; Grant et al. 2008) was to use data where ≥75% of the data was valid within a set time period, however, due to difficulties associated with open source micrometeorological measurements, this criterion resulted in a small number of valid emission days and thus limited open/area source daily data sets. As a result of the limited open/area source data sets, the SAB suggested expanding the data completeness criteria in order to increase the amount of valid data. This suggested change to data quality procedures was investigated in a recent study by Grant et al. (2013b). In the Grant et al. (2013b) study, the fraction of NH_3 emissions needed to determine an accurate daily average using NAEMS data from swine finishing and swine sow farms in Oklahoma was investigated. Using the statistical relationship between air temperature and NH_3 emissions, Grant et al. (2013b) determined that to have a daily emissions error of < 25%, at least 25 out of 48 (52%) 30-minute measurements needed to be valid (additional information on the methodology for determining daily emission error values is provided in Grant et al. (2013b)). Therefore, based on this study, the data completeness criteria for open/area source data for the updated NAEMS data set will be revised from 75% to 52%, thus meaning that daily emissions will be considered invalid if less than 52% (25) of the 48 30-minute periods recorded during that day were valid. This data quality procedure revision from 75% to 52% will increase the open/area source data set size.

It should be noted that the aforementioned M&DQ QAPP data completeness criteria value of 75% had less of an effect on the amount of valid barn emissions data. The potential need to revise this value for barn source emissions will be assessed at a later date, if appropriate.

3.2 Data Analysis, Interpretation and Management

3.2.1 Initial Data Analysis Techniques

Initial data analysis on the revised NAEMS data set (due to revisions discussed in the Section 3.1.1) will include time series analysis and composite hourly average analysis of pollutant emissions, concentrations, air flow (ventilation rate for barns and wind speed for open/area sources) and environmental parameters at each AFO site over each seasonal sampling period. In addition, summary statistics such as mean, maximum, minimum, median, standard deviation and number (of data points) values will be determined for pollutant emissions and environmental parameters over seasonal, annual and bi-annual time periods for each AFO. The animal diet (if available) and manure management practices at each AFO site will also be examined during the monitoring periods. This analysis allows a macro examination of trends in data and can be used to provide a qualitative guide to the influence of production, management and environmental conditions on emissions. This analysis can also be used to identify potential data trends that may need further investigation. This analysis may also help determine the number of EEMs that need to be developed since EEMs will be developed for different emission source categories and this analysis will help determine the appropriate emission source categories for this study (described in further detail in section 3.2.2). Progress in data analysis will be documented in informal reports (see section 7.1 for more details).

3.2.2 Determining ES&P Categories for EEM Development

Before EEM development, an initial determination of emission source categories for the NAEMS AFO sites will be completed. AFO emission source categories are typically developed where there is a significant difference in how AFO site conditions affect emission processes, however, determining when there is a significant difference in how conditions affect emissions processes can be complex and depends on the diversity of the conditions associated with each production type. AFO emission sources can be categorized by general production type (i.e. broiler, layer, dairy, swine) and general source type (i.e. barn, lagoon/basin, corral). However, within these categories, more specific determination of emission sources may be needed as differences in production type, manure management practices, and barn and manure storage type can significantly influence emission processes and thus emissions, meaning that additional emission source categories may potentially need to be developed. Table 1 presents the possible emission source categories for the NAEMS AFO sites. The first column determines the number of emission source categories based on general production type and the general source type with thick solid lines around each category, yielding seven emission source categories. The second column determines the number of emission source categories based on specific production type and specific source type that pertains to the additional differences in AFO site characteristics that may influence emission processes. These emission sources categories are indicated by dashed lines and yield thirteen emission source categories. While it is known that general production type and general source type (barn, lagoon/basin, corral) have a significant influence on emission processes and thus need separate EEMs, it is not known whether the differences in specific production type and specific source type (presented in the second column) have a significant influence on emission processes. The number of emission source categories will be initially investigated using the initial data analysis techniques described in section 3.2.1. However, the emission source categories might be revised during subsequent stages of EEM development as the influence of different site conditions are further investigated. Progress in determining emission source categories will be documented in informal reports (see section 7.1 for more details). There is currently no established criterion to determine whether an emission source warrants its own category. Any future criterion that is developed will likely consider data analysis, model characteristics and model performance, and will be decided in consultation with our project members in OAQPS, who will be responsible for approving the final report.

In terms of pollutants, there are six pollutant categories for barns including three gases NH_3, H_2S, VOCs and three sizes of PM, $PM_{2.5}$, PM_{10} and total suspended particulates (TSP). For open/area sources, there are also pollutant categories for NH_3, H_2S and VOCs, but not for PM, since PM emission measurements were not conducted at open/areas sources in the NAEMS as emissions from open/area sources are insignificant in comparison with barn emissions.

Table 1. Potential emission source categories for NAEMS AFO sites.

Emission Source Categories		NAEMS AFO Site ID
General Production Type/ General Source Type	**Specific Production Type[1]/ Specific Source Type**	
Broiler Barn source	Broiler Barn-MV	CA1B KY1B-1 KY1B-2
Layer Barn source	Layer High Rise Barn-MV	CA2B NC2B IN2H
	Layer Manure Belt Barn & Manure Shed-MV	IN2B
Dairy Barn source	Dairy Barn & Milking Center-MV	IN5B WI5B NY5B
	Dairy Barn-NV	CA5B WA5B
Dairy Corral Source	Dairy Corral	TX5A
Dairy Lagoon/Basin source	Dairy Lagoon	IN5A
	Dairy Basin	WI5A WA5A
Swine Barn source	Swine-Sow Gestation Barn & Farrowing room-MV	IA4B NC4B OK4B
	Swine-Finisher Barn-MV	IN3B NC3B
Swine Lagoon/Basin source	Swine-Sow Lagoon	IN4A NC4A OK4A
	Swine-Finisher Lagoon	NC3A OK3A
	Swine-Finisher Basin	IA3A

[1] Provided if applicable
MV = mechanically ventilated
NV = naturally ventilated

3.3 Data Storage

The data collected for NAEMS (discussed in sections 1.1 and 3.1) is stored using the Microsoft Access® software platform. The NAEMS database was originally developed by the Eastern Research Group under contract EP-W-12-006, Work Assignment 0-01. The database is designed to receive data submissions electronically to minimize the potential for errors introduced during data entry. The database can receive different types of data including MS excel files, text files and XML files. The NAEMS database is stored in its own designated folder on the L-drive (path:L:PRIV/NRML_AEMD/DROP/Ian Rumsey/NAEMS databases), which automatically backs up on a daily basis. The database folder will be private and will only be available to group members. The NAEMS database will contain database files for each emission source category. Database files will be stored with the version number and date in the file name. Any changes to the database files will result in creating a new version of the database with new version number (version numbering will be sequential) and appropriate date. The database folder will contain the current and all historical versions of the database.

4.0 Model Development

Broadly, there are two different types of methodologies or modeling approaches that can be used to estimate air emissions from AFOs. These are process modeling and statistical modeling. Process modeling can be defined as a "procedure by which the behavior of a system is derived from a set of functional components and their interactions with each other and the system environment through physical and mechanistic processes occurring over time." (Makela et al., 2000). As applied to this project, it means that air emissions would be estimated by using mathematical equations that describe the biological, chemical and physical processes involved in air emissions from AFOs. Statistical models are developed through statistical analysis of empirical data, which is then used to determine which factors (parameters) influence emissions and the relationship between the parameters and the emissions. From this, a statistical model is developed, which can be used to predict emissions at AFOs.

A general option available in regards to estimating emissions from AFOs is to use or modify and use a process or statistical model that has already been developed and is published in peer-reviewed journals. When selecting a model to use from literature, it is also important to consider the ease in which the models can be implemented to estimate emissions by the agricultural community, therefore the ease of implementation by the agricultural community will be evaluated for each model and will be taken into consideration when deciding if the models in these studies can be used or modified for use in EEM development in this current effort. Progress in evaluating the ease of model implementation by the agricultural community will be documented in informal reports (see section 7.1 for more details).

In selecting statistical models from literature for use, the priority is to use any statistical model that has been developed based on NAEMS data and that have been evaluated for its accuracy in predicting NAEMS emissions. An example of models in literature that fulfill this criterion are the statistical models developed by Grant et al. (2013b) and Grant et al. (2016). Grant et al. (2013b) and Grant et al. (2016) describe the development of statistical models using NAEMS data to predict NH_3 emissions from swine lagoons. In the Grant et al. (2013b) and Grant et al. (2016) studies,

there are models of varying complexity, which are each evaluated for accuracy (see section 6.3 for model evaluation results for the Grant et al. (2013b) and Grant et al. (2016) studies). As mentioned, the ease of implementation by the agricultural community will also be evaluated for each model and will be taken into consideration when deciding if the models in these studies can be used or modified for use for EEM development in this current effort.

In selecting process models from literature for use, the priority is to use a process model that has accurately predicted NAEMS emissions based on NAEMS input data. An example of a model available in literature that fulfills this criterion is the dairy gas emission model, which is a process-based sub-model of the Integrated Farm System Model (IFSM) developed by USDA. In Rotz et al. (2014), the dairy gas emission model was used to estimate NH_3 emissions from NAEMS dairy barns and dairy manure storage structures. The Rotz et al. (2014) study also includes an evaluation of the accuracy of the process model in predicting NAEMS NH_3 emissions (see section 6.3 for model evaluation results for the Rotz et al. (2014) study). Similarly, the ease in which this model can be implemented by the agricultural community will be evaluated and will be taken into consideration when deciding if this model will be used or modified for use for EEM development in this current effort.

If for an emission source and pollutant category, there is no suitable model available in literature to use or use after modification, then the second option available is to develop new statistical models.

4.1 Development of New Statistical Models

4.1.1 Conceptual Model

Multivariable statistical models will be developed to estimate air emissions at AFOs. Multivariable statistical models can be defined as models that have two or more independent or predictor variables and one dependent or response variable. For this study, the dependent or response variable is emissions (for each ES&P category) and the independent or predictor variables are parameters that represent the varying conditions at an AFO. If the modeled emissions for an ES&P category are related to one predictor variable, then accordingly, a univariable statistical model will be developed.

Due to the wide variance in conditions at AFOs, developing EEMs is a complex process, therefore the first stage of EEM model development will use a focused approach to develop models based on factors (parameters) that satisfy the following conditions:

1. Known to have a major influence on air emissions from AFOs
2. Well monitored by the NAEMS
3. Can easily be monitored by the agricultural community

Some of the factors that satisfy the aforementioned conditions influence both gas and particulate emissions, while some only influence gas or particulate emissions. The reason for this differentiation is that many of the processes that generate gas and particulate emissions from AFOs are different. While gas emissions are related to the formation, generation, release and emission of chemical specie in gas form from manure, particulate emissions are caused by physical suspension (or release) of a range of different materials in barns including feed, manure, bedding, animal skin, and feathers (Cambra-Lopez et al., 2010) that are then emitted from the barn into the atmosphere.

Factors that satisfy the aforementioned conditions and influence both gas and particulate emissions include the amount of manure produced at an AFO. The amount of manure produced at an AFO is a function of the number and weight of animals at an AFO site, which therefore serves as a proxy for this factor. While the number of animals at an AFO is typically determined daily as part of the farming operation, weight is commonly estimated based on initial and final weights, which are typically recorded by the producers. The significance of the influence of animal number and weight on AFO air emissions is supported by the units used for reporting AFO emissions, which are typically reported either normalized for the number of animals or for live animal weight, which is the product of animal number and weight. The influence of both production terms will be investigated in the first stage of EEM model development for all ES&P categories. Manure surface area (MSA) is another factor that has a major influence on both gas and particulate emissions. Typically, a larger MSA results in increased emissions. The significance of this factor on manure storage is supported by lagoon emissions being typically reported in units normalized for surface area. Increased MSA in animal housing can increase emissions per animal (USDA, 2016), therefore this factor will also be investigated for barn EEM model development and thus all ES&P categories.

Gas emissions are additionally influenced by temperature as temperature affects chemical specie concentration in manure due to its influence on the decomposition of manure, the Henry's law constant and the dissociation constant. Gas emissions are also influenced by temperature due to its effect on the transfer of chemical compounds from manure into the free-air stream. The transfer occurs through two processes, diffusion, which transports chemicals through the manure to its surface and convective mass transfer, which transfers the gas from the manure surface into a free air stream (Ni, 1999). The process of diffusion is dependent on temperature (Ni, 1999) whereas the convective mass transfer is dependent on temperature and the air velocity above the manure surface (Ni, 1999 and references within; Montes et al., 2009 and references within). Increasing air velocity above the manure surface also reduces the boundary layer thickness above the manure surface, therefore lowering the resistance to volatilization (Arogo et al., 1999). The transfer rates through the manure and gas phases vary for different chemical specie and are governed by chemical specie solubility. The influence of temperature and air velocity will be investigated for all emission source and gas pollutant categories. For open/area sources AFO sites, these factors will be investigated using measurements of ambient temperature and wind speed. For barn sources, these factors will be investigated using ambient temperature and barn temperature and ventilation rate which are inter-related to ambient temperature. Ventilation rate also controls the air velocity across the manure surface in barns.

PM emissions are controlled by factors that influence the suspension of materials in the air. This process is influenced by the moisture content of the material. High moisture levels cause manure particles to aggregate together, meaning they have greater resistance to being suspended in the air. Manure moisture is influenced by temperature, relative humidity and ventilation rate as well as manure management practices. The influence of moisture content will be investigated for all barn source and PM categories using measurements of ambient temperature, barn temperature ventilation rate and ambient relative humidity.

As mentioned, statistical models will be developed to estimate air emissions at AFOs. For this method, the main goals will be to identify which parameters (that satisfy the conditions provided earlier in this section) have a significant influence (e.g. p-value) on pollutant emissions and also the relationship between the significant parameters and emissions. As mentioned, a focused approach is being used in the first stage of this study, meaning that the relationships

between parameters and emissions will also be investigated by considering observed physical relationships between the parameters and emissions. Often the observed relationships between parameters and emission processes are non-linear, resulting in non-linear relationships between the parameters and emissions. An example of using the observed physical relationship between the parameter and emission processes to develop a model that predicts emissions is provided by Grant et al. (2016), in which statistical models were developed to predict NH_3 emissions at five NAEMS swine lagoon sites. In the Grant et al. (2016) study, models were developed that included the influence of air temperature on NH_3 emissions. In the models, Grant et al. (2016) related air temperature to NH_3 emissions using the Van't Hoff equation, which includes an exponential function to describe the influence of temperature. The Van't Hoff equation relates the changes of equilibrium constants such as the Henry's Law constant and the dissociation constant, which influence emissions due to the change in temperature.

The performance of these first stage statistical models will be evaluated and will serve as a guide to the level of sophistication needed in later stages of model development.

4.1.2 Model Parameters

Section 4.1.1 describes the parameters that will be investigated in the first stage of EEM development. A summary of these parameters and the associated main emission source category is provided in Table 2.

Table 2. Parameters to be investigated in the first stage of EEM development for each emission source category.

Main Emission Source Category	Parameters
Gas Open/area	n & weight of animals, MSA, ambient temp, wind speed
Gas Barn	n & weight of animals, MSA, ambient temp, barn temp, ventilation rate
PM Barn	n & weight of animals, MSA, ambient temp, barn temp, ventilation rate, ambient relative humidity

n = number
temp = temperature
MSA = manure surface area

After the first stage of EEM development, there may be additional statistical analysis conducted to determine if other parameters measured during the NAEMS have a significant influence on emissions. Model development and final model description will be documented in the informal reports (see section 7.1 for more details). A list of parameters measured during the NAEMS is provided in Table 3.

Table 3. Parameters measured during NAEMS for barns and lagoons (modified from 2012 draft EEM reports (U.S. EPA, 2012a; U.S. EPA 2012b)).

	Parameter	Units
Barn Conditions	Temperature	°C
	Relative humidity	%
	Activity (personnel and livestock)	Volts DC
	Light operation	On/off
	Feeder operation	On/off
	Livestock heater operation	On/off
	Barn dimensions	m
	Ventilation rate	m^3/min
Meteorological Conditions	Ambient temperature	°C
	Ambient relative humidity	%
	Barometric/Atmospheric pressure	kPa/ATM
	Surface wetness	millivolts
	Solar radiation	Watts/m^2
	Wind speed	ft./sec
	Wind direction	Degrees
Manure Characteristics	Manure volume	Gal
	Manure loadout (Solids, N, NH_3, TKN, Ash)	Wt.%
	Layer/Surface manure (Solids, N, NH_3, TKN, Ash)	Wt.%
	Bedding / Litter (pH, Ash, NH_3, Solids, N)	Wt.%
Livestock Characteristics	Age	Days
	Livestock inventory/Mortality	n of animals
	Animal weight	Truck balance
	Average livestock mass	kg
Mass Balance Information	Feed consumption rate	lb
	Feed (Sulfur, Ash, Solids, TKN, N) content	mg/g
	Milk (TKN, N) & Eggs (Solids, N, TKN, Ash)	mg/g
	Water consumption	gal
	Incoming/new bedding addition rate	lb
	Incoming/new bedding nitrogen content	mg/g
	Litter nitrogen volume	ft^3
	Litter nitrogen content	mg/g
	Water (TKN, P, Sulfur, N, NO_3^- & NO_2^-)	mg/l
Lagoon Liquid Conditions	Lagoon Temperature	°C
	Lagoon pH	pH
	Sludge & liquid depth	m
	Lagoon appearance	coloration
	Pit liquid TAN	mg/l
	Lagoon reduction/oxidation (redox) potential	millivolts
	Lagoon dimensions	m

4.1.3 Computer Hardware/Software

The statistical models will be developed using Statistical Analysis Software (SAS v9.4, Cary, NC).

5.0 New Statistical Model Application

5.1 Use & Limitations

The developed statistical models will be used to estimate air emissions from AFOs. Statistical models are restricted by the uncertainty of the parameters used to develop them. Another limitation of statistical models is related to the data used to develop them. While the aim of the NAEMS was to measure air emissions from AFO in a wide range of conditions, it is not possible to make measurements that represent all conditions at AFOs in the U.S. For example, air emissions measurements during the NAEMS were not made during all possible air temperatures. As a result, extrapolating the model beyond the range of development (i.e. for temperature extremes) would increase the uncertainty associated with estimated air emissions.

5.2 Description

An example of a multivariable statistical model that may be developed is the multiple linear regression model, which is described as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k + \varepsilon \qquad (1)$$

In equation 1, Y is the dependent variable, $X_1, X_2, \ldots, X_k$ are the independent or predictor variables, β_0 is the intercept and $\beta_1, \beta_2, \ldots, \beta_k$ are regression coefficients and ε is the error term. If a univariable statistical model is developed, the model is described as follows:

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon \qquad (2)$$

Non-linear regression models may also be developed. A non-linear regression model takes the same form as equation 1 or 2 with the exception that at least one of the regression coefficients is non-linear.

6.0 Model Verification and Evaluation

6.1 Approach

The statistical models will be verified by using re-sampling methods. Before re-sampling methods can be applied, the ES&P datasets have to be finalized and statistically characterized. It

is expected that the statistical characteristics of each ES&P category will vary and this may influence the choice of re-sampling methods. Possible re-sampling methods to verify EEMs include cross-validation, which involves dividing the ES&P data into two parts, a training set, which is used to develop the EEM and a validation set, which is used to predict the responses (James et al., 2017). There are different types of cross-validation approaches including the standard validation set approach, the leave-one-out cross-validation approach, and the k-fold cross-validation approach (James et al., 2017). Another potential re-sampling method is the bootstrap approach. The bootstrap approach allows the use of computer software to simulate the process of obtaining new data by repeatedly sampling observations from the initial data set, so the error of a predictive model can be estimated without generating additional samples (James et al., 2017). If chosen, bootstrapping would be performed using SAS. Before performing model verification, the various re-sampling methods will be evaluated for different ES&P data sets, which will aid in the process of deciding which re-sampling methods will be used. Informal reports will document the model verification approach (see section 7.1 for more details).

6.2 Model Evaluation

Agreement between observed and model predicted emissions will be evaluated using a variety of different methodologies that have been used in the evaluation of atmospheric models (Walker et al., 2014; Tong and Mauzerall, 2006), including fractional bias (FB), geometric mean bias (MG), mean bias (MB), normalized mean bias (NMB), mean error (ME), normalized mean error (NME), normalized mean square error (NMSE), geometric variance (VG) and fraction of model predicted values within a factor of two of observed values (FAC2). Root mean square error (RMSE) is a further methodology that can be used to assess a model (Bruce and Bruce, 2017) in addition to normalized root mean square error (NRMSE).

$$\text{FB} = \frac{2(\overline{E_{obs}} - \overline{E_{mod}})}{(\overline{E_{obs}} + \overline{E_{mod}})} \tag{3}$$

$$\text{MG} = \exp(\overline{lnE_{obs}} - \overline{lnE_{mod}}) \tag{4}$$

$$\text{MB} = \frac{1}{n}\sum_{i=1}^{n}(E_{mod}(i) - E_{obs}(i)) \tag{5}$$

$$\text{NMB} = \frac{1}{n}\frac{\sum_{i=1}^{n}(E_{mod}(i) - E_{obs}(i))}{\sum_{i=1}^{n}E_{obs}(i)}\, x100\% \tag{6}$$

$$\text{ME} = \frac{1}{n}\sum_{i=1}^{n}|E_{mod}(i) - E_{obs}(i)| \tag{7}$$

$$\text{NME} = \frac{1}{n}\frac{\sum_{i=1}^{n}|E_{mod}(i) - E_{obs}(i)|}{\sum_{i=1}^{n}E_{obs}(i)}\, x100\% \tag{8}$$

$$\text{NMSE} = \frac{\overline{(E_{obs} - E_{mod})^2}}{\overline{E_{obs}E_{mod}}} \tag{9}$$

$$\text{VG} = \exp\left[\overline{(lnE_{obs} - lnE_{mod})^2}\right] \tag{10}$$

$$FB = \frac{2(\overline{E_{obs}} - \overline{E_{mod}})}{(\overline{E_{obs}} + \overline{E_{mod}})} \quad (3)$$

$$RMSE = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(E_{mod}(i) - E_{obs}(i))^2} \quad (11)$$

$$NRMSE = \frac{\sqrt{\frac{1}{n}\sum_{i=1}^{n}(E_{mod}(i) - E_{obs}(i))^2}}{\frac{1}{n}\sum_{i=1}^{n}E_{obs}} x\ 100\% \quad (12)$$

Where $\bar{E}$ (overbar) is the average over the data set, n is the number of data points, E_{mod} and E_{obs} are the corresponding model predicted emissions and observed emissions and *i* the *i*th model-observation data points. Walker et al. (2014) and Tong and Mauzerall (2006) evaluated observed and predicted air concentrations, but the methodologies can be similarly used for emission values. These different methodologies quantify bias and/or scatter of model predicted emissions. Informal reports will document the model evaluation results (see section 7.1 for more details).

6.3 Assessment Process

There is currently no established criterion to determine whether the models are of sufficient quality for their intended use. Any future criterion for model quality that is developed will likely be decided in consultation with our project members in OAQPS, who will be responsible for approving the final report. However, model evaluation results can be examined for EEMs already developed and published in peer-reviewed journals (Grant et al., 2016; Rotz et al., 2014), although it is currently unknown how the performance of the EEMs developed in this project for the various ES&P categories will compare to those in the Grant et al. (2016) and Rotz et al. (2014) studies. Grant et al. (2016) developed statistical models to predict NH_3 emissions at five NAEMS swine lagoon sites. The most successful of the models developed by Grant et al. (2016) predicted emissions with a NRMSE ranging from 21-51% across sites with an overall site average NRMSE of 37%. Rotz et al. (2014) is another published study that describes the development and evaluation of an EEM. In the Rotz et al. (2014) study, a process-based emission model was developed for dairy NH_3 emissions and was used to predict emissions for barns and lagoons at various dairy sites including the NAEMS dairy sites. In comparison to measured NAEMS emissions, model predicted emissions had a NRMSE ranging from 29 to 75% for each site with an average NRMSE value across all sites of 49%. Model NME values reported by Rotz et al. (2014) were lower than NRMSE values with an NME ranging from 23 to 64% for each site with an average NME value of 41% across all sites. The error of the process based model developed by Rotz et al. (2014) for predicting dairy lagoon emissions at two NAEMS sites was higher with NRMSE values ranging from 85 to 105% and NME ranging from 44 to 69%.

7.0 Reporting

7.1 Project Documentation

Informal reports, which will be created at a minimum on a quarterly basis, will be used to

report progress in data analysis, determining emission source categories, evaluating the ease of model implementation by the agricultural community, and model development (including any significant changes in the model). In addition, these informal reports will document final model description (including model equation(s) and specifications), model verification approach (i.e. re-sampling) and model evaluation results. The reports will be stored on the L-drive in their own designated folders, (path:L:PRIV/NRML_AEMD/DROP/Ian Rumsey/NAEMS-EEM informal reports) with the date of the report in the title. These folders will be private and will be only available to group project members.

7.2 Deliverables

The deliverables for this project are the following for each ES&P category:

- Model verification data sets, and training sets for ES&P categories where a new statistical model is developed.
- Informal reports, which will report progress in data analysis, determining emission source categories, evaluating the ease of model implementation by the agricultural community and model development (including any significant changes in the model) as well as documenting final model description (including model equation(s) and specifications), model verification approach (i.e. re-sampling) and model evaluation results.

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Message

From: Costa, Allison [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B345CA759FAE4B7FB1AFA4C500D4CFB7-ACOSTA]
Sent: 11/4/2019 9:03:49 PM
To: jory@comforttechs.com
Subject: RE: Website inquiry about AFO Air Emissions

Hi Jory,

Thanks for your recent question about the monitoring study that measured air emissions from animal feeding operations (AFOs). EPA maintains a webpage about the National Air Emissions Monitoring Study (NAEMS) and its current status at: https://www.epa.gov/afos-air/national-air-emissions-monitoring-study.

To summarize, EPA and the animal feeding operation industry entered into a voluntary air compliance agreement in 2005. Poultry, swine and dairy farms funded a study that monitored air emissions at 24 farms for approximately 2 years and gave the data to EPA. EPA is using the data to develop methods that these types of farms can use to estimate emissions of certain pollutants (ammonia, hydrogen sulfide, particle pollution and volatile organic compounds) from their sites. After the methods are finalized, the farms that participated in the voluntary air compliance agreement will use the methods to determine whether or not they meet criteria that require them to get permits for their air emissions.

The process of estimating air emissions from AFOs is complex and can be influenced by a number of factors, including the type of animal, the particular management practices a farm uses, weather and other environmental conditions. Therefore, the methods that will be used to estimate these emissions will involve analysis of a number of these factors and their interactions. According to the current schedule, EPA anticipates releasing draft methods for estimating emissions from poultry, swine and dairy farms in 2020. After the draft methods are released, there will be a process to request public feedback on the methods. Based on the feedback, changes may be made and then final methods will be released. Currently, we do not have an estimated date for when the final methods will be released, which will be determined based on the scope of the public comments.

As mentioned above, after the final methods are released, the farms that participated in the voluntary air compliance agreement will use the methods to determine whether or not they need to apply for any applicable permits under the Clean Air Act.

Thanks again for your question!

Sincerely,
Allison Costa

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

-----Original Message-----
Sent: Friday, November 01, 2019 2:27 PM
Subject: Form submission from: Air Monitoring at Agricultural Operations Contact Us about Air Monitoring at Animal Feeding Operations (AFOs) form

Submitted on 11/01/2019 2:26PM
Submitted values are:

Name: Jory Heiss
Email Address: jory@comforttechs.com
Comments:
Hello,
Could you please explain what is going to happen to the monitoring or study that is going to take place year 2020 on Large Cafo's? Particularly poultry.
Thank you.

north to land from a line connecting the following points 47°37.36′ N, 122°42.29′ W and 47°37.74′ N, 122° 40.64′ W.

(2) All waters of Lake Washington south of the interstate 90 bridge and north of Andrew's Bay, WA to include all waters east of the shoreline within the following points: 47°34.15′ N, 122°16.40′ W; 47°34.31′ N, 122°15.96′ W; 47°35.18′ N, 122°16.31′ W; 47°35.00′ N, 122°16.71′ W.

(3) All waters of Lake Sammamish south to land from a line connecting the following points 47°33.810′ N, 122°04.810′ and 47°33.810′ N 122°03.674′ W.

(b) *Notice of Enforcement or Suspension of Enforcement.* This special local regulation will be activated and thus subject to enforcement, under the following conditions: the Coast Guard must receive and approve a marine event permit for each hydroplane event in accordance with 33 CFR part 100. The Captain of the Port will provide notice of the enforcement of this special local regulation by all appropriate means to ensure the widest dissemination among the affected segments of the public, as practicable; such means of notification may include but are not limited to, Broadcast Notice to Mariners or Local Notice to Mariners.

(c) *Regulations.* (1) When this special local regulation is enforced, non-participant vessels are prohibited from entering the designated race areas unless authorized by the designated on-scene Patrol Commander.

Spectator craft may remain in designated spectator areas but must follow the directions of the designated on-scene Patrol Commander. The event sponsor may also function as the designated on-scene Patrol Commander. Spectator craft entering, exiting or moving within the spectator area must operate at speeds which will create a minimum wake.

(2) *Emergency Signaling.* A succession of sharp, short signals by whistle or horn from vessels patrolling the areas under the discretion of the designated on-scene Patrol Commander shall serve as a signal to stop. Vessels signaled shall stop and shall comply with the orders of the patrol vessel. Failure to do so may result in expulsion from the area, citation for failure to comply, or both.

Dated: November 24, 2010.

G.T. Blore,

Rear Admiral, U.S. Coast Guard, Commander, Thirteenth Coast Guard District.

[FR Doc. 2011–1022 Filed 1–18–11; 8:45 am]

BILLING CODE 9110–04–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[EPA–HQ–OAR–2010–0960; FRL–9254–9]

Call for Information: Information Related to the Development of Emission-Estimating Methodologies for Animal Feeding Operations

AGENCY: Environmental Protection Agency (EPA).

ACTION: Call for information.

SUMMARY: The Environmental Protection Agency is publishing this Call for Information to solicit quality-assured emissions and process data that are relevant to developing emissions-estimating methodologies for animal feeding operations. EPA may use the data to supplement the emissions and process data collected under the National Air Emission Monitoring Study for animal feeding operations.

DATES: Information must be received on or before March 7, 2011.

ADDRESSES: Submit your information, identified by Docket ID Number EPA–HQ–OAR–2010–0960, by one of the following methods:

http://www.regulations.gov: Follow the on-line instructions for submitting data.

E-mail: Send your information via electronic mail to *a-and-r-docket@epa.gov,* Attention Docket ID Number EPA–HQ–OAR–2010–0960.

Facsimile: Fax your comments to (202) 566–1741, Attention Docket ID Number EPA–HQ–OAR–2010–0960.

Mail: Send your information to: EPA Docket Center (EPA/DC), Environmental Protection Agency, Mailcode 6102T, 1200 Pennsylvania Ave., NW., Washington, DC 20460, Attention Docket ID Number EPA–HQ–OAR–2010–0960. Please include two copies. We request that a separate copy also be sent to the contact person identified below (*see* **FOR FURTHER INFORMATION CONTACT**).

Hand Delivery: Deliver your information to: EPA Docket Center (EPA/DC), EPA West Building, Room 3334, 1301 Constitution Ave., NW., Washington, DC 20460, Attention Docket ID Number EPA–HQ–OAR–2010–0960. Such deliveries are only accepted during the normal hours of operation (8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays) and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your data and information to Docket ID Number EPA–HQ–OAR–2010–0960. EPA's policy is that all information received will be included in the public docket and may be made available on-line at *http://www.regulations.gov,* including any personal information provided, unless the submission includes information claimed to be CBI or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI, or otherwise protected, through *http://www.regulations.gov* or e-mail. The *http://www.regulations.gov* Web site is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your information. If you send an e-mail directly to EPA without going through *http://www.regulations.gov,* your e-mail address will be automatically captured and included as part of the information that is placed in the public docket and made available on the Internet. If you submit the electronic data and information, EPA recommends that you include your name and other contact information in the body of your information and with any disk or CD–ROM you submit. If EPA cannot read your information due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your information. Electronic files should avoid the use of special characters or any form of encryption, and should be free of any defects or viruses.

Docket: EPA has established a docket for this action under Docket ID Number EPA–HQ–OAR–2010–0960. All documents in the docket are listed in the *http://www.regulations.gov* index. Although listed in the index, some information is not publicly available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy form. Publicly available docket materials are available either electronically in *http://www.regulations.gov* or in hard copy at EPA's Docket Center (EPA/DC), EPA West Building, Room 3334, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for EPA's Docket Center is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: Mr. Larry Elmore, Natural Resources and Commerce Group, Sector Policies and Programs Division, (E143–03),

Environmental Protection Agency, Research Triangle Park, NC 27711; telephone number: (919) 541–5433; Facsimile number: (919) 541–3470; e-mail address: *elmore.larry@epa.gov.*

SUPPLEMENTARY INFORMATION:

Acronyms and Abbreviations. The following terms and acronyms are used in this document:

AFOs Animal Feeding Operations
CAA Clean Air Act
CBI Confidential Business Information
CD ROM Compact Disc-Read Only Memory
CERCLA Comprehensive Environmental Response, Compensation and Liability Act
EEM Emissions-Estimating Methodology
EPCRA Emergency Planning and Community Right-To-Know Act
H_2S Hydrogen Sulfide
lb/hr Pounds per Hour
NAEMS National Air Emission Monitoring Study
NH_3 Ammonia
PM Particulate Matter
PM_{10} PM less than 10 micrometers in diameter
$PM_{2.5}$ PM less than 2.5 micrometers in diameter
ppmv Parts per Million by Volume
TSP Total Suspended Particulate
VOC Volatile Organic Compounds

Organization of This Document. The following outline is provided to aid in locating information in this preamble.

Table of Contents

I. General Information
A. What is the purpose of this action?
B. What specific information is EPA seeking?
C. Submitting Confidential Business Information

I. General Information

A. What is the purpose of this action?

In 2005, EPA offered AFOs an opportunity to participate in a voluntary consent agreement (70 FR 4958) referred to as the Air Compliance Agreement. Under the Air Compliance Agreement, participating AFOs provided, among other things, the funding for the NAEMS, a two-year, nationwide industry-run emissions monitoring study of the broiler, egg-layer, swine, and dairy industries. The NAEMS began in the summer of 2007 and consisted of 25 monitoring sites located in 10 states. The study collected process and emissions data for PM_{10}, $PM_{2.5}$, TSP, H_2S, NH_3, and VOC from a representative sample of animal housing structures and manure storage and treatment units across the country. EPA plans to use these data to develop EEMs for AFOs, which will help AFOs determine and comply with their regulatory responsibilities under the CAA, CERCLA, and EPCRA. Additional information regarding the NAEMS can be found at: *http://www.epa.gov/agriculture/airmonitoringstudy.html.*

EPA committed in the January 2005 **Federal Register** notice that it will use data generated from the NAEMS and all other available, relevant data to develop EEMs. Through this Call for Information, EPA is requesting that interested parties submit data that are relevant to EPA's effort to develop EEMs.

B. What specific information is EPA seeking?

EPA is requesting emissions and process data for broiler, egg-layer, swine, dairy, beef, and turkey AFOs. While EPA is interested in all air pollutants emissions data from AFOs, we are specifically seeking PM_{10}, $PM_{2.5}$, TSP, H_2S, NH_3, and VOC emissions data and related process information for animal confinement and manure storage and treatment processes.

Consistent with the Air Compliance Agreement, EPA is focusing in the near term on developing EEMs for AFOs. However, we acknowledge the recommendation made by the National Academy of Sciences in its December 2002 final report ("Air Emissions from Animal Feeding Operations: Current Knowledge, Future Needs") that EPA develop a process-based modeling approach that incorporates "mass balance" constraints to determine emissions from AFOs. Unfortunately, manure land application sites, which are a necessary component for developing a process-based approach, were not part of the NAEMS. Although our current focus is on developing the EEMs, we envision developing a process-based modeling approach at a later date. Thus, EPA is also requesting process and emissions data for land application of manure.

We will review all of the information available to us. To ensure compatibility with the NAEMS data, the emissions and related process data provided to EPA should be accompanied, to the extent possible, by documentation that contains detailed descriptions of the following parameters, as applicable.

General information:

- Description of AFO process measured (*e.g.,* animal confinement structure; manure storage and treatment unit; land application site).
- Location of AFO process measured (*e.g.,* physical address, latitude/longitude coordinates of facility).
- Beginning and ending dates of the monitoring period.

Monitoring data:

- Quality assurance and quality control plan.
- Site monitoring plan.
- Test methods, instrumentation, and standard operating procedures used to collect emissions and process data measurements.
- Results of audits conducted on instruments and procedures.
- Field notes and associated documentation collected during the study.
- Emissions data (unanalyzed or analyzed) and associated process data.
- Meteorological data, including average ambient temperature, relative humidity, pressure, wind speed, wind direction, and insolation (solar radiation), for each day that the study was conducted.
- Production data (*e.g.,* number of eggs produced per day or quantity of milk produced per day).
- Calculations and assumptions used to convert concentration data (*e.g.,* ppmv) into mass emissions (*e.g.,* lb/hr).

Animal confinement structures:

- Dimensions of structures monitored.
- Designed and permitted animal capacity.
- Type, age, number, and weight of animals contained in the confinement structure over the duration of the monitoring period.
- Manure management system (*e.g.,* pull-plug pit, scrape).
- Manure removal activities over the duration of the monitoring period.
- Ventilation method (*i.e.,* natural or mechanical).
- Calculations and assumptions used to estimate the ventilation rate of the monitored confinement structure.
- Calibration procedures for instruments (*e.g.,* flow meters, fan relays) used to collect data for calculating ventilation rate of the monitored confinement structure.
- Nitrogen content of process inputs and outputs (*e.g.,* feed, water, bedding, eggs, milk).
- Nitrogen content of manure excreted.
- Description of any control device or work practice used in the monitored structure to reduce emissions.

Manure storage and treatment processes:

- Type, age, number, and weight of animals contributing manure to the storage and treatment process over the monitoring period.
- Dimensions of storage/treatment unit monitored (*e.g.,* storage pile, tank, lagoon).

• Depth of settled solids in storage/treatment unit.

• Temperature, pH, and reduction/oxidation potential of manure contained in the storage/treatment unit.

• Moisture, total solids, volatile solids, total Kjeldahl nitrogen, and ammoniacal nitrogen content and pH of manure entering storage and treatment process over the monitoring period.

Manure land application sites:

• Type, age, number, and weight of animals contributing manure to the land application site.

• Method used to apply manure (*e.g.,* direct injection, broadcast spreading and frequency of application.

• Area (*e.g.,* acres, square feet) used for manure application over the monitoring period.

• Quantity and moisture content of manure applied.

With regard to the format of the information, we request that emissions, process, and production data be submitted to EPA in Microsoft® Excel® spreadsheet or Access® database format. In cases where the emissions, process, and production data correspond to time increments shorter than one hour, please provide sufficient information and supporting documentation with the data to allow EPA to develop emission estimates on a per-hour and per-day basis. For all formats, please clearly label the units of measure of emissions, process, and production data submitted.

C. Submitting Confidential Business Information

Do not submit information you consider to be CBI electronically through *http://www.regulations.gov* or e-mail. Send or deliver information identified as CBI to only the following address: Mr. Larry Elmore, c/o Office of Air Quality Planning and Standards (OAQPS) Document Control Officer (Room C404–02), U.S. EPA, Research Triangle Park, NC 27711, Attention Docket ID Number EPA–HQ–OAR–2010–0960. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD–ROM that you mail to EPA, mark the outside of the disk or CD–ROM as CBI and then identify electronically within the disk or CD–ROM the specific information that is claimed as CBI. In addition to one complete version of the information claimed as CBI, a copy of the information that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information marked as CBI will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

If you have any questions about CBI or the procedures for claiming CBI, please consult the person identified in the **FOR FURTHER INFORMATION CONTACT** section.

Dated: December 14, 2010.

Gina McCarthy,

Assistant Administrator, Office of Air and Radiation.

[FR Doc. 2011–1011 Filed 1–18–11; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 98

[EPA–HQ–OAR–2010–0929 and EPA–HQ–OAR–2010–0964; FRL–9252–4]

Extension of Comment Period on Change to the Reporting Date for Certain Data Elements Required Under the Mandatory Reporting of Greenhouse Gases Rule; and Public Hearing and Extension of Comment Period on Call for Information on Inputs to Emission Equations Under the Mandatory Reporting of Greenhouse Gases Rule

AGENCY: Environmental Protection Agency (EPA).

ACTION: Public hearing notice and extension of public comment periods.

SUMMARY: On December 27, 2010, EPA concurrently published a proposed Change to the Reporting Date for Certain Data Elements Required Under the Mandatory Reporting of Greenhouse Gases Rule and a Call for Information on Inputs to Emission Equations Under the Mandatory Reporting of Greenhouse Gases Rule. In this action, EPA is providing notice of a public hearing on the Call for Information, to be held on February 3, 2011, and extending the comment period for both actions until March 7, 2011.

DATES: *Comments.* This action extends the comment period for the proposed Change to the Reporting Date for Certain Data Elements Required Under the Mandatory Reporting of Greenhouse Gases Rule (75 FR 81350). Comments must be received on or before March 7, 2011. This action also extends the comment period for the Call for Information on Inputs to Emission Equations Under the Mandatory Reporting of Greenhouse Gases Rule (75 FR 81366). Comments must be received on or before March 7, 2011.

Public Hearing. EPA will hold a hearing on the Call for Information on Inputs to Emission Equations Under the Mandatory Reporting of Greenhouse Gases Rule (75 FR 81366). The hearing will be conducted on February 3, 2011, in the Washington, DC area. EPA will provide further information about both hearings on its Web page: *http://www.epa.gov/climatechange/emissions/ghgrulemaking.html.*

ADDRESSES:

Proposed Change to the Reporting Date for Certain Data Elements Required Under the Mandatory Reporting of Greenhouse Gases Rule

Submit your comments, identified by Docket ID No. EPA–HQ–OAR–2010–0929, by one of the following methods:

Federal eRulemaking Portal: http://www.regulations.gov. Follow the online instructions for submitting comments.

E-mail: GHGReportingCBI@epa.gov. Include Docket ID No. EPA–HQ–OAR–2010–0929 (and/or RIN number) in the subject line of the message.

Fax: (202) 566–1741.

Mail: Environmental Protection Agency, EPA Docket Center (EPA/DC), Mailcode 2822T, Attention Docket ID No. EPA–HQ–OAR–2010–0929, 1200 Pennsylvania Avenue, NW., Washington, DC 20460.

Hand/Courier Delivery: EPA Docket Center, Public Reading Room, EPA West Building, Room 3334, 1301 Constitution Avenue, NW., Washington, DC 20004. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OAR–2010–0929. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be confidential business information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *http://www.regulations.gov* or e-mail. The *http://www.regulations.gov* Web site is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through *http://www.regulations.gov* your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA

Message

From: Do, Bebhinn [do.bebhinn@epa.gov]
Sent: 12/17/2019 9:32:50 PM
To: Dunkins, Robin [Dunkins.Robin@epa.gov]
Subject: Reminder: Call Donald Peters (CAAAC) re: NAEMS schedule
Attachments: FW: For your awareness; RE: CAAAC request

Robin,

Just a follow up from the NAEMS meeting today: You noted you needed to call Donald Peters from CAAAC to discuss his questions on the NAEMS. The original emails/letter are attached for your reference.

Best regards,
Bebhinn

Ms. Bebhinn Do
U.S. EPA | OAQPS | Sector Policies and Programs Division | Natural Resources Group
109 T.W. Alexander Drive | Research Triangle Park, NC 27711
Mail Code: E143-03 | Phone: 919 541-0573 | email: do.bebhinn@epa.gov

Message

From: Hull, George [Hull.George@epa.gov]
Sent: 11/13/2019 4:20:53 PM
To: Jones, Enesta [Jones.Enesta@epa.gov]
CC: Egan, Patrick [egan.patrick@epa.gov]
Subject: RE: Media Inquiry: Reporter seeking farms signed on to ACA Agreement

Thanks for finding this. Ex. 5 Deliberative Process (DP) I'll circle back as soon as I close the loop with OAR. - George

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Wednesday, November 13, 2019 11:19 AM
To: Hull, George <Hull.George@epa.gov>
Cc: Egan, Patrick <egan.patrick@epa.gov>
Subject: Re: Media Inquiry: Reporter seeking farms signed on to ACA Agreement

George,

Ex. 5 Deliberative Process (DP)

On Nov 13, 2019, at 11:08 AM, Hull, George <Hull.George@epa.gov> wrote:

Enesta,

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP) - George

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Tuesday, November 12, 2019 4:59 PM
To: Hull, George <Hull.George@epa.gov>
Cc: Egan, Patrick <egan.patrick@epa.gov>
Subject: Re: Media Inquiry: Reporter seeking farms signed on to ACA Agreement

Still holding, George?

On Nov 6, 2019, at 1:52 PM, Hull, George <Hull.George@epa.gov> wrote:

Ex. 5 Deliberative Process (DP) - George

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Wednesday, November 06, 2019 1:51 PM
To: Hull, George <Hull.George@epa.gov>
Cc: Egan, Patrick <egan.patrick@epa.gov>
Subject: Re: Media Inquiry: Reporter seeking farms signed on to ACA Agreement

Ok. Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP)

On Nov 6, 2019, at 1:49 PM, Hull, George <Hull.George@epa.gov> wrote:

Enesta,

Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP) - George

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Wednesday, November 06, 2019 1:35 PM
To: Hull, George <Hull.George@epa.gov>
Cc: Egan, Patrick <egan.patrick@epa.gov>
Subject: Re: Media Inquiry: Reporter seeking farms signed on to ACA Agreement

Hi George,

Do you have an update on this? (Ex. 5 Deliberative Process (DP)

On Nov 4, 2019, at 10:37 AM, Hull, George <Hull.George@epa.gov> wrote:

Enesta, I'll check with our Air Enforcement Division. I don't know if we are the keepers of this info, or OAR. - George

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Monday, November 04, 2019 10:10 AM
To: Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>
Cc: Jones, Enesta <Jones.Enesta@epa.gov>
Subject: Media Inquiry: Reporter seeking farms signed on to ACA Agreement

Hello George and Patrick, she has returned with a follow-up question below. Can OECA assist? Please advise. Her DDL is today. Tnx.

Is there a list available of the farms that signed on to the Air Compliance Agreement in 2005?

On Aug 8, 2019, at 1:00 PM, Bremer, Kristen <Bremer.Kristen@epa.gov> wrote:

Here's our proposed response. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: Ex. 6 Personal Privacy (PP)

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Tuesday, August 06, 2019 9:29 PM
To: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>
Cc: Jones, Enesta <Jones.Enesta@epa.gov>
Subject: OAR & OECA: Reporter seeking interview re: status of EEMs/NAEMS

Hello all, looking back at my notes, this is an OAQPS & OECA issue. Please see her follow-up below. Her ddl is 8/9. Tnx.

Hi Enesta,

Thanks for your response to my questions back in June. I presume that EPA has no comment on whether the NAEMS study is still on track for its 2020 deadline and other specifics that I asked about. **I'm following up with one more question for now.**

The story will discuss the timeline of EPA's creation of a methodology to estimate farm air emissions, including findings from the 2017 EPA OIG report that remarks that "NAEMS monitoring was completed more than 7 years ago at a cost of about $15 million, but the EPA had not finalized any emission estimating methodologies for animal feeding operations" despite its estimate that such work would be underway in 2009. Would EPA like to comment on this delayed timeline?

Thanks much,
Leah Douglas

On Wed, Jun 26, 2019 at 5:19 PM Jones, Enesta <Jones.Enesta@epa.gov> wrote:

> Hello Leah,
>
> **Please note**: The questions you are asking involve both the **National Air Emissions Monitoring Study (NAEMS)** and the **Air Quality Compliance Agreement(s)**. They are related, but they are not the same thing.
>
> **Attributable to an EPA Spokesperson**
>
> IN 2005, EPA developed the **Air Compliance Agreement** to:
>
> - Reduce air pollution;
> - Ensure AFOs' compliance with applicable Clean Air Act, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and Emergency Planning and Community Right-to-Know Act (EPCRA) requirements;
> - Monitor and evaluate AFO emissions in a national monitoring study; and
> - Promote a national consensus on AFO emissions estimating methodologies.
>
> As part of the Air Compliance Agreement, participating AFO owners and operators:

- o Paid a civil penalty of $200 to $100,000 based on the size and number of AFOs covered by their respective Air Compliance Agreements;
- o Agreed to make their AFOs available as potential monitoring sites for the NAEMS;
- o Were responsible for contributing to a fund covering the costs of NAEMS; and
- o Must comply with applicable Clean Air Act, CERCLA, and EPCRA requirements after EPA publishes the final emissions estimating methodologies.

Approximately 2,600 AFO owners and operators signed the voluntary Air Compliance Agreements with EPA to resolve liability for potential past and ongoing violations of the Clean Air Act, CERCLA, and EPCRA resulting from air emission from their AFOs. Those approximately 2,600 Agreements covered approximately 14,000 AFOs.

For more information, refer to the Air Compliance Agreement *Federal Register* notice: https://www.federalregister.gov/documents/2005/01/31/05-1536/animal-feeding-operations-consent-agreement-and-final-order

On Jun 20, 2019, at 12:03 PM, Leah Douglas <leah@thefern.org> wrote:

Hi Enesta,

Sure. A few questions are below. Next Wednesday (6/26) would work as a deadline. Next week is also very open for interviews if EPA prefers to comment that way.

- The material on EPA's website related to NAEMS states January 2020 as the soonest timeline for the first draft

models to emerge from the study. Is the project still on track to meet that timeline?

- Does EPA have a current estimate for the finalization of all emission estimating technologies?
- Can EPA provide a list of the farm operators, by name of facility and/or name of parent company, who participated in the NAEMS study?
- If just 24 sites were used to collect data for NAEMS, why did EPA sign on 14,000 facilities to participate in the study? Did the remaining facilities participate in NAEMS in other ways?
- How much was the civil penalty that farm operators paid to participate in NAEMS and receive protection from civil enforcement under the Clean Air Act?
- When was the last occurrence of EPA taking civil enforcement action against an AFO under the Clean Air Act?

Thanks much,
Leah Douglas

On Wed, Jun 19, 2019 at 1:06 PM Jones, Enesta <Jones.Enesta@epa.gov> wrote:

> Hi Leah, thanks for reaching out. Can you please share your specific questions and deadline? I'm not sure that we can provide an interview, but we should, at a minimum, be able to provide written responses.
>
> **From:** Leah Douglas <leah@thefern.org>
> **Sent:** Friday, June 14, 2019 11:25 AM
> **To:** Rumsey, Ian <rumsey.ian@epa.gov>
> **Subject:** Reporter seeking interview re: status of EEMs/NAEMS
>
> Hi Mr. Rumsey,

I'm a reporter with the Food and Environment Reporting Network, where I cover agribusiness and its regulation. I'm working on a story about CAFO odors and air emissions, which will discuss EPA's ongoing work to develop EEMs with the data collected during the NAEMS.

I'm hoping to speak with you about the current status of that project, so I can be sure I have the most up-to-date information as I move forward with my reporting. Can we find a few minutes to talk on the phone next week or the following? Next week, Wednesday, Thursday, and Friday are all flexible for me, and the week of the 24th is quite flexible as well.

Thanks much, and talk soon,
Leah Douglas

--
Leah Douglas
(917) 972-3479

--
Leah Douglas
(917) 972-3479

Message

From: Bremer, Kristen [Bremer.Kristen@epa.gov]
Sent: 10/17/2019 4:55:53 PM
To: Jones, Enesta [Jones.Enesta@epa.gov]
CC: DeLuca, Isabel [DeLuca.Isabel@epa.gov]; Hull, George [Hull.George@epa.gov]; Egan, Patrick [egan.patrick@epa.gov]; Ashley, Jackie [Ashley.Jackie@epa.gov]
Subject: RE: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

EPA has not finalized any emissions estimating methodologies for animal feeding operations.

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: Ex. 6 Personal Privacy (PP)

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Thursday, October 17, 2019 12:52 PM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>
Cc: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>; Ashley, Jackie <Ashley.Jackie@epa.gov>
Subject: Re: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

Please see his follow-up below:

Thanks for pointing out the responses embedded in that OIG report. I also found a copy of the March 2018 QAPP. I have additional questions.

EPA response to OIG dated 06/23/2017 indicated it was developing EEMs for AFOs, including a longer-term process-based EEM and an interim EEM. Have *any* EEMs been finalized?

On Oct 16, 2019, at 4:24 PM, Bremer, Kristen <Bremer.Kristen@epa.gov> wrote:

Here's our proposed response:

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: Ex. 6 Personal Privacy (PP)

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Wednesday, October 16, 2019 3:57 PM
To: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Ashley, Jackie <Ashley.Jackie@epa.gov>
Cc: Jones, Enesta <Jones.Enesta@epa.gov>
Subject: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

Hi All. Please see the inquiry below. I believe this overlaps OAR & OECA. DDL is 10/18. Tnx.

I'm working on a story and had a few questions. I've read through the proposed rule/call for information posted on 10/01/2019, but wanted more info related to some points raised by the OIG in the 2017 report about emission estimates from animal feeding operations.

1. The report says EPA provided planned corrective actions in response to the OIG recommendations, but I can't find any documentation beyond this notification letter. Are there any reports/documents detailing how EPA addressed the concerns detailed in this report? If so, can you point me to/send me a copy?

According to that OIG report, as of May 2017:

- EPA has not finalized any emissions estimating methodologies for animal feeding operations
- EPA has not finalized its workplan or established timeframes for completing EEMs
- EPA has not developed any additional draft EEMs

2. Has the status on any of those changed since the OIG report was published?

Thanks for your help,

Joe

Joe Wertz

Senior Environment Reporter

The Center for Public Integrity

@joewertz

publicintegrity.org

Office: 202-481-1262

Mobile: Ex. 6 Personal Privacy (PP)

Signal:

PGP: BBE7 2478 6820 3E3B 51EE
5BFB 3BF8 A51A 5BC9 5CD9

Message

From: Jones, Enesta [Jones.Enesta@epa.gov]
Sent: 8/8/2019 5:03:06 PM
To: Bremer, Kristen [Bremer.Kristen@epa.gov]; Hull, George [Hull.George@epa.gov]; Egan, Patrick [egan.patrick@epa.gov]
CC: DeLuca, Isabel [DeLuca.Isabel@epa.gov]
Subject: Re: OAR & OECA: Reporter seeking interview re: status of EEMs/NAEMS

Appreciate, Kristen. Any edits/suggestions, George & Patrick?

On Aug 8, 2019, at 1:00 PM, Bremer, Kristen <Bremer.Kristen@epa.gov> wrote:

Here's our proposed response. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

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Email: bremer.kristen@epa.gov
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Sent: Tuesday, August 06, 2019 9:29 PM
To: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>
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The story will discuss the timeline of EPA's creation of a methodology to estimate farm air emissions, including findings from the 2017 EPA OIG report that remarks that "NAEMS monitoring was completed more than 7 years ago at a cost of about $15 million, but the EPA had not finalized any emission estimating methodologies for animal feeding operations" despite its estimate that such work would be underway in 2009. Would EPA like to comment on this delayed timeline?

Thanks much,
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Attributable to an EPA Spokesperson

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To: Rumsey, Ian <rumsey.ian@epa.gov>
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Leah Douglas

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Leah Douglas
(917) 972-3479

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Leah Douglas
(917) 972-3479

Message

From: Bremer, Kristen [Bremer.Kristen@epa.gov]
Sent: 8/7/2019 12:28:33 PM
To: Jones, Enesta [Jones.Enesta@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]; Hull, George [Hull.George@epa.gov]; Egan, Patrick [egan.patrick@epa.gov]
Subject: RE: OAR & OECA: Reporter seeking interview re: status of EEMs/NAEMS

Checking.

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: Ex. 6 Personal Privacy (PP)

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Tuesday, August 06, 2019 9:29 PM
To: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>
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Subject: OAR & OECA: Reporter seeking interview re: status of EEMs/NAEMS

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Thanks much,
Leah Douglas

On Wed, Jun 26, 2019 at 5:19 PM Jones, Enesta <Jones.Enesta@epa.gov> wrote:

> Hello Leah,
>
> **Please note**: The questions you are asking involve both the **National Air Emissions Monitoring Study (NAEMS**) and the **Air Quality Compliance Agreement(s**). They are related, but they are not the same thing.
>
> **Attributable to an EPA Spokesperson**
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> IN 2005, EPA developed the **Air Compliance Agreement** to:
> - Reduce air pollution;

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- Agreed to make their AFOs available as potential monitoring sites for the NAEMS;
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Approximately 2,600 AFO owners and operators signed the voluntary Air Compliance Agreements with EPA to resolve liability for potential past and ongoing violations of the Clean Air Act, CERCLA, and EPCRA resulting from air emission from their AFOs. Those approximately 2,600 Agreements covered approximately 14,000 AFOs.

For more information, refer to the Air Compliance Agreement *Federal Register* notice: https://www.federalregister.gov/documents/2005/01/31/05-1536/animal-feeding-operations-consent-agreement-and-final-order

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Sent: Friday, June 14, 2019 11:25 AM

To: Rumsey, Ian <rumsey.ian@epa.gov>
Subject: Reporter seeking interview re: status of EEMs/NAEMS

Hi Mr. Rumsey,

I'm a reporter with the Food and Environment Reporting Network, where I cover agribusiness and its regulation. I'm working on a story about CAFO odors and air emissions, which will discuss EPA's ongoing work to develop EEMs with the data collected during the NAEMS.

I'm hoping to speak with you about the current status of that project, so I can be sure I have the most up-to-date information as I move forward with my reporting. Can we find a few minutes to talk on the phone next week or the following? Next week, Wednesday, Thursday, and Friday are all flexible for me, and the week of the 24th is quite flexible as well.

Thanks much, and talk soon,
Leah Douglas

--
Leah Douglas
(917) 972-3479

--
Leah Douglas
(917) 972-3479

Message

From: Jones, Enesta [Jones.Enesta@epa.gov]
Sent: 6/26/2019 7:34:39 PM
To: Egan, Patrick [egan.patrick@epa.gov]
CC: Hull, George [Hull.George@epa.gov]
Subject: Re: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

Appreciate it, Patrick.

On Jun 26, 2019, at 3:34 PM, Egan, Patrick <egan.patrick@epa.gov> wrote:

No issues Enesta.

On Jun 26, 2019, at 9:10 AM, Jones, Enesta <Jones.Enesta@epa.gov> wrote:

George/Pat, any issues on your end? OAQPS engaged OECA technical staff on this directly.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Message

From: Jonesi, Gary [Jonesi.Gary@epa.gov]
Sent: 6/26/2019 7:27:11 PM
To: Egan, Patrick [egan.patrick@epa.gov]; Porter, Amy [Porter.Amy@epa.gov]; Smith-Watts, David [Smith-Watts.David@epa.gov]
CC: Hull, George [Hull.George@epa.gov]
Subject: RE: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

No, looks good as is, thanks.

--Gary

Be kind to the environment.
Please do not print this email unless necessary.

Gary A. Jonesi
Office of Civil Enforcement
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W. (Rm. 4102-C)
Washington, D.C. 20004

202-564-4002 (direct)
Ex. 6 Personal Privacy (PP) (cell)
jonesi.gary@epa.gov

From: Egan, Patrick
Sent: Wednesday, June 26, 2019 3:26 PM
To: Jonesi, Gary <Jonesi.Gary@epa.gov>; Porter, Amy <Porter.Amy@epa.gov>; Smith-Watts, David <Smith-Watts.David@epa.gov>
Cc: Hull, George <Hull.George@epa.gov>
Subject: RE: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

Just circling back to find out if you have any comments or edits.

Thanks,

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--Gary

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Below are Q & A's that were developed by OAQPS with input from OECA technical staff. Please let us know if you have any comments or edits.

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From: Jones, Enesta
Sent: Wednesday, June 26, 2019 9:10 AM
To: Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>

Cc: Jones, Enesta <Jones.Enesta@epa.gov>
Subject: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

George/Pat, any issues on your end? OAQPS engaged OECA technical staff on this directly.

Ex. 5 Deliberative Process (DP)

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Message

From: Smith-Watts, David [Smith-Watts.David@epa.gov]
Sent: 6/26/2019 2:18:10 PM
To: Egan, Patrick [egan.patrick@epa.gov]; Jonesi, Gary [Jonesi.Gary@epa.gov]; Porter, Amy [Porter.Amy@epa.gov]
CC: Hull, George [Hull.George@epa.gov]
Subject: RE: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

Patrick – I've reviewed and don't have any edits/comments. Gary may have some. Ex. 5 Deliberative Process (DP) Ex. 5 Deliberative Process (DP)

****

David Smith-Watts
Attorney-Advisor
U.S. EPA/OECA/OCE/IO/XPS
1200 Pennsylvania Ave., NW (MC 2241A)
Washington, DC 20460
Phone: (202) 564-4083
Email: smith-watts.david@epa.gov

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From: Egan, Patrick
Sent: Wednesday, June 26, 2019 10:14 AM
To: Jonesi, Gary <Jonesi.Gary@epa.gov>; Porter, Amy <Porter.Amy@epa.gov>; Smith-Watts, David <Smith-Watts.David@epa.gov>
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Ex. 5 Deliberative Process (DP)

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Message

From: Jones, Enesta [Jones.Enesta@epa.gov]
Sent: 6/26/2019 2:10:09 PM
To: Egan, Patrick [egan.patrick@epa.gov]
CC: Hull, George [Hull.George@epa.gov]
Subject: Re: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

COB today.

On Jun 26, 2019, at 10:09 AM, Egan, Patrick <egan.patrick@epa.gov> wrote:

What's the deadline?

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From: Jones, Enesta
Sent: Wednesday, June 26, 2019 9:29 AM
To: Egan, Patrick <egan.patrick@epa.gov>
Cc: Hull, George <Hull.George@epa.gov>
Subject: Re: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

This is who reviewed it:

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement

Office of Enforcement and Compliance Assurance

On Jun 26, 2019, at 9:15 AM, Egan, Patrick <egan.patrick@epa.gov> wrote:

Enesta,

Do we know which office in OECA they collaborated with?

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Message

From: Hull, George [Hull.George@epa.gov]
Sent: 8/8/2019 7:09:38 PM
To: Jones, Enesta [Jones.Enesta@epa.gov]; Egan, Patrick [egan.patrick@epa.gov]
Subject: RE: OECA Review: Reporter seeking interview re: status of EEMs/NAEMS

Looks good. No edits from us. Thanks, George

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Thursday, August 08, 2019 2:57 PM
To: Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>
Cc: Jones, Enesta <Jones.Enesta@epa.gov>
Subject: OECA Review: Reporter seeking interview re: status of EEMs/NAEMS

Any edits/suggestions, George & Patrick?

On Aug 8, 2019, at 1:00 PM, Bremer, Kristen <Bremer.Kristen@epa.gov> wrote:

Here's our proposed response. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: Ex. 6 Personal Privacy (PP)

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Tuesday, August 06, 2019 9:29 PM
To: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>
Cc: Jones, Enesta <Jones.Enesta@epa.gov>
Subject: OAR & OECA: Reporter seeking interview re: status of EEMs/NAEMS

Hello all, looking back at my notes, this is an OAQPS & OECA issue. Please see her follow-up below. Her ddl is 8/9. Tnx.

Hi Enesta,

Thanks for your response to my questions back in June. I presume that EPA has no comment on whether the NAEMS study is still on track for its 2020 deadline and other specifics that I asked about. **I'm following up with one more question for now.**

The story will discuss the timeline of EPA's creation of a methodology to estimate farm air emissions, including findings from the 2017 EPA OIG report that remarks that "NAEMS monitoring was completed more than 7 years ago at a cost of about $15 million, but the EPA had not finalized any emission estimating methodologies for animal feeding operations" despite its estimate that such work would be underway in 2009. Would EPA like to comment on this delayed timeline?

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> Leah Douglas

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Leah Douglas
(917) 972-3479

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Leah Douglas
(917) 972-3479

Message

From: Egan, Patrick [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A8AF6E75E84A463A935E3A70BA72D043-PEGAN]
Sent: 6/26/2019 7:33:27 PM
To: Jonesi, Gary [Jonesi.Gary@epa.gov]
CC: Porter, Amy [Porter.Amy@epa.gov]; Smith-Watts, David [Smith-Watts.David@epa.gov]; Hull, George [Hull.George@epa.gov]
Subject: Re: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

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--Gary

<image001.jpg>

<image002.png>

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<image001.jpg>

<image002.png>

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Washington, DC 20460
Office: 202-564-4059 | Cell: Ex. 6 Personal Privacy (PP)

From: Jonesi, Gary
Sent: Wednesday, June 26, 2019 10:08 AM
To: Egan, Patrick <egan.patrick@epa.gov>; Porter, Amy <Porter.Amy@epa.gov>; Smith-Watts, David <Smith-Watts.David@epa.gov>
Cc: Hull, George <Hull.George@epa.gov>
Subject: RE: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

Thanks Patrick. Is there any way you can ask who OAQPS worked with in OECA? Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP) When do you need comments, if any?

--Gary

<image001.jpg>

<image002.png>

Gary A. Jonesi
Office of Civil Enforcement
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W. (Rm. 4102-C)
Washington, D.C. 20004

202-564-4002 (direct)
Ex. 6 Personal Privacy (PP) (cell)
jonesi.gary@epa.gov

From: Egan, Patrick
Sent: Wednesday, June 26, 2019 9:57 AM
To: Porter, Amy <Porter.Amy@epa.gov>; Jonesi, Gary <Jonesi.Gary@epa.gov>; Smith-Watts, David <Smith-Watts.David@epa.gov>
Cc: Hull, George <Hull.George@epa.gov>
Subject: FW: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

Below are Q & A's that were developed by OAQPS with input from OECA technical staff. Please let us know if you have any comments or edits.

Patrick J. Egan, M.P.A.
Deputy Director of Communications
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW (MC: 2201A)
Washington, DC 20460
Office: 202-564-4059 | Cell: Ex. 6 Personal Privacy (PP)

From: Jones, Enesta
Sent: Wednesday, June 26, 2019 9:10 AM
To: Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>
Cc: Jones, Enesta <Jones.Enesta@epa.gov>
Subject: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

George/Pat, any issues on your end? OAQPS engaged OECA technical staff on this directly.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Message

From: Egan, Patrick [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A8AF6E75E84A463A935E3A70BA72D043-PEGAN]
Sent: 6/26/2019 1:29:39 PM
To: Jones, Enesta [Jones.Enesta@epa.gov]
CC: Hull, George [Hull.George@epa.gov]
Subject: RE: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

Excellent. Thanks Enesta. We'll have it looked at.

Patrick J. Egan, M.P.A.
Deputy Director of Communications
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW (MC: 2201A)
Washington, DC 20460
Office: 202-564-4059 | Cell: Ex. 6 Personal Privacy (PP)

From: Jones, Enesta
Sent: Wednesday, June 26, 2019 9:29 AM
To: Egan, Patrick <egan.patrick@epa.gov>
Cc: Hull, George <Hull.George@epa.gov>
Subject: Re: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

This is who reviewed it:

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement

Office of Enforcement and Compliance Assurance

On Jun 26, 2019, at 9:15 AM, Egan, Patrick <egan.patrick@epa.gov> wrote:

Enesta,

Do we know which office in OECA they collaborated with?

Patrick J. Egan, M.P.A.
Deputy Director of Communications
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW (MC: 2201A)
Washington, DC 20460
Office: 202-564-4059 | Cell: Ex. 6 Personal Privacy (PP)

From: Jones, Enesta
Sent: Wednesday, June 26, 2019 9:10 AM
To: Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>
Cc: Jones, Enesta <Jones.Enesta@epa.gov>
Subject: Inquiry: Food and Environment Reporting Network re: status of EEMs/NAEMS

George/Pat, any issues on your end? OAQPS engaged OECA technical staff on this directly.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Message

From: Campbell, Ann [Campbell.Ann@epa.gov]
Sent: 8/27/2019 6:52:11 PM
To: Harlow, David [harlow.david@epa.gov]; Woods, Clint [woods.clint@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: Fwd: SAN#7588 NAEMS Call for Info Notice - CMS# OAR-19-000-7723
Attachments: NAEMS Post-It Note.pdf; ATT00001.htm; NAEMS Action Memo23Aug19.pdf; ATT00002.htm; NAEMS CFI Rollout_082219.docx; ATT00003.htm; FRN NAEMS Call for Information Preamble_082219.docx; ATT00004.htm; NAEMS CFI_Action Information_082219.docx; ATT00005.htm; NAEMS Call for Info FR Cover-Form.pdf; ATT00006.htm; NAEMS TypesettingRqst.pdf; ATT00007.htm; OGC Concurrence_NAEMS CFI.pdf; ATT00008.htm

This came in for review and signature. Please let me know who will review. Thanks!

Ann Campbell
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

Begin forwarded message:

From: "Mcquilkin, Wendy" <Mcquilkin.Wendy@epa.gov>
To: "Campbell, Ann" <Campbell.Ann@epa.gov>
Cc: "Shaw, Betsy" <Shaw.Betsy@epa.gov>, "Lubetsky, Jonathan" <Lubetsky.Jonathan@epa.gov>, "Shoaff, John" <Shoaff.John@epa.gov>, "Culligan, Kevin" <Culligan.Kevin@epa.gov>, "Iglesias, Amber" <Iglesias.Amber@epa.gov>, "Costa, Allison" <Costa.Allison@epa.gov>, "Dunkins, Robin" <Dunkins.Robin@epa.gov>, "South, Peter" <South.Peter@epa.gov>, "Cozzie, David" <Cozzie.David@epa.gov>, "Crowley, Kate" <crowley.kate@epa.gov>, "Mills, Kathy" <Mills.Kathy@epa.gov>, "Schrock, Bill" <Schrock.Bill@epa.gov>, "Eck, Janet" <Eck.Janet@epa.gov>, "Morgan, Ruthw" <morgan.ruthw@epa.gov>, "Morris, Joseph" <Morris.Joseph@epa.gov>, "Adams, Darryl" <Adams.Darryl@epa.gov>, "Brown, Stephanie N." <Brown.StephanieN@epa.gov>, "Gaines, Cynthia" <Gaines.Cynthia@epa.gov>, "Muellerleile, Caryn" <Muellerleile.Caryn@epa.gov>, "Manibusan, Mary" <Manibusan.Mary@epa.gov>, "Pritchard, Eileen" <Pritchard.Eileen@epa.gov>, "Wiggins, Lanelle" <Wiggins.Lanelle@epa.gov>, "Walker, Sherri" <Walker.Sherri@epa.gov>, "Millett, John" <Millett.John@epa.gov>, "DeLuca, Isabel" <DeLuca.Isabel@epa.gov>
Subject: SAN#7588 NAEMS Call for Info Notice - CMS# OAR-19-000-7723

TO: THE IMMEDIATE OFFICE FOR REVIEW AND AA'S SIGNATURE

08/27/19 01:31PM **Tier: 4** **CMS Control #: OAR-19-000-7723**

: Information Related to the Development of Emission Estimating Methodologies for Animal Feeding Operations Notice (SAN 7588).

Reviewers	Sign Off	Concur	Concur w/ Comment	Non- Concur	Date
Ann Campbell					
Anne Idsal					

Stage:
Deadline:

OMB exempt action. OGC concurred w/this action on 8/15/19. Their concurrence is also attached here.

Contact: OAQPS: William Schrock: 919-541-5032
Mgmt. Level Reviewer: Kevin Culligan: 202-564-0611
OAPPS Contact:

Return to: Wendy McQuilkin
564-1348, 5442S WJC North

Message

From: Koerber, Mike [Koerber.Mike@epa.gov]
Sent: 8/30/2019 5:41:21 PM
To: OAR Briefings [OAR_Briefings@epa.gov]
CC: Smith, Darcie [Smith.Darcie@epa.gov]
Subject: FW: NAEMS for 09/03
Attachments: NAEMS Overview_090319.docx

From: Ashley, John <ashley.john@epa.gov>
Sent: Friday, August 30, 2019 1:13 PM
To: Smith, Darcie <Smith.Darcie@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>; McKinney, Voronina <mckinney.voronina@epa.gov>
Cc: Lassiter, Penny <Lassiter.Penny@epa.gov>; Cozzie, David <Cozzie.David@epa.gov>; South, Peter <South.Peter@epa.gov>; Dunkins, Robin <Dunkins.Robin@epa.gov>; Schrock, Bill <Schrock.Bill@epa.gov>; Costa, Allison <Costa.Allison@epa.gov>; Crowley, Kate <crowley.kate@epa.gov>; Mills, Kathy <Mills.Kathy@epa.gov>
Subject: NAEMS for 09/03

Hi Darcie,

Attached is the pager for Tuesday's NAEMS briefing with Anne. Due to the holiday, I would image this needs to be forwarded to OAR today, if possible. Please let me know if you have any questions.

Thanks.

John Ashley
Office of Air Quality Planning and Standards
Sector Policies and Programs Division
(919) 541-1458

Message

From: Jones, Enesta [Jones.Enesta@epa.gov]
Sent: 10/16/2019 9:19:35 PM
To: Hull, George [Hull.George@epa.gov]
Subject: Re: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

Appreciate it.

On Oct 16, 2019, at 5:04 PM, Hull, George <Hull.George@epa.gov> wrote:

Agreed. Thanks, George

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Wednesday, October 16, 2019 4:28 PM
To: Bremer, Kristen <Bremer.Kristen@epa.gov>; Hull, George <Hull.George@epa.gov>
Cc: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>; Ashley, Jackie <Ashley.Jackie@epa.gov>
Subject: Re: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

Appreciate it, Kristen. Ex. 5 Deliberative Process (DP) OAR & OECA agree?

On Oct 16, 2019, at 4:24 PM, Bremer, Kristen <Bremer.Kristen@epa.gov> wrote:

Here's our proposed response:

Ex. 5 Deliberative Process (DP)

Kristen Bremer
Policy Analysis & Communications
U.S. EPA, Office of Air Quality Planning & Standards
Email: bremer.kristen@epa.gov
Phone: 919.541.9424
Cell: Ex. 6 Personal Privacy (PP)

From: Jones, Enesta <Jones.Enesta@epa.gov>
Sent: Wednesday, October 16, 2019 3:57 PM
To: DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Hull, George <Hull.George@epa.gov>; Egan, Patrick <egan.patrick@epa.gov>; Bremer, Kristen <Bremer.Kristen@epa.gov>; Ashley, Jackie <Ashley.Jackie@epa.gov>
Cc: Jones, Enesta <Jones.Enesta@epa.gov>
Subject: Media Inquiry: Center for Public Integrity re OIG report on CAFO emission estimates

Hi All. Please see the inquiry below. I believe this overlaps OAR & OECA. DDL is 10/18. Tnx.

I'm working on a story and had a few questions. I've read through the proposed rule/call for information posted on 10/01/2019, but wanted more info related to some points raised by the OIG in the 2017 report about emission estimates from animal feeding operations.

1. The report says EPA provided planned corrective actions in response to the OIG recommendations, but I can't find any documentation beyond this notification letter. Are there any reports/documents detailing how EPA addressed the concerns detailed in this report? If so, can you point me to/send me a copy?

According to that OIG report, as of May 2017:

- EPA has not finalized any emissions estimating methodologies for animal feeding operations
- EPA has not finalized its workplan or established timeframes for completing EEMs
- EPA has not developed any additional draft EEMs

2. Has the status on any of those changed since the OIG report was published?

Thanks for your help,

Joe

Joe Wertz

Senior Environment Reporter

The Center for Public Integrity

@joewertz

publicintegrity.org

Office: 202-481-1262

Mobile Ex. 6 Personal Privacy (PP)
Signal:

PGP: BBE7 2478 6820 3E3B 51EE
5BFB 3BF8 A51A 5BC9 5CD9

Message

From: Hull, George [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=F6DD2FAB273845218756495C7A2D94AD-GHULL]
Sent: 11/14/2019 6:31:37 PM
To: Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: RE: Quick Q - ongoing reporter Q about list of NAEMS participants

Just finishing another call. Will call you, shortly. - George

---

From: Sullivan, Tim <Sullivan.Tim@epa.gov>
Sent: Thursday, November 14, 2019 1:11 PM
To: Hull, George <Hull.George@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: Quick Q - ongoing reporter Q about list of NAEMS participants

Hi, George.

I just left you a voicemail on this. **Ex. 5 Deliberative Process (DP)** **Ex. 5 Deliberative Process (DP)** Please call when you have a minute.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Sullivan, Tim <Sullivan.Tim@epa.gov>
Sent: Thursday, November 14, 2019 9:55 AM
To: Costa, Allison <Costa.Allison@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Hull, George <Hull.George@epa.gov>; Nguyen, Quoc <Nguyen.Quoc@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: FW: Quick Q - ongoing reporter Q about list of NAEMS participants

Ex. 5 AC/DP

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Sullivan, Tim
Sent: Thursday, November 14, 2019 9:47 AM
To: Costa, Allison <Costa.Allison@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Hull, George <Hull.George@epa.gov>; Nguyen, Quoc <Nguyen.Quoc@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: Quick Q - ongoing reporter Q about list of NAEMS participants

Hi, Allison.

Ex. 5 AC/DP

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Thursday, November 14, 2019 8:30 AM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>
Subject: Quick Q - ongoing reporter Q about list of NAEMS participants
Importance: High

Hi Tim,

Ex. 5 AC/DP

Thanks!
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

Message

Sent: 4/4/2019 12:16:26 PM
To: Spriggs, Gwendolyn [spriggs.gwendolyn@epa.gov]
CC: Porter, Amy [Porter.Amy@epa.gov]
Subject: FW: OIG Enforcement Assignment: Interview Questions
Attachments: Ex. 7(E) .pdf; OIG Interview Questions for OECA-OCE 12-18-18_with_links.docx

Gwen – please find below an email and attachments we sent to the OIG after we (me and Amy met with the OIG re: attached questions).

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Tesch, Danielle
Sent: Tuesday, December 18, 2018 1:11 PM
To: Porter, Amy <Porter.Amy@epa.gov>; Hess, Kathryn <Hess.Kathryn@epa.gov>; Triebwasser, Charles <triebwasser.charles@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Enforcement Assignment: Interview Questions

Thank you, Amy and Lauren!

I did mean to say during our meeting, if any of the resources that you share with us are privileged and/or enforcement confidential that we will make sure to mark them as such in our working papers and there will be a couple of opportunities for OECA to weigh in on report language. We definitely do not want to disclose enforcement techniques or procedures or have an adverse effect on agency enforcement.

We will touch base with you again in the new year after we have had a chance to review some more of the links you provided.

Happy holidays and happy new year!

All the best,
Danielle

Danielle M. Tesch
Social Scientist
USEPA – Office of Inspector General | Office of Audit and Evaluation (OAE)
1650 Arch Street | Mail Code 3Ai00 | Philadelphia, PA 19103-2029
Phone: (215) 814-2337 | Fax: (215) 814-2351

live in the sunshine. swim in the sea. drink the wild air. –Emerson

From: Porter, Amy
Sent: Tuesday, December 18, 2018 12:20 PM
To: Tesch, Danielle <Tesch.Danielle@epa.gov>; Hess, Kathryn <Hess.Kathryn@epa.gov>; Triebwasser, Charles

<triebwasser.charles@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Enforcement Assignment: Interview Questions

Danielle, Kathy, and Chip –

Please see attached documents – your questions with the links we referenced on today's call, Ex. 7(E)

Ex. 7(E)

Please let us know if you have any additional questions or if we can be helpful in any way.

Thank you,

Amy

Amy Porter, Director
Crosscutting Policy Staff
Office of Civil Enforcement
US Environmental Protection Agency
202-564-2431

From: Tesch, Danielle
Sent: Thursday, December 13, 2018 6:16 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>; Porter, Amy <Porter.Amy@epa.gov>
Cc: Hess, Kathryn <Hess.Kathryn@epa.gov>; Triebwasser, Charles <triebwasser.charles@epa.gov>
Subject: OIG Enforcement Assignment: Interview Questions

Hi, Lauren and Amy,

Please find attached a set of questions for next week's interview (apologies for sending them a little later than anticipated). The questions are aimed at providing us with a better understanding of the civil enforcement process, trends in civil enforcement actions and results over time, and a couple observations we have made while preliminarily analyzing ECHO/ICIS enforcement data. If any of the questions stray outside your (or OCE's) lane, just let us know during the interview.

Thank you!
Danielle

Message

Sent: 5/6/2019 11:17:21 AM
To: Porter, Amy [Porter.Amy@epa.gov]
Subject: FW: Cert Memo: OIG Animal Feeding...17-P-0396
Attachments: Cert memo animal feeding CAA.docx; _epaoig_20170919-17-P-0396_cert.pdf

OK to send below to RK? Will cc: you and Tim Sullivan.

Ex. 5 AC/DP

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/YPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Spriggs, Gwendolyn
Sent: Wednesday, March 20, 2019 12:49 PM
To: Kadish, Rochele <Kadish.Rochele@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: FW: Cert Memo: OIG Animal Feeding...17-P-0396

Rochele…

I'm so sorry. I sent this to you inadvertently.

Lauren….here's the mystery email.

From: Spriggs, Gwendolyn
Sent: Tuesday, March 19, 2019 4:56 PM
To: Kadish, Rochele <Kadish.Rochele@epa.gov>
Subject: Cert Memo: OIG Animal Feeding...17-P-0396

Hi Lauren,

Please disregard my earlier message requesting the attachment for the subject audit. I found it - CRAZZZZY!!!

I have completed the cert memo and if you can return w/in a week, we'll be able to update and close in MATS before the 3/31/19 due date.

Let me know if you have any questions/concerns/edits..

thanks, GJS 564-2439

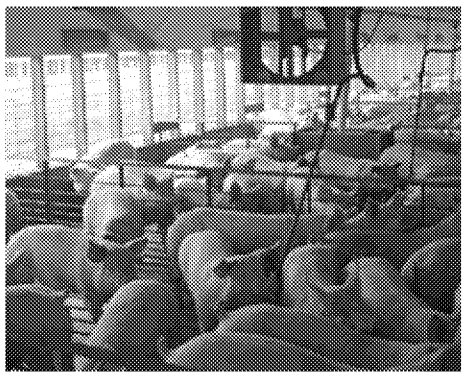
U.S. ENVIRONMENTAL PROTECTION AGENCY

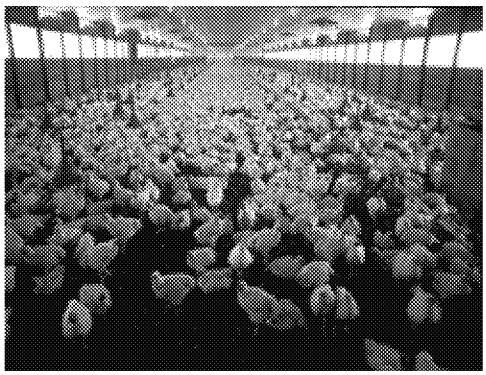
OFFICE OF INSPECTOR GENERAL

Improving air quality

Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes

Report No. 17-P-0396 **September 19, 2017**





Report Contributors:

Richard Jones
Erica Hauck
Jim Hatfield
Kevin Good
Julie Narimatsu

Abbreviations

AFO	Animal Feeding Operation
CAA	Clean Air Act
CAFO	Concentrated Animal Feeding Operation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DQO	Data Quality Objective
EEM	Emissions Estimating Methodology
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
GAO	U.S. Government Accountability Office
NAEMS	National Air Emissions Monitoring Study
NAS	National Academy of Sciences
OAQPS	Office of Air Quality Planning and Standards
OIG	Office of Inspector General
PM	Particulate Matter
SAB	Science Advisory Board
USDA	U.S. Department of Agriculture
VOC	Volatile Organic Compound

Cover photos: Hogs (left) and chickens (right) in confined spaces at animal feeding operations. (EPA photos)

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17-P-0396
September 19, 2017

U.S. Environmental Protection Agency
Office of Inspector General

At a Glance

Why We Did This Review

We conducted this review to determine what actions the U.S. Environmental Protection Agency (EPA) has taken to evaluate air emissions from animal feeding operations.

The EPA estimates there are about 18,000 large animal feeding operations nationwide, which can potentially emit air pollutants in high-enough quantities to subject these facilities to Clean Air Act and other statutory requirements. A lack of reliable methods for estimating these emissions prevented the EPA and state and local agencies from determining whether these operations are subject to statutory requirements.

In 2005, the EPA and the animal feeding operations industry entered into a compliance agreement to address this challenge. As part of this agreement, the industry agreed to fund an air emissions monitoring study that the EPA would use to develop improved emission estimating methodologies for the industry.

This report addresses the following:

- *Improving air quality.*

Send all inquiries to our public affairs office at (202) 566-2391 or visit www.epa.gov/oig.

Listing of OIG reports.

Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes

What We Found

Until the EPA develops sound methods to estimate emissions, the agency cannot reliably determine whether animal feeding operations comply with applicable Clean Air Act requirements.

The industry-funded National Air Emissions Monitoring Study (NAEMS) and the EPA's analyses of the study's results comprised the agency's primary actions to evaluate air emissions from animal feeding operations over the past decade. The NAEMS monitoring was completed more than 7 years ago at a cost of about $15 million, but the EPA had not finalized any emission estimating methodologies for animal feeding operations. In addition, the EPA had only drafted methodologies for about one-fourth of the emission source and pollutant combinations studied in the NAEMS. The EPA expected to develop and begin publishing emission estimating methodologies by 2009, so the methodologies could be used by the EPA, state and local agencies, and industry operators to determine the applicability of Clean Air Act and other statutory requirements.

Delays in developing the emission estimating methodologies stemmed from limitations with NAEMS data, uncertainty about how to address significant feedback from the EPA's Science Advisory Board, and a lack of EPA agricultural air expertise and committed resources. The EPA had not finalized its work plan or established timeframes to finish the methodologies. As a result, the applicability of requirements to control emissions from individual animal feeding operations remained undetermined, enforcement protections for consent agreement participants remained in effect longer than anticipated, and a number of agency actions on animal feeding operation emissions continued to be on hold. Further, because the EPA had not conducted systematic planning, the agency was at risk of developing emission estimating methodologies that cannot be widely applied to animal feeding operations.

Recommendations and Planned Corrective Actions

We recommend that the EPA conduct systematic planning for future development of emission estimating methodologies. Based on the results of this planning, the EPA should determine whether it can develop emission estimating methodologies of appropriate quality for each of the emission source and pollutant combinations studied. If the EPA determines that it cannot develop certain emission estimating methodologies, it should notify agreement participants and end civil enforcement protections. For the emission estimating methodologies that can be developed, the EPA should establish public milestones for issuing the draft methodologies. The EPA agreed with our recommendations, and we accepted the agency's planned corrective actions.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

THE INSPECTOR GENERAL

September 19, 2017

MEMORANDUM

SUBJECT: Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes
Report No. 17-P-0396

FROM: Arthur A. Elkins Jr.

TO: Sarah Dunham, Acting Assistant Administrator
Office of Air and Radiation

Lawrence Starfield, Acting Assistant Administrator
Office of Enforcement and Compliance Assurance

This is our report on the subject evaluation conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency (EPA). The project number for this evaluation was OPE-FY16-0018. This report contains findings that describe the problems the OIG has identified and corrective actions the OIG recommends. This report represents the opinion of the OIG and does not necessarily represent the final EPA position. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures.

Action Required

In accordance with EPA Manual 2750, your office provided planned corrective actions in response to the OIG recommendations. We consider the planned corrective actions for all recommendations to be acceptable. Therefore, you are not required to provide a written response to this final report. The OIG may make periodic inquiries on your progress in implementing these corrective actions. Please update the EPA's Management Audit Tracking System as you complete planned corrective actions.

We will post this report to our website at www.epa.gov/oig.

Table of Contents

Chapters

1 Introduction 1

Purpose 1
Background 1
Responsible Offices 8
Scope and Methodology 8
Prior Report 9

2 EPA Plans for Finalizing EEMs Were Not Accomplished and Potential Air Quality Impacts Continue 10

Development of EEMs Is Years Behind Schedule 10
Responding to SAB Concerns and a Lack of Resources Slowed Development of EEMs 12
AFO Air Emissions Remain Largely Uncharacterized and Important Agency Actions Are on Hold 16
Conclusion 18

3 EPA Needs to Implement Systematic Planning to Assure That EEMs Have Sufficient Quality 19

EPA Quality System 19
EPA Has Not Fully Implemented a Systematic Planning Process to Assure a Desired Level of Quality for EEMs 21
Conclusion 22
Recommendations 23
Agency Response and OIG Evaluation. 24

4 EPA Has Not Updated Some Stakeholders and Public on Current Status of EEM Efforts 25

EPA Provided Extensive Public Outreach During Early Stages 25
EPA Has Not Publicly Communicated on EEM Development Efforts Since 2013 25
Conclusion 26
Recommendation 26
Agency Response and OIG Evaluation 26

Status of Recommendations and Potential Monetary Benefits 27

- continued -

Appendices

A Office of Air and Radiation Response to Draft Report 28

B Office of Enforcement and Compliance Assurance Response to Draft Report 31

C Distribution 34

Chapter 1
Introduction

Purpose

We conducted this evaluation to determine what actions the U.S. Environmental Protection Agency (EPA) has taken to evaluate air emissions from animal feeding operations (AFOs), including the status of the National Air Emissions Monitoring Study (NAEMS).

Background

AFOs are agriculture operations where animals are kept and raised in confined areas. The U.S. Department of Agriculture (USDA) has estimated that there are about 450,000 AFOs nationwide. While the majority of these are small operations with fewer than 300 animals, the EPA has estimated there are more than 18,000 large AFOs[1] that may raise thousands of animals. For more than two decades, movements to improve profitability within the agriculture industry have resulted in larger AFO facilities that often are geographically concentrated. As facility size has increased and greater numbers of animals are housed in confined spaces, concerns have arisen regarding these facilities' impacts on the environment and public health.

The EPA regulates certain larger AFOs under the Clean Water Act's National Pollutant Discharge Elimination System permit program, which regulates the discharge of pollutants to the waters of the United States. AFO air emissions are not regulated by any AFO-specific standards under the Clean Air Act (CAA), but AFOs that emit air pollutants in sufficient quantities can trigger CAA permit requirements. In the late 1990s, the EPA recognized that it did not have sufficient AFO air emissions data to develop reliable emission estimating methodologies (EEMs) for determining whether individual AFOs are subject to CAA permit requirements or emission reporting requirements under two other statutes: the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Emergency Planning and Community Right-to-Know Act (EPCRA).[2] Both CAA permitting requirements and CERCLA/EPCRA release

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[1] EPA water regulations define AFOs and a subset of larger AFOs called concentrated animal feeding operations (CAFOs), and the Clean Water Act includes CAFOs as a type of point source. The CAA does not define or reference these terms, and the EPA's Office of Air and Radiation does not distinguish between an AFO and a CAFO. Thus, we use the term "AFO" throughout our report, even when referring to a facility that would meet the definition of a CAFO under the Clean Water Act.

[2] EPCRA and CERCLA require facilities to report emissions of certain hazardous substances if they are released in quantities at or above certain thresholds. This includes two hazardous substances commonly released by AFOs: ammonia and hydrogen sulfide.

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reporting requirements are triggered only if a facility emits certain pollutants at or above specific regulatory thresholds.

The agency began discussions with representatives of the AFO industry in 2001 to address uncertainty in determining the applicability of statutory requirements for air emissions. As a result, the EPA and certain sectors of the AFO industry[3] (e.g., pork and broiler producers, egg layers, and dairy) negotiated a consent agreement, which was published in 2005[4] and entered into by AFO owners/operators who elected to participate. Under this agreement, participating AFO owners/operators agreed to pay a civil penalty, comply with all applicable requirements of the agreement, and participate (if selected) in a national monitoring study. The AFO sectors agreed to fund the monitoring study to provide data the EPA would use to develop EEMs for various AFO pollutants and emission sources.

Air Emissions From AFOs

AFOs can release several pollutants, including but not limited to: ammonia, hydrogen sulfide, particulate matter (PM), volatile organic compounds (VOCs) and hazardous air pollutants. AFO air emissions come from lagoons, barns and other structures, and manure spread on fields. Table 1 lists the key pollutants emitted from AFOs, along with their common emission sources and associated health and air quality effects.

Table 1: Emission sources and health effects of key pollutants from AFOs

Pollutant	Common emission sources	Health and air quality effects
Ammonia (NH_3)	Decomposition of animal manure.	Can cause severe cough and chronic lung disease. It also contributes directly to the formation of $PM_{2.5}$, and deposition can impact sensitive ecosystems.
Volatile organic compounds (VOCs)	Animal feed and waste.	Can cause eye, nose and throat irritation; damage to liver, kidney and central nervous system; and cancer. VOCs also contribute to the formation of ground-level ozone.
Particulate matter (PM)*	Dry manure, bedding and feed materials, and dirt feed lots.	Exposure is linked to a variety of problems, including decreased lung function, increased respiratory symptoms, and premature death in people with heart or lung disease.
Hydrogen Sulfide (H_2S)	Decomposition of animal manure stored in wet conditions such as lagoons.	Can cause eye and respiratory irritation at lower concentrations. At higher concentrations, paralysis of the respiratory center can lead to rapid death. Excess emissions can contribute to the formation of $PM_{2.5}$ and acid rain.

Source: EPA Office of Inspector General (OIG) analysis.

* PM includes both fine particles ($PM_{2.5}$,) and coarser particles (PM_{10}).

[3] According to the EPA, state and local agencies, and an environmental organization also participated in initial discussions on the agreement.

[4] Animal Feeding Operations Consent Agreement and Final Order, 70 Fed. Reg. 4958-4977 (Jan. 31, 2005).

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AFOs can be located near residences, and some communities have multiple AFOs nearby. For example, several counties in eastern North Carolina have the highest concentration of swine AFOs in the United States. Some studies have raised concerns that lower-income and minority communities are disproportionately impacted by air emissions from AFOs. Studies conducted in North Carolina found that residents living near swine AFOs were disproportionately low-income people of color. Air pollution from these AFOs is associated with the potential health impacts listed in Table 1 above, as well as a reduced quality of life due to persistent odors[5] and declining property values.[6]

Highlights from external studies on impacts from AFO air emissions:

- **Residential property values were reduced by an average of almost 23 percent within 1.25 miles of a large swine AFO.[a]**
- **The closer children go to school near a large AFO, the greater the risk of asthma symptoms.[b]**
- **Living in close proximity to large swine AFOs may result in impaired mental health and negative mood states, such as tension, depression or anger.[c, d]**

[a] Simons, R.A. et al., 2014. The Effect of a Large Hog Barn Operation on Residential Sales Prices in Marshall County, KY. JOSRE. 6(1).
[b] Mirabelli, M. C. et al., 2006. Asthma Symptoms Among Adolescents Who Attend Public Schools That Are Located Near Confined Swine Feeding Operations. Pediatrics. 118;66-75.
[c] Bullers, S., 2005. Environmental Stressors, Perceived Control, and Health: The Case of Residents Near Large-Scale Hog Farms in Eastern North Carolina. Human Ecology. 33(1).
[d] Schiffman, S. S. et al., 1995. The Effect of Environmental Odors Emanating From Commercial Swine Operations on the Mood of Nearby Residents. Brain Research Bulletin. 37(4): 369-375.

Characterizing air emissions from AFOs is difficult due to a number of factors. AFOs can have many and varied sources of air emissions, including barns, houses, feedlots, pits, lagoons, basins and manure spray fields. Each of these emission sources can emit a variety of air pollutants, and emission rates can fluctuate depending on climate and geographical conditions, among other factors. Further, characterizing AFO air emissions requires expertise in multiple scientific disciplines, including animal nutrition, AFO practices and atmospheric chemistry.

The EPA and the USDA have been collaborating on a manual of voluntary best management practices to provide AFO owner/operators and state and local governments with options to reduce AFO air emissions. The manual contains best management practices for reducing particulate matter, ammonia, hydrogen sulfide, and other air emissions through various aspects of AFO management, including feed management, manure management, land application, and other areas. The EPA plans to publish the manual before the end of 2017, pending agency administration approval.

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[5] Odors are not regulated by the EPA, but may be addressed under some state and local laws.
[6] Simons, R.A. et al., 2014. The Effect of a Large Hog Barn Operation on Residential Sales Prices in Marshall County, KY. JOSRE. 6(1).
Kim, J. et al., 2009. A Spatial Hedonic Approach to Assess the Impact of Swine Production on Residential Property Values. Environ Resource Econ. 42: 509-534.

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National Academy of Sciences Report on AFO Air Emissions

In 2001, the EPA and USDA jointly requested that the National Academy of Sciences (NAS) evaluate the body of scientific information used for estimating various kinds of air emissions from AFOs. In 2003, the NAS reported[7] that accurate emissions estimates were needed to determine AFOs' potential impacts and to assess the implementation of measures to control emissions. The NAS also reported that the EPA had not dedicated the necessary resources to estimate AFO air emissions, and that the agency's approach to estimating emissions was inadequate. That approach involved deriving emission factors from published emissions data, as well as gathering emission factors from existing literature. These emission factors were then applied to representative farms to estimate annual mass emissions. The NAS reported that this approach did not account for the variability among AFOs (e.g., differences in geography and climate) and thus cannot adequately estimate air emissions from an individual AFO.

The NAS recommended that the EPA develop a "process-based" approach to estimate AFO air emissions. The NAS favored such an approach for most types of emissions as the primary focus for both short- and long-term research,[8] but also stated that short-term research should focus on providing "defensible estimates of air emissions that could be used to support responsible regulation."[9] The NAS described process-based models as mathematical models "that describe the movement of various substances of interest at each major stage of the process of producing livestock products: movement into the next stage, movement in various forms to the environment, and ultimately movement into products used by humans."[10]

Air Compliance Agreement With AFO Industries

In 2002, spurred in part by uncertainty about emission levels from AFOs and concerns about applicability of CAA requirements, representatives of the pork, egg producers, and other AFO sectors proposed a plan to EPA officials to produce air emissions monitoring data from AFOs. Negotiations between the EPA and AFO sectors[11] lasted for more than 2 years before an agreement was finalized in 2005. As a condition of the 2005 Air Compliance Agreement (henceforth, the "Agreement"), the industry agreed to fund a large-scale emissions monitoring study. The EPA was to use the emissions monitoring data to develop EEMs that

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[7] *Air Emissions from Animal Feeding Operations: Current Knowledge, Future Needs*, NAS National Research Council (2003).
[8] 2003 NAS report, pp. 152-153.
[9] 2003 NAS report, p. 25.
[10] 2003 NAS report, p. 9.
[11] Participating AFO sectors included egg layers, broiler chickens, dairy cattle and swine. The turkey sector was a part of the negotiations as well, but not enough turkey AFO owners/operators signed up to fund monitoring. The Agreement did not cover beef cattle.

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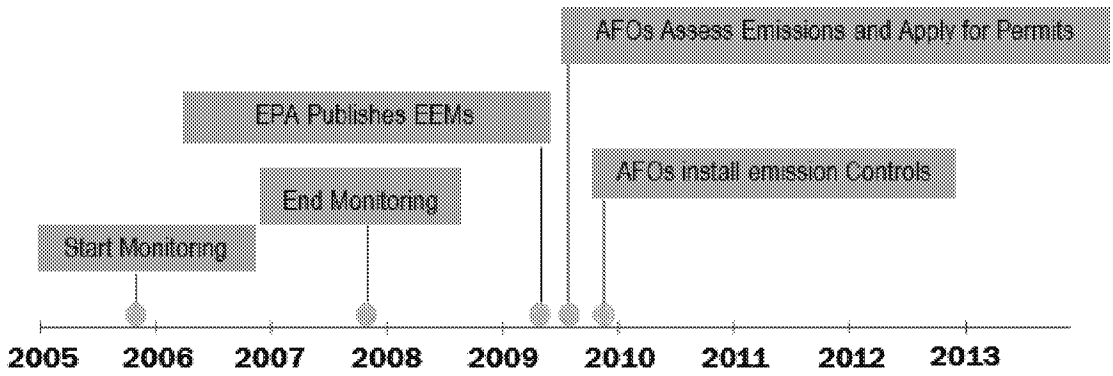
AFOs could apply to estimate their emissions and determine the applicability of CAA permitting and CERCLA/EPCRA release reporting requirements. Once a facility applied the EEMs to determine its emissions, the facility was to submit all required CAA permit applications and/or report any hazardous substance releases requiring notice under CERCLA/EPCRA.[12]

The Federal Register Notice (henceforth, the "Notice") that published the Agreement included the EPA's expectation that the emissions monitoring study would begin in 2005 and last 2 years. The Notice also described the EPA's expected timeframes for completing the tasks subsequent to the study. Based on these original expectations, the EPA would begin publishing final EEMs in 2009, and AFOs would have obtained any necessary permits and installed emission controls by 2010. Figure 1 shows the timing for these different activities.

Figure 1: Expected timeframes for monitoring study and EEM development



Source: OIG analysis of the Notice publishing the Agreement. 70 Fed. Reg. 4958-4977 (Jan. 31, 2005).

[12] In a 2008 rule, the EPA exempted from CERCLA Section 103 reporting requirements all releases of hazardous substances to the air from animal waste at AFOs. The rule also exempted such releases from EPCRA Section 304 reporting requirements, except when AFOs confine a number of animals at or above the large CAFO threshold, as defined under Clean Water Act regulations. However, on April 11, 2017, the U.S. Court of Appeals for the District of Columbia Circuit ruled in favor of a group of environmental organizations that challenged the exemption and ordered that the 2008 rule be vacated (*Waterkeeper Alliance et al. v. EPA*). On July 17, 2017, the EPA filed a motion requesting the Court grant a stay of the ruling for six months to allow the EPA time to develop guidance for farms on reporting requirements. On August 16, 2017, the Court ordered a stay of the ruling through November 14, 2017. The EPA has 75 days from August 16, 2017, to request an extension of the stay if needed.

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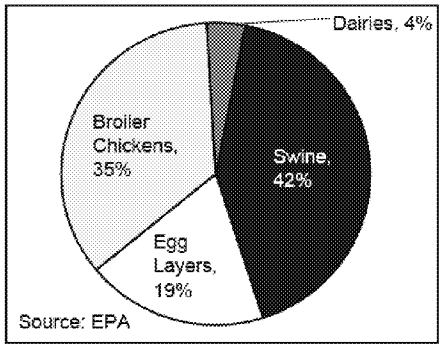
Primary provisions for AFOs participating in the Air Compliance Agreement include:

- **Pay up to $2,500 per farm to fund a 2-year emissions study.**
- **Agree to make their property available for emissions monitoring if selected as a monitoring site for the study.**
- **Pay a civil penalty ranging from $200 to $1,000, depending on the size and number of AFOs covered by the participant's Air Compliance Agreement.**
- **Receive protection from enforcement actions for civil violations of the CAA, CERCLA and EPCRA, to last until either (1) the EPA finalizes EEMs, or (2) the EPA notifies the facility that it was unable to finalize EEMs.**

Under the Agreement, participating AFOs were granted a release and covenant not to sue for potential CAA, CERCLA and EPCRA violations alleged in the Agreement (henceforth, "civil enforcement protections") until the EEMs are developed and AFOs apply for applicable CAA permits and report qualifying releases under CERCLA and EPCRA, or the EPA determines it cannot develop EEMs and notifies Agreement participants accordingly.

The EPA entered into 2,568 separate agreements with AFO owners and operators, which covered about 13,900 AFOs in 42 states. According to the EPA, these 13,900 AFOs comprise more than 90 percent of the largest AFOs in the United States. Figure 2 illustrates the percentage of all Agreement participants by type of animal raised.

Figure 2: Agreement participants by type of animal raised



Monitoring Study Methodology

About $15 million was collected from the AFO sectors participating in the Agreement to fund the NAEMS emissions study. The NAEMS protocol provided the framework for the field sampling plan, and was developed through a collaborative effort of industry experts, university scientists, EPA and other government scientists, and other stakeholders knowledgeable in the field. The Agricultural Air Research Council—a nonprofit organization established by industry—was responsible for managing and disbursing funds for the study.

The Agricultural Air Research Council was also responsible for selecting a Science Advisor to develop a detailed study design and quality assurance plan, and to oversee the emissions monitoring work, including work conducted by the contracted principal investigators. The principal investigators—most of whom were researchers at land grant universities with expertise in animal agriculture and/or emissions measurement—carried out the monitoring at selected sites. EPA staff did not collect monitoring data, but conducted audits at monitoring sites to ensure that proper techniques and protocols were followed.

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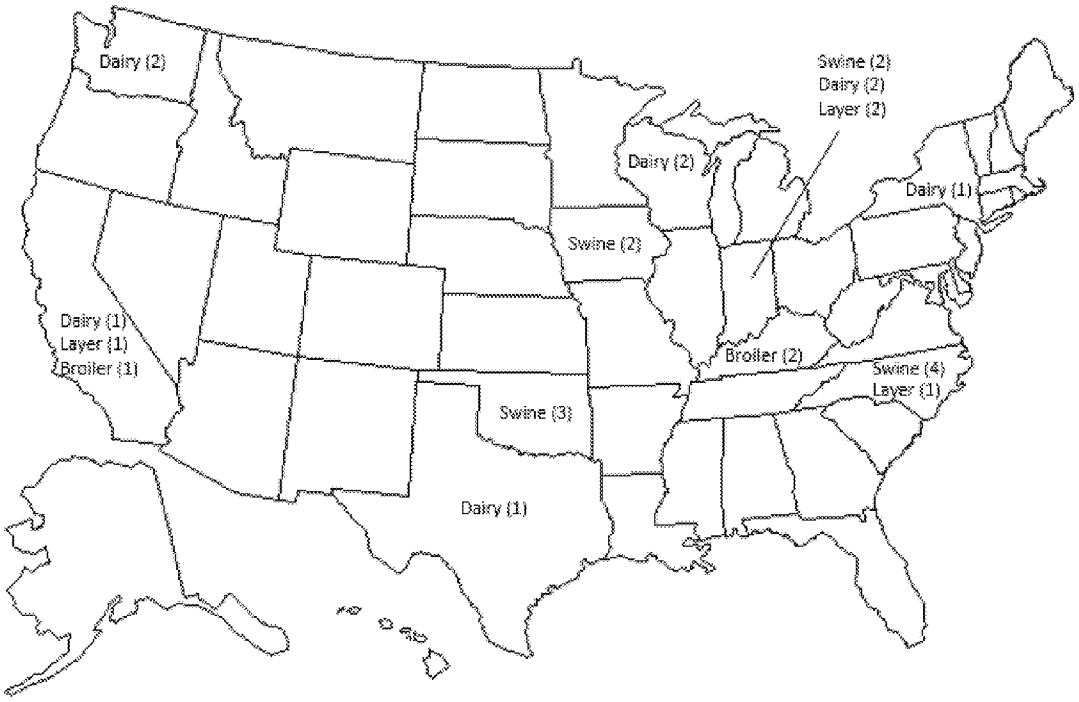
Monitoring was conducted at 27 total sites (i.e., specific sources of emissions such as a barn or a lagoon).[13] Measurements of ammonia, particulate matter (PM_{10} and $PM_{2.5}$),[14] total suspended particulates, VOCs, hydrogen sulfide, and carbon dioxide[15] were taken at broiler chicken, egg layer, swine, and dairy confinement sites (e.g., houses and barns). Measurements of ammonia, hydrogen sulfide, and VOCs were taken at swine and dairy open-source sites (e.g., lagoons and basins). Figure 3 shows the location of monitoring sites across the country.

Figure 3: NAEMS monitoring site locations



Source: OIG analysis of NAEMS site reports.

Other types of measurements were also taken at monitoring sites to help characterize emissions. These measurements included meteorological data (such as temperature and wind speed), and information on the number of animals at AFO monitoring locations, how the animals were housed, and how their waste was managed. The Agreement stated that the EPA would use data from the NAEMS and any other relevant data to develop EEMs.

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[13] The 27 monitoring sites were located at 23 AFOs. Monitoring was conducted at two sites (emission sources) for four of the 23 participating AFOs.

[14] PM_{10} describes inhalable particles with diameters that are generally 10 micrometers and smaller. $PM_{2.5}$ describes fine inhalable particles with diameters that are generally 2.5 micrometers and smaller.

[15] While carbon dioxide was measured at confinement sites as part of the NAEMS, the EPA never intended to create EEMs for carbon dioxide emissions.

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Responsible Offices

The EPA office primarily responsible for development of the Agreement was the Office of Enforcement and Compliance Assurance. The EPA office responsible for developing EEMs from the NAEMS data is the Office of Air Quality Planning and Standards within the EPA's Office of Air and Radiation, while the Office of Research and Development plays a supporting role.

Scope and Methodology

We conducted our performance audit from April 2016 through May 2017, in accordance with generally accepted government auditing standards. Those standards require that we obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our objective. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective.

To address our objective, we identified and reviewed applicable statutes, regulations, policies and guidance, including sections of the CAA and the Clean Water Act, CAA permitting requirements and thresholds, and the Agreement and associated monitoring protocol. To help us determine the status of the EPA's NAEMS, as well as other efforts to evaluate AFO air emissions, we obtained and reviewed EPA emission reports and analyses, NAEMS-related reports and studies, an EPA Science Advisory Board (SAB) report, and documents related to EPA legal proceedings.

To determine state efforts to address AFO air emissions, we reviewed state regulations and programs for a selected number of states. We also reviewed petitions requesting that the EPA regulate AFO air emissions, and an administrative complaint alleging discrimination against minorities in North Carolina in permitting AFOs. In addition, we reviewed academic studies and reports to determine AFO air emissions and health impacts, and potential disparate impacts in overburdened communities.

We interviewed EPA staff and managers in the Office of Air Quality Planning and Standards, the Office of Enforcement and Compliance Assurance, the Office of Research and Development, the Office of Civil Rights, the Office of Water, and EPA Region 4 (which covers North Carolina), to gain an understanding of EPA actions to evaluate and address AFO air emissions. We also interviewed the following stakeholders to discuss the Agreement and the history and status of the NAEMS:

- USDA's Natural Resources Conservation Service staff.
- SAB members who reviewed the EPA's draft EEMs.
- An AFO industry advisor.
- AFO academic researchers at Purdue University, North Carolina State University, and University of North Carolina-Chapel Hill.

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In addition, we interviewed organizations (Sierra Club, Food & Water Watch, EarthJustice, Waterkeeper Alliance) that submitted CAA petitions to regulate AFO emissions. We also interviewed organizations that submitted a Title VI administrative complaint (the North Carolina Environmental Justice Network and the Rural Empowerment Association for Community Help) alleging discrimination in AFO permitting in North Carolina.

To assess internal controls, we reviewed EPA policies and guidance on quality assurance, including the following:

- The EPA's Quality Policy.
- The EPA's Procedure for Quality Policy.
- The EPA's *Guidance on Systematic Planning Using the Data Quality Objectives Process.*
- The EPA's Office of Air Quality Planning and Standards' Quality Management Plan.

We also reviewed the quality assurance project plans developed for the NAEMS and early draft EEM development.

Prior Report

In September 2008, the U.S. Government Accountability Office (GAO) issued a report on AFOs titled *Concentrated Animal Feeding Operations: EPA Needs More Information and a Clearly Defined Strategy to Protect Air and Water Quality from Pollutants of Concern* (GAO-08-944). GAO reported that the EPA did not have the data needed to effectively regulate CAFO air emissions; specifically, the EPA lacked data on air emission from CAFOs, which the EPA is trying to address through the NAEMS. GAO found that the EPA lacked consistent and accurate data for CAFOs regulated under the Clean Water Act, and that such data—like the locations of the CAFOs—could assist with an assessment of CAFO air emissions. GAO reported that two, then-recent decisions by the EPA suggest that the agency had not yet determined how it intended to regulate air emissions from CAFOs:

- The EPA proposed to exempt releases to the air of hazardous substances from farm manure from both CERCLA and EPCRA notification requirements.

- The EPA stated it will not make key regulatory decisions on how federal air regulations apply to CAFOs until after the NAEMS is completed.

GAO recommended that the EPA (1) reassess the data collection efforts of the NAEMS, and (2) establish a strategy and timetable for developing process-based emission estimating protocols for CAFOs. GAO determined that the EPA has implemented the first recommendation but has not completed the second one.

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Chapter 2
EPA Plans for Finalizing EEMs Were Not Accomplished and Potential Air Quality Impacts Continue

The EPA had not published any final EEMs for AFOs, and had not finalized its workplan or established timeframes for completing them. Moreover, progress had been limited since 2013, when the EPA's SAB concluded that draft EEMs developed by the EPA should not be applied on a national scale as intended, and made several recommendations to improve the EPA's statistical analyses. At the time of the Agreement in 2005, the EPA expected that it would begin publishing final EEMs in 2009. Further, the EPA expected that by 2010 the AFO industry would have used the EEMs to assess their emissions, apply for any applicable CAA permits, and install any necessary emission reduction controls.

The EPA collaborated with a committee of external stakeholders to develop a protocol they believed would provide sufficient, representative data for the EPA's EEM development efforts. However, public comments submitted to the EPA on the planned NAEMS protocol, and the 2008 GAO report, questioned whether the NAEMS would provide enough data to produce scientifically and statistically valid EEMs. As a result of the delays, individual AFOs have not applied EEMs to determine whether their air emissions were significant enough to require CAA permits and related emissions controls, while civil enforcement protections for Agreement participants remained in effect.

Development of EEMs Is Years Behind Schedule

Based on the original expectations for completion of the tasks in the Notice, the NAEMS monitoring would have been completed in 2007, and the EPA would have begun publishing EEMs in 2009. By 2010 all facilities would have done the following:

1. Applied the EEMs to determine whether they met or exceeded CAA permitting and/or CERCLA/EPCRA release reporting thresholds, and whether permitting and reporting were required.

2. Submitted any required CAA permit applications and CERCLA/EPCRA release notifications.

3. Implemented the mitigation and emission control requirements described in their permits. At this point, the protections from civil enforcement actions under the Agreement would have ended for participating AFOs.

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However, EPA staff told us that this timeline did not account for time required for the EPA's Environmental Appeals Board to approve individual agreements, which took longer than anticipated and was not completed until December 2006. Further, it did not account for monitoring that occurred on a rolling basis, and thus took more than 2 years to complete.

The NAEMS monitoring was completed in early 2010, about 2 years later than originally expected. The EPA began developing draft EEMs after monitoring was completed. In 2012, the EPA placed its draft EEMs on its public website for public comment. Draft EEMs covered eight[16] of the 36[17] emission source and pollutant combinations described in the Agreement. The EPA's Office of Air and Radiation also submitted the draft EEMs to the SAB to obtain feedback on EEM development and related questions. The SAB conducted its review of draft EEMs in 2012 and issued its final report[18] on April 19, 2013.

At the time we finished our review in May 2017, the EPA had not finalized any draft EEMs, or developed any additional draft EEMs. According to the 2005 Agreement, the EPA expected to begin publishing final EEMs within 18 months after completion of the NAEMS monitoring.

Figure 4 shows a timeline of expected and actual NAEMS and EEM development activities up to the 2013 SAB final report.

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[16] These included EEMs to estimate six different types of emissions from broiler chicken houses, and EEMs to estimate ammonia emissions from dairy and swine lagoons/basins. Also, see Table 2.

[17] According to the Office of Air and Radiation, the number of EEMs that will ultimately be developed will be influenced by factors such as differences in production, management and building conditions, as well as availability of sufficient data.

[18] *SAB Review of Emissions-Estimating Methodologies for Broiler Animal Feeding Operations and for Lagoons and Basins at Swine and Dairy Animal Feeding Operations*, EPA-SAB-13-003 (2013).

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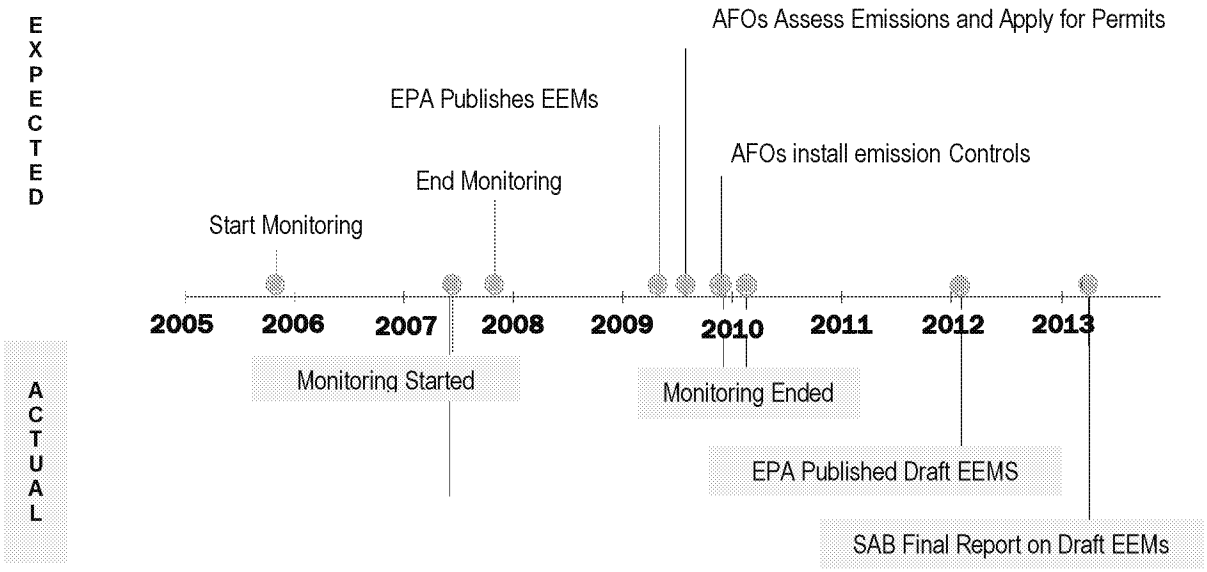
Figure 4: Expected and actual NAEMS/EEM development timeline



Source: OIG analysis of EPA documents.

Responding to SAB Concerns and a Lack of Resources Slowed Development of EEMs

The SAB identified several concerns with the draft EEMs, and the Office of Air and Radiation did not agree with some of the concerns. Since that time, EEM development slowed considerably, as the EPA decided how to address the SAB's concerns. The EPA also encountered resource constraints and a lack of available technical expertise.

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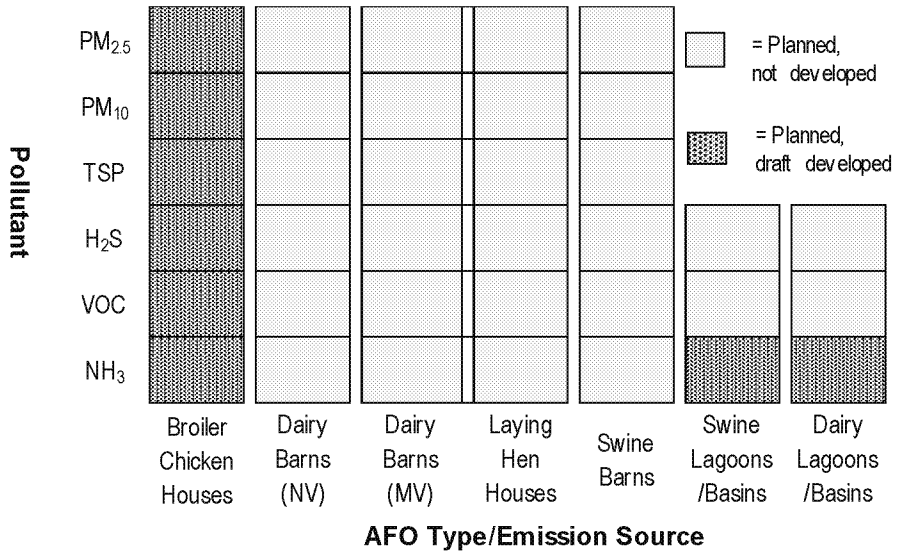
Table 2 shows all emission source and pollutant combinations from the Agreement,[19] and the draft EEMs that were developed and submitted to the SAB for review.

Table 2: Status of EEM development



Source: OIG analysis.

$PM_{2.5}$:	Particulate matter < 2.5 micrometers	H_2S:	Hydrogen Sulfide
PM_{10}:	Particulate matter < 10 micrometers	VOC:	Volatile organic compounds
TSP:	Total suspended particulates	NH_3:	Ammonia

SAB Review of Draft EEMs and EPA Response

The SAB concluded that the data and methodology used to develop the draft EEMs limited the ability of the models to estimate emissions beyond the small number of AFOs in the NAEMS data set. Specifically, the SAB concluded that the number of sites monitored was too small relative to the size of the industry; the models were based on variables that did not accurately predict emissions; the EPA should not have combined swine and dairy lagoon/basin data; and there were significant limitations with the VOC data for broiler houses. Thus, the SAB recommended that the EPA not apply the current version of the EEMs beyond the AFOs in the EPA's dataset.

[19] This included EEMs for both naturally ventilated (NV) and mechanically ventilated (MV) dairy barns, as discussed in the Agreement.

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The SAB made a number of other recommendations, including having the EPA do the following:

- Expand its dataset by collecting data from monitoring efforts outside of the NAEMS, and using NAEMS data that were initially excluded due to the EPA's data completeness criteria.
- Not generate an EEM for VOC emissions from broiler operations based on current data limitations.
- Separate swine and dairy lagoon/basin data that had been combined for EEM development.

The SAB also advocated a process-based modeling approach to EEM development. The NAS had advocated a process-based modeling approach to estimating emissions in its 2003 report. Further, in its 2008 report, GAO recommended that the EPA establish a strategy and timetable for developing process-based emission estimating protocols for CAFOs. The SAB noted the following:

> Process-based models would be more likely to be successful in representing a broad range of conditions than the current models because process-based models represent the chemical, biological and physical processes and constraints associated with emissions.

According to the Notice publishing the Agreement, the EPA believed process-based modeling to be a large and complex, multiyear research effort. Therefore, the EPA planned to develop an interim modeling approach, which would be a critical first step to developing a process-based modeling approach. The modeling approach the EPA ultimately selected for the draft EEMs used a statistical software program to analyze the various measurements taken during the NAEMS and identify those variables that predict emissions. The SAB recognized that the EPA may need to apply statistical approaches to assess emissions while it was developing and evaluating process-based models, and thus made recommendations to improve the EPA's chosen approach, as discussed above.

Prior Stakeholder Feedback Questioned the NAEMS Monitoring Approach

The SAB's concerns about the number of monitoring sites being able to support statistically based EEMs was raised in public comments on the Agreement and protocol before the EPA began developing EEMs, and was also raised by GAO in its 2008 report on the EPA's efforts to characterize AFO pollution.

After the NAEMS protocol was made available for public comment in 2005, a number of external groups expressed concerns about the study design and whether it would lead to credible scientific data. Some commenters noted that the number of

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sites was too limited to account for all the differences in types of manure management systems, building types, ventilation rates, feeding practices, animal type/age, animal management practices, geography and climate. The commenters noted that even for the types of AFOs monitored, there may not be a sufficient number of samples to establish statistically valid EEMs. Similarly, in its 2008 report, GAO cautioned that the NAEMS may not supply the data needed for the EPA to develop comprehensive EEMs. Further, the GAO report stated that members of the USDA Agricultural Air Quality Task Force had raised concerns about the quality and quantity of data collected, and had pushed for the EPA to review the first 6 months of monitoring data to determine whether the study needed to be revised to yield more useful information.

According to the NAEMS Science Advisor, the NAEMS protocol could be viewed as a compromise between compliance-minded EPA, budget-minded industry, and publication-minded universities. The protocol developers decided on an approach that focused on collecting a comprehensive set of monitoring data (i.e., 2 years of monitoring many different AFO conditions and parameters) at a smaller number of sites, as opposed to collecting a smaller set of data at more sites. According to the EPA, costs were a factor in this decision because mobilizing and demobilizing equipment and then re-deploying at new sites would have depleted funds that could be used for monitoring. The protocol developers believed the chosen monitoring plan would produce sufficient data for EEM development if the selected monitoring sites represented how the majority of animals are raised in the different AFO sectors.

Although the monitoring protocol was developed as a joint effort of researchers knowledgeable about AFO operations and/or monitoring techniques, there was no comprehensive internal or external assessment to determine the amount of data needed to produce scientifically and statistically sound EEMs that could be extrapolated nationwide. The EPA did not perform such an assessment prior to the NAEMS, in part, because it did not know which variables would most impact air emissions at AFOs, and the agency wanted to see the data before selecting a modeling approach for EEM development. Also, the NAEMS protocol and detailed monitoring plans were not peer reviewed to ensure that the NAEMS would provide sufficient data for the EPA to produce a comprehensive suite of EEMs.

EPA's EEM Development Activities Since 2013 Have Been Limited

The EPA planned to continue EEM development using its statistically based approach, and had addressed some of the SAB's recommendations by acquiring additional data sets from other external studies, and reassessing data completeness criteria for the NAEMS. However, the draft EEMs that were submitted to the SAB for review had not been revised, and the EPA had not begun developing EEMs for the remaining 28 emission source and pollutant combinations.

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A lack of expertise and resources slowed the agency's work on the EEMs in recent years. According to EPA managers, the agency in recent years did not have staff with combined expertise in agricultural emissions, air quality and statistical analysis. At the time the NAEMS protocol was developed, the EPA had more applicable expertise, but the key staff involved in the NAEMS protocol development retired. Further, competing priorities resulted in the EPA's Office of Air and Radiation putting the EEM effort largely on hold. The EPA had dedicated few agency resources to develop EEMs since the SAB's 2013 final report. The few remaining agency staff who worked on the NAEMS and subsequent data analysis were reassigned to other work, and the EPA stopped funding the contract for NAEMS analysis.

The EPA's most recent draft EEM development work plan, dated March 2016, provided a general framework for how the EPA intended to finish all planned EEMs. The draft plan stated that a new staff person with appropriate expertise, along with student contractor support, would complete the EEMs. The EPA hired the new staff person and a student contractor in January 2017 but had not yet finalized timeframes for completing EEM development.

AFO Air Emissions Remain Largely Uncharacterized and Important Agency Actions Are on Hold

Eleven years after the Agreement was entered, and 7 years after NAEMS monitoring was completed, the EPA, state, local and tribal permitting authorities, and AFO owners/operators, did not have scientifically defensible EEMs needed to make CAA and CERCLA/EPCRA compliance determinations. In addition, the civil enforcement protections for the approximately 14,000 AFOs that participated in the Agreement remained in effect more than 6 years after intended expiration, and several important EPA actions were on hold pending development of the EEMs.

CAA Permit and CERCLA/EPCRA Reporting Determinations Have Not Been Made

Per the Agreement, facilities were not required to determine whether CAA permitting and CERCLA/EPCRA reporting requirements apply to them until the EPA publishes final EEMs. However, once final EEMs are published, participating AFOs are required to use the EEMs to estimate their emissions and come into compliance with applicable CAA and CERCLA/EPCRA requirements.

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The Agreement states that a source with emissions exceeding CAA major source permitting thresholds[20] would have to do one of the following:

1. Apply for and obtain a permit that contains a federally enforceable limitation or condition that limits the potential emissions to less than the applicable major source threshold for the area where the source is located.

2. Install either best available control technology in attainment areas,[21] or lowest achievable emission rate technology in nonattainment areas;[22] and then obtain a federally enforceable permit that incorporates the appropriate best available control technology or lowest achievable emission rate limit.

Delays in issuing the EEMs resulted in facilities continuing to have civil enforcement protections even if their emissions were exceeding CAA permit or CERCLA/EPCRA reporting thresholds. Given the lack of reliable EEMs, it was difficult to estimate how many facilities could be exceeding these thresholds. However, monitoring conducted as part of an EPA enforcement case in 2003 demonstrated that some large AFOs can exceed the 250-tons-per-year permitting threshold for PM emissions. That monitoring showed total PM emissions of 550 and 700 tons per year at two large egg-layer AFOs.

The NAEMS Science Advisor analyzed NAEMS data for the pork and egg-layer industries, which indicated that pork and egg-layer AFOs could frequently exceed the EPCRA reporting threshold for ammonia of 100 pounds per day. This analysis indicated that pork and egg layer AFOs were unlikely to exceed 250 tons per year of PM_{10} or VOC emissions. However, the Science Advisor's analysis did not address whether pork or egg-layer AFOs would trigger permitting requirements in poor air quality areas where regulatory thresholds are lower.

Paragraph 38 of the Agreement required the EPA to end civil enforcement protections for those emission sources/types for which the EPA determined it was unable to develop EEMs. As described earlier, the SAB concluded in its 2013 report that the EPA did not have sufficient data to develop an EEM for VOC emissions from broiler houses. Further, more than 7 years since completion of the NAEMS, the EPA had only developed draft EEMs for eight of a possible 36 emission source and pollutant combinations. However, the EPA had not yet determined that it could not develop any of the EEMs, and thus has not waived enforcement protections for any of the emissions sources covered under the 2005 Agreement.

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[20] Applicable regulatory thresholds range from 10 tons per year in areas with very poor air quality (called extreme nonattainment areas) to 250 tons per year in areas with adequate air quality (called attainment areas).
[21] A geographic area is generally designated as being in attainment for a particular criteria air pollutant if the concentration of that pollutant is found to be at or below the regulated or "threshold" level for the associated National Ambient Air Quality Standard.
[22] A geographic area is generally designated as being in nonattainment for a particular criteria air pollutant if the concentration of that pollutant is found to exceed the regulated or "threshold" level for the associated National Ambient Air Quality Standard.

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Agency Actions on Hold

Delays in completing EEMs have also caused important agency efforts to address or mitigate AFO air emissions to remain on hold. The EPA stated it would not take the following actions until the EEMs are finalized because they are needed to inform the agency's decision-making:

Responding to citizen petitions to regulate AFOs. The EPA has received petitions to address AFO emissions in regulations beyond the current permitting CAA provisions, which include a 2009 petition to list and regulate AFOs as a source category under CAA Section 111, and a 2011 petition to regulate ammonia as a criteria pollutant under CAA Sections 108 and 109. EPA staff told us they did not plan to evaluate the need for additional regulations as laid out in these petitions until the EEMs are finalized.

Defining "source" for aggregation purposes. The aggregation of sources pertains to how many individual emission sources are counted together to determine whether a facility exceeds CAA major source status, and thus impacts how many facilities could exceed permitting thresholds. For example, if a barn at an AFO rather than the entire AFO is a "source," fewer AFOs could be impacted by CAA permitting requirements. The EPA had not issued guidance on this issue, and said it planned to do so after developing the EEMs.

In our view, final EEMs are also necessary for the EPA to develop compliance and enforcement strategies for Agreement non-participants, and to assess whether AFO emissions may contribute to disproportionate health risks to certain communities.

Conclusion

The EPA's ability to characterize and address AFO air emissions is unchanged since its 2005 Agreement with the AFO industry intended to produce reliable emissions estimation methods. As a result, individual AFOs have not estimated their emissions to determine whether they are required to implement controls to reduce emissions and/or report their emissions to the appropriate emergency responders. Additionally, other important agency actions pertaining to AFO air emission estimates continue to be on hold.

Timeframes for completing EEM development were uncertain, as staffing and contract support needed to finish EEMs only recently became available and the EPA had not yet finalized its work plan at the time we completed our review. Further, SAB concerns about the EPA's EEM development methodology have not been resolved. Despite these uncertainties, parties to the 2005 Agreement continue to receive protections from civil enforcement actions. We make recommendations in Chapters 3 and 4 of this report.

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Chapter 3
EPA Needs to Implement Systematic Planning to Assure That EEMs Have Sufficient Quality

The EPA's planning for EEM development did not describe the desired level of quality needed for the EEMs' intended purpose of estimating individual AFO air emissions nationwide. The establishment of such criteria is a key component of systematic planning for agency projects. In accordance with the agency's data quality policies, EPA organizations should conduct systematic planning to ensure that projects will result in scientific products that are defensible and useful for their intended purpose. The agency's most recent EEM development draft work plan used the terms "appropriate" and "meaningful" to describe final EEM products, but did not explain how those terms would be used to evaluate the quality or acceptability of the final EEMs.

As noted in Chapter 2, the agency's SAB concluded that the EPA's 2012 draft EEMs were not suitable for their intended purpose. Consequently, if the agency does not fully implement systematic planning for future EEM development, the EPA is at risk of producing additional draft EEMs that are not sufficient for estimating air emissions at individual AFOs across the United States.

EPA Quality System

The EPA's Procedure for its Quality Policy[23] establishes management principles and responsibilities for ensuring that EPA products and services meet agency quality-related requirements, and are of sufficient quality for their intended use and support the EPA's mission to protect human health and the environment. The policy applies to agency products and services developed for external distribution or dissemination. Each EPA organization is responsible for implementing the EPA Quality Policy and Program within its organization. Requirements for implementing the program include conforming to the minimum specifications of the American National Standards Institute and the American Society for Quality Control standard, ANSI/ASQC E4-1994.[24]

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[23] EPA Chief Information Officer's CIO Order 2106-P-01.0 (October 20, 2008).
[24] *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs,* the American National Standards Institute and the American Society for Quality Control (1994). This standard is the basis for the EPA's Quality System.

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At the project level, these minimum specifications include the following:

- Using a systematic planning approach (e.g., the data quality objectives process) to develop acceptance or performance criteria covered by the EPA Quality Policy.

- Having approved quality assurance project plans, or equivalent documents, for all applicable tasks involving environmental data.

To implement the EPA's Quality Policy, each EPA organization must develop a quality management plan that describes its quality system, documents its quality policies, and identifies the environmental programs to which the quality system applies. The EPA's Office of Air Quality Planning and Standards (OAQPS) developed a quality management plan that describes options for ensuring that OAQPS projects are of appropriate quality for their intended purpose. These options include elements of systematic planning to ensure that quality considerations are built into a product at the beginning, and consist of (1) developing a quality assurance project plan or similar document, and/or (2) conducting pre-dissemination review (e.g., peer review) of information.

According to the OAQPS quality management plan, quality documentation describes in detail the activities that must be implemented to assure that the results of work will satisfy the stated performance criteria. The performance criteria may be stated in the form of data quality objectives (DQOs). DQOs are qualitative or quantitative statements that clarify project technical and quality objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors (e.g., uncertainty) that will be used as the basis for identifying the data needed to support decisions. EPA quality assurance guidance[25] recommends that systematic planning include DQOs when data are to be used to make a regulatory decision or emission estimations.

The DQO process is the agency's recommendation when data are to be used to make some type of decision (e.g., compliance or noncompliance with a standard) or estimation (e.g., ascertain the mean concentration level of a contaminant).

Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4, February 2006

Further, DQOs should be specified for a project before the agency develops its plan for collecting the data, since the DQOs will drive key data collection decisions. For estimation, the guidance states that DQOs are typically expressed in terms of acceptable uncertainty (e.g., width of an uncertainty band or interval) associated with a point estimate at a desired level of statistical confidence.

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[25] The EPA's *Guidance on Systematic Planning Using the Data Quality Objectives Process* (2006).

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The OAQPS quality management plan also provides for the pre-dissemination review of OAQPS information as a way to provide assurance that quality has been built into the information that the office disseminates. The quality management plan cites peer review as an example of pre-dissemination review, and notes that it can be appropriate to incorporate the pre-dissemination review for project planning documents, such as the quality assurance project plan, prior to beginning the project.

EPA Has Not Fully Implemented a Systematic Planning Process to Assure a Desired Level of Quality for EEMs

The EPA's planning process for EEM development had yet to establish data quality objectives describing the performance or acceptance criteria for the final EEMs. While extensive planning went into assuring the quality of the monitoring data collected during the NAEMS, this planning did not describe the desired quality of the end products resulting from EPA analysis of the NAEMS data (i.e., the EEMs), or the type and extent of emissions monitoring data needed to produce EEMs of desired quality.

Planning for Draft Development of EEMs Was Not Systematic

Ideally, under a systematic planning process, a methodology for producing a final product at the desired quality is determined up front. This methodology then drives the data collection efforts. When data are to be used to make some type of decision or estimation, the EPA recommends that the desired level of quality be expressed in the form of DQOs. As noted in Chapters 1 and 2, the EPA collaborated with external scientists to develop the monitoring protocol. However, several factors influenced the scope of the NAEMS, and that effort was not specifically designed to produce data to satisfy acceptance criteria for the EEMs. Among these factors was that, prior to the study, the EPA did not know which variables most impact air emissions at AFOs. Thus, the EPA tried to create an EEM development methodology using the data that was available from the NAEMS.

> **Unless some form of planning is conducted prior to investing the necessary time and resources to collect data, the chances can be unacceptably high that these data will not meet specific project needs.**
>
> *Guidance on Systematic Planning Using the Data Quality Objectives Process*, EPA QA/G-4, February 2006

The NAEMS protocol stated that the NAEMS and subsequent data analyses and interpretation would allow the EPA and livestock and poultry producers to "reasonably determine" which AFOs were subject to CAA regulatory provisions and CERCLA/EPCRA reporting requirements. However, as part of its planning, the EPA did not define what was meant by "reasonably determine." The EPA developed a quality assurance project plan for its efforts to develop the draft EEMs that were published in 2012, but it focused on assessing the quality of incoming data from the NAEMS and other sources. The quality assurance project

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plan did not include DQOs or other performance criteria defining the acceptable level of uncertainty for EEM predictions, or the quality control measures the EPA would use to assure its statistical models were scientifically and statistically sound.

The EPA had its draft EEMs peer reviewed by the SAB, but the agency did not involve the SAB in its planning process to ensure that the NAEMS would provide sufficient data for EEM development. As discussed in Chapter 2, the SAB concluded that the EPA's draft EEMs were not useful for making compliance determinations nationwide due to problems with the underlying data and analysis.

Plans for Completing Development of EEMs Can Be Strengthened

The EPA had not yet conducted systematic planning for the EEM completion effort, but had developed a draft work plan. That draft work plan contained little information about systematic planning to assure the quality of future EEMs. The plan did not address whether a quality assurance project plan would be developed, or commit to peer review of the planned methodology or the draft or final EEMs.[26]

The draft work plan described a future scoping study that would allow the EPA to plan activities and resources for developing "appropriate" EEMs, and stated that EEMs developed in the future would be tested to determine whether they can reproduce "meaningful" emissions estimates. However, the work plan did not define or establish acceptance criteria for "appropriate" or "meaningful" EEMs. Staff from OAQPS stated that they planned to make quality planning decisions once the new staff person had been hired to conduct the scoping study and subsequent EEM development.

Conclusion

As explained in the EPA's quality assurance guidance, systematic planning that defines the level of quality required for an end product should be conducted prior to data collection efforts, to reduce the risk that the data collected is not sufficient. Such planning for the EEMs was not conducted prior to the NAEMS or draft EEM development efforts, in part, because the EPA did not have a full understanding of the factors that influence AFO air emissions. Further, the NAEMS protocol and monitoring plans were not developed exclusively to provide data needed for EEM development. Based on its experience and peer review feedback in developing the initial set of draft EEMs, the EPA should be in a better position to conduct systematic planning for the EEM completion effort.

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[26] In the draft plan, the EPA stated it will provide developed EEMs to "appropriate stakeholders and possibly the Science Advisory Board" for review, and then modify the EEMs based on comments received. However, the plan does not commit to obtaining independent, external peer review of the EEMs or the planned methodology that will be used to develop the EEMs.

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Without adequate systematic planning, the EPA is at risk of spending additional time and resources to develop EEMs that still are not sufficient for estimating AFO emissions nationwide.

Recommendations

We recommend that the Assistant Administrator for Air and Radiation:

1. In accordance with EPA quality assurance guidance, conduct comprehensive systematic planning for future emission estimating methodology development through either the quality assurance project plan or pre-dissemination review processes.

    - If the EPA chooses to develop a quality assurance project plan, it should first develop data quality objectives for the emission estimating methodologies.

    - If the EPA chooses to conduct a pre-dissemination review, it should obtain independent, external feedback on the adequacy of its emission estimating methodologies development and plans prior to beginning the project.

2. Based on the results of systematic planning, determine and document the decision as to whether the EPA is able to develop scientifically and statistically sound emission estimating methodologies for each originally planned emission source and pollutant combination.

3. For the emission source and pollutant combinations for which the Office of Air and Radiation determines it can develop scientifically and statistically sound emission estimating methodologies, establish public milestone dates for issuing each draft emission estimating methodology. For any emission source and pollutant combinations for which the Office of Air and Radiation determines that it cannot develop scientifically and statistically sound emission estimating methodologies, notify the Office of Enforcement and Compliance Assurance of that determination.

We recommend that the Assistant Administrator for Enforcement Compliance and Assurance:

4. For any emission source and pollutant combinations for which the Office of Air and Radiation determines it cannot develop emission estimating methodologies, notify Air Compliance Agreement participants of this determination, and that the release and covenant not to sue for those emission sources and pollutant types will expire in accordance with paragraph 38 of the 2005 Air Compliance Agreement.

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Agency Response and OIG Evaluation

The Office of Air and Radiation agreed with Recommendations 1, 2 and 3, and provided acceptable planned corrective actions and completion dates. The Office of Enforcement and Compliance Assurance agreed with Recommendation 4 and provided an acceptable corrective action plan.

The agency also provided technical comments that were incorporated into our final report as appropriate. Appendices A and B contain the responses to our report from the Office of Air and Radiation, and the Office of Enforcement and Compliance Assurance, respectively.

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Chapter 4
EPA Has Not Updated Some Stakeholders and Public on Current Status of EEM Efforts

The 2005 Air Compliance Agreement between the AFO industry and the EPA generated significant stakeholder and public interest in AFO air emissions, and any actions the agency would take to address those emissions. Leading up to the monitoring study, and for 2 years after monitoring data was available, the EPA provided frequent public updates related to the NAEMS and EEMs. However, since the SAB's 2013 final report, the agency had provided only high-level updates to selected stakeholders. This left many stakeholders and the public uninformed about the current status of the work, the reasons for delays, and current timelines for finalizing the EEMs. The EPA should resume providing public updates on the status of EEM development through its website or other public means, to ensure the transparency of its process and accountability in setting completion dates.

EPA Provided Extensive Public Outreach During Early Stages

The EPA issued four press releases in 2006 announcing individual agreements entered into between the EPA and AFOs. Further, in the years after it received all monitoring data in 2010, the EPA provided frequent updates on EEM development efforts and the SAB's review of draft EEMs. In 2011, the EPA published data from the NAEMS monitoring, issued a Call for Information to collect information to supplement the NAEMS data, and updated the public on processes related to the planned SAB review. In 2012, the EPA released its draft EEMs for public comment.

EPA Has Not Publicly Communicated on EEM Development Efforts Since 2013

Since the EPA posted the SAB's 2013 final report on its public website, the EPA had not updated some stakeholders and the public on recent aspects of its NAEMS data analysis and EEM development efforts. An OAQPS manager told us that the agency planned to post final EEMs on its public webpage, but used other mechanisms to provide updates on the status of EEM development. Such updates were provided only upon request, and typically to groups with which the agency had regular contact, such as the USDA's Agricultural Air Quality Task Force. Numerous interested parties—including the SAB Chair, a SAB panel member, and three external groups—told us that they had no information about the ongoing NAEMS data analysis, the reasons for delays, or how long it might take the EPA to publish final EEMs.

Further, staff at the USDA told us that while they periodically received high-level updates from the EPA at Agricultural Air Quality Task Force and intra-agency

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workgroup meetings, they were not aware of the EPA's current plans for completing EEM development. The EPA's 2016 update to the Agricultural Air Quality Task Force provided the SAB's recommendations regarding the draft EEMs, as previous updates had done, and stated that the EPA will continue developing EEMs to account for air emissions from AFOs.

Conclusion

Despite being years behind schedule in finalizing the EEMs, the EPA has not provided public updates since 2013 on the NAEMS data analysis and the agency's current efforts to finalize the EEMs. Thus, stakeholders and the public do not know where the EPA currently stands with respect to EEM development. To ensure transparency and accountability in completing EEMs for the $15 million investment in the NAEMS study, the EPA should provide public updates on the status of EEM development and establish public milestones for completion of each draft EEM.

Recommendation

We recommend that the Assistant Administrator for Air and Radiation:

5. Provide the public with the status of emission estimating methodology development and the agency's planned next steps for analyzing the National Air Emissions Monitoring Study data and finalizing the emission estimating methodologies, including the completion of milestone dates for each draft emission estimating methodology it plans to develop.

Agency Response and OIG Evaluation

The Office of Air and Radiation agreed with Recommendation 5, and provided an acceptable corrective action plan and completion date. The Office of Air and Radiation also provided technical comments that were incorporated into our final report as appropriate. Appendix A contains the Office of Air and Radiation's response to our report.

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Status of Recommendations and Potential Monetary Benefits

RECOMMENDATIONS

Rec. No.	Page No.	Subject	Status[1]	Action Official	Planned Completion Date	Potential Monetary Benefits (in $000s)
1	23	In accordance with EPA quality assurance guidance, conduct comprehensive systematic planning for future emission estimating methodology development through either the quality assurance project plan or pre-dissemination review processes. o If the EPA chooses to develop a quality assurance project plan, it should first develop data quality objectives for the emission estimating methodologies. o If the EPA chooses to conduct a pre-dissemination review, it should obtain independent, external feedback on the adequacy of its emission estimating methodologies development and plans prior to beginning the project.	R	Assistant Administrator for Air and Radiation	3/31/18	
2	23	Based on the results of systematic planning, determine and document the decision as to whether the EPA is able to develop scientifically and statistically sound emission estimating methodologies for each originally planned emission source and pollutant combination.	R	Assistant Administrator for Air and Radiation	6/30/18	
3	23	For the emission source and pollutant combinations for which the Office of Air and Radiation determines it can develop scientifically and statistically sound emission estimating methodologies, establish public milestone dates for issuing each draft emission estimating methodology. For any emission source and pollutant combinations for which the Office of Air and Radiation determines that it cannot develop scientifically and statistically sound emission estimating methodologies, notify the Office of Enforcement and Compliance Assurance of that determination.	R	Assistant Administrator for Air and Radiation	6/30/18	
4	23	For any emission source and pollutant combinations for which the Office of Air and Radiation determines it cannot develop emission estimating methodologies, notify Air Compliance Agreement participants of this determination, and that the release and covenant not to sue for those emission sources and pollutant types will expire in accordance with paragraph 38 of the 2005 Air Compliance Agreement.	R	Assistant Administrator for Enforcement and Compliance Assurance	9/30/18[2]	
5	26	Provide the public with the status of emission estimating methodology development and the agency's planned next steps for analyzing the National Air Emissions Monitoring Study data and finalizing the emission estimating methodologies, including the completion of milestone dates for each draft emission estimating methodology it plans to develop.	R	Assistant Administrator for Air and Radiation	6/30/18	

[1] C = Corrective action completed.
R = Recommendation resolved with corrective action pending.
U = Recommendation unresolved with resolution efforts in progress.

[2] If applicable, based on the Office of Air and Radiation's determination in response to Recommendation 3.

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Office of Air and Radiation Response to Draft Report

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 23 2017

OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: Response to the Office of Inspector General's Draft Report, *Emissions From Animal Feeding Operations Remain Largely Uncharacterized More Than 7 Years After Study Completed* (Project No. OPE-FY16-0018)

FROM: Sarah Dunham
Acting Assistant Administrator

TO: Carolyn Copper
Assistant Inspector General
Office of Program Evaluation
Office of Inspector General

The EPA's Office of Air and Radiation (OAR) appreciates the opportunity to review and comment on the Office of Inspector General (OIG) draft report titled "*Emissions From Animal Feeding Operations Remain Largely Uncharacterized More Than 7 Years After Study Completed.*" OAR agrees in general with the OIG's recommendations.

OAR's current task is the development of Emissions Estimating Methodologies (EEMs) for animal feeding operations (AFOs), using statistically-based methodologies to develop emissions factors for select types of AFOs from data collected through the National Air Emissions Monitoring Study (NAEMS). In partnership with the Office of Research and Development (ORD), we are undertaking this effort and incorporating a National Academy of Sciences (NAS) recommendation that the EPA develop an interim method for estimating emissions while we participate in a longer-term effort to develop process-based EEMs. In addition, our work will include objectives outlined in the 2005 Air Compliance Agreement (Agreement) the EPA entered into with participating AFOs. The AFO sectors represented in the Agreement covered the monitoring study costs. Individual participating AFOs did not directly pay monitoring study funds. The EPA remains committed to fulfilling this goal of developing EEMs for AFOs based on scientifically and statistically sound methods. The

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statistically-based EEMs must also be easily implemented by the agricultural community and other users, and be based on non-proprietary inputs.

While we generally agree with your characterizations of the Agreement and the associated NAEMS, there are a few places where information in the draft report is slightly unclear where the information differs from our understanding of specific facts. Please refer to the attached list of these instances and suggested revisions intended to help clarify and improve the draft report's accuracy.

Below are OAR's responses to the OIG's specific recommendations (recommendation numbers 1, 2, 3 and 5), which we developed in consultation with ORD. On June 9, 2017, OECA provided a separate response to recommendation number 4 as it is assigned to their office. In the attached technical comments, we provide suggested additional detailed changes in the form of a markup.

Recommendation 1: In accordance with EPA quality assurance guidance, conduct comprehensive systematic planning for future emission estimating methodology development through either the quality assurance project plan or pre-dissemination review processes.

- **If the EPA chooses to develop a quality assurance project plan, it should first develop data quality objectives for the emission estimating methodologies.**
- **If the EPA chooses to conduct a pre-dissemination review, it should obtain independent, external feedback on the adequacy of its emission estimating methodologies development and plans prior to beginning the project.**

Response 1: OAR and ORD agree with this recommendation and have initiated development of a quality assurance project plan (QAPP) for evaluation of the data and completion of the EEMs. As part of the QAPP development, appropriate data quality objectives will be defined. We intend to make this document publicly available on our website (see below).

Planned completion date: FY 2018, Q2 (March).

Recommendation 2: Based on the results of systematic planning, determine and document the decision as to whether the EPA is able to develop scientifically and statistically sound emission estimating methodologies for each originally planned emission source and pollutant combination.

Response 2: OAR agrees with this recommendation. As noted, completion of this task is contingent upon the results and decisions made during the QAPP development. Upon completion of the QAPP, OAR and ORD will determine which EEMs can be completed and the appropriate schedules for their completion. We intend to make the schedules publicly available on our website (see below).

Planned Completion Date: As stated above, development of the QAPP is ongoing with completion anticipated in the second quarter of FY 2018. Upon completion of the QAPP, decisions

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on EEM development and schedules will be determined and transmitted to the Office of Enforcement and Compliance Assurance (OECA). We anticipate that the schedules will be established in third quarter of FY 2018.

Recommendation 3: For the emission source and pollutant combinations for which the Office of Air and Radiation determines it can develop scientifically and statistically sound emission estimating methodologies, establish public milestone dates for issuing each draft emission estimating methodology. For any emission source and pollutant combinations for which the Office of Air and Radiation determines that it cannot develop scientifically and statistically sound emission estimating methodologies, notify the Office of Enforcement and Compliance Assurance of that determination.

Response 3: OAR agrees with this recommendation and will develop a schedule for completion of the EEMs after completion of data review and QAPP development, which is currently planned for completion in the second quarter of FY 2018.

Planned Completion Date: As stated above, development of the QAPP is ongoing with completion anticipated in the second quarter of FY 2018. Upon completion of the QAPP, decisions on EEM development and schedules will be determined and transmitted to OECA and made available to the public. We anticipate that the schedules will be established in the third quarter of FY 2018.

Recommendation 5: Provide the public with the status of emission estimating methodology development and the agency's planned next steps for analyzing the National Air Emissions Monitoring Study data and finalizing the emission estimating methodologies, including the completion milestone dates for each draft emission estimating methodology it plans to develop.

Response 5: OAR agrees with this recommendation and will post the schedule on our website for completion of the EEMs after completion of data review and QAPP development, which is currently planned for completion in the second quarter of FY 2018. We anticipate providing updates on our progress with subsequent website postings.

Planned Completion Date: As stated above, development of the QAPP is ongoing with completion anticipated in the second quarter of FY 2018. Upon completion of the QAPP, decisions on EEM development and schedules will be determined and milestones will be made available to the public. We anticipate that the schedules will be established in the third quarter of FY 2018.

If you have any questions regarding this response, please contact Mike Jones, Office of Air Quality Planning and Standards (OAQPS) Audit Liaison, at (919) 541-0528.

Attachment

ED_004549_00036445-00036

Office of Enforcement and Compliance Assurance Response to Draft Report

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN - 9 2017

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

MEMORANDUM

SUBJECT: Response to the Office of Inspector General Draft Report: "Emissions from Animal Feeding Operations Remain Largely Uncharacterized More Than 7 Years After Study Completed," Project No. OPE-FY16-0018 (May 12, 2017)

FROM: Lawrence E. Starfield
Acting Assistant Administrator
Office of Enforcement and Compliance Assurance

TO: Carolyn Copper
Assistant Inspector General
Office of Program Evaluation
Office of Inspector General

Thank you for the opportunity to respond to the Office of Inspector General (OIG) Draft Report, "Emissions from Animal Feeding Operations Remain Largely Uncharacterized More Than 7 Years After Study Completed" (Draft Report). The Office of Enforcement and Compliance Assurance (OECA) appreciates OIG's careful examination of this issue, and we are committed to following the terms of the Animal Feeding Operations (AFO) Air Compliance Agreement (Agreement) and OIG's recommendation for OECA – Recommendation Number 4. We concur with Recommendation Number 4, and we provide a high-level intended corrective action with an estimated completion date below.

While we generally agree with your characterizations of the Agreement and its associated National Air Emissions Monitoring Study (NAEMS), there are a few places where the Draft Report is slightly unclear or where the information differs from our understanding of specific facts. Enclosed for your consideration, we include a list of these instances and suggested revisions intended to help clarify and improve the Draft Report's accuracy.

ED_004549_00036445-00037

OECA has discussed the Draft Report with the Office of Air and Radiation (OAR) and we understand that OAR will be providing a separate response addressing the Draft Report's findings and recommendations for OAR – Recommendation Numbers 1, 2, 3, and 5.

OECA Response to Recommendation Number 4 – Concur

No.	Recommendation	High-Level Intended Corrective Action	Planned Completion Date
4	For any emission source and pollutant combinations for which the Office of Air and Radiation determines it cannot develop emission estimating methodologies, notify Air Compliance Agreement participants of this determination and that the release and covenant not to sue for those emission sources and pollutant types will expire in accordance with paragraph 38 of the 2005 Air Compliance Agreement.	If the EPA determines it cannot develop emission estimating methodologies for any emission source and pollutant combinations, OECA will notify Agreement participants in writing that the EPA has made such a determination and that the release and covenant not to sue will expire in accordance with paragraph 38 of the Agreement.	If necessary, OECA will complete the intended corrective action within 60 days of OAR finalizing its determination.

We concur with OIG's recommendation that OECA notify Agreement participants if OAR determines that it cannot develop emission estimating methodologies for any emission source and pollutant combinations. OECA notes that this recommendation will only require a corrective action if OAR determines it cannot develop emission estimating methodologies for any source and pollutant combinations. Paragraph 38 of the Agreement requires the EPA to notify Agreement participants in writing if the Agency makes such a determination. OECA intends to continue abiding by the Agreement's terms, and we will notify Agreement participants if the Agency determines it cannot develop emission estimating methodologies for any emission source and pollutant combinations.

If you have any questions regarding this response, please contact OECA Audit Liaison, Gwendolyn Spriggs, at 202.564.2439.

Attachment

cc: Susan Shinkman, OECA/OCE
Rosemarie Kelley, OECA/OCE
Lauren Kabler, OECA/OCE
Apple Chapman, OECA/OCE
Tim Sullivan, OECA/OCE

ED_004549_00036445-00038

Gwendolyn Spriggs, OECA/OAP
Sarah Dunham, OAR
Robin Dunkins, OAR/OAQPS
Mike Jones, OAR/OAQPS

ED_004549_00036445-00039

Distribution

The Administrator
Chief of Staff
Chief of Staff for Operations
Deputy Chief of Staff for Operations
Assistant Administrator for Air and Radiation
Assistant Administrator for Enforcement and Compliance Assurance
Agency Follow-Up Official (the CFO)
Agency Follow-Up Coordinator
General Counsel
Associate Administrator for Congressional and Intergovernmental Relations
Associate Administrator for Public Affairs
Career Deputy Assistant Administrator, Office of Air and Radiation
Deputy Assistant Administrator, Office of Enforcement and Compliance Assurance
Audit Follow-Up Coordinator, Office of the Administrator
Audit Follow-Up Coordinator, Office of Air and Radiation
Audit Follow-Up Coordinator, Office of Enforcement and Compliance Assurance

ED_004549_00036445-00040

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

July 30, 2018

OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: Certification Memo for Office of Inspector General (OIG) Report No. 17-P-0396, "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply with Clean Air Act and Other Statutes," Dated September 19, 2017

FROM: William L. Wehrum
Assistant Administrator

7-30-18

TO: Holly Greaves, Chief Financial Officer
Office of the Chief Financial Officer

The Office of Air and Radiation (OAR) certifies that the four OAR corrective actions specified in the September 19, 2017, OIG Report No. 17-P-0396, "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply with Clean Air Act and Other Statutes," have been completed. Attached are the corrective actions completed in response to the OIG's recommendations. All relevant documentation to support each corrective action is available in OAR's files.

Attachment

cc: Arthur A. Elkins, Jr.
Kevin Christensen
James Hatfield
Erica Hauck
Elizabeth Shaw
Peter Tsirigotis
David Cozzie
Jeff Whitlow
Robin Dunkins
Marc Vincent
Mike Jones

Corrective Actions Completed in Response to the OIG's Recommendations to the Assistant Administrator for Air and Radiation:

- **In accordance with EPA quality assurance guidance, conduct comprehensive systematic planning for future emission estimating methodology development through either the quality assurance project plan or pre-dissemination review processes. If the EPA chooses to develop a quality assurance project plan, it should first develop data quality objectives for the emission estimating methodologies. If the EPA chooses to conduct a pre-dissemination review, it should obtain independent, external feedback on the adequacy of its emission estimating methodologies development and plans prior to beginning the project.** OAR and ORD have initiated development of a quality assurance project plan (QAPP) for evaluation of the data and completion of the emission estimating methodologies (EEMs). As part of the QAPP development, appropriate data quality objectives will be defined. We intend to make this document publicly available on our website. Completion Date: March 29, 2018, and posted at https://www.epa.gov/afos-air/qapp-development-emission-estimating-methodologies-air-emissions-animal-feeding-operations.

- **Based on the results of systematic planning, determine and document the decision as to whether the EPA is able to develop scientifically and statistically sound emission estimating methodologies for each originally planned emission source and pollutant combination.** Completion of this task is contingent upon the results and decisions made during the QAPP development. Upon completion of the QAPP, OAR and ORD will determine which EEMs can be completed and the appropriate schedules for their completion. We intend to make the schedules publicly available on our website. Completion Date: June 29, 2018, and posted at https://www.epa.gov/afos-air/national-air-emissions-monitoring-study#naems-status.

- **For the emission source and pollutant combinations for which the Office of Air and Radiation determines it can develop scientifically and statistically sound emission estimating methodologies, establish public milestone dates for issuing each draft emission estimating methodology. For any emission source and pollutant combinations for which the Office of Air and Radiation determines that it cannot develop scientifically and statistically sound emission estimating methodologies, notify the Office of Enforcement and Compliance Assurance of that determination.** OAR will develop a schedule for completion of the EEMs after completion of data review and QAPP development, which is currently planned for completion in the second quarter of FY 2018. Completion Date: June 29, 2018, and posted at https://www.epa.gov/afos-air/national-air-emissions-monitoring-study#naems-status.

- **Provide the public with the status of emission estimating methodology development and the agency's planned next steps for analyzing the National Air Emissions Monitoring Study data and finalizing the emission estimating methodologies, including the completion of milestone dates for each draft emission estimating methodology it plans to develop.** OAR will post the schedule on our website for completion of the EEMs after completion of data review and QAPP development, which

is currently planned for completion in the second quarter of FY 2018. We anticipate providing updates on our progress with subsequent website postings. Completion Date: June 29, 2018, and posted at https://www.epa.gov/afos-air/national-air-emissions-monitoring-study#naems-status.

Message

From: Kabler.Lauren@epa.gov [Kabler.Lauren@epa.gov]
Sent: 3/20/2019 12:22:08 AM
To: Spriggs, Gwendolyn [Spriggs.Gwendolyn@epa.gov]
Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"
Attachments: FW: OAR-18-000-9472 - Certification Memo for Office of the Inspector General (OIG) Report No. 17-P-0396; ATT00001.htm

Is this it?

Begin forwarded message:

From: "Sullivan, Tim" <Sullivan.Tim@epa.gov>
Date: September 27, 2018 at 10:20:55 AM EDT
To: "Spriggs, Gwendolyn" <Spriggs.Gwendolyn@epa.gov>
Cc: "Kabler, Lauren" <Kabler.Lauren@epa.gov>, "Sullivan, Greg" <Sullivan.Greg@epa.gov>, "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>, "Sullivan, Tim" <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Good morning, Gwen.

I have attached the email from the OAR POC, Allison Kosta, that she sent to me on August 2, 2018. OAR's certificiation memo to OIG is dated July 30, 2018. While there is no corrective action required of OECA at this time, if OAR determines at some point in the future that it cannot develop certain emission estimating methodologies, OECA would have to take action consistent with the Air Compliance Agreement and our corrective action for OIG Recommendation #4.

Please let me know if you have any questions or require any additional information from me.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Spriggs, Gwendolyn
Sent: Wednesday, September 26, 2018 3:27 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi TIM,

Thanks for the response and vm.

I believe the email below will be appropriate for me to close this corrective action in MATS, assuming you will not have to take any future action on this corrective action.

Also, it would be helpful if you could provide the OAR POC and date that this info was shared with you for our official record. Just forward this info to me via email. If you could share this info before midday Friday (9/28), I can close this info in the MATS database during this reporting period. If not, no worries…it will just close in the next reporting period.

Feel free to call with any questions.

Thanks. GJS 202-564-2439

From: Sullivan, Tim
Sent: Tuesday, September 25, 2018 11:14 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi, Gwen.

Please see my response to Lauren below.

Ex. 5 Deliberative Process (DP)

Thanks –

Tim

Timothy J. Sullivan

Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Sullivan, Tim
Sent: Thursday, September 20, 2018 11:43 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"
Importance: High

Hi, Lauren.

Thanks for the note. I have checking in with you on this topic on my to-do list, but things were crazy as I was prepping for being out of the office last Friday through yesterday.

OAR completed its deliverables due at the end of June 2018. For now, OAR is proceeding with developing emission estimating methodologies for all pollutant and source categories. Ex. 5 AC/DP
Ex. 5 AC/DP
Ex. 5 AC/DP Do we need to submit a statement to OIG memorializing this?

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Timothy Sullivan [Ex. 6 Personal Privacy (PP)]
Sent: Thursday, September 20, 2018 8:02 AM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Sent from my iPhone

Begin forwarded message:

> **From:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>
> **Date:** September 19, 2018 at 12:52:16 PM MDT
> **To:** Timothy Sullivan <Ex. 6 Personal Privacy (PP)>
> **Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"**
>
> Hi Tim!! Hope all is well in R8!!
>
> Any idea where OAR is on this?
>
> Sent from my iPhone
>
> Begin forwarded message:
>
>> **From:** "Spriggs, Gwendolyn" <Spriggs.Gwendolyn@epa.gov>
>> **Date:** September 18, 2018 at 4:49:47 PM EDT
>> **To:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>
>> **Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"**
>>
>> Hi Lauren,
>>
>> I just left a vm for you on this report. I'm currently updating MATS. I'm just curious if we have any ideal when OAR will complete their piece (I can only imagine they have a due date in MATS). Having this info (due date) will allow us to better monitor when OCE should implement their CA. Right now, not sure how to determine due date.

If you staff doesn't have info...I guess I can contact OAR, but wanted to check internally before I contacted them.

Thanks, GJS 564-2439

From: Spriggs, Gwendolyn
Sent: Wednesday, September 20, 2017 7:39 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Cool.

I'll add to MATS report with a TBD...

Thanks much...GJS

From: Kabler, Lauren
Sent: Wednesday, September 20, 2017 7:15 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren V. Kabler
Special Counsel
OCE/IO/XPS

From: Sullivan, Tim
Sent: Tuesday, September 19, 2017 4:40 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Cc: Chapman, Apple <Chapman.Apple@epa.gov>; Fried, Gregory <Fried.Gregory@epa.gov>; Miller, Anthony <Miller.Anthony@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi, Lauren.

Thank you for forwarding the report.

A response is unnecessary. I will reconfirm with OAR that they will keep us apprised of their plans and actions so that we can start planning to implement our corrective action if and when necessary.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Kabler, Lauren
Sent: Tuesday, September 19, 2017 2:01 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Miller, Anthony <Miller.Anthony@epa.gov>
Subject: Fw: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi Tim! Please let me know if you think a response is necessary. Note that because the OIG accepted our corrective action a response is not required. Also, can you answer Gwen's question - I am sure OAR will notify you but can you just confirm? Thanks!

Lauren V. Kabler

Special Counsel

Crosscutting Policy Staff

From: Spriggs, Gwendolyn
Sent: Tuesday, September 19, 2017 2:08 PM
To: Kabler, Lauren
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren,

Pls find attached a copy of the final report. It's provided for your review and distribution.

Pls note a response is NOT required. The OIG accepted OCE's proposed corrective action. If OCE would like to submit a response, pls let me know and we'll plan accordingly. Otherwise, we can close this report and add to MATS.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP) Will OCE will receive info from OAR regarding status of their CA completion which will allow OCE to begin it's CA tracking? Pls advise.

Thanks, GJS 564-2439

From: OIG News
Sent: Tuesday, September 19, 2017 1:31 PM
To: Dunham, Sarah <Dunham.Sarah@epa.gov>; Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Pruitt, Scott <Pruitt.Scott@epa.gov>; Jackson, Ryan <jackson.ryan@epa.gov>; Darwin, Henry <darwin.henry@epa.gov>; Chmielewski, Kevin <chmielewski.kevin@epa.gov>; Bloom, David <Bloom.David@epa.gov>; Trent, Bobbie <Trent.Bobbie@epa.gov>; Anthony, Sherri <Anthony.Sherri@epa.gov>; Howard, MarkT

<Howard.Markt@epa.gov>; Minoli, Kevin <Minoli.Kevin@epa.gov>; Lyons, Troy <lyons.troy@epa.gov>; Valentine, Julia <Valentine.Julia@epa.gov>; Threet, Derek <Threet.Derek@epa.gov>; Shaw, Betsy <Shaw.Betsy@epa.gov>; Cozad, David <Cozad.David@epa.gov>; Traylor, Patrick <traylor.patrick@epa.gov>; Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>; Vincent, Marc <Vincent.Marc@epa.gov>
Subject: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Attached is the EPA Office of Inspector General (OIG) report, *Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes* (Report No. 17-P-0396). This report will be available to the public on the OIG's website at www.epa.gov/oig.

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Message

From: Costa, Allison [Costa.Allison@epa.gov]
Sent: 8/2/2018 11:51:56 AM
To: Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: FW: OAR-18-000-9472 - Certification Memo for Office of the Inspector General (OIG) Report No. 17-P-0396
Attachments: Signed Memorandum for OIG Report No 17-P0396 Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods.pdf

Hi Tim,

As we discussed yesterday, here is the final certification memo for the OIG report on NAEMS.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

From: Dunkins, Robin
Sent: Monday, July 30, 2018 12:38 PM
To: Schrock, Bill ; Costa, Allison
Subject: Fwd: OAR-18-000-9472 - Certification Memo for Office of the Inspector General (OIG) Report No. 17-P-0396

For your records

Robin Dunkins, Group Leader
Natural Resources Group
OAR/OAQPS/SPPD Mail Code E143-03
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711
919-541-5335 office
Ex. 6 Personal Privacy (PP) cell
dunkins.robin@epa.gov

Begin forwarded message:

> **From:** "Carroll, Maria" <carroll.maria@epa.gov>
> **Date:** July 30, 2018 at 12:28:44 PM EDT
> **To:** "Greaves, Holly" <greaves.holly@epa.gov>
> **Cc:** "Elkins, Arthur" <Elkins.Arthur@epa.gov>, "Christensen, Kevin" <Christensen.Kevin@epa.gov>, "Hatfield, James" <Hatfield.Jim@epa.gov>, "Hauck, Erica" <Hauck.Erica@epa.gov>, "Shaw, Betsy" <Shaw.Betsy@epa.gov>, "Tsirigotis, Peter" <Tsirigotis.Peter@epa.gov>, "Cozzie, David" <Cozzie.David@epa.gov>, "Whitlow, Jeff" <Whitlow.Jeff@epa.gov>, "Dunkins, Robin" <Dunkins.Robin@epa.gov>, "Vincent, Marc" <Vincent.Marc@epa.gov>, "Jones, Mike" <Jones.Mike@epa.gov>, "Hamilton, Sabrina" <Hamilton.Sabrina@epa.gov>, "Strine, Lora" <Strine.Lora@epa.gov>

Message

From: Spriggs, Gwendolyn [Spriggs.Gwendolyn@epa.gov]
Sent: 3/29/2019 3:45:30 PM
To: Kabler, Lauren [Kabler.Lauren@epa.gov]
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"
Attachments: Cert memo animal feeding CAA.docx

Lauren,

What's status of attached…? pls return asap. I must update MATS right away. GJS

From: Spriggs, Gwendolyn
Sent: Wednesday, March 20, 2019 10:56 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Here ya go!

Pls review, edit and return, as soon as can.

I'd like to update MATS no later than 3/27/19…let me know if that's possible.

Thanks, GJS

From: Kabler, Lauren
Sent: Wednesday, March 20, 2019 8:30 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

I never received the cert. fyi.

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Spriggs, Gwendolyn
Sent: Tuesday, March 19, 2019 4:41 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren,

You know how my email and I DON'T get along!!!

If you could forward me the attachment to this email…I'd greatly appreciate it!

I can't locate it in my mail…I'm beginning to prepare the cert memo, which will come to you in the next day or so. I'll need to add the attachment to Tim's email.

Thanks, GJS

From: Kabler, Lauren
Sent: Thursday, September 27, 2018 2:35 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>; Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Thanks Tim!

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Sullivan, Tim
Sent: Thursday, September 27, 2018 10:21 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>; Sullivan, Greg <Sullivan.Greg@epa.gov>; Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Good morning, Gwen.

I have attached the email from the OAR POC, Allison Kosta, that she sent to me on August 2, 2018. OAR's certificiation memo to OIG is dated July 30, 2018. While there is no corrective action required of OECA at this time, if OAR determines at some point in the future that it cannot develop certain emission estimating methodologies, OECA would have to take action consistent with the Air Compliance Agreement and our corrective action for OIG Recommendation #4.

Please let me know if you have any questions or require any additional information from me.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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http://www.epa.gov/compliance/complaints/index.html

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Also, it would be helpful if you could provide the OAR POC and date that this info was shared with you for our official record. Just forward this info to me via email. If you could share this info before midday Friday (9/28), I can close this info in the MATS database during this reporting period. If not, no worries…it will just close in the next reporting period.

Feel free to call with any questions.

Thanks. GJS 202-564-2439

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Hi, Gwen.

Please see my response to Lauren below.

Ex. 5 Deliberative Process (DP)

Thanks –

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Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Sent from my iPhone

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> **From:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>
> **Date:** September 19, 2018 at 12:52:16 PM MDT
> **To:** Timothy Sullivan <Ex. 6 Personal Privacy (PP)>
> **Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"**
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> >
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I'll add to MATS report with a TBD…

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Lauren V. Kabler
Special Counsel
OCE/IO/XPS

From: Sullivan, Tim
Sent: Tuesday, September 19, 2017 4:40 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Cc: Chapman, Apple <Chapman.Apple@epa.gov>; Fried, Gregory <Fried.Gregory@epa.gov>; Miller, Anthony <Miller.Anthony@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi, Lauren.

Thank you for forwarding the report.

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Thanks –

Tim

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From: Kabler, Lauren
Sent: Tuesday, September 19, 2017 2:01 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Miller, Anthony <Miller.Anthony@epa.gov>
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Hi Tim! Please let me know if you think a response is necessary. Note that because the OIG accepted our corrective action a response is not required. Also, can you answer Gwen's question - I am sure OAR will notify you but can you just confirm? Thanks!

Lauren V. Kabler

Special Counsel

Crosscutting Policy Staff

Office of Civil Enforcement

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Sent: Tuesday, September 19, 2017 2:08 PM
To: Kabler, Lauren
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren,

Pls find attached a copy of the final report. It's provided for your review and distribution.

Pls note a response is NOT required. The OIG accepted OCE's proposed corrective action. If OCE would like to submit a response, pls let me know and we'll plan accordingly. Otherwise, we can close this report and add to MATS.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP) Will OCE will receive info from OAR regarding status of their CA completion which will allow OCE to begin it's CA tracking? Pls advise.

Thanks, GJS 564-2439

From: OIG News
Sent: Tuesday, September 19, 2017 1:31 PM
To: Dunham, Sarah <Dunham.Sarah@epa.gov>; Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Pruitt, Scott <Pruitt.Scott@epa.gov>; Jackson, Ryan <jackson.ryan@epa.gov>; Darwin, Henry <darwin.henry@epa.gov>; Chmielewski, Kevin <chmielewski.kevin@epa.gov>; Bloom, David <Bloom.David@epa.gov>; Trent, Bobbie <Trent.Bobbie@epa.gov>; Anthony, Sherri <Anthony.Sherri@epa.gov>; Howard, MarkT <Howard.Markt@epa.gov>; Minoli, Kevin <Minoli.Kevin@epa.gov>; Lyons, Troy <lyons.troy@epa.gov>; Valentine, Julia <Valentine.Julia@epa.gov>; Threet, Derek <Threet.Derek@epa.gov>; Shaw, Betsy <Shaw.Betsy@epa.gov>; Cozad, David <Cozad.David@epa.gov>; Traylor, Patrick <traylor.patrick@epa.gov>; Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>; Vincent, Marc <Vincent.Marc@epa.gov>
Subject: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Attached is the EPA Office of Inspector General (OIG) report, *Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes* (Report No. 17-P-0396). This report will be available to the public on the OIG's website at www.epa.gov/oig.

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www.epa.gov

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a more efficient and cost effective manner.

Message

From: Spriggs, Gwendolyn [Spriggs.Gwendolyn@epa.gov]
Sent: 3/20/2019 2:55:56 PM
To: Kabler, Lauren [Kabler.Lauren@epa.gov]
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"
Attachments: Cert memo animal feeding CAA.docx

Here ya go!

Pls review, edit and return, as soon as can.

I'd like to update MATS no later than 3/27/19…let me know if that's possible.

Thanks, GJS

From: Kabler, Lauren
Sent: Wednesday, March 20, 2019 8:30 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

I never received the cert. fyi.

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Spriggs, Gwendolyn
Sent: Tuesday, March 19, 2019 4:41 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren,

You know how my email and I DON'T get along!!!

If you could forward me the attachment to this email…I'd greatly appreciate it!

I can't locate it in my mail…I'm beginning to prepare the cert memo, which will come to you in the next day or so. I'll need to add the attachment to Tim's email.

Thanks, GJS

From: Kabler, Lauren
Sent: Thursday, September 27, 2018 2:35 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>; Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Thanks Tim!

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Sullivan, Tim
Sent: Thursday, September 27, 2018 10:21 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>; Sullivan, Greg <Sullivan.Greg@epa.gov>; Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

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Please see my response to Lauren below.

Ex. 5 Deliberative Process (DP)

Thanks –

Tim

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Lauren V. Kabler
Special Counsel
OCE/IO/XPS

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Special Counsel

Crosscutting Policy Staff

Office of Civil Enforcement

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Sent: Tuesday, September 19, 2017 1:31 PM
To: Dunham, Sarah <Dunham.Sarah@epa.gov>; Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Pruitt, Scott <Pruitt.Scott@epa.gov>; Jackson, Ryan <jackson.ryan@epa.gov>; Darwin, Henry <darwin.henry@epa.gov>; Chmielewski, Kevin <chmielewski.kevin@epa.gov>; Bloom, David <Bloom.David@epa.gov>; Trent, Bobbie <Trent.Bobbie@epa.gov>; Anthony, Sherri <Anthony.Sherri@epa.gov>; Howard, MarkT <Howard.Markt@epa.gov>; Minoli, Kevin <Minoli.Kevin@epa.gov>; Lyons, Troy <lyons.troy@epa.gov>; Valentine, Julia <Valentine.Julia@epa.gov>; Threet, Derek <Threet.Derek@epa.gov>; Shaw, Betsy <Shaw.Betsy@epa.gov>; Cozad, David <Cozad.David@epa.gov>; Traylor, Patrick <traylor.patrick@epa.gov>; Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>; Vincent, Marc <Vincent.Marc@epa.gov>
Subject: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

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a more efficient and cost effective manner.

Message

Sent: 4/4/2019 12:19:03 PM
To: Spriggs, Gwendolyn [spriggs.gwendolyn@epa.gov]
CC: Porter, Amy [Porter.Amy@epa.gov]
Subject: FW: OIG Enforcement Assignment: Interview Questions
Attachments: Ex. 7(E) pdf; OIG Interview Questions for OECA-OCE 12-18-18_with_links.docx

Gwen – please find below an email and attachments we sent to the OIG after we (me and Amy Porter) met with the OIG re: the attached questions.

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Tesch, Danielle
Sent: Tuesday, December 18, 2018 1:11 PM
To: Porter, Amy <Porter.Amy@epa.gov>; Hess, Kathryn <Hess.Kathryn@epa.gov>; Triebwasser, Charles <triebwasser.charles@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Enforcement Assignment: Interview Questions

Thank you, Amy and Lauren!

I did mean to say during our meeting, if any of the resources that you share with us are privileged and/or enforcement confidential that we will make sure to mark them as such in our working papers and there will be a couple of opportunities for OECA to weigh in on report language. We definitely do not want to disclose enforcement techniques or procedures or have an adverse effect on agency enforcement.

We will touch base with you again in the new year after we have had a chance to review some more of the links you provided.

Happy holidays and happy new year!

All the best,
Danielle

Danielle M. Tesch
Social Scientist
USEPA – Office of Inspector General | Office of Audit and Evaluation (OAE)
1650 Arch Street | Mail Code 3Ai00 | Philadelphia, PA 19103-2029
Phone: (215) 814-2337 | Fax: (215) 814-2351

live in the sunshine. swim in the sea. drink the wild air. –Emerson

From: Porter, Amy
Sent: Tuesday, December 18, 2018 12:20 PM
To: Tesch, Danielle <Tesch.Danielle@epa.gov>; Hess, Kathryn <Hess.Kathryn@epa.gov>; Triebwasser, Charles

<triebwasser.charles@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Enforcement Assignment: Interview Questions

Danielle, Kathy, and Chip –

Please see attached documents – your questions with the links we referenced on today's call, a Ex. 7(E)

Ex. 7(E)

Please let us know if you have any additional questions or if we can be helpful in any way.

Thank you,

Amy

Amy Porter, Director
Crosscutting Policy Staff
Office of Civil Enforcement
US Environmental Protection Agency
202-564-2431

From: Tesch, Danielle
Sent: Thursday, December 13, 2018 6:16 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>; Porter, Amy <Porter.Amy@epa.gov>
Cc: Hess, Kathryn <Hess.Kathryn@epa.gov>; Triebwasser, Charles <triebwasser.charles@epa.gov>
Subject: OIG Enforcement Assignment: Interview Questions

Hi, Lauren and Amy,

Please find attached a set of questions for next week's interview (apologies for sending them a little later than anticipated). The questions are aimed at providing us with a better understanding of the civil enforcement process, trends in civil enforcement actions and results over time, and a couple observations we have made while preliminarily analyzing ECHO/ICIS enforcement data. If any of the questions stray outside your (or OCE's) lane, just let us know during the interview.

Thank you!
Danielle

Message

From: Spriggs, Gwendolyn [Spriggs.Gwendolyn@epa.gov]
Sent: 4/2/2019 7:35:05 PM
To: Kabler, Lauren [Kabler.Lauren@epa.gov]
Subject: RE: CERT MEMO RE: OIG Animal Feeding...17-P-0396 - For Your Review
Attachments: image2020-04-02-144409.pdf

For your records. GJS

From: Kabler, Lauren
Sent: Friday, March 29, 2019 12:38 PM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: Fwd: CERT MEMO RE: OIG Animal Feeding...17-P-0396 - For Your Review

Good to go!

Begin forwarded message:

> **From:** "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>
> **Date:** March 29, 2019 at 12:20:25 PM EDT
> **To:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>, "Sullivan, Greg" <Sullivan.Greg@epa.gov>
> **Cc:** "Porter, Amy" <Porter.Amy@epa.gov>, "Sullivan, Tim" <Sullivan.Tim@epa.gov>, "Buterbaugh, Kristin" <Buterbaugh.Kristin@epa.gov>
> **Subject: RE: CERT MEMO RE: OIG Animal Feeding...17-P-0396 - For Your Review**
>
> I approve.
>
> Thanks for the reminder.
>
> Regards,
> Rosemarie A. Kelley, Director
> Office of Civil Enforcement
> Office of Enforcement and Compliance Assurance
> 202-564-4014

> **From:** Kabler, Lauren
> **Sent:** Friday, March 22, 2019 2:06 PM
> **To:** Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Sullivan, Greg <Sullivan.Greg@epa.gov>
> **Cc:** Porter, Amy <Porter.Amy@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
> **Subject:** CERT MEMO RE: OIG Animal Feeding...17-P-0396 - For Your Review
>
> Rosemarie and Greg,
>
> This corrective action is complete. The cert memo is attached. As soon as you approve, I will let Gwen know and she will put it in the signature chain for Mark B. signature after which this will be closed out in MATS.

Ex. 5 Deliberative Process (DP)

Lauren V. Kabler
Special Counsel
OCE/IO/XPS
202-564-4052 (desk)
Ex. 6 Personal Privacy (PP) (cell)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 2 - 2019

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

MEMORANDUM

SUBJECT: Certification of Performance Audit –
Eleven years after Agreement, EPA has not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply with Clean Aire Act and Other Statues, Report Number: 17-P-0396 Dated: September 19, 2017

FROM: Mark Badalamente, Director
Office of Administration and Policy

TO: Holly Greaves
Chief Financial Officer

The Office of Enforcement and Compliance Assurance (OECA) certifies the corrective action specified in the Management Decision Agreement with the Office of Inspector General is complete. Provided in the attachment is a listing of the agreed upon corrective action, completion date and related documentation.

Should you have any questions regarding this certification of completion, you may contact, OECA's Audit Follow Up Coordinator, Gwendolyn Spriggs, via email at spriggs.gwendolyn@epa.gov.

Attachment

Eleven years after Agreement, EPA has not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply with Clean Aire Act and Other Statues
Report Number: 17-P-0396
Dated: September 19, 2017

No	Recommendation	Corrective Action	Completion Date
4	For any emission source and pollutant combinations for which the Office of Air and Radiation determines it cannot develop emission estimating methodologies, notify Air Compliance Agreement participants of this determination and that the release and covenant not to sue for those emission sources and pollutant types will expire in accordance with paragraph 38 of the 2005 Air Compliance Agreement.	If the EPA determines it cannot develop emission estimating methodologies for any emission source and pollutant combinations, OECA will notify Agreement participants in writing that the EPA has made such a determination and that the release and covenant not to sue will expire in accordance with paragraph 38 of the Agreement.	If necessary, OECA will complete the intended corrective action within 60 days of OAR finalizing its determination. OAR Memo: OAR Certification Memo dated: July 30, 2018 Signed Memorandum for O

Message

From: Spriggs, Gwendolyn [Spriggs.Gwendolyn@epa.gov]
Sent: 3/20/2019 4:49:06 PM
To: Kadish, Rochele [Kadish.Rochele@epa.gov]
CC: Kabler, Lauren [Kabler.Lauren@epa.gov]
Subject: FW: Cert Memo: OIG Animal Feeding...17-P-0396
Attachments: Cert memo animal feeding CAA.docx

Rochele…

I'm so sorry. I sent this to you inadvertently.

Lauren….here's the mystery email.

From: Spriggs, Gwendolyn
Sent: Tuesday, March 19, 2019 4:56 PM
To: Kadish, Rochele <Kadish.Rochele@epa.gov>
Subject: Cert Memo: OIG Animal Feeding...17-P-0396

Hi Lauren,

Please disregard my earlier message requesting the attachment for the subject audit. I found it - CRAZZZZY!!!

I have completed the cert memo and if you can return w/in a week, we'll be able to update and close in MATS before the 3/31/19 due date.

Let me know if you have any questions/concerns/edits..

thanks, GJS 564-2439

Message

From: Kabler, Lauren [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=43AD0B706D274149971842470865A30B-KABLER, LAUREN]
Sent: 3/29/2019 4:38:02 PM
To: Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]
Subject: Re: CERT MEMO RE: OIG Animal Feeding...17-P-0396 - For Your Review

Thank you!!

On Mar 29, 2019, at 12:20 PM, Kelley, Rosemarie <Kelley.Rosemarie@epa.gov> wrote:

I approve.

Thanks for the reminder.

Regards,
Rosemarie A. Kelley, Director
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
202-564-4014

From: Kabler, Lauren
Sent: Friday, March 22, 2019 2:06 PM
To: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Sullivan, Greg <Sullivan.Greg@epa.gov>
Cc: Porter, Amy <Porter.Amy@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: CERT MEMO RE: OIG Animal Feeding...17-P-0396 - For Your Review

Rosemarie and Greg,

This corrective action is complete. The cert memo is attached. As soon as you approve, I will let Gwen know and she will put it in the signature chain for Mark B. signature after which this will be closed out in MATS.

Ex. 5 Deliberative Process (DP)

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)

Ex. 6 Personal Privacy (PP) (CELL)

Message

From: Kabler, Lauren [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=43AD0B706D274149971842470865A30B-KABLER, LAUREN]
Sent: 3/29/2019 3:53:41 PM
To: Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]; Sullivan, Greg [Sullivan.Greg@epa.gov]
CC: Porter, Amy [Porter.Amy@epa.gov]
Subject: Re: CERT MEMO RE: OIG Animal Feeding...17-P-0396 - For Your Review

Are you all ok with this? Gwen needs to update MATS today. Thanks!

On Mar 22, 2019, at 2:05 PM, Kabler, Lauren <Kabler.Lauren@epa.gov> wrote:

Rosemarie and Greg,

This corrective action is complete. The cert memo is attached. As soon as you approve, I will let Gwen know and she will put it in the signature chain for Mark B. signature after which this will be closed out in MATS.

Ex. 5 Deliberative Process (DP)

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

<Cert memo animal feeding CAA.docx>
<_epaoig_20170919-17-P-0396_cert.pdf>

Message

From: Kabler, Lauren [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=43AD0B706D274149971842470865A30B-KABLER, LAUREN]
Sent: 3/22/2019 6:06:01 PM
To: Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]; Sullivan, Greg [Sullivan.Greg@epa.gov]
CC: Porter, Amy [Porter.Amy@epa.gov]; Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: CERT MEMO RE: OIG Animal Feeding...17-P-0396 - For Your Review
Attachments: Cert memo animal feeding CAA.docx; _epaoig_20170919-17-P-0396_cert.pdf

Rosemarie and Greg,

This corrective action is complete. The cert memo is attached. As soon as you approve, I will let Gwen know and she will put it in the signature chain for Mark B. signature after which this will be closed out in MATS.

Ex. 5 Deliberative Process (DP)

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

Message

From: Kabler, Lauren [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=43AD0B706D274149971842470865A30B-KABLER, LAUREN]
Sent: 3/22/2019 5:23:31 PM
To: Porter, Amy [Porter.Amy@epa.gov]
Subject: FW: Cert Memo: OIG Animal Feeding...17-P-0396
Attachments: Cert memo animal feeding CAA.docx; _epaoig_20170919-17-P-0396_cert.pdf

OK to send below to RK? Will cc: you and Tim Sullivan.

Ex. 5 AC/DP

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

Message

From: Kabler, Lauren [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=43AD0B706D274149971842470865A30B-KABLER, LAUREN]
Sent: 3/21/2019 9:48:07 PM
To: Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Thanks Tim!

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Sullivan, Tim
Sent: Wednesday, March 20, 2019 3:21 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi, Lauren.

Hope all is well with you!

No comments on the closeout memo.

Thanks, and take care –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Kabler, Lauren
Sent: Wednesday, March 20, 2019 9:06 AM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi Tim! Any concerns with attached? This is the close out memo for this eval.

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Kabler, Lauren
Sent: Thursday, September 27, 2018 2:35 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>; Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Thanks Tim!

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Sullivan, Tim
Sent: Thursday, September 27, 2018 10:21 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>; Sullivan, Greg <Sullivan.Greg@epa.gov>; Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Good morning, Gwen.

I have attached the email from the OAR POC, Allison Kosta, that she sent to me on August 2, 2018. OAR's certificiation memo to OIG is dated July 30, 2018. While there is no corrective action required of OECA at this time, if OAR determines at some point in the future that it cannot develop certain emission estimating methodologies, OECA would have to take action consistent with the Air Compliance Agreement and our corrective action for OIG Recommendation #4.

Please let me know if you have any questions or require any additional information from me.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)

Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Spriggs, Gwendolyn
Sent: Wednesday, September 26, 2018 3:27 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi TIM,

Thanks for the response and vm.

I believe the email below will be appropriate for me to close this corrective action in MATS, assuming you will not have to take any future action on this corrective action.

Also, it would be helpful if you could provide the OAR POC and date that this info was shared with you for our official record. Just forward this info to me via email. If you could share this info before midday Friday (9/28), I can close this info in the MATS database during this reporting period. If not, no worries…it will just close in the next reporting period.

Feel free to call with any questions.

Thanks. GJS 202-564-2439

From: Sullivan, Tim
Sent: Tuesday, September 25, 2018 11:14 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi, Gwen.

Please see my response to Lauren below.

Ex. 5 Deliberative Process (DP)

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Sullivan, Tim
Sent: Thursday, September 20, 2018 11:43 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"
Importance: High

Hi, Lauren.

Thanks for the note. I have checking in with you on this topic on my to-do list, but things were crazy as I was prepping for being out of the office last Friday through yesterday.

OAR completed its deliverables due at the end of June 2018. For now, OAR is proceeding with developing emission estimating methodologies for all pollutant and source categories. Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP Do we need to submit a statement to OIG memorializing this?

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Timothy Sullivan [Ex. 6 Personal Privacy (PP)]
Sent: Thursday, September 20, 2018 8:02 AM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Sent from my iPhone

Begin forwarded message:

> **From:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>
> **Date:** September 19, 2018 at 12:52:16 PM MDT
> **To:** Timothy Sullivan <Ex. 6 Personal Privacy (PP)>
> **Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"**
>
> Hi Tim!! Hope all is well in R8!!
>
> Any idea where OAR is on this?
>
> Sent from my iPhone
>
> Begin forwarded message:
>
>> **From:** "Spriggs, Gwendolyn" <Spriggs.Gwendolyn@epa.gov>
>> **Date:** September 18, 2018 at 4:49:47 PM EDT
>> **To:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>
>> **Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"**
>>
>> Hi Lauren,
>>
>> I just left a vm for you on this report. I'm currently updating MATS. I'm just curious if we have any ideal when OAR will complete their piece (I can only imagine they have a due date in MATS). Having this info (due date) will allow us to better monitor when OCE should implement their CA. Right now, not sure how to determine due date.
>>
>> If you staff doesn't have info...I guess I can contact OAR, but wanted to check internally before I contacted them.

Thanks, GJS 564-2439

From: Spriggs, Gwendolyn
Sent: Wednesday, September 20, 2017 7:39 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Cool.

I'll add to MATS report with a TBD…

Thanks much…GJS

From: Kabler, Lauren
Sent: Wednesday, September 20, 2017 7:15 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren V. Kabler
Special Counsel
OCE/IO/XPS

From: Sullivan, Tim
Sent: Tuesday, September 19, 2017 4:40 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Cc: Chapman, Apple <Chapman.Apple@epa.gov>; Fried, Gregory <Fried.Gregory@epa.gov>; Miller, Anthony <Miller.Anthony@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi, Lauren.

Thank you for forwarding the report.

A response is unnecessary. I will reconfirm with OAR that they will keep us apprised of their plans and actions so that we can start planning to implement our corrective action if and when necessary.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Kabler, Lauren
Sent: Tuesday, September 19, 2017 2:01 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Miller, Anthony <Miller.Anthony@epa.gov>
Subject: Fw: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi Tim! Please let me know if you think a response is necessary. Note that because the OIG accepted our corrective action a response is not required. Also, can you answer Gwen's question - I am sure OAR will notify you but can you just confirm? Thanks!

Lauren V. Kabler

Special Counsel

Crosscutting Policy Staff

Office of Civil Enforcement

From: Spriggs, Gwendolyn
Sent: Tuesday, September 19, 2017 2:08 PM
To: Kabler, Lauren
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed

Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren,

Pls find attached a copy of the final report. It's provided for your review and distribution.

Pls note a response is NOT required. The OIG accepted OCE's proposed corrective action. If OCE would like to submit a response, pls let me know and we'll plan accordingly. Otherwise, we can close this report and add to MATS.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP) Will OCE will receive info from OAR regarding status of their CA completion which will allow OCE to begin it's CA tracking? Pls advise.

Thanks, GJS 564-2439

From: OIG News
Sent: Tuesday, September 19, 2017 1:31 PM
To: Dunham, Sarah <Dunham.Sarah@epa.gov>; Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Pruitt, Scott <Pruitt.Scott@epa.gov>; Jackson, Ryan <jackson.ryan@epa.gov>; Darwin, Henry <darwin.henry@epa.gov>; Chmielewski, Kevin <chmielewski.kevin@epa.gov>; Bloom, David <Bloom.David@epa.gov>; Trent, Bobbie <Trent.Bobbie@epa.gov>; Anthony, Sherri <Anthony.Sherri@epa.gov>; Howard, MarkT <Howard.Markt@epa.gov>; Minoli, Kevin <Minoli.Kevin@epa.gov>; Lyons, Troy <lyons.troy@epa.gov>; Valentine, Julia <Valentine.Julia@epa.gov>; Threet, Derek <Threet.Derek@epa.gov>; Shaw, Betsy <Shaw.Betsy@epa.gov>; Cozad, David <Cozad.David@epa.gov>; Traylor, Patrick <traylor.patrick@epa.gov>; Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>; Vincent, Marc <Vincent.Marc@epa.gov>
Subject: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Attached is the EPA Office of Inspector General (OIG) report, *Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes* (Report No. 17-P-0396). This report will be available to the public on the OIG's website at www.epa.gov/oig.

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a more efficient and cost effective manner.

Message

From: Kabler, Lauren [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=43AD0B706D274149971842470865A30B-KABLER, LAUREN]
Sent: 4/15/2019 1:41:37 PM
To: Porter, Amy [Porter.Amy@epa.gov]
Subject: FW: UPDATE - additional information/material provided RE: OIG Request to meet with AED, WED and WCED managers re: OIG Study: Enforcement Activities/Results
Attachments: OIG Interview Questions for OECA-OCE 12-18-18_with_links.docx

Hi Amy! Can you remind AED and WCED at today's manager's meeting that I need to hear back from them re: 2 dates/times when managers can meet with OIG the week of April 22 or April 29? I've already heard from Rosemarie and WED. Thanks!

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Kabler, Lauren
Sent: Thursday, April 11, 2019 8:55 AM
To: Theis, Joseph <Theis.Joseph@epa.gov>; Brooks, Phillip <Brooks.Phillip@epa.gov>; Chapman, Apple <Chapman.Apple@epa.gov>; Belser, Evan <Belser.Evan@epa.gov>; Pollins, Mark <Pollins.Mark@epa.gov>; Saenz, Diana <Saenz.Diana@epa.gov>; Miles, James <miles.james@epa.gov>; Vizard, Elizabeth <Vizard.Elizabeth@epa.gov>
Cc: Porter, Amy <Porter.Amy@epa.gov>
Subject: UPDATE - additional information/material provided RE: OIG Request to meet with AED, WED and WCED managers re: OIG Study: Enforcement Activities/Results

I'm attaching the list of topics Amy and I discussed with the OIG. Note that after we met with the OIG we inserted LINKS in the attached document and sent it back to the OIG.

Ex. 5 Deliberative Process (DP)

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
202-368-5590 (CELL)

From: Theis, Joseph
Sent: Thursday, April 11, 2019 8:31 AM

To: Kabler, Lauren <Kabler.Lauren@epa.gov>; Brooks, Phillip <Brooks.Phillip@epa.gov>; Chapman, Apple <Chapman.Apple@epa.gov>; Belser, Evan <Belser.Evan@epa.gov>; Pollins, Mark <Pollins.Mark@epa.gov>; Saenz, Diana <Saenz.Diana@epa.gov>; Miles, James <miles.james@epa.gov>; Vizard, Elizabeth <Vizard.Elizabeth@epa.gov>
Cc: Porter, Amy <Porter.Amy@epa.gov>
Subject: RE: OIG Request to meet with AED, WED and WCED managers re: OIG Study: Enforcement Activities/Results and some background/prep material

Lauren,
It would be helpful to see the list of topics for discussion the OIG had sent to you for the December meeting. I'll get back with you with proposed dates/times that would work.
- Joe

Joseph G. Theis
Associate Director
Water Enforcement Division
Office of Enforcement and Compliance Assurance
U.S. EPA (2243A)
1200 Pennsylvania Ave, NW
Washington, D.C. 20460
(202)564-4053

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From: Kabler, Lauren
Sent: Thursday, April 11, 2019 8:13 AM
To: Brooks, Phillip <Brooks.Phillip@epa.gov>; Chapman, Apple <Chapman.Apple@epa.gov>; Belser, Evan <Belser.Evan@epa.gov>; Pollins, Mark <Pollins.Mark@epa.gov>; Theis, Joseph <Theis.Joseph@epa.gov>; Saenz, Diana <Saenz.Diana@epa.gov>; Miles, James <miles.james@epa.gov>; Vizard, Elizabeth <Vizard.Elizabeth@epa.gov>
Cc: Porter, Amy <Porter.Amy@epa.gov>
Subject: OIG Request to meet with AED, WED and WCED managers re: OIG Study: Enforcement Activities/Results and some background/prep material

All - the OIG has asked to meet with the OCE Division managers (BCs optional) regarding their study on Enforcement Activities/Results (*see*, attached and below email chain). Note that OIG will also meet with Rosemarie and OSRE managers – all separate meetings. Note also that OIG will provide a list of topics for discussion prior to the meeting – the questions will be tailored to your Division. Note also that Amy and I met with OIG in late December regarding this study – if you are interested in seeing the list of topics for discussion sent to us by OIG please let me know and I will send.

Please send me, by **Friday COB**, two **two dates/times during the weeks of April 22nd and April 29th** that work for the managers in your Division. Thanks!

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Spriggs, Gwendolyn
Sent: Wednesday, April 10, 2019 10:47 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>; Keim, Stephen <Keim.Stephen@epa.gov>
Subject: RE: OIG Study: Enforcement Activities/Results

OK…

Here's what the OIG is requesting…all separate meetings:

OCE
Office Directors (1 hour)
Air Enforcement (1.5 hours)
Water Enforcement (1.5 hours)
Waste & Chemical Enforcement (1.5 hours)
No need to talk to crosscutting policy again

OSRE
Office Directors (1 hour)
Enforcement Division for Superfund (1.5 hours)
Enforcement Division for RCRA (1.5 hours)

If possible, pls provide two meeting time options for each meeting. That will help significantly with planning.

Thanks, GJS 56-2439

From: Kabler, Lauren
Sent: Wednesday, April 10, 2019 8:56 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>; Keim, Stephen <Keim.Stephen@epa.gov>
Subject: RE: OIG Study: Enforcement Activities/Results

Gwen – need some additional clarification from OIG in order to schedule. We have three Divisions – air, waste/chem and water – does OIG want separate meetings with each Division or just one meeting? Also, please confirm that OIG does not need to meet with our Crosscutting Policy office again (we met with Katie late 2018). Thanks!

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Spriggs, Gwendolyn
Sent: Wednesday, April 10, 2019 8:47 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>; Keim, Stephen <Keim.Stephen@epa.gov>
Subject: OIG Study: Enforcement Activities/Results

Lauren and Stephen,

OIG would like to schedule separate meetings with your offices. They're interested in discussing enforcement trends and the factors contributing to those trends. They specifically requested to meet with Division Directors, the branch chiefs are welcome and optional. I've asked whether ODs should be included in this invitation. I'm waiting for their response and will update you when I have more info. However, I request that you plan around your ODs availability just in case they're expected to participate.

They'd like to schedule these 90 minute meetings during the weeks of April 22nd or April 29th. The OIG will provide a list of topics for the discussion prior to the meeting.

Pls share at least two meeting times per office no later than Friday (4/12) before noon. If you have any questions…let me know.

GJS 564-2439

Message

From: Kabler, Lauren [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=43AD0B706D274149971842470865A30B-KABLER, LAUREN]
Sent: 3/20/2019 12:22:23 AM
To: Spriggs, Gwendolyn [Spriggs.Gwendolyn@epa.gov]
Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"
Attachments: FW: OAR-18-000-9472 - Certification Memo for Office of the Inspector General (OIG) Report No. 17-P-0396; ATT00001.htm

Is this it?

Begin forwarded message:

From: "Sullivan, Tim" <Sullivan.Tim@epa.gov>
Date: September 27, 2018 at 10:20:55 AM EDT
To: "Spriggs, Gwendolyn" <Spriggs.Gwendolyn@epa.gov>
Cc: "Kabler, Lauren" <Kabler.Lauren@epa.gov>, "Sullivan, Greg" <Sullivan.Greg@epa.gov>, "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>, "Sullivan, Tim" <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Good morning, Gwen.

I have attached the email from the OAR POC, Allison Kosta, that she sent to me on August 2, 2018. OAR's certificiation memo to OIG is dated July 30, 2018. While there is no corrective action required of OECA at this time, if OAR determines at some point in the future that it cannot develop certain emission estimating methodologies, OECA would have to take action consistent with the Air Compliance Agreement and our corrective action for OIG Recommendation #4.

Please let me know if you have any questions or require any additional information from me.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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http://www.epa.gov/compliance/complaints/index.html

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From: Spriggs, Gwendolyn
Sent: Wednesday, September 26, 2018 3:27 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi TIM,

Thanks for the response and vm.

I believe the email below will be appropriate for me to close this corrective action in MATS, assuming you will not have to take any future action on this corrective action.

Also, it would be helpful if you could provide the OAR POC and date that this info was shared with you for our official record. Just forward this info to me via email. If you could share this info before midday Friday (9/28), I can close this info in the MATS database during this reporting period. If not, no worries…it will just close in the next reporting period.

Feel free to call with any questions.

Thanks. GJS 202-564-2439

From: Sullivan, Tim
Sent: Tuesday, September 25, 2018 11:14 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi, Gwen.

Please see my response to Lauren below.

Ex. 5 Deliberative Process (DP)

Thanks –

Tim

Timothy J. Sullivan

Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Sullivan, Tim
Sent: Thursday, September 20, 2018 11:43 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"
Importance: High

Hi, Lauren.

Thanks for the note. I have checking in with you on this topic on my to-do list, but things were crazy as I was prepping for being out of the office last Friday through yesterday.

Ex. 5 AC/DP

Ex. 5 AC/DP Do we need to submit a statement to OIG memorializing this?

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Timothy Sullivan [Ex. 6 Personal Privacy (PP)]
Sent: Thursday, September 20, 2018 8:02 AM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Sent from my iPhone

Begin forwarded message:

> **From:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>
> **Date:** September 19, 2018 at 12:52:16 PM MDT
> **To:** Timothy Sullivan <Ex. 6 Personal Privacy (PP)>
> **Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"**
>
> Hi Tim!! Hope all is well in R8!!
>
> Any idea where OAR is on this?
>
> Sent from my iPhone
>
> Begin forwarded message:
>
>> **From:** "Spriggs, Gwendolyn" <Spriggs.Gwendolyn@epa.gov>
>> **Date:** September 18, 2018 at 4:49:47 PM EDT
>> **To:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>
>> **Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"**
>>
>> Hi Lauren,
>>
>> I just left a vm for you on this report. I'm currently updating MATS. I'm just curious if we have any ideal when OAR will complete their piece (I can only imagine they have a due date in MATS). Having this info (due date) will allow us to better monitor when OCE should implement their CA. Right now, not sure how to determine due date.

If you staff doesn't have info...I guess I can contact OAR, but wanted to check internally before I contacted them.

Thanks, GJS 564-2439

From: Spriggs, Gwendolyn
Sent: Wednesday, September 20, 2017 7:39 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Cool.

I'll add to MATS report with a TBD...

Thanks much...GJS

From: Kabler, Lauren
Sent: Wednesday, September 20, 2017 7:15 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren V. Kabler
Special Counsel
OCE/IO/XPS

From: Sullivan, Tim
Sent: Tuesday, September 19, 2017 4:40 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Cc: Chapman, Apple <Chapman.Apple@epa.gov>; Fried, Gregory <Fried.Gregory@epa.gov>; Miller, Anthony <Miller.Anthony@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi, Lauren.

Thank you for forwarding the report.

A response is unnecessary. I will reconfirm with OAR that they will keep us apprised of their plans and actions so that we can start planning to implement our corrective action if and when necessary.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Kabler, Lauren
Sent: Tuesday, September 19, 2017 2:01 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Miller, Anthony <Miller.Anthony@epa.gov>
Subject: Fw: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi Tim! Please let me know if you think a response is necessary. Note that because the OIG accepted our corrective action a response is not required. Also, can you answer Gwen's question - I am sure OAR will notify you but can you just confirm? Thanks!

Lauren V. Kabler

Special Counsel

Crosscutting Policy Staff

From: Spriggs, Gwendolyn
Sent: Tuesday, September 19, 2017 2:08 PM
To: Kabler, Lauren
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren,

Pls find attached a copy of the final report. It's provided for your review and distribution.

Pls note a response is NOT required. The OIG accepted OCE's proposed corrective action. If OCE would like to submit a response, pls let me know and we'll plan accordingly. Otherwise, we can close this report and add to MATS.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP) Will OCE will receive info from OAR regarding status of their CA completion which will allow OCE to begin it's CA tracking? Pls advise.

Thanks, GJS 564-2439

From: OIG News
Sent: Tuesday, September 19, 2017 1:31 PM
To: Dunham, Sarah <Dunham.Sarah@epa.gov>; Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Pruitt, Scott <Pruitt.Scott@epa.gov>; Jackson, Ryan <jackson.ryan@epa.gov>; Darwin, Henry <darwin.henry@epa.gov>; Chmielewski, Kevin <chmielewski.kevin@epa.gov>; Bloom, David <Bloom.David@epa.gov>; Trent, Bobbie <Trent.Bobbie@epa.gov>; Anthony, Sherri <Anthony.Sherri@epa.gov>; Howard, MarkT

<Howard.Markt@epa.gov>; Minoli, Kevin <Minoli.Kevin@epa.gov>; Lyons, Troy <lyons.troy@epa.gov>; Valentine, Julia <Valentine.Julia@epa.gov>; Threet, Derek <Threet.Derek@epa.gov>; Shaw, Betsy <Shaw.Betsy@epa.gov>; Cozad, David <Cozad.David@epa.gov>; Traylor, Patrick <traylor.patrick@epa.gov>; Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>; Vincent, Marc <Vincent.Marc@epa.gov>
Subject: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Attached is the EPA Office of Inspector General (OIG) report, *Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes* (Report No. 17-P-0396). This report will be available to the public on the OIG's website at www.epa.gov/oig.

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Message

From: Kabler, Lauren [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=43AD0B706D274149971842470865A30B-KABLER, LAUREN]
Sent: 4/4/2019 7:01:32 PM
To: Porter, Amy [Porter.Amy@epa.gov]; Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]; Sullivan, Greg [Sullivan.Greg@epa.gov]
Subject: heads up - Susan being interviewed by OIG on Monday re: Enforcement Trends
Attachments: Ex. 7(E) .pdf; OIG Interview Questions for OECA-OCE 12-18-18_with_links.docx

FYI below – note that OIG is interviewing Susan Bodine re: enforcement trends on Monday. Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP) As you know Amy and I met with OIG on this evaluation in late December. I'm attaching the documents we provided to OIG (Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP)

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202.564.4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Tesch, Danielle
Sent: Thursday, April 04, 2019 2:31 PM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>; Kadish, Rochele <Kadish.Rochele@epa.gov>; Kabler, Lauren <Kabler.Lauren@epa.gov>; Keim, Stephen <Keim.Stephen@epa.gov>; Knopes, Christopher <Knopes.Christopher@epa.gov>; Badalamente, Mark <Badalamente.Mark@epa.gov>
Cc: Walker, Khadija <walker.khadija@epa.gov>; Hess, Kathryn <Hess.Kathryn@epa.gov>; Triebwasser, Charles <triebwasser.charles@epa.gov>
Subject: OIG Enforcement Assignment Update (OA&E-FY19-0030)

Good afternoon,

Please find the third assignment update for the enforcement audit below. Thank you for providing the actual enforcement FTE numbers and the internal mid-year enforcement results documents during this past month. Please feel free to share this update with others and to reach out if you have any questions about the information included in this update.

All the best,
Danielle

EPA OIG Performance Audit: EPA Trends in Enforcement Results Over Time (OA&E-FY19-0030)
April 4th, 2019 Update (3rd assignment update)

Notification Memo Issued: November 5, 2018
Kick-Off Meeting with Agency (OECA)**:** November 29, 2018

Audit Objectives (unchanged from notification memo)**:**

1. What are the trends in enforcement results stemming from EPA enforcement actions (injunctive relief, supplementary environmental projects and penalties) over time (2006-2018)?

2. What are the key factors explaining differences in enforcement results stemming from EPA enforcement actions over time, among EPA regions, and among environmental statutes?

Selected Recent OIG Activities:

- Continued analyzing enforcement data and reviewing requested documents
- Conducted interviews with non-EPA organizations and outside enforcement experts
- Conducted interviews with two former OECA Assistant Administrators
- Conducted interviews with two regional enforcement directors

Selected Upcoming OIG Activities:

- Interview current OECA Assistant Administrator (scheduled for April 8, 2019)
- Continue finalizing data analyses to identify trends in enforcement results
- Schedule follow-up interviews with appropriate OECA staff to discuss identified trends and possible key factors contributing to those trends

Next Expected Update: May 6, 2019

Message

From: Kabler, Lauren [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=43AD0B706D274149971842470865A30B-KABLER, LAUREN]
Sent: 4/4/2019 12:56:42 PM
To: Spriggs, Gwendolyn [spriggs.gwendolyn@epa.gov]
CC: Porter, Amy [Porter.Amy@epa.gov]
Subject: FW: OIG Enforcement Assignment: Interview Questions
Attachments: Ex. 7(E) .pdf; OIG Interview Questions for OECA-OCE 12-18-18_with_links.docx

Gwen – please find below an email and attachments we sent to the OIG after we (me and Amy Porter) met with the OIG re: the attached questions.

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Tesch, Danielle
Sent: Tuesday, December 18, 2018 1:11 PM
To: Porter, Amy <Porter.Amy@epa.gov>; Hess, Kathryn <Hess.Kathryn@epa.gov>; Triebwasser, Charles <triebwasser.charles@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Enforcement Assignment: Interview Questions

Thank you, Amy and Lauren!

I did mean to say during our meeting, if any of the resources that you share with us are privileged and/or enforcement confidential that we will make sure to mark them as such in our working papers and there will be a couple of opportunities for OECA to weigh in on report language. We definitely do not want to disclose enforcement techniques or procedures or have an adverse effect on agency enforcement.

We will touch base with you again in the new year after we have had a chance to review some more of the links you provided.

Happy holidays and happy new year!

All the best,
Danielle

Danielle M. Tesch
Social Scientist
USEPA – Office of Inspector General | Office of Audit and Evaluation (OAE)
1650 Arch Street | Mail Code 3Ai00 | Philadelphia, PA 19103-2029
Phone: (215) 814-2337 | Fax: (215) 814-2351

live in the sunshine. swim in the sea. drink the wild air. –Emerson

From: Porter, Amy
Sent: Tuesday, December 18, 2018 12:20 PM
To: Tesch, Danielle <Tesch.Danielle@epa.gov>; Hess, Kathryn <Hess.Kathryn@epa.gov>; Triebwasser, Charles <triebwasser.charles@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Enforcement Assignment: Interview Questions

Danielle, Kathy, and Chip –

Please see attached documents – your questions with the links we referenced on today's call, Ex. 7(E)

Ex. 7(E)

Please let us know if you have any additional questions or if we can be helpful in any way.

Thank you,

Amy

Amy Porter, Director
Crosscutting Policy Staff
Office of Civil Enforcement
US Environmental Protection Agency
202-564-2431

From: Tesch, Danielle
Sent: Thursday, December 13, 2018 6:16 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>; Porter, Amy <Porter.Amy@epa.gov>
Cc: Hess, Kathryn <Hess.Kathryn@epa.gov>; Triebwasser, Charles <triebwasser.charles@epa.gov>
Subject: OIG Enforcement Assignment: Interview Questions

Hi, Lauren and Amy,

Please find attached a set of questions for next week's interview (apologies for sending them a little later than anticipated). The questions are aimed at providing us with a better understanding of the civil enforcement process, trends in civil enforcement actions and results over time, and a couple observations we have made while preliminarily analyzing ECHO/ICIS enforcement data. If any of the questions stray outside your (or OCE's) lane, just let us know during the interview.

Thank you!
Danielle

Message

From: Starfield, Lawrence [Starfield.Lawrence@epa.gov]
Sent: 9/16/2019 3:53:57 PM
To: Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]; Koslow, Karin [Koslow.Karin@epa.gov]
CC: Shiffman, Cari [Shiffman.Cari@epa.gov]
Subject: NAEMS briefings
Attachments: Idsal Meeting Request: NAEMS and CAA Requirements

Rosemarie,

Susan had two meetings on "CAA requirements for livestock and poultry operations and implications of the NAEMS project" on her calendar for this Thursday – one at 11 am and one at 4:30 pm.

-----Original Appointment-----
From: Idsal, Anne <idsal.anne@epa.gov>
Sent: Thursday, September 12, 2019 3:22 PM
To: Idsal, Anne; Harlow, David; Woods, Clint; Campbell, Ann; Tsirigotis, Peter; Koerber, Mike; Lassiter, Penny; Dunkins, Robin; Costa, Allison; Schrock, Bill; Leopold, Matt (OGC); Schwab, Justin; Marks, Matthew; Doster, Brian; Jordan, Scott; Bianco, Karen; Bodine, Susan; Kelley, Rosemarie; Sullivan, Tim; Smith, Darcie; South, Peter; Cozzie, David; Crowley, Kate; McKinney, Voronina; Joseph, Wanda; Hunt, Virginia; Eck, Janet
Cc: Srinivasan, Gautam; Lee, Michael
Subject: NAEMS and CAA Requirements
When: Thursday, September 19, 2019 4:30 PM-5:15 PM (UTC-05:00) Eastern Time (US & Canada).
Where: WJC - N 5400

We are no longer seeing the 11 am meeting on her calendar. Ex. 5 Deliberative Process (DP)
Ex. 5 Deliberative Process (DP)

Also, if you receive briefing materials or otherwise have an update on whether OAR is ready to publish final emission estimating methodologies (triggering an end to OECA's Animal Feeding Operations Air Compliance Agreement), please let us know.

Thanks.

Larry

Message

From: McKinney, Voronina [mckinney.voronina@epa.gov]
Sent: 9/11/2019 1:51:38 PM
To: Rakosnik, Delaney [rakosnik.delaney@epa.gov]
CC: Jacks, Susan [Jacks.Susan@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Smith, Darcie [Smith.Darcie@epa.gov]; Joseph, Wanda [joseph.wanda@epa.gov]; Eck, Janet [Eck.Janet@epa.gov]
Subject: Idsal Meeting Request: NAEMS and CAA Requirements
Attachments: NAEMS CAA meeting request.docx

Good morning Delaney,

Idsal Meeting Request: Please schedule this meeting with Anne re: NAEMS CAA meeting. Meeting request attached. Thank you, Nina

---

From: Joseph, Wanda <joseph.wanda@epa.gov>
Sent: Wednesday, September 11, 2019 9:44 AM
To: Smith, Darcie <Smith.Darcie@epa.gov>; McKinney, Voronina <mckinney.voronina@epa.gov>
Cc: Dunkins, Robin <Dunkins.Robin@epa.gov>; Cozzie, David <Cozzie.David@epa.gov>; South, Peter <South.Peter@epa.gov>
Subject: NAEMS and CAA Requirements

Darcie

Attached is an OAR Meeting request for NAEMS and CAA Requirements. Please review and submit for scheduling.

Thanks,

Wanda Joseph
Administrative Specialist
Sector Policies and Programs Division
109 T.W. Alexander Drive, MC: D205-01
Research Triangle Park, NC 27711
(919) 541-3114

Message

From: Sullivan, Tim [Sullivan.Tim@epa.gov]
Sent: 4/3/2019 3:09:36 PM
To: Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]
CC: Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: FW: EPA-HQ-2019-004716 assignment help
Attachments: EPA-HQ-2019-004716 Case File.pdf; 05-13672.pdf; Final Order 1.27.06.pdf

Flag: Follow up

Good morning, Rosemarie.

EPA has received the attached FOIA request Ex. 5 AC/DP

Ex. 5 AC/DP

I hope this finds all well with you.

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Dunkins, Robin
Sent: Wednesday, April 3, 2019 8:49 AM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>; Nguyen, Quoc <Nguyen.Quoc@epa.gov>
Cc: Costa, Allison <Costa.Allison@epa.gov>; Schrock, Bill <Schrock.Bill@epa.gov>
Subject: FW: EPA-HQ-2019-004716 assignment help

Tim and Quoc,

I'm sending this to you as a heads up. I asked our FOIA liaison to follow up with FOIA office and OGC cross-office Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP

Thanks,
robin

Robin Dunkins, Group Leader
Natural Resources Group
OAR/OAQPS/SPPD Mail Code: E143-03
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711
919-541-5335
dunkins.robin@epa.gov

From: Purifoy, Tiffany
Sent: Wednesday, April 03, 2019 8:52 AM
To: Dunkins, Robin <Dunkins.Robin@epa.gov>
Subject: FW: EPA-HQ-2019-004716 assignment help

Hi Robin,

There is a FOIA request. Ex. 5 Deliberative Process (DP) Ex. 5 Deliberative Process (DP) Should it be assigned to OECA?

Thanks,

Tiffany

From: Hamilton, Sabrina
Sent: Wednesday, April 03, 2019 8:17 AM
To: Purifoy, Tiffany <Purifoy.Tiffany@epa.gov>; Noonan, Jenny <Noonan.Jenny@epa.gov>
Cc: Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Schumacher, Wendy <schumacher.wendy@epa.gov>; Sandfoss, Kristina <Sandfoss.Kristina@epa.gov>; Newman, Maya <Newman.Maya@epa.gov>; Hauser, Mitchell <hauser.mitchell@epa.gov>; Bossard, Justin <bossard.justin@epa.gov>
Subject: FW: EPA-HQ-2019-004716 assignment help

Tiffany or Jenny,

Please review the attached FOIA and let us know if OAQPS is the correct office or if another office should have the lead? Thanks

Sabrina Hamilton

Sabrina Hamilton
Air and Radiation Liaison Specialist
and FOIA Coordinator
Office of Air and Radiation
U.S. Environmental Protection Agency (EPA)
1200 Pennsylvania Avenue, N.W. (6101-A)
Washington, D.C. 20460
Tel: (202) 564-1083

From: Schumacher, Wendy
Sent: Wednesday, April 3, 2019 8:06 AM
To: Hamilton, Sabrina <Hamilton.Sabrina@epa.gov>; Sandfoss, Kristina <Sandfoss.Kristina@epa.gov>; Newman, Maya <Newman.Maya@epa.gov>
Cc: Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Hauser, Mitchell <hauser.mitchell@epa.gov>; Bossard, Justin <bossard.justin@epa.gov>
Subject: EPA-HQ-2019-004716 assignment help

Good morning,

Ex. 5 Deliberative Process (DP)

Thanks, Wendy

Wendy Schumacher, Ph.D., PMP
Government Information Specialist | National FOIA Office
U.S. Environmental Protection Agency | Office of General Counsel
1200 Pennsylvania Avenue, N.W. (MC 2310 A)
Washington, D.C. 20460 | WJCN 5315 E
Phone (202) 566-2513 | schumacher.wendy@epa.gov

National FOIA Office
EPA Office of General Counsel

Message

From: Sullivan, Tim [Sullivan.Tim@epa.gov]
Sent: 9/19/2019 2:35:25 PM
To: Kelley, Rosemarie [Kelley.Rosemarie@epa.gov]
CC: Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: RE: Quick Ag/NAEMS Update

Good morning, Rosemarie.

Ex. 5 Deliberative Process (DP)

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Sent: Thursday, September 19, 2019 6:41 AM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Re: Quick Ag/NAEMS Update

Tom-

Ex. 5 Deliberative Process (DP)

Rosemarie

On Sep 19, 2019, at 8:34 AM, Starfield, Lawrence <Starfield.Lawrence@epa.gov> wrote:

Tim,

Sharing Susan's observation below, FYI.

Larry

From: Bodine, Susan <bodine.susan@epa.gov>
Sent: Wednesday, September 18, 2019 2:00 PM
To: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Traylor, Patrick <traylor.patrick@epa.gov>
Subject: RE: Quick Ag/NAEMS Update

Ex. 5 Deliberative Process (DP)

Patrick, I think you attended the meeting on June 8, 2018 with OAR on this issue. Can you attend the meeting on Thursday? You are invited.

Susan

From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Tuesday, September 17, 2019 4:16 PM
To: Bodine, Susan <bodine.susan@epa.gov>
Subject: Fwd: Quick Ag/NAEMS Update

Susan,

As further background for the NAEMS meeting(s), here's an email from Tim Sullivan with some additional thoughts.

Larry

Sent from my iPhone

Begin forwarded message:

> **From:** "Sullivan, Tim" <Sullivan.Tim@epa.gov>
> **Date:** September 16, 2019 at 7:46:54 PM EDT
> **To:** "Starfield, Lawrence" <Starfield.Lawrence@epa.gov>
> **Cc:** "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>, "Buterbaugh, Kristin" <Buterbaugh.Kristin@epa.gov>, "Sullivan, Tim" <Sullivan.Tim@epa.gov>
> **Subject: RE: Quick Ag/NAEMS Update**
>
> Larry:

Ex. 5 AC/DP

Ex. 5 AC/DP

I only have the 4:30 pm eastern meeting on my calendar – I have not seen or heard anything about an 11 am eastern meeting.

Finally, I have attached the standard Air Compliance Agreement template and my notes on the Agreement's compliance requirements for reference. I am happy to discuss any of these issues ahead of Thursday's meeting.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Monday, September 16, 2019 12:12 PM
To: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: RE: Quick Ag/NAEMS Update

Thank you – this is very helpful.

Ex. 5 AC/DP

Larry

From: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Sent: Monday, September 16, 2019 12:31 PM
To: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: FW: Quick Ag/NAEMS Update
Importance: High

Larry—

On September 5, Tim Sullivan participated in an informational briefing for Anne Idsal on the Animal Feeding Operations (AFO) National Air Emissions Monitoring Study (NAEMS) and the Air Compliance Agreement. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

I only see a 4:30 meeting on the calendar for Thursday. Tim and I plan to participate. I do not know about the 11 am meeting that is referenced in the email you sent.

Rosemarie

From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Thursday, September 5, 2019 1:03 PM
To: Bianco, Karen <Bianco.Karen@epa.gov>; Jordan, Scott <Jordan.Scott@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Quick Ag/NAEMS Update

Hi Karen and Scott,

Anne Idsal requested a briefing on NAEMS (our ongoing project to characterize emissions from livestock/poultry farms), which we held today. Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP Robin gave Matt Marks a brief call as a heads up and I said I would follow up with you as well.

Matt said we should invite the two of you, as well as Brian Doster and another staff person who works on related permitting topics. Do either of you know offhand who that is or could you ask him? (Robin didn't write the name down.)

Tim/Bill – Ex. 5 AC/DP
Ex. 5 AC/DP

Tim – can you give me a list of names to include on the invite for OECA?

From all – any input you have on how to frame the agenda questions would be much appreciated.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

<NAEMS Overview_090319_final.docx>

<AFO Air Compliance Agreement - Background Info_01.19.2018.docx>

<NAEMS Schedule_6.8.18_v3.docx>

Message

From: Kelley, Rosemarie [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23B7C900323047FCA012DF62C58C4D22-RKELLEY]
Sent: 9/16/2019 10:29:32 PM
To: Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: RE: Quick Ag/NAEMS Update

That's fine. I just want to be sure you knew I was looking to you for a response.

From: Sullivan, Tim <Sullivan.Tim@epa.gov>
Sent: Monday, September 16, 2019 6:28 PM
To: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: Quick Ag/NAEMS Update

Hi, Rosemarie.

Yes – I will respond to Larry's question. Please pardon the delay – I just got back from a negotiation and I am assessing what needs attention. This is at the top of the list, and I'll be responding shortly.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Sent: Monday, September 16, 2019 4:26 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: FW: Quick Ag/NAEMS Update

Tim –

Could you answer Larry's question?

Rosemarie

From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Monday, September 16, 2019 2:12 PM
To: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: RE: Quick Ag/NAEMS Update

Thank you – this is very helpful.

Ex. 5 AC/DP

Larry

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Sent: Monday, September 16, 2019 12:31 PM
To: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: FW: Quick Ag/NAEMS Update
Importance: High

Larry—

On September 5, Tim Sullivan participated in an informational briefing for Anne Idsal on the Animal Feeding Operations (AFO) National Air Emissions Monitoring Study (NAEMS) and the Air Compliance Agreement. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

I only see a 4:30 meeting on the calendar for Thursday. Tim and I plan to participate. I do not know about the 11 am meeting that is referenced in the email you sent.

Rosemarie

From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Thursday, September 5, 2019 1:03 PM
To: Bianco, Karen <Bianco.Karen@epa.gov>; Jordan, Scott <Jordan.Scott@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Quick Ag/NAEMS Update

Hi Karen and Scott,

Anne Idsal requested a briefing on NAEMS (our ongoing project to characterize emissions from livestock/poultry farms), which we held today. Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP Peter has confirmed that we don't need to prepare any meeting materials other than an agenda. Robin gave Matt Marks a brief call as a heads up and I said I would follow up with you as well.

Matt said we should invite the two of you, as well as Brian Doster and another staff person who works on related permitting topics. Do either of you know offhand who that is or could you ask him? (Robin didn't write the name down.)

Tim/Bill – Ex. 5 AC/DP

Ex. 5 AC/DP

Tim – can you give me a list of names to include on the invite for OECA?

From all – any input you have on how to frame the agenda questions would be much appreciated.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

Message

From: Kelley, Rosemarie [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23B7C900323047FCA012DF62C58C4D22-RKELLEY]
Sent: 9/16/2019 4:32:25 PM
To: Shiffman, Cari [Shiffman.Cari@epa.gov]
Subject: FW: Quick Ag/NAEMS Update
Attachments: NAEMS Overview_090319_final.docx

Importance: High

I should have copied you on the email below.

From: Kelley, Rosemarie
Sent: Monday, September 16, 2019 12:31 PM
To: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: FW: Quick Ag/NAEMS Update
Importance: High

Larry—

On September 5, Tim Sullivan participated in an informational briefing for Anne Idsal on the Animal Feeding Operations (AFO) National Air Emissions Monitoring Study (NAEMS) and the Air Compliance Agreement. Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

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Sent: Thursday, September 5, 2019 1:03 PM
To: Bianco, Karen <Bianco.Karen@epa.gov>; Jordan, Scott <Jordan.Scott@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
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Ex. 5 AC/DP

Ex. 5 AC/DP

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Matt said we should invite the two of you, as well as Brian Doster and another staff person who works on related permitting topics. Do either of you know offhand who that is or could you ask him? (Robin didn't write the name down.)

Tim/Bill – Ex. 5 AC/DP
Ex. 5 AC/DP

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From all – any input you have on how to frame the agenda questions would be much appreciated.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

Message

From: Kelley, Rosemarie [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23B7C900323047FCA012DF62C58C4D22-RKELLEY]
Sent: 9/16/2019 4:31:51 PM
To: Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: FW: NAEMS briefings
Attachments: Idsal Meeting Request: NAEMS and CAA Requirements

FYI

From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Monday, September 16, 2019 11:54 AM
To: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Koslow, Karin <Koslow.Karin@epa.gov>
Cc: Shiffman, Cari <Shiffman.Cari@epa.gov>
Subject: NAEMS briefings

Rosemarie,

Susan had two meetings on "CAA requirements for livestock and poultry operations and implications of the NAEMS project" on her calendar for this Thursday – one at 11 am and one at 4:30 pm.

> -----Original Appointment-----
> **From:** Idsal, Anne <idsal.anne@epa.gov>
> **Sent:** Thursday, September 12, 2019 3:22 PM
> **To:** Idsal, Anne; Harlow, David; Woods, Clint; Campbell, Ann; Tsirigotis, Peter; Koerber, Mike; Lassiter, Penny; Dunkins, Robin; Costa, Allison; Schrock, Bill; Leopold, Matt (OGC); Schwab, Justin; Marks, Matthew; Doster, Brian; Jordan, Scott; Bianco, Karen; Bodine, Susan; Kelley, Rosemarie; Sullivan, Tim; Smith, Darcie; South, Peter; Cozzie, David; Crowley, Kate; McKinney, Voronina; Joseph, Wanda; Hunt, Virginia; Eck, Janet
> **Cc:** Srinivasan, Gautam; Lee, Michael
> **Subject:** NAEMS and CAA Requirements
> **When:** Thursday, September 19, 2019 4:30 PM-5:15 PM (UTC-05:00) Eastern Time (US & Canada).
> **Where:** WJC - N 5400

We are no longer seeing the 11 am meeting on her calendar **Ex. 5 Deliberative Process (DP)**
Ex. 5 Deliberative Process (DP)

Also, if you receive briefing materials or otherwise have an update on whether OAR is ready to publish final emission estimating methodologies (triggering an end to OECA's Animal Feeding Operations Air Compliance Agreement), please let us know.

Thanks.

Larry

Message

From: Kelley, Rosemarie [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=23B7C900323047FCA012DF62C58C4D22-RKELLEY]
Sent: 9/17/2019 8:06:56 PM
To: Sullivan, Tim [Sullivan.Tim@epa.gov]
Subject: Re: Quick Ag/NAEMS Update

Thanks for clearing up this mystery, Tim.

Rosemarie

On Sep 17, 2019, at 4:05 PM, Sullivan, Tim <Sullivan.Tim@epa.gov> wrote:

Larry and Rosemarie:

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

will keep you apprised of any further developments.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Monday, September 16, 2019 8:23 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: Re: Quick Ag/NAEMS Update

Thanks, Tim. Got it.

Sent from my iPhone

On Sep 16, 2019, at 7:46 PM, Sullivan, Tim <Sullivan.Tim@epa.gov> wrote:

Larry:

Ex. 5 AC/DP

I only have the 4:30 pm eastern meeting on my calendar – I have not seen or heard anything about an 11 am eastern meeting.

Finally, I have attached the standard Air Compliance Agreement template and my notes on the Agreement's compliance requirements for reference. I am happy to discuss any of these issues ahead of Thursday's meeting.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

Help eliminate environmental violations - report tips and complaints at:
http://www.epa.gov/compliance/complaints/index.html

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From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Monday, September 16, 2019 12:12 PM
To: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: RE: Quick Ag/NAEMS Update

Thank you – this is very helpful.

Ex. 5 AC/DP

Larry

From: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Sent: Monday, September 16, 2019 12:31 PM
To: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: FW: Quick Ag/NAEMS Update
Importance: High

Larry—

On September 5, Tim Sullivan participated in an informational briefing for Anne Idsal on the Animal Feeding Operations (AFO) National Air Emissions Monitoring Study (NAEMS) and the Air Compliance Agreement. **Ex. 5 Deliberative Process (DP)**

Ex. 5 Deliberative Process (DP)

I only see a 4:30 meeting on the calendar for Thursday. Tim and I plan to participate. I do not know about the 11 am meeting that is referenced in the email you sent.

Rosemarie

From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Thursday, September 5, 2019 1:03 PM
To: Bianco, Karen <Bianco.Karen@epa.gov>; Jordan, Scott <Jordan.Scott@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Quick Ag/NAEMS Update

Hi Karen and Scott,

Anne Idsal requested a briefing on NAEMS (our ongoing project to characterize emissions from livestock/poultry farms), which we held today. **Ex. 5 AC/DP**

Ex. 5 AC/DP

Ex. 5 AC/DP Peter has confirmed that we don't need to prepare any meeting materials other than an agenda. Robin gave Matt Marks a brief call as a heads up and I said I would follow up with you as well.

Matt said we should invite the two of you, as well as Brian Doster and another staff person who works on related permitting topics. Do either of you know offhand who that is or could you ask him? (Robin didn't write the name down.)

Tim/Bill – Ex. 5 AC/DP
Ex. 5 AC/DP

Tim – can you give me a list of names to include on the invite for OECA?

From all – any input you have on how to frame the agenda questions would be much appreciated.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

<NAEMS Overview_090319_final.docx>

<AFO CAFO - Standard Agreement.pdf>

<AFO CAFO - Compliance Req Notes.docx>

Message

From: Cortelyou-Lee, Jan [Cortelyou-Lee.Jan@epa.gov]
Sent: 9/18/2019 5:59:43 PM
To: Koerber, Mike [Koerber.Mike@epa.gov]; Mckelvey, Laura [Mckelvey.Laura@epa.gov]; Perez, Idalia [Perez.Idalia@epa.gov]
CC: OAQPS OD PACS [OAQPS_OD_PACS@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]; Smith, Darcie [Smith.Darcie@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: NAEMS Call for Information

Earlier today, the acting Administrator for Air signed a notice requesting voluntary submissions of data on volatile organic compound emissions from animal confinement processes and manure storage and treatment processes at broiler, egg-layer, swine, and dairy animal feeding operations (AFOs). EPA is developing emission estimating methodologies for AFOs and is providing this opportunity for the public to supplement the information it has already collected. In 2005, through a voluntary consent agreement known as the Air Compliance Agreement, federal agencies and the AFO industry committed to methodologies to estimate air emissions from these sources.

A pre-publication version of the notice is available on our website at: https://www.epa.gov/afos-air/national-air-emissions-monitoring-study#naems-status .

Please share with your interested stakeholders.

Mike - the Division is reaching out to the state organizations. THis is for your FYI only.

Message

From: Eck, Janet [Eck.Janet@epa.gov]
Sent: 8/20/2019 8:21:48 PM
To: Smith, Darcie [Smith.Darcie@epa.gov]
CC: Koerber, Mike [Koerber.Mike@epa.gov]; South, Peter [South.Peter@epa.gov]
Subject: NAEMS Call for Info Notice Review
Attachments: CAFO 2019 NAEMS VOC Call for Information Preamble_082019.docx

Hi Darcie, Attached is the National Air Emissions Monitoring Study: Call for Information for OAQPS review. No deadlines apply to this action. I will bring the blue folder by shortly. Thanks.

Message

From: Cortelyou-Lee, Jan [Cortelyou-Lee.Jan@epa.gov]
Sent: 1/27/2020 9:03:06 PM
To: DeLuca, Isabel [DeLuca.Isabel@epa.gov]
CC: OAQPS OD PACS [OAQPS_OD_PACS@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]
Subject: Status of EEMs/NAEMS
Attachments: NAEMS Schedule desk statement QA May 15 2019.docx

Hey

FYI – just letting you know that we are updating our schedule for developing draft emission estimating methodologies for agricultural sources.

I have updated and attached the desk statement/QAs we put together when we updated our schedule in May 2019.

The schedule is posted on the web at: https://www.epa.gov/afos-air/national-air-emissions-monitoring-study#naems-status.

Here are the changes we have made.

Timeline for the Release of Emission Estimating Methodologies for AFO Emissions

Date	Milestone
July ~~January~~ 2020	Draft models for ammonia, hydrogen sulfide and particulate matter emissions from swine farms
November ~~April~~ 2020	Draft models for ammonia, hydrogen sulfide and particulate matter emissions from poultry (broiler and layer) farms
March 2021 ~~July 2020~~	Draft models for ammonia, hydrogen sulfide and particulate matter emissions from dairy farms
July 2021 ~~November 2020~~	Draft models for volatile organic compound emissions from swine, poultry and dairy farms
TBD	Stakeholder review period
TBD	Finalization of all emission estimating methodologies

Message

From: Alvarez, Christine [Alvarez.Christine@epa.gov]
Sent: 3/16/2020 12:39:00 PM
To: Tong-Argao, Sania [Tong-Argao.Sania@epa.gov]; Baxter, Ann-Marie [baxter.ann-marie@epa.gov]; Nessley, Libby [Nessley.Libby@epa.gov]
Subject: FW: Annual QAPP Review Needed for Project J-AESMD-0031352: Development of Emission Estimating Methodologies for Air Emissions from Animal Feeding Operations
Attachments: Final_EEM_QAPP_v0.0_signed.pdf

Hi Ladies, I am not sure if Ian was under NRMRL or NERL before, but my guess is NRMRL. Thus I am forwarding this to all of you to be safe.
Thanks
Christine

Christine Alvarez
Acting A-E Associate National Program Director
ORD/RTP
919-541-3881 M-Th
303-815-7510 F

From: qatrack@epa.gov <qatrack@epa.gov>
Sent: Monday, March 16, 2020 2:20 AM
To: Rumsey, Ian <rumsey.ian@epa.gov>
Cc: Alvarez, Christine <Alvarez.Christine@epa.gov>
Subject: Annual QAPP Review Needed for Project J-AESMD-0031352: Development of Emission Estimating Methodologies for Air Emissions from Animal Feeding Operations

Please do not reply to this email. Thank you.

RE: QAPP J-AESMD-0031352: Development of Emission Estimating Methodologies for Air Emissions from Animal Feeding Operations
Previous ID: G-AEMD-0031352
QAPP Approval Date: November 29, 2017
Latest Annual QAPP Review Date: February 15, 2019

This is an automated email notification from ORD QA TRACK to alert you to do an annual review of the Quality Assurance Project Plan (QAPP) listed above. You are receiving this email because you are listed as the Point of Contact for this QAPP. The current project QA Manager is cc'd on this email. The Project Lead needs to review the QAPP and decide if the QAPP is still current, needs to be revised/updated, or is no longer in use and should be archived.

Please use this email to inform your QA Manager about the status of the QAPP requiring the annual review, as follows:

1. Click on "Forward" from the action buttons at the top of this email.
2. Move to the "To:" field and enter the name of your QA Manager.
3. Put your cursor back in the area of the original email.
4. Type an "X" in the column with the most appropriate response for the QAPP.
5. Click on "Send."

List of Responses

[ ] I have reviewed the QAPP and no revisions are necessary. [Project Status: Active; QAPP Status: Approved]
[ ] I have reviewed the QAPP and will provide you with a revision. [Project Status: Active; QAPP Status: In Revision]
[ ] QAPP no longer in use, data collection has been completed, but products are being prepared. [Project Status: Inactive]
[ ] QAPP no longer in use, data collection and analysis have been completed, and all expected products have been completed. [Project Status: Archived]

If the review is not complete by the 15th of the following month, you will receive another reminder. If you have any questions, please contact your QA Manager. Thank you.

NRMRL QUALITY ASSURANCE PROJECT PLAN

Office of Research and Development (ORD)
National Risk Management Research Laboratory (NRMRL)
Air Energy and Management Division (AEMD)
Energy and Natural Systems Branch (ENSB)
Distributed Source and Buildings Branch (DSBB)

Development of Emission Estimating Methodologies for Air Emissions from Animal Feeding Operations

QA Category B: Model Application
(G-AEMD-0031352-QP-1-0)

Revision Number: 0
March 13, 2018

Prepared by
ORD/NRMRL/AEMD
Research Triangle Park, NC 27711

Approvals

QA Project Plan Title:	**Development of Emission Estimating Methodologies for Air Emissions from Animal Feeding Operations**
NRMRL QA Tracking ID:	**G-AEMD-0031352, QTRAK No. 18006**
EPA NRMRL Project Approvals	
Name: Ian Rumsey AEMD Technical Lead Person (TLP)	Signature/Date: 03/13/2018
Name: William Yelverton AEMD TLP's Supervisor	Signature/Date: 03/13/2018
Name: Libby Nessley AEMD QA (Lead) Manager	Signature/Date: Nessley, Libby Digitally signed by Nessley, Libby Date: 2018.03.22 09:22:44 -04'00'
EPA OAQPS Project Approvals	
Name: Robin Dunkins OAQPS/SPPD Supervisor	Signature/Date: 3/14/2018
Name: Joe Elkins OAQPS QA Manager	Signature/Date: 3/14/2018

Change History

Change No.	Description	Date Submitted	Date Approved	Revised Section	Changes
0	Final QAPP issuance	11/27/17	03/13/2018	All	

Table of Contents

Approvals 2
Figures 5
Tables 5
Distribution List 6
Acknowledgments and Disclaimers 6
Acronyms and Abbreviations 7
1.0 Project Description and Objectives 10
1.1 Background 10
1.2 Project Objective 11
2.0 Project Organization and Responsibilities 11
2.1 Project Personnel 11
2.2 Project Schedule 12
3.0 Emissions Database 14
3.1 Data Sources and Quality Metrics 14
3.1.1 Changes to Data Quality Procedures 14
3.1.1.1 Inclusion of open/area source emissions determined by the BLS method 14
3.1.1.2 Revision of the data completeness criteria 15
3.2 Data Analysis, Interpretation and Management 15
3.2.1 Initial Data Analysis Techniques 15
3.2.2 Determining ES&P categories for EEM development 16
3.3 Data Storage 18
4.0 Model Development 18
4.1 Development of New Statistical Models 19
4.1.1 Conceptual Model 19
4.1.2 Model Parameters 21
4.1.3 Computer Hardware/Software 21
5.0 New Statistical Model Application 23
5.1 Use & Limitations 23
5.2 Description 23
6.0 Model Verification and Evaluation 23
6.1 Approach 23
6.2 Model Evaluation 24
6.3 Assessment Process 25
7.0 Reporting 25
7.1 Project Documentation 25
7.2 Deliverables 26

8.0 References 27

Figures

Figure 1. Organizational chart. 13

Tables

Table 1. Potential emission source categories for NAEMS AFO sites. 17
Table 2. Parameters to be investigated in the first stage of EEM development for each emission source category. 21
Table 3. Parameters measured during NAEMS for barns and lagoons 22

Distribution List

Copies of this plan and all revisions will be sent initially to the following individuals. It is the responsibility of the EPA/NRMRL/AEMD's Technical Lead Person to make copies of the plan available to all project personnel.

EPA/ORD/NRMRL/AEMD

Ian Rumsey - AEMD/ENSB, Technical Lead Person/Principal Investigator

Chelsey Fattal (ORAU) - AEMD/DSBB, Modeling & Support

John Walker - AEMD/ENSB, Project Support

Eben Thoma - AEMD/DSBB, Project Support

Will Yelverton - AEMD/ENSB, Project Support & Supervisor

Richard Shores - AEMD/DSBB, Project Support & Supervisor

Libby Nessley - AEMD QA (Lead) Manager

EPA/OAR/OAQPS/SPPD

William Schrock - SPPD/NRG, Project Support

Allison Costa - SPPD/NRG, Project Support

Robin Dunkins - SPPD/NRG, Project Support & Supervisor

EPA/OAR/OAQPS/CORE

Joe Elkins, QA Manager

Acknowledgments and Disclaimers

Any mention of trade names, products, or services does not imply an endorsement by the US Government or the United States Environmental Protection Agency (EPA). EPA does not endorse any commercial products, services, or enterprises.

Acronyms and Abbreviations

AEMD	Air and Energy Management Division (within EPA)
AFO	animal feeding operation
ATM	atmosphere(s)
β_0	intercept
β_k	regression coefficient
BLS	Backwards Lagrangian Stochastic
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CORE	Central Operations and Resources (within EPA)
DC	direct current
DSBB	Distributed Source & Buildings Branch (within EPA)
ε	error term
EEM	emission estimating methodology
ENSB	Energy & Natural Systems Branch (within EPA)
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-To-Know Act
ES&P	emission source & pollutant
FAC2	fraction of predicted values within a factor of 2 of observations
FB	fractional bias
ft^3	cubic feet
ft/sec	feet per second
gal	gallon(s)
HAP	hazardous air pollutant
H_2S	hydrogen sulfide
IFSM	Integrated Farm System Model
kg	kilogram(s)
kPA	kilopascal(s)
lb	pound(s)
m	meter(s)
MB	mean bias
M&DQ QAPP	measurement and data quality assurance project plan
ME	mean error
MG	geometric mean bias
mg/g	milligram(s) per gallon

mg/l	milligram(s)m per liter
min	minute
MSA	manure surface area
MV	mechanically ventilated
mv	millivolt(s)
N	nitrogen
n	number
NAEMS	National Air Emissions Monitoring Study
NAS	National Academy of Sciences
NH_3	ammonia
NH_4^+	ammonium
NMB	normalized mean bias
NME	normalized mean error
NMSE	normalized mean square error
NRG	Natural Resources Group (within EPA)
NRMSE	normalized root mean square error
NO_2^-	nitrite
NO_3^-	nitrate
NRMRL	National Risk Management Research Laboratory (within EPA)
NV	naturally ventilated
OAQPS	Office of Air Quality Planning & Standards (within EPA)
OAR	Office of Air and Radiation (within EPA)
ORAU	Oak Ridge Associated Universities (contractor)
ORD	Office of Research & Development (within EPA)
P	phosphorous
pH	Measure of hydrogen ion concentration
PI	principal investigator (of study)
PM	particulate matter
$PM_{2.5}$	particulate matter, with a diameter less than or equal to 2.5 micrometers
PM_{10}	particulate matter, with a diameter less than or equal to 10 micrometers
QA	quality assurance
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
RMSE	root mean square error
S	sulfur

SAB	Science Advisory Board
SAS	Statistical Analysis Software
SPPD	Sector Policies and Programs Division (within EPA)
temp	temperature
TKN	total Kjeldahl nitrogen
TLP	technical lead person
TSP	total suspended particulates
USDA	United States Department of Agriculture
VG	geometric variance
VOC	volatile organic compound
VRPM	Vertical Radial Plume Mapping model
Wt.%	weight percentage
W/m^2	watt(s) per meter squared
X_k	independent or predictor variables
Y	dependent variable
%	percentage
°	cardinal directions; degrees of a compass
°C	degrees Celsius

1.0 Project Description and Objectives

1.1 Background

Animal feeding operations (AFOs) are agricultural operations where animals are kept and raised in confined areas (U.S. Environmental Protection Agency (EPA), 2017a). For over six decades, there have been movements to improve profitability within animal agriculture, resulting in fewer, but larger AFOs that are also more geographically concentrated. For example, a study by Graham and Nachman (2010) determined that since the 1950's, production of livestock and poultry have more than doubled, while the number of operations had decreased by 80%. In a recent report, the EPA estimated using U.S. Department of Agriculture (USDA) 2007 census data that there were approximately 2.2 billion livestock and poultry producing an estimated 1.1 billion tons of manure in the United States (U.S. EPA, 2013). AFOs and the associated manure emit various pollutants into the atmosphere including ammonia (NH_3), hydrogen sulfide (H_2S), volatile organic compounds (VOCs) and particulate matter (PM) (Aneja et al., 2008). Thus, there are concerns regarding these facilities due to the potential impact these compounds can have on human health and the environment.

AFOs can directly emit a significant amount of PM into the atmosphere (Takai et al. 1998). Emissions of NH_3 from AFOs can also lead to the formation of secondary PM. Atmospheric NH_3 is the dominant alkaline gas in the atmosphere and reacts with a variety of acidic atmospheric species (i.e. sulfuric, nitric and hydrochloric acid) to form ammonium (NH_4^+) PM (Seinfield and Pandis, 2006). As a particle, the NH_4^+ aerosol impacts atmospheric visibility (Seinfield and Pandis, 2006). The NH_4^+ particle also contributes a significant fraction of total $PM_{2.5}$ mass (Adams et al., 1999). The inhalation of $PM_{2.5}$ can have a number of adverse health effects including premature mortality (Pope et al., 2002). Gaseous NH_3 and NH_4^+ PM are removed through wet and dry deposition to the earth's surface, which may result in the eutrophication of terrestrial and aquatic ecosystems (Galloway, 2003). Gaseous H_2S can contribute to the formation of $PM_{2.5}$, although its primary effect is related to its odor, and has an odor characteristic described as "rotten eggs" (Schiffman et al., 2001). In addition, some VOCs are also odorous. Emissions of odorous compounds can impact people who live nearby, as they can potentially affect human health (Schiffman and Williams, 2005) and quality of life (Wing and Wolf, 2000). Additionally, many VOCs are classified as hazardous air pollutants (HAPs). HAPs are described by the EPA as "pollutants that are known or suspected to cause cancer or other serious health effects such as reproductive effects or birth defects, or adverse environmental effects" (U.S. EPA, 2017b). VOC emissions can also have regional effects. VOCs are generally reactive, and can, through a set of reactions, form ozone. Ozone can have negative impacts on the human respiratory system, and is associated with mortality (Ito et al., 2005).

Air emissions from AFOs are not regulated by any AFO specific standards within the Clean Air Act (CAA), but AFOs could emit air pollutants in sufficient quantity to trigger certain general CAA permit requirements or emission reporting requirements under two other statutes: (1) Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and (2) Emergency Planning and Community Right-to-Know Act (EPCRA). Both CAA permitting requirements and emission reporting requirements are triggered only if a facility produces emissions over certain regulatory thresholds. In the late 1990's, the EPA recognized that they did not have adequate air emissions data from AFOs to develop reliable emission estimating

methodologies (EEMs) for determining whether individual farms are subject to CAA permit requirements or emission reporting requirements (U.S. EPA, 2017c). This lack of sufficient AFO data is partly related to the difficulty in characterizing air emissions, as there is a diversity in production, management and environmental conditions at AFO sites. In 2001, the EPA and the USDA asked the National Academy of Sciences (NAS) to evaluate the current state of the science and provide recommendations on estimating air emissions from AFOs. In their 2003 seminal report (NAS National Research Council, 2003), NAS made several recommendations including a recommendation that the "EPA and USDA should initiate and conduct a coordinated research program to produce a scientifically sound basis for measuring and estimating air emissions from AFOs". Subsequently, in 2005, a voluntary Air Compliance Agreement between the EPA and the animal industries was announced. In this agreement, the industry agreed to fund a large-scale emissions monitoring study known as the National Air Emissions Monitoring Study (NAEMS). Furthermore, as part of the Air Compliance Agreement, the EPA was to use the NAEMS emissions data and other relevant data sources to develop EEMs, while the AFO industry participants agreed to use these EEMs to estimate their emissions for purposes of complying with applicable CERCLA and EPCRA reporting requirements.

The NAEMS is the most comprehensive AFO air pollution monitoring study to date, measuring emissions from representative broiler, layer, swine and dairy AFOs in the U.S. over a monitoring period of two years. The NAEMS measured emissions of NH_3, H_2S, VOCs, and PM at 27 monitoring sites. While making emission measurements, production, management and environment conditions were also monitored and/or documented.

Air monitoring for the NAEMS began in 2007 and ended in early 2010 with the data submitted to EPA by August 2010. After organizing, documenting and analyzing the data, two draft reports containing draft EEMs for NH_3, H_2S, VOC, and PM emissions from broiler houses and NH_3 emissions from swine and dairy lagoon/basins were developed. In February 2012, the EPA submitted these draft reports to the Science Advisory Board (SAB) for review and for their recommendations, which were returned to the EPA in April 2013. The SAB identified several concerns with the draft EEMs and recommended that the EEMs should not be used to estimate air emissions from AFOs on a national scale.

Currently, per the Air Compliance Agreement, the EPA is still tasked with developing EEMs, which is the subject of this QAPP.

1.2 Project Objective

To develop EEMs for air emissions from AFOs using data from the NAEMS and other relevant data sources.

2.0 Project Organization and Responsibilities

2.1 Project Personnel

This work will be conducted under the EPA's continued effort to develop and implement approaches that can be used to quantify farm-by-farm emission estimates. Project personnel for

this effort will include multiple individuals from EPA/ORD/NRMRL and EPA/OAR/OAQPS. The primary personnel are described here with organization connection details contained in Figure 1.

Ian Rumsey (ORD/ENSB) is the project coordinator and principal investigator (PI) for this study. He is responsible for communicating the overall project technical direction to EPA ORD contractor (ORAU), Chelsey Fattal, as well as to the other project coordinators and NAEMS-EEM supporting investigators. Chelsey Fattal (ORD/DSBB) will provide assistance in the modeling of air emissions from AFOs as well as providing support in other areas of the project. John Walker (ORD/ENSB) and Eben Thoma (ORD/DSBB) are the leads in providing technical support and guidance to this project, however, William Yelverton (ORD/ENSB Chief) and Richard Shores (ORD/DSBB Chief) will also provide technical support and guidance. John Walker, Eben Thoma, William Yelverton and Richard Shores will review the QAPP and provide comments. William Schrock (OAR/NRG) and Allison Costa (OAR/NRG) are co-lead project coordinators in OAQPS and will provide support and guidance to this project. William Yelverton and Richard Shores will also perform personnel management roles for ORD and will communicate appropriately with other ORD supervisors as required. Robin Dunkins (OAR/NRG) will provide guidance to this project, perform personnel management roles for OAR and will communicate appropriately with other OAR supervisors as required. William Schrock, Allison Costa and Robin Dunkins will review the QAPP and provide comments.

Libby Nessley (ORD/NRMRL) is the QA Manager and QA lead for this project for activities performed within NRMRL. Ms. Nessley will formally review and approve this QAPP per NRMRL requirements. As needed, Ms. Nessley will review and approve project reporting as part of EPA ORD's publication clearance process to verify that the project was implemented as specified in this document. Joe Elkins (OAR/OAQPS) is the QA Manager for OAQPS. Mr. Elkins will formally review and approve this QAPP per OAQPS requirements.

2.2 Project Schedule

The overall effort for this project started in January 2017. Initial project tasks involved preparing and planning for EEM development, which included determining the status of the NAEMS data set and developing this QAPP for the development of EEMs for air emissions from AFOs. The draft QAPP was submitted in November 2017. It is currently unknown how much time will be spent developing EEMs for the various emission source and pollutant (ES&P) categories, however, the plan is to determine a schedule for EEMs development in consultation with our group members in OAQPS in the third quarter of FY 2018. A summary of the project timeline and the anticipated project schedule is as follows:

- 01/8/17-03/13/18: Project preparation and planning.
- 11/27/17: Draft QAPP submitted for QA review.
- 03/13/18: Final version of initial QAPP completed.
- 06/30/18: Determine EEMs schedule for ES&P categories.

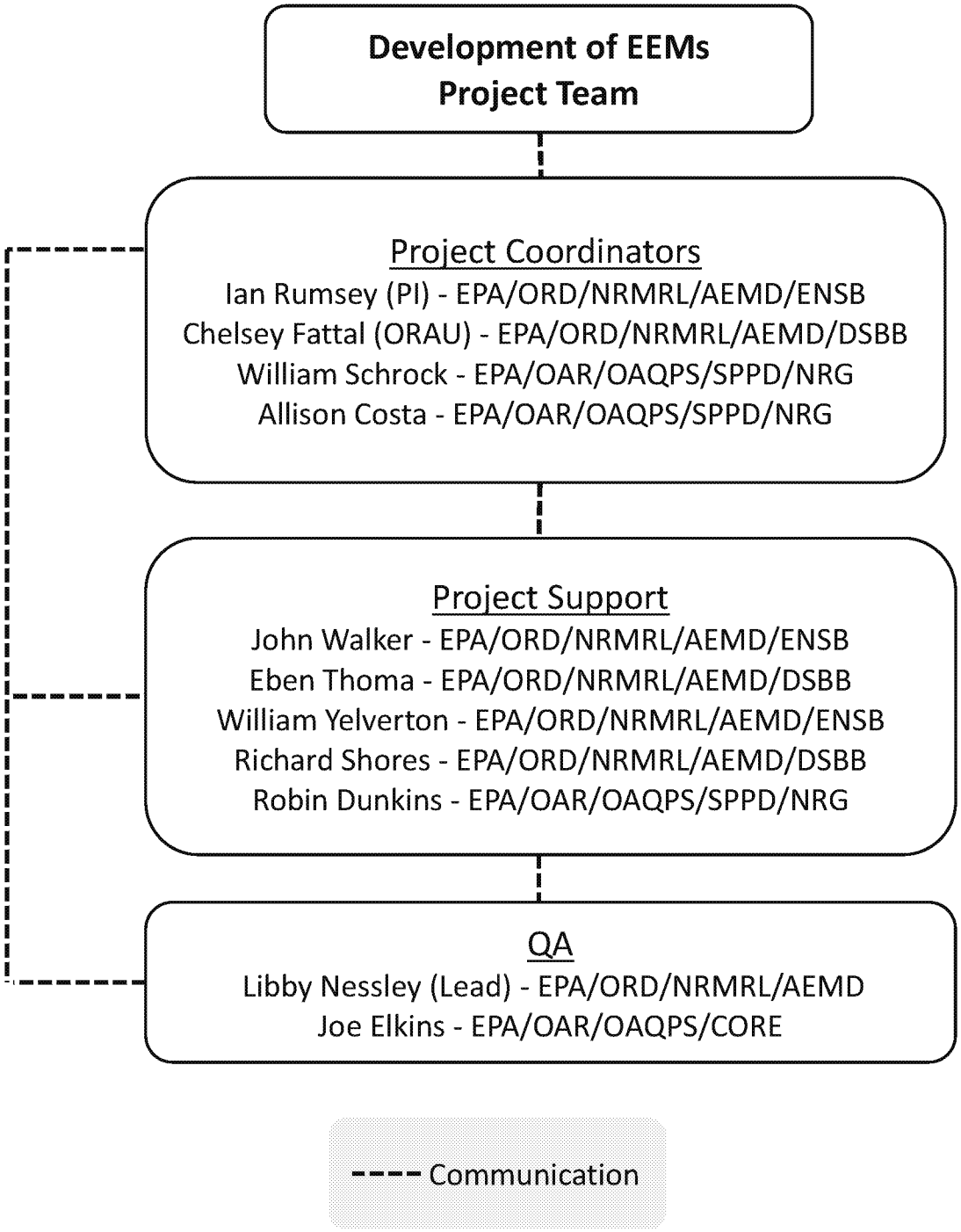

Figure 1. Organizational chart.

3.0 Emissions Database

3.1 Data Sources and Quality Metrics

EEMs will be developed using data from the NAEMS. The NAEMS data was collected under rigorous quality assurance/quality control (QA/QC) procedures that are outlined in the Measurement and Data Quality QAPPs (M&DQ QAPPs). Separate M&DQ QAPPs were developed for monitoring from barn and open/area sources associated with the project (Heber et al., 2008; Grant et al., 2008). The M&DQ QAPP was used to develop a NAEMS data set that was analyzed and used for 2012 draft EEM development reports, hereafter referred to as "2012 EEM reports". However, applying the data quality and validation procedures associated with the M&DQ QAPPs resulted in small open/area source data sets. In their review of the 2012 EEM reports, the SAB suggested two approaches that could be used to increase the amount of available data. These were to include the use of open/area source emissions determined by the Backwards Lagrangian Stochastic (BLS) method and revise the data completeness criteria. In this project, these SAB suggested changes to data quality procedures will be applied to the NAEMS dataset, thus producing a revised version of the NAEMS data set. Section 3.1.1 will discuss the rationale, methodology and application of these changes to the data quality procedures.

The potential need for additional non-NAEMS data in developing EEMs will be investigated if appropriate at a later stage of the project and addressed in a secondary data addendum to this QAPP.

3.1.1 Changes to data quality procedures

3.1.1.1 Inclusion of open/area source emissions determined by the BLS method

In the NAEMS, emissions for open/area sources could potentially have been determined using two different methodologies, the BLS method and the Vertical Radial Plume Mapping model (VRPM) method (both discussed in M&DQ QAPP (Grant et al. 2008)). However, open/area source emissions determined by the BLS method were not included in the initial NAEMS database as there were concerns with the validity of the measurement method. However, after the publication of the 2012 EEM reports, a validation study was reported by Grant et al. (2013a) (Dr. Richard Grant is the NAEMS PI for open/area sources). In the Grant et al. (2013a) study, NH_3 emissions, determined by both the BLS and VRPM methods were compared at eight NAEMS monitoring sites. In comparison, the overall BLS mean emission estimate was found to be 5% ± 25% lower than the VRPM method. Based on their findings, Grant et al. (2013a) concluded that that both the BLS and VPRM methods "can be assumed to equally represent the actual flux conditions for open waste lagoon sources". Therefore, for this project, emissions determined by the BLS method will be included in the database as suggested by the SAB, thus meaning that this project will develop EEMs using emission data determined by both the BLS and the VRPM method. The inclusion of emissions determined by the BLS method will increase the amount of data, as there were times when the BLS method produced valid emissions when the VPRM method did not. In periods, when both the BLS method and VRPM method determine valid emissions, an overall emission value will be determined based on the methodologies described in Grant et al. (2013a) and Grant et al. (2016).

3.1.1.2 Revision of the data completeness criteria

In general terms, the criteria for data completeness outlined in the M&DQ QAPPs (Heber et al. 2008; Grant et al. 2008) was to use data where ≥75% of the data was valid within a set time period, however, due to difficulties associated with open source micrometeorological measurements, this criterion resulted in a small number of valid emission days and thus limited open/area source daily data sets. As a result of the limited open/area source data sets, the SAB suggested expanding the data completeness criteria in order to increase the amount of valid data. This suggested change to data quality procedures was investigated in a recent study by Grant et al. (2013b). In the Grant et al. (2013b) study, the fraction of NH_3 emissions needed to determine an accurate daily average using NAEMS data from swine finishing and swine sow farms in Oklahoma was investigated. Using the statistical relationship between air temperature and NH_3 emissions, Grant et al. (2013b) determined that to have a daily emissions error of < 25%, at least 25 out of 48 (52%) 30-minute measurements needed to be valid (additional information on the methodology for determining daily emission error values is provided in Grant et al. (2013b)). Therefore, based on this study, the data completeness criteria for open/area source data for the updated NAEMS data set will be revised from 75% to 52%, thus meaning that daily emissions will be considered invalid if less than 52% (25) of the 48 30-minute periods recorded during that day were valid. This data quality procedure revision from 75% to 52% will increase the open/area source data set size.

It should be noted that the aforementioned M&DQ QAPP data completeness criteria value of 75% had less of an effect on the amount of valid barn emissions data. The potential need to revise this value for barn source emissions will be assessed at a later date, if appropriate.

3.2 Data Analysis, Interpretation and Management

3.2.1 Initial Data Analysis Techniques

Initial data analysis on the revised NAEMS data set (due to revisions discussed in the Section 3.1.1) will include time series analysis and composite hourly average analysis of pollutant emissions, concentrations, air flow (ventilation rate for barns and wind speed for open/area sources) and environmental parameters at each AFO site over each seasonal sampling period. In addition, summary statistics such as mean, maximum, minimum, median, standard deviation and number (of data points) values will be determined for pollutant emissions and environmental parameters over seasonal, annual and bi-annual time periods for each AFO. The animal diet (if available) and manure management practices at each AFO site will also be examined during the monitoring periods. This analysis allows a macro examination of trends in data and can be used to provide a qualitative guide to the influence of production, management and environmental conditions on emissions. This analysis can also be used to identify potential data trends that may need further investigation. This analysis may also help determine the number of EEMs that need to be developed since EEMs will be developed for different emission source categories and this analysis will help determine the appropriate emission source categories for this study (described in further detail in section 3.2.2). Progress in data analysis will be documented in informal reports (see section 7.1 for more details).

3.2.2 Determining ES&P Categories for EEM Development

Before EEM development, an initial determination of emission source categories for the NAEMS AFO sites will be completed. AFO emission source categories are typically developed where there is a significant difference in how AFO site conditions affect emission processes, however, determining when there is a significant difference in how conditions affect emissions processes can be complex and depends on the diversity of the conditions associated with each production type. AFO emission sources can be categorized by general production type (i.e. broiler, layer, dairy, swine) and general source type (i.e. barn, lagoon/basin, corral). However, within these categories, more specific determination of emission sources may be needed as differences in production type, manure management practices, and barn and manure storage type can significantly influence emission processes and thus emissions, meaning that additional emission source categories may potentially need to be developed. Table 1 presents the possible emission source categories for the NAEMS AFO sites. The first column determines the number of emission source categories based on general production type and the general source type with thick solid lines around each category, yielding seven emission source categories. The second column determines the number of emission source categories based on specific production type and specific source type that pertains to the additional differences in AFO site characteristics that may influence emission processes. These emission sources categories are indicated by dashed lines and yield thirteen emission source categories. While it is known that general production type and general source type (barn, lagoon/basin, corral) have a significant influence on emission processes and thus need separate EEMs, it is not known whether the differences in specific production type and specific source type (presented in the second column) have a significant influence on emission processes. The number of emission source categories will be initially investigated using the initial data analysis techniques described in section 3.2.1. However, the emission source categories might be revised during subsequent stages of EEM development as the influence of different site conditions are further investigated. Progress in determining emission source categories will be documented in informal reports (see section 7.1 for more details). There is currently no established criterion to determine whether an emission source warrants its own category. Any future criterion that is developed will likely consider data analysis, model characteristics and model performance, and will be decided in consultation with our project members in OAQPS, who will be responsible for approving the final report.

In terms of pollutants, there are six pollutant categories for barns including three gases NH_3, H_2S, VOCs and three sizes of PM, $PM_{2.5}$, PM_{10} and total suspended particulates (TSP). For open/area sources, there are also pollutant categories for NH_3, H_2S and VOCs, but not for PM, since PM emission measurements were not conducted at open/areas sources in the NAEMS as emissions from open/area sources are insignificant in comparison with barn emissions.

Table 1. Potential emission source categories for NAEMS AFO sites.

Emission Source Categories		NAEMS AFO Site ID
General Production Type/ General Source Type	**Specific Production Type[1]/ Specific Source Type**	
Broiler Barn source	Broiler Barn-MV	CA1B KY1B-1 KY1B-2
Layer Barn source	Layer High Rise Barn-MV	CA2B NC2B IN2H
	Layer Manure Belt Barn & Manure Shed-MV	IN2B
Dairy Barn source	Dairy Barn & Milking Center-MV	IN5B WI5B NY5B
	Dairy Barn-NV	CA5B WA5B
Dairy Corral Source	Dairy Corral	TX5A
Dairy Lagoon/Basin source	Dairy Lagoon	IN5A
	Dairy Basin	WI5A WA5A
Swine Barn source	Swine-Sow Gestation Barn & Farrowing room-MV	IA4B NC4B OK4B
	Swine-Finisher Barn-MV	IN3B NC3B
Swine Lagoon/Basin source	Swine-Sow Lagoon	IN4A NC4A OK4A
	Swine-Finisher Lagoon	NC3A OK3A
	Swine-Finisher Basin	IA3A

[1] Provided if applicable
MV = mechanically ventilated
NV = naturally ventilated

3.3 Data Storage

The data collected for NAEMS (discussed in sections 1.1 and 3.1) is stored using the Microsoft Access® software platform. The NAEMS database was originally developed by the Eastern Research Group under contract EP-W-12-006, Work Assignment 0-01. The database is designed to receive data submissions electronically to minimize the potential for errors introduced during data entry. The database can receive different types of data including MS excel files, text files and XML files. The NAEMS database is stored in its own designated folder on the L-drive (path:L:PRIV/NRML_AEMD/DROP/Ian Rumsey/NAEMS databases), which automatically backs up on a daily basis. The database folder will be private and will only be available to group members. The NAEMS database will contain database files for each emission source category. Database files will be stored with the version number and date in the file name. Any changes to the database files will result in creating a new version of the database with new version number (version numbering will be sequential) and appropriate date. The database folder will contain the current and all historical versions of the database.

4.0 Model Development

Broadly, there are two different types of methodologies or modeling approaches that can be used to estimate air emissions from AFOs. These are process modeling and statistical modeling. Process modeling can be defined as a "procedure by which the behavior of a system is derived from a set of functional components and their interactions with each other and the system environment through physical and mechanistic processes occurring over time." (Makela et al., 2000). As applied to this project, it means that air emissions would be estimated by using mathematical equations that describe the biological, chemical and physical processes involved in air emissions from AFOs. Statistical models are developed through statistical analysis of empirical data, which is then used to determine which factors (parameters) influence emissions and the relationship between the parameters and the emissions. From this, a statistical model is developed, which can be used to predict emissions at AFOs.

A general option available in regards to estimating emissions from AFOs is to use or modify and use a process or statistical model that has already been developed and is published in peer-reviewed journals. When selecting a model to use from literature, it is also important to consider the ease in which the models can be implemented to estimate emissions by the agricultural community, therefore the ease of implementation by the agricultural community will be evaluated for each model and will be taken into consideration when deciding if the models in these studies can be used or modified for use in EEM development in this current effort. Progress in evaluating the ease of model implementation by the agricultural community will be documented in informal reports (see section 7.1 for more details).

In selecting statistical models from literature for use, the priority is to use any statistical model that has been developed based on NAEMS data and that have been evaluated for its accuracy in predicting NAEMS emissions. An example of models in literature that fulfill this criterion are the statistical models developed by Grant et al. (2013b) and Grant et al. (2016). Grant et al. (2013b) and Grant et al. (2016) describe the development of statistical models using NAEMS data to predict NH_3 emissions from swine lagoons. In the Grant et al. (2013b) and Grant et al. (2016) studies,

there are models of varying complexity, which are each evaluated for accuracy (see section 6.3 for model evaluation results for the Grant et al. (2013b) and Grant et al. (2016) studies). As mentioned, the ease of implementation by the agricultural community will also be evaluated for each model and will be taken into consideration when deciding if the models in these studies can be used or modified for use for EEM development in this current effort.

In selecting process models from literature for use, the priority is to use a process model that has accurately predicted NAEMS emissions based on NAEMS input data. An example of a model available in literature that fulfills this criterion is the dairy gas emission model, which is a process-based sub-model of the Integrated Farm System Model (IFSM) developed by USDA. In Rotz et al. (2014), the dairy gas emission model was used to estimate NH_3 emissions from NAEMS dairy barns and dairy manure storage structures. The Rotz et al. (2014) study also includes an evaluation of the accuracy of the process model in predicting NAEMS NH_3 emissions (see section 6.3 for model evaluation results for the Rotz et al. (2014) study). Similarly, the ease in which this model can be implemented by the agricultural community will be evaluated and will be taken into consideration when deciding if this model will be used or modified for use for EEM development in this current effort.

If for an emission source and pollutant category, there is no suitable model available in literature to use or use after modification, then the second option available is to develop new statistical models.

4.1 Development of New Statistical Models

4.1.1 Conceptual Model

Multivariable statistical models will be developed to estimate air emissions at AFOs. Multivariable statistical models can be defined as models that have two or more independent or predictor variables and one dependent or response variable. For this study, the dependent or response variable is emissions (for each ES&P category) and the independent or predictor variables are parameters that represent the varying conditions at an AFO. If the modeled emissions for an ES&P category are related to one predictor variable, then accordingly, a univariable statistical model will be developed.

Due to the wide variance in conditions at AFOs, developing EEMs is a complex process, therefore the first stage of EEM model development will use a focused approach to develop models based on factors (parameters) that satisfy the following conditions:

1. Known to have a major influence on air emissions from AFOs
2. Well monitored by the NAEMS
3. Can easily be monitored by the agricultural community

Some of the factors that satisfy the aforementioned conditions influence both gas and particulate emissions, while some only influence gas or particulate emissions. The reason for this differentiation is that many of the processes that generate gas and particulate emissions from AFOs are different. While gas emissions are related to the formation, generation, release and emission of chemical specie in gas form from manure, particulate emissions are caused by physical suspension (or release) of a range of different materials in barns including feed, manure, bedding, animal skin, and feathers (Cambra-Lopez et al., 2010) that are then emitted from the barn into the atmosphere.

Factors that satisfy the aforementioned conditions and influence both gas and particulate emissions include the amount of manure produced at an AFO. The amount of manure produced at an AFO is a function of the number and weight of animals at an AFO site, which therefore serves as a proxy for this factor. While the number of animals at an AFO is typically determined daily as part of the farming operation, weight is commonly estimated based on initial and final weights, which are typically recorded by the producers. The significance of the influence of animal number and weight on AFO air emissions is supported by the units used for reporting AFO emissions, which are typically reported either normalized for the number of animals or for live animal weight, which is the product of animal number and weight. The influence of both production terms will be investigated in the first stage of EEM model development for all ES&P categories. Manure surface area (MSA) is another factor that has a major influence on both gas and particulate emissions. Typically, a larger MSA results in increased emissions. The significance of this factor on manure storage is supported by lagoon emissions being typically reported in units normalized for surface area. Increased MSA in animal housing can increase emissions per animal (USDA, 2016), therefore this factor will also be investigated for barn EEM model development and thus all ES&P categories.

Gas emissions are additionally influenced by temperature as temperature affects chemical specie concentration in manure due to its influence on the decomposition of manure, the Henry's law constant and the dissociation constant. Gas emissions are also influenced by temperature due to its effect on the transfer of chemical compounds from manure into the free-air stream. The transfer occurs through two processes, diffusion, which transports chemicals through the manure to its surface and convective mass transfer, which transfers the gas from the manure surface into a free air stream (Ni, 1999). The process of diffusion is dependent on temperature (Ni, 1999) whereas the convective mass transfer is dependent on temperature and the air velocity above the manure surface (Ni, 1999 and references within; Montes et al., 2009 and references within). Increasing air velocity above the manure surface also reduces the boundary layer thickness above the manure surface, therefore lowering the resistance to volatilization (Arogo et al., 1999). The transfer rates through the manure and gas phases vary for different chemical specie and are governed by chemical specie solubility. The influence of temperature and air velocity will be investigated for all emission source and gas pollutant categories. For open/area sources AFO sites, these factors will be investigated using measurements of ambient temperature and wind speed. For barn sources, these factors will be investigated using ambient temperature and barn temperature and ventilation rate which are inter-related to ambient temperature. Ventilation rate also controls the air velocity across the manure surface in barns.

PM emissions are controlled by factors that influence the suspension of materials in the air. This process is influenced by the moisture content of the material. High moisture levels cause manure particles to aggregate together, meaning they have greater resistance to being suspended in the air. Manure moisture is influenced by temperature, relative humidity and ventilation rate as well as manure management practices. The influence of moisture content will be investigated for all barn source and PM categories using measurements of ambient temperature, barn temperature ventilation rate and ambient relative humidity.

As mentioned, statistical models will be developed to estimate air emissions at AFOs. For this method, the main goals will be to identify which parameters (that satisfy the conditions provided earlier in this section) have a significant influence (e.g. p-value) on pollutant emissions and also the relationship between the significant parameters and emissions. As mentioned, a focused approach is being used in the first stage of this study, meaning that the relationships

between parameters and emissions will also be investigated by considering observed physical relationships between the parameters and emissions. Often the observed relationships between parameters and emission processes are non-linear, resulting in non-linear relationships between the parameters and emissions. An example of using the observed physical relationship between the parameter and emission processes to develop a model that predicts emissions is provided by Grant et al. (2016), in which statistical models were developed to predict NH_3 emissions at five NAEMS swine lagoon sites. In the Grant et al. (2016) study, models were developed that included the influence of air temperature on NH_3 emissions. In the models, Grant et al. (2016) related air temperature to NH_3 emissions using the Van't Hoff equation, which includes an exponential function to describe the influence of temperature. The Van't Hoff equation relates the changes of equilibrium constants such as the Henry's Law constant and the dissociation constant, which influence emissions due to the change in temperature.

The performance of these first stage statistical models will be evaluated and will serve as a guide to the level of sophistication needed in later stages of model development.

4.1.2 Model Parameters

Section 4.1.1 describes the parameters that will be investigated in the first stage of EEM development. A summary of these parameters and the associated main emission source category is provided in Table 2.

Table 2. Parameters to be investigated in the first stage of EEM development for each emission source category.

Main Emission Source Category	Parameters
Gas Open/area	n & weight of animals, MSA, ambient temp, wind speed
Gas Barn	n & weight of animals, MSA, ambient temp, barn temp, ventilation rate
PM Barn	n & weight of animals, MSA, ambient temp, barn temp, ventilation rate, ambient relative humidity

n = number
temp = temperature
MSA = manure surface area

After the first stage of EEM development, there may be additional statistical analysis conducted to determine if other parameters measured during the NAEMS have a significant influence on emissions. Model development and final model description will be documented in the informal reports (see section 7.1 for more details). A list of parameters measured during the NAEMS is provided in Table 3.

Table 3. Parameters measured during NAEMS for barns and lagoons (modified from 2012 draft EEM reports (U.S. EPA, 2012a; U.S. EPA 2012b)).

	Parameter	Units
Barn Conditions	Temperature	°C
	Relative humidity	%
	Activity (personnel and livestock)	Volts DC
	Light operation	On/off
	Feeder operation	On/off
	Livestock heater operation	On/off
	Barn dimensions	m
	Ventilation rate	m^3/min
Meteorological Conditions	Ambient temperature	°C
	Ambient relative humidity	%
	Barometric/Atmospheric pressure	kPa/ATM
	Surface wetness	millivolts
	Solar radiation	Watts/m^2
	Wind speed	ft./sec
	Wind direction	Degrees
Manure Characteristics	Manure volume	Gal
	Manure loadout (Solids, N, NH_3, TKN, Ash)	Wt.%
	Layer/Surface manure (Solids, N, NH_3, TKN, Ash)	Wt.%
	Bedding / Litter (pH, Ash, NH_3, Solids, N)	Wt.%
Livestock Characteristics	Age	Days
	Livestock inventory/Mortality	n of animals
	Animal weight	Truck balance
	Average livestock mass	kg
Mass Balance Information	Feed consumption rate	lb
	Feed (Sulfur, Ash, Solids, TKN, N) content	mg/g
	Milk (TKN, N) & Eggs (Solids, N, TKN, Ash)	mg/g
	Water consumption	gal
	Incoming/new bedding addition rate	lb
	Incoming/new bedding nitrogen content	mg/g
	Litter nitrogen volume	ft^3
	Litter nitrogen content	mg/g
	Water (TKN, P, Sulfur, N, NO_3^- & NO_2^-)	mg/l
Lagoon Liquid Conditions	Lagoon Temperature	°C
	Lagoon pH	pH
	Sludge & liquid depth	m
	Lagoon appearance	coloration
	Pit liquid TAN	mg/l
	Lagoon reduction/oxidation (redox) potential	millivolts
	Lagoon dimensions	m

4.1.3 Computer Hardware/Software

The statistical models will be developed using Statistical Analysis Software (SAS v9.4, Cary, NC).

5.0 New Statistical Model Application

5.1 Use & Limitations

The developed statistical models will be used to estimate air emissions from AFOs. Statistical models are restricted by the uncertainty of the parameters used to develop them. Another limitation of statistical models is related to the data used to develop them. While the aim of the NAEMS was to measure air emissions from AFO in a wide range of conditions, it is not possible to make measurements that represent all conditions at AFOs in the U.S. For example, air emissions measurements during the NAEMS were not made during all possible air temperatures. As a result, extrapolating the model beyond the range of development (i.e. for temperature extremes) would increase the uncertainty associated with estimated air emissions.

5.2 Description

An example of a multivariable statistical model that may be developed is the multiple linear regression model, which is described as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k + \varepsilon \qquad (1)$$

In equation 1, Y is the dependent variable, $X_1, X_2, \ldots, X_k$ are the independent or predictor variables, β_0 is the intercept and $\beta_1, \beta_2, \ldots, \beta_k$ are regression coefficients and ε is the error term. If a univariable statistical model is developed, the model is described as follows:

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon \qquad (2)$$

Non-linear regression models may also be developed. A non-linear regression model takes the same form as equation 1 or 2 with the exception that at least one of the regression coefficients is non-linear.

6.0 Model Verification and Evaluation

6.1 Approach

The statistical models will be verified by using re-sampling methods. Before re-sampling methods can be applied, the ES&P datasets have to be finalized and statistically characterized. It

is expected that the statistical characteristics of each ES&P category will vary and this may influence the choice of re-sampling methods. Possible re-sampling methods to verify EEMs include cross-validation, which involves dividing the ES&P data into two parts, a training set, which is used to develop the EEM and a validation set, which is used to predict the responses (James et al., 2017). There are different types of cross-validation approaches including the standard validation set approach, the leave-one-out cross-validation approach, and the k-fold cross-validation approach (James et al., 2017). Another potential re-sampling method is the bootstrap approach. The bootstrap approach allows the use of computer software to simulate the process of obtaining new data by repeatedly sampling observations from the initial data set, so the error of a predictive model can be estimated without generating additional samples (James et al., 2017). If chosen, bootstrapping would be performed using SAS. Before performing model verification, the various re-sampling methods will be evaluated for different ES&P data sets, which will aid in the process of deciding which re-sampling methods will be used. Informal reports will document the model verification approach (see section 7.1 for more details).

6.2 Model Evaluation

Agreement between observed and model predicted emissions will be evaluated using a variety of different methodologies that have been used in the evaluation of atmospheric models (Walker et al., 2014; Tong and Mauzerall, 2006), including fractional bias (FB), geometric mean bias (MG), mean bias (MB), normalized mean bias (NMB), mean error (ME), normalized mean error (NME), normalized mean square error (NMSE), geometric variance (VG) and fraction of model predicted values within a factor of two of observed values (FAC2). Root mean square error (RMSE) is a further methodology that can be used to assess a model (Bruce and Bruce, 2017) in addition to normalized root mean square error (NRMSE).

$$\text{FB} = \frac{2(\overline{E_{obs}} - \overline{E_{mod}})}{(\overline{E_{obs}} + \overline{E_{mod}})} \tag{3}$$

$$\text{MG} = \exp(\overline{lnE_{obs}} - \overline{lnE_{mod}}) \tag{4}$$

$$\text{MB} = \frac{1}{n}\sum_{i=1}^{n}(E_{mod}(i) - E_{obs}(i)) \tag{5}$$

$$\text{NMB} = \frac{1}{n}\frac{\sum_{i=1}^{n}(E_{mod}(i) - E_{obs}(i))}{\sum_{i=1}^{n}E_{obs}(i)}\, x100\% \tag{6}$$

$$\text{ME} = \frac{1}{n}\sum_{i=1}^{n}|E_{mod}(i) - E_{obs}(i)| \tag{7}$$

$$\text{NME} = \frac{1}{n}\frac{\sum_{i=1}^{n}|E_{mod}(i) - E_{obs}(i)|}{\sum_{i=1}^{n}E_{obs}(i)}\, x100\% \tag{8}$$

$$\text{NMSE} = \frac{\overline{(E_{obs} - E_{mod})^2}}{\overline{E_{obs}E_{mod}}} \tag{9}$$

$$\text{VG} = \exp\left[\overline{(lnE_{obs} - lnE_{mod})^2}\right] \tag{10}$$

$$\text{RMSE} = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(E_{mod}(i) - E_{obs}(i))^2} \quad (11)$$

$$\text{NRMSE} = \frac{\sqrt{\frac{1}{n}\sum_{i=1}^{n}(E_{mod}(i) - E_{obs}(i))^2}}{\frac{1}{n}\sum_{i=1}^{n}E_{obs}} x\ 100\% \quad (12)$$

Where $\bar{E}$ (overbar) is the average over the data set, n is the number of data points, E_{mod} and E_{obs} are the corresponding model predicted emissions and observed emissions and *i* the *i*th model-observation data points. Walker et al. (2014) and Tong and Mauzerall (2006) evaluated observed and predicted air concentrations, but the methodologies can be similarly used for emission values. These different methodologies quantify bias and/or scatter of model predicted emissions. Informal reports will document the model evaluation results (see section 7.1 for more details).

6.3 Assessment Process

There is currently no established criterion to determine whether the models are of sufficient quality for their intended use. Any future criterion for model quality that is developed will likely be decided in consultation with our project members in OAQPS, who will be responsible for approving the final report. However, model evaluation results can be examined for EEMs already developed and published in peer-reviewed journals (Grant et al., 2016; Rotz et al., 2014), although it is currently unknown how the performance of the EEMs developed in this project for the various ES&P categories will compare to those in the Grant et al. (2016) and Rotz et al. (2014) studies. Grant et al. (2016) developed statistical models to predict NH_3 emissions at five NAEMS swine lagoon sites. The most successful of the models developed by Grant et al. (2016) predicted emissions with a NRMSE ranging from 21-51% across sites with an overall site average NRMSE of 37%. Rotz et al. (2014) is another published study that describes the development and evaluation of an EEM. In the Rotz et al. (2014) study, a process-based emission model was developed for dairy NH_3 emissions and was used to predict emissions for barns and lagoons at various dairy sites including the NAEMS dairy sites. In comparison to measured NAEMS emissions, model predicted emissions had a NRMSE ranging from 29 to 75% for each site with an average NRMSE value across all sites of 49%. Model NME values reported by Rotz et al. (2014) were lower than NRMSE values with an NME ranging from 23 to 64% for each site with an average NME value of 41% across all sites. The error of the process based model developed by Rotz et al. (2014) for predicting dairy lagoon emissions at two NAEMS sites was higher with NRMSE values ranging from 85 to 105% and NME ranging from 44 to 69%.

7.0 Reporting

7.1 Project Documentation

Informal reports, which will be created at a minimum on a quarterly basis, will be used to report progress in data analysis, determining emission source categories, evaluating the ease of model implementation by the agricultural community, and model development (including any

significant changes in the model). In addition, these informal reports will document final model description (including model equation(s) and specifications), model verification approach (i.e. re-sampling) and model evaluation results. The reports will be stored on the L-drive in their own designated folders, (path:L:PRIV/NRML_AEMD/DROP/Ian Rumsey/NAEMS-EEM informal reports) with the date of the report in the title. These folders will be private and will be only available to group project members.

7.2 Deliverables

The deliverables for this project are the following for each ES&P category:

- Model verification data sets, and training sets for ES&P categories where a new statistical model is developed.
- Informal reports, which will report progress in data analysis, determining emission source categories, evaluating the ease of model implementation by the agricultural community and model development (including any significant changes in the model) as well as documenting final model description (including model equation(s) and specifications), model verification approach (i.e. re-sampling) and model evaluation results.

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Message

From: Porter, Amy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8A3C7DFBB2E445A7A6D37AABBE73D06B-APORTE02]
Sent: 3/22/2019 5:34:18 PM
To: Kabler, Lauren [Kabler.Lauren@epa.gov]
Subject: RE: Cert Memo: OIG Animal Feeding...17-P-0396

Ok but your email has multiple fonts so it looks like you cut and pasted.

Thanks!

From: Kabler, Lauren
Sent: Friday, March 22, 2019 1:24 PM
To: Porter, Amy <Porter.Amy@epa.gov>
Subject: FW: Cert Memo: OIG Animal Feeding...17-P-0396

OK to send below to RK? Will cc: you and Tim Sullivan.

****

Ex. 5 AC/DP

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

Message

From: Porter, Amy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8A3C7DFBB2E445A7A6D37AABBE73D06B-APORTE02]
Sent: 5/2/2019 12:49:07 AM
To: Sullivan, Greg [Sullivan.Greg@epa.gov]; Saenz, Diana [Saenz.Diana@epa.gov]
Subject: FW: OIG Enforcement Assignment: Interview Questions
Attachments: OIG Interview Questions for OECA-OCE 12-18-18_with_links.docx; Ex. 7(E) .pdf

Ex. 5 Deliberative Process (DP)

Thanks
Amy

From: Porter, Amy
Sent: Tuesday, December 18, 2018 12:20 PM
To: Tesch, Danielle <Tesch.Danielle@epa.gov>; Hess, Kathryn <Hess.Kathryn@epa.gov>; Triebwasser, Charles <triebwasser.charles@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Enforcement Assignment: Interview Questions

Danielle, Kathy, and Chip –

Please see attached documents – your questions with the links we referenced on today's call, Ex. 7(E)

Ex. 7(E)

Please let us know if you have any additional questions or if we can be helpful in any way.

Thank you,

Amy

Amy Porter, Director
Crosscutting Policy Staff
Office of Civil Enforcement
US Environmental Protection Agency
202-564-2431

From: Tesch, Danielle
Sent: Thursday, December 13, 2018 6:16 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>; Porter, Amy <Porter.Amy@epa.gov>
Cc: Hess, Kathryn <Hess.Kathryn@epa.gov>; Triebwasser, Charles <triebwasser.charles@epa.gov>
Subject: OIG Enforcement Assignment: Interview Questions

Hi, Lauren and Amy,

Please find attached a set of questions for next week's interview (apologies for sending them a little later than anticipated). The questions are aimed at providing us with a better understanding of the civil enforcement process, trends in civil enforcement actions and results over time, and a couple observations we have made while preliminarily analyzing ECHO/ICIS enforcement data. If any of the questions stray outside your (or OCE's) lane, just let us know during the interview.

Thank you!
Danielle

Message

From: Shiffman, Cari [Shiffman.Cari@epa.gov]
Sent: 3/26/2019 3:26:28 PM
To: Branning, Hannah [Branning.Hannah@epa.gov]
Subject: FW: Signed Memo re: OIG General Draft Report AFO
Attachments: Signed Memo re Response to OIG Emission from AFO.pdf

Please enter and close out in CMS.

Cari Shiffman, Chief of Staff
U.S. Environmental Protection Agency
Office of Enforcement and Compliance Assurance
Office: (202) 564-2898 | Mobile: Ex. 6 Personal Privacy (PP)

From: Washington, Debra
Sent: Friday, June 09, 2017 2:42 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Miles, Erin <Miles.Erin@epa.gov>; Shiffman, Cari <Shiffman.Cari@epa.gov>; Chapman, Apple <Chapman.Apple@epa.gov>; Cathey, Tawanna <Cathey.Tawanna@epa.gov>
Subject: Signed Memo re: OIG General Draft Report AFO

Heads Up
Please note Larry Starfield has signed the memo on June 9, 2017
re: Response to the OIG Draft Report on AFO
Attached is a copy for your records.

OFFICE OF CIVIL ENFORCEMENT
ROUTING AND TRANSMITTAL SLIP

Ex. 5 Deliberative Process (DP)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN - 9 2017

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

MEMORANDUM

SUBJECT: Response to the Office of Inspector General Draft Report: "Emissions from Animal Feeding Operations Remain Largely Uncharacterized More Than 7 Years After Study Completed," Project No. OPE-FY16-0018 (May 12, 2017)

FROM: Lawrence E. Starfield
Acting Assistant Administrator
Office of Enforcement and Compliance Assurance

TO: Carolyn Copper
Assistant Inspector General
Office of Program Evaluation
Office of Inspector General

Thank you for the opportunity to respond to the Office of Inspector General (OIG) Draft Report, "Emissions from Animal Feeding Operations Remain Largely Uncharacterized More Than 7 Years After Study Completed" (Draft Report). The Office of Enforcement and Compliance Assurance (OECA) appreciates OIG's careful examination of this issue, and we are committed to following the terms of the Animal Feeding Operations (AFO) Air Compliance Agreement (Agreement) and OIG's recommendation for OECA – Recommendation Number 4. We concur with Recommendation Number 4, and we provide a high-level intended corrective action with an estimated completion date below.

While we generally agree with your characterizations of the Agreement and its associated National Air Emissions Monitoring Study (NAEMS), there are a few places where the Draft Report is slightly unclear or where the information differs from our understanding of specific facts. Enclosed for your consideration, we include a list of these instances and suggested revisions intended to help clarify and improve the Draft Report's accuracy.

OECA has discussed the Draft Report with the Office of Air and Radiation (OAR) and we understand that OAR will be providing a separate response addressing the Draft Report's findings and recommendations for OAR – Recommendation Numbers 1, 2, 3, and 5.

OECA Response to Recommendation Number 4 – Concur

No.	Recommendation	High-Level Intended Corrective Action	Planned Completion Date
4	For any emission source and pollutant combinations for which the Office of Air and Radiation determines it cannot develop emission estimating methodologies, notify Air Compliance Agreement participants of this determination and that the release and covenant not to sue for those emission sources and pollutant types will expire in accordance with paragraph 38 of the 2005 Air Compliance Agreement.	If the EPA determines it cannot develop emission estimating methodologies for any emission source and pollutant combinations, OECA will notify Agreement participants in writing that the EPA has made such a determination and that the release and covenant not to sue will expire in accordance with paragraph 38 of the Agreement.	If necessary, OECA will complete the intended corrective action within 60 days of OAR finalizing its determination.

We concur with OIG's recommendation that OECA notify Agreement participants if OAR determines that it cannot develop emission estimating methodologies for any emission source and pollutant combinations. OECA notes that this recommendation will only require a corrective action if OAR determines it cannot develop emission estimating methodologies for any source and pollutant combinations. Paragraph 38 of the Agreement requires the EPA to notify Agreement participants in writing if the Agency makes such a determination. OECA intends to continue abiding by the Agreement's terms, and we will notify Agreement participants if the Agency determines it cannot develop emission estimating methodologies for any emission source and pollutant combinations.

If you have any questions regarding this response, please contact OECA Audit Liaison, Gwendolyn Spriggs, at 202.564.2439.

Attachment

cc: Susan Shinkman, OECA/OCE
Rosemarie Kelley, OECA/OCE
Lauren Kabler, OECA/OCE
Apple Chapman, OECA/OCE
Tim Sullivan, OECA/OCE
Gwendolyn Spriggs, OECA/OAP
Sarah Dunham, OAR
Robin Dunkins, OAR/OAQPS
Mike Jones, OAR/OAQPS

ATTACHMENT

Response to the Office of Inspector General Draft Report: "Emissions from Animal Feeding Operations Remain Largely Uncharacterized More Than 7 Years After Study Completed," Project No. OPE-FY16-0018 (May 12, 2017)

Technical Comments on the Draft Report

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

Message

From: Spriggs, Gwendolyn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=4B039668B37F4FFB9B3F1EFFC89442D0-GSPRIG02]
Sent: 3/29/2019 6:43:44 PM
To: Kabler, Lauren [Kabler.Lauren@epa.gov]
Subject: RE: CERT MEMO RE: OIG Animal Feeding...17-P-0396 - For Your Review

Thanks!

From: Kabler, Lauren
Sent: Friday, March 29, 2019 12:38 PM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: Fwd: CERT MEMO RE: OIG Animal Feeding...17-P-0396 - For Your Review

Good to go!

Begin forwarded message:

> **From:** "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>
> **Date:** March 29, 2019 at 12:20:25 PM EDT
> **To:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>, "Sullivan, Greg" <Sullivan.Greg@epa.gov>
> **Cc:** "Porter, Amy" <Porter.Amy@epa.gov>, "Sullivan, Tim" <Sullivan.Tim@epa.gov>, "Buterbaugh, Kristin" <Buterbaugh.Kristin@epa.gov>
> **Subject: RE: CERT MEMO RE: OIG Animal Feeding...17-P-0396 - For Your Review**
>
> I approve.
>
> Thanks for the reminder.
>
> Regards,
> Rosemarie A. Kelley, Director
> Office of Civil Enforcement
> Office of Enforcement and Compliance Assurance
> 202-564-4014

> **From:** Kabler, Lauren
> **Sent:** Friday, March 22, 2019 2:06 PM
> **To:** Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Sullivan, Greg <Sullivan.Greg@epa.gov>
> **Cc:** Porter, Amy <Porter.Amy@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
> **Subject:** CERT MEMO RE: OIG Animal Feeding...17-P-0396 - For Your Review
>
> Rosemarie and Greg,
>
> This corrective action is complete. The cert memo is attached. As soon as you approve, I will let Gwen know and she will put it in the signature chain for Mark B. signature after which this will be closed out in MATS.

Ex. 5 Deliberative Process (DP)

Lauren V. Kabler
Special Counsel
OCE/IO/XPS
202-564-4052 (desk)
Ex. 6 Personal Privacy (PP) (cell)

Message

From: Spriggs, Gwendolyn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=4B039668B37F4FFB9B3F1EFFC89442D0-GSPRIG02]
Sent: 3/29/2019 4:11:34 PM
To: Kabler, Lauren [Kabler.Lauren@epa.gov]
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Perfect! Thanks so much!

GJS

From: Kabler, Lauren
Sent: Friday, March 29, 2019 12:05 PM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: Re: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

I just reminded her. When I hear back I will forward.

On Mar 29, 2019, at 12:03 PM, Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov> wrote:

> Hey, No worries...
>
> I really need asap. Can you forward approval/comments today?
>
> Thanks, GJS
>
> ---
>
> **From:** Kabler, Lauren
> **Sent:** Friday, March 29, 2019 11:52 AM
> **To:** Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
> **Subject:** Re: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"
>
> It's with Rosemarie. I'll have to check - forgot about it.
>
> On Mar 29, 2019, at 11:45 AM, Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov> wrote:
>
>> Lauren,
>>
>> What's status of attached...? pls return asap. I must update MATS right away. GJS
>>
>> ---
>>
>> **From:** Spriggs, Gwendolyn
>> **Sent:** Wednesday, March 20, 2019 10:56 AM
>> **To:** Kabler, Lauren <Kabler.Lauren@epa.gov>
>> **Subject:** RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"
>>
>> Here ya go!

Pls review, edit and return, as soon as can.

I'd like to update MATS no later than 3/27/19...let me know if that's possible.

Thanks, GJS

From: Kabler, Lauren
Sent: Wednesday, March 20, 2019 8:30 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

I never received the cert. fyi.

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Spriggs, Gwendolyn
Sent: Tuesday, March 19, 2019 4:41 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren,

You know how my email and I DON'T get along!!!

If you could forward me the attachment to this email...I'd greatly appreciate it!

I can't locate it in my mail...I'm beginning to prepare the cert memo, which will come to you in the next day or so. I'll need to add the attachment to Tim's email.

Thanks, GJS

From: Kabler, Lauren
Sent: Thursday, September 27, 2018 2:35 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>; Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Thanks Tim!

LAUREN V. KABLER
SPECIAL COUNSEL
OCE/IO/XPS
202-564-4052 (DESK)
Ex. 6 Personal Privacy (PP) (CELL)

From: Sullivan, Tim
Sent: Thursday, September 27, 2018 10:21 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>; Sullivan, Greg <Sullivan.Greg@epa.gov>; Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Good morning, Gwen.

I have attached the email from the OAR POC, Allison Kosta, that she sent to me on August 2, 2018. OAR's certificiation memo to OIG is dated July 30, 2018. While there is no corrective action required of OECA at this time, if OAR determines at some point in the future that it cannot develop certain emission estimating methodologies, OECA would have to take action consistent with the Air Compliance Agreement and our corrective action for OIG Recommendation #4.

Please let me know if you have any questions or require any additional information from me.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Spriggs, Gwendolyn
Sent: Wednesday, September 26, 2018 3:27 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi TIM,

Thanks for the response and vm.

I believe the email below will be appropriate for me to close this corrective action in MATS, assuming you will not have to take any future action on this corrective action.

Also, it would be helpful if you could provide the OAR POC and date that this info was shared with you for our official record. Just forward this info to me via email. If you could share this info before midday Friday (9/28), I can close this info in the MATS database during this reporting period. If not, no worries…it will just close in the next reporting period.

Feel free to call with any questions.

Thanks. GJS 202-564-2439

From: Sullivan, Tim
Sent: Tuesday, September 25, 2018 11:14 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi, Gwen.

Please see my response to Lauren below.

Ex. 5 Deliberative Process (DP)

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Sullivan, Tim
Sent: Thursday, September 20, 2018 11:43 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"
Importance: High

Hi, Lauren.

Thanks for the note. I have checking in with you on this topic on my to-do list, but things were crazy as I was prepping for being out of the office last Friday through yesterday.

OAR completed its deliverables due at the end of June 2018. For now, OAR is proceeding with developing emission estimating methodologies for all pollutant and source categories. Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP Do we need to submit a statement to OIG memorializing this?

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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http://www.epa.gov/compliance/complaints/index.html

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From: Timothy Sullivan Ex. 6 Personal Privacy (PP)
Sent: Thursday, September 20, 2018 8:02 AM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed

Sent from my iPhone

Begin forwarded message:

> **From:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>
> **Date:** September 19, 2018 at 12:52:16 PM MDT
> **To:** Timothy Sullivan <Ex. 6 Personal Privacy (PP)>
> **Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"**
>
> Hi Tim!! Hope all is well in R8!!
>
> Any idea where OAR is on this?
>
> Sent from my iPhone
>
> Begin forwarded message:
>
>> **From:** "Spriggs, Gwendolyn" <Spriggs.Gwendolyn@epa.gov>
>> **Date:** September 18, 2018 at 4:49:47 PM EDT
>> **To:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>
>> **Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"**
>>
>> Hi Lauren,
>>
>> I just left a vm for you on this report. I'm currently updating MATS. I'm just curious if we have any ideal when OAR will complete their piece (I can only imagine they have a due date in MATS). Having this info (due date) will allow us to better monitor when OCE should implement their CA. Right now, not sure how to determine due date.
>>
>> If you staff doesn't have info...I guess I can contact OAR, but wanted to check internally before I contacted them.
>>
>> Thanks, GJS 564-2439
>>
>> ---
>>
>> **From:** Spriggs, Gwendolyn
>> **Sent:** Wednesday, September 20, 2017 7:39 AM

To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Cool.

I'll add to MATS report with a TBD…

Thanks much…GJS

From: Kabler, Lauren
Sent: Wednesday, September 20, 2017 7:15 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren V. Kabler
Special Counsel
OCE/IO/XPS

From: Sullivan, Tim
Sent: Tuesday, September 19, 2017 4:40 PM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Cc: Chapman, Apple <Chapman.Apple@epa.gov>; Fried, Gregory <Fried.Gregory@epa.gov>; Miller, Anthony <Miller.Anthony@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi, Lauren.

Thank you for forwarding the report.

A response is unnecessary. I will reconfirm with OAR that they will keep us apprised of their plans and actions so that we can start planning to implement our corrective action if and when necessary.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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http://www.epa.gov/compliance/complaints/index.html

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From: Kabler, Lauren
Sent: Tuesday, September 19, 2017 2:01 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Miller, Anthony <Miller.Anthony@epa.gov>
Subject: Fw: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi Tim! Please let me know if you think a response is necessary. Note that because the OIG accepted our corrective action a response is not required. Also, can you answer Gwen's question - I am sure OAR will notify you but can you just confirm? Thanks!

Lauren V. Kabler

Special Counsel

Crosscutting Policy Staff

From: Spriggs, Gwendolyn
Sent: Tuesday, September 19, 2017 2:08 PM
To: Kabler, Lauren
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren,

Pls find attached a copy of the final report. It's provided for your review and distribution.

Pls note a response is NOT required. The OIG accepted OCE's proposed corrective action. If OCE would like to submit a response, pls let me know and we'll plan accordingly. Otherwise, we can close this report and add to MATS.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP) Will OCE will receive info from OAR regarding status of their CA completion which will allow OCE to begin it's CA tracking? Pls advise.

Thanks, GJS 564-2439

From: OIG News
Sent: Tuesday, September 19, 2017 1:31 PM
To: Dunham, Sarah <Dunham.Sarah@epa.gov>; Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Pruitt, Scott <Pruitt.Scott@epa.gov>; Jackson, Ryan <jackson.ryan@epa.gov>; Darwin, Henry <darwin.henry@epa.gov>; Chmielewski, Kevin <chmielewski.kevin@epa.gov>; Bloom, David

<Bloom.David@epa.gov>; Trent, Bobbie <Trent.Bobbie@epa.gov>; Anthony, Sherri <Anthony.Sherri@epa.gov>; Howard, MarkT <Howard.Markt@epa.gov>; Minoli, Kevin <Minoli.Kevin@epa.gov>; Lyons, Troy <lyons.troy@epa.gov>; Valentine, Julia <Valentine.Julia@epa.gov>; Threet, Derek <Threet.Derek@epa.gov>; Shaw, Betsy <Shaw.Betsy@epa.gov>; Cozad, David <Cozad.David@epa.gov>; Traylor, Patrick <traylor.patrick@epa.gov>; Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>; Vincent, Marc <Vincent.Marc@epa.gov>
Subject: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Attached is the EPA Office of Inspector General (OIG) report, *Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes* (Report No. 17-P-0396). This report will be available to the public on the OIG's website at www.epa.gov/oig.

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www.epa.gov

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a more efficient and cost effective manner.

<Cert memo animal feeding CAA.docx>

Message

From: Spriggs, Gwendolyn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=4B039668B37F4FFB9B3F1EFFC89442D0-GSPRIG02]
Sent: 3/20/2019 11:36:36 AM
To: Kabler, Lauren [Kabler.Lauren@epa.gov]
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Yes!

Thank you. I was able to find it after sending the email yesterday. So sorry for the inconvenience.

You should have received the cert memo yesterday. Pls review and respond…as soon as you can.

Have a great day!

Thanks, GJS

From: Kabler, Lauren
Sent: Tuesday, March 19, 2019 8:22 PM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Is this it?

Begin forwarded message:

> **From:** "Sullivan, Tim" <Sullivan.Tim@epa.gov>
> **Date:** September 27, 2018 at 10:20:55 AM EDT
> **To:** "Spriggs, Gwendolyn" <Spriggs.Gwendolyn@epa.gov>
> **Cc:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>, "Sullivan, Greg" <Sullivan.Greg@epa.gov>, "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>, "Sullivan, Tim" <Sullivan.Tim@epa.gov>
> **Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"**
>
> Good morning, Gwen.
>
> I have attached the email from the OAR POC, Allison Kosta, that she sent to me on August 2, 2018. OAR's certificiation memo to OIG is dated July 30, 2018. While there is no corrective action required of OECA at this time, if OAR determines at some point in the future that it cannot develop certain emission estimating methodologies, OECA would have to take action consistent with the Air Compliance Agreement and our corrective action for OIG Recommendation #4.
>
> Please let me know if you have any questions or require any additional information from me.
>
> Thanks –
>
> Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Spriggs, Gwendolyn
Sent: Wednesday, September 26, 2018 3:27 PM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi TIM,

Thanks for the response and vm.

I believe the email below will be appropriate for me to close this corrective action in MATS, assuming you will not have to take any future action on this corrective action.

Also, it would be helpful if you could provide the OAR POC and date that this info was shared with you for our official record. Just forward this info to me via email. If you could share this info before midday Friday (9/28), I can close this info in the MATS database during this reporting period. If not, no worries…it will just close in the next reporting period.

Feel free to call with any questions.

Thanks. GJS 202-564-2439

From: Sullivan, Tim
Sent: Tuesday, September 25, 2018 11:14 AM
To: Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>
Cc: Kabler, Lauren <Kabler.Lauren@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi, Gwen.

Please see my response to Lauren below.

Ex. 5 Deliberative Process (DP)

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

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From: Sullivan, Tim
Sent: Thursday, September 20, 2018 11:43 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"
Importance: High

Hi, Lauren.

Thanks for the note. I have checking in with you on this topic on my to-do list, but things were crazy as I was prepping for being out of the office last Friday through yesterday.

OAR completed its deliverables due at the end of June 2018. For now, OAR is proceeding with developing emission estimating methodologies for all pollutant and source categories. Ex. 5 AC/DP
Ex. 5 AC/DP
Ex. 5 AC/DP Do we need to submit a statement to OIG memorializing this?

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
1595 Wynkoop Street (MC 8MSU)
Denver, Colorado 80202

Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Timothy Sullivan [Ex. 6 Personal Privacy (PP)]
Sent: Thursday, September 20, 2018 8:02 AM
To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Sent from my iPhone

Begin forwarded message:

> **From:** "Kabler, Lauren" <Kabler.Lauren@epa.gov>
> **Date:** September 19, 2018 at 12:52:16 PM MDT
> **To:** Timothy Sullivan <[Ex. 6 Personal Privacy (PP)]>
> **Subject: Fwd: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"**
>
> Hi Tim!! Hope all is well in R8!!
>
> Any idea where OAR is on this?
>
> Sent from my iPhone
>
> Begin forwarded message:

From: "Spriggs, Gwendolyn" <Spriggs.Gwendolyn@epa.gov>
Date: September 18, 2018 at 4:49:47 PM EDT
To: "Kabler, Lauren" <Kabler.Lauren@epa.gov>
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Hi Lauren,

I just left a vm for you on this report. I'm currently updating MATS. I'm just curious if we have any ideal when OAR will complete their piece (I can only imagine they have a due date in MATS). Having this info (due date) will allow us to better monitor when OCE should implement their CA. Right now, not sure how to determine due date.

If you staff doesn't have info...I guess I can contact OAR, but wanted to check internally before I contacted them.

Thanks, GJS 564-2439

From: Spriggs, Gwendolyn
Sent: Wednesday, September 20, 2017 7:39 AM
To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Subject: RE: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Cool.

I'll add to MATS report with a TBD...

Thanks much...GJS

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Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren V. Kabler
Special Counsel
OCE/IO/XPS

From: Sullivan, Tim
Sent: Tuesday, September 19, 2017 4:40 PM

To: Kabler, Lauren <Kabler.Lauren@epa.gov>
Cc: Chapman, Apple <Chapman.Apple@epa.gov>; Fried, Gregory <Fried.Gregory@epa.gov>; Miller, Anthony <Miller.Anthony@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
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Thanks –

Tim

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From: Kabler, Lauren
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To: Sullivan, Tim <Sullivan.Tim@epa.gov>
Cc: Miller, Anthony <Miller.Anthony@epa.gov>
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Hi Tim! Please let me know if you think a response is necessary. Note that because the OIG accepted our corrective action a response is not required. Also, can you answer Gwen's question - I am sure OAR will notify you but can you just confirm? Thanks!

Lauren V. Kabler

Special Counsel

Crosscutting Policy Staff

Office of Civil Enforcement

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Sent: Tuesday, September 19, 2017 2:08 PM
To: Kabler, Lauren
Subject: FW: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

Lauren,

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Pls note a response is NOT required. The OIG accepted OCE's proposed corrective action. If OCE would like to submit a response, pls let me know and we'll plan accordingly. Otherwise, we can close this report and add to MATS.

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP) Will OCE will receive info from OAR regarding status of their CA completion which will allow OCE to begin it's CA tracking? Pls advise.

Thanks, GJS 564-2439

From: OIG News
Sent: Tuesday, September 19, 2017 1:31 PM
To: Dunham, Sarah <Dunham.Sarah@epa.gov>; Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Pruitt, Scott <Pruitt.Scott@epa.gov>; Jackson, Ryan <jackson.ryan@epa.gov>; Darwin, Henry <darwin.henry@epa.gov>; Chmielewski, Kevin <chmielewski.kevin@epa.gov>; Bloom, David <Bloom.David@epa.gov>; Trent, Bobbie <Trent.Bobbie@epa.gov>; Anthony, Sherri <Anthony.Sherri@epa.gov>; Howard, MarkT <Howard.Markt@epa.gov>; Minoli, Kevin <Minoli.Kevin@epa.gov>; Lyons, Troy <lyons.troy@epa.gov>; Valentine, Julia <Valentine.Julia@epa.gov>; Threet, Derek <Threet.Derek@epa.gov>; Shaw, Betsy <Shaw.Betsy@epa.gov>; Cozad, David <Cozad.David@epa.gov>; Traylor, Patrick <traylor.patrick@epa.gov>; Spriggs, Gwendolyn <Spriggs.Gwendolyn@epa.gov>; Vincent, Marc <Vincent.Marc@epa.gov>
Subject: OIG Report: "Eleven Years After Agreement, EPA Has Not Developed Reliable Emission Estimation Methods to Determine Whether Animal Feeding Operations Comply With Clean Air Act and Other Statutes"

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Message

From: Starfield, Lawrence [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=8A89D6CD217D4254A5879ABECB3F314E-STARFIELD, LAWRENCE]
Sent: 9/17/2019 2:24:01 AM
To: Bailey-Morton, Ethel [Bailey-Morton.Ethel@epa.gov]
Subject: Fwd: Quick Ag/NAEMS Update
Attachments: NAEMS Overview_090319_final.docx; ATT00001.htm; AFO CAFO - Standard Agreement.pdf; ATT00002.htm; AFO CAFO - Compliance Req Notes.docx; ATT00003.htm

Please print and put it on my chair. Thanks.

Sent from my iPhone

Begin forwarded message:

From: "Sullivan, Tim" <Sullivan.Tim@epa.gov>
Date: September 16, 2019 at 7:46:54 PM EDT
To: "Starfield, Lawrence" <Starfield.Lawrence@epa.gov>
Cc: "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>, "Buterbaugh, Kristin" <Buterbaugh.Kristin@epa.gov>, "Sullivan, Tim" <Sullivan.Tim@epa.gov>
Subject: RE: Quick Ag/NAEMS Update

Larry:

Ex. 5 AC/DP

I only have the 4:30 pm eastern meeting on my calendar – I have not seen or heard anything about an 11 am eastern meeting.

Finally, I have attached the standard Air Compliance Agreement template and my notes on the Agreement's compliance requirements for reference. I am happy to discuss any of these issues ahead of Thursday's meeting.

Thanks –

Tim

Timothy J. Sullivan
Air Enforcement Division
Office of Civil Enforcement
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Phone: 303.312.6196 | Email: sullivan.tim@epa.gov

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From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Monday, September 16, 2019 12:12 PM
To: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: RE: Quick Ag/NAEMS Update

Thank you – this is very helpful.

Ex. 5 AC/DP

Larry

From: Kelley, Rosemarie <Kelley.Rosemarie@epa.gov>
Sent: Monday, September 16, 2019 12:31 PM
To: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>
Subject: FW: Quick Ag/NAEMS Update
Importance: High

Larry—

On September 5, Tim Sullivan participated in an informational briefing for Anne Idsal on the Animal Feeding Operations (AFO) National Air Emissions Monitoring Study (NAEMS) and the Air Compliance Agreement. **Ex. 5 Deliberative Process (DP)**

Ex. 5 Deliberative Process (DP)

I only see a 4:30 meeting on the calendar for Thursday. Tim and I plan to participate. I do not know about the 11 am meeting that is referenced in the email you sent.

Rosemarie

From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Thursday, September 5, 2019 1:03 PM
To: Bianco, Karen <Bianco.Karen@epa.gov>; Jordan, Scott <Jordan.Scott@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Quick Ag/NAEMS Update

Hi Karen and Scott,

Anne Idsal requested a briefing on NAEMS (our ongoing project to characterize emissions from livestock/poultry farms), which we held today. Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP Robin gave Matt Marks a brief call as a heads up and I said I would follow up with you as well.

Matt said we should invite the two of you, as well as Brian Doster and another staff person who works on related permitting topics. Do either of you know offhand who that is or could you ask him? (Robin didn't write the name down.)

Tim/Bill – Ex. 5 AC/DP
Ex. 5 AC/DP

Tim – can you give me a list of names to include on the invite for OECA?

From all – any input you have on how to frame the agenda questions would be much appreciated.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711

Phone: 919.541.1322 I email: Costa.Allison@epa.gov

Message

From: Bodine, Susan [bodine.susan@epa.gov]
Sent: 9/18/2019 5:59:39 PM
To: Starfield, Lawrence [Starfield.Lawrence@epa.gov]
CC: Traylor, Patrick [traylor.patrick@epa.gov]
Subject: RE: Quick Ag/NAEMS Update
Attachments: NAEMS Overview_090319_final.docx; AFO Air Compliance Agreement - Background Info_01.19.2018.docx; NAEMS Schedule_6.8.18_v3.docx

Ex. 5 Deliberative Process (DP)

Patrick, I think you attended the meeting on June 8, 2018 with OAR on this issue. Can you attend the meeting on Thursday? You are invited.

Susan

From: Starfield, Lawrence <Starfield.Lawrence@epa.gov>
Sent: Tuesday, September 17, 2019 4:16 PM
To: Bodine, Susan <bodine.susan@epa.gov>
Subject: Fwd: Quick Ag/NAEMS Update

Susan,

As further background for the NAEMS meeting(s), here's an email from Tim Sullivan with some additional thoughts.

Larry

Sent from my iPhone

Begin forwarded message:

> **From:** "Sullivan, Tim" <Sullivan.Tim@epa.gov>
> **Date:** September 16, 2019 at 7:46:54 PM EDT
> **To:** "Starfield, Lawrence" <Starfield.Lawrence@epa.gov>
> **Cc:** "Kelley, Rosemarie" <Kelley.Rosemarie@epa.gov>, "Buterbaugh, Kristin" <Buterbaugh.Kristin@epa.gov>, "Sullivan, Tim" <Sullivan.Tim@epa.gov>
> **Subject: RE: Quick Ag/NAEMS Update**
>
> Larry:

Ex. 5 AC/DP

Ex. 5 AC/DP

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Thanks –

Tim

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Thank you – this is very helpful.

Ex. 5 AC/DP

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Cc: Sullivan, Tim <Sullivan.Tim@epa.gov>; Buterbaugh, Kristin <Buterbaugh.Kristin@epa.gov>

Subject: FW: Quick Ag/NAEMS Update
Importance: High

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Ex. 5 Deliberative Process (DP)

I only see a 4:30 meeting on the calendar for Thursday. Tim and I plan to participate. I do not know about the 11 am meeting that is referenced in the email you sent.

Rosemarie

From: Costa, Allison <Costa.Allison@epa.gov>
Sent: Thursday, September 5, 2019 1:03 PM
To: Bianco, Karen <Bianco.Karen@epa.gov>; Jordan, Scott <Jordan.Scott@epa.gov>
Cc: Schrock, Bill <Schrock.Bill@epa.gov>; Sullivan, Tim <Sullivan.Tim@epa.gov>
Subject: Quick Ag/NAEMS Update

Hi Karen and Scott,

Anne Idsal requested a briefing on NAEMS (our ongoing project to characterize emissions from livestock/poultry farms), which we held today. Ex. 5 AC/DP

Ex. 5 AC/DP

Ex. 5 AC/DP Robin gave Matt Marks a brief call as a heads up and I said I would follow up with you as well.

Matt said we should invite the two of you, as well as Brian Doster and another staff person who works on related permitting topics. Do either of you know offhand who that is or could you ask him? (Robin didn't write the name down.)

Tim/Bill – Ex. 5 AC/DP

Ex. 5 AC/DP

Tim – can you give me a list of names to include on the invite for OECA?

From all – any input you have on how to frame the agenda questions would be much appreciated.

Cheers,
Allison

Allison Costa
U.S. EPA I Natural Resources Group I Sector Policies and Programs Division, OAQPS
109 T.W. Alexander Drive (Mail Drop E143-03) I Research Triangle Park, NC 27711
Phone: 919.541.1322 I email: Costa.Allison@epa.gov

Appointment

From: Idsal, Anne [idsal.anne@epa.gov]
Sent: 8/29/2019 5:07:47 PM
To: Idsal, Anne [idsal.anne@epa.gov]; Harlow, David [harlow.david@epa.gov]; Woods, Clint [woods.clint@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]; Lassiter, Penny [Lassiter.Penny@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Smith, Darcie [Smith.Darcie@epa.gov]; South, Peter [South.Peter@epa.gov]; Cozzie, David [Cozzie.David@epa.gov]; Crowley, Kate [crowley.kate@epa.gov]; McKinney, Voronina [mckinney.voronina@epa.gov]; Joseph, Wanda [joseph.wanda@epa.gov]; Hunt, Virginia [Hunt.Virginia@epa.gov]; Eck, Janet [Eck.Janet@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]

Subject: Call for Information: Information Related to the Development of Emissions Estimating Methodologies for Animal Feeding Operations
Attachments: Idsal Mtg Rqst: Call for Information: Information Related to the Development of Emission Estimating Methodologies for Animal Feeding Operations
Location: WJC - N 5400 + Video with RTP + Personal Privacy / Ex. 6

Start: 9/3/2019 7:00:00 PM
End: 9/3/2019 7:45:00 PM
Show Time As: Busy

Idsal Mtg Rqst: Call for Informati...

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Session 2 Follow-up Questions for Presenters

Process-based emission models

The audience questions and comments for Peter Adams centered on the comparison of process-based models to emission factors. Viney Aneja (North Carolina State University) commented that the process-based model is being calibrated with emission factors. So why would your answer differ from emission factor? How is your approach more useful? The response was that process-based models are better but not a magic bullet; old challenges persist. They are valuable as a way of interpolating between locations and to capture variability in emissions driven by factors such as temperature and windspeed. The model is unbiased because it is tuned to emission factors but there is still scatter around the mean emission, so the question is how well can simple model explains that variability (scatter). Process-based models explain more of the variability in emissions than emission factors.

Bret Schichtel (National Park Service) commented that in Colorado effort is being made to modify agricultural activities during upslope events that transport nitrogen into Rocky Mountain National Park. To evaluate the success of these alternative practices we need to know how management activities contribute to emissions, particularly emission pulses. Process based models allow us to capture this important short-term variability in emissions and to incorporate management strategies into models. Emission factors do not allow this.

Satellite resampling methodology

Audience questions for Kang Sun focused on the technical details of the resampling procedure presented. Yanxu Zhang (Nanjing University of China) noted that the retrieval methodology is highly technical and asked how the grid resolution for resampling is decided and has the sensitivity to the choice of resolution been tested? Kang Sun replied that the resolution is fundamentally decided by the size of satellite pixel. It is an inherent property of the instrument. Satellites can have different resolution but can be resampled on the same grid size (1km, 10km, etc). Everything should be sampled on same grid for consistency. The mass enhancement approach minimizes the differences in grid resolution of the resampling procedure because the data is averaged.

Daven Henze (UC Boulder) followed up with additional comments and questions regarding the impact of instrument sensitivity on the uncertainty of the resampling procedure. In one of the plots presented, IASI and CrIS column concentrations differ by factor of 2. This illustrates that what the instruments are seeing is fundamentally different. How does your method account for instrument sensitivity and its impact on the uncertainty of column concentration? Kang Sun responded that, within the simple framework presented, there is no way to consider vertical resolution of the averaging kernels. All averaging kernels will have some uncertainty, i.e. vertical distribution of sensitivity, which is not evenly distributed across the troposphere. The impact of lightning NOx on NO_2 is an example. The averaging kernel is more sensitive to the higher part of the troposphere. In the framework presented, this will be included as systematic uncertainty of the column concentration.

Moderated Panel Discussion

Panel members: Peter Adams (Speaker, Carnegie-Mellon University), Kang Sun (Speaker, University at Buffalo), April Leytem (USDA Agricultural Research Service), Marc Houyoux (EPA Office of Air Quality Planning and Standards), Ian Rumsey (EPA Office of Research and Development)

The panel was asked to give their opinion on the largest uncertainties in emission inventories for reactive nitrogen.

Spatial and temporal allocation of emissions

Marc Houyoux began the discussion by noting that we have emission estimates at county-level but we need better spatial allocation at sub-county scale. A critical data gap here is the location of animal facilities. Perhaps satellites can help in this regard. Mark Barna (National Park Service) reiterated that we struggle with spatial allocation. For example, cows are dispersed throughout a county and we need to know where they are to properly allocate the emissions. A nationally coordinated method of developing a database of CAFO facility locations is critically needed. April Leytem (USDA ARS) noted that Google Earth is helpful. However, this may not be a practical approach for regional or national scales. Ian Rumsey (EPA ORD) noted that North Carolina State University has developed a facility-scale database using Google Earth for North Carolina and that perhaps facility identification could be automated. B.H. Baek (University of North Carolina) suggested that this kind of GIS information (i.e., shape files of NC CAFO locations) could be combined with satellite observations to refine spatial allocation at sub-county grid.

Peter Adams (CMU) presented a slightly different perspective, acknowledging that satellites will help with spatial allocation but that for some applications or questions sub-county scale spatial resolution in emissions is not required. For example, transport and receptor scales are on the order of hundreds of kilometers. Moving a single animal production facility 10 km in a county will not strongly affect chemical transport model predictions of $PM_{2.5}$, for example. We need to make sure, though, that the animal populations at the county scale are accurate. Marc Houyoux (EPA) agreed that sub-county allocation is not an issue for some processes (regional transport) but is important for local issues/local planning.

Marc Houyoux (EPA) noted that satellites can also help with temporal allocations. We now have monthly temporal allocation in inventories. As illustrated in Kang Sun's presentation, temporal variations observed by satellites at the monthly timescale show different patterns than temporally allocated bottom-up emissions in some areas. Peter Adams (CMU) commented that this brings up the important question of how we combine bottom-up with top-down emission approaches. With current inventories and satellite products, are we at a point where satellite data and bottom-up emission inventories can be reconciled? The satellite is like having an emission factor measurement repeated over time but we need to better understand where the two correlate poorly or well and why.

Farm management practices and activity data

Marc Houyoux (EPA OAQPS) noted that in Peter Adam's presentation we heard importance of knowing manure management practices. Knowledge of farm management practices is important to do the best job of creating emission estimates for localities. Regarding the importance of accurate activity data, Marc gave an example that before 2017 the dairy populations used in the EPA National Emissions Inventory (NEI) were too low. In 2017, the NEI process better represented the populations and emissions increased and improved, especially in southern California. April Leytem (USDA ARS) followed up by agreeing that lack of activity data for facilities is a critical gap at the larger scale but at the facility scale knowing the differences in emissions and their processes between the housing and manure storage (i.e., management practices) is very important. Limei Ran (EPA ORD) commented that knowledge of manure application practices is an important uncertainty in the integrated air/soil/water

models that EPA uses to understand agricultural impacts. For example, in the Soil and Water Assessment Tool (SWAT) we need to know manure application amount and timing, which we often don't know, to assess impacts of fertilizer runoff at the watershed scale. Ensuring that processes are properly integrated across models is also important. When we configure the Environmental Policy Integrated Climate (EPIC) model we minimize manure application to avoid double counting of ammonia emissions from fertilizer in the bidirectional ammonia flux module within the Community Multi-scale Air Quality Model (CMAQ). We need to understand these uncertainties and limitations when using integrated models. Ian Rumsey reiterated that there are important uncertainties in emissions from manure applications, which, for example, can be as much as 1/3rd of total emissions from swine production facilities.

John Walker (EPA ORD) noted that the need for improved activity data is key data/knowledge gap the keeps coming up in the discussion. This seems to be an example where engagement with agricultural stakeholders could help. A question for April Leytem (USDA ARS) is, what is the first step in pushing that question forward and which groups should be working together? April responded that it will be different for each industry. For example, poultry and swine are run by large integrators and they know all the details of on-farm activity and management practices. Management will be consistent from farm-to-farm and information could therefore be relatively easy to obtain. The beef industry is another example where the management practices are not very diverse, at least for feedlot operations, potentially making it easier to collect information from farmers. For example, if you know what the cows are eating you have a good idea of the emissions. They lose approximately 50% of the nitrogen they ingest on a feedlot. Emissions from backgrounding cattle (e.g., rangeland and pasture) are more difficult to characterize because there can be much more uncertainty in the amount of food consumed and the forage quality. Accurate management information may therefore be more difficult to obtain. Furthermore, backgrounding cattle are a large percentage of total emissions from beef cattle. Dairy is more challenging because management may be specific to the individual dairy facility. Working at the state or regional level with individual dairy commodity groups, such as Idaho Dairyman's Association, would be one approach. Every state has a dairy commodity group that you could make contact with. For all of the sectors (i.e, dairy, beef, poultry, swine), developing relationships and building mutual trust with industry groups will be key to improving activity and management data.

The panel was asked to discuss the role of ground-based monitoring in reducing uncertainties in emission inventories

Regarding the comparisons of bottom-up and top-down measurements, Marc Houyoux (EPA OAQPS) suggested that focusing an intensive ammonia measurement campaign in a specific area to link ground measurements to process models would be very useful for comparison with satellites. Viney Aneja (NCSU) asked Ian Rumsey (EPA ORD) if he could comment on the National Air Emissions Monitoring Study (NAEMS). Specifically, how do emissions measured under the NAEMS study differ from other emision data? Ian responded that those comparisons have not yet been developed but did recap the basic details of the study, noting that emission and ancillary measurements of ammonia, hydrogen sulfide, volatile organic compounds and PM were conducted over a period of two years at poultry, swine and dairy operations. Ian noted that while NAEMS is the most comprehensive emissions study to date, it did not include emissions from manure applications. Peter Adams (CMU) remarked that NAEMS has

been a significant step forward, particularly the fact that emissions were measured throughout the year. Winter emissions are important for PM modeling, even though emissions themselves are lower during winter compared to summer. NAEMS has more information and documentation on ancillary parameters like manure pH that other studies do not have. It is a good foundation to build on for future emissions studies.

Follow-up Questions for Presenters

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Commented [WJ1]: 2:11:10

Daven Henze followed up with additional comments and questions regarding the impact of instrument sensitivity on the uncertainty of the resampling procedure. In one of the plots presented, IASI and CrIS column concentrations differ by factor of 2. This illustrates that what they are seeing is fundamentally different. How does your method account for instrument sensitivity and its impact on the uncertainty of column concentration? Kang Sun responded that, within this simple framework presented, there is no way to consider vertical resolution of the averaging kernels. All averaging kernels will have some uncertainty, this is the vertical distribution of sensitivity, which is not evenly distributed across the troposphere. The impact of lightning NOx on NO_2 is an example. It is more sensitive to the higher part of the troposphere. In the framework presented, this will be included as systematic uncertainty of the column concentration.

Moderator-prompted Discussion

Panel members: Peter Adams (Speaker, Carnegie-Mellon University), Kang Sun (Speaker, University at Buffalo), April Leytem (USDA Agricultural Research Service), Marc Houyoux (EPA Office of Air Quality Planning and Standards), Ian Rumsey (EPA Office of Research and Development)

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Peter Adams (CMU) presented a slightly different perspective, acknowledging that satellites will help with spatial allocation but that for some applications or questions the level of spatial resolution in emissions is not necessary. For example, transport and receptor scales are on the order of 100s of kilometers. Moving a single CAFO 10 km in a county will not affect PM2.5 too much, for example. We need to make sure, though, that the animal populations at the county scale are accurate. Marc Houyoux (EPA) agreed that for the most part sub-county allocation not a big deal for some issues (regional transport) but is important for local issues/local planning.

MH Maybe satellilites can also help with temporal allocations as well. We now have monthly temporal allocation.

PA – How do we combine bottom up with top down emission approaches. Can we reconcile satellite data with emission inventories? Where and when do the two correlate well or poorly? Satellite is like having an emission factor measurement repeated over time.

Farm management practices and activity data

Marc Houyoux led of the discussion by noting that in Peter Adam's presentation we heard importance of knowing manure management practices. This is important to do the best job of creating emission estimates for localities. Spatial allocation is an important issue.

MH - Before 2017 the dairy populations were way too low. In 2017 NEI process capture better population 3s and emissions when up and improved, especially in souther CA for example. It's a

problem for counties where there may be only 1 facility and the location is proprietary. Agree that for the most part sub-county allocation not a big deal for some issues (regional transport) but is important for local issues/local planning.

GB – April can you elaborate on uncertainties in dairy? Exactly what Mark says. At the facility scale, knowing what the emission are relative to housing, manure, emission processes is important (ground proofing). At larger scale, lack of activity data for facilities is a critical gap.

John – Need for improved activity data is key data/knowledge gap that keeps coming up. Seems to be an example where engagement from stakeholders could help. For April – what is first step for pushing that question forward? Which groups should be working together.

April – Will be different for each industry. For example, poultry and swine are run by large integrators and they know all the details of on-farm activity and management details. But they may not be willing to share that information. That should be an easy avenue, though. Dairy is more challenging because management may be specific to individual dairy. You could try to work on state or regional level with individual dairy groups, such as Idaho Dairyman's Association. Every state has a dairy group and if you could work with them you could get this type of info. Beef groups like to stay out of this issue altogether. They did not participate in NAEMS. That industry may also be pretty easy to get management info. Management practices for beef facilities are not very diverse and if you know what they are eating you have a good idea of the emissions. They lose 50% of the nitrogen they ingest from a feedlot. Rangeland (backgrounding cattle) beef us much more difficult to characterize because you don't know what they are eating or the forage quality. Feedlot cattle is really a small part of total – backgrounding cattle very large percentage of total. Key is to develop relationships with industry groups. They don't really like to work with the government because there is mistrust. The key is to build relationships.

Peter Adams (CMU) presented a slightly different perspective, acknowledging that satellites will help with spatial allocation but that for some applications or questions the level of spatial resolution in emissions is not necessary. For example, transport and receptor scales are on the order of 100s of kilometers. Moving a single CAFO 10 km in a county will not affect PM2.5 too much, for example. We need to make sure, though, that the animal populations at the county scale are accurate.

VA for IR – Can you give me some sense of difference between NAEMS and other emission data?

IR – Cant answer that question yet.

VA – Can you say anything about the NAEMS data?

IR – I can give you the history of the study. 2 yeas of monitoring for several animal types. Even though NAEMS is most comprehensive data it does not contain manure application.

PA – NAEMS is a big step forward, particularly year round measurements. Winter time emissions info is important for PM modeling, even though emissions themselves are lower. NAEMS has more info on ancillary parameters like pH, environmental parameters, etc.

Limei – Following up on manure comment. At EPA we try to use integrated ag/atmosphere/hydrology modeling but the manure application is a challenge. When we configure EPIC we minimize manure application because when we run CMAQ application bidi return off manure to avoid double counting. In

SWAT we need to know manure application amount and timing, which we often don't know. We need to understand these uncertainties when using integrated models.

Ian – Manure application important. May be 1/3 of total emissions from swine farms.

Kang – How well is this community communicating with methane emissions groups. April – Same types of uncertainties and more complicated than NH3. How manure is stored for example greatly affects methane emissions. For NH3, as long as you know what they are eating you can constrain emissions. Total per cow head can be predicted pretty well. In eastern US you apply manure differently, which affects emissions per head of cow. Out west > 70% of emission come from housing. In east a larger fraction comes from manure application so getting that right is important.

Greg for panel – What role can ground monitoring play in addressing emission inventory uncertainty.

MH – Would it be possible to collect specific information for an area to do a really solid job with process models, ground measurements for a specific area and see how that compares with satellites. Can we learn something by comparing bottom up and top down measurements.

2. What is the process for incorporating new science into the EPA emissions inventory?
3. What are the most critical barriers to development of a facility-scale national inventory for livestock ammonia?
4. What advances in ground-based monitoring, process-level measurements, and satellite products are most needed to improve mobile and agricultural emission inventories for ammonia and oxidized nitrogen?

Appointment

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Sent: 8/29/2019 5:07:44 PM
To: Rakosnik, Delaney [rakosnik.delaney@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]; Jacks, Susan [Jacks.Susan@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]

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Sent: 9/3/2019 6:30:39 PM
To: Rakosnik, Delaney [rakosnik.delaney@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]; Jacks, Susan [Jacks.Susan@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]

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Sent: 8/29/2019 3:34:50 PM
To: Rakosnik, Delaney [rakosnik.delaney@epa.gov]
CC: Smith, Darcie [Smith.Darcie@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Jacks, Susan [Jacks.Susan@epa.gov]; Eck, Janet [Eck.Janet@epa.gov]; Joseph, Wanda [joseph.wanda@epa.gov]
Subject: Idsal Mtg Rqst: Call for Information: Information Related to the Development of Emission Estimating Methodologies for Animal Feeding Operations
Attachments: Idsal Meeting Request-Call for Info Related to Development of Emission Estimating Methodologies for AFO.docx

Hello Delaney,

Idsal Meeting Request: Please schedule this meeting with Anne re: Call for info Related to Development of Emission Estimating Methodologies for Animal Feeding Operations project. Meeting request is attached.

Thank you,

Nina

From: Eck, Janet <Eck.Janet@epa.gov>
Sent: Thursday, August 29, 2019 11:26 AM
To: McKinney, Voronina <mckinney.voronina@epa.gov>
Cc: Smith, Darcie <Smith.Darcie@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>; Dunkins, Robin <Dunkins.Robin@epa.gov>; Costa, Allison <Costa.Allison@epa.gov>; Schrock, Bill <Schrock.Bill@epa.gov>; South, Peter <South.Peter@epa.gov>; Cozzie, David <Cozzie.David@epa.gov>; Crowley, Kate <crowley.kate@epa.gov>; Joseph, Wanda <joseph.wanda@epa.gov>; Hunt, Virginia <Hunt.Virginia@epa.gov>
Subject: OAR Mtg Rqst - Call for Information: Information Related to the Development of Emission Estimating Methodologies for Animal Feeding Operations

Hi Nina, Attached is an OAR meeting request concerning the Call for Information: Information Related to the Development of Emission Estimating Methodologies for Animal Feeding Operations project. Please review and forward for further processing. Thanks.

Message

From: Campbell, Ann [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B8C25A0C2FB648B6A947694A8492311E-CAMPBELL, ANN]
Sent: 8/28/2019 4:54:41 PM
To: Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Koerber, Mike [Koerber.Mike@epa.gov]; Josh Lewis (Lewis.Josh@epa.gov) [Lewis.Josh@epa.gov]; Culligan, Kevin [culligan.kevin@epa.gov]
CC: Rakosnik, Delaney [rakosnik.delaney@epa.gov]
Subject: FW: SAN#7588 NAEMS Call for Info Notice - CMS# OAR-19-000-7723
Attachments: NAEMS Post-It Note.pdf; NAEMS Action Memo23Aug19.pdf; NAEMS CFI Rollout_082219.docx; FRN NAEMS Call for Information Preamble_082219.docx; NAEMS CFI_Action Information_082219.docx; NAEMS Call for Info FR Cover-Form.pdf; NAEMS TypesettingRqst.pdf; OGC Concurrence_NAEMS CFI.pdf

Gentlemen, Anne has requested to be briefed on this action prior to signing. Please provide Delaney with the needed information to schedule the briefing.

Thank you,

Ann Campbell
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 566 1370

From: Mcquilkin, Wendy <Mcquilkin.Wendy@epa.gov>
Sent: Tuesday, August 27, 2019 1:41 PM
To: Campbell, Ann <Campbell.Ann@epa.gov>
Cc: Shaw, Betsy <Shaw.Betsy@epa.gov>; Lubetsky, Jonathan <Lubetsky.Jonathan@epa.gov>; Shoaff, John <Shoaff.John@epa.gov>; Culligan, Kevin <Culligan.Kevin@epa.gov>; Iglesias, Amber <Iglesias.Amber@epa.gov>; Costa, Allison <Costa.Allison@epa.gov>; Dunkins, Robin <Dunkins.Robin@epa.gov>; South, Peter <South.Peter@epa.gov>; Cozzie, David <Cozzie.David@epa.gov>; Crowley, Kate <crowley.kate@epa.gov>; Mills, Kathy <Mills.Kathy@epa.gov>; Schrock, Bill <Schrock.Bill@epa.gov>; Eck, Janet <Eck.Janet@epa.gov>; Morgan, Ruthw <morgan.ruthw@epa.gov>; Morris, Joseph <Morris.Joseph@epa.gov>; Adams, Darryl <Adams.Darryl@epa.gov>; Brown, Stephanie N. <Brown.StephanieN@epa.gov>; Gaines, Cynthia <Gaines.Cynthia@epa.gov>; Muellerleile, Caryn <Muellerleile.Caryn@epa.gov>; Manibusan, Mary <Manibusan.Mary@epa.gov>; Pritchard, Eileen <Pritchard.Eileen@epa.gov>; Wiggins, Lanelle <Wiggins.Lanelle@epa.gov>; Walker, Sherri <Walker.Sherri@epa.gov>; Millett, John <Millett.John@epa.gov>; DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Subject: SAN#7588 NAEMS Call for Info Notice - CMS# OAR-19-000-7723

TO: THE IMMEDIATE OFFICE FOR REVIEW AND AA'S SIGNATURE

08/27/19 01:31PM **Tier: 4** **CMS Control #: OAR-19-000-7723**

: Information Related to the Development of Emission Estimating Methodologies for Animal Feeding Operations Notice (SAN 7588).

Reviewers	Sign Off	Concur	Concur w/ Comment	Non- Concur	Date
Ann Campbell					
Anne Idsal					

Stage:
Deadline:

OMB exempt action. OGC concurred w/this action on 8/15/19. Their concurrence is also attached here.

Contact: OAQPS: William Schrock: 919-541-5032
Mgmt. Level Reviewer: Kevin Culligan: 202-564-0611
OAPPS Contact:

Return to: Wendy McQuilkin
564-1348, 5442S WJC North

Appointment

From: Costa, Allison [Costa.Allison@epa.gov]
Sent: 2/24/2020 9:25:35 PM
To: Costa, Allison [Costa.Allison@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Do, Bebhinn [Do.Bebhinn@epa.gov]; Houyoux, Marc [Houyoux.Marc@epa.gov]; Rao, Venkatesh [Rao.Venkatesh@epa.gov]; Lassiter, Penny [Lassiter.Penny@epa.gov]; Wayland, Richard [Wayland.Richard@epa.gov]

Subject: NAEMS Data Uses
Location: RTP-E101-Max40/RTP-Bldg-E-Restricted; RTP-OAQPS-Ex. 6 PP / Ex. 7(C) SPPD/Phone-Line/RTP-OAQPS-BLDG-C

Start: 3/9/2020 6:00:00 PM
End: 3/9/2020 7:00:00 PM
Show Time As: Busy

Draft Agenda:

1) Status of NAEMS datasets (including differences between old and new) (NRG)
2) Plans for/timing of public review of NAEMS data with EEMs (NRG)
3) Plans for use of NAEMS data in the ammonia inventory (EIAG)
4) Timing for public review of NEI (EIAG)
5) Concerns
6) Path forward

Appointment

From: Do, Bebhinn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=CE5A954491DF4DD2A084BA5BEFAA11DE-DO, BEBHINN]
Sent: 2/4/2020 2:39:33 PM
To: Do, Bebhinn [Do.Bebhinn@epa.gov]

Subject: Hold for USDA Meeting

Start: 4/1/2020 4:00:00 AM
End: 4/3/2020 4:00:00 AM
Show Time As: Free

Appointment

From: Do, Bebhinn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ce5a954491df4dd2a084ba5befaa11de-Do, Bebhinn]
Sent: 4/7/2020 7:45:50 PM
To: Do, Bebhinn [Do.Bebhinn@epa.gov]; Nash, Maliha [Nash.Maliha@epa.gov]
CC: Rumsey, Ian [rumsey.ian@epa.gov]

Subject: NAEMS Swine Document Feedback
Location: Skype Meeting

Start: 4/8/2020 6:00:00 PM
End: 4/8/2020 7:00:00 PM
Show Time As: Busy

Quick meeting to discuss the statistical write up.

I set it up as skype, since there is the option to get a local number.

BD

Join Skype Meeting

Trouble Joining? Try Skype Web App

Join by phone

Toll number: Ex. 6 PP / Ex. 7(C) (Dial-in Number) English (United States)
Find a local number

Conference ID: Ex. 6 PP / Ex. 7(C)
Forgot your dial-in PIN? | Help

Appointment

From: Dunkins, Robin [Dunkins.Robin@epa.gov]
Sent: 12/2/2019 2:51:04 PM
To: Dunkins, Robin [Dunkins.Robin@epa.gov]; Do, Bebhinn [Do.Bebhinn@epa.gov]; Banner, Shannon [banner.shannon@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]

Subject: NAEMS updates
Attachments: NAEMS updates/ Ex. 6 PP / Ex. 7(C) Conference ID Ex. 6 PP / Ex. 7(C) NAEMS updates Ex. 6 PP / Ex. 7(C) ; Canceled: NAEMS upates
Location: RTP-OAQPS-E141B/RTP-OAQPS-BLDG-E

Start: 1/9/2020 7:00:00 PM
End: 1/9/2020 8:00:00 PM
Show Time As: Busy

Recurrence: Weekly
every 2 week(s) on Thursday from 2:00 PM to 3:00 PM

NRG team updates. I've scheduled these meetings for every 2 weeks. We can cancel meeting when there are no updates.

Appointment

To: Schrock, Bill [Schrock.Bill@epa.gov]; Banner, Shannon [banner.shannon@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Banner, Shannon [banner.shannon@epa.gov]; Do, Bebhinn [Do.Bebhinn@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]

Subject: NAEMS updates/ Ex. 6 PP / Ex. 7(C) Conference ID Ex. 6 PP / Ex. 7(C)
Location: RTP-OAQPS-E141B/RTP-OAQPS-BLDG-E

Start: 3/19/2020 7:00:00 PM
End: 3/19/2020 7:30:00 PM
Show Time As: Busy

Recurrence: (none)

NRG team updates. I've scheduled these meetings for every 2 weeks. We can cancel meeting when there are no updates.

Appointment

To: Banner, Shannon [banner.shannon@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]; Banner, Shannon [banner.shannon@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Do, Bebhinn [Do.Bebhinn@epa.gov]; Banner, Shannon [banner.shannon@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]

Subject: NAEMS updates Ex. 6 PP / Ex. 7(C)
Location: RTP-OAQPS-E141B/RTP-OAQPS-BLDG-E

Start: 4/7/2020 1:30:00 PM
End: 4/7/2020 2:30:00 PM
Show Time As: Busy

Recurrence: (none)

NRG team updates. I've scheduled these meetings for every 2 weeks. I need to follow up on a personal issue this afternoon. I'm rescheduling for Tuesday morning. Sorry for the late minute change.

Appointment

From: Rumsey, Ian [rumsey.ian@epa.gov]
Sent: 11/22/2019 3:19:38 PM
To: Rumsey, Ian [rumsey.ian@epa.gov]; Walker, JohnT [Walker.Johnt@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]; Nash, Maliha [Nash.Maliha@epa.gov]; Croghan, Carry [Croghan.Carry@epa.gov]; Thompson, Rhonda [Thompson.Rhonda@epa.gov]; Do, Bebhinn [Do.Bebhinn@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Dietrich, Yijia [Dietrich.Yijia@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]

Subject: EEM Development Meeting
Attachments: Untitled Attachment; Untitled Attachment; Untitled Attachment; Untitled Attachment; Canceled: EEM Development Meeting
Location: RTP-D349-Max40/RTP-Bldg-D

Start: 1/6/2020 4:00:00 PM
End: 1/6/2020 5:00:00 PM
Show Time As: Busy

Recurrence: Weekly
every 2 week(s) on Monday from 11:00 AM to 12:00 PM

Phone-in info:
Dial In: Ex. 6 PP / Ex. 7(C)
Conf ID: Ex. 6 PP / Ex. 7(C)

Direct line to conference room:
Ex. 6 PP / Ex. 7(C)

Appointment

From: Do, Bebhinn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ce5a954491df4dd2a084ba5befaa11de-Do, Bebhinn]
Sent: 4/17/2020 4:00:08 PM
To: Do, Bebhinn [Do.Bebhinn@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Rumsey, Ian [rumsey.ian@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Nash, Maliha [Nash.Maliha@epa.gov]; Walker, JohnT [Walker.Johnt@epa.gov]; Dietrich, Yijia [Dietrich.Yijia@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]; Zwicke, Greg - NRCS, Fort Collins, CO [greg.zwicke@usda.gov]; Sullivan, Tim [Sullivan.Tim@epa.gov]
CC: Costa, Allison [Costa.Allison@epa.gov]; Banner, Shannon [banner.shannon@epa.gov]; Thompson, Rhonda [Thompson.Rhonda@epa.gov]; Croghan, Carry [Croghan.Carry@epa.gov]; Ro, Kyoung [kyoung.ro@usda.gov]; Bash, Jesse [Bash.Jesse@epa.gov]; Leytem, April [april.leytem@usda.gov]; Pierce, Tom [Pierce.Tom@epa.gov]; Crowley, Kate [crowley.kate@epa.gov]; Trabue, Steven [steven.trabue@usda.gov]; Parker, David - ARS [david.parker@usda.gov]

Subject: USDA - EPA NAEMS meeting (Day 1)
Attachments: SkypeMeetingTips.docx; May_5-6_USDA_Meeting_Agenda.docx; 02_NAEMS_ProcessOverview_05.04.2020.pptx; 01_NAEMS_BackGround_05.04.2020.pptx
Location: Skype Meeting

Start: 5/5/2020 5:15:00 PM
End: 5/5/2020 9:00:00 PM
Show Time As: Busy

**** Day 1 slides now attached ****

Thank you for your patience as we have shifted to an online meeting.

The meeting invite has been updated with the agenda.

To join the Skype meeting, just click the link below. In case you need them, I've also included some tips on skype meetings.

We'll be sharing slides, so there is no need for you to share video.

I will be providing copies of the slide prior to the meetings.

Please let me know if you have any questions,
Bebhinn

Join Skype Meeting

Trouble Joining? Try Skype Web App

Join by phone

Toll number: Ex. 6 PP / Ex. 7(C) (Dial-in Number) English (United States)
Find a local number

Conference ID: Ex. 6 PP / Ex. 7(C)
Forgot your dial-in PIN? | Help

NAEMS Swine Report

USDA – EPA Ammonia and Agriculture Informal Workgroup Call

May 5 – 6th

Time		Topic	Presenter
Eastern	Pacific	DAY 1 - May 5	
13:30 - 13:45	10:30 - 10:45	Log-in/connectivity check	
13:45 - 13:50	10:45 - 10:50	Logistics (Schedule, breaks, mute)	Bebhinn Do
13:50 - 14:10	10:50 - 11:10	Welcome	Robin Dunkins and Greg Zwicke
14:10 - 15:00	11:10 - 12:00	Background - NAEMS history and goals for this meeting	Bebhinn Do
15:00 - 15:15	12:00 - 12:15	Break	
15:15 - 16:45	12:15 - 13:45	EEM Development Process: An Overview	Bebhinn Do
4:45:00 PM	1:45:00 PM	Adjourn	
Eastern	Pacific	DAY 2 - May 6	
13:30 - 13:45	10:30 - 10:45	Log-in/connectivity check	
13:45 - 13:50	10:45 - 10:50	Agenda	Bebhinn Do
13:50 - 15:20	10:50 - 12:20	EEM Development: Ammonia Emissions from Swine Lagoons	Ian Rumsey
15:20 - 15:35	12:20 - 12:35	Break	
15:35 - 16:50	12:35 - 13:50	EEM Development: Particulate Matter Emissions from Swine Barns	Ian Rumsey
16:50 - 17:00	13:50 - 14:00	Next steps/Wrap up	
5:00:00 PM	2:00:00 PM	Adjourn	

Appointment

From: Do, Bebhinn [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ce5a954491df4dd2a084ba5befaa11de-Do, Bebhinn]
Sent: 4/7/2020 7:45:50 PM
To: Do, Bebhinn [Do.Bebhinn@epa.gov]; Nash, Maliha [Nash.Maliha@epa.gov]
CC: Rumsey, Ian [rumsey.ian@epa.gov]

Subject: NAEMS Swine Document Feedback
Location: Skype Meeting

Start: 4/8/2020 7:00:00 PM
End: 4/8/2020 8:00:00 PM
Show Time As: Busy

Shifted to 3PM Eastern/Noon Pacific.

Quick meeting to discuss the statistical write up.

I set it up as skype, since there is the option to get a local number.

BD

Join Skype Meeting

Trouble Joining? Try Skype Web App

Join by phone

Toll number: Ex. 6 PP / Ex. 7(C) (Dial-in Number) English (United States)
Find a local number

Conference ID: Ex. 6 PP / Ex. 7(C)
Forgot your dial-in PIN? | Help

Appointment

From: Costa, Allison [Costa.Allison@epa.gov]
Sent: 2/24/2020 9:25:35 PM
To: Costa, Allison [Costa.Allison@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Do, Bebhinn [Do.Bebhinn@epa.gov]; Houyoux, Marc [Houyoux.Marc@epa.gov]; Rao, Venkatesh [Rao.Venkatesh@epa.gov]; Lassiter, Penny [Lassiter.Penny@epa.gov]; Wayland, Richard [Wayland.Richard@epa.gov]

Subject: NAEMS Data Uses
Location: RTP-E101-Max40/RTP-Bldg-E-Restricted; RTP-OAQPS-Ex. 6 PP / Ex. 7(C) SPPD/Phone-Line/RTP-OAQPS-BLDG-C

Start: 3/9/2020 6:00:00 PM
End: 3/9/2020 7:00:00 PM
Show Time As: Busy

Reminder & updated agenda----

Agenda:

1) Review roles and responsibilities related to NAEMS
2) Clarify EIAG's request regarding NAEMS data
3) Describe status of NAEMS data and timing for NAEMS EEM development
4) Discuss concerns
5) Determine path forward

Appointment

From: Rumsey, Ian [rumsey.ian@epa.gov]
Sent: 2/14/2020 2:11:32 PM
To: Rumsey, Ian [rumsey.ian@epa.gov]; Walker, JohnT [Walker.Johnt@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]; Nash, Maliha [Nash.Maliha@epa.gov]; Croghan, Carry [Croghan.Carry@epa.gov]; Thompson, Rhonda [Thompson.Rhonda@epa.gov]; Do, Bebhinn [Do.Bebhinn@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Dietrich, Yijia [Dietrich.Yijia@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]

Subject: EEM Development Meeting
Location: RTP-E310A-Max10/RTP-Bldg-E

Start: 2/24/2020 7:00:00 PM
End: 2/24/2020 8:00:00 PM
Show Time As: Busy

Please note that the room number is different from normal.

Phone-in info:
Dial In: Ex. 6 PP / Ex. 7(C)
Conf ID: Ex. 6 PP / Ex. 7(C)

Direct line to conference room:
Ex. 6 PP / Ex. 7(C)

Appointment

From: Do, Bebhinn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=CE5A954491DF4DD2A084BA5BEFAA11DE-DO, BEBHINN]
Sent: 1/21/2020 2:24:44 PM
To: Do, Bebhinn [Do.Bebhinn@epa.gov]; Rumsey, Ian [rumsey.ian@epa.gov]; Nash, Maliha [Nash.Maliha@epa.gov]; Dietrich, Yijia [Dietrich.Yijia@epa.gov]
CC: Thompson, Rhonda [Thompson.Rhonda@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Croghan, Carry [Croghan.Carry@epa.gov]
BCC: RTP-E101-Max40/RTP-Bldg-E-Restricted [RTP-E101-Max40@epa.gov]

Subject: NAEMS Stats discussion
Attachments: Section6_StatisticalApproach.docx
Location: RTP-E101-Max40/RTP-Bldg-E-Restricted

Start: 1/29/2020 7:30:00 PM
End: 1/29/2020 8:30:00 PM
Show Time As: Busy

Now with draft write up.

Just wanted to set aside some time next week to talk stats while Maliha is here.

Since the process has evolved since the layers write up, I'll step through my understanding of the changes so Maliha can correct and clarify as necessary. I'll provide a draft of the methods section by Monday, if anyone wants to review prior to the meeting. We can also talk about next/remaining steps, and other questions people might have. Let me know if there is anything specific you want to discuss.

Bebhinn

Agenda

1. Review method changes and details
    a. Annual uncertainty
    b. Verify details of analysis
    c. Initial text for swine attached
2. Next steps
    a. Write up
    b. Refinement of images for report
    c. Delegation of tasks
3. Questions

Appointment

From: Do, Bebhinn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=CE5A954491DF4DD2A084BA5BEFAA11DE-DO, BEBHINN]
Sent: 1/14/2020 9:34:54 PM
To: Do, Bebhinn [Do.Bebhinn@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Houyoux, Marc [Houyoux.Marc@epa.gov]; Rao, Venkatesh [Rao.Venkatesh@epa.gov]; Walker, JohnT [Walker.Johnt@epa.gov]; Dietrich, Yijia [Dietrich.Yijia@epa.gov]
CC: Yelverton, William [Yelverton.William@epa.gov]; Rumsey, Ian [rumsey.ian@epa.gov]
BCC: RTP-E101-Max40/RTP-Bldg-E-Restricted [RTP-E101-Max40@epa.gov]

Subject: NAEMS and the NEI
Location: RTP-E101-Max40/RTP-Bldg-E-Restricted

Start: 1/27/2020 6:00:00 PM
End: 1/27/2020 7:00:00 PM
Show Time As: Busy

Tesh and Marc,

ORD is working with us on the NAEMS project and mentioned EIAG has an interest in using the data in the next iteration of the NEI. NRG wanted to get all of us to get together to discuss how it would be used and the timeline for the work/task order.

It's a lot of people to coordinate, a few of whom have very packed calendars, so let me know if you would prefer another time. The other best options I identified were:

Date	Time	Conflicts
1/22	3PM	Robin has a conflict, and Marc has a tentative meeting
	4PM	Marc and Will end their day at 4PM
1/23	1PM	Marc; John (1:30)
1/27	4PM	Marc and Will end their day at 4PM
1/29	3PM	Marc has a tentative meeting

Best regards,
Bebhinn

Ms. Bebhinn Do
U.S. EPA | OAQPS | Sector Policies and Programs Division | Natural Resources Group
109 T.W. Alexander Drive | Research Triangle Park, NC 27711
Mail Code: E143-03 | Phone: 919 541-0573 | email: do.bebhinn@epa.gov

Appointment

From: Dunkins, Robin [Dunkins.Robin@epa.gov]
Sent: 12/2/2019 2:51:04 PM
To: Dunkins, Robin [Dunkins.Robin@epa.gov]; Do, Bebhinn [Do.Bebhinn@epa.gov]; Banner, Shannon [banner.shannon@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Costa, Allison [Costa.Allison@epa.gov]

Subject: NAEMS updates
Attachments: NAEMS updates/ Ex. 6 PP / Ex. 7(C) Conference ID Ex. 6 PP / Ex. 7(C) NAEMS updates 2 Ex. 6 PP / Ex. 7(C)
Location: RTP-OAQPS-E141B/RTP-OAQPS-BLDG-E

Start: 1/9/2020 7:00:00 PM
End: 1/9/2020 8:00:00 PM
Show Time As: Busy

Recurrence: Weekly
every 2 week(s) on Thursday from 2:00 PM to 3:00 PM

NRG team updates. I've scheduled these meetings for every 2 weeks. We can cancel meeting when there are no updates.

Appointment

From: Do, Bebhinn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=CE5A954491DF4DD2A084BA5BEFAA11DE-DO, BEBHINN]
Sent: 11/12/2019 4:39:15 PM
To: Do, Bebhinn [Do.Bebhinn@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Rumsey, Ian [rumsey.ian@epa.gov]; Sullivan, Tim [Sullivan.Tim@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]
CC: Costa, Allison [Costa.Allison@epa.gov]; Croghan, Carry [Croghan.Carry@epa.gov]; Crowley, Kate [crowley.kate@epa.gov]; Hassett-Sipple, Beth [Hassett-Sipple.Beth@epa.gov]; Lowe, Theresa [Lowe.Theresa@epa.gov]; Nash, Maliha [Nash.Maliha@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Thompson, Rhonda [Thompson.Rhonda@epa.gov]; Walker, JohnT [Walker.Johnt@epa.gov]; Dietrich, Yijia [Dietrich.Yijia@epa.gov]; Banner, Shannon [banner.shannon@epa.gov]

Subject: NAEMS Coordination Meeting

Start: 4/7/2020 6:00:00 PM
End: 4/7/2020 7:00:00 PM
Show Time As: Busy

Monthly Coordination Meeting

We're still meeting, but on Skype (use link **or** number below).

Agenda

1. Schedule
2. FOIA
3. Proposed progress updates to the website

Join Skype Meeting

Trouble Joining? Try Skype Web App

Join by phone

Toll number: Ex. 6 PP / Ex. 7(C) (Dial-in Number) English (United States)
Find a local number

Conference ID: Ex. 6 PP / Ex. 7(C)
Forgot your dial-in PIN? | Help

Appointment

From: Do, Bebhinn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=CE5A954491DF4DD2A084BA5BEFAA11DE-DO, BEBHINN]
Sent: 11/12/2019 4:28:14 PM
To: Do, Bebhinn [Do.Bebhinn@epa.gov]; Crowley, Kate [crowley.kate@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Rumsey, Ian [rumsey.ian@epa.gov]; Sullivan, Tim [Sullivan.Tim@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]; RTP-OAQPS-Ex. 6 PP / Ex. 7(C) PPD/Phone-Line/RTP-OAQPS-BLDG-C [RTP-OAQPS-Ex. 6 PP / Ex. 7(C) SPPD@epa.gov]
CC: Costa, Allison [Costa.Allison@epa.gov]; Croghan, Carry [Croghan.Carry@epa.gov]; Hassett-Sipple, Beth [Hassett-Sipple.Beth@epa.gov]; Lowe, Theresa [Lowe.Theresa@epa.gov]; Nash, Maliha [Nash.Maliha@epa.gov]; Nunez, Carlos [Nunez.Carlos@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Thompson, Rhonda [Thompson.Rhonda@epa.gov]; Walker, JohnT [Walker.Johnt@epa.gov]; Dietrich, Yijia [Dietrich.Yijia@epa.gov]; Banner, Shannon [banner.shannon@epa.gov]
BCC: RTP-E101-Max40/RTP-Bldg-E-Restricted [RTP-E101-Max40@epa.gov]

Subject: NAEMS Coordination Meeting
Attachments: NAEMS coordination meeting 01.28.2020.docx
Location: RTP-E101-Max40/RTP-Bldg-E-Restricted

Start: 1/28/2020 7:00:00 PM
End: 1/28/2020 8:00:00 PM
Show Time As: Busy

Just following up with notes from the meeting, just in case you couldn't join us.
BD

Monthly Coordination Meeting
Call-in number: Ex. 6 PP / Ex. 7(C)

Agenda

1. EEM update from Ian
2. USDA Workgroup
3. Schedule update

I'll send out a summary after the meeting, if you are unable to attend.

BD

Appointment

From: Do, Bebhinn [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=CE5A954491DF4DD2A084BA5BEFAA11DE-DO, BEBHINN]
Sent: 2/4/2020 5:47:50 PM
To: Crowley, Kate [crowley.kate@epa.gov]; Dunkins, Robin [Dunkins.Robin@epa.gov]; Rumsey, Ian [rumsey.ian@epa.gov]; Sullivan, Tim [Sullivan.Tim@epa.gov]; Yelverton, William [Yelverton.William@epa.gov]; RTP-OAQPS-Ex. 6 PP / Ex. 7(C) PPD/Phone-Line/RTP-OAQPS-BLDG-C [RTP-OAQPS-Ex. 6 PP / Ex. 7(C) SPPD@epa.gov]
CC: Costa, Allison [Costa.Allison@epa.gov]; Croghan, Carry [Croghan.Carry@epa.gov]; Hassett-Sipple, Beth [Hassett-Sipple.Beth@epa.gov]; Lowe, Theresa [Lowe.Theresa@epa.gov]; Nash, Maliha [Nash.Maliha@epa.gov]; Nunez, Carlos [Nunez.Carlos@epa.gov]; Schrock, Bill [Schrock.Bill@epa.gov]; Thompson, Rhonda [Thompson.Rhonda@epa.gov]; Walker, JohnT [Walker.Johnt@epa.gov]; Dietrich, Yijia [Dietrich.Yijia@epa.gov]; Banner, Shannon [banner.shannon@epa.gov]
BCC: RTP-E101-Max40/RTP-Bldg-E-Restricted [RTP-E101-Max40@epa.gov]

Subject: NAEMS Coordination Meeting
Attachments: NAEMS coordination meeting 01.28.2020.docx
Location: RTP-E101-Max40/RTP-Bldg-E-Restricted

Start: 1/28/2020 7:00:00 PM
End: 1/28/2020 8:00:00 PM
Show Time As: Tentative

Just following up with notes from the meeting, just in case you couldn't join us.
BD

Monthly Coordination Meeting
Call-in number: Ex. 6 PP / Ex. 7(C)

Agenda

1. EEM update from Ian
2. USDA Workgroup
3. Schedule update

I'll send out a summary after the meeting, if you are unable to attend.

BD