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Addressing Methane from Landfills

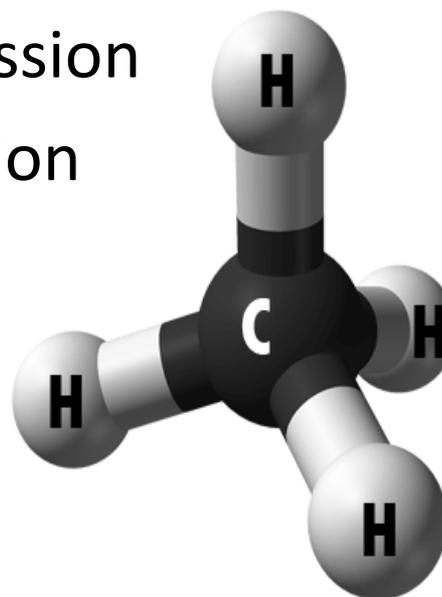


Stakeholder Meeting

March 31, 2017

Discussion Topics

- Background
 - Maryland Climate Change Commission
 - Greenhouse Gas Emission Reduction Act
- Maryland Methane Emissions
- EPA Rules
- MDE Objectives
- Next Steps



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Maryland Commission on Climate Change (MCCC)

- Originated in 2007
- Developed 2008 Maryland “Climate Action Plan”
- This led to the “Greenhouse Gas Emission Reduction Act” of 2009 or GGRA
- Commission codified into law in 2015
 - Recommended enhancements to the 2009 GGRA in December of 2015
- GGRA of 2016 signed into law in April 2016
- Basic charge of the Commission:
 - Provide recommendations on how to reduce greenhouse gas emissions and adapt to the impacts of climate change



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Greenhouse Gas Emission Reduction Act (GGRA)

- Originally adopted in 2009
- Required that Maryland develop and implement a plan to reduce greenhouse gas (GHG) emissions by 25% by 2020
- The law also requires that the plan support a healthy economy and create new jobs
- Refreshed by the General Assembly in 2016 to add an additional goal for 2030
 - 40 % GHG reduction by 2030
 - Same focus on the economy and jobs



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2016 MCCC Recommendations

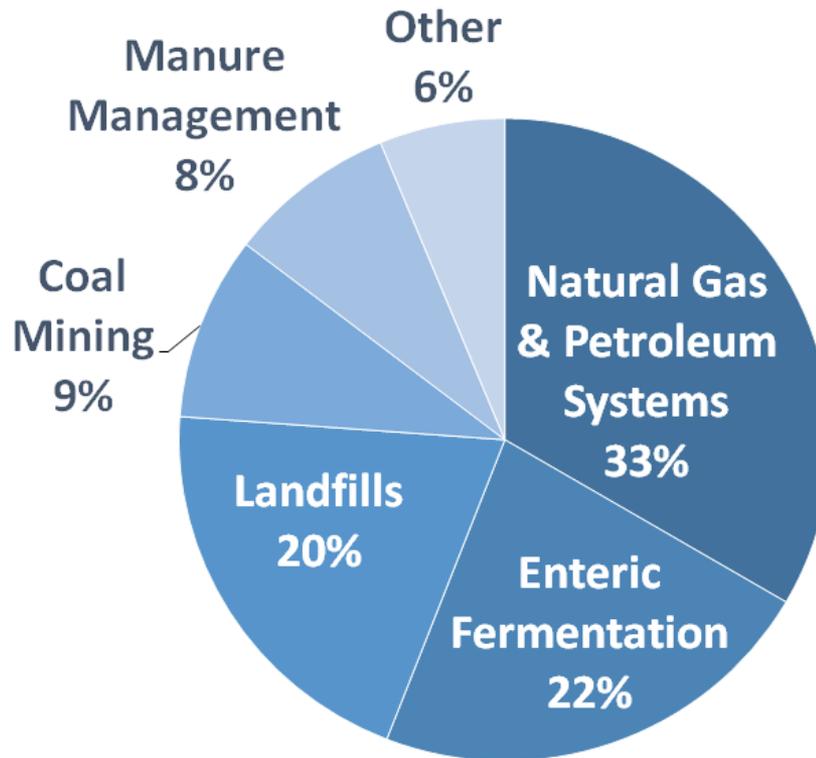
- On November 15, 2016 the MCCC issued its annual report
- The report included over forty recommendations on mitigation, adaptation and education, communication and outreach
- One was specific to in-state methane emission reductions:
 - *“... the MCCC supports MDE’s efforts to reduce methane emissions from landfills, natural gas infrastructure (e.g. compressor stations and underground storage), and waste water treatment plants, and recommends further research into additional sources such as agriculture and fuel production/transport”.*



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National Methane Emissions

U.S. Methane Emissions, By Source



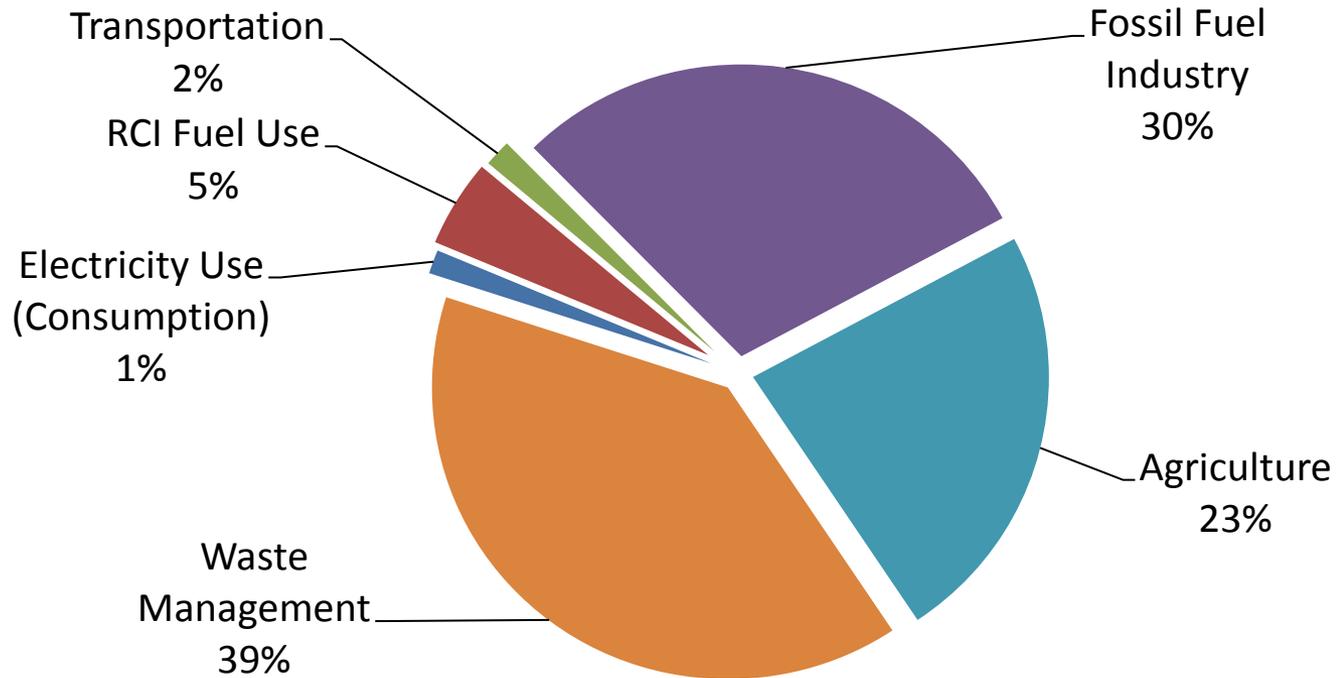
U.S. Environmental Protection Agency (2014).
U.S. Greenhouse Gas Inventory Report: 1990-2014.



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Maryland Methane Emissions

2014 Methane Emissions (% by Sector)



Source: Graphic derived from Maryland's 2014 Greenhouse Gas Inventory



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Maryland Methane Emissions

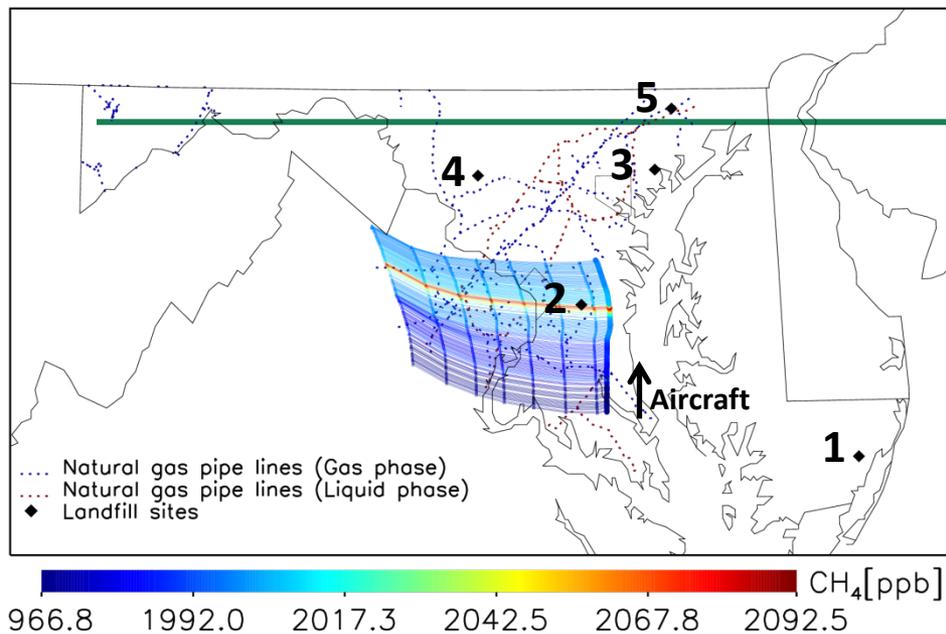
Researchers are also looking at Maryland methane emissions



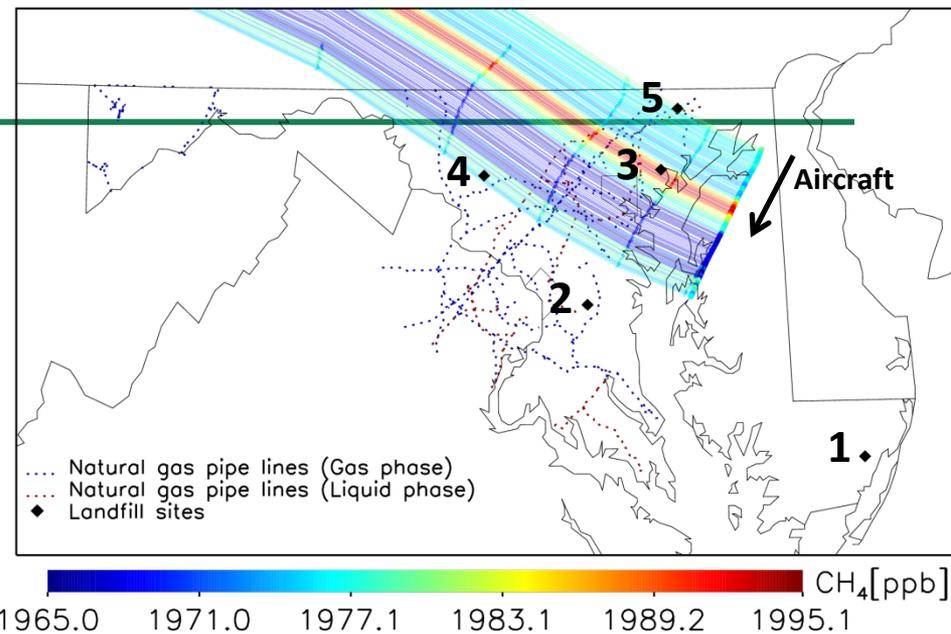
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HYSPLIT Back trajectory analysis: CH₄ from Brown Station & Eastern Sanitary Landfills

HYSPLIT -8 hrs trajectory (every 5 sec)
 20 FEB 2015 22:20-22:35 80400-81350 (14) [UTC]



HYSPLIT -8 hrs trajectory (every 5 sec)
 25 FEB 2015 17:48-18:06 64100-65180 (5) [UTC]



Top 5 CH₄ emitting landfills (MD) CH₄ Emissions* (metric tons CH₄ yr⁻¹)

[1]: Central sanitary	6,642
[2]: Brown station	5,775
[3]: Eastern sanitary	5,188
[4]: Reichs ford municipal	3,955
[5]: Harford waste disposal center	3,446

*Source: US EPA Greenhouse Reporting Program
 (GHGRP, 2014) <https://ghgdata.epa.gov/ghgp/>



Estimated CH₄ Emissions from Landfills Based on Aircraft Observations in Feb/Mar 2015

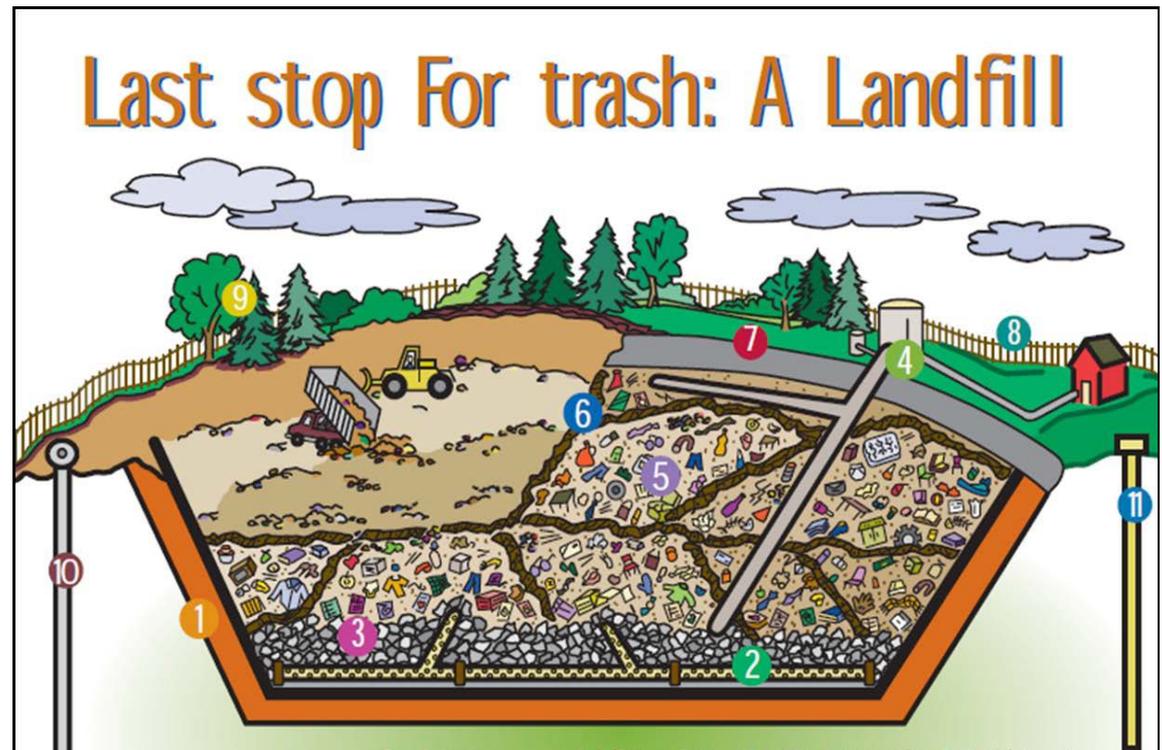
Landfill (# of transects/flights)	CH ₄ Emission (metric tons CH ₄ yr ⁻¹) Mean \pm 1 σ
Brown Station (27/10)	25,700 \pm 17,600
Eastern Sanitary (9/3)	10,800 \pm 10,300
Quarantine Road (17/7)	4,200 \pm 6,300
Reichs Ford (5/4)	7,300 \pm 8,100
Route 40 West (5/5)	3,400 \pm 2,400
Charles County (16/8)	3,100 \pm 3,000
Harford Waste (6/6)	2,900 \pm 1,800
Cecil Central (2/1)	1,500 \pm 1,400



• The observed total CH₄ emissions from these landfills are higher than the EPA inventory by a factor of 3.

EPA Initiatives - Landfills

- On August 29, 2016, EPA announced final updates to its NSPS to reduce emissions of methane-rich landfill gas from new, modified and reconstructed municipal solid waste (MSW) landfills. (40 CFR 60 Subpart XXX)
- The EPA also issued guidelines for reducing emissions from existing MSW landfills (40 CFR 60 Subpart Cf)



New Source Performance Standards (NSPS)

Federal Rule for New Municipal Solid Waste (MSW) landfills

Promulgated in 1996 40 CFR Subpart WWW	Promulgated in 2016 40 CFR Subpart XXX
MSW landfill for which construction, reconstruction or modification commenced after May 30, 1991	MSW landfill for which construction, reconstruction or modification commenced after July 17, 2014

Both Subparts continue to apply



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Emission Guidelines (EG)

Federal Rule for Existing Municipal Solid Waste (MSW) landfills

Promulgated in 1996 40 CFR Subpart Cc	Promulgated in 2016 40 CFR Subpart Cf
MSW landfill that accepted waste after November 8, 1987, and commenced construction, reconstruction, or modification before May 30, 1991	MSW landfill that accepted waste after November 8, 1987, and commenced construction, reconstruction, or modification before July 17, 2014

Subpart Cf replaces Cc

Clean Air Act Section 111 (d) requires states to submit plans detailing Implementation of EGs for existing landfills.



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EPA Initiatives – Landfills NSPS/EG

Rule Summary

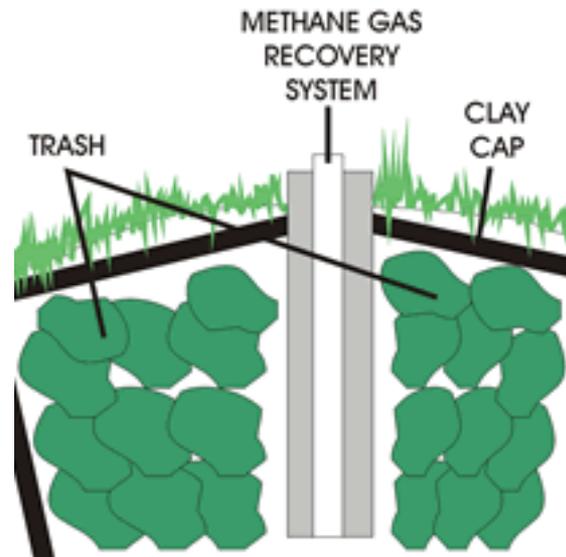
EPA has determined that a well-designed and well-operated landfill gas collection and control system (GCCS) remains the best system of emission reduction for controlling landfill gas

Reduces threshold that requires facilities to install a GCCS from 50 mg/yr of non-methane organic compound (NMOC) to 34 mg/yr

Provides optional method for determining when a landfill must install and operate a GCCS

Clarifies control options for GCCS.

New definition for landfill gas treatment and treatment system monitoring plan



Requires landfill owners/operators to monitor temperature and pressure at wellheads on a monthly basis and take corrective action for elevated temperature or positive pressure

Requires landfill owners/operators to monitor surface emissions of methane quarterly

Includes criteria for capping or removing a landfill GCCS

SSM – standards of performance apply at all times

Maryland Objectives

- Work with stakeholders to revise COMAR 26.11.19.20 –Control of Landfill Gas Emissions from MSW Landfills to at least match federal rules
- Understand current MSW landfills operations, especially those with voluntary GCCS.



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Regulation Timeline (tentative)

- Landfills
 1. Stakeholder Meeting – Today
 2. Draft Regulations to Stakeholders/2nd Stakeholder meeting – June 2017
 3. Proposed Regulation to AQCAC – September 2017
 4. NPA – November 2017
 5. Public Hearing – December 2017
 6. Final Regulation Adoption – February 2018
 7. SIP Submittal April 2018



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Questions/Discussions



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