



ENVIRONMENTAL LAW SECTION



Air & Waste Management Association
East Michigan Chapter

Joint Environmental Conference

November 8, 2018

Lansing Community College – West Campus

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ENVIRONMENTAL LAW SECTION



Joint Environmental Conference

**A message from Cathy Stepp
Regional Administrator, EPA Region V**

<https://youtu.be/722trclhytM>

AIR REGULATIONS & REQUIREMENTS FOR NON-ATTAINMENT

Kim Essenmacher, General Motors

Greg Myers, Marathon Petroleum

Steve Zervas, Trinity Consultants

Moderator:

Lillian Woolley, Fishbeck Thompson, Carr & Huber

A banner for the Fall Joint Environmental Conference. The background is a photograph of a modern building with a glass facade and a street lamp. The text is overlaid on the left side of the image.

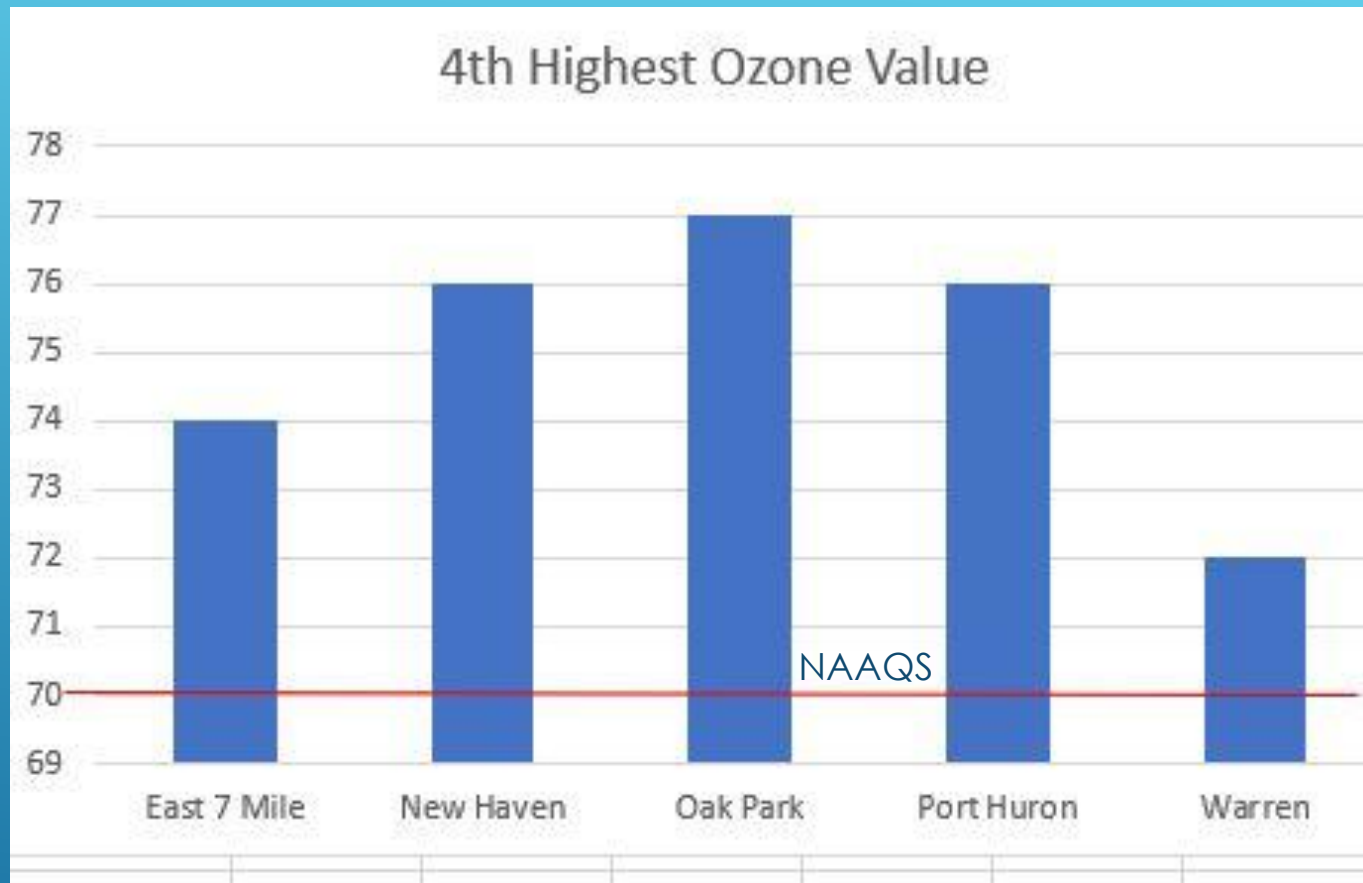
FALL JOINT ENVIRONMENTAL CONFERENCE

SPONSORED BY THE STATE BAR OF MICHIGAN
ENVIRONMENTAL LAW SECTION AND EAST
MICHIGAN & WEST MICHIGAN CHAPTERS OF THE
AIR & WASTE MANAGEMENT ASSOCIATION



- ▶ Seven counties in SE Michigan (Monroe, Washtenaw, Oakland, Macomb, St. Clair, Wayne and Livingston Counties) are in marginal nonattainment for ozone
- ▶ Berrien, portions of Allegan and Muskegon Counties are also in marginal nonattainment.
- ▶ USEPA has no specific requirements for marginal nonattainment areas – except that they come into compliance with the Standard in 3 years (2021)!

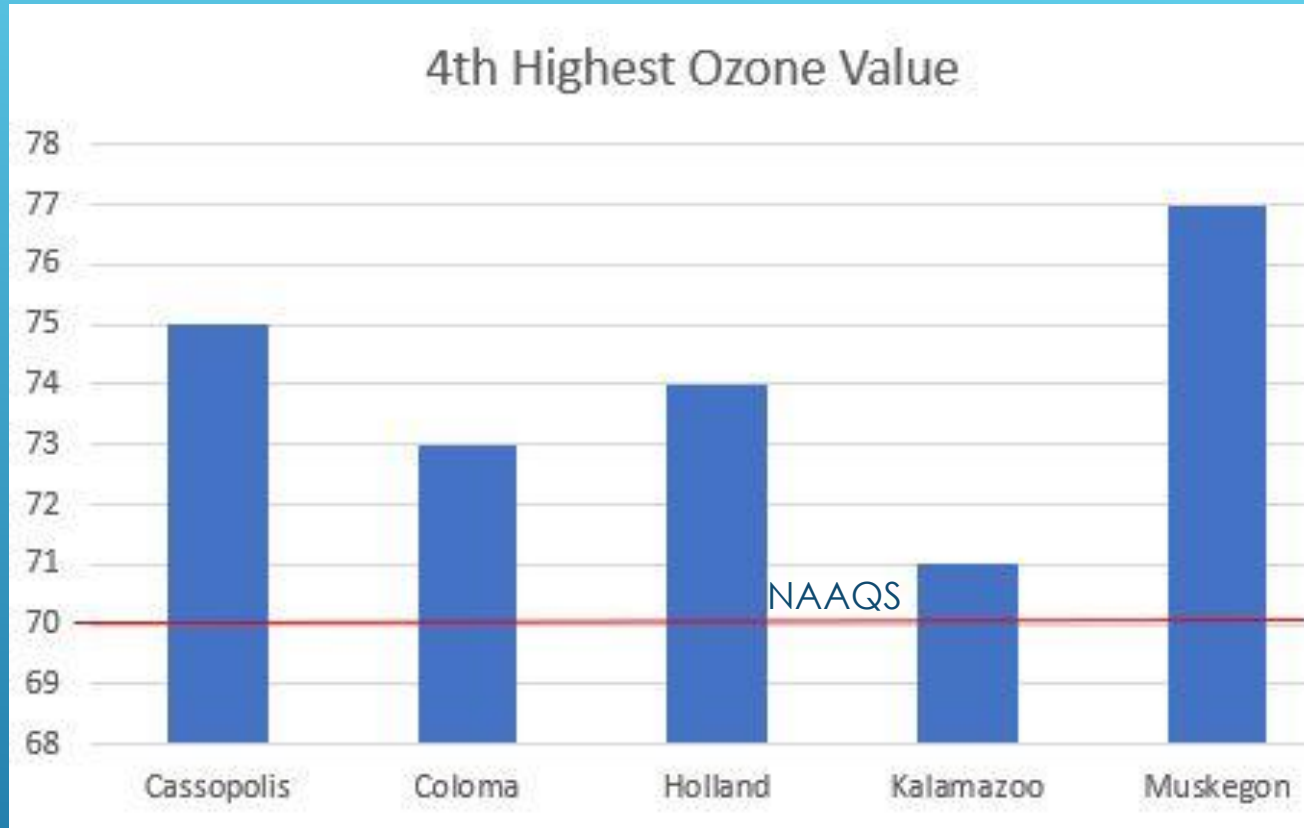
MICHIGAN NONATTAINMENT AREAS



Source: MDEQ Monitor Data

Unless the next two years are unusually cool, these areas will likely be “bumped up” to moderate – which has additional requirements

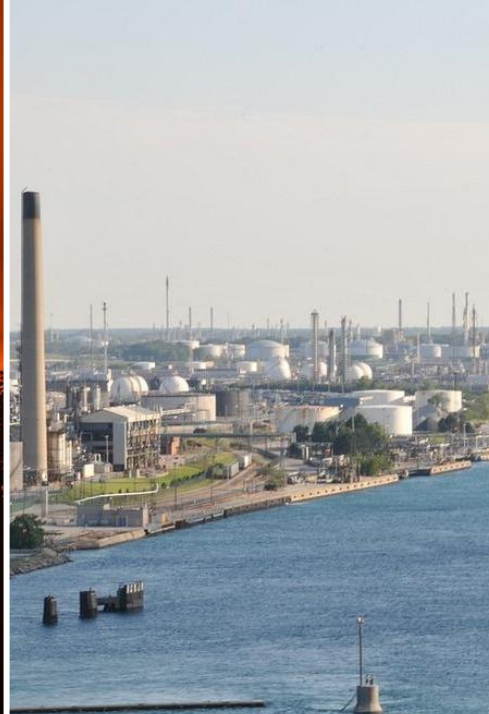
SUMMER WAS A LITTLE HARSH IN SE MICHIGAN...



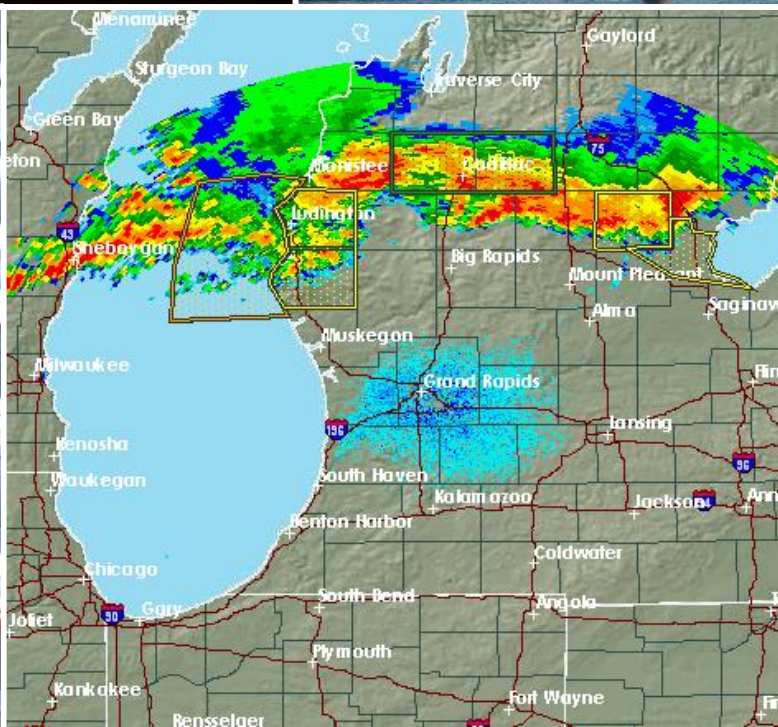
Source: MDEQ Monitor Data

Western
Michigan will
also likely be
“bumped up”

AND IN WESTERN MICHIGAN...



- ▶ Meteorology
- ▶ Wildfires
- ▶ Transport from Canada
- ▶ Emissions



FACTORS INFLUENCING OZONE IN SE MICHIGAN

But keep in mind...

- ▶ Is “do nothing” really an option?
- ▶ Rulemaking in Michigan is not “swift”
- ▶ There could be extenuating circumstances
- ▶ It’s really close...



Additional Rulemaking for:

- ▶ Consumer product rules
- ▶ Architectural and industrial coatings

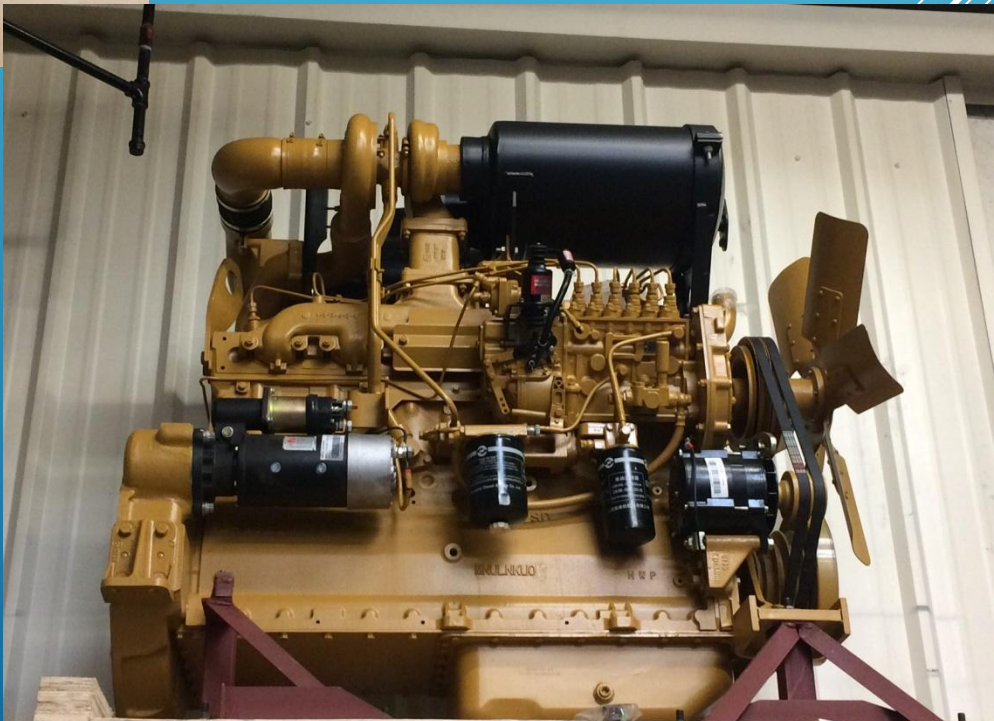


VOC RACT for:

- ▶ Solvents, degreasers and adhesives
- ▶ Coatings – metal parts, plastic parts, automotive
- ▶ Storage

NOx RACT for:

- ▶ Engines and boilers



OPTIONS



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Nonattainment Permitting Basics

Steve Zervas
Managing Consultant

Lansing, Michigan
November 8, 2018



Introduction

Contact Information

Steve Zervas

Managing Consultant

Office: 734.224.6600

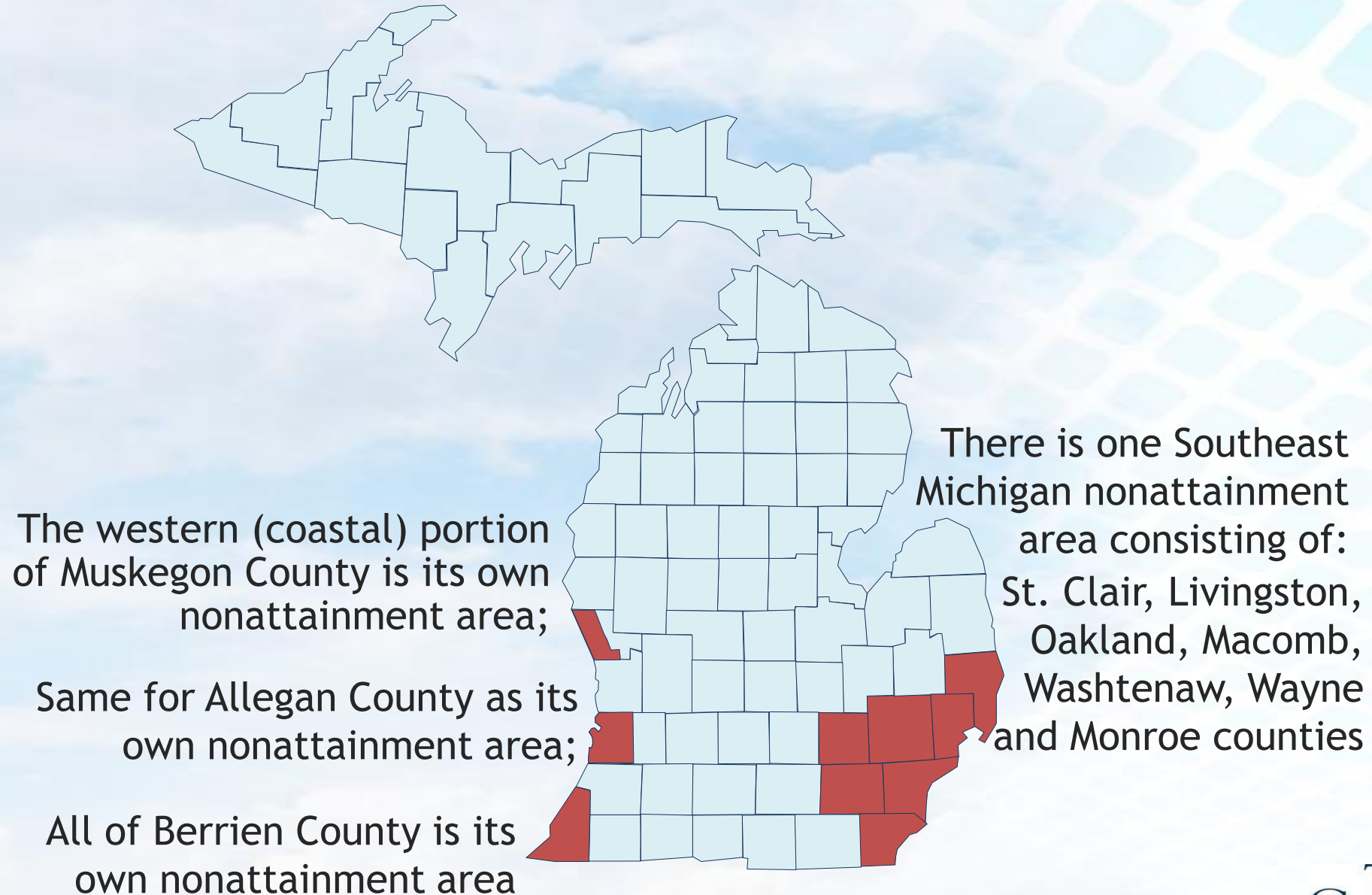
Cell: 734.474.7709

szervas@trinityconsultants.com

Nonattainment Areas

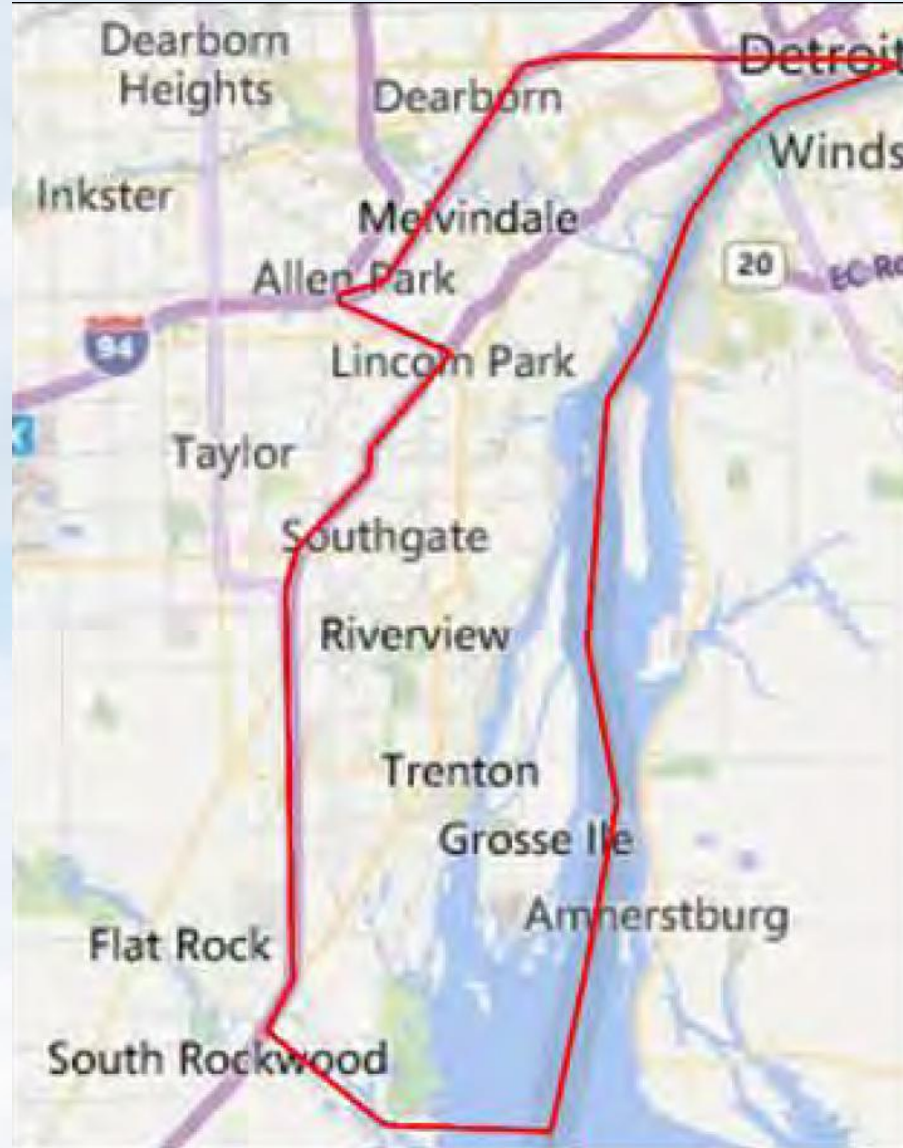
- > Nonattainment areas are areas where modeled or monitored violations of the NAAQS exist
- > Attainment and nonattainment designations are made by the USEPA and are published in 40 CFR Part 81
- > Comprehensive nonattainment areas listing: www.epa.gov/airprogm/oar/oaqps/greenbk/

Michigan Ozone Nonattainment Areas



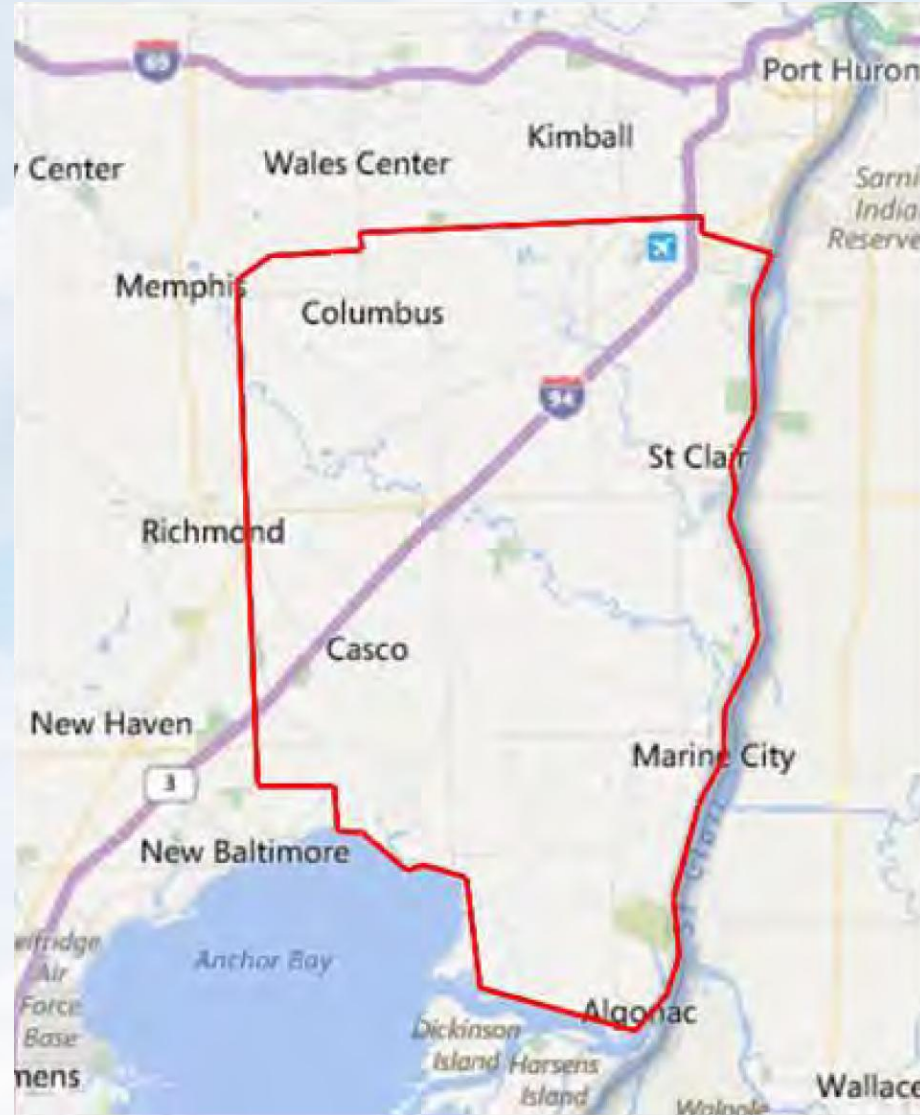
Michigan SO₂ Nonattainment Areas

(Wayne County)



Michigan SO₂ Nonattainment Areas

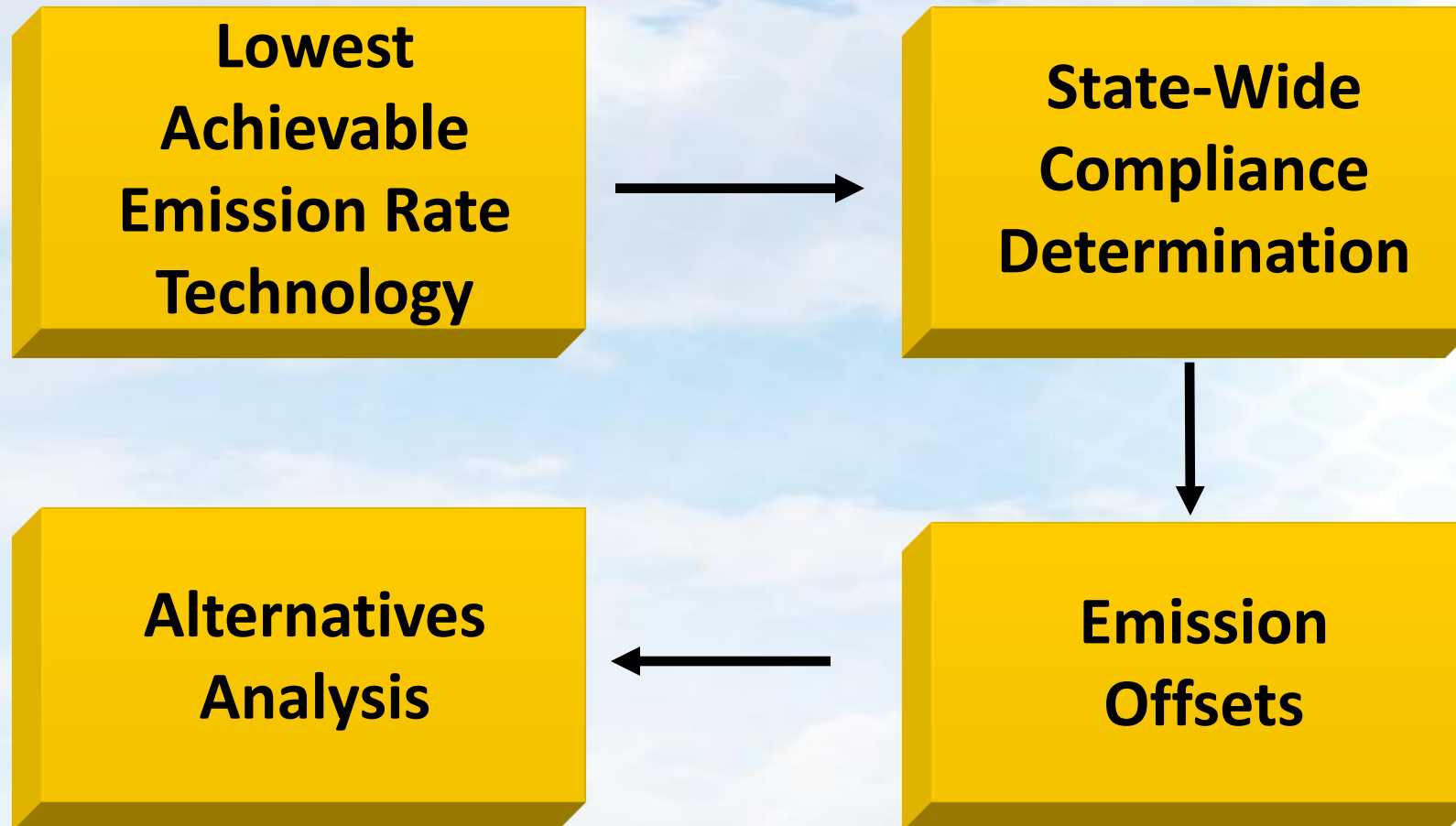
(St. Clair County)



Nonattainment Area Permitting

- > Like PSD, Nonattainment NSR applies to:
 - ❖ New major sources, or
 - ❖ Major modifications at existing major sources
- > Major Source and Major Modification are defined the nonattainment pollutant(s)
 - ◆ Source can be major for a nonattainment pollutant and minor for attainment pollutants
 - ◆ Vice versa

Nonattainment NSR Requirements



What is LAER?

- > Most stringent emission limitation in any state's SIP or a limit any facility has to comply with (i.e., achieved in practice)
 - ❖ Irrespective of cost
 - ❖ See R 336.2901(r) for exact definition
- > *“If any other Source meets that limit, you have to meet it, or beat it”*

How Do I Do LAER?

- > Search EPA's RACT/BACT/LAER Database
- > Search Individual State SIPs
- > Search Individual Site Permits

WHAT AM I LOOKING FOR?

- > The most stringent limit for the same or similar type of emission unit

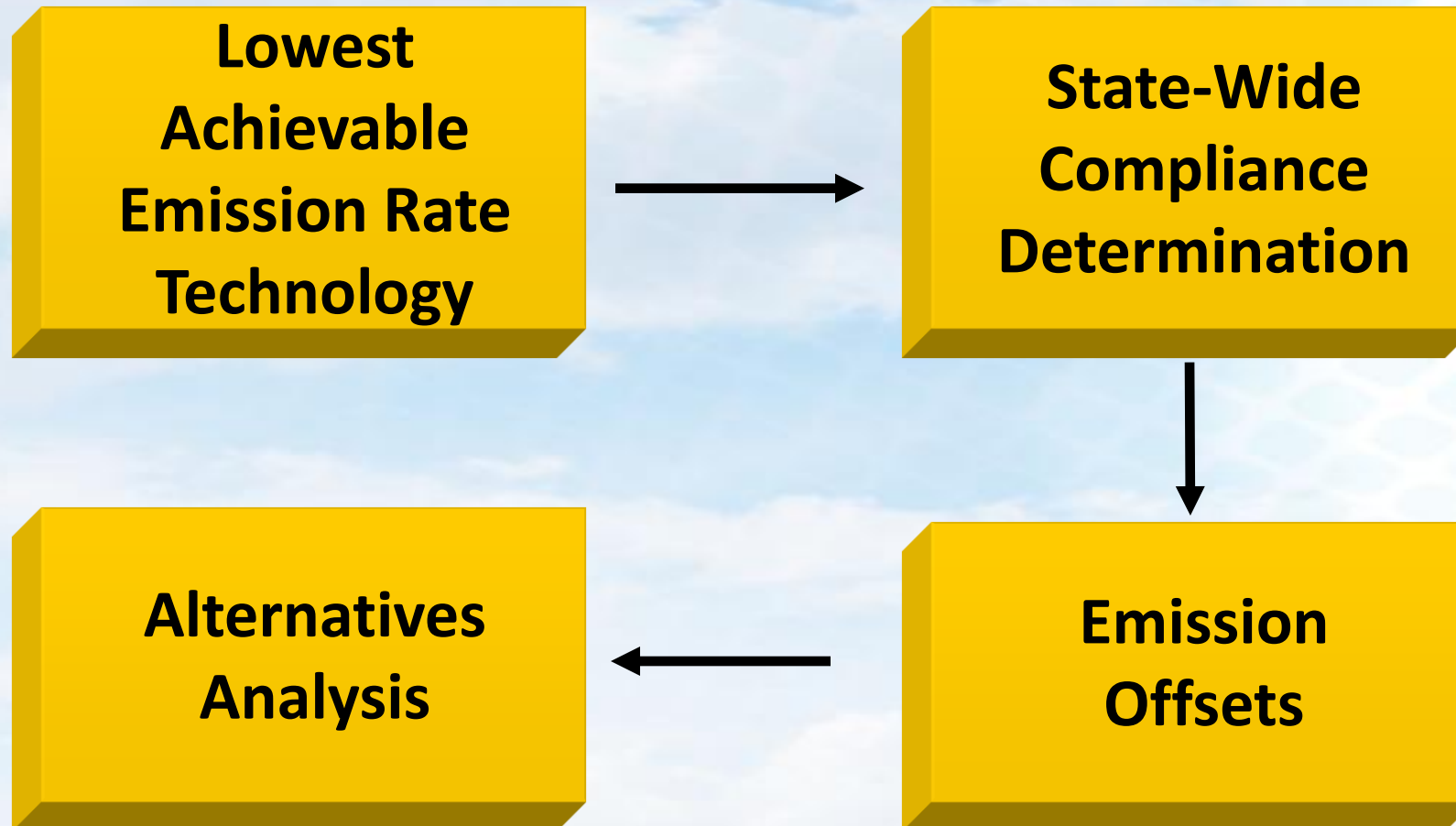
LAER is NOT a Technology

- > LAER is the emission rate that can be achieved by any or all of the following:
 - ❖ Add-on control technology
 - ❖ Process changes
 - ❖ Changes in raw materials
- > In some cases, LAER can be a work practice

Cost is Not a Factor in LAER

- > There is no ability to use economic, energy, or other environmental factors to disqualify an emission limit from becoming LAER.
- > If someone has had to meet it, so do you
- > One exception is if you can show:
“No plant in industry could bear the costs of such technology”

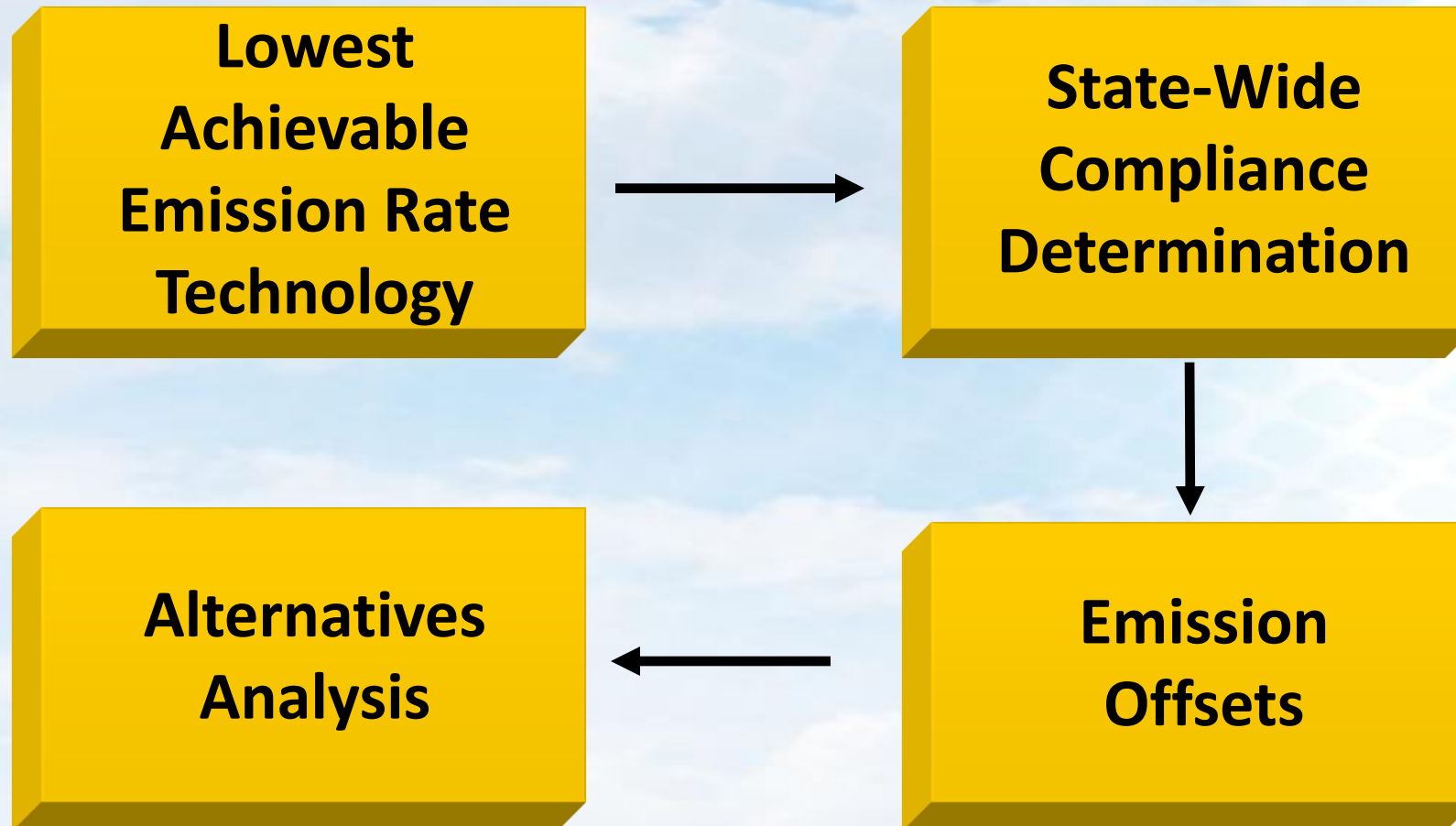
Nonattainment NSR Requirements



Statewide Compliance

- > Demonstrate that all other major sources under common control in Michigan are in compliance (or on enforceable schedule to achieve compliance) with all state and federal emission limitations and standards
- > This can be the cause of significant delays in permitting (waiting for other facilities to resolve non-compliance)

Nonattainment NSR Requirements



Emission Offsets

- > Emission offsets are decreases in actual emissions that make room for increases such that there is a net zero increase, or a decrease, in emissions in the nonattainment area
- > Emission offsets must be:
 - ❖ Surplus - based on a reduction beyond what is required by any regulatory requirement
 - ❖ Permanent - obtained from shutdown equipment or made permanent by permit condition
 - ❖ Quantifiable - can be accurately measured
 - ❖ Federally Enforceable - enforceable as a practical matter (see Rule 205 requirements)

Emission Offsets

- > Emission increases must be offset with actual reductions in the same nonattainment area
 - ❖ Adjacent nonattainment areas can also be a source of offsets if they are of equal or higher classification
 - ❖ There are no such adjacent nonattainment areas in Michigan
- > How do I find offsets?
 - ❖ Good question. MDEQ does not keep a registry of available offsets
 - ❖ Talk to folks that would know: your MDEQ inspector, your consultant, AQD permit section staff

Emission Offsets - SO₂ & Ozone

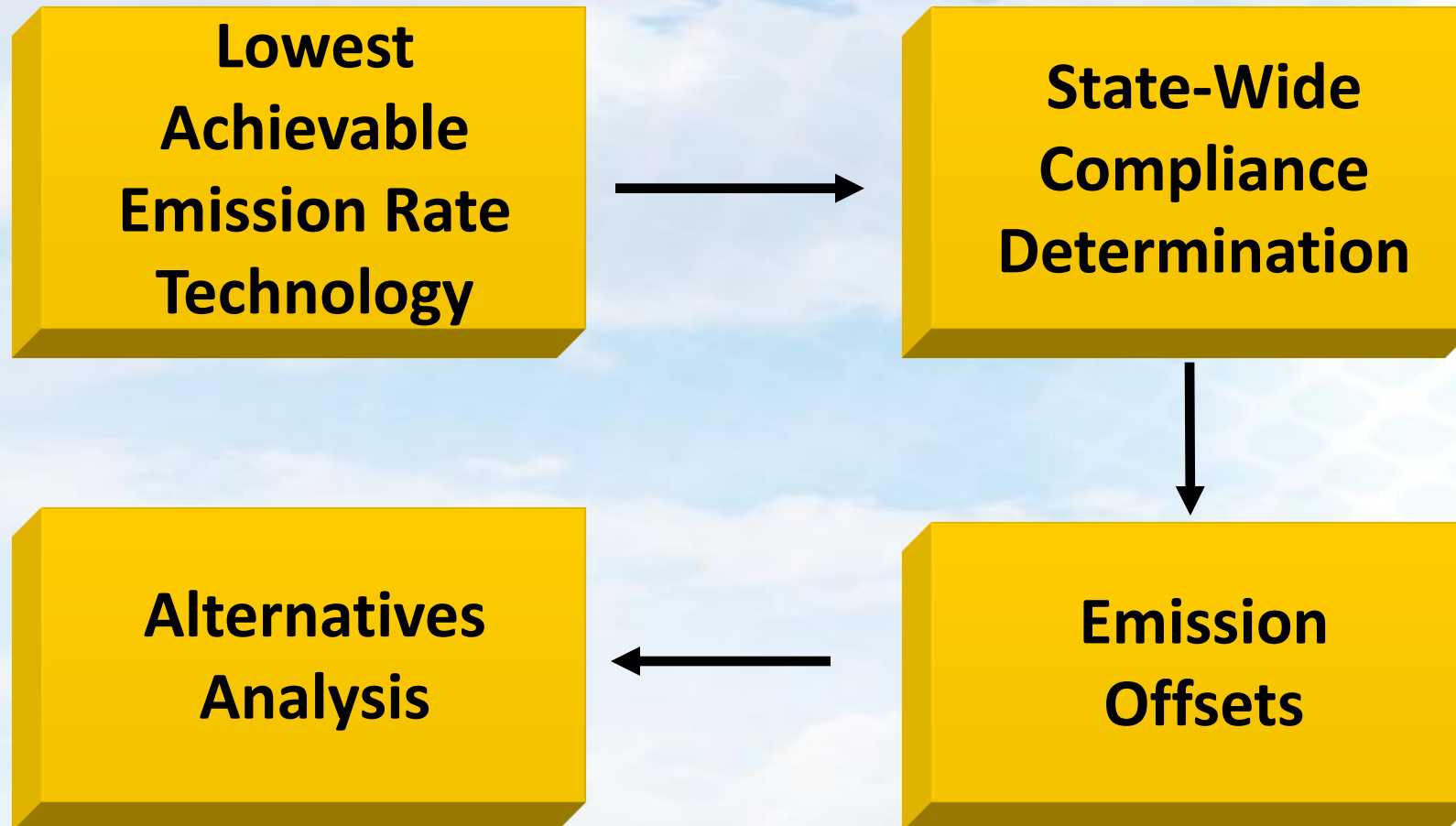
- > For SO₂, offsets must equal or exceed the increase (i.e., be at least 1:1)
- > For Ozone, the ratio depends on the area classification:

<i>Classification</i>	<i>Ratio (VOC or NO_x)</i>
Marginal	←.....→ 1.10 to 1
Moderate	←.....→ 1.15 to 1
Serious	←.....→ 1.2 to 1
Severe	←.....→ 1.3 to 1

Emission Offsets

- > When do I have to have them?
 - ❖ The emission reductions generating offsets must be made by the time the new source or modification commences OPERATION
 - ❖ In the past, MDEQ has allowed concurrent ramp-up/ramp-down by permit condition

Nonattainment NSR Requirements



Alternatives Analysis

- > Applicant must consider alternatives to executing the desired project in the nonattainment area
 - ❖ Sites
 - ❖ Size
 - ❖ Production processes
 - ❖ Control techniques
- > Do the benefits of locating in this nonattainment **SIGNIFICANTLY** outweigh the environmental and social costs of the project?
- > Sometimes this can be the biggest obstacle to obtaining a nonattainment permit

NSR Avoidance

Opportunities to Avoid Burdensome Requirements

- > Can you scale back the magnitude of the production increase you are asking for? Have you asked for a 30% production increase when 15% increase is enough?
- > Can you volunteer less effective, less expensive, controls to avoid the cost of LAER level controls? (e.g., install low-NOX burners to avoid SCR)
- > Such choices can keep your Project from NSR applicability
- > Such avoidance will require enforceable permit limits
- > **Caution! Once an enforceable limit is in place, relaxing that limit can be considered a NSR trigger**

Contact Information

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SE MICHIGAN OZONE NON-ATTAINMENT: WHAT DOES IT MEAN?

NOVEMBER 8, 2018

Kim Essenmacher, CHMM
Staff Environmental Engineer
GM Sustainable Workplaces – Air Compliance



GENERAL MOTORS

CHALLENGES OF NSR AIR PERMITTING

LAER – Lowest Achievable Emission Rate

- The most stringent emission limitation based on either:
 - 1) Most stringent emission limitation achieved in practice by class or source category (w/o taking into account economic, energy or other environmental factors, OR
 - 2) Most stringent limitation in any SIP or that class or source category

Required Emission Offsets

- The offset provision shifts the burden of accommodating new growth in nonattainment areas to new sources
- Lack of Offset or Offset Bank Availability

CHALLENGES OF NSR AIR PERMITTING

A company must certify all major operations owned by the source in the state are in compliance with the SIP

Potentially longer permit processing time

Company decision impacts for new projects

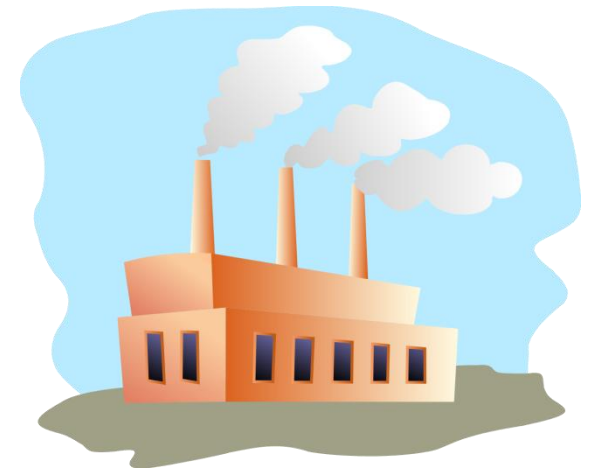


WHAT CAN WE ALL DO?

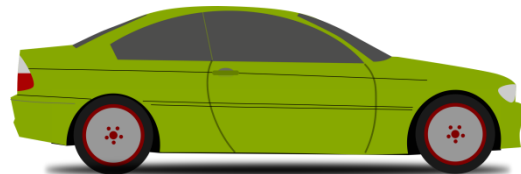


**Review Inventory
Data and Validate
Accuracy to State
Database (MAERS)**

**Verify Correct Source
Category for your
Industrial Sector**



GENERAL MOTORS



WHAT CAN WE ALL DO?



**Compare Current Actual
Emission Rate(s) to
Industrial RACT
Standard**

**Communicate to the
MDEQ-AQD**



WHAT CAN WE ALL DO

Work towards beneficial RACT rule updates

Develop arguments to avoid the bump up from marginal to moderate

Benchmark other states that have history of addressing nonattainment

QUESTIONS?

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WASTE TRACK

PFAS 201 Panel Discussion

Fall Joint Environmental Conference

Kurt Brauer (Partner, Warner Norcross + Judd)
Jim Cai (Senior Project Manager, GZA)
Tracy Kecskemeti (MDEQ, District Supervisor,
SE Michigan District Office)

11.8.18



Warner Norcross + Judd

First, the Disclaimers . . .

1. We are not dispensing legal or consulting advice.
2. We will not talk about specific client matters, unless authorized.
3. Any observations we make or opinions we express are our own, and are not an official position of our respective organizations, unless otherwise noted.

The State of the Regulatory Environment May Seem....



Working Together to Make it Look More Like This:



But, Hey, Haven't We Been Here Before?

- PCBs
- 1,4 Dioxane
- Dioxin
- Asbestos



Some Background: What are PFAS?

- Per- and polyfluoroalkyl Substances (PFAS)
- ATSDR Fact Sheet:
https://www.atsdr.cdc.gov/pfc/docs/pfas_fact_sheet.pdf
- 478 PFAS chemical reported to EPA. More like 4,000+ individual compounds. It is a very large family.
- 2 currently “regulated” in Michigan (PFOA and PFOS)
- MDEQ gathering information on 24 compounds

Some Background: What are PFAS? (cont.)

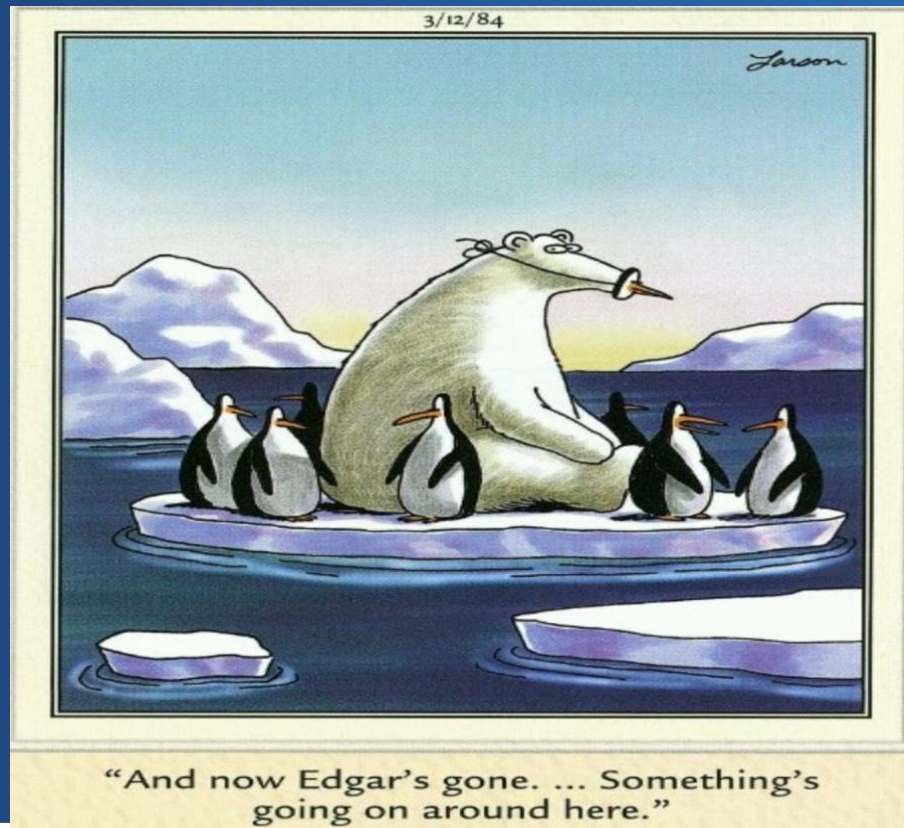
- 3M started producing PFAS in 1947
 - A lot of time went by
 - Concerns focus on potential toxicity, persistence and bio-accumulative properties

What Have PFASs Been Used For?

Lots of stuff:

- Aqueous Film-Forming Foam (“AFFF”)
- Plating Industry (Fume Suppressant)
 - Meet Chrome VI MACT
- Water and Stain Resistance
 - Carpets, paper, clothing, cardboard, non-stick pans
- Coatings, Surfactants and Lubricants
- Cosmetics, Lotions and Sunscreen

Polar Bears and Penguins . . .



So, This Stuff Isn't Available Anymore, Right?

Wrong. PFOS voluntarily phased out in the US:

- PFOA no longer manufactured in the US
- PFOS and PFOA are currently produced in Italy, China and Germany (and perhaps other places)
- PFAS compounds can be created due to the presence of precursors
- Persistent in the Environment
- Imported Goods/Contamination

So Figuring Out Where PFAS Are Is a Breeze?



In a Manner of Speaking . . .



PFAS Properties, Fate and Transport, Remediation

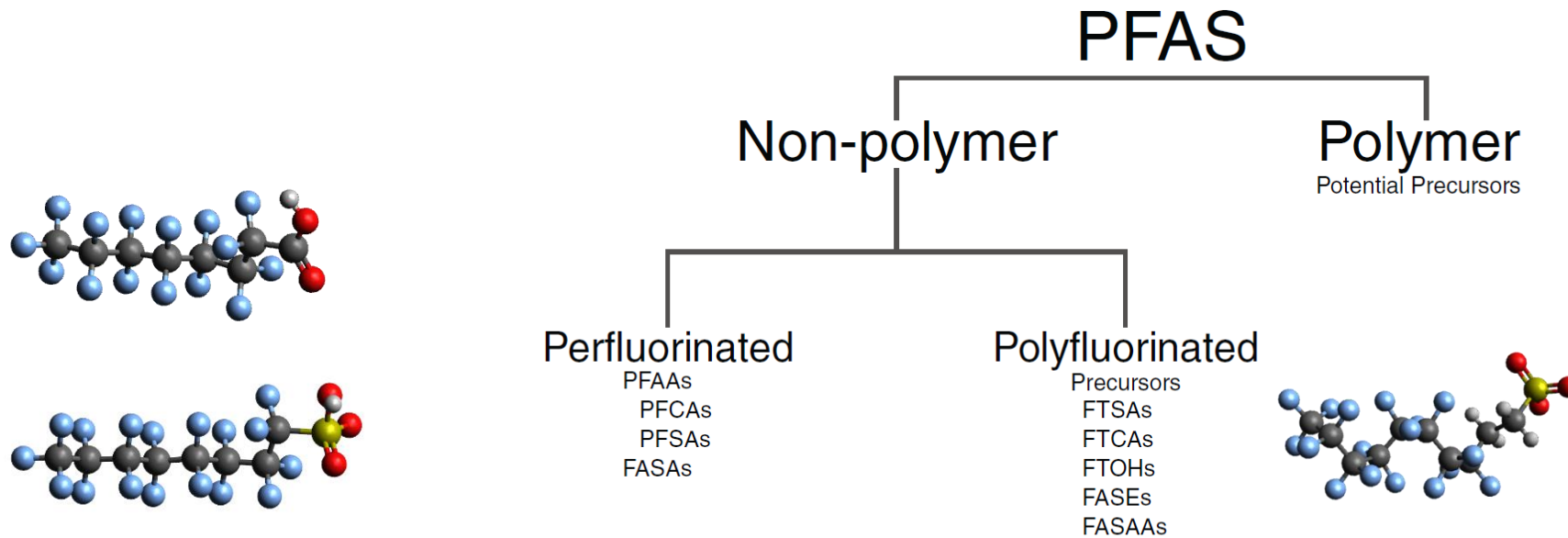
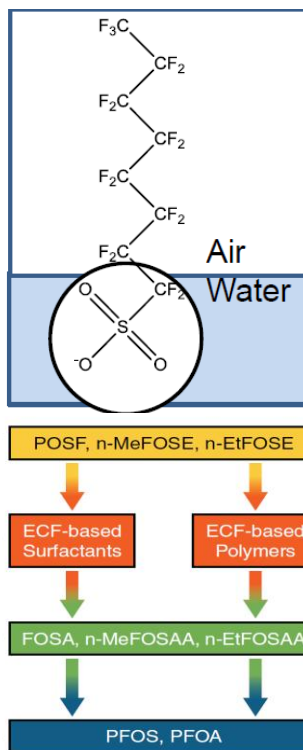
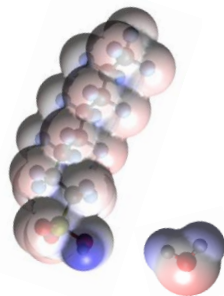
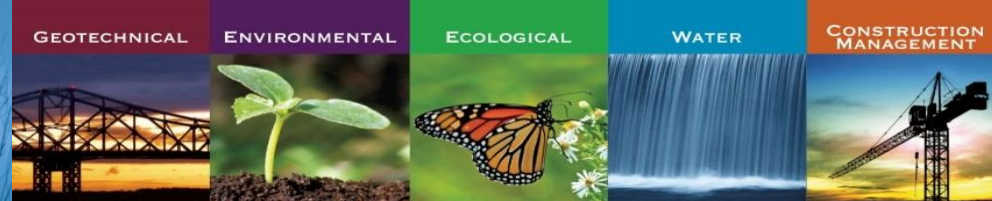


Figure 2-1. Summary of PFAS families

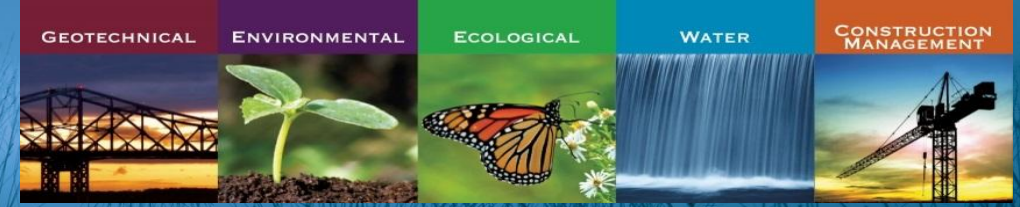
Properties, Fate and Transport



- Stable C-F Bond;
- Dual Nature: Hydrophobic, lipophobic tails; Adding hydrophilic head groups -> Hydrophilic; Micelle;
- Chain Length affect solubility, volatility, sorption and other physiochemical properties;
- pH and electrostatic interaction with soil;
- Mobility: Low sorption of some PFAS poses challenge for sorption based remedial technologies;
- Commingling with other hydrocarbon surfactants.
- So many PFAS create challenges to analysis and characterization;
- Low VP: SVE/Air Sparging not viable;
- Precursors degraded to stable PFCAs/PFSAs – Biological Funneling;

Based on NGWA, 2017, ITRC 2017/2018

Sampling Protocol



Personal Detox 48 Hours Prior to Sampling

- 1 – Clothes “laundered”
- 2 – No fast food consumption



Day of Sampling

- 1 – No cosmetics or personal care items
- 2 – Baby sunscreen (Unscented Titanium) and specific brand of bug repellent (e.g. Deep Off, Herbal Armor)
- 3 – Untreated clothing only

Field Equipment Highlights

- 1 – No waterproof paper
- 2 – Only ball point pens
- 3 – Only aluminum clipboard
- 4 – Absolutely no Teflon in equipment
- 5 – Only use real ice, no packs or gel-based



Clean Hands / Dirty Hands

Dirty Hands does all of the equipment hauling, faucets, outside of coolers, note taking, etc.



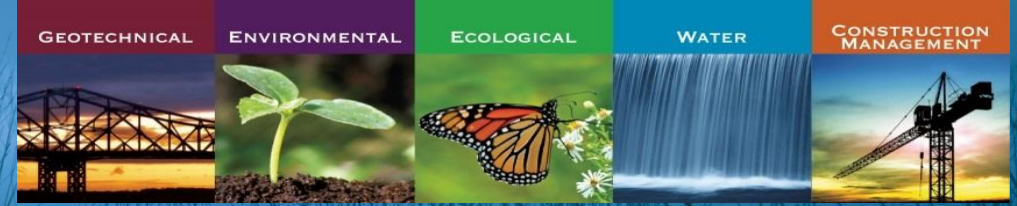
Clean Hands essentially only touches the sample bottles, labels, and inside coolers.



Gloves are changed between every action, task, or touching of new items.



Soil Remediation Technologies



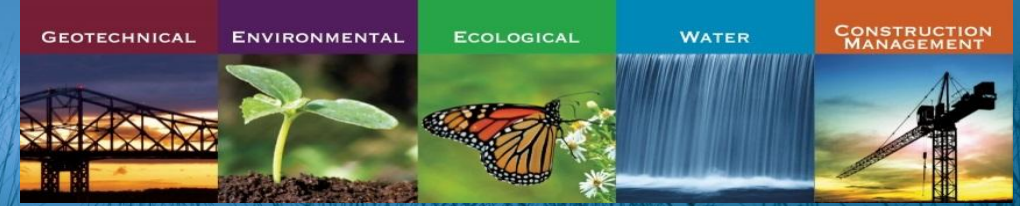
Field Implemented Technologies:

- ❖ In Situ Sorption and Stabilization with carbon-based or minerals-based amendments (e.g. RemBind)
- ❖ Excavation and Disposal (Landfill or Incinerator)

Limited Application or Developing Technologies:

- ❖ Thermal Treatment/Destruction – High temperature to vaporize and capture for destruction. Requires high temperature to destroy ($>1,000\text{ }^{\circ}\text{C}$) (Hawley et al., 2012)

Groundwater Remedial Technologies



Field Implemented Technologies:

- ❖ Activated carbon
- ❖ Ion exchange resins
- ❖ Reverse osmosis

Limited Application or Developing Technologies:

- ❖ Sorption: Colloidal Activated Carbon; Coated Sand; Zeolites/Clay Minerals; Biochar.
- ❖ Precipitation/Coagulation/Flocculation.
- ❖ Nanofiltration.
- ❖ Ozone-Fractionation; In-Situ Foam Fractionation.
- ❖ Oxidation: Ozone-Based; Catalyzed Hydrogen Peroxide; Activated Persulfate; Sonolysis; Photolysis; Electrochemical Treatment; Plasma.
- ❖ Advanced Reduction: Solvated Electrons; Doped ZVI; Alkaline Metal Reduction.
- ❖ Biodegradation.
- ❖ High Energy Electron Beam.

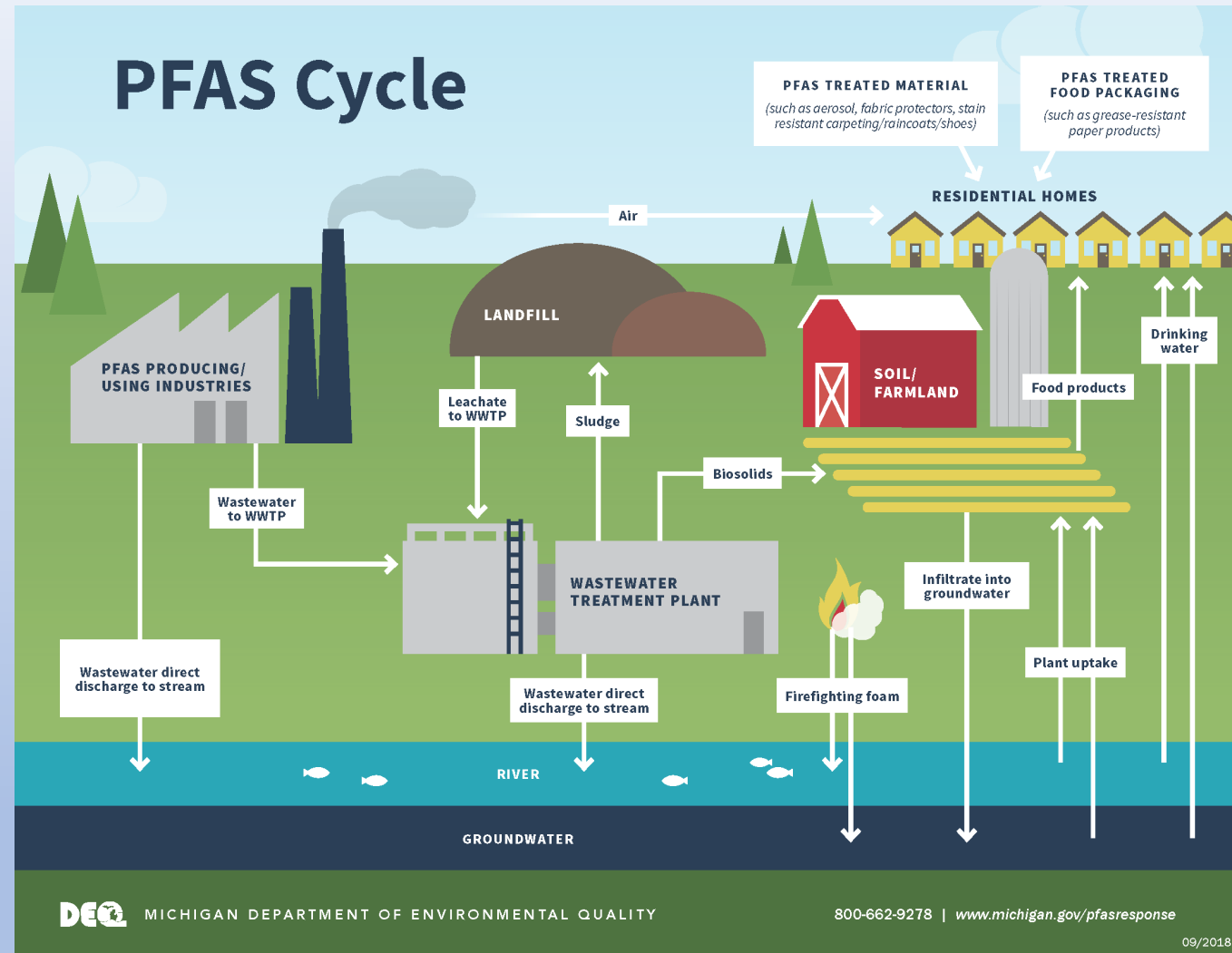
Point-of-Use Filters



- Only certified treatment, note removal certification for PFOA/PFOS only
- Six manufacturers, 68 models
- Includes GAC and RO units
 - RO “recycles” the PFOS/PFOA
- Both countertop and permeant install/tap



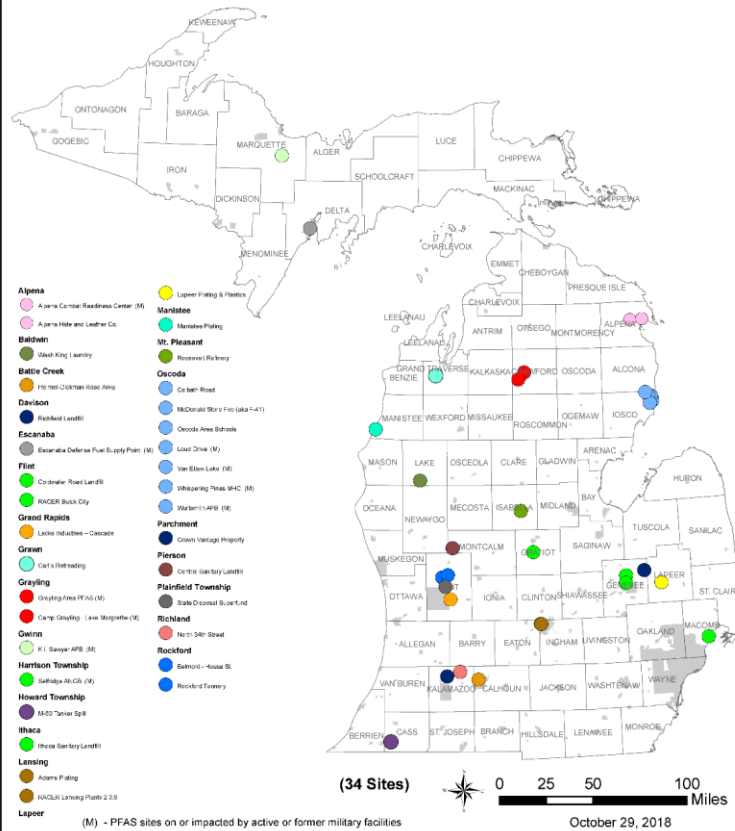
PFAS Cycle



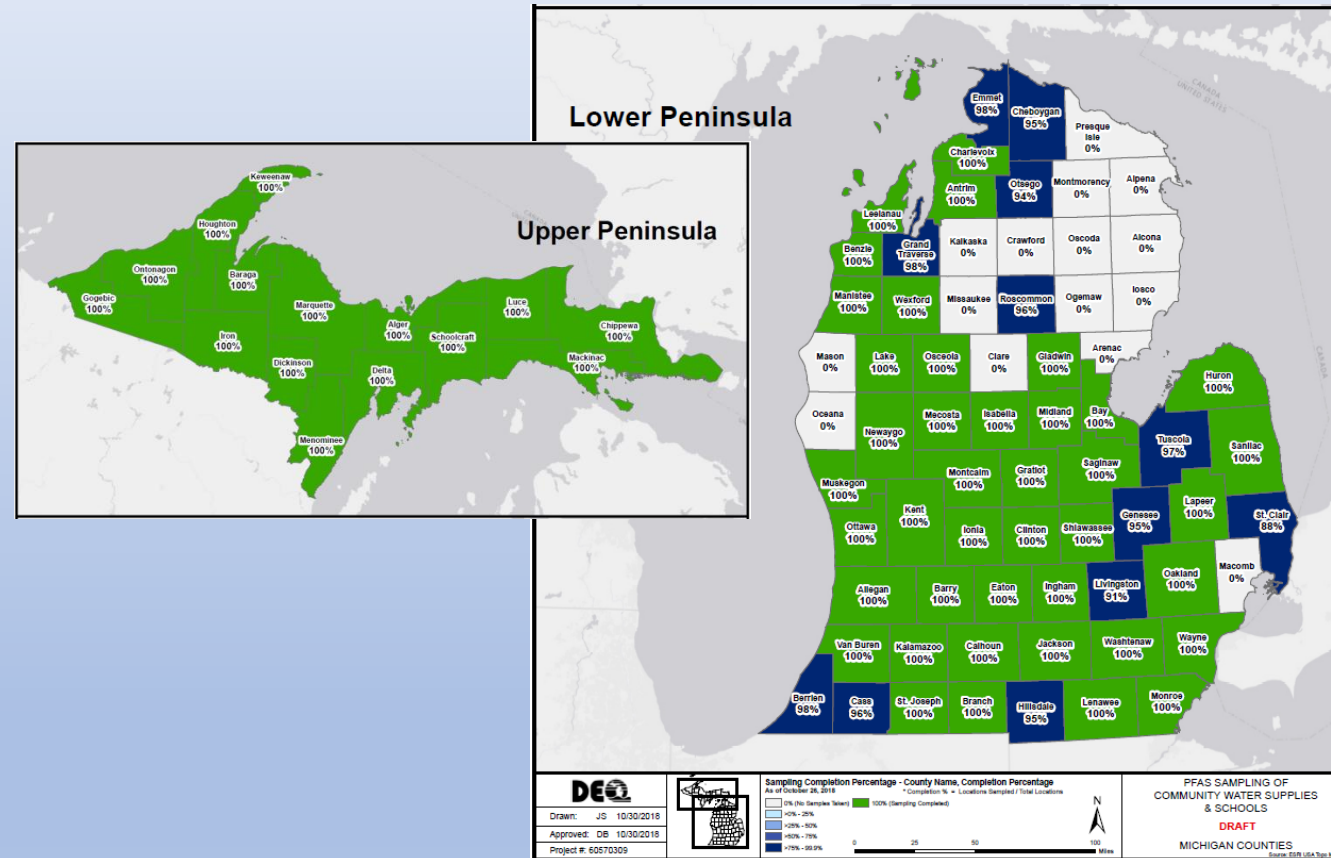


Michigan Department of
Environmental Quality

Michigan PFAS Sites Being Investigated



Public Drinking Water Testing



PWS Testing Progress

(as of 10/26/18)

	Overall Number of Supplies	Supplies with Samples Collected	% Supplies with Samples Collected (not results received)	Supplies with Results Received	% of Supplies with Results Received	Non-Detect Total PFAS	< 10 ppt Total PFAS (Not ND)	10 – 70 ppt PFOS/PFOA (> 10 ppt Total PFAS)	> 70ppt PFOS/PFOA
Community Water Supplies	1,111	988	89%	746	76%	661	64	20	1
Schools on Wells	460	391	85%	315	81%	287	14	14	0
Tribes	16	14	88%	6	43%	6	0	0	0
Total	1,587	1,393	88%	1,067	77%	954	78	34	1
				As of October 26, 2018; there is a 1 week lag		89.4%	7.3%	3.2%	0.1%

michigan.gov/pfasresponse/0,9038,7-365-86512_88987_88989-481104--,00.html

Michigan.gov

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PFAS RESPONSE

TAKING ACTION, PROTECTING MICHIGAN

HEALTHTESTING AND TREATMENTMICHIGAN PFAS SITESFISH AND WILDLIFEFIREFIGHTING FOAMABOUT MPART

PFAS RESPONSE / FISH AND WILDLIFE

Consumption guidelines for fish with elevated PFOS levels

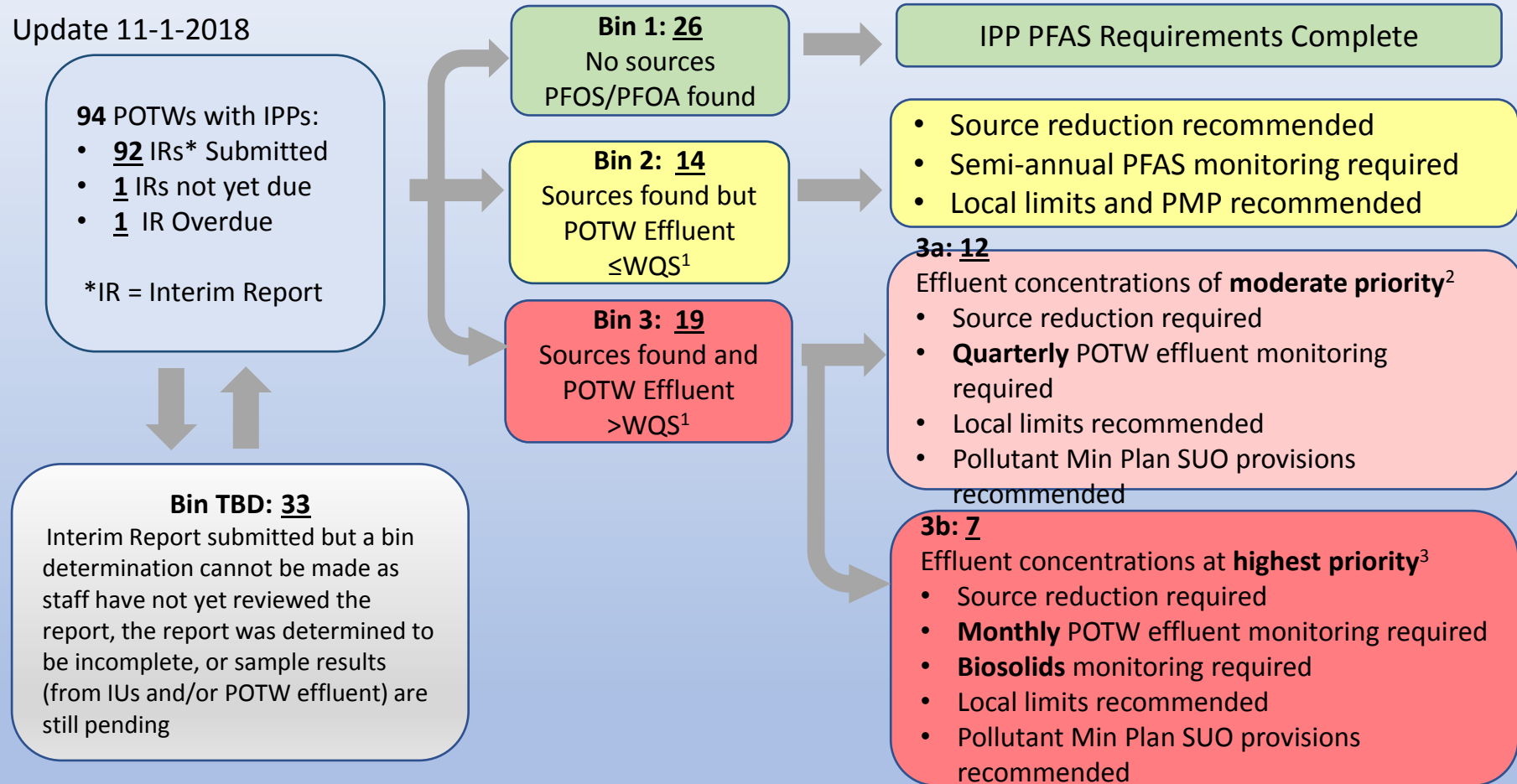
EAT SAFE FISH GUIDELINES

Eat Safe Fish Guidelines

Region	County	Water body	Type of Fish	Chemical of Concern	Size of Fish (length in inches)	MI Servings per Month
Northeast	Crawford	Lake Margrethe	Bluegill	PFOS	Any	8
Northeast	Crawford	Lake Margrethe	Sunfish	PFOS	Any	8
Northeast	Iosco	Allen Lake	All Other Species (MDHHS also has issued guidelines for bluegill & sunfish and largemouth & smallmouth bass due to mercury.)	PFOS	Any	Do Not Eat
Northeast	Iosco	Au Sable River (downstream of the Foote Dam; includes Van Etten Creek)	Bluegill	PFOS	Any	Do Not Eat
Northeast	Iosco	Au Sable River (downstream of the Foote Dam; includes Van Etten Creek)	Largemouth Bass	PFOS	Any	Do Not Eat

IPP PFAS Initiative Status

Update 11-1-2018



MI Standards

Media	Standard	Compound	Concentration	Statute	Enforceable or Recommended	Effective or Proposed	Established Date	Process for Establishing
Drinking Water	Lifetime Health Advisory	PFOA + PFOS	70 PPT		R	E	May 2016	EPA published
Surface Water	Water Quality Standards	PFOA (DW Source)	420 PPT	Part 31	E	E	May 2011	Rule 57, calculate and publish
		PFOA	12,000 PPT	Part 31	E	E	May 2011	Rule 57, calculate and publish
		PFOS (DW Source)	11 PPT	Part 31	E	E	March 2014	Rule 57, calculate and publish
		PFOS	12 PPT	Part 31	E	E	March 2014	Rule 57, calculate and publish
Groundwater	Drinking water cleanup criteria	PFOA + PFOS	70 PPT	Part 201	E	E	January 2014	Adopted by rule
	GSI	PFOA (DW Source)	420 PPT	Part 201	E	E	May 2011	Adopted by statute
		PFOA	12,000 PPT	Part 201	E	E	May 2011	Adopted by statute
		PFOS (DW Source)	11 PPT	Part 201	E	E	March 2014	Adopted by statute
		PFOS	12 PPT	Part 201	E	E	March 2014	Adopted by statute
Soil	Soil criteria protective of GSI	PFOA	10,000 µg/kg	Part 201	E	E	June 2018	Calculated and published
		PFOS	0.24 µg/kg	Part 201	E	E	June 2018	Calculated and published
	Soil criteria protective of drinking water	PFOA	59 µg/kg	Part 201	E	P		Calculate and publish
		PFOS	1.4 µg/kg	Part 201	E	P		Calculate and publish
	Soil direct contact criteria	PFOA	2,100 µg/kg	Part 201	E	P		Calculate and publish
		PFOS	2,100 µg/kg	Part 201	E	P		Calculate and publish
Air	Initial Threshold Screening Levels	PFOA	0.07 µg/m3	Part 55			February 2018	Calculate, 60 day comment, publish
		PFOS	0.07 µg/m3	Part 55	E	E	February 2018	Calculate, 60 day comment, publish
					E	E		

PFAS Response - PFAS F

michigan.gov/pfasresponse

Michigan.gov

FAQSNEWS AND EDUCATIONCONTACT MPARTSEARCH

PFAS RESPONSE

TAKING ACTION, PROTECTING MICHIGAN

HEALTHTESTING AND TREATMENTMICHIGAN PFAS SITESFISH AND WILDLIFEFIREFIGHTING FOAMABOUT MPART

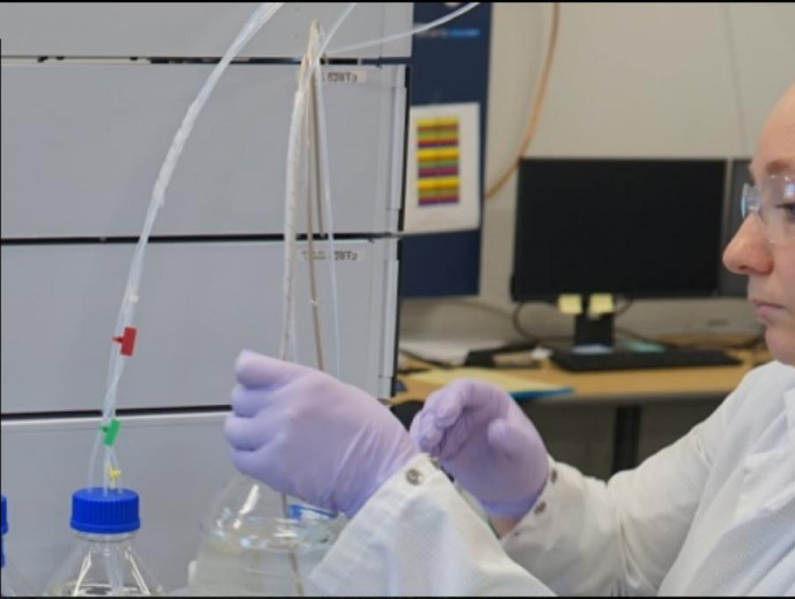
TAKING ACTION TO PROTECT THE PUBLIC'S WATER

Perfluoroalkyl and polyfluoroalkyl substances (PFAS), such as perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), are part of a group of chemicals used globally during the past century in manufacturing, firefighting and thousands of common household and other consumer products.

In recent years, experts have become increasingly concerned by the potential effects of high concentrations of PFAS on human health.


Although there is more to learn about PFAS and human health, the State of Michigan takes this issue seriously and is one of the first states in the nation to establish a clean-up standard for PFAS in groundwater used for drinking water.

Launched in 2017, the Michigan PFAS Action Response Team (MPART) is the first



11:22 PM10/29/2018

Type here to search





Who Regulates PFAS? (International)

- **Internationally-European Union**
 - REACH-regulated PFOS starting in 2006 for finished and semi-finished products. 2010 limits are 10 ppm.
 - REACH-PFOA compounds restricted starting in 2020
 - Individual Countries: Sweden, Denmark, Australia, Canada

Who Regulates PFAS?

- **Federal**
 - Clean Air Act:
 - EPA Phased Out PFOS in Fume Suppressants (2015)
 - Further Phase-Out if Feasible Alternatives Exist
 - Watch for regulations to be developed
 - Safe Drinking Water Act (No Enforceable MCLs)
 - PFOA/PFOS Drinking Water *Life Time Healthy Advisory* 70 ppt
 - Unregulated Contaminant Monitoring Rule (UCMR 3)

Federal (cont.)

- 2016 TSCA (Lautenberg) Amendment: Prioritization?
 - Significant New Use Rules (“SNUR”)
- RCRA: Substantial Endangerment
- CERCLA: Not a Listed Hazardous Substance
 - Pollutants or Contaminants
 - Risk-Based Cleanups/Protective of Human Health and Environment
 - 106 Unilateral Administrative Orders

Who Regulates PFAS (State)

- **Michigan**
 - Cleanup Standards: Part 201 (Groundwater)
 - Drinking Water Criteria: 70 ppt (JJ)(PFOS *plus* PFOA)
 - GSI (PFOA 12 ppb/PFOS 12 ppt)
 - Land Application of Bio-solids
 - DNR: Fish Advisories

Who Regulates PFAS (State)(Cont.)

- **NPDES Permits**
 - Part 4: Water Quality
 - “Toxic substances shall not be present in the surface waters of the state at levels that are or may become injurious to the public health, safety, or welfare, plant and animal life, or the designated uses of the waters.” Rule 57

PFAS Compound	HNV (Non-DW)	HNV (DW)
PFOS	12 ng/L	11 ng/l
PFAS	12,000 ng/L	420 ng/L

Who Regulates PFAS (State)(Cont.)

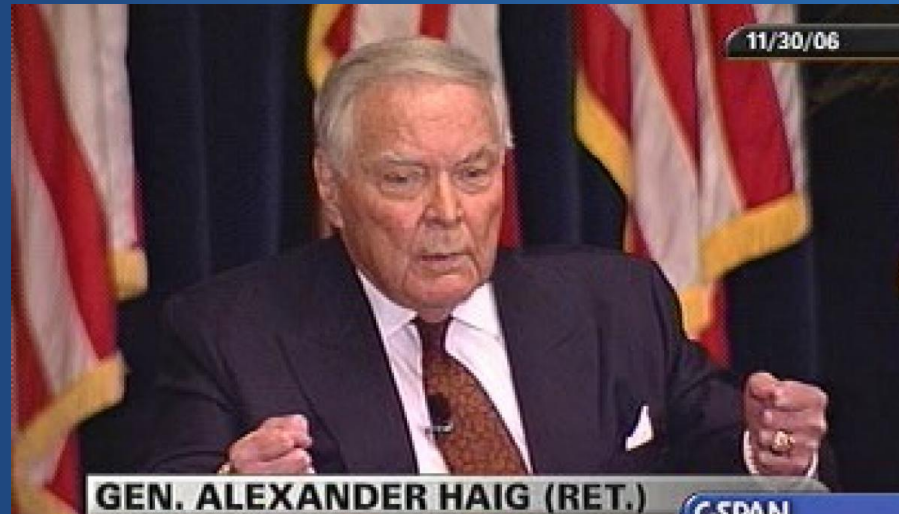
- MDEQ POTW Letter February 20, 2018
 - POTWs Subject to IPP Requirements
 - Current permit requirement
 - Reduce or eliminate sources
 - Determine potential sources
 - April 18, 2018 follow-up letter
- Unintended Consequences and Uncertainty
 - Regulatory Confusion
 - Reliability of Sampling and Analysis
 - Laboratory Capacity
 - Grab or Composite?
 - Uncertainty as to Method
 - Turnaround Times for Samples

(USEPA 537(o), ASTM D7979, DOD isotope dilution, something else?)

Who Regulates PFAS (Local)

Local?

- IPP Programs-Local Limits



Other Legal Issues/Non-Regulatory Actions

- Natural Resource Damages
- Citizen Suits (RCRA “Substantial Endangerment”)
- 90-Day Notice Requirement
 - Diligent Prosecution
 - 106 Unilateral Order Bar
- Common Law Claims
 - Negligence-property damages/physical injury
 - Trespass-contaminants come to be located on property of another
 - Nuisance-Public or Private

Some Concerns for Industry

1. Shut Downs/Supply Chain Interruptions
2. Unforeseable Regulatory Action
3. Additional Compliance/Reporting Obligations
4. Unanticipated Costs of Investigation and Cleanup
5. Indemnity Obligations
6. New Capital Investment or Plant Expansions
7. Risk to Financing and Incentives

Questions?



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Michigan Taking Action on PFAS



CAROL ISAACS JD
Director of MPART
November 8, 2018



Michigan PFAS Action Response Team (MPART)

- Governor Rick Snyder's Executive Directive
 - November 2017
 - Cooperation and coordination among all levels of government
 - Directs implementation of state's action strategy





Federal Advisories and Screening Levels and State Criteria

US EPA

- 2016 Lifetime Health Advisory Level of 70 ppt
 - PFOA and PFOS combined or individually
- No other PFAS Lifetime Health Advisories

ATSDR

- June 2018 Minimal Risk Levels for four PFAS: PFOA, PFOS, PFHxS, and PFNA
- Use to calculate drinking water screening levels

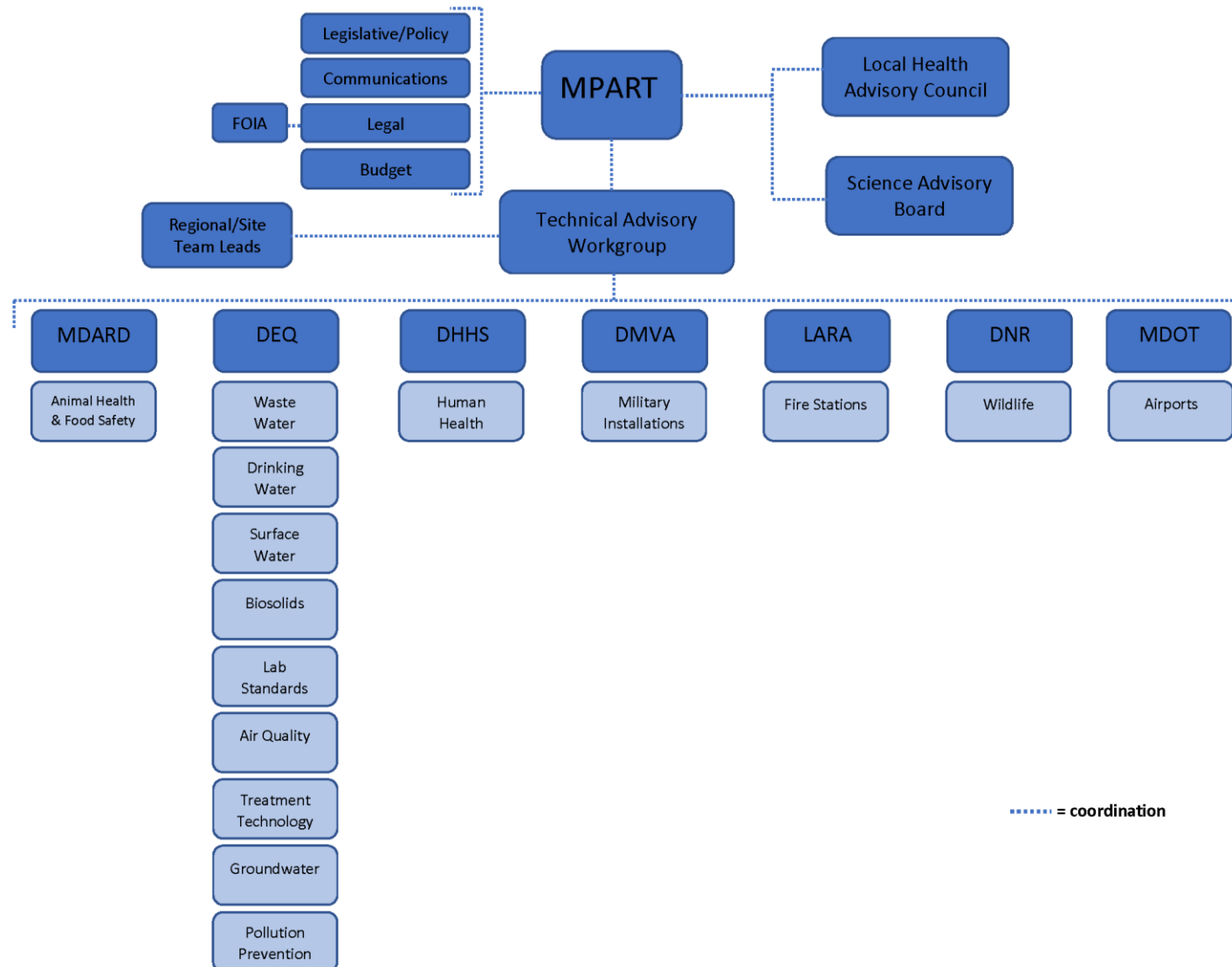
Both are guidance and not enforceable standards or regulations



STANDARDS

- ▶ ATSDR has developed MRL screening values for perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexane sulfonic acid (PFHxS) and perfluorononanoic acid (PFNA) that can be converted into drinking water concentrations for adults and children. When ATSDR uses an average adult's or child's weight and water intake to convert these MRLs into drinking water concentrations, the individual PFOA, PFOS, PFHxS, and PFNA concentrations are
- ▶ PFOA: 78 ppt (adult) and 21 ppt (child)
- ▶ PFOS: 52 ppt (adult) and 14 ppt (child)
- ▶ PFHxS: 517 ppt (adult) and 140 ppt (child)
- ▶ PFNA: 78 ppt (adult) and 21 ppt (child)
- ▶ These concentrations are compared to concentrations in drinking water to determine if further evaluation is needed.

Michigan PFAS Action Response Team (MPART)





Funding

- \$23.2M supplemental for 2018
 - \$14.8M DEQ
 - \$8.4M DHHS
- 2019 Supplemental?
 - More and expanded investigations
 - Alternate water
 - Local and small business assistance
- Continuous need



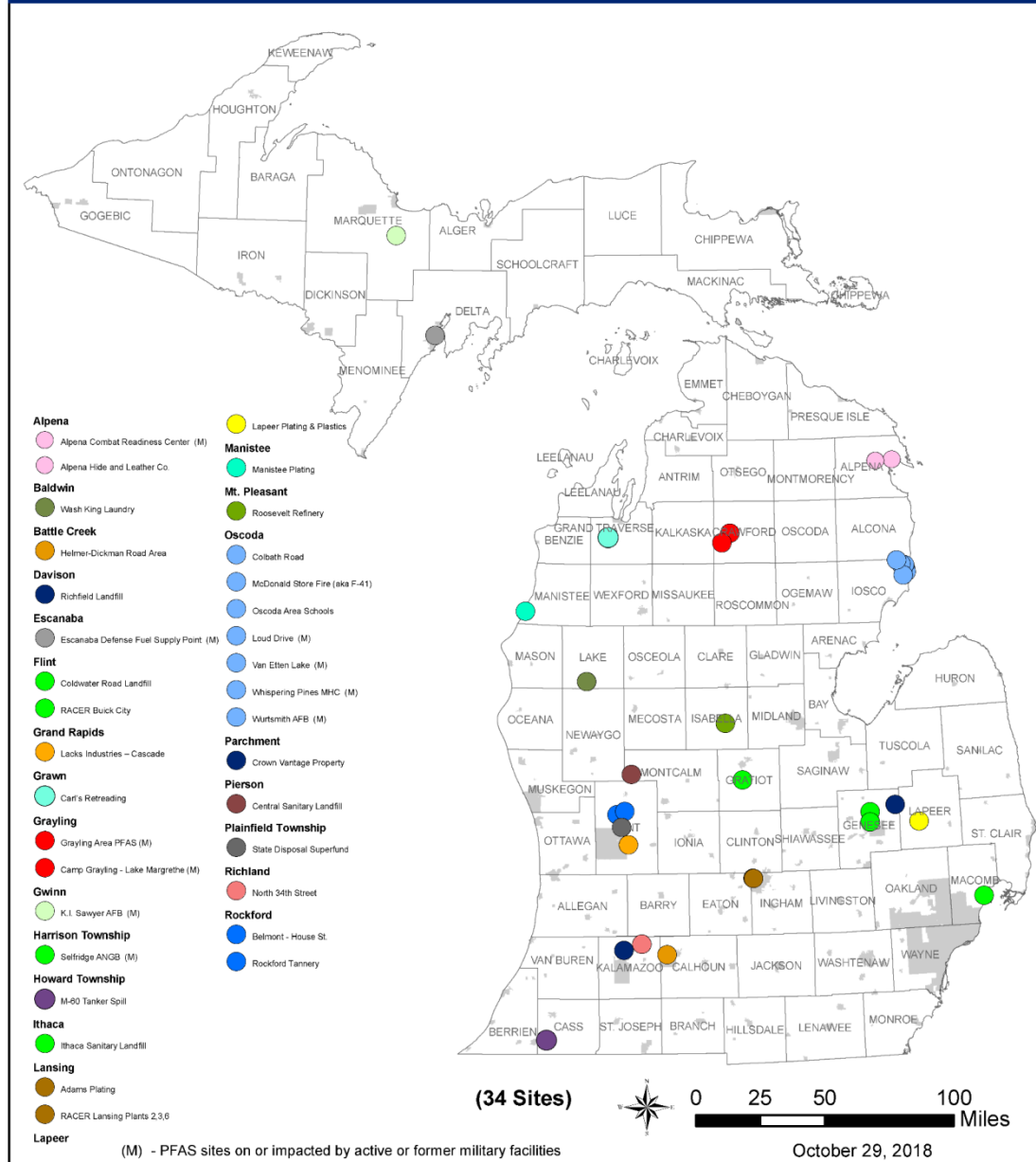
Michigan PFAS Sites Being Investigated

- Multi-agency project teams
- Investigation
- Alternate drinking water
- Community engagement



Michigan Department of
Environmental Quality

Michigan PFAS Sites
Being Investigated





MPART

MPART DEFINED

- ▶ 1. Unique management structure - centralized, organized, all state, local and federal response
- ▶ 2. Raising Awareness
 - ▶ Federal Partners - EPA, ATSDR, FAA, FDA, DOD
 - ▶ Other States
 - ▶ Congress and State Legislature-3 Congressional hearings
- ▶ 3. Communication - all levels
- ▶ 4. Protective of Health
 - ▶ PFAS Science Board, LPH Advisory Board, state scientists



MPART

- ▶ 5. Proactive Approach
 - ▶ Targeted Investigations - 34 sites
 - ▶ Private Wells, Public Water Systems, Landfills, WWTP, IPP, etc.
 - ▶ Mitigation and Remediation - Public Health, Water, Filters, GAC
 - ▶ Standards
 - ▶ 70 PPT EPA Lifetime Health Advisory
 - ▶ 70 PPT State Groundwater Clean up Criteria
 - ▶ State surface water standard 11-12
 - ▶ Future Standards - drinking water
 - ▶ Legal Action
 - ▶ State water violation notices
 - ▶ Dispute resolution - Oscoda
 - ▶ Litigation - WWW with EPA
 - ▶ Responsible Party



City of Parchment, Michigan

Kalamazoo will extend water system to Parchment in wake of PFAS contamination

By BRYCE HUFFMAN • AUG 6, 2018

[Tweet](#) [Share](#) [Google+](#) [Email](#)





MPART

▶ Future Actions

- ▶ PFAS is an emerging contaminant. Other chemicals threaten the water supply. PFAS applies to all.
- ▶ Incorporate into larger initiative with all other water issues that threaten public health
- ▶ Rebuilding Michigan's Water Infrastructure
- ▶ Emergency Funds - needed for response to water contamination
- ▶ Long term remediation requires capital grant, loans, etc. Municipal systems, new wells, GAC filters
- ▶ Funding will be necessary - see Governor Snyder Proposals
- ▶ Recommendations from Science Board and new standards



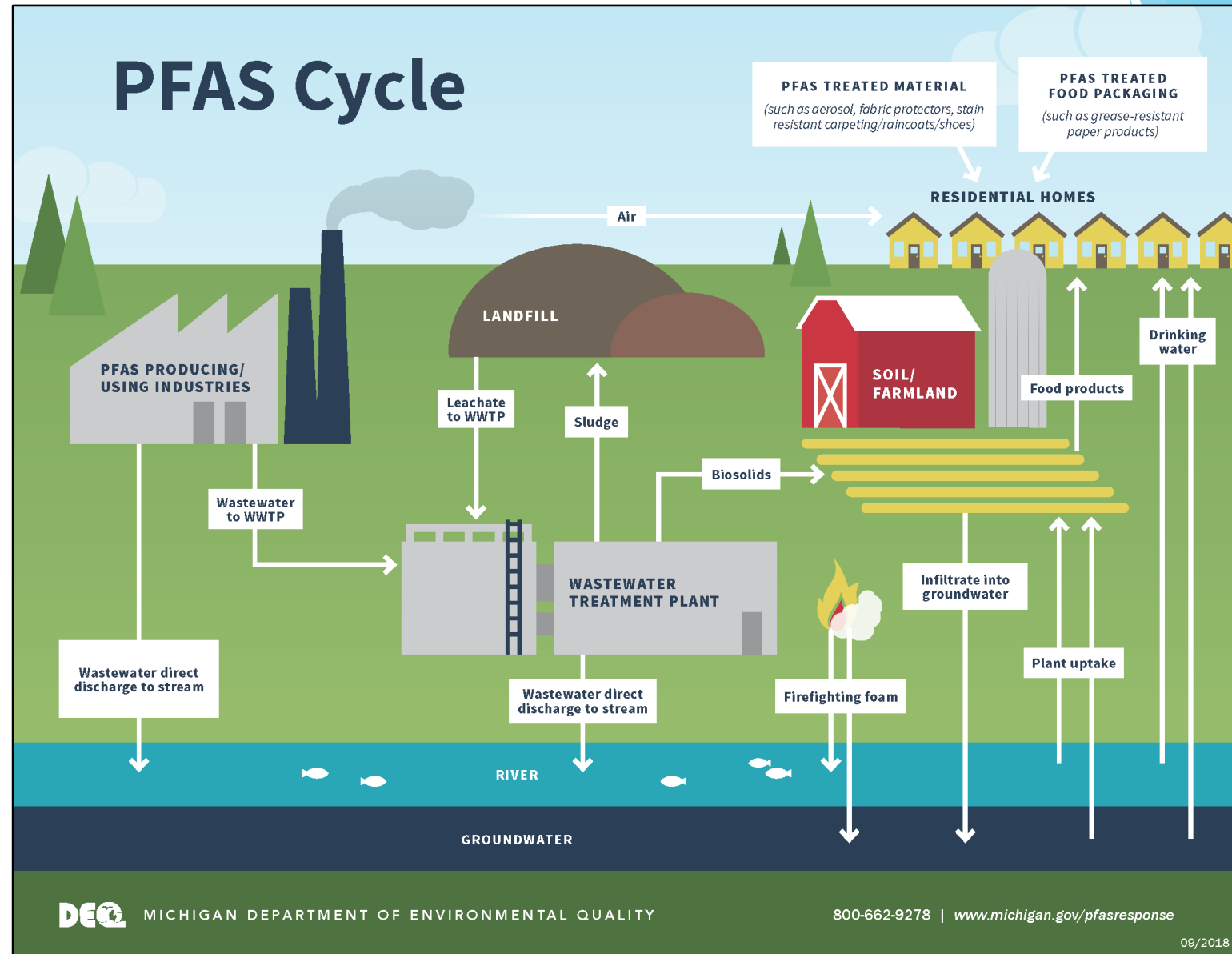
PFAS Investigations

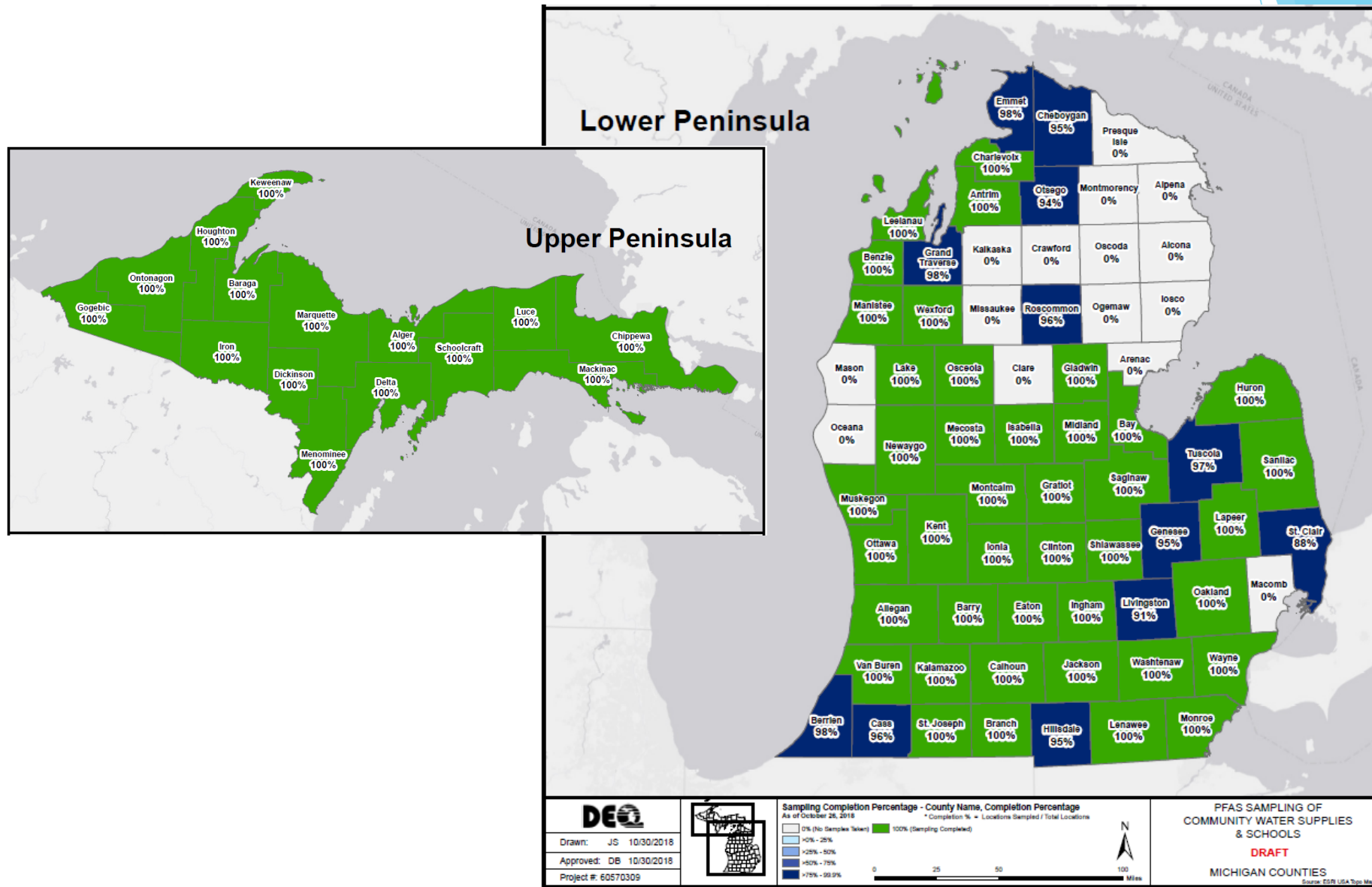
Steve Sliver

DEQ PFAS Executive Lead



Challenges of the cycle







PWS Testing Progress

(as of 10/26/18)

	Overall Number of Supplies	Supplies with Samples Collected	% Supplies with Samples Collected (not results received)	Supplies with Results Received	% of Supplies with Results Received	Non-Detect Total PFAS	< 10 ppt Total PFAS (Not ND)	10 – 70 ppt PFOS/PFOA (> 10 ppt Total PFAS)	> 70ppt PFOS/PFOA
Community Water Supplies	1,111	988	89%	746	76%	661	64	20	1
Schools on Wells	460	391	85%	315	81%	287	14	14	0
Tribes	16	14	88%	6	43%	6	0	0	0
Total	1,587	1,393	88%	1,067	77%	954	78	34	1
As of October 26, 2018; there is a 1 week lag						89.4%	7.3%	3.2%	0.1%



Surface Water Investigation

- Ambient monitoring
- Public owned treatment works
 - Industrial pretreatment program
 - Biosolids
- Industrial direct dischargers
- Surface water foam





Example: Lapeer WWTP

- Elevated PFAS results in Flint River tracked to Lapeer WWTP
- DEQ found PFOS in discharge in June 2017
- Worked with City to find the source
- City working with source to eliminate PFOS
- Evaluating land application sites





PFOS in Fish Tissue

- At least 43 species in 15 counties have advisories related to PFOS.

Officials: Don't eat fish from Huron River

Associated Press Published 4:09 p.m. ET Aug. 4, 2018 | Updated 4:09 p.m. ET Aug. 4, 2018



(Photo: Brandy Baker, Detroit News file)

Milford – Health officials are warning people not to eat fish from parts of the Huron River because of chemical contamination.

The emergency "Do Not Eat" advisory issued Saturday applies to all fish from the Huron River from Oakland County's Milford to the Livingston and Washtenaw county border. That includes lakes connected by the river, including Kent Lake.

Fish from the lake were tested for perfluorooctane sulfonate (PFOS) and found to contain high levels. The substances, among chemicals referred to broadly as PFAS, are used in manufacturing, firefighting and thousands of household and consumer products.

Touching the fish or swimming in the water isn't considered a health concern.

PFAS have been detected in waterways in about 30 states. The Michigan Legislature enacted \$23 million in emergency spending to address PFAS contamination.



PFOS in Deer Tissue



MICHIGAN DEPARTMENT OF
NATURAL RESOURCES

- DNR NEWS -

FOR IMMEDIATE RELEASE: October 19, 2018

MDHHS Contact: [Angela Minicuci](#), 517-241-2112

DNR Contact: [Tammy Newcomb](#), 517-284-5832

**‘Do Not Eat’ Advisory Issued for Deer Taken
within five miles of Clark’s Marsh, Oscoda
Township**



Sample Results from PFAS Sites

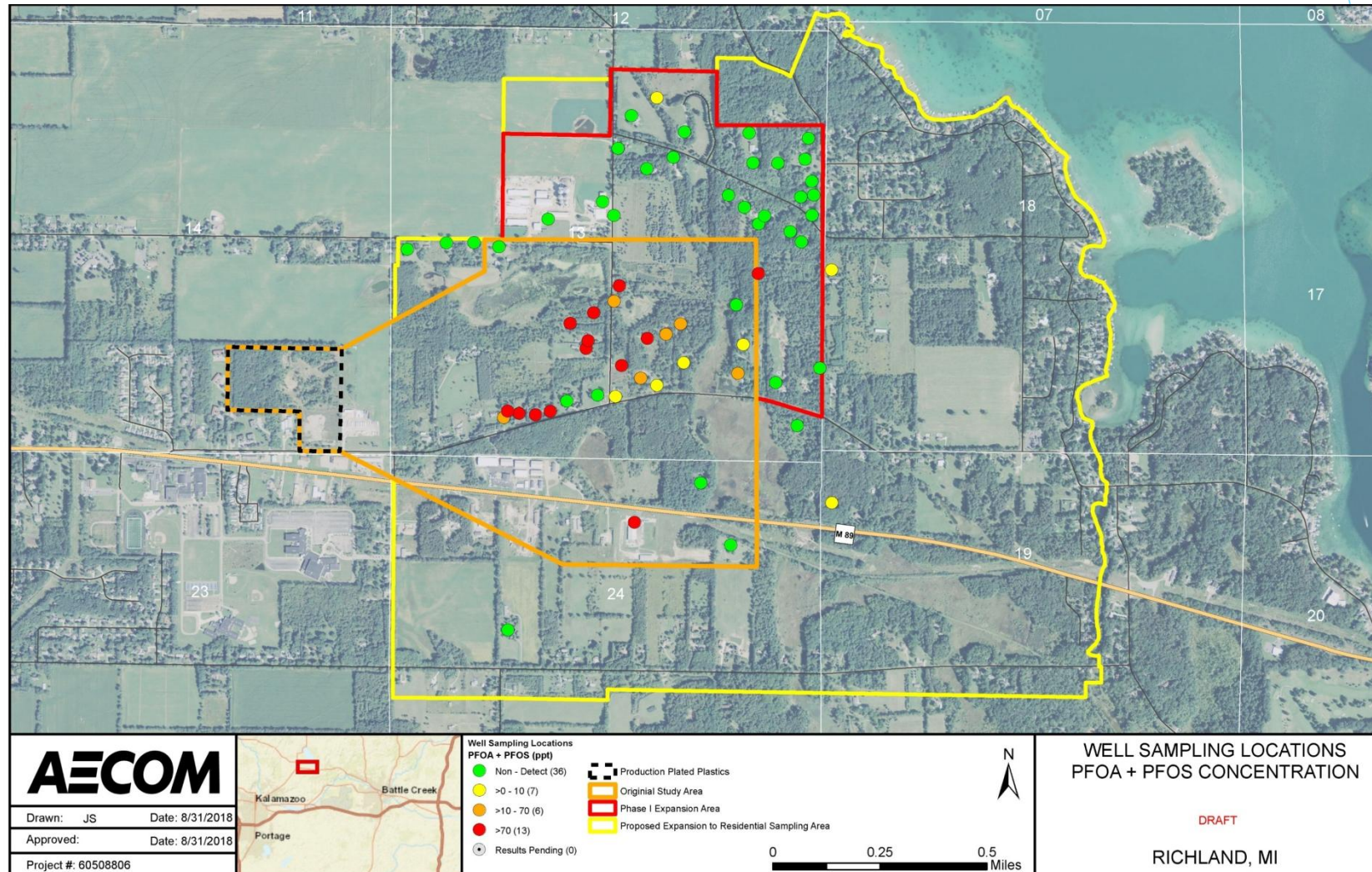
Media	Total Samples Taken	Results Back	Non-Detect (ND)	ND – Standard	> Standard
Total	6,041	5,816 (96.3%)	2,562 (44.1%)	2,328 (40.0%)	941 (16.2%)
Drinking Water	3,696	3,654 (98.9%)	2,130 (58.3%)	1,362 (37.7%)	162 (4.4%)
Groundwater	1,972	1,798 (91.2%)	401 (22.3%)	798 (44.4%)	624 (34.7%)
Surface water	373	364 (97.6%)	31 (8.5%)	168 (46.2%)	155 (42.6%)

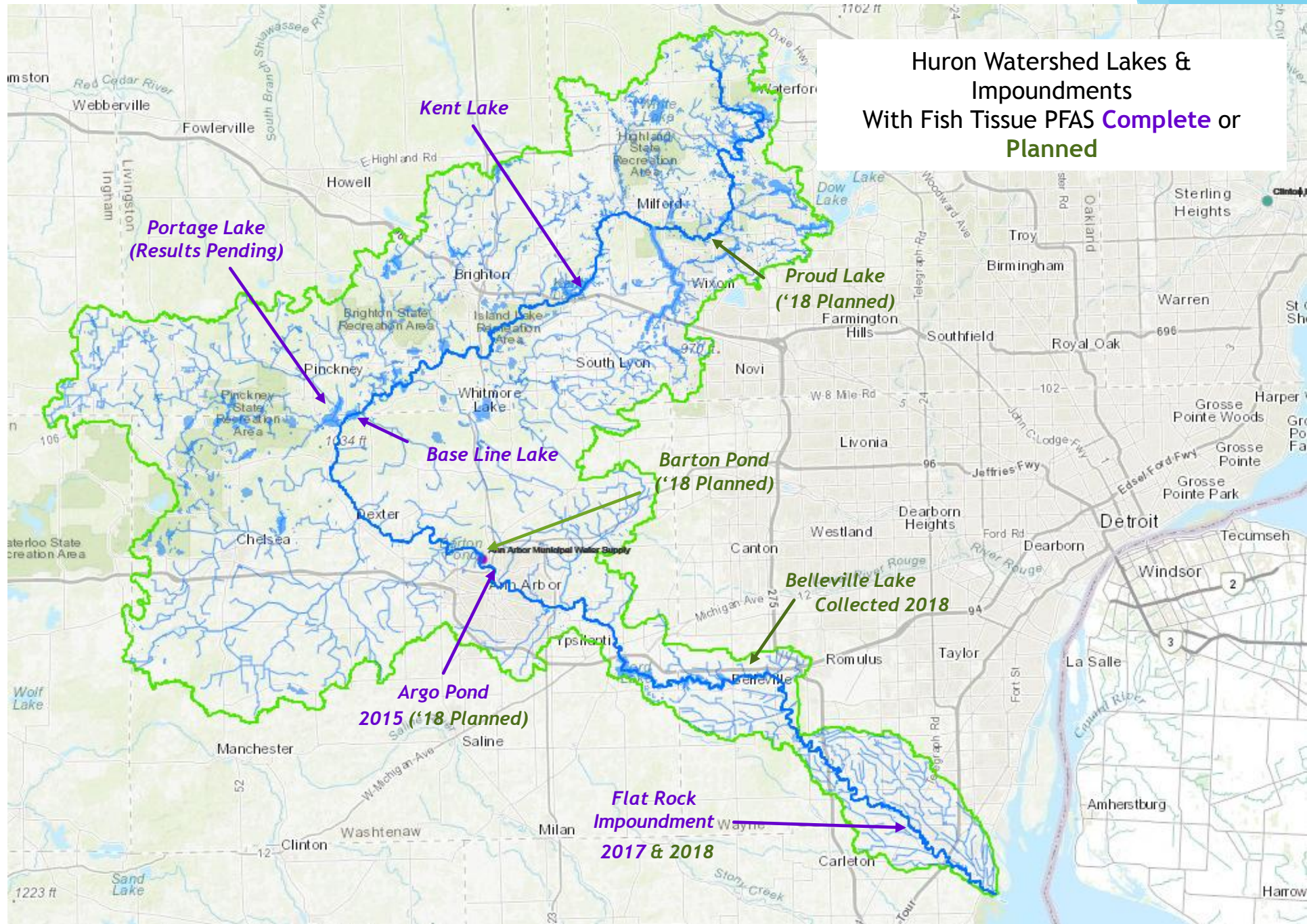
MI Standards

Media	Standard	Compound	Concentration	Statute	Enforceable or Recommended	Effective or Proposed	Established Date	Process for Establishing
Drinking Water	Lifetime Health Advisory	PFOA + PFOS	70 PPT		R	E	May 2016	EPA published
Surface Water	Water Quality Standards	PFOA (DW Source)	420 PPT	Part 31	E	E	May 2011	Rule 57, calculate and publish
		PFOA	12,000 PPT	Part 31	E	E	May 2011	Rule 57, calculate and publish
		PFOS (DW Source)	11 PPT	Part 31	E	E	March 2014	Rule 57, calculate and publish
		PFOS	12 PPT	Part 31	E	E	March 2014	Rule 57, calculate and publish
Groundwater	Drinking water cleanup criteria	PFOA + PFOS	70 PPT	Part 201	E	E	January 2018	Adopted by rule
	GSI	PFOA (DW Source)	420 PPT	Part 201	E	E	May 2011	Adopted by statute
		PFOA	12,000 PPT	Part 201	E	E	May 2011	Adopted by statute
		PFOS (DW Source)	11 PPT	Part 201	E	E	March 2014	Adopted by statute
		PFOS	12 PPT	Part 201	E	E	March 2014	Adopted by statute
Soil	Soil criteria protective of GSI	PFOA	10,000 µg/kg	Part 201	E	E	June 2018	Calculated and published
		PFOS	0.24 µg/kg	Part 201	E	E	June 2018	Calculated and published
	Soil criteria protective of drinking water	PFOA	59 µg/kg	Part 201	E	P		Calculate and publish
		PFOS	1.4 µg/kg	Part 201	E	P		Calculate and publish
	Soil direct contact criteria	PFOA	2,100 µg/kg	Part 201	E	P		Calculate and publish
		PFOS	2,100 µg/kg	Part 201	E	P		Calculate and publish
Air	Initial Threshold Screening Levels	PFOA	0.07 µg/m3	Part 55			February 2018	Calculate, 60 day comment, publish
		PFOS	0.07 µg/m3	Part 55	E	E	February 2018	Calculate, 60 day comment, publish
					E	E		



Strategic Investigation and Response







More Information – www.michigan.gov/PFASresponse

The screenshot shows the Michigan.gov website's PFAS Response section. At the top, the Michigan.gov logo is on the left, and navigation links for FAQs, News and Education, Contact MPART, and a search bar are on the right. Below this is a dark green header with the text "PFAS RESPONSE" and "TAKING ACTION, PROTECTING MICHIGAN". Underneath the header is a horizontal menu with links for Health, Testing and Treatment, Michigan PFAS Sites, Fish and Wildlife, Firefighting Foam, and About MPART. The main content area features a large image of a laboratory setting with a person wearing safety glasses. Overlaid on the left side of this image is a text box with the heading "TAKING ACTION TO PROTECT THE PUBLIC'S WATER" and a paragraph explaining that perfluoroalkyl and polyfluoroalkyl substances (PFAS), such as perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), are part of a group of chemicals used globally in manufacturing, firefighting, and consumer products.

Michigan.gov

FAQS NEWS AND EDUCATION CONTACT MPART SEARCH

PFAS RESPONSE

TAKING ACTION, PROTECTING MICHIGAN

HEALTH TESTING AND TREATMENT MICHIGAN PFAS SITES FISH AND WILDLIFE FIREFIGHTING FOAM ABOUT MPART

TAKING ACTION TO PROTECT THE PUBLIC'S WATER

Perfluoroalkyl and polyfluoroalkyl substances (PFAS), such as perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), are part of a group of chemicals used globally during the past century in manufacturing, firefighting and thousands of common household and other consumer products.

The background features abstract, overlapping geometric shapes in various shades of blue, ranging from light sky blue to deep navy blue. These shapes are primarily located on the left and right sides of the frame, creating a modern, dynamic feel. The central area is a plain, light grayish-white.

Questions?

Air Quality Modeling Update

**Fall Joint Environmental Conference
SBM and East & West MI AWMA
Brian Leahy, Barr Engineering Co.
November 8, 2018**

Presentation Outline

Not a modeling “how-to”, but rather an update on recent modeling changes and how they may affect your permitting experience.

1. Status of the AQD’s *Dispersion Modeling Guidance for Federally Regulated Pollutants*
2. Impact of recent federal guidance and model revisions on PSD increment/NAAQS compliance
3. Best practices for using modeling to support your permit, including methods for using modeling to expand operational flexibility
4. Emerging issues/anticipated modeling changes

Minor Sources - Impact of AQD's Modeling Policy



Policy and Procedure AQD-022

- March 3, 2015: AQD issues *"Dispersion Modeling Guidance for Federally Regulated Pollutants"*
 - Purpose: To ensure protection of the PSD increments and NAAQS when permitting minor sources and minor modifications
 - Driven by three factors:
 - Promulgation of short-term NAAQS
 - Enable consistency among AQD permit writers
 - Applicant desire for "certainty"
 - Replaces 1998 Fiedler memo (double-edged sword)

Divides Projects into Five Source Categories

Categories “typically” excluded from modeling:

1. Minor SER Greenfield
2. Minor SER Modification
3. Minor SER Modification of Non-Major Pollutant

Categories that may trigger modeling:

4. Minor SER Modification at Existing Minor PSD Source
5. Minor SER Modification at Existing Major PSD Source

Policy and Procedure AQD-022 (cont.)

- Excludes new sources and minor modifications where facility-wide PTE < SER
- Minor changes to sources with PTE > SER trigger air impact demonstration unless specified stack/building height criteria are met
- Excludes from “table” requirements:
 - Exempt EUs
 - EUs that contribute <20% of project emissions increase
- Provides the flexibility to submit a qualitative analysis under certain conditions

Policy and Procedure AQD-022 (cont.)

- Unreasonably focused on “allowable emissions”
 - Applicant may not consider the project emissions change, emissions that the unit was already capable of accommodating, or source-wide netting
 - Therefore, more stringent than PSD rules
- Focused on annual emissions when key NAAQS are based on short-term averaging periods
- Qualitative assessment decision-making not in AQD modelers hands
- No break for pollution control projects (e.g., coal-to-gas)

Policy and Procedure AQD-022 (cont.)

- What we've learned 3 years in...
 - An AQD Policy and Procedure *"does not have the force and effect of law."* (hmm...)
 - The "qualitative assessment" exclusion rarely approved
 - Many applicants struggle with interpretation
 - Procedure is silent on secondary impacts triggers
 - If my minor source increases NO_x > 40 tpy, am I subject to NO₂, PM_{2.5}, and ozone NAAQS modeling?
 - Claim that procedure is a "living document" currently being put to the test

Policy and Procedure AQD-022 (cont.)

- Key MMA-recommended changes:
 - Shift focus from “allowable emissions” to the “project emissions change”, consistent with NSR
 - AQD labeled this a “non-starter”
 - Incorporate these exceptions to the table requirements:
 - When there is no increase in allowable hourly emissions and allowable annual emissions < SERs
 - When combustion sources are being modified to reduce/eliminate coal or high sulfur fuel oil
 - Projects that are installing control devices if the allowable emissions < SERs
- AQD decision (and other revisions?) pending

Federal Guidance – No Longer on Auto-pilot



revisions to the Guideline on Air Quality Models

- Guidance for the application of dispersion models and modeling techniques codified under 40 CFR Part 51, Appendix W
 - Effectively the modeling bible for federal/state regulators, tribes, and regulated facilities
 - Had not been revised since 2005 (well before recent NAAQS revisions)
 - Countless OAQPS guidance memos had been piling up
- May 22, 2017 – Significant Appendix W revisions became effective

Beware! – EPA has since promulgated additional modeling guidance

revisions to the Guideline on Air Quality Models (Cont.)

- Technical enhancements to EPA's workhorse model (AERMOD):
 - Updated NO_x to NO₂ transformation techniques
 - Met data refinements
 - U*adjusted met data
 - Prognostic met data
 - Treatment of horizontal/capped stacks
 - Incorporated algorithms from the now-delisted BLP model to account for buoyant plume rise from line sources

Note: These changes tend to improve model accuracy and, therefore, should be welcome by the regulated community

revisions to the Guideline on Air Quality Models (Cont.)

- Technical enhancements to AERMOD:
 - “Alpha” options:
 - Model updates considered to be in the research phase and not fully evaluated/peer reviewed by the scientific community
 - Non-scientific model options in development that require rigorous testing and for which EPA is seeking feedback from the user community
 - “Beta” options:
 - Model updates fully vetted through the scientific community with appropriate evaluation/peer review
 - Require alternative model approval by the EPA Regional Office and concurrence by the Model Clearing House
 - Current version of AERMOD: Release No. 18081

revisions to the Guideline on Air Quality Models (cont.)

- Developed tiered approach for assessing secondary Ozone and PM_{2.5} formation
 - Result of EPA granting a 2012 petition by Sierra Club to require modeling analysis of secondary pollutants
 - Approach better fleshed out in guidance presented at the June 5, 2018 RSL Modelers Workshop
 - Newest acronym in air quality: **MERP**
- CALPUFF officially delisted as a “preferred/recommended model” for long range transport (> 50 km)
 - May still be used as part of an alternative screening technique

revisions to the Guideline on Air Quality Models (cont.)

Table 8-2. - Point Source Model Emission Inputs for NAAQS Compliance in PSD Demonstrations

Averaging time	Emissions limit (lb/MMBtu) ¹	X	Operating level (MMBtu/hr) ²	X	Operating factor (e.g. , hr/yr, hr/day)
Proposed Major New or Modified Source					
Annual & quarterly	Maximum allowable emission limit or federally enforceable permit limit.		Design capacity or federally enforceable permit condition.		Continuous operation (i.e., 8760 hours). ²
Short term (≤ 24 hours)	Maximum allowable emission limit or federally enforceable permit limit.		Design capacity or federally enforceable permit condition. ³		Continuous operation, i.e., all hours of each time period under consideration (for all hours of the meteorological database). ²
Nearby Source(s)^{4,5}					
Annual & quarterly	Maximum allowable emission limit or federally enforceable permit limit. ⁵		Annual level when actually operating, averaged over the most recent 2 years. ⁶		Actual operating factor averaged over the most recent 2 years. ^{6,8}
Short term (≤ 24 hours)	Maximum allowable emission limit or federally enforceable permit limit. ⁵		Temporally representative level when actually operating, reflective of the most recent 2 years. ^{6,7}		Continuous operation, i.e., all hours of each time period under consideration (for all hours of the meteorological database). ²
Other Source(s)^{5,9}					

The ambient impacts from Non-nearby or Other Sources (e.g. , natural sources, minor sources and ,distant major sources, and unidentified sources) can be represented by air quality monitoring data unless adequate data do not exist.

revisions to the Guideline on Air Quality Models (cont.)

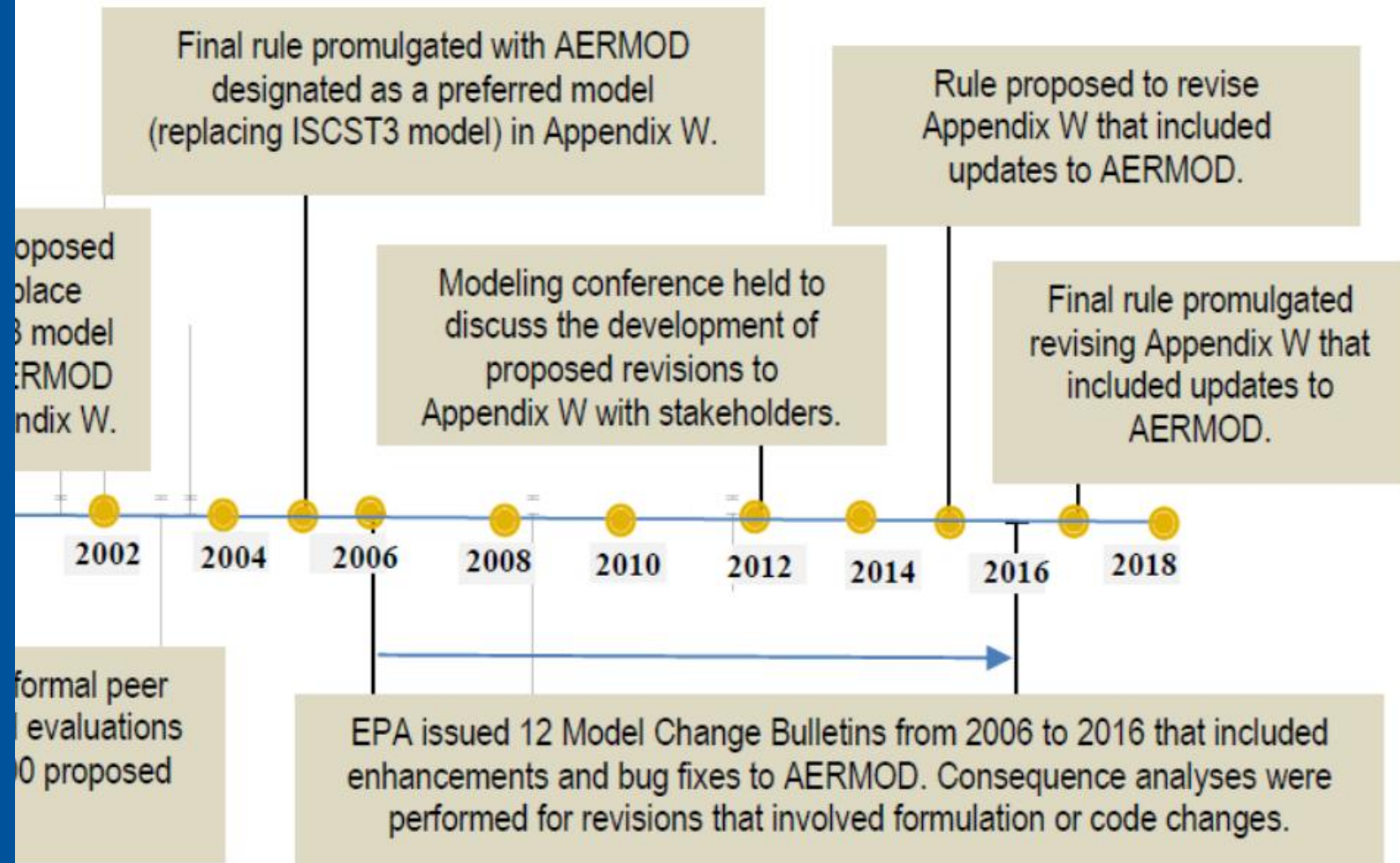
- What do the Appendix W revisions mean to you?
 - Modeling techniques becoming more refined (i.e., more complex)
 - Most revisions reduce (but not eliminate) model over-prediction
 - AERMOD still “buggy” under certain conditions
 - 117 bug fixes between 2006 and 2016
 - Modelers/agencies – **don’t** accept initial results as gospel
- What has EPA changed without appropriate analysis/notice?
 - *“...potential air quality impacts associated with cavity and wake effects should also be considered for stacks that equal or exceed the EPA formula height for GEP.”*

EPA white
papers
(Sept. 2017)

- EPA's "near-term" focus for further AERMOD improvements:
 - **Building Downwash** – BPIP-PRIME significantly over-predicts impacts under certain conditions
 - **LOWWIND Options** – Continued efforts to address model's tendency to over-predict in low wind conditions
 - **Saturated Plumes** – Treatment of moist plumes due to enhanced thermodynamics
 - **NO₂ Modeling Techniques** – Improve Tier 3 approach
 - **Mobile Source Modeling** – Integrate mobile source algorithm
 - **Off-shore Sources** – Incorporate algorithms to improve model-prediction from offshore sources (would replace the OCD model)

EPA OIG Audit (Sept. 2018)

Memo to Bill Wehrum – EPA Can Strengthen Its Process for Revising Air Quality Dispersion Models that Predict Impact of Pollutant Emissions

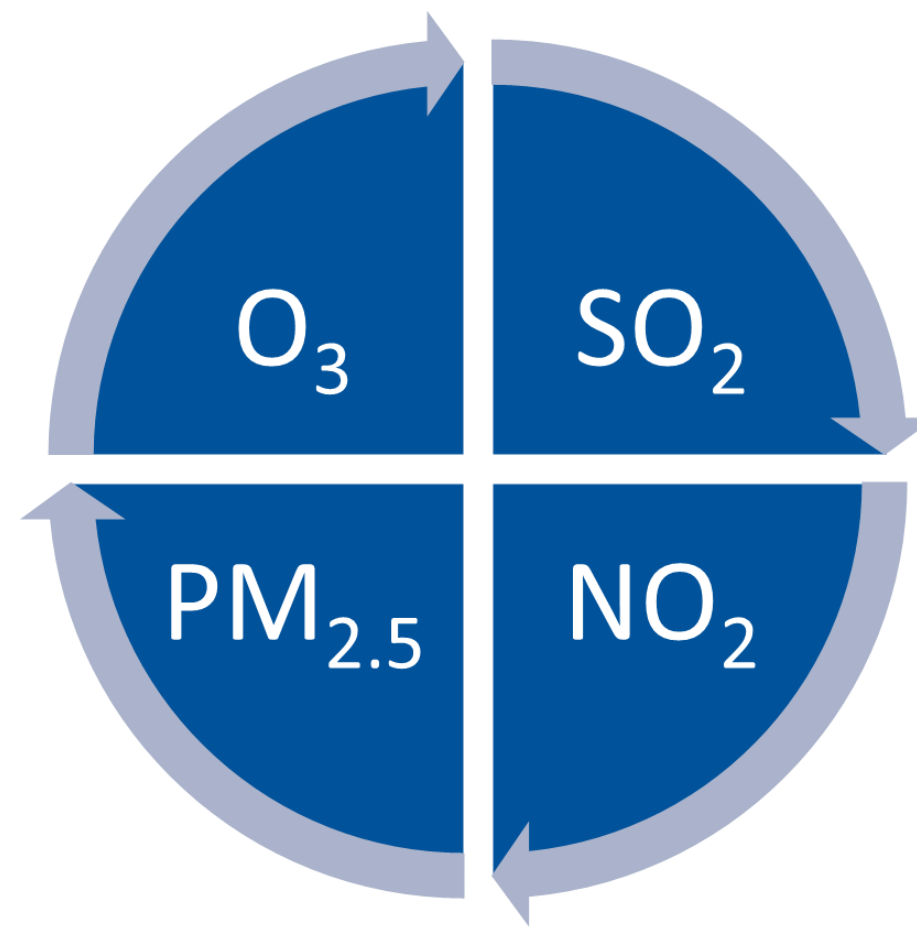


117 bug fixes, 56 enhancements, 65 misc. changes, 12 versions of AERMOD

EPA OIG Audit (Cont.)

- Four recommendations:
 - Develop SOPs to assure consistency in the development, evaluation, and approval of revisions to existing models.
 - Develop QAPPs defining the activities that will be conducted to assure the desired quality of results when developing or revising a preferred model.
 - Revise the OAQPS Management Plan to include the SOPs and QAPPs.
 - Provide training to AQMD staff to ensure consistent model evaluation.

Impact of the NAAQS Revisions on Modeling



SO₂ implementation

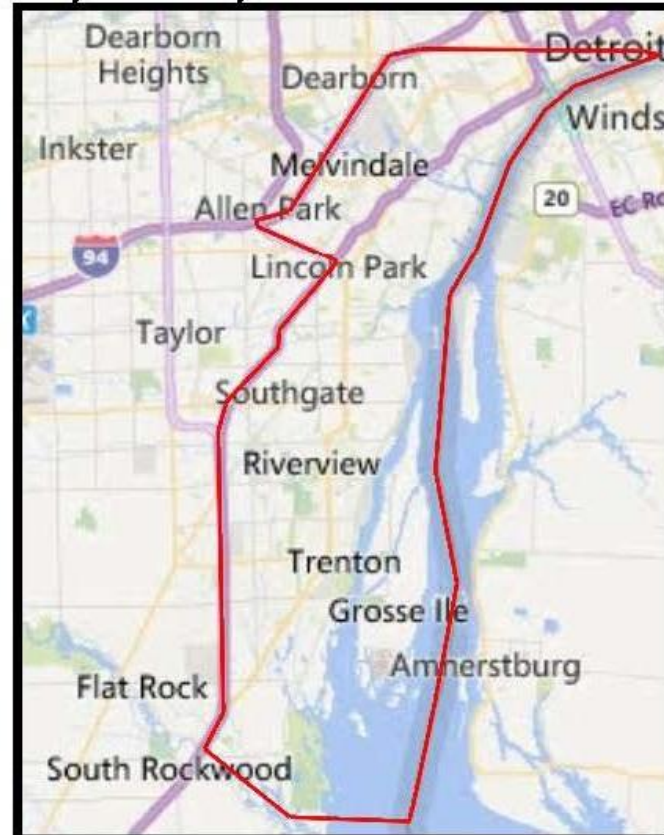
- June 2, 2010: EPA establishes a 1-hour SO₂ NAAQS
 - 75 ppb (196 µg/m³) based on 3-yr avg. of the 99th percentile of daily max. 1-hour concentrations
- Existing SO₂ standards
 - 3-hour NAAQS retained (1,300 µg/m³)
 - Annual and 24-hour NAAQS revoked
 - Annual and 24-hour PSD increments still apply
- Hourly standard sets the compliance bar
 - 3-hr/annual SO₂ ratio – 16.25
 - 1-hr/annual SO₂ ratio – 2.45

SO₂ implementation (Cont.)

- August 10, 2015 – EPA finalizes the SO₂ Data Requirements Rule (DRR)
 - Provided air agencies with flexibility to use monitoring or modeling to designate attainment

Sulfur Dioxide Nonattainment Areas

Wayne County Area



St. Clair County Area



NO₂ implementation

- January 22, 2010: EPA establishes a 1-hour NO₂ NAAQS
 - 100 ppb (188 µg/m³)
 - Existing annual NAAQS of 53 ppb (100 µg/m³) retained
- Improvements in NO_x to NO₂ conversion techniques
 - ARM2 the regulatory default for Tier 2 screening
 - OLM and PVMRM the regulatory default for Tier 3 screening
 - In-stack NO₂/NO_x ratio is a critical parameter
 - Default = 0.5 (often **way** too conservative)
 - EPA's combustion source database
 - Previous EPA determinations
 - Existing sources – consider tracking ratio with CEMs

PM_{2.5} implementation (how we got here)

- 2011 – EPA's PM₁₀ Surrogate Policy officially ends
- 2012 – PM_{2.5} NAAQS revised
 - 35 µg/m³ (24-hour)
 - 15 µg/m³ (annual)
 - Primary NAAQS subsequently reduced to 12 µg/m³ (annual)
- 2013 – U.S. Court of Appeals for the D.C. Circuit vacates the PM_{2.5} SILs and SMC
- 2014 – EPA issues "*Guidance on PM_{2.5} Permit Modeling*"
 - Secondary PM_{2.5} formation due to NO_x, SO₂, VOC, or NH₃ emissions/reactions
 - Assessment requirements determined by direct PM_{2.5} and precursor emissions

PM_{2.5} impact assessment triggers (2014 guidance)

Assessment Case	Description of Assessment Case	Primary Impacts Approach	Secondary Impacts Approach
Case 1	Direct PM _{2.5} emissions < 10 tpy (SER)	NA	NA
	NO _x and SO ₂ emissions < 40 tpy (SER)		
Case 2	Direct PM _{2.5} emissions > 10 tpy (SER)	Dispersion modeling	NA
	NO _x and SO ₂ emissions < 40 tpy (SER)		
Case 3	Direct PM _{2.5} emissions > 10 tpy (SER) NO _x and SO ₂ emissions > 40 tpy (SER)	Dispersion modeling	* Qualitative
			* Hybrid approach
			* Photochemical grid modeling
Case 4	Direct PM _{2.5} emissions < 10 tpy (SER) NO _x and SO ₂ emissions > 40 tpy (SER)	NA	* Qualitative
			* Hybrid approach
			* Photochemical grid modeling

PM_{2.5}
implementation
(how we got
here)

- April 2017 – Appendix W revisions
 - Modified the tiered approach (qualitative removed)
 - Modeled Emission Rates for Precursors (MERPs)
- April 2018 – EPA issues *"Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program"*
 - 1.2 µg/m³ (24-hour SIL)
 - 0.2 µg/m³ (Annual SIL)* ← **Extremely low**
- Draft guidance provided at 2018 RSL Modelers Workshop

PM_{2.5} impact assessment triggers (2018 RSL Workshop guidance)

Assessment Case	Description of Assessment Case	Primary Impacts Approach	Secondary Impacts Approach
Case 1: No Air Quality Analysis	Direct PM _{2.5} emissions < 10 tpy SER Both NO _x and SO ₂ emissions < 40 tpy SER	N/A	N/A
Case 2: PM _{2.5} Assessment (Primary and Secondary Air Quality Impacts)	Direct PM _{2.5} emissions ≥ 10 tpy SER or NO _x and/or SO ₂ emissions ≥ 40 tpy SER	Appendix W preferred or approved alternative dispersion model	<ul style="list-style-type: none">• Tier 1 Approach (<i>e.g.</i>, MERPs)• Tier 2 Approach (Chemical Transport Modeling)• Qualitative (Very Rare Situation)

RSL Workshop Guidance – PM_{2.5} Modeling Requirements

- Direct PM_{2.5} **will be modeled** in all situations that the primary and/or secondary pollutant is above the SER
 - If direct PM_{2.5} PTE only 1 tpy, it must be modeled if NO_x or SO₂ increase above 40 tpy
 - Could be problematic for fugitive PM sources
- Important to accurately characterize source and emissions
 - Reliance upon old or overly conservative emissions factors could easily cause compliance demonstration issues

RSL Workshop Guidance – PM_{2.5} Modeling Requirements (Cont.)

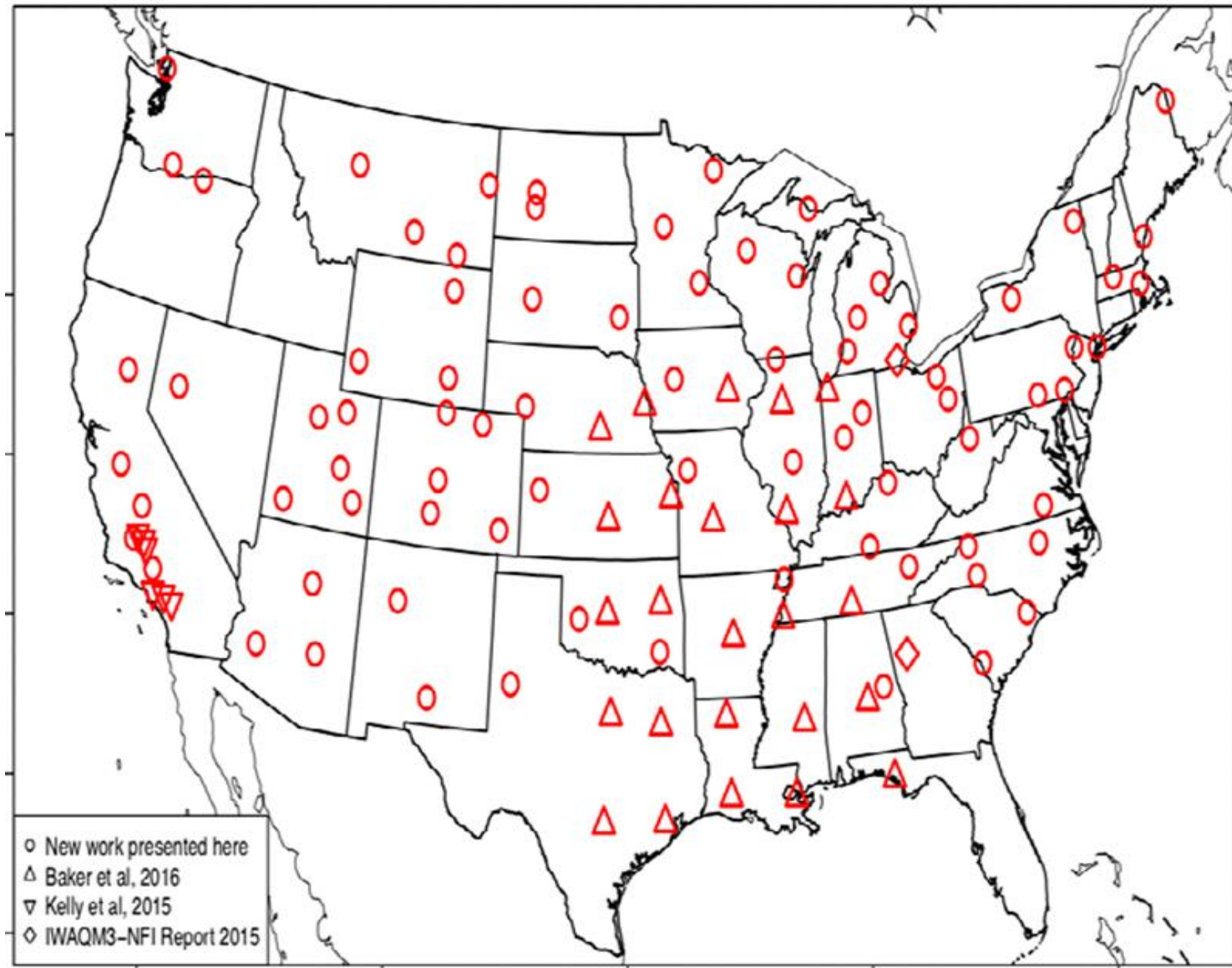
- Secondary impact from **both** NO_x and SO₂ must be assessed in all situations that the primary **and/or** secondary pollutant is above the SER.
 - If SO₂ > 40 tpy, then a 25 tpy NO_x source must be assessed from a PM_{2.5} perspective...and visa-versa
 - If direct PM_{2.5} > 10 tpy, then a sub-40 tpy NO_x and/or SO₂ source must be assessed from a PM_{2.5} perspective
- **Take-away:** If you trigger modeling for either the primary or secondary component of PM_{2.5}, then you are assessing PM_{2.5} for everything
- **Good news:** The Tier 1 MERP approach will usually show secondary PM_{2.5} impacts to be < SILs

RSL Workshop Guidance – PM_{2.5} Modeling Requirements (Cont.)

- Secondary PM_{2.5} modeling options
 - Tier 1 – use technical information between precursors and secondary impacts from existing modeling (e.g., MERPs)
 - Tier 2 – sophisticated chemical transport modeling
- PM_{2.5} compliance procedure
 - Model direct PM_{2.5} sources at the new or modifying facility
 - Add the max. conc. from AERMOD to the MERP-calculated impact for NO_x and the MERP-calculated impact for SO₂
 - If combined PM_{2.5} impact < SIL, no further analyses required
- MERPs allowed in a SIL or cumulative impacts analysis

Note: In Michigan, these requirements may be applicable to new or modified minor source applications.

MERPs – your new best friend?



Note: EPA recommends that the applicant use the most representative MERP for the site area and not the most conservative MERP for the entire country.

MERPs – Your New Best Friend?

$$\text{Modeled air quality Impact from hypothetical source} = \text{Critical Air Quality Threshold} * \left(\frac{\text{Modeled emission rate from hypothetical source}}{\text{MERP}} \right)$$

Distribution of EPA's illustrative MERP Values (tons per year) for Daily PM2.5 NAAQS by precursor and climate zone

Climate Zone	Daily PM2.5 from NO _x			Daily PM2.5 from SO ₂		
	Lowest	Median	Highest	Lowest	Median	Highest
Northeast	2,218	16,165	57,564	623	4,137	17,868
Southeast	1,820	8,721	27,451	324	2,547	9,012
Ohio Valley	2,499	10,266	63,597	305	3,001	32,927
Upper Midwest	2,963	10,651	51,920	435	2,821	10,475
Rockies/Plaines	1,925	9,808	60,188	238	3,387	34,381
South	1,693	7,417	39,759	250	1,310	14,727
Southwest	6,514	26,322	123,170	1,508	9,065	45,857
West	1,073	8,570	34,279	188	2,236	24,596
Northwest	3,003	11,943	20,716	1,203	3,319	8,418

DRAFT-Subject to Change

RSL Workshop Guidance – Ozone Modeling Requirements

- April 2018 – EPA issues *"Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program"*
 - 1.0 ppb (8-hour ozone SIL)
- Tier 1 compliance approach similar to PM_{2.5}, except no direct pollutant modeling with AERMOD
 - Precursor pollutants are NO_x and VOCs
 - Add the MERP-calculated impact for NO_x and the MERP-calculated impact for VOCs
 - This is regrettably conservative as ozone is either formed under NO_x-limited or VOC-limited conditions and the summation of the two impacts is not possible.
 - If the combined ozone impact < SIL, then no further analyses required

Ozone impact assessment triggers (2018 guidance)

Assessment Case	Description of Assessment Case		Primary Impacts Approach	Secondary Impacts Approach
Case 1: No Air Quality Analysis	Both NO _x and VOC emissions < 40 tpy SER		N/A	N/A
Case 2: Ozone Assessment (Secondary Air Quality Impacts)	NO _x and/or VOC emissions ≥ 40 tpy SER		N/A	<ul style="list-style-type: none">• Tier 1 Approach (e.g., MERPs)• Tier 2 Approach (Chemical Transport Modeling)• Qualitative (Very Rare Situation)

Best Modeling Practices



PSD Permit (pre- application phase)

- Benefits of collaborating with the AQD's SIP Development Unit
 - Better permit defense during the public hearing
 - More likely to battle Region V on your behalf
 - May have emerging EPA/AQD guidance
 - Can more readily obtain necessary databases (e.g., O₃ data, additional sources, etc.)
- Submit a modeling protocol
 - Recommended contents
 - Focus of recent Region V comments
- Pre-application monitoring waiver request
- Pre-application meeting

Minor Source
or Minor
Modification
Permit (pre-
application
phase)

- Carefully review AQD Modeling Procedure
 - Don't assume that a pollution reduction project excludes you from modeling
 - Find a "best fit" from the published examples
 - Assess whether there easy S_h or emissions adjustments that can be made to avoid modeling
 - Submit qualitative assessment?
- Though protocol/pre-application meeting not necessary, collaborating with the AQD's SIP Development Unit still has benefits
 - May still be subject to a public hearing

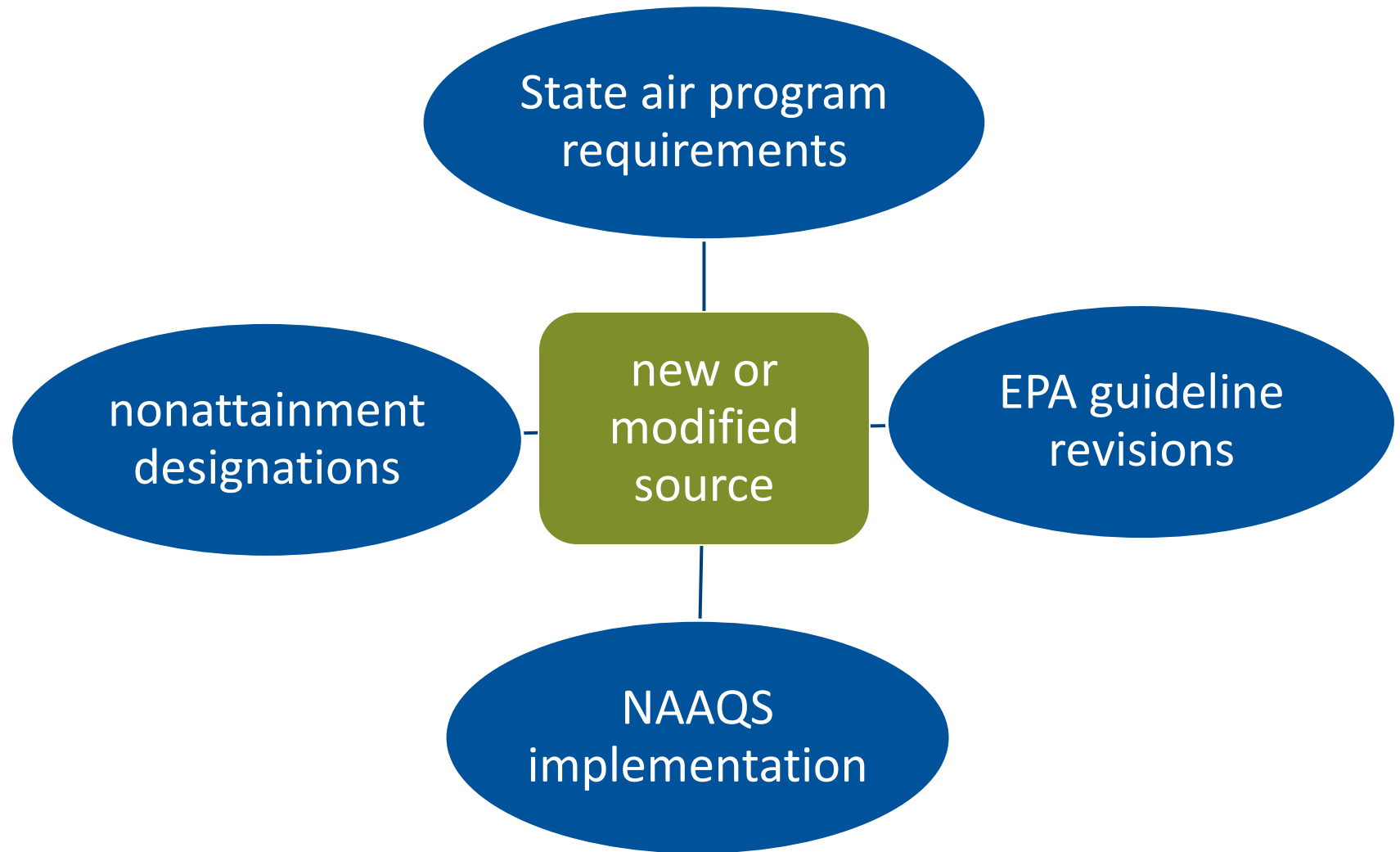
Permitting
Regardless of
Source Size
(pre-
application
phase)

- Health-based screening level requirement (R 225 - 229)
- Don't forget secondary impacts if dealing with PM_{2.5} or ozone
 - If emitted in significant amounts, a NO_x increase would trigger air quality impact requirements for NO₂, PM_{2.5}, and ozone

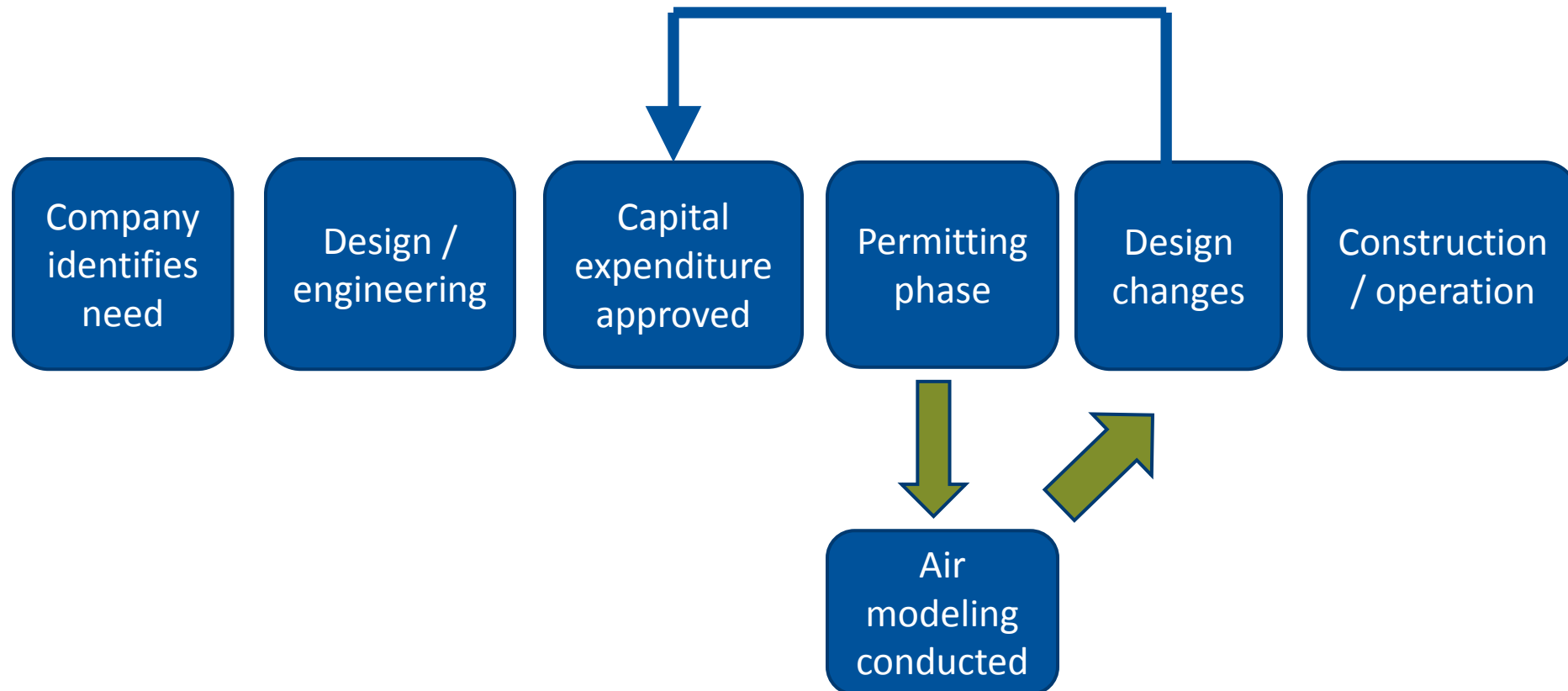
Tips for Expanding Operational Flexibility



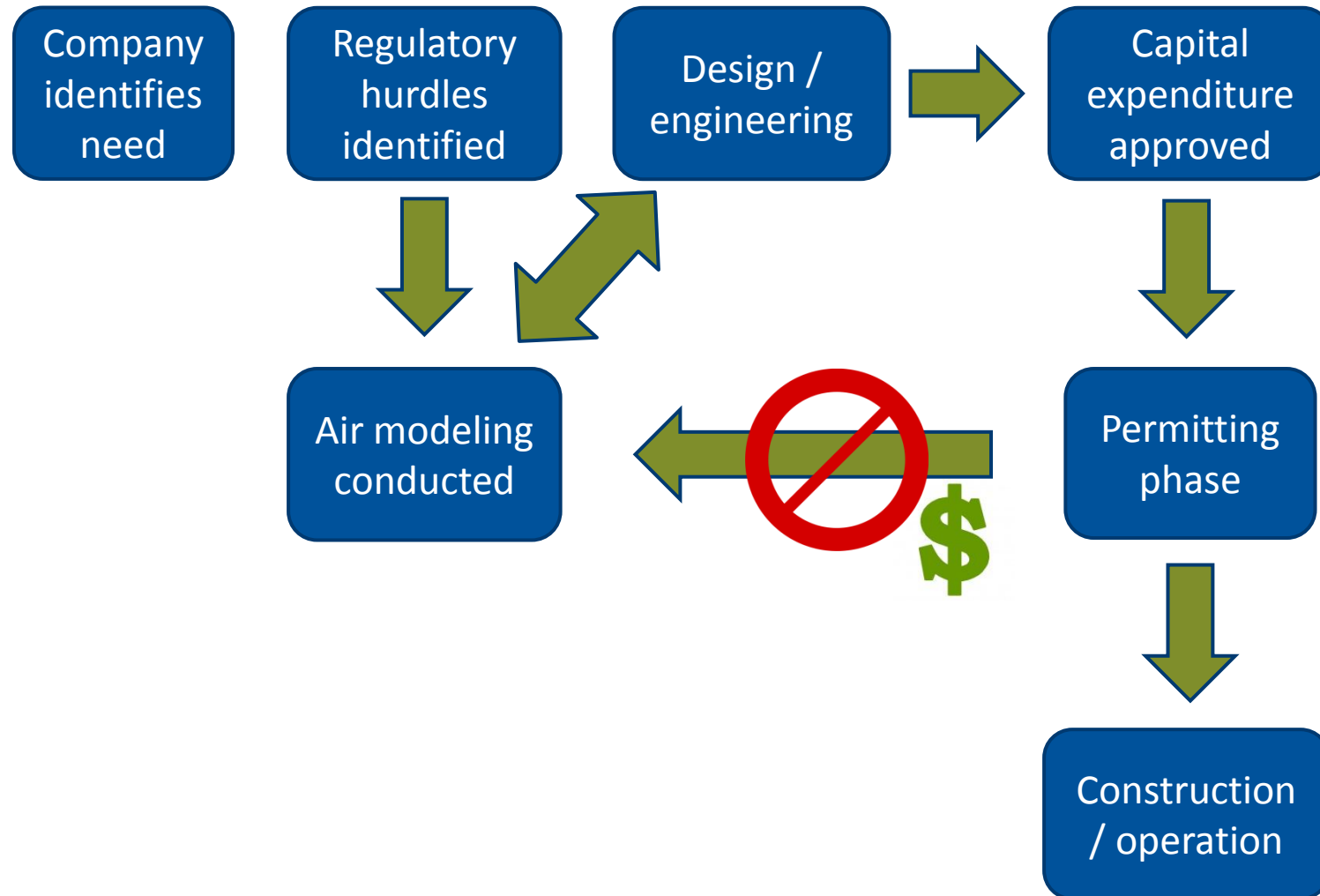
as air impact
requirements
evolve, how
can your
facility best
optimize
operational
flexibility?



typical flow for new projects



recommended flow for new projects



tips for optimizing flexibility

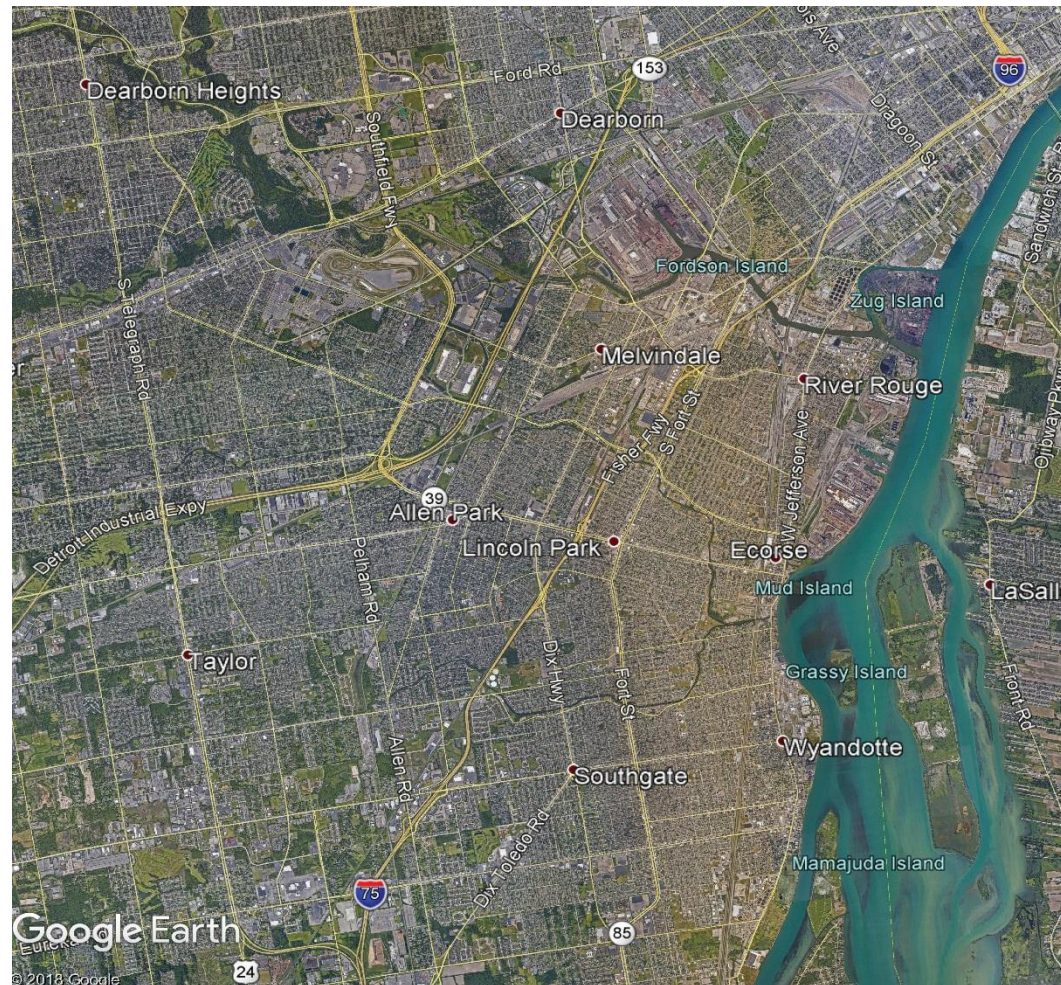
- conduct preliminary modeling before committing to a set facility/process design
- identify the most important pollutants and any state-specific requirements
- use all the tools in the toolbox
 - project impacts stay below SILs
 - NO_x-NO₂ conversion techniques
 - meteorological datasets
 - background concentration reductions

Emerging Issues / Anticipated Modeling Changes



Emerging Issues / Anticipated Modeling Changes

- Revisions to “ambient air” definition
 - *“That portion of the atmosphere, external to buildings, to which the general public has access”* (40 CFR 50.1(e))



Emerging Issues / Anticipated Modeling Changes (Cont.)

- Anticipate additional EPA guidance memos
- PFAS deposition
- Use of modeling for a R285 “meaningful change” demonstration?
- Siting or modifying a source near a nonattainment area
 - How will AQD apply secondary impacts policy?
- Use of modeling by NGOs to affect policy
 - CAPHE Study
 - The fear: Another USA Today report situation

thanks – don't forget to tip your modeler

any questions?

Brian Leahy

(616) 512-7018

bleahy@barr.com



Supply Chain Sustainability: Building Supplier Capability

Sherry Mueller

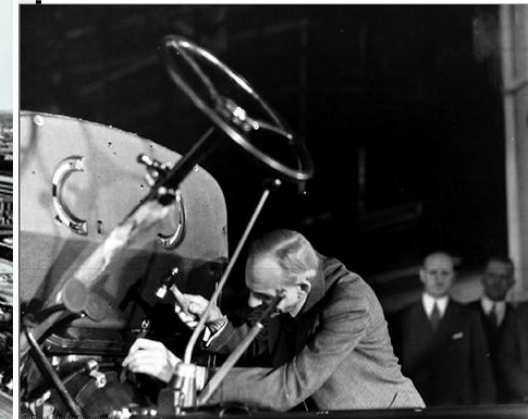
Ford Motor Company

November 8, 2018

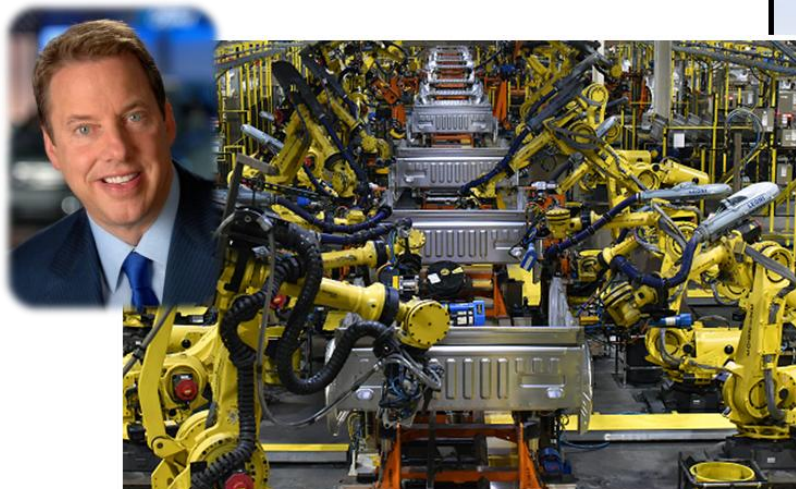
Automotive

Then and Now

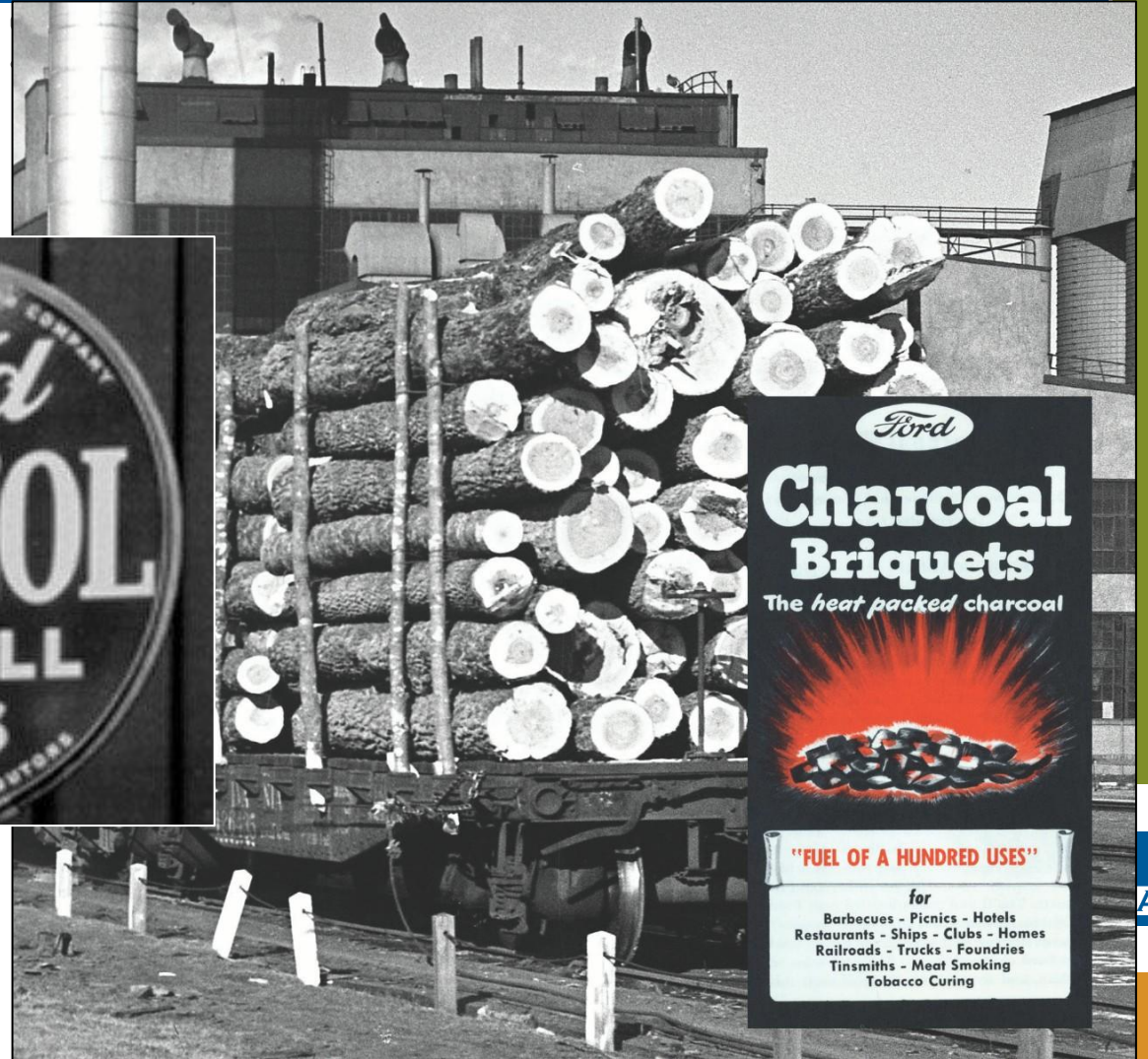
1910s



2010s

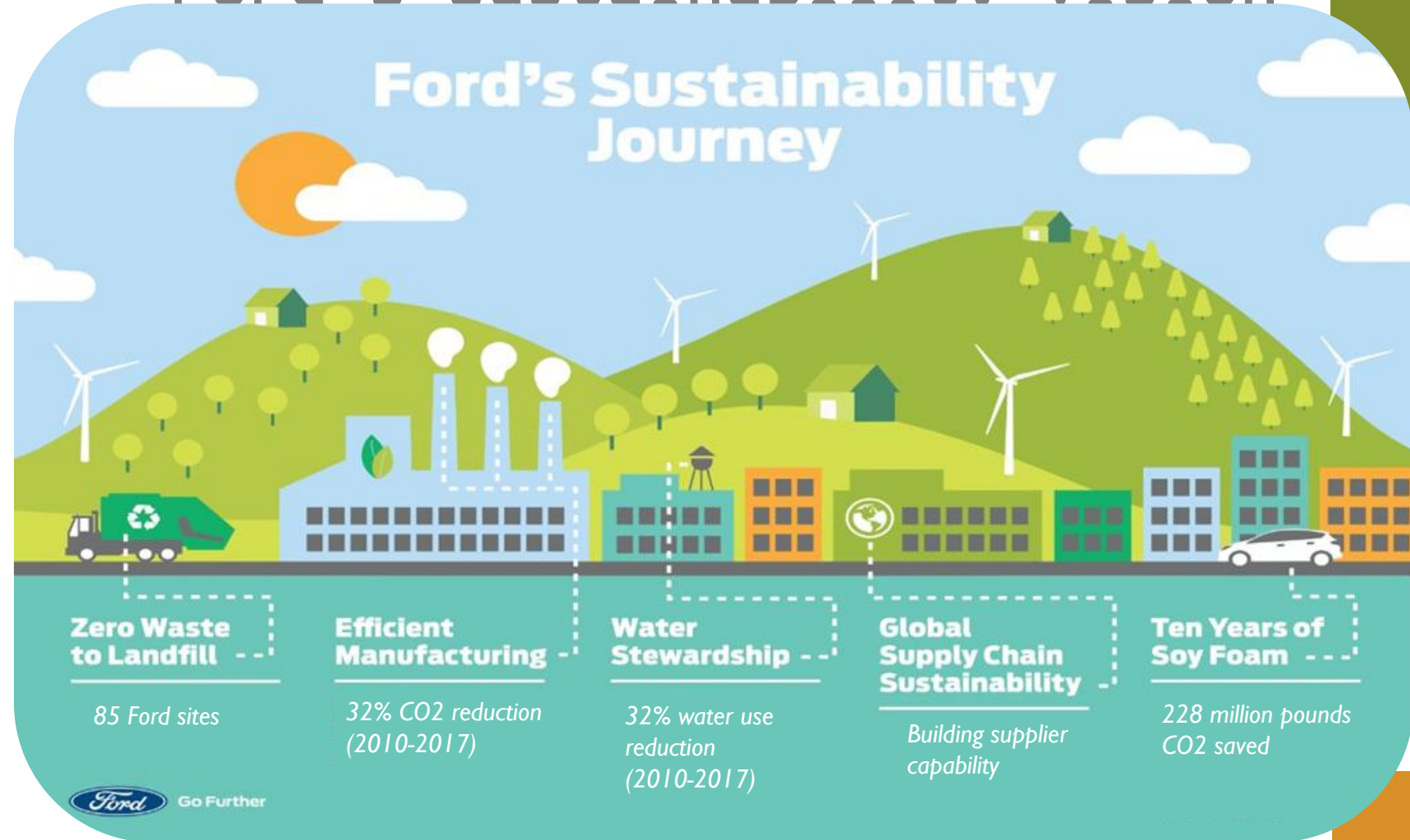


inabilit



Ford's Sustainability Vision

“Our long-term vision is not just about selling more cars. It’s to make people’s lives better by changing the way the world moves.”



Ford's Manufacturing Waste Strategy

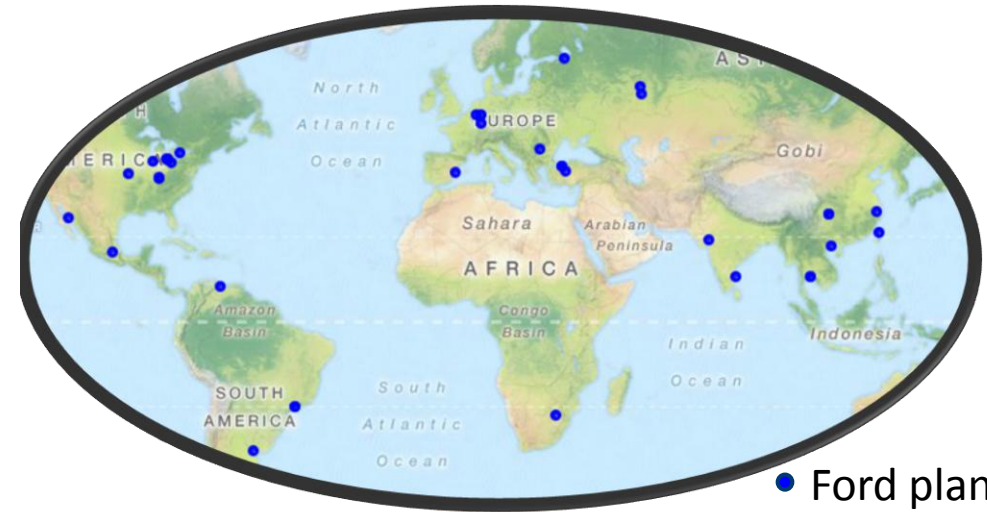
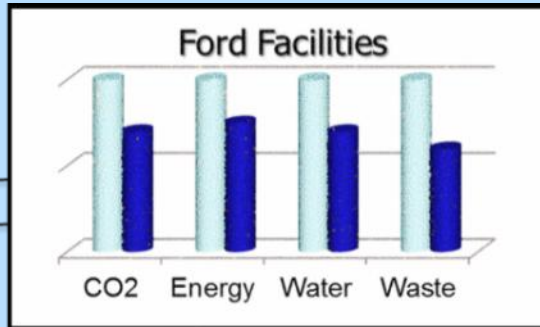
OUR PLAN: Minimize manufacturing and production waste

OUR PROGRESS:

- 61% reduction in waste-to-landfill per vehicle since 2013
 - ✓ Focusing on Top 5 sources at each facility
 - ✓ Implementing new technologies
 - ✓ Sorting to improve recyclability
 - ✓ Working with suppliers
- 85 Ford sites are zero-waste-to-landfill (absolutely no manufacturing waste from the facility goes to landfill sites)
- Closing the loop on aluminum recycling at Dearborn Truck, Buffalo Stamping and Kentucky Truck



Building Supplier Capability



Production Suppliers

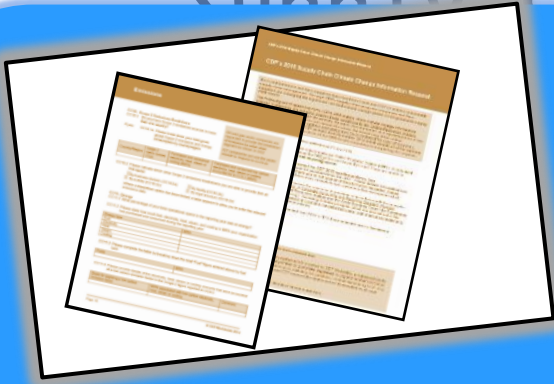
100,000+
Parts

1,200+
Suppliers

4,400+
Manufacturing
Sites

60+
Countries

Supply Chain Sustainability Environmental



CDP-Supply Chain

- Ford asks selected suppliers to respond to climate change and water questionnaires annually



Partnership for A Cleaner Environment (PACE)

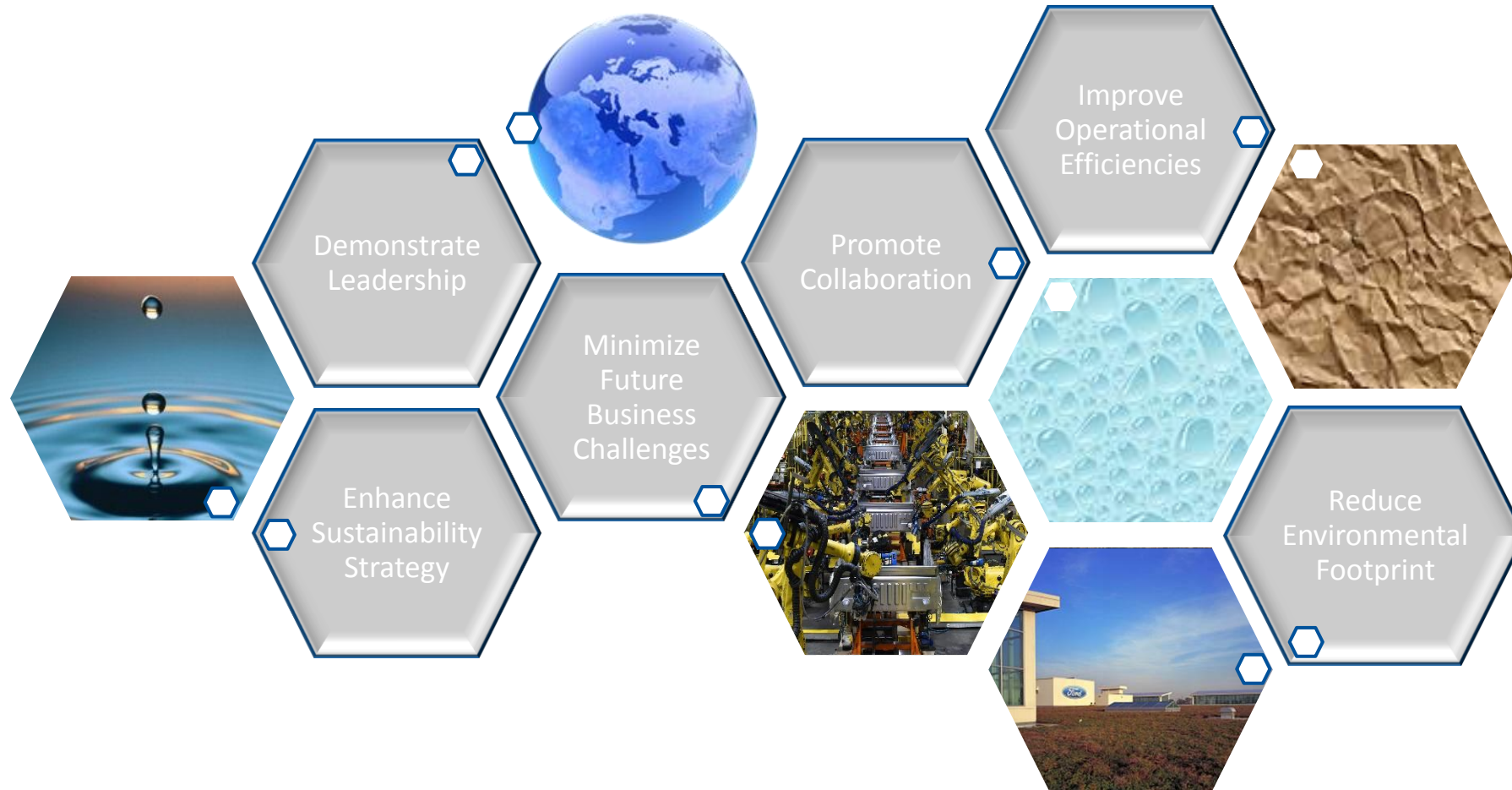
- Ford program to share our leading practices for energy, air emissions, water use, and waste reductions with selected suppliers



Supplier Site Environmental Audits

- Selected supplier sites are audited by a third-party auditor using the Responsible Business Alliance (formerly EICC) Validated Audit Protocol

Supplier Participation Benefits



Working Together For People And The Planet

*Partnership for
A Cleaner
Environment*



Energy



Water



Waste



Air Emissions



PACE Program: Air & Waste Modules



Waste

Hazardous and Non-Hazardous

- Packaging
- Kitchen/Domestic
- Waste Management
- Recycling
- Paints
- Sludge/Swarf



Air Emissions

CO, NOx, PM (2.5, 10 and total), SO₂, VOC and Pb


- Material Exchange
- Manufacturing Process Modifications
- Combustion
- Production Controls
- Logistics

PACE Reporting Tool



Introduction Tab





Partnership for A Cleaner Environment (PACE)

Program Introduction

FAQs

Click to Get Started!

Ford Motor Company is committed to reducing the environmental footprint of our vehicles, our operations and our supply chain. For our own operations, we have a commitment and a strategy to reduce greenhouse gas (GHG) and air emissions, water use and waste. We are working to promote a similar commitment throughout the automotive supply chain.

The Partnership for a Cleaner Environment (PACE) Program is an environmental supply chain sustainability initiative to reduce the collective environmental footprint of Ford and our automotive supply chain. Our goal is to teach our suppliers about the initiatives that Ford has implemented to reduce our environmental impact and encourage them to implement actions within their facilities. We are also encouraging our Tier 1 suppliers to share these leading practices with their own suppliers to amplify environmental responsibility and sustainability impact further down the supply chain. PACE is expected to align with and supplement our current CDP Supply Chain Program disclosure request and each PACE Reporting Tool provides a list of actions to minimize energy use, water consumption, waste generation or air emissions. A roadmap is also included which allows suppliers to track progress toward reducing each of these environmental impacts.

Participation in the PACE program is voluntary and the program consists of a 4-step iterative process with submittal of the completed form to Ford at the email address below by January 31, 2018.

- 1) Suppliers create multi-year plans for increasing environmental performance through reductions in GHG and air emissions, water use and/or waste generation.
- 2) Suppliers review leading practices, then enter baseline environmental data as well as current and future reduction projects into the PACE Reporting Tool(s).
- 3) As leading practices are implemented, suppliers allocate environmental data based on business with Ford and report progress annually.
- 4) Leading practice lists will be updated annually to include additional leading practices reported to Ford by our suppliers or implemented in our own facilities.

Ford appreciates your company's participation in this initiative and we look forward to working with you to reduce our collective environmental footprint!

Please submit the completed form by January 31, 2018 to: paceprog@ford.com

Please be advised that your participation in the Partnership for A Cleaner Environment (PACE) program is not guaranteed to result in decreased energy usage, water consumption, air emissions or waste generated. Your participation in the PACE program is completely voluntary and implementation of recommended practices is subject to your sole discretion. Ford Motor Company (Ford) is not responsible for the consequences of PACE program recommendations as implemented by participants or for any loss or damage resulting from program participation or the use of external resources cited in PACE materials. Targeted projections of reduced energy and water use, air emissions and waste generation are provided solely for informational purposes and are not a guarantee of actual results. All information and feedback and leading practices for energy, water use, air emissions and waste reduction obtained by Ford from participants is provided without restrictions on Ford's use or disclosure, and Ford shall be free to use or share such information with third parties, including other program participants.

Introduction

General Information

Corporate Waste Reductions

Waste Leading Practice List

Non-Hazardous Waste Roadmap

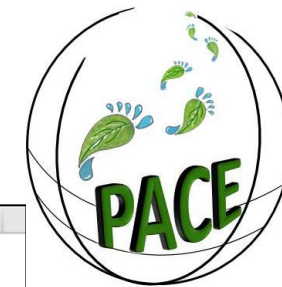
Hazardous Waste Roadmap

To ensure complete functionality, please click on Enable Content before navigating the workbook.



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Leading Practices Tab



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Corporate Waste Reductions Tab



Partnership for A Cleaner Environment (PACE) Program

Waste Generation - Corporate Reductions

Waste Generation and Shipment Reductions

Instructions for Entry of Facility/Division Reduction Projects:
1. Enter current and future reduction projects in table (click on the Waste Reduction button to the right to review additional opportunities). Provide as much information as possible.
2. Upon completion of the table, click the button to complete the next facility/division or to view the Waste Reduction Roadmap results.
3. Review comments in cells located in table header rows (Rows 20-21) for additional instruction.

Non-Hazardous Waste Roadmap

Waste Reduction Leading Practice List

Hazardous Waste Roadmap

COMPANY LEVEL PROJECTS

Enter Waste Category Targeted by Project	Select Leading Practice List Project ID (optional)	Enter Project Description	Select Year to be Completed	Enter Total Number of Projects for Activity (optional)	OPTION 1: CALCULATED ALLOCATED SAVINGS		OPTION 2: ENTER ALLOCATED SAVINGS	
					Enter Estimated Annual Savings for all Projects (kilograms) Total Savings	Enter Percentage of Project(s) Allocated to Ford	Estimated Annual Savings (kilograms) Savings Allocated to Ford	Enter Estimated Annual Savings (kilograms) Savings Allocated to Ford
Non-Hazardous Waste		Total Company-Wide Actions	2019	5	1,000.00	25.00%	250	
Non-Hazardous Waste	WS-015	Kitchen Waste	2017	1	106.00	20.00%	21.2	
		Dinnerware and Trays						
Non-Hazardous Waste	WS-037	Packaging	2019	1	450.00	15.00%	67.5	
		Waste Prevention / Returnable Containers						
Non-Hazardous Waste	WS-037	Packaging	2016	1	750.00	20.00%	150	
		Waste Prevention / Returnable Containers						
Non-Hazardous Waste		Total Company-Wide Actions	2020	15	6,000.00		-	500.00
(select from list)							0	
(select from list)							0	
(select from list)							0	
(select from list)							0	
(select from list)							0	
(select from list)							0	
(select from list)							0	
(select from list)							0	

Introduction

General Information

Corporate Waste Reductions

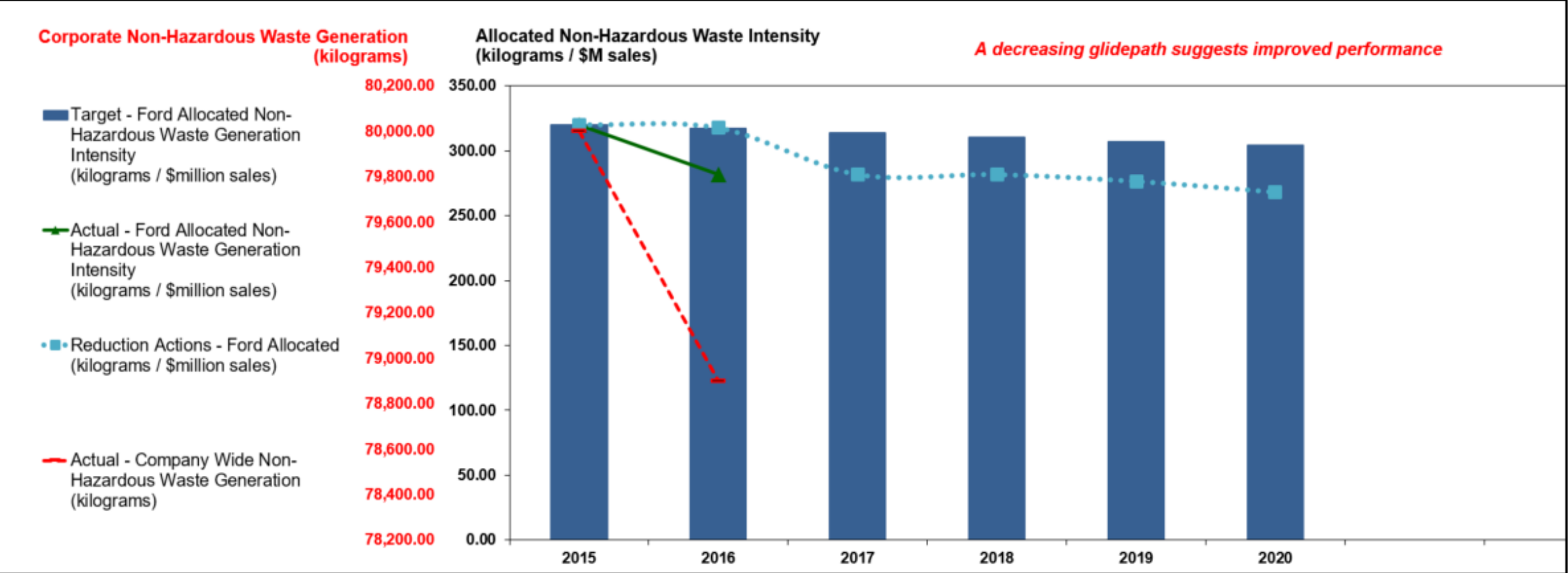
Waste Leading Practice List

Non-Hazardous Waste Roadmap

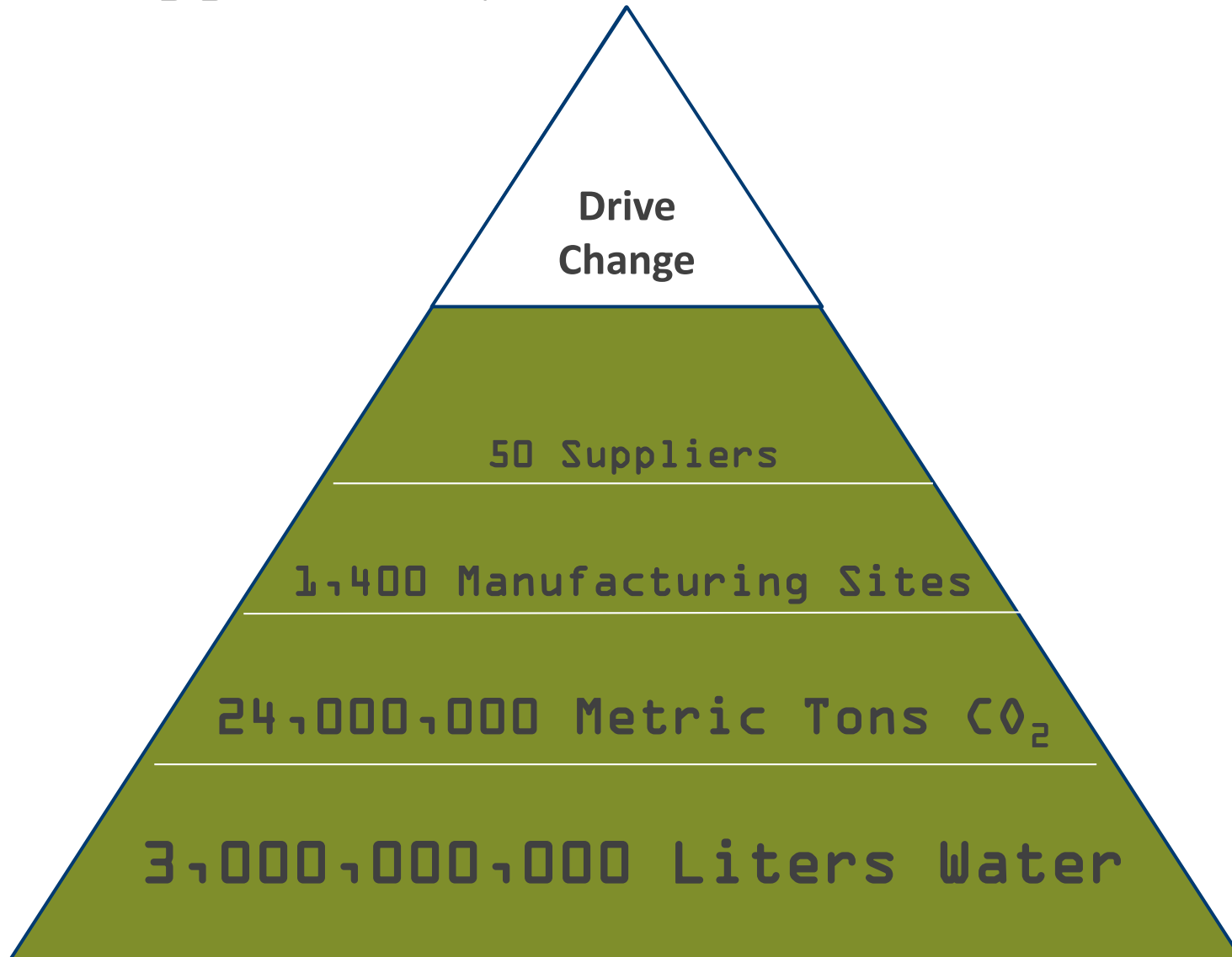
Hazardous Waste Roadmap



Roadmap Tab



Bigger Steps Leave A Smaller Footprint

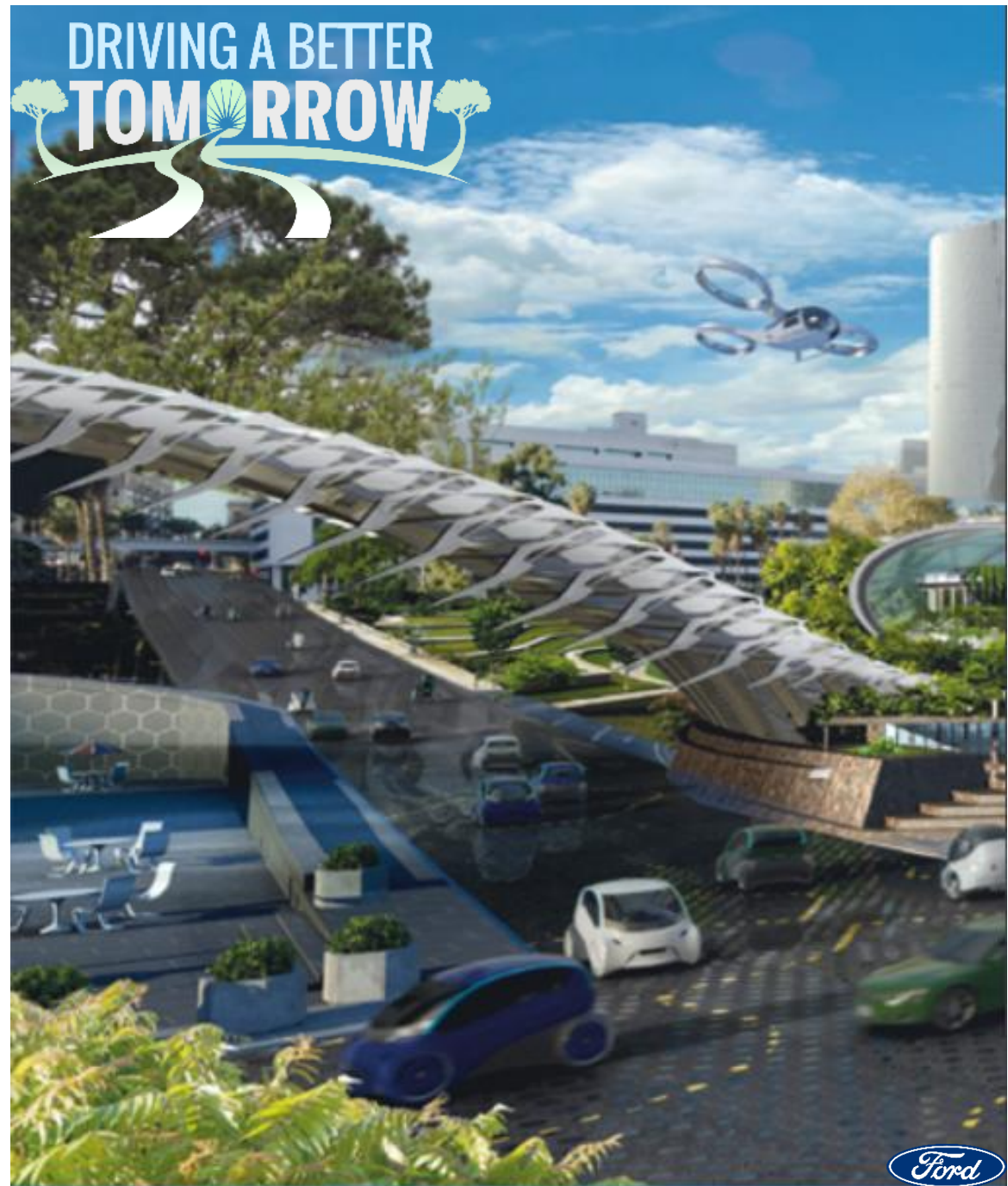


If you always do
What you always did
You'll always get
What you always got

— Henry Ford



Thank you!



ENVIRONMENTAL JUSTICE AND PUBLIC PARTICIPATION

Nick Schroeck

Director of Clinical Programs, Associate Professor of Law

University of Detroit Mercy School of Law

MLK1968



MLK1968



Poor People's Campaign 1968

- ❖ Address issues related to poverty in minority communities
- ❖ Sanitation Workers' conditions in Memphis, TN
- ❖ 2 workers killed on the job
- ❖ Eventually highlighted environmental health disparities
- ❖ Early mention of EJ

WHAT IS ENVIRONMENTAL JUSTICE?

U.S. ENVIRONMENTAL PROTECTION AGENCY

Environmental Justice is the **fair treatment** and **meaningful involvement** of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

WHAT IS ENVIRONMENTAL JUSTICE?

NONGOVERNMENT/NON- PROFIT/ADVOCACY

Environmental Justice is the requirement that all individuals have **equal access** to environmental **protection** and equal **opportunity** to enjoy environmental **benefits**.

HISTORY OF ENVIRONMENTAL JUSTICE

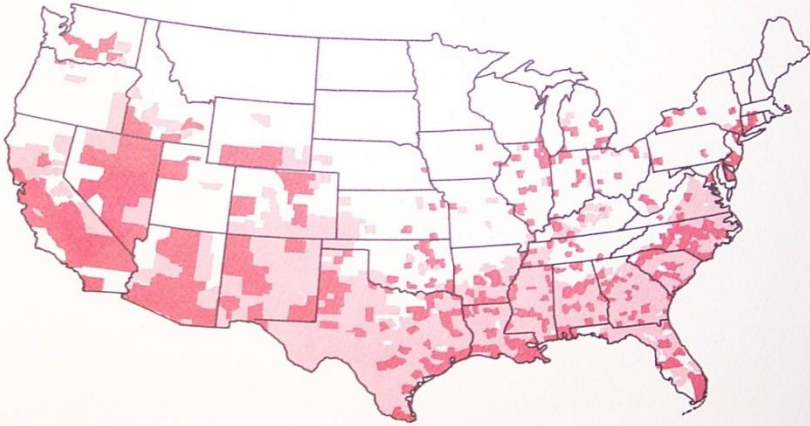


- ❖ **U.S. Environmental Protection Agency (EPA) was created by Executive Order in December 1970**
- ❖ **EPA had 4 goals:**
 - ❖ Create & enforce environmental standards
 - ❖ Conduct research on pollution and the best methods of control
 - ❖ Assist the Council on Environmental Quality in recommending policies to the President
 - ❖ Assist others, through grants and technical assistance, to address pollution issues
- ❖ **EPA's basic mission** is to Protect human health and the environment -- air, water, and land.

HISTORY OF ENVIRONMENTAL JUSTICE

TOXIC WASTES AND RACE In The United States

A National Report on the Racial and Socio-Economic
Characteristics of Communities
with Hazardous Waste Sites



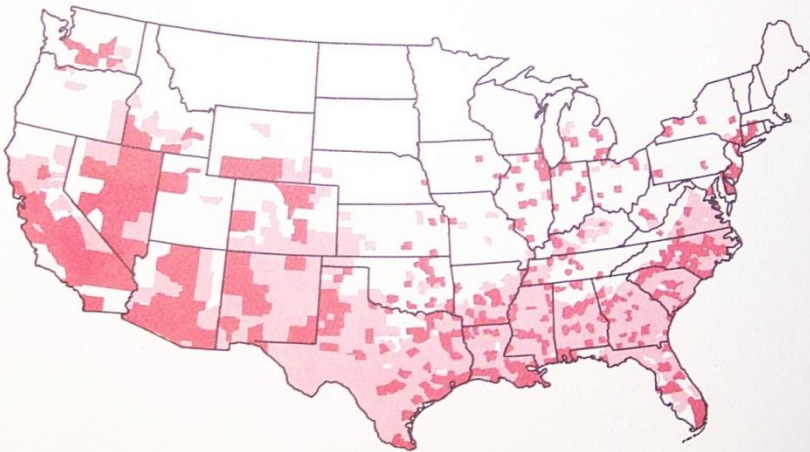
COMMISSION FOR RACIAL JUSTICE
United Church of Christ
©1987

- ❖ **Suspicion of health disparities**
- ❖ **United Church of Christ - Commission for Racial Justice 5 year study**
 - ❖ Focus on the location of hazardous waste sites
 - ❖ Related to race and socioeconomic status
- ❖ ***Toxic Waste and Race Report released in 1987***
 - ❖ Race was the most significant variable in location of waste sites
 - ❖ Poor minorities were 2x more likely to have a site in their community
 - ❖ Poor minorities were 3x more likely to have 2+ sites in their community
 - ❖ 3 out of every 5 Blacks (15 million) and Hispanics (8 million) lived near an uncontrolled site

HISTORY OF ENVIRONMENTAL JUSTICE

TOXIC WASTES AND RACE In The United States

A National Report on the Racial and Socio-Economic
Characteristics of Communities
with Hazardous Waste Sites



COMMISSION FOR RACIAL JUSTICE
United Church of Christ
©1987

Toxic Waste and Race Report findings

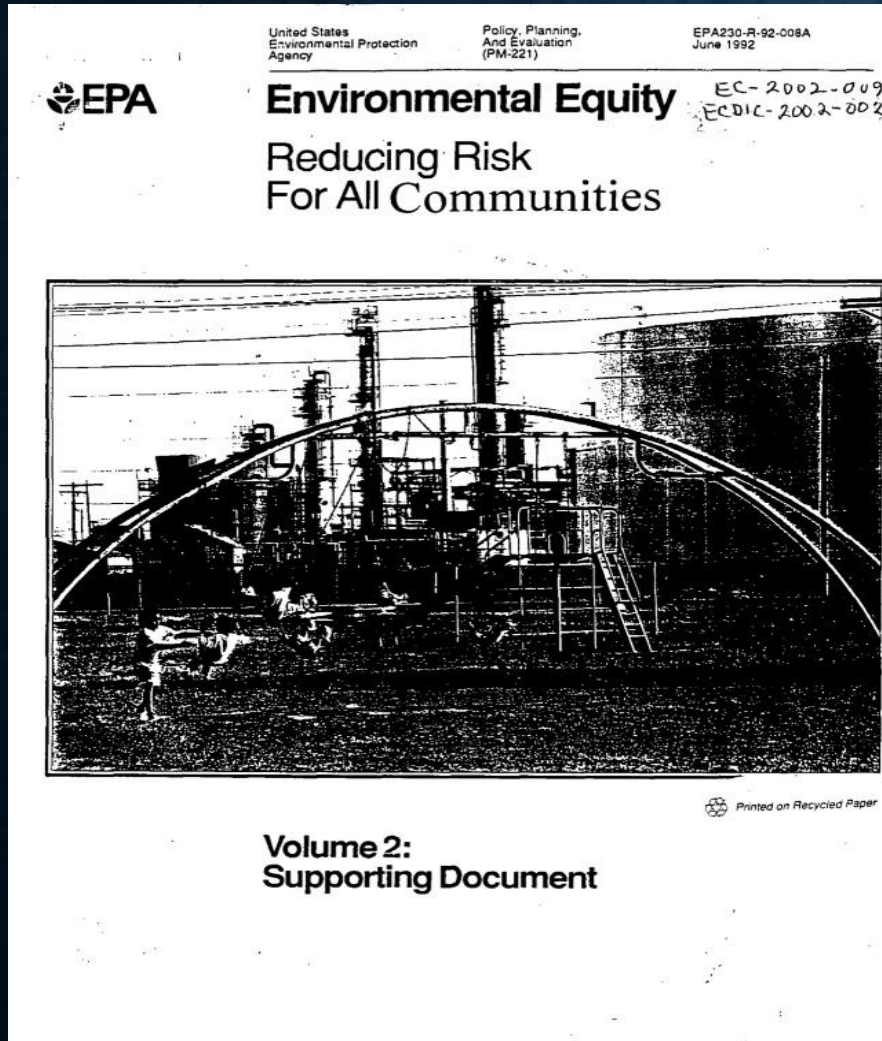
- ❖ Communities **lacked access to information** regarding environmental action/decision-making
 - ❖ 90% of activist groups reported obstacles to information
 - ❖ 50% of those groups reported that the government actively tried to deny them access to information
- ❖ Poor economic conditions made communities **more vulnerable to unfair deals & risks** (trade off for jobs; economic development)
- ❖ **Disproportionate impact** that living near a hazardous waste site had on the **physical health** of minority and poor communities

HISTORY OF ENVIRONMENTAL JUSTICE

1990 - Congressional Black Caucus (CBC)

- ❖ Reviews *Toxic Waste and Race* Report
- ❖ Petitions the Pres. Bush and EPA to address the issue in early 1990
- ❖ EPA establishes Environmental Equity Work Group (EEW) later that same year to determine “the validity of the CBC’s concerns”
- ❖ EEW releases its finding 2 years later titled *Reducing Risk for All Communities (July 1992)*
- ❖ The report validated the CBC’s concerns and affirmed the findings in *Toxic Waste and Race*.

HISTORY OF ENVIRONMENTAL JUSTICE



Reducing Risk for All Communities findings:

1. 75% of hazardous waste landfills were located in majority black communities
2. 54% to 68% of black children living in poverty had unacceptably high blood lead levels, whereas their (white children were at 23% to 38%)
3. Hispanics were at higher risks for pesticide exposure
4. Poor minorities were at higher risks of exposure to air pollution
5. Fish consumed by minorities more likely to contain pollutants.

HISTORY OF ENVIRONMENTAL JUSTICE

Recommendations:

1. Establish an Office on Environmental Equity
(*Reducing Risk*, July 1992)
2. Establish National Advisory Council on Racial & Ethnic Concerns (*Toxic Waste and Race*, 1987)

Actions:

- ❖ November 1992: Pres. Bush has EPA create the Office of Environmental Equity; later becomes Office of Environmental Justice (OEJ)
- ❖ No action taken by Presidents Reagan or Bush to form a National Advisory Council on Racial and Ethnic Concerns

HISTORY OF ENVIRONMENTAL JUSTICE

National Environmental Justice Advisory Council (NEJAC)

- ❖ 1993: Pres. Clinton advises EPA to create NEJAC
- ❖ Federal Advisory Committee to EPA
- ❖ Helps integrate environmental justice with other EPA priorities and initiatives
- ❖ members come from various, non-federal sectors
- ❖ Workgroups: Air & Water; Enforcement; Health and Research; Indigenous Peoples; International; Puerto Rico; and Waste & Facility Siting

HISTORY OF ENVIRONMENTAL JUSTICE

Executive Order 12898

- ❖ February 16, 1994: Pres. Clinton issues EO12898 - *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*
- ❖ Directed all federal agencies to focus on the human and environmental health effects of agency actions on minorities and low-income communities
- ❖ Required agencies to create **environmental justice plans** that are to be adhered to agency-wide
- ❖ Created **Interagency Working Group** on Environmental Justice

HISTORY OF ENVIRONMENTAL JUSTICE

Executive Order 12898 Continued

- ❖ **2001-2008: EO12898 largely inactive under Pres. Bush**
 - ❖ IWG was disbanded
 - ❖ Federal Agencies were not required to create and adhere to EJ Plans; most didn't
- ❖ **2009 - 2017: EO12898 was revived by Pres. Obama**
 - ❖ *August 2011: Memorandum of Understanding on Environmental Justice and Executive Order 12898*
 - ❖ *Reconvened and expanded IWG (Lisa Jackson)*
 - ❖ Strengthened EJ policies under CRA of 1964
- ❖ **2018 & Beyond: What do you think is next for EO12898?**

MICHIGAN & ENVIRONMENTAL JUSTICE



**What does this
have to do with
Michigan?**

MICHIGAN & ENVIRONMENTAL JUSTICE

- ❖ Michigan has *many* EJ Communities, minority communities living in poverty
- ❖ Advocates fought to implement a Michigan EJ Plan in 2006
- ❖ Gov. Granholm issued ***Michigan Executive Directive No. 2007-23 “Promoting Environmental Justice”*** in November 2007
- ❖ Directive did two things: 1) **Defined EJ** 2) Required MDEQ to establish a working group tasked with drafting and adopting an **EJ Plan for the state**

MICHIGAN & ENVIRONMENTAL JUSTICE

Michigan Environmental Justice Plan

- ❖ MDEQ convened the Environmental Justice Working Group in 2008
- ❖ State government, the nonprofit sector, and private industry collaborated for 3 years to create the EJ Plan
- ❖ The final EJ Plan was adopted in December 2010
- ❖ The plan mandated:
 - ❖ Creation of an **Interdepartmental Working Group**
 - ❖ Increased **public participation** & community engagement
 - ❖ Establishing **environmental justice metrics/measurements** for state government decision-making

MICHIGAN & ENVIRONMENTAL JUSTICE

With the Michigan EJ Plan, could we have avoided the Flint water crisis?

- ❖ **Interdepartmental Working Group** would have required involvement of **all relevant departmental leaders** in the Flint water decisions
- ❖ **Public participation** would have required the MDEQ to go through a **comprehensive community engagement process** in which citizens concerns could have been heard and adequately responded to; citizens would have also been informed and educated about the water issues
- ❖ **Environmental Justice Metrics** would have served as a clear indicator for whether **this particular community was more vulnerable** to environmental and public health risks than other communities; requiring preventative action.

EMERGING MICHIGAN EJ AND PUBLIC PARTICIPATION ISSUES

- Arab-American community in Dearborn, South Dearborn, Southwest Detroit
- Translation of public participation documents
- Continuing issues with Tribal Consultation. Remember Treaty of Washington of 1836 and continuing rights of Tribes (13.8 million acres, 37% of current land in Michigan). Anishinaabeg reserve the right to hunt and fish! Animals need habitat, fish need water.
- Lack of trust

MICHIGAN & ENVIRONMENTAL JUSTICE

Next Steps

- ❖ Calling on the Governor and State Legislature to formally adopt the plan as state law
- ❖ Explore other ways to prevent EJ crisis from happening (again) in the state of Michigan
- ❖ **Governor Snyder's Working Group on Environmental Justice**
- ❖ **Thoughts on Governor Whitmer Administration and AG Nessel**

MICHIGAN & ENVIRONMENTAL JUSTICE

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Thanks to Jeremy Orr for his work on this
presentation!



Public Participation

William C. Fink

Country View Family Farms



A network of farms that includes 18 sow farms and over 200 nursery and finishing farms that are owned and operated by independent farm families located throughout Indiana, New York, Ohio, and Pennsylvania.

Food Processing



Pork processing facilities located in Hatfield and Emmaus, Pennsylvania and Coldwater, Michigan.

PV Transport



A logistics and transportation company that transports hogs from farm to farm, from farm to the plants, as well as finished products directly to customers.

Mission / Vision



May the favor of the Lord our God rest on us;
establish the work of our hands for us—
yes, establish the work of our hands.
Psalm 90:17

We aspire to operate in a way that honors the Lord Jesus Christ as demonstrated through our ethics, integrity, and stewardship.

To be a provider of wholesome, sustainable food for our families and customers with a world-class team practicing ethics, integrity, and stewardship.

Core Values



Ethics

“I’ll do the right thing”

is at the heart of our commitment to doing business the right way every day. It means putting others first: our customers, other team members, the animals in our care. Simply put, we practice a passionate adherence to fair and upstanding principles.



Integrity

“I’ll do what I say”

Honesty in all that we do is a non-negotiable principle that every team member at Clemens is expected to live by. Truthfulness in all business dealings as well as honest care for our team members is one reason that we’ve been able to thrive for 120 years.



Stewardship

“I’ll build a foundation for the future.”

Caring for the environment, the community, and our fellow team members are key pillars of who we are as a company. We strive to be good stewards of our planet with state-of-the art sustainability practices in our offices and at our farms.

2012 Feasibility Study

2014 Producer Partners and Engagement with State and Local Governments

2015 moving dirt and ground excavation

2016 Building

2017 Plant opening and operations begin

2018 Full operation

2 years of Community engagement

- Festivals
- Parades
- Job fairs

Philanthropy

Building a team of 800+

- Welcome center
- Over 200 team member worked in PA to learn

Site selection process

Before Purchase

- local officials
- Neighbors
- Tour Facilities

Purchase Farm

- Pre-application permitting meeting
- News release before public notice
- Work with locals groups / churches

Open House

- Show what was built

- Bio-filter replacement
- Rendering scrubber upgrade

Hatfield



- Good neighbor policy

Farms



Keeping with Clemens Core values has helped with effective community engagement

Ethics



“I’ll do the right thing”

Integrity



“I’ll do what I say”

Stewardship



“I’ll build a foundation for the future.”

California's Prop 65: Confusion, Disbelief and Unanticipated Costs

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November 8, 2018

Why Talk About California at a Michigan Conference?

- ▶ Why worry about California? My company is not located in California.
- ▶ California's economy is the 5th largest in the world, ahead of the United Kingdom!
- ▶ If your company manufactures or sells a product, chances are the product is sold in California.
- ▶ California regulations have become the de facto national standard for products.

First, A Bit of History

- ▶ The Toxic Substances Control Act of 1976 (“TSCA”)
 - TSCA was ineffective in regulating chemicals (it could not even support a ban on asbestos).
- ▶ California voters passed Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986.
- ▶ 2016 TSCA Amendments passed
 - TSCA chemical inventory is being updated to reflect the chemicals currently being manufactured/imported.
 - Existing chemicals will be prioritized and assessed.
 - New chemicals must be assessed before approval to manufacture/import and sensitive subpopulations will be considered.

Prop 65, This Can't Be!

“Surely you are not serious, this is not logical,” questioned one European executive upon hearing of a state statute that:

- ▶ Requires businesses to redesign products even though they comply with federal safety standards
- ▶ Provides only a vague notice of what chemical concentration in a product triggers a warning
- ▶ Places the compliance burden of proof on the manufacturer or distributor

Prop 65 Basics

- ▶ Requires the state of California to promulgate a list of chemicals “known” to be carcinogens or reproductive toxins.
 - Currently, there are approximately 900 chemicals on the list.
- ▶ If a company manufactures or distributes a product that contains a chemical on this list, the product must include a warning label, unless the average daily exposure is below a safe harbor exposure level.
- ▶ Warning signs also must warn of environmental exposure, such as vehicle exhaust in a parking garage.

What is “Exposure”?

- ▶ Exposure does not = concentration
- ▶ Exposure = (average concentration) x (amount released into the body per unit of time under typical use scenario)
 - Requires product-specific assumptions
 - Exposure assessments are expensive and technically complex

Safe Harbor Levels

- ▶ Warning labels are not required if “exposure” is below the state determined safe harbor level for a chemical.
 - For example, the safe harbor level for lead is 0.5 micrograms/day
- ▶ Since per day “exposure” to chemicals will be different for different types of products, allowable chemical concentrations will vary from product to product.
- ▶ The result is that companies do not know what constitutes compliance until after they have litigated or settled a Proposition 65 case or if a settlement was previously reached on a similar product that identified an acceptable concentration.

Prop 65 Warning

- ▶ The requirement to include a warning is triggered by the mere presence of a chemical in a product, REGARDLESS OF RISK.
- ▶ August 31, 2018, new warning regulations became effective.
 - New warning content and transmission requirements
 - Specific warning requirements applicable to certain products, including:
 - Food, alcoholic beverages, warnings for restaurants, dental care, vehicles, furniture, parking structures
 - Generally require the identification of at least one chemical
 - Allow manufacturers to shift the burden of compliance to retailers

PFAS Again!

- ▶ PFOA and PFOS were added to the Prop 65 list of chemicals
- ▶ Beginning November 10, 2018, plaintiffs may file Prop 65 claims for these chemicals.
- ▶ PFOA and PFOS are still manufactured in China, for example, so they may still be in the supply chain.
- ▶ PFOA and PFOS could enter industrial facilities through the water supply and then impact finished consumer products in detectable levels as contaminants.
- ▶ Testing has shown the presence of these chemicals as impurities in food sources (snack foods, vegetables, meat, dairy), and other consumer products.

PFAS

- ▶ California has not set a safe harbor level for either chemical.
- ▶ Plaintiffs need only detect trace amounts of PFOA/PFOS to support a Prop 65 claim, then the burden shifts to defendants to try to demonstrate no significant risk.
- ▶ If the chemical is present at any detectable level in a product, it would be prudent to provide a warning to the consumer prior to purchase.

Enforcement

- ▶ Enforcers include:
 - State and local district attorneys
 - Private citizens (“bounty hunters”)
 - Can enforce the statute and recover penalties and litigation costs
- ▶ The courts have interpreted Prop 65 as shifting the burden of proof to the defendant to demonstrate that exposure is less than the safe harbor level.

Bounty Hunters

- ▶ The profit motive has become the primary factor in the initiation of many lawsuits.
- ▶ Between 2013 and the end of 2017:
 - 8,136 Prop 65 60-Day Notices filed
 - 3,045 settlements
 - Over \$129 MM paid by companies
 - Average settlement was \$42,000
 - Attorney's fees accounted for 72% of the settlement payments
- ▶ Note: These costs DO NOT include costs to defend these claims and potential reputational damages.

No Place is Safe From Prop 65

- ▶ Due to the significant potential liability associated with Prop 65, companies seeking to avoid liability include warning signs EVERYWHERE in California and on a variety of products.

Food



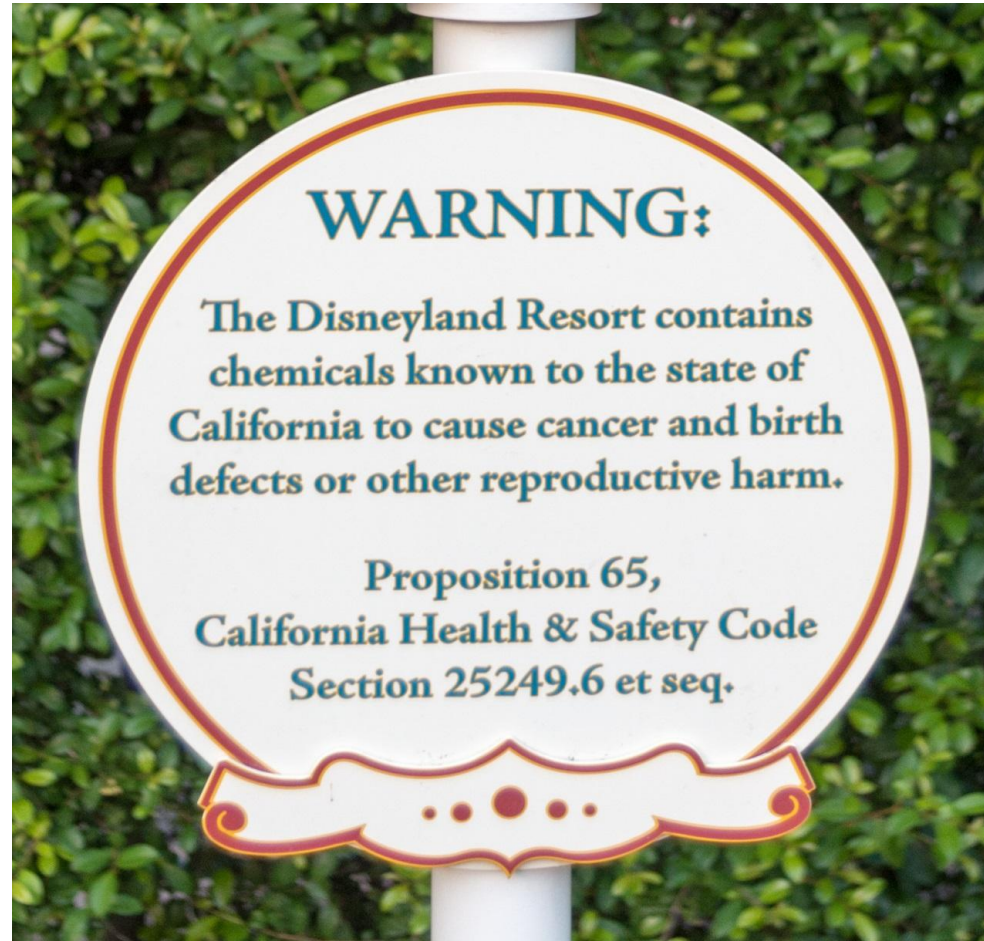
Parking Garage



Alcoholic Beverages



Even Disneyland!



The Take Away

- ▶ Prop 65 represents a real liability risk for every company that sells products in California.
- ▶ Companies need to include Prop 65 in their regulatory compliance programs and as part of due diligence in any acquisition.
- ▶ Prop 65 warning labels are the only way to prevent a Prop 65 claim.
 - Even if a company's test data demonstrates there are no significant exposure risks from Prop 65 chemicals in its products, without a warning label a bounty hunter can still file a Prop 65 claim.
 - The company may prevail, but would still be required to incur defense costs and potential damage to its reputation.

Questions & Answers

For more information, visit
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