NC Division of Air Quality's PFAS Updates

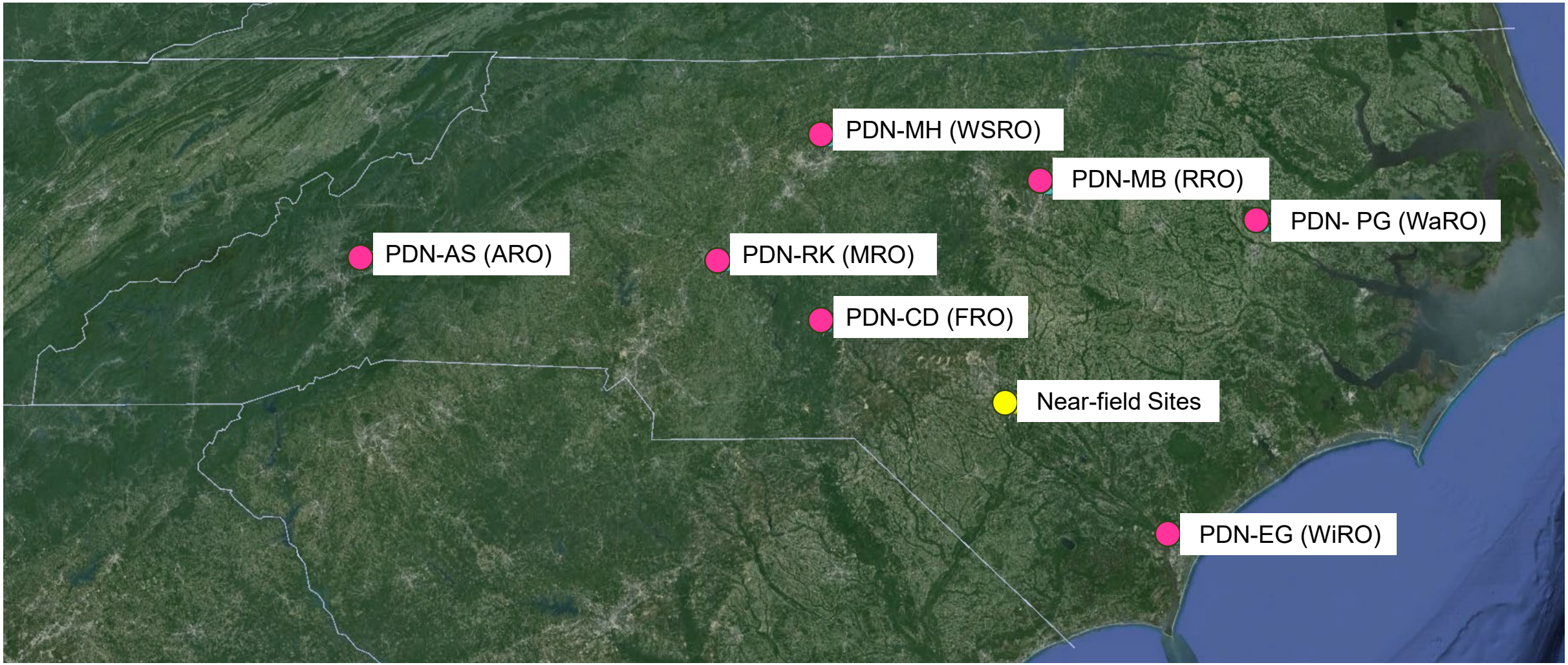
AAPCA Spring Meeting
May 1, 2025

Taylor Hartsfield, Deputy Director
Department of Environmental Quality

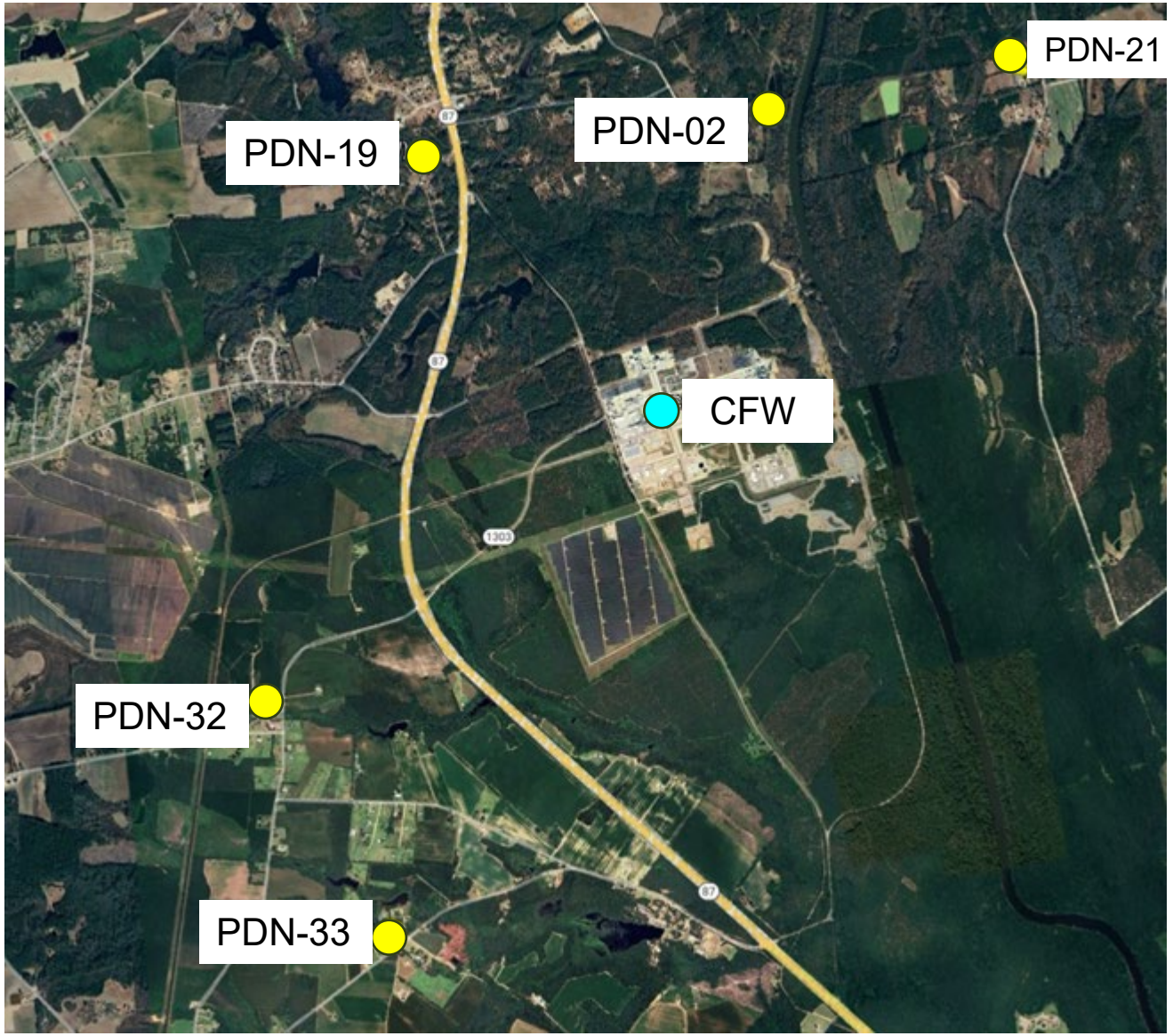
Overview

- North Carolina's PFAS Deposition Network (PDN)
- PDN Data Analysis and Graphs
- Emerging Contaminants - Screening Questions & Multi-media priorities
- Permit Conditions for Disclosure and Testing
- NC DAQ's PFAS Wish List

PDN - Background Sites at Regional Offices



PDN Sites Near-field to Chemours Fayetteville Works



Sites Near-field to Chemours Fayetteville Works

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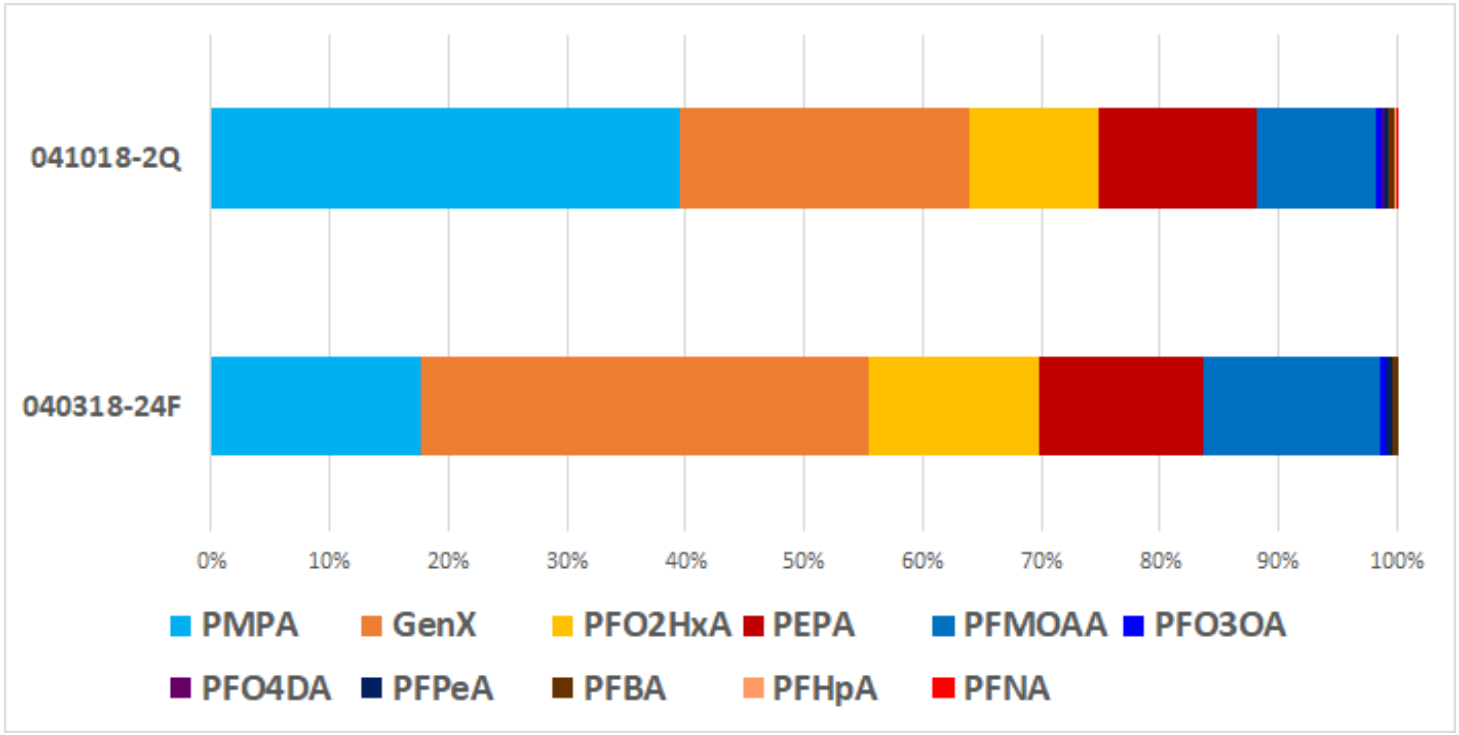
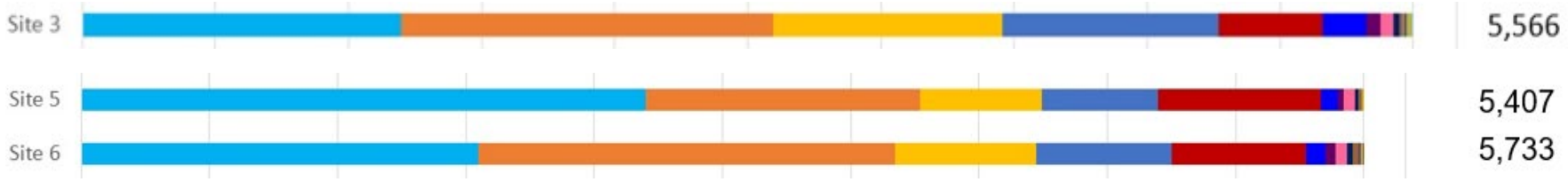
PFAS Signatures in April 2018 Wet/Dry Deposition Sample



	Total (GenX)PFAS (ng/L)	Deposition (ng/m2) = (Concentration * sample volume) / Bucket opening
	1,254 (307)	26,200 (6,420)
	532 (200)	11,100 (4,180)

Groundwater PFAS Signatures from GAC Pilot Study



	Total PFAS (ng/L)
Site 3	5,566
Site 5	5,407
Site 6	5,733

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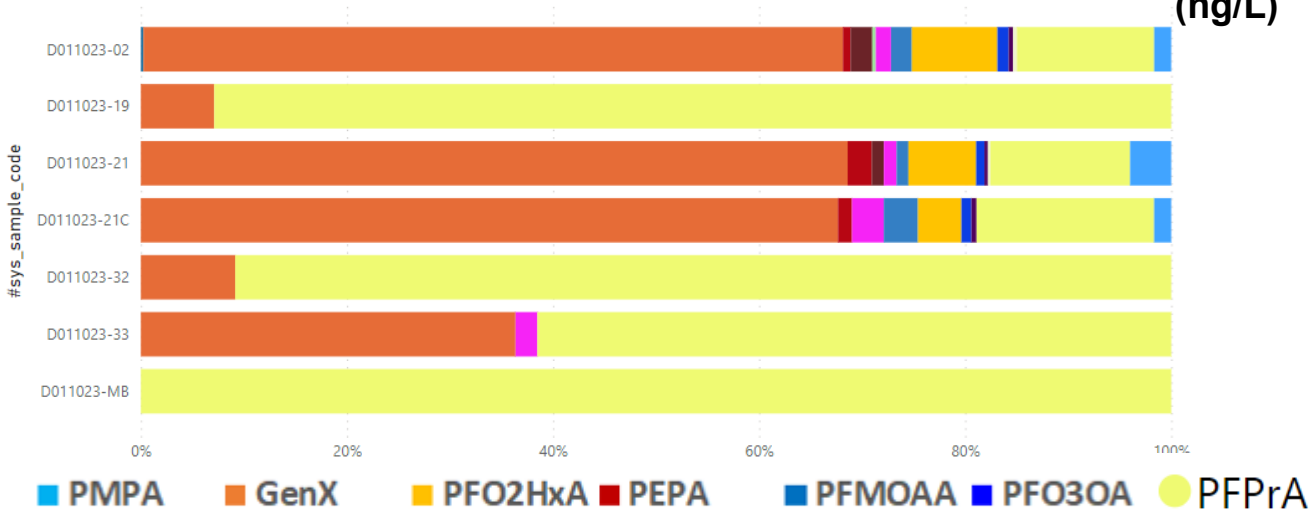
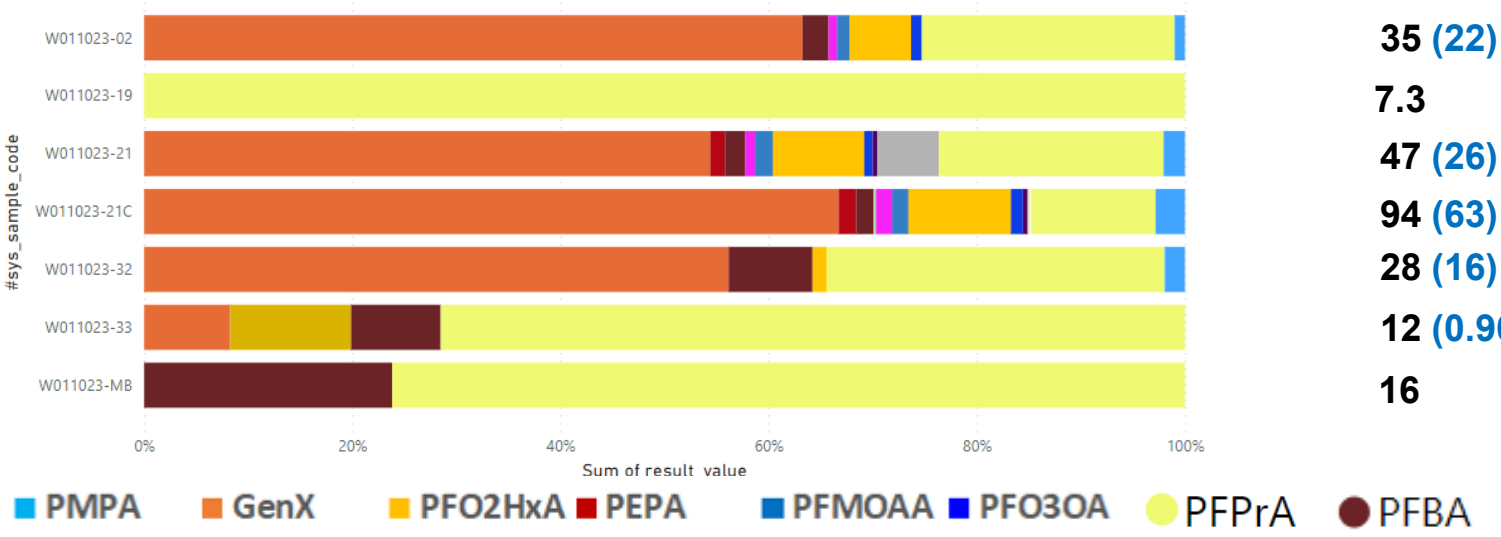
Deposition in 2023 Samples

Dry Deposition



	Total PFAS (GenX) Conc (ng/L)	Total PFAS (GenX) Dry Deposition (ng/m2)
D011023-02	107 (73)	1,000 (670)
D011023-19	9.1 (0.647)	80 (6)
D011023-21	95 (65.3)	880 (600)
D011023-21C	38 (25.8)	350 (240)
D011023-32	7.5 (0.687)	70 (6)
D011023-33	14 (5.09)	130 (47)
D011023-MB	8	0.007

Wet Deposition



	Total PFAS (GenX) Conc (ng/L)	Total PFAS (GenX) Wet Deposition (ng/m2)
W011023-02	35 (22)	320 (200)
W011023-19	7.3	70
W011023-21	47 (26)	430 (240)
W011023-21C	94 (63)	880 (590)
W011023-32	28 (16)	260 (150)
W011023-33	12 (0.96)	110 (90)
W011023-MB	16	190

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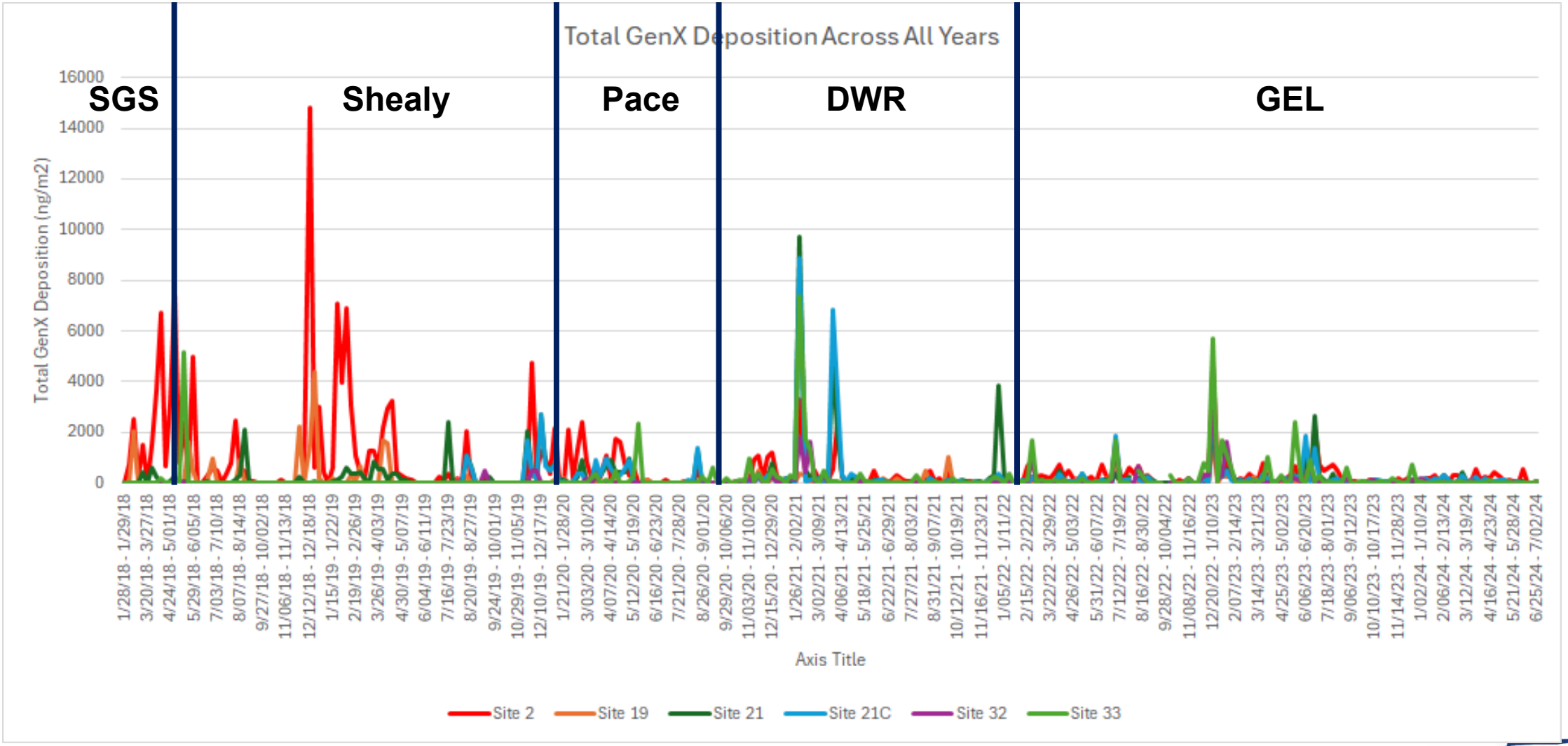
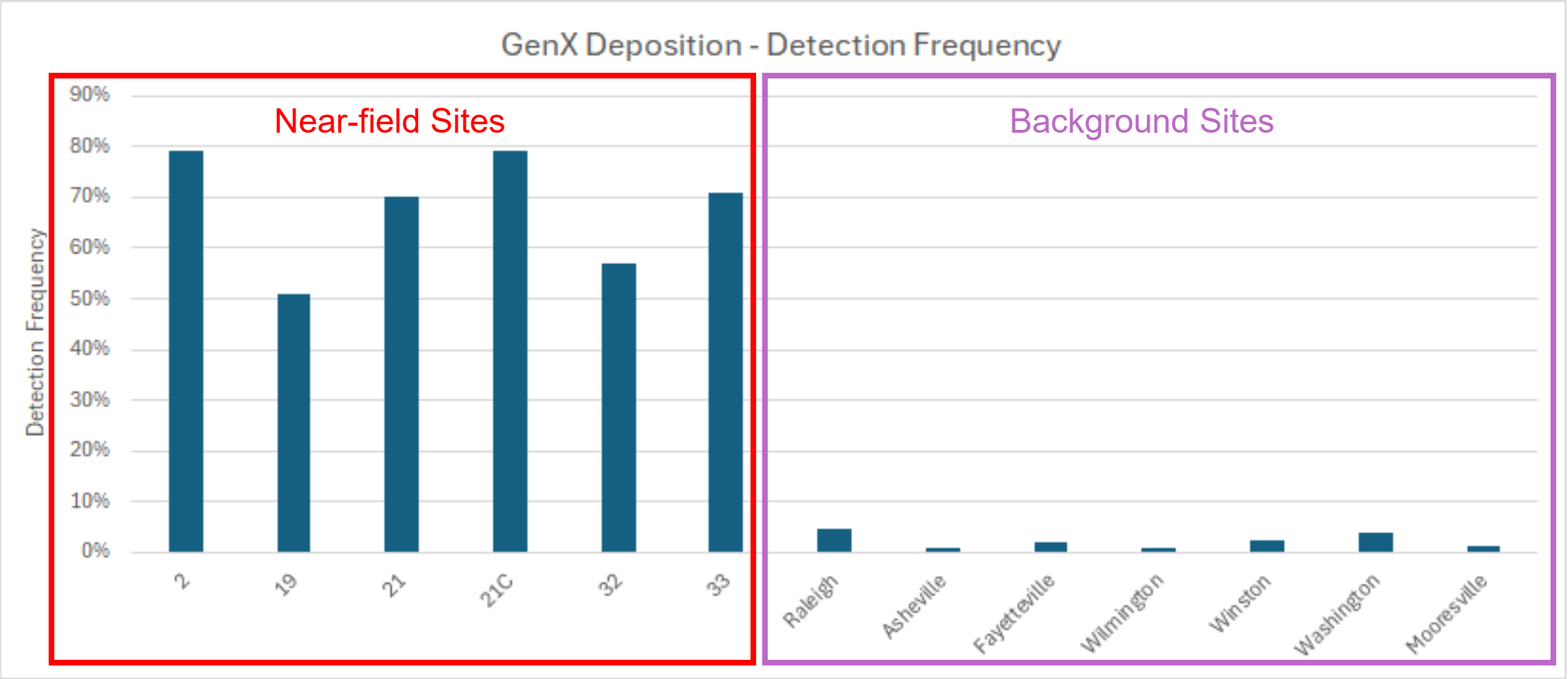
Near-field Site GenX Total Deposition



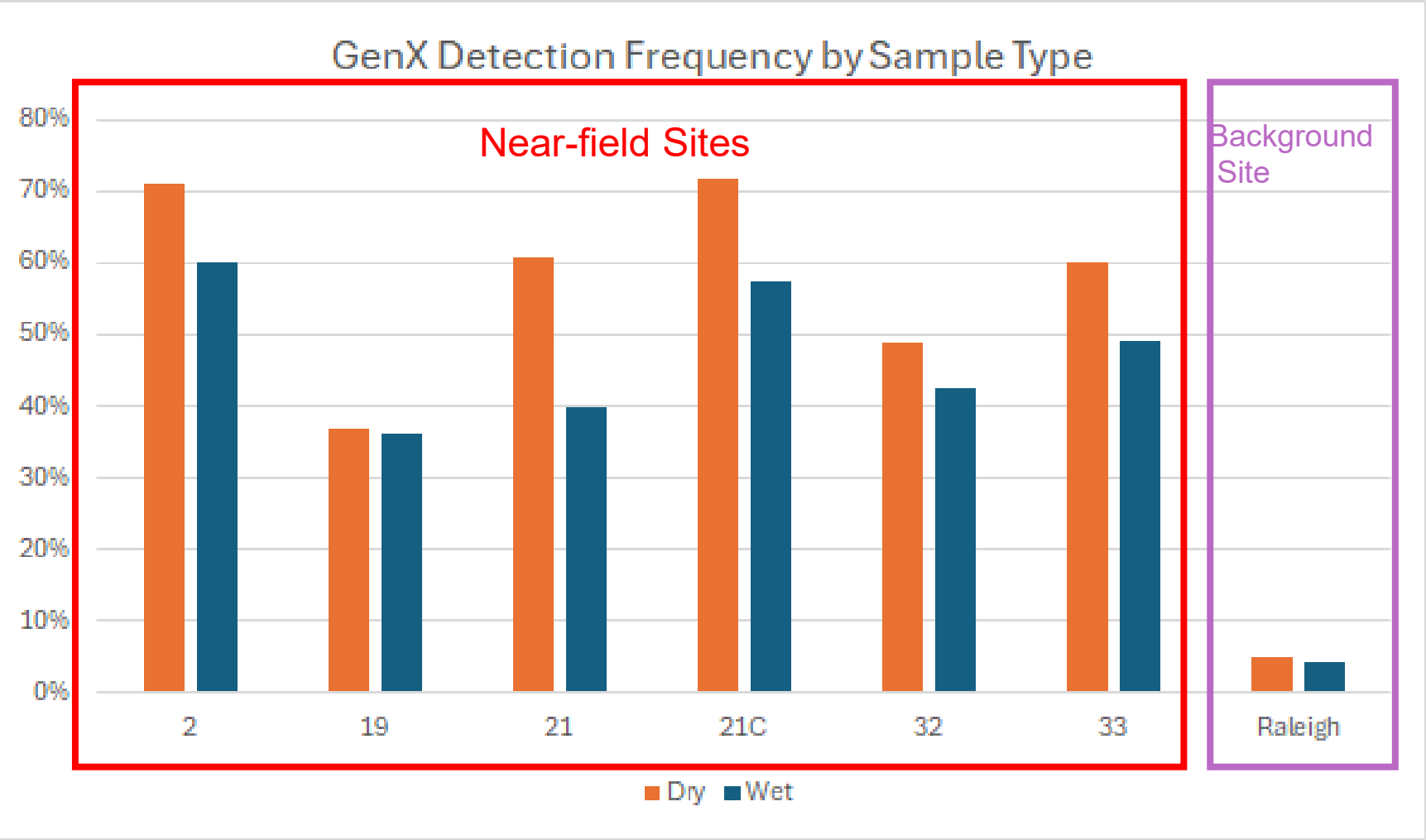
Note: Frequency of detection increases with time due to lower quantitation limits

GenX Detection Frequency Since 2018



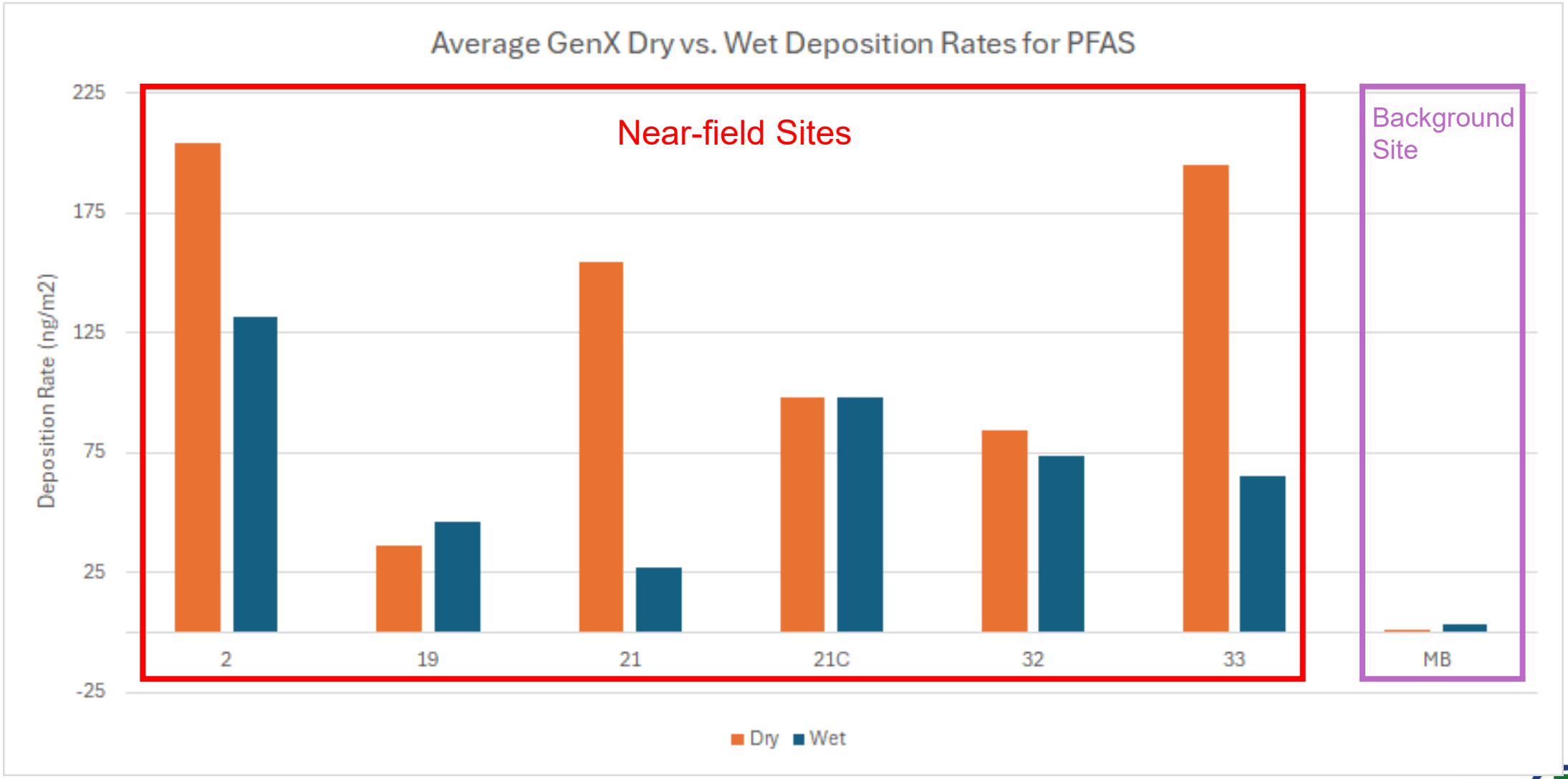
Notes: GenX detection frequency now greater
PFOA, PFOS, PFNA found in 0% to 2% of samples at all locations

GenX in Detection Frequency in Dry vs. Wet Samples



Typical pattern for most PFAS with the following exceptions:
PFMOAA, PFPrA, PFBA

GenX Deposition Rates in Dry vs. Wet Samples



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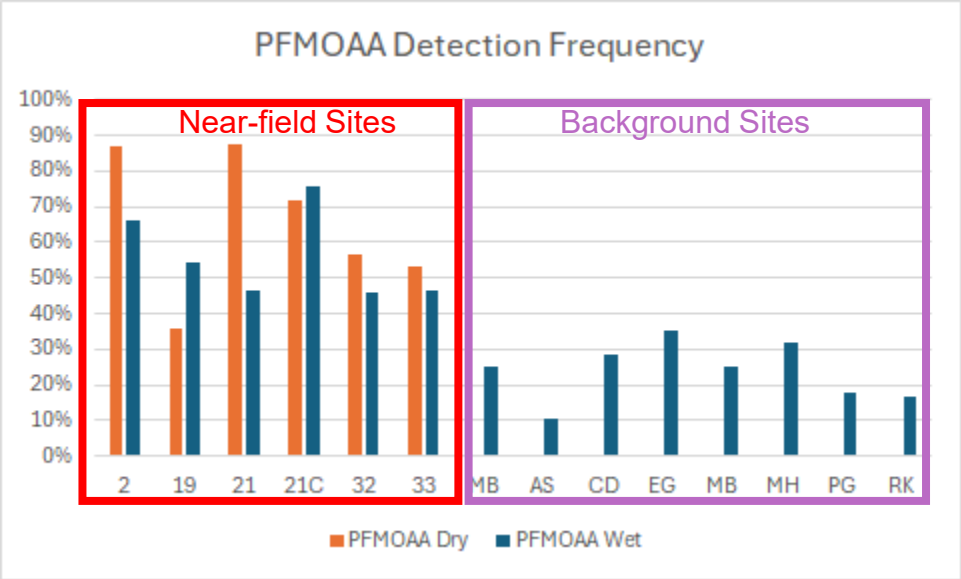
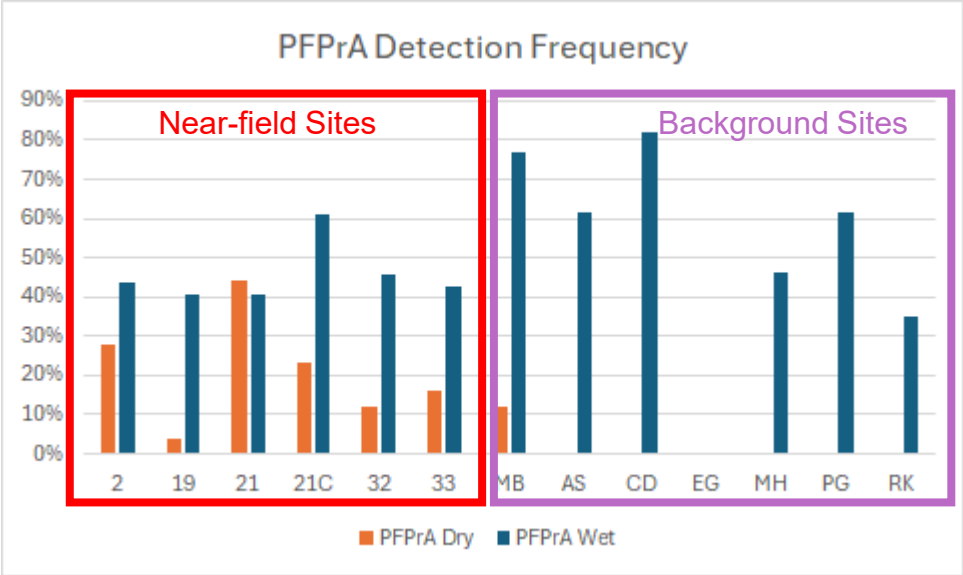
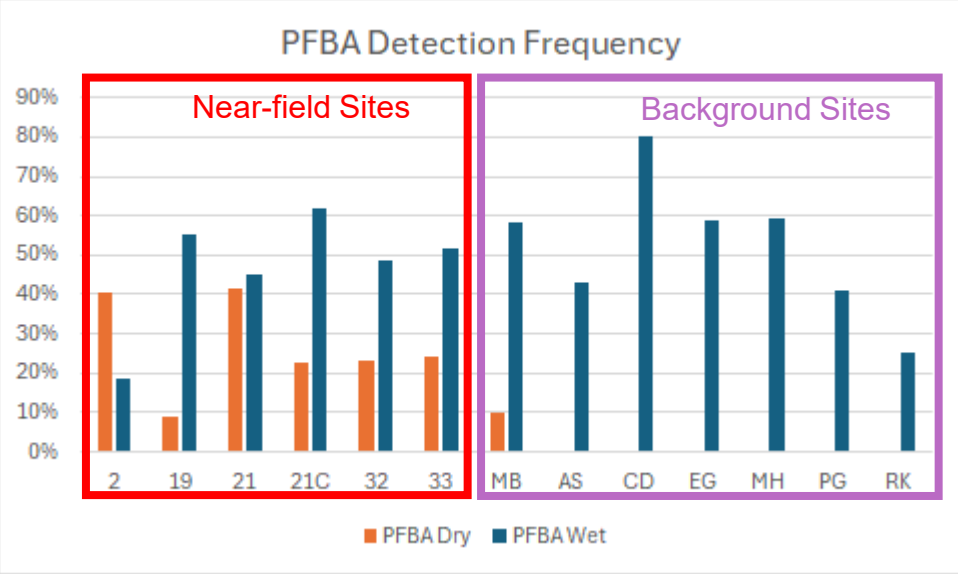
Data beginning in 2022

PFAS Detection Frequency







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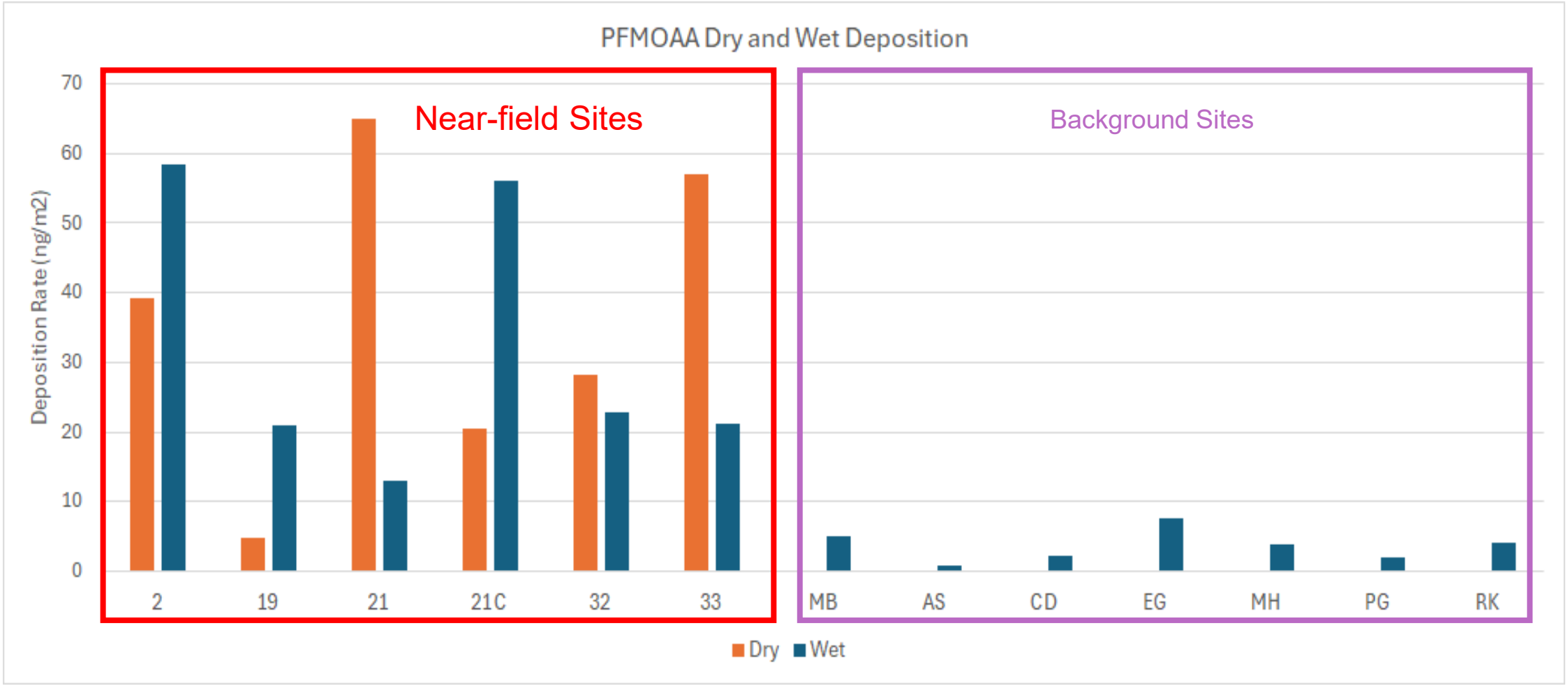
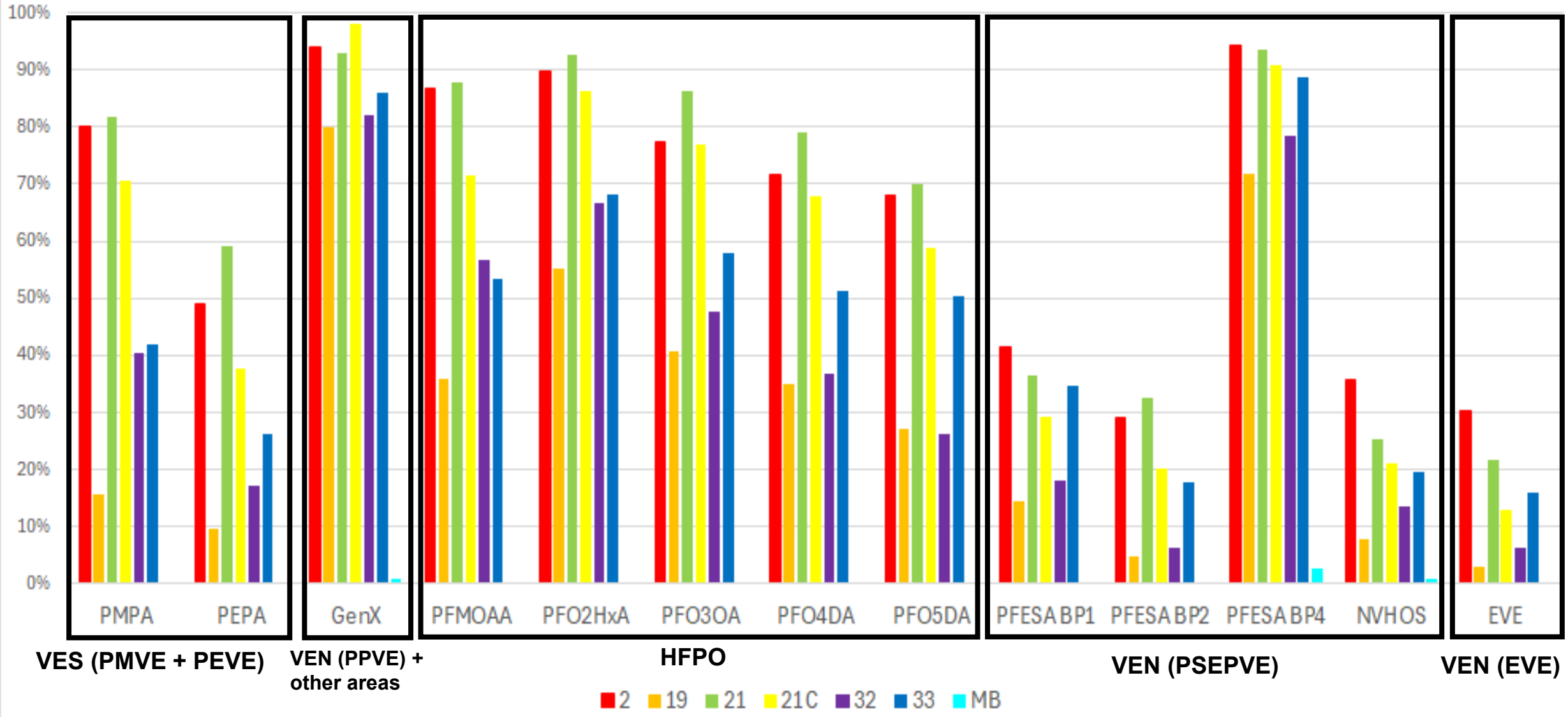
PFMOAA Deposition Rates in Dry vs. Wet Samples



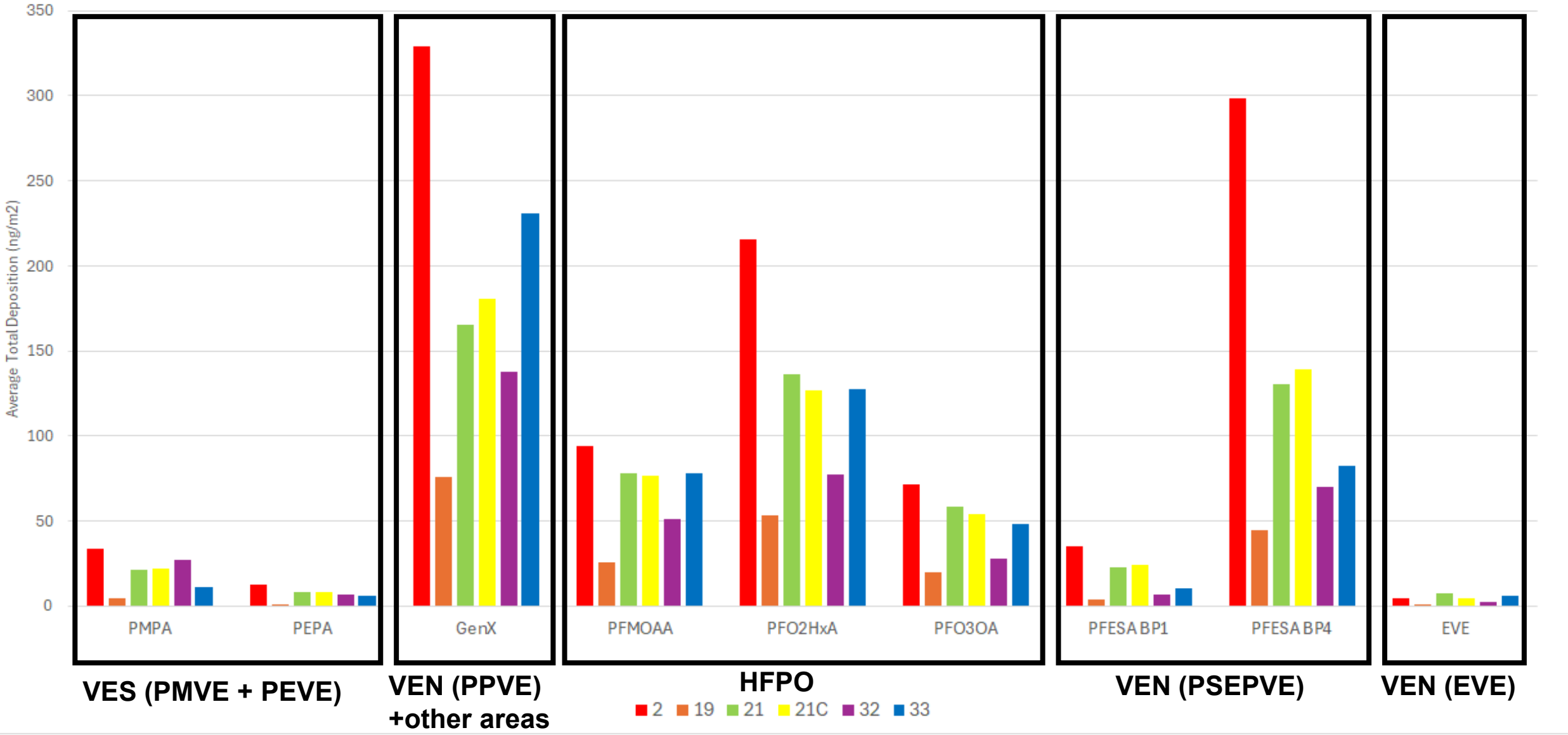
Some results calculated with values that are BQL and are estimates

Data beginning in 2022

Near-field Site Dry Deposition Detection Frequency



Near-field Site Average Total Deposition Rates



Emerging Contaminants – NC DEQ Priority List

- Urethane/Other Foam Manufacturing (AFFF)
- Solid Waste Landfill
- Sewage Treatment (SSI)
- Plastics Material and Resin Manufacturing
- Surface active agent manufacturing
- Electroplating, Plating, Polishing, Anodizing, and Coloring
- All Other Basic Organic Chemical Manufacturing
- Paint and Coating Manufacturing
- Semiconductor Industry
- Broadwoven Fabric Mills
- Primary Battery (EV et al.)
- Corrugated and Solid Fiber Box Manufacturing
- Pulp mills
- Pharmaceutical and Medicine Manufacturing

Resources:
- EPA's PFAS Analytic Tools
- EPA's PFAS Strategic Roadmap

Emerging Contaminants - Screening Questions

1. Will your facility use any material or products in your operations that contain **fluorinated chemicals**? If so, please identify such materials or products and the **fluorinated chemicals** they contain.
2. Will your facility formulate/create products or byproducts (directly or indirectly) containing **fluorinated chemicals** (across multiple media)? If so, please identify such products or byproducts and the **fluorinated chemicals** they contain.
3. Will your facility generate solid, liquid, or gaseous related emissions, discharges, or wastes/products containing **fluorinated chemicals**? If so, please identify such waste streams or materials and the **fluorinated chemicals** they contain.
4. Do your facility's processes or operations use equipment, material, or components that contain **fluorinated chemicals** (e.g., surface coating, clean room applications, solvents, lubricants, fittings, tubing, processing tools, packaging, facility infrastructure, air pollution control units)? Could these processes or operations directly or indirectly (e.g., through leaching, chemical process, heat treatment, pressurization, etc.) result in the release of **fluorinated chemicals** into the environment?

Emerging Contaminants - Screening Questions

5. List the **fluorinated chemicals** identified (i.e., through testing or desktop review) above in your response under the appropriate methods/approaches? If one is not, are they on any other known US or International target lists?
   - OTM-45 (air emissions)
   - Methods 533 & 537.1 (drinking water)
   - SW-846: Method 8327 (water)
   - Draft Method 1633 (water, solids, tissue)
   - "Total PFAS" Draft Method 1621 for Adsorbable Organic Fluorine (wastewater)
   - Non targeted analytical methods
   - Qualitative approach through suspect screening
6. Are there other facilities or operations in the U.S. or internationally engaged in the same or similar activities involving **fluorinated chemicals** addressed in your response to the above questions? If so, please provide facility identification information? In addition, are there any ISO (International Organization for Standardization) certification requirements?
7. Do you plan to store AFFF on site, use it in fire training at the site, use it for fighting fires at the facility, or include it in a fire fighting system at the site?
8. Are other emerging contaminants (e.g., 1,4-dioxane, brome, perchlorate, 1,2,3-Trichloropropane) used in some capacity within your facility or operations?
9. Do you need technical assistance to answer the above questions?

Permit Condition - Disclosure

State-enforceable only

Disclosure of Information Relating to Emissions of Fluorinated Chemicals [15A NCAC 02Q. 0308(a); 15A NCAC 02Q.0309(b)]

The Permittee shall have an ongoing duty to disclose the presence of materials containing fluorinated chemicals at the facility that have the potential to result in the emission of fluorinated chemicals to the environment. Such disclosures shall be in writing and submitted to the Regional Office Supervisor within thirty days of the Permittee becoming aware of such information, unless such information has already been disclosed to DAQ by the Permittee. The disclosure shall describe the identity, quantity, and use of such material to the extent known. DAQ may require the permittee to conduct analysis or testing of fluorinated chemical emissions as necessary to properly evaluate emissions sources at the facility. As used in this condition, the term "fluorinated chemicals" includes but is not limited to per- and polyfluoroalkyl substances (PFAS).

Permit Condition - Testing

State-enforceable only - Testing Requirement

As required by 15A NCAC 02D .0508(f), the Permittee shall conduct an initial performance test for per- and polyfluoroalkyl substances (PFAS) at the inlet where the landfill gas enters the facility.

i. The Permittee shall utilize a DAQ approved reference test method in accordance with the testing protocol submittal form.

ii. The Permittee shall submit a protocol to DAQ at least 45 days prior to initial compliance testing and shall submit a notification of initial compliance testing at least 15 days in advance of the testing.

iii. Testing shall be completed within 180 days of achieving steady operation at typical operating capacity of the RNG Plant unless an alternate date is approved in advance by DAQ. The protocol must be approved by DAQ in advance of the testing. To afford the Regional Supervisor, DAQ, the opportunity to have an observer present, the Permittee shall PROVIDE the Regional Office, in WRITING, at least 15 days' notice of any required performance test(s). All associated testing costs are the responsibility of the Permittee.

iv. The Permittee shall submit a written report of the test results to the Regional Supervisor, DAQ, no later than 30 days following sample collection test in accordance with 15A NCAC 02D .2602(f), unless an alternative date is approved in advance by DAQ.

NC DAQ's PFAS Wish List

- Petition to add PFOA, PFOS, PFNA, and GenX (HFPO-DA) to CAA list of HAPs
- Need more stack test methods (OTM-55 in development, OTM-60?, others?)
- Need stack test and other data from various destruction technologies:
  - Supercritical Water Oxidation Technology (374Water & Revive Environmental)
  - Plasma synthesis reformer (HelioStorm) (Heartland Water Technology)
  - Thermal Desorption (Clean Earth)
- Need review of these destruction technologies regarding phase transfer

NC DAQ's PFAS Wish List (continued)

- Reliable analytical methods to complement existing targeted methods
  - Non-targeted analysis
  - TOF (extractable organic fluorine method)
  - TOP assay (to include short-chain PFAS, especially TFA and PFPrA)
  - Methods for compounds in air samples not amenable to LC/MS/MS analysis
- Further study on the complex air/surface/groundwater interactions. How much of what is deposited through atmospheric deposition reaches groundwater?
- Further study of potential atmospheric transformations is needed.
- Further study of surface microlayer of Cape Fear River and Atlantic Ocean

NC Division of Air Quality - Contacts

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Questions?

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