

The PFAS Conundrum – Proactive or Reactive?

GIEC Corrective Action Sites Workshop VII

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Federal and State Regulators are Acting on a Plan to comprehensively regulate PFAS



PFAS Strategic Roadmap: EPA's Commitments to Action 2021–2024



EPA's Goals in the Strategic Roadmap

RESEARCH

Invest in research, development, and innovation to increase understanding of

- PFAS exposures and toxicities;
- Human health and ecological effects; and
- Effective interventions that incorporate the best-available science.

RESTRICT

Pursue a comprehensive approach to proactively prevent PFAS from entering air, land, and water at levels that can adversely impact human health and the environment.

REMEDiate

Broaden and accelerate the cleanup of PFAS contamination to protect human health and ecological systems.

US EPA – Mid-Atlantic (Region 3)

*“hold polluters accountable” “**industrial sites, airports, military bases, ... biosolids**” “bold actions”
“leverage the full range of statutory authorities” “deliver tangible public health benefits” “look upstream”
“comprehensive approach” “restrict these dangerous chemicals from getting into the environment”
“actions under all available statutory authorities” “prevent any future releases” “accelerate progress”
“**address PFAS-containing firefighting foams for stormwater permits**” “lifecycle approach”
“preventing PFAS from entering the environment in the first place” “commits to bolder new policies”
“attack the problem on multiple fronts” “accelerates implementation of policy actions”
“not the only actions underway at EPA, nor will they be the last”*

Estimated PFAS Cleanup Costs

EBJ Working Model of Sites with PFAS Contamination

Site Category	Sites	% possible PFAS contamination	Est. Sites PFAS contamination	Avg \$mil remediation costs	Total \$mil remediation costs	Upgrading System Cost* \$mil
NPL: Superfund	1,850	20-40%	555	7.5	4,163	
RCRA Corrective Action	4,000	20-30%	1,000	5.0	5,000	
RCRA UST	140,000	3-5%	5,600	0.5	2,800	
DOD AFFF Sites	300	100%	300	30.0	9,000	
DOD	4,400	60-70%	2,860	2.5	7,150	
DOE	5,000	10-15%	600	5.0	3,000	
Civilian Agencies	3,000	25-30%	810	2.0	1,620	
State Sites	120,000	5-10%	8,400	0.5	4,200	
PFAS Manufacturing Sites	60	100%	60	300	18,000	
Manufacturing Sites Using PFAS	3,600	80-90%	2,880	7.5	21,600	
Other Manufacturing Sites	270,000	2-3%	6,750	0.5	3,375	
Chromium/Electroplating Operations	4,400	30-50%	1,760	1.0	1,760	
Refineries	130	80-90%	104	20.0	2,080	
Landfills: Active	3,100	50-70%	1,860	2.0	3,720	
Landfills: Closed	10,000	40-50%	4,500	0.5	2,250	
Airports: Major	260	80-90%	221	20.0	4,420	
Airports: Regional	1,200	30-40%	396	7.5	2,970	
Airports: Commercial/Private	17,540	3-5%	702	6.0	4,210	
Biosolids/Landfarming	500	70-80%	375	2.0	750	
Wastewater: POTWs 10 MGD+	500	70-80%	375	100		37,500
Wastewater: POTWs <10 MGD	15,000	30-40%	4,950	7.5		37,125
Water Utilities: Urban	4,000	30-40%	1,320	15		19,800
Water Utilities: Rural	50,000	10-20%	7,500	1.5		11,250
Other	50,000	5-10%	3,500	0.5	1,750	
Total	708,840	8%	57,378	1.8	103,817	105,675

Source: Environmental Business International, Inc. EBI estimates using site count estimates from EPA, ITRC, US Census, US DOT FAA, and others; a consensus of respondents to '% possible PFAS contamination' from a survey and interviews with remediation experts and estimated sites with PFAS contamination a factor of 'possible' sites. * water/wastewater treatment system cost is capex and estimated opex for 20-year O&M

- > \$200 billion to cleanup existing contamination
- Costs expected to increase with additional regulation
- Does not include operations (e.g., stormwater permits), product compliance, supply chain, etc.

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- Specific regulatory requirements not defined across most targeted programs
- Some action drivers in play now include:
 - *Clean Water Act permitting – EPA December 2022 guidance included widespread outfall sampling with enforceable Effluent Limitations Guidelines for multiple industries being fast-tracked (see Plan 15)*
 - *CERCLA – plan to designate several PFAS as hazardous impacts execution of planned capital improvement projects (i.e., make sound decisions waste management decisions to keep liabilities from growing)*
 - *Firefighting foam (AFFF to F3) – some states are banning use/sale and the new F3 mil spec is out*
- Is it better to “know” or “not know” my PFAS risks at this time?
- On what information should I establish my environmental reserves? Is the liability definable under SEC rules?
- Should I sit tight and see what happens to everyone else or should I be aggressive?
- Effect of negative publicity on ESG score and market capitalization?
- All these factors lead us to the PFAS Conundrum...

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- We are going to go over a few scenarios and identify several of the pros and cons of taking a proactive vs reactive approach to potential PFAS liabilities/concerns.

Proactive Pros	Reactive Pros
Proactive Cons	Reactive Cons

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Clean Water Act/NPDES – *Addressing PFAS Discharges in NPDES Permits and Through the Pretreatment Program and Monitoring Programs, EPA Memorandum dated December 5, 2022.*

Proactive Pros <ul style="list-style-type: none">• Identify PFAS in waste stream and eliminate it before reporting and compliance is required• No PFAS detected in samples – peace of mind and available documentation• Ability to address before PFAS polluter linkage established	Reactive Pros <ul style="list-style-type: none">• Maintain business Status Quo
Proactive Cons <ul style="list-style-type: none">• Possible disruption to current supply chain and/or processes• Potential additional costs to address PFAS discharges	Reactive Cons <ul style="list-style-type: none">• Will be at the mercy of the regulating body

Potential Initial Actions

- Desktop assessment PFAS associations with specific industry, processes, and products
- Effluent sampling (at direction of attorney?)
- Process water sampling (contaminated source water = contaminated effluent)

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Superfund/CERCLA – Regulations are and will continue to be forthcoming (hazardous substances, RSL/RML Table updates, RCRA ramifications, etc.)

Proactive Pros <ul style="list-style-type: none">• Limit additional exposure through mergers and acquisitions• Identify and minimize PFAS waste streams now• Identify and take early action where reputational risk is significant	Reactive Pros <ul style="list-style-type: none">• Maintain business Status Quo
Proactive Cons <ul style="list-style-type: none">• Spending money unnecessarily – overdoing or underdoing assessments	Reactive Cons <ul style="list-style-type: none">• Knowledge without action could provide additional exposure• May not have adequate reserves to cover potential liabilities

Potential Initial Actions

- Merger & acquisition strategy
- Desktop assessment PFAS associations with specific industry, processes, and products
- Site/portfolio screening
- PFAS supply chain review
- Capital project PFAS assessment and waste management program

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AFFF Transition to F3 (Fluorine Free Foam)

Proactive Pros <ul style="list-style-type: none">• Be at the head of the line for new F3 products – potential cost savings and supply chain protection• Eliminate potential PFAS source now (eliminate discharge potential)	Reactive Pros <ul style="list-style-type: none">• Maintain business Status Quo
Proactive Cons <ul style="list-style-type: none">• Cash-flow “negative”• F3 alternatives not fully defined• Existing AFFF systems will need to be cleaned and modified for F3, or replaced altogether	Reactive Cons <ul style="list-style-type: none">• Potentially accruing liability with continued usage of AFFF.• May not have adequate reserves to cover potential transition costs

Potential Initial Actions

- Vulnerability assessment
- Use/alternatives evaluation
- AFFF transition planning

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Safe Drinking Water Act – new proposed MCLs came out in March 2023 (4 ppt for both PFOA and PFOS)

Proactive Pros <ul style="list-style-type: none">• Start remedial actions now to prevent further PFAS spread (i.e., prevent impact sensitive downgradient receptor)• Develop remediation reserves, scale and timeframe	Reactive Pros <ul style="list-style-type: none">• Potentially avoiding spending \$ unnecessarily• Let someone else figure out best approach first
Proactive Cons <ul style="list-style-type: none">• Regulations may/will continue to evolve and possibly result in a turn in project direction	Reactive Cons <ul style="list-style-type: none">• Not having adequate reserves to address contamination issues that may be discovered by others (e.g., offsite impact)• Cost of not preventing spread

Potential Initial Actions

- Site/portfolio screening
- Limited investigation
- Plume management (migration mitigation)
- Facility potable water supply sampling

Thank You

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