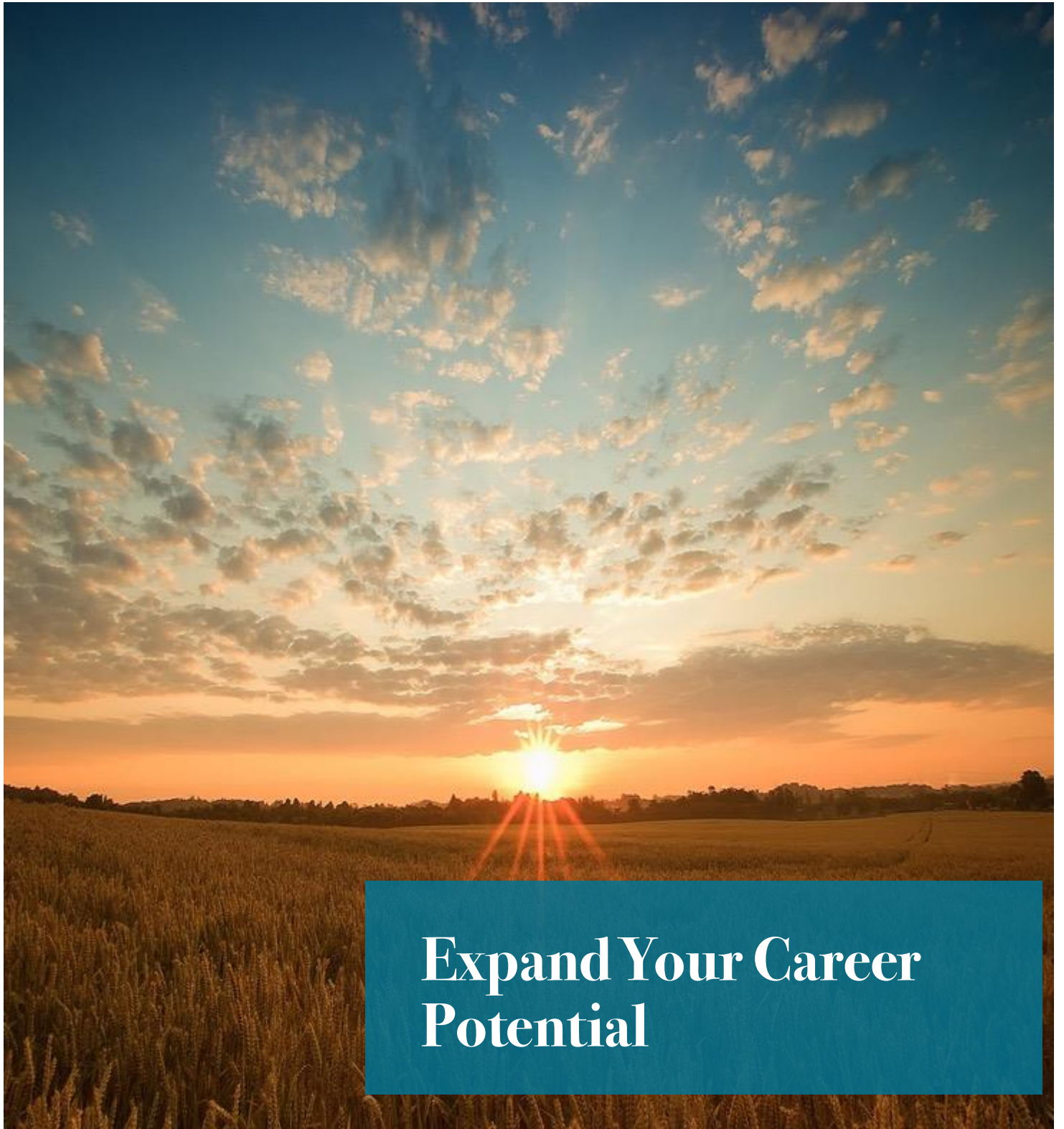


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PFAS at Dry Cleaners, Car Washes, Airfields and Warehouses: A Phase II Data Deep(ish) Dive

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A group of emerging contaminants, per- and polyfluoroalkyl substances (PFAS), have been recognized as a potential concern since emerging contaminants were required to be addressed as a non-scope item under ASTM E 1527 in November 2021. As of July 8th, 2024, the EPA issued a final rule to designate the two PFAS chemicals perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) as hazardous substances under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). As a result, PFAS risk is now evaluated as part of Phase I Environmental Site Assessments (ESAs) in the same manner as other hazardous substances, and PFAS has become a more familiar, and sometimes unwelcome term to commercial real estate and lending professionals, and the service providers who serve them.

Due to these changes, several EBA members initiated a PFAS related addendum to its well-regarded Contamination Discovery Rate (CDR) initiative where rates of environmental impacts at several types of commercial properties were evaluated to ascertain the presence of contamination both above and below regulatory actions levels at select property types. This original study did not address PFAS.

To supplement the CDR initiative, a PFAS related Phase II study was conducted in 2024 by the EBA member firms Partner ESI, Terracon and TRC, who reviewed Phase II PFAS results at select property types including dry cleaners, car washes, airfields, and warehouses. The purpose of this study was to gain a preliminary understanding of the levels of PFAS at these types of properties in Phase I ESAs and what factors may or may not contribute to the presence or absence of contamination. This study also looked at the average cost of Phase II ESAs for these sites as compared to Phase II ESAs that did not include PFAS and considered the following factors:

- Years of operation
- Whether the suspect source of contamination originated from on-site or off-site
- Presence and depth of groundwater
- Detections of PFAS above and below regulatory standards in soil and groundwater
- Type of PFAS detected in excess of state/federal levels

The results of the study were presented as A Phase II Data Deep(ish) Dive at the EBA Winter Conference in February 2025.

The presentation panel was moderated by Kathryn Peacock of Partner ESI and included Dana Wagner of Terracon, Elizabeth Denly of TRC, Dale Allison of TRC, and Kristine MacWilliams of Partner ESI. This presentation provided an analysis of findings, identified selected case studies highlighting environmental concerns, discussed the variations within soil and groundwater regulatory standards and presented insights on evaluating the potential usage of PFAS at a facility during due diligence.

The panel opened with a discussion regarding biosolids which are generated at wastewater treatment facilities as a byproduct of the treatment process. In general, collateral constituents in the wastewater stream like PFAS are concentrated in the waste sludge. Historically, those waste sludges have been used as fertilizer on farmland; in fact, almost 70 million acres of farmland have been amended with biosolids. While not all agricultural property may have been treated with waste sludge, the percentage is quite high, indicating that it might be prudent to evaluate farmland for the potential use of biosolids as part of due diligence.

The impetus for this presentation was to get an early look at Phase II findings for certain property types to potentially gain insight into whether these property types may present a significant PFAS concern doing due diligence in the future. As these were early days in the Phase II evaluation of PFAS within the context of a recognized environmental condition (REC) finding, it was no surprise that our findings subset was relatively small with 67 sites being evaluated in this initial review. The breakdown of sites and average age of the sites were:

	Count	Average Age
Airfield	12	68
Car Wash	12	33
Dry Cleaner	6	29
Warehouses	37	57

A review of PFAS Phase II costs indicated that, on average, PFAS-related Phase II investigations were 40% to 490% higher than was realized for non-PFAS related sites:

Property Type	Phase II Cost
All Sites 2024 (not with PFAS)	\$12,785
Airfields	\$21,477
Warehouses (with Manufacturing)	\$62,779
Car Washes	\$17,846
Dry Cleaners	\$ 25,145

Notably it was also recognized by the group that PFAS sample collection considerations, laboratory costs and turnaround times present new considerations to those setting due diligence budgets and schedules.



Below is a summary of what was presented in each of the property types studied:

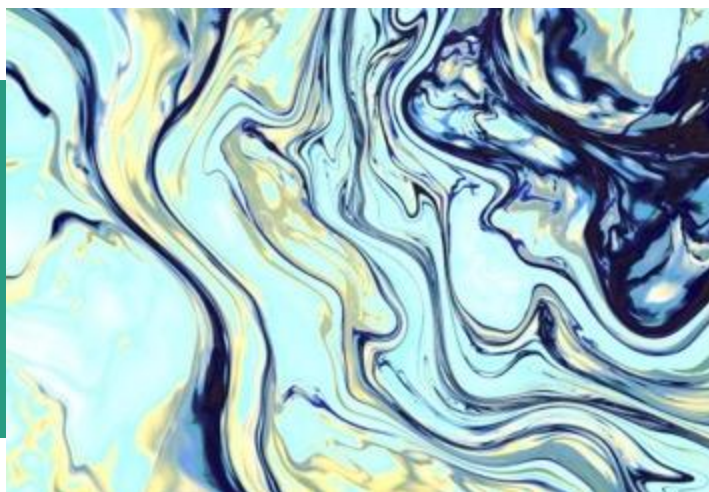
Airfields

Of the 12 sites assessed, over 1/3 had PFAS soil detections exceeding state/federal standards while 20% had PFAS detections in groundwater exceeding state/federal standards. PFAS compounds detected included PFOS, PFOA and to varying degrees; PFHxS, PFNA, PFPeA, PFHxA, PFHpA and PFBS. A case study of a former hangar site adjoining an airfield in Maryland was presented where the airfield had documented historical aqueous film forming foam (AFFF) use. The former hangar site Phase II did not detect PFAS impacts in soil; however, PFOA, PFOS, PFHxS and PFNA exceedances were noted in groundwater and attributed to the prior AFFF use at the airfield site. Primary takeaways from the study were that regional airfields can present for soil and groundwater impacts and like their larger counterparts, the source areas can be localized but can be mobilized based upon the nature of the operations, duration and physical setting. Of course, much higher risks are realized at military aviation facilities. Other airfield source areas were also discussed by the panel and include hangar fire suppression systems, fire training areas, prior fire response areas and fuel farms.

Car Washes

Car washes were a category which held significant interest as this has heretofore been a fairly benign property use environmentally. However, car finishing products including soaps and waxes have also been the “beneficiaries” of PFAS’ remarkable duality of hydrophobic and hydro/oleophilic qualities. The panel also discussed the possibility that water sources, whether private or public, may contain PFAS residual impact which can be a concern (not only for drinking purposes) but at facilities where large scale water use and wastewater generation are realized. In our evaluation we saw PFAS in soil detection rates at 35% with a state/federal exceedance rate of less than 10%. Groundwater was observed to have a significantly higher PFAS detection rate at 50% and state/federal exceedance rate at 20%. PFOS and PFOA were the primary impact, but other compounds, PFBS, PFHxS and PFNA, were also detected in groundwater at 50% of the sites. Like many sources, a pathway to the subsurface is critical including potentially leaking features such as oil-water separators, sediment traps and sewers. The panel also noted that to a lesser degree there is a potential for onsite disposal of impacted trap sediments and on-site/off-site distribution owing to vehicle wash/rinse water drag-out or where mists from operations can introduce the car wash constituents to surfaces outside the structure where they can be entrained by stormwater and conveyed to drainage areas.

A review of case studies in Virginia and Iowa affirmed there was a variation in results owing to type of car wash, relative vehicle throughput volumes and duration of operation. Interestingly, a case study from Florida presented an operational media approach to evaluation. The incoming water source from the city, wastewater after the car wash and sludge were evaluated for PFAS; while the city source water did not have detections, the wastewater and sludge both indicated detections above federal criteria.



Dry Cleaners

Dry cleaners have traditionally been a significant environmental concern due to the chlorinated solvents used and subsequent waste and solid waste by-products generated in the process. PFAS can be potentially present in wastewater, sludge and filter streams owing to its presence in cleaning products and water and stain repellent treated fabrics which are cleaned. Accordingly, the study results found that PFAS in soil were detected over 67% of the time with exceedances of state/federal standards noted at a rate of 50%. Rates in groundwater were lower with a detection and exceedance rate of 37%.

Two case studies from Florida and Wisconsin were presented, and in the Florida case, no chlorinated solvents were detected at the site though PFOA and PFOS were detected in groundwater exceeding federal criteria. The source was noted in this case to be nearby airport and industrial operations-an affirmation to consider adjoining potential sources in review of PFAS risks.

In review of the findings, it was noted that PFAS impacts sourced at dry cleaner facilities would primarily be a co-contaminant, though recognized it has a much lower standard and detection limit than chlorinated solvents. It was recognized that numerous closed dry cleaner release sites will likely present as needing further assessment during due diligence and potentially for regulatory file reopeners based upon state agency priority.

Warehouses with Manufacturing

As the face of manufacturing changes, with processes being located within warehouses and industrial centers and not in manufacturing districts, the potential for ancillary impacts due to poor housekeeping and inadvertent discharges is on the rise.



The warehouse category represented our largest cohort, 37 sites, and the results noted a PFAS detection rate in soil <20% with a 10% exceedance rate.



Groundwater was impacted at much higher rates with detection rates at 60% and exceedance of state/federal standards at 55%. PFOA and PFOS led the way with PFNA and/or PFHxS also detected at up to 40% of the sites. It was evident that such facilities present an elevated risk of PFAS impact. A case study from New Jersey noted significant impact from various on-site and offsite sources with the worst-case remedial scenario in the \$5.8-\$9.6 million range. This is a testimony as to how significant PFAS issues can be at commercial real estate sites with elevated risks.

The panel discussed state-specific background standards which accounting for ubiquity may bring regulatory relief to sites where low levels of PFAS are detected. Several states have guidance in place or are being worked on, with efforts and background levels in Vermont, Maine, New Hampshire and Massachusetts being profiled.

Delving briefly into the topic of information sources regarding possible PFAS use at a facility it was noted that safety data sheets (SDS), whether materials are sourced domestically or internationally, and supplier verification statements can be great ways to understand past and present PFAS use. Tips on reviewing SDS (e.g., ingredient lists, hazardous combustion products, and regulatory information) related to PFAS were discussed.

Lastly the panel acknowledged that current federal maximum contaminant levels (MCLs) under the Safe Drinking Water Act would be anticipated to become statewide standards. However, as of this writing, the current Administration has identified several USEPA PFAS initiatives which are being re-evaluated with some being rolled-back, including the current PFAS MCL rule. They propose to maintain the MCLs for PFOA and PFOS at the current 4 parts per trillion and will extend the compliance deadline for drinking water sources to 2031.



However, the EPA proposes to rescind the MCL determination on PFHxS, PFNA, GenX and PFBS and will reconsider their approach to these and other PFAS compounds.

That said, it appears the current rule listing PFOS and PFOA as CERCLA hazardous substances, though an unconventional rulemaking approach which made consideration of these compounds within the scope of ASTM E1527 a requirement, are likely to be maintained and remain an important consideration in transaction due diligence.

Call to Action

The EBA study group intends to continue gathering PFAS Phase II data to enhance the dataset and findings and invites other associate firms to join us in this endeavor. Your role in helping bring visibility and solid data to these proceedings makes for a better understanding and applied practice for all EBA members!