

# CURRENTS

A Quarterly Publication of POWER Engineers Environmental **FALL 2025**



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# CURRENTS

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FALL 2025

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POWER Engineers Environmental provides planning, permitting, compliance, EHS, engineering, and site assessment and corrective action services to clients worldwide. Across multiple industries, we specialize in the areas of air, water, waste, ecological, cultural and wastewater. And as part of POWER Engineers, member of WSP, we can provide integrated engineering and environmental solutions.

With 50 offices located across the country and internationally, we have local resources and expertise where you need it.



# LEADERSHIP INSIGHTS



## Looking Back, Leading Forward

Jennifer Junker | Corporate Services Director

**B**eing asked to write for this final issue of *Currents* brought up a flurry of emotions. I felt honored, humbled and nostalgic...and maybe a little old.

More than 30 years ago, Zephyr Environmental Corporation first launched *Currents*—a simple newsletter that aimed to share current events in the environmental world with clients and colleagues.

Back then, as a junior engineer, I'll admit that writing news briefs was not my favorite thing to do. Still, I could see the value *Currents* provided: giving a platform to up-and-coming industry experts, building closer connections with clients and colleagues, and sharing important information in an easy-to-read format.

When POWER Engineers acquired Zephyr almost eight years ago, *Currents* became part of the Environmental Division and matured into a more polished product. Now that POWER is becoming part of WSP, we've come to the end of our journey with *Currents*.

Reflecting on the success of this publication over the last three decades has also led me to reflect on my career. I've been fortunate to work with some amazing people who have shaped my personal leadership style. Some of these leaders believed in me more than I believed in myself, helping me see that I was capable of things I never thought I could do.

As we move into this new chapter, I'd like to send off new and seasoned leaders with my reflections on the top ten practices that make a respected and impactful leader.

**10. Get to know your team.** Learning more about each person—not just professionally, but personally—shows that you see them as more than just a company asset.

**9. People have different currencies.** Money, time, title, recognition, office space, time off, feeling they add value and so on. Do your best to figure out what a person's currency is and use it to everyone's advantage.

**8. Be open to opportunities.** You never know what unexpected projects, people or new responsibilities might help you grow as a leader.

**7. Everyone makes mistakes,** even perfectionists (guilty as charged). Own your mistakes and take responsibility for fixing them. Be empathetic to others when they fail and, more importantly, share your failures with others; it helps everyone learn.

**6. Give others credit and opportunities.** Letting other people shine and grow in their career is a direct reflection on you as a leader.

**5. Do the dirty work.** No task should be beneath you. Be willing to jump in and help out—no matter what the assignment is.

**4. Be honest and direct with people.** As a leader, you need to give people feedback, but aim to do so in a respectful, constructive and compassionate manner.

**3. Do what you say you are going to do.** Being reliable and dependable is critical to your team and peers. If you can't deliver, be prepared to own it.

**2. Learn from others.** Don't be afraid to ask questions, listen and implement different ideas and approaches. Nobody knows it all, and being a leader means you need to be in constant learning mode.

**1. Be humble and be vulnerable.** Showing you are human builds trust with your team and people respect those that lead with vulnerability and without arrogance.

These tips have been my compass throughout my career, and I hope they will serve you just as faithfully on the journey ahead. Farewell, *Currents*. Hello to new opportunities on the horizon. 🌅

We're celebrating the final issue of *Currents* after 30 years. But many new doors are opening as our Environmental colleagues join WSP's global Earth & Environment team. We'll continue to share valuable environmental insights—so be sure to follow **WSP Earth & Environment** and **WSP in the U.S.** on LinkedIn to stay connected.



# Phasing Out Forever Chemicals—What’s Next for PFAS?

**Bryan Osborne**  
Senior Project Manager

**I**nnovation and manufacturing continue to be pillars of American industry and economic strength, contributing an impressive \$2 to \$3 trillion annually to the U.S. gross- domestic product. America remains a powerhouse in creating cutting-edge solutions across chemical manufacturing, microchip, aerospace and defense sectors.

Over time, the U.S. manufacturing industry has steadily improved the safety and sustainability of products and processes through better materials. Materials and processes that pose health and environmental risks have been phased out.

Iconic shifts include the transition from lead oxides to titanium dioxide in paints, the move from leaded gasoline to unleaded gas with oxygenate additives like ethanol and the substitution of ammonia

refrigerants with other plasticizers in food containers. While these transformations may have appeared seamless to consumers, each required innovative strategies from manufacturers.

## **The Forever Chemical: PFAS**

Per- and polyfluoroalkyl substances (PFAS), commonly referred to as “forever chemicals,” are among the most widely used synthetic chemical compounds in industrial applications today. They are valued for their water- and grease-resistant properties and are found in products like non-stick pans, waterproof and stain-resistant textiles, firefighting foams, medical products, HVAC refrigerants and semiconductors.

The carbon-fluorine bonds that make these compounds so durable are a double-edged sword—they make PFAS extremely resistant to natural breakdown. As PFAS



**Alternative options.** PFAS are used in over 60 industries—including textiles, electronics and food packaging—but safer alternatives like plant-based coatings, biopolymers and waxes are emerging to reduce health and environmental risks.

accumulate in the environment, including in drinking water sources, they can enter the human body.

Exposure to PFAS compounds has been linked to reproductive system toxicity, developmental delays in children and increased cancer risk. As a result, organizations like the European Union and the U.S. Environmental Protection Agency have listed PFAS as hazardous substances and established exposure standards.

#### Shifting to Healthier Alternatives

Due to these risks, industrial manufacturers are actively exploring and implementing replacement options for PFAS. For example, ceramic coatings can be used instead of polytetrafluoroethylene (Teflon™) in non-stick cookware.

Firefighting foams are being developed with alternative ingredients, including octanol and charcoal residues. Medical polymers containing PFAS are rapidly being replaced with alternatives that remain hydrophilic, chemically resistant and thermally stable.

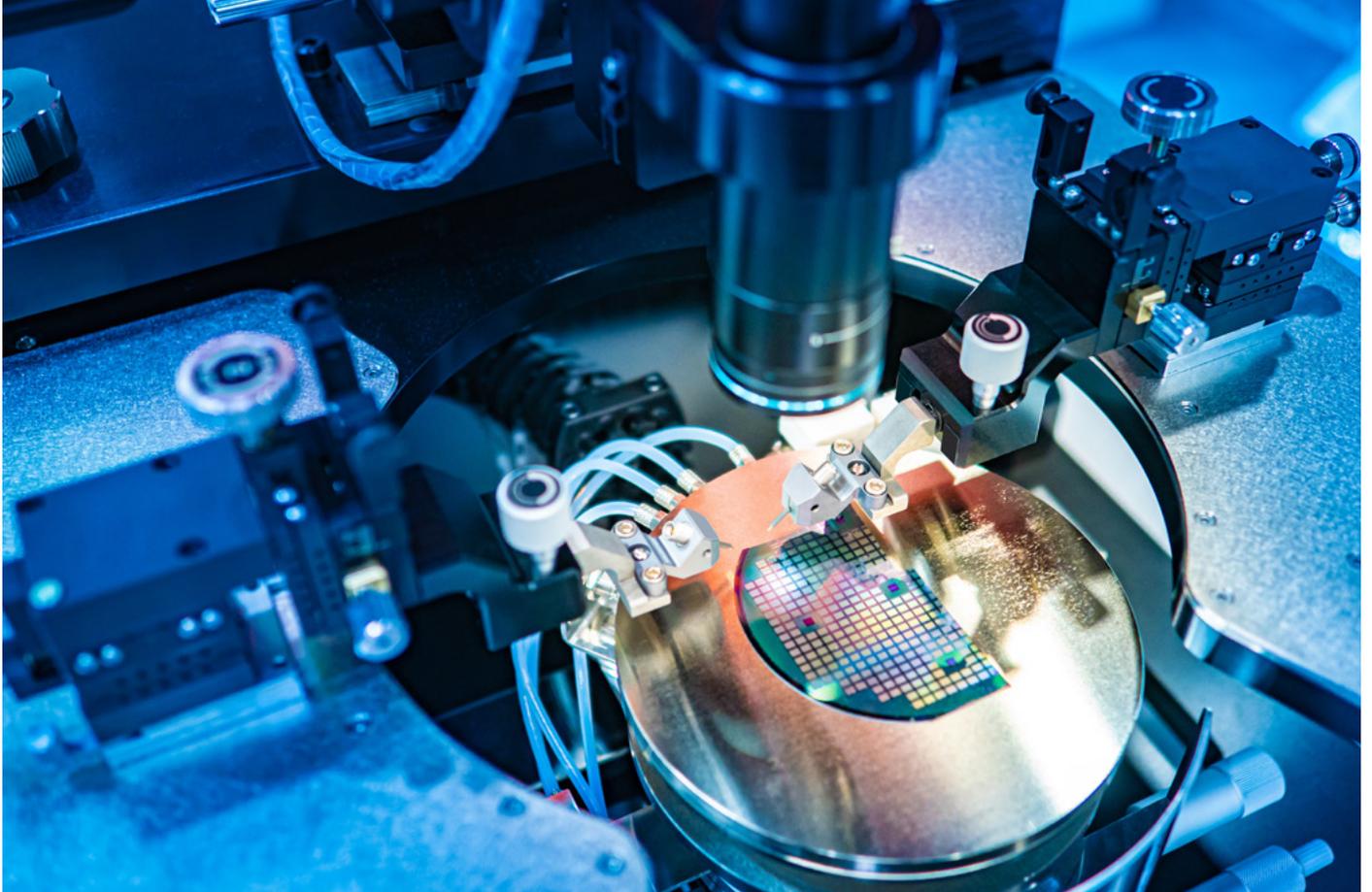
Substitution doesn't happen overnight. It takes time to test products, identify new supply chains and educate consumers. Additionally, solutions that may be effective for pans used to cook food are not held to the same standards as the products used to extinguish fires on passenger aircraft. Rigorous testing—both in laboratories and real-world conditions—must occur before a replacement can be considered viable and widely adopted.

#### Challenges of PFAS in Semiconductor Manufacturing

What happens to industries or processes that don't have an immediate and effective substitute?

In semiconductor manufacturing, PFAS compounds aren't part of the final product. They are used in the manufacturing process as photoresist “masks” and photoacid generators that etch patterns into silicon substrates. These patterns ultimately form semiconductor products.

Each chip is manufactured according to a different proprietary “recipe.” Typically, the most complex chips—used in computer processors and memory applications—have the smallest and most intricate transistors, requiring state-of-the-art chip design and manufacturing chemistry.



***New innovations.** Some semiconductor manufacturers are testing advanced oxidation processes and plasma-based destruction technologies to break down PFAS in wastewater, with some achieving over 90% degradation efficiency.*

While some alternatives to PFAS in semiconductor manufacturing exist and others are likely in development, current options are very limited. The performance requirements vary widely between legacy chips designed for automotive use—where space and size are less critical—and cutting-edge chips inside smartphones.

#### **Paving the Path Forward**

From a public health and safety standpoint, the ultimate goal is to remove PFAS from manufacturing entirely. Until viable substitutes are available, not every manufacturer will be able to eliminate them.

Certain sectors produce critical products that rely on PFAS but have yet to identify alternatives. These sectors must pursue regulatory education, phased or extended compliance schedules and engagement with manufacturer advocacy groups while collaborating with researchers and

innovators to find suitable replacements. Great strides have been made towards supply chain resiliency. The European Union's Restriction of Hazardous Substances

*Substitution doesn't happen overnight.*

*It takes time to test products, identify new supply chains and educate consumers.*

(ROHS) Directive requires manufacturers to provide and maintain detailed product documentation. Although not a U.S.

regulation, these policies have been widely adopted throughout the country by American exporters of high-tech products. PFAS compounds likely won't be the last class of chemicals discovered to have adverse health effects. The manufacturing industry is already doing a great deal to prepare for whatever comes next.

The more we know about which compounds are present in the composition and manufacturing of products, the easier it will be for manufacturers to identify and document which products may be affected by future regulatory restrictions.

While many air, waste and water regulations for PFAS are still being determined, the race for replacements continues. In the meantime, the question remains: "Can all PFAS be replaced?" That's quite a bit of science and environmental policy to consider the next time you're cooking scrambled eggs on a Saturday morning. 🍳

## Is It Time to Audit?

Erich Birch | Birch, Becker & Moorman LLP

People often need reminders more than instruction. Most environmental professionals understand the importance of periodically evaluating a facility's compliance with permits and regulations. However, with overwhelming responsibilities and time commitments, it's easy to forget to act on that knowledge.

So, here's your friendly reminder of why we should be making time for environmental audits.

### What Is an Environmental Audit?

At its core, an environmental audit is a self-examination initiated by a facility's management to assess compliance with applicable environmental laws and regulations.

Some may question the need for a formal audit—especially if a facility's environmental obligations are minimal or if competent personnel are already managing compliance. However, environmental laws and regulations can be daunting. The Clean Air Act and its implementing regulations alone span thousands of pages of legal requirements. Add in constantly changing state and local laws, regulations, ordinances and the permits issued under these authorities and it's easy to miss something. In over 25 years of conducting environmental audits, I have yet to find a perfectly compliant facility.

### The Advantages of Self-Auditing

The benefits of conducting an environmental audit are both practical and economical.

An audit forces everyone involved to pause and focus on compliance. Like the proverbial forest missed because of all those darn trees, even an experienced full-time environmental

professional can be so busy preparing applications and filing reports that a glaring compliance issue may go unnoticed.

The primary purpose of an audit is to detect and correct non-compliances before they result in regulatory enforcement action and penalties. Audit investigations can uncover a multitude of issues: facilities operating without permits, controls that were never installed, missing records, unfiled reports, excessive emissions and more. Often, these compliance issues have existed for years and would be easy targets for a regulatory investigator.

Many states and the Environmental Protection Agency (EPA) offer statutory or regulatory programs that incentivize audits, such as immunity from penalties for disclosed violations. These incentives exist for a reason: a voluntary self-investigation reduces the regulator's workload. There's little reason to investigate a facility that has already audited itself, allowing agencies to focus on less proactive facilities.

Most regulated facilities will eventually be subject to an environmental investigation. Regulatory inspectors conduct "file reviews" of required reports filed with agencies, meaning facilities are inspected every day without even realizing it. EPA also conducts "data mining" investigations, cross-checking compliance using multiple reporting databases.

I represented a client in an EPA enforcement matter that demonstrated the value of an audit. A year prior to EPA's investigation, the facility's consultant, POWER Engineers, had conducted an environmental audit. Fortunately for the client, the alleged violations had already

been discovered and disclosed under the state's audit statute. Although convincing EPA took effort, the allegations were ultimately dismissed—along with a six-figure penalty.

A final, but significant benefit of an environmental audit is the peace of mind and good night's sleep that comes from eliminating worrisome compliance issues.

### A Roadmap for Auditing

Once you've decided to conduct an audit, here is a simple roadmap you can follow.

1. Set a schedule and define the audit scope (comprehensive or targeted).
2. If needed, obtain management support and approval.
3. Select knowledgeable "fresh eye" auditors (this should not include current compliance staff; experienced environmental consultants make excellent auditors).
4. Adhere to the procedures of any applicable state audit programs to secure immunity or other incentives.
5. Include legal counsel (an environmental attorney and accompanying privileges may be crucial if a serious, unanticipated compliance issue is discovered).
6. Document the audit findings and comply with any audit statute immunity requirements.
7. Correct the violations and document the corrective actions (violations discovered and documented but not corrected are smoking guns).

### The Time is Now

If you've been waiting for a sign to audit your facility—this is it. Identifying and remedying compliance issues yourself is far more beneficial and cost-effective than waiting for a regulatory body to do it for you. 

## Bridging the Gap Between Fieldwork and Planning

Olivia Walker | Environmental Planner

**A**s a biologist by degree, I have a passion for the natural environment. However, after working in the humidity, fighting off ticks and managing allergens in Virginia and North Carolina, I realized that my passion might not actually lie in being outdoors.

I'm more of a "casual" nature person—someone who enjoys nature walks, bike rides, beaches and visits to the local botanical garden. I'm just not suited for backpacking across the country or wading through swamps!

As I prepared to enter the environmental industry after graduation, I worried whether I'd be able to find a career that allowed me to stay close to home without the travel and long field days. Fortunately, as an environmental planner, I am part of the team working behind the scenes to ensure that projects comply with environmental permits and regulations while supporting technical experts from the office—and only occasionally from the field.

While many environmental planners have experience in land-use planning, my background is in environmental permitting which supports the construction of transmission lines. A typical day involves participating in project calls, coordinating environmental surveys, keeping detailed notes, collaborating with project managers

and facilitating communication across a cross-disciplinary team.

One of the most rewarding parts of my job is working with our field staff—biologists, cultural resources specialists and threatened and endangered species specialists—to ensure they are prepared to do their job safely and efficiently.

Many people pursue field work to have the opportunity to travel to new locations and spend time in the outdoors. This work does

not come without sacrifice as our field staff face physically demanding days and time away from loved ones. However, they often prefer this to being behind a desk.

One of the most impactful things project managers and planners can do is ensure our field teams have everything they need to succeed through (but not limited to)

the following strategies.

### Communicate Early and Often

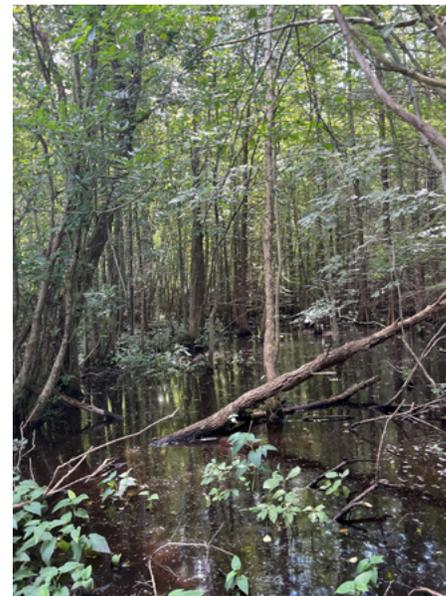
Communicating data needs to the project team early and often is one of the most important lessons I've learned in my career. For instance, we need to clearly define our survey area before environmental surveys can be conducted. For transmission line projects, we often need information like structure locations, proposed centerlines, limits of disturbance, access road data and workspace information.

It's important to communicate data needs to engineering teams and clients early to ensure they provide the required data in a timely manner, avoiding delays to surveys or the project overall. Documenting these needs via data requests helps clarify exactly what we need, why we need it and when we need it by.

### Engage Field Staff in Survey Planning

It is also important to engage field staff early in survey planning. Our project managers will seek input from environmental leads while preparing proposals, but those doing the work are not always involved in preparing the scope of work. Holding project kick-off meetings to discuss the overall project scope and schedule, share available project data and define the survey area helps bridge that gap.

*One of the most impactful things project managers and planners can do is ensure our field teams have everything they need to succeed.*



**Natural features.** A forested wetland thrives just beyond the transmission line right-of-way, showcasing its ecological importance as a natural carbon sink, water purifier and vital habitat for diverse wildlife.



**Soil color.** *Oliva examines the wetland soil using a Munsell color chart, identifying low chroma hues—grays and blues—that signal reduced conditions. Orange or rusty-colored iron deposits are also prominent redox indicators of wetland hydrology.*

Kick-off meetings, safety briefings and regular check-ins establish clear lines of communication and expectations. The goal is to provide field crews with all the information they need to complete their surveys efficiently and answer any questions they may have. This also fosters a culture where people feel encouraged to voice concerns and contribute to continuous improvement.

Additionally, because field crews must access privately-owned properties, it's important for landowners to be notified of survey activities. Field staff should be engaged ahead of field surveys to provide survey and property access plans. The right-of-way team should be aware of when and where surveys are happening so landowners can be informed accordingly and relay any property-specific restrictions or property-specific safety training to field crews.

#### **Build Trust with Your Field Teams**

I've supported biologists and cultural resource specialists on wetland and

stream delineations as well as cultural resource surveys, and I can attest that a 20-acre field looks a lot larger when you're standing in it than it does in Google Earth. Having empathy and understanding for what our field crews are doing are essential to supporting their needs while meeting project goals. We should be able to communicate their work to other team members and explain why it's vital to the overall project.

Additionally, ensuring projects are properly budgeted can help reduce stress on field crews, especially during unexpected delays such as adverse weather, thick brush or difficult terrain. When these delays are encountered, we don't want our field crews to be rushed to get the job done. Rushed work increases the risk of safety incidents and compromises quality. By allocating sufficient time and resources, we reduce stress, maintain high quality work and most importantly, ensure our crews return home safely.

Our technical experts possess valuable knowledge of wetlands, streams, archaeological sites, architectural resources and endangered species. Their expertise supports our ability to provide detailed information and recommendations to minimize environmental impacts.

Successful survey planning and project execution are driven by a detail-oriented, organized and proactive mindset in project management and planning, paired with the skills of our subject matter experts. The more integrated the project management team is with subject matter experts, the better we can understand and meet each other's needs. 🐼

## What Are Environmental Surveys?

Environmental surveys are field investigations and assessments used to identify and document natural and cultural resources that may be impacted by project development. These surveys help ensure compliance with environmental regulations and guide responsible planning. Some examples of environmental surveys include:

- **Wetland and Stream Delineations:** These surveys determine the boundaries of wetlands and streams based on soil, vegetation and hydrology. They are used to ensure compliance with the Clean Water Act.
- **Cultural Resources Surveys:** These surveys identify historic buildings, archaeological sites and other culturally significant features (i.e. cemeteries). They are used to ensure compliance with the National Historic Preservation Act.
- **Threatened & Endangered Species Surveys:** These surveys assess the presence of protected plant and animal species in a project area. They are used to ensure compliance with the Endangered Species Act.



**Wetland indicator.** *Swamp Rose Mallow blooms near the transmission corridor, signaling the presence of wetland vegetation—one of three primary wetland indicators, along with soil characteristics and hydrology.*

## Air Quality Engineering in a Changing World

Tom Rolfson, P.E. | Air Quality Engineer

**W**e had the opportunity to sit down with air quality engineer Tom Rolfson, who has more than a decade of experience in air quality permitting, air emission inventories, air dispersion modeling and multi-media environmental compliance. In this interview, Tom talks about reliability and resiliency, emerging technologies and the unique opportunities he's had as part of an air quality engineering team in a larger, multidisciplinary firm.

***Tell us about your professional background and role, including the types of tasks you tend to work on these days. How did you come to do what you're doing now?***

My career started at POWER Engineers, and I was fortunate to join when we had a pretty small air quality practice. Working in a small group within a large, multidisciplinary consulting firm with a variety of service offerings gave me access to unique opportunities that I likely wouldn't have had at a traditional air quality firm.

I've gotten a lot of outside-the-box experience and gained some unique perspectives that have allowed me to flourish in a technical leadership role. I got to collaborate with skilled individuals and teams in other divisions at POWER like Environmental, Generation, Facilities, Government Services and Power Delivery. Now, when a problem pops up, I either know how to find the answer or know how to find someone who does.

Currently, I'm a project manager/department manager, so I don't get into the technical weeds as much as I used to, but I dive in on occasion, which is always fun. Just recently, I was processing

meteorological data for use in air dispersion modeling, which is a bit of a specialized skill set.

***What drew you to working in air quality?***

Throughout my education and the start of my career, I was one of those "jack of all trades, master of none" types. My undergraduate degree was a bachelor's in physics. Soon after, I went to graduate school for a master's degree in engineering. Physics was a degree program that was easy for me to slide into, but it was still a very general degree, and while I enjoyed

*[W]e don't want to just be efficient for the environment's sake. We want to be efficient for everything's sake.*

the things I was learning, I didn't really know how I wanted to apply that to a career. I knew that I wanted to go into something scientific and engineering-focused, and I aspired to move into a managerial role someday because I've always had good people skills and liked being a leader.

When I was interviewing for positions, somehow, this really cool air quality opportunity opened up in a small town in Maine where I had grown up. There was no way that I wasn't going to do everything I could to get it. That's how I ended up here, and as time went on, I realized how good of a fit it was.

***Looking to the future with the push toward cleaner electrified energy systems, how do you see utilities balancing reliability and resilience?***

You can't have one without the other. The goal is creating and delivering electrons to our homes, businesses or vehicles in the most efficient way. Part of that efficiency is making sure that your system is not going to be in constant need of repair or replacement.

Additionally, one of the net effects of resiliency and reliability is that it benefits the environment by ensuring that the grid can handle more renewables and higher levels of electrification, both of which are proven system-wide decarbonization tools.

But we don't want to just be efficient for the environment's sake. We want to be efficient for everything's sake.

We don't want to extract more fuel from the earth than we need. We don't want to put unnecessary stress on the equipment in a power plant. If we can burn a little bit less fuel to get more out of it, that's great. It's always better to use less input to get the same amount of output. Better for our wallets, for our energy and for our world.

***Are you seeing any emerging technologies or innovative solutions that will enable large-scale electrification and/or reduce emissions?***

We're seeing a lot of small improvements across the board. I think the onset of renewables into the electric mix has been very helpful, but you can't just put renewables on the grid without doing something to ease the burden. Battery energy storage systems, pumped hydro, compressed air



*Outdoor fun. Tom and his daughter pose next to a snow pile at his home in Maine.*

energy storage, efficient peaking plants and more are all critical to make sure we're not just adding that stress to the grid.

Even though the sun isn't always shining and the wind isn't always blowing, solar and wind energy are tremendous assets. We need to get those assets connected to the grid so that we can make the most of them. I'm personally excited to see developments in energy storage systems and rapid-start or peaking power plants. They've always been around, but we're seeing a lot more of them entering the generating mix lately.

*I'm personally excited to see developments in energy storage systems and rapid-start or peaking power plants.*

***Given your experience in the various industries you've been exposed to, do you have any general advice for clients to foster more successful projects?***

Everything takes time. Environmental permitting and regulatory changes, especially. We're seeing a lot of deregulatory activity right now, but it's not like these regulations are just going away overnight. Changes of this nature often take years.

I would encourage businesses of all sizes to be cognizant of the realistic timeline for their projects.

For small projects, like a routine boiler replacement at a hospital, regulatory activity isn't likely to be a huge driver. You might need to get an air permit, which takes time, but you don't need to worry about the broader regulatory landscape. However, for larger projects, you need to consider the longer-term regulatory changes that may occur. For example, if a large power plant developer is looking at an emerging technology for a project because there is a tax credit available, they need to be aware that in a few years, a new regulatory administration might make changes and that tax credit might go away.

Companies who have projects with long lead times should understand where risks are with permitting and regulatory activities before they make decisions based on those factors.

On top of that, knowing who your resources are for staying on top of regulatory updates and supporting the permitting process are essential for navigating change.

Finally, know what you can tolerate. I like to think of it as a diet. We all know that we have to eat a variety of different types of foods, but if you have to pick one meal for the next 20 years, you want to make it one that you like. With infrastructure projects, we often have to live with equipment and systems for a minimum of 20 years before changes or upgrades are justifiable. 🐼

## LIGHTNING ROUND

***What is one thing on your bucket list?***

I'd like to travel somewhere very far north and remote, like northern Scandinavia or Canada.

***If you were a professional wrestler, what would your entrance song be?***

*Thunderstruck* by AC/DC.

***What is one skill you wish you had?***

I used to be able to play piano and I wish I had that skill back... being able to read music again and actually play it.

***What's the best piece of advice that you've ever received?***

Don't worry too much about things that might or might not happen in the future, because you have no idea if they're actually going to happen or not.



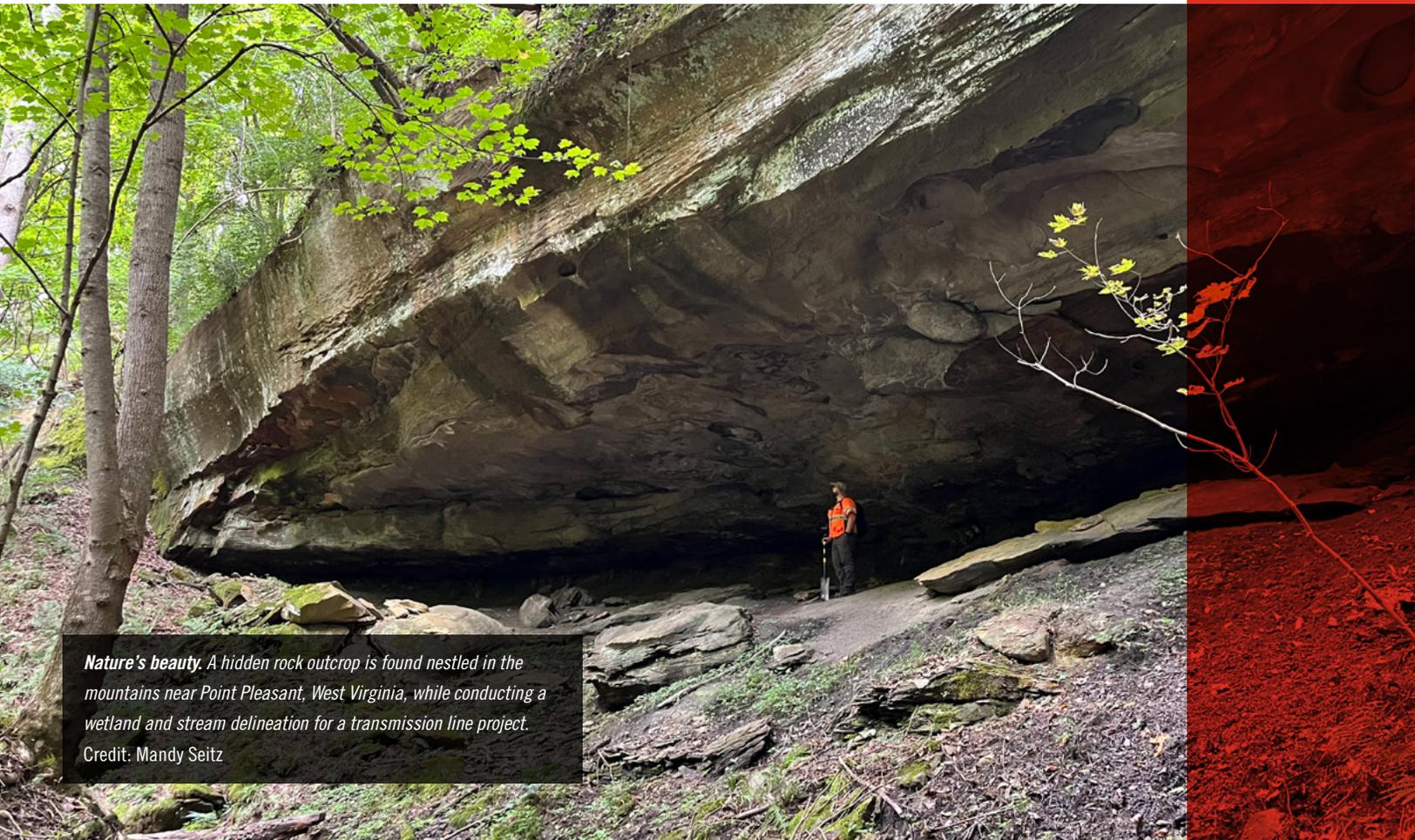
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*Nature's beauty.* A hidden rock outcrop is found nestled in the mountains near Point Pleasant, West Virginia, while conducting a wetland and stream delineation for a transmission line project.  
Credit: Mandy Seitz