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Santa Maria Airport Takes Common Sense Approach to PFAS Testing

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Published in: October, 2022

A few short years ago, Chris Hastert had heard about PFAS (per- and polyfluoroalkyl substances) but didn't know much about them. By March 2019, he was fully embroiled in the topic.


CHRIS HASTERT

That's when the California Water Board began sending letters to all commercial airports in the state as part of its larger initiative about PFAS contamination in groundwater. The letter required Part 139 certificate holders to begin investigating whether they had PFAS contaminants on site. As general manager at Santa Maria Airport (SMX), it was up to Hastert to start the process at the two-runway facility on California's central coast.

The chemicals are an issue for airports because they are key ingredients in the aqueous film-forming foam that emergency crews use to fight aircra fires that cannot be extinguished with water—burning fuel and aircra components that contain titanium, for instance. The problem occurs when the foam makes its way into groundwater because PFAS are linked to serious health complications for humans and animals.

While fires that require the use of aqueous film-forming foam are rare, commercial airports are required to store and conduct regular training with the foam and test equipment that dispenses it.

"We initially didn't even know what to do with the Water Board order because we first had to educate ourselves on what PFAS was," recalls Hastert. "We began looking for consultants who could help us with this and who had experience with this type of testing."

With a $4.5 million annual budget, Hastert had immediate concerns about additional expenses associated with the new testing requirements. "We don't have a lot of revenue to spend, especially on surprise costs like the PFAS investigation," he comments.

Treading completely new territory, the airport hired SCS Engineers to help get its arms around the emerging environmental issue. Straight away, the airport and consulting firm focused on developing a "common sense approach" to the testing process. "We didn't want to drill potholes all over the airport property," Hastert recalls. "It's a lot of land [2,600 acres] to start poking holes to figure out where PFAS is. SCS helped us come up with a scientific approach to where we might identify PFAS at the airport and where we might want to start testing."

The engineering team concentrated its initial investigation on areas where PFAS could most likely be found. "We wanted to hit the high points to determine where we thought we'd find PFAS," explains Chuck Houser, SCS project manager. "We wanted to gain a preliminary understanding of the presence or traces of PFAS. And then over time, we reasoned that we could rule out some areas and start to zero in on other areas where there is an issue."

Naturally, it was critical to get the state regulatory body to approve the game plan. "We worked closely with the Water Board staff," says Hastert. "They were very reasonable and took time to meet with us to discuss the methods we were proposing."

The project team submitted its initial work plan in October 2019 and received approval from the Water Board by late December the same year. The plan targeted four main areas: the airport fire station where firefighting foam was/is stored, the former racetrack area in the southern part of the airfield where nozzle testing took place, and two locations where foam was used during emergencies—at a hangar where an aircra caught fire in 2010, and near Runway 30-12 and Taxiway A6, where a general aviation airplane landed without its landing gear down in 2007.

Identifying the four areas for initial testing took investigative work by airport staff. "We had to go through our past incident reports and figure out which incidents may or may not have had foam applied," Hastert explains. "We looked for historical pictures, even from the local newspaper, to see if we could get visual confirmation that an incident involved foam, because it was never recorded by the fire department what extinguishing agents may or may not have been used."

Airport personnel caught a break regarding the 2010 hangar fire, because some employees who responded to the incident were still working at SMX. "That meant we could ask questions," Hastert says. "We were able to find out where the foam had been sprayed and where the flow of the water went."

The SCS team spent four days in March 2020 taking soil samples using "direct push" drilling equipment at the designated sites. Crews remained diligent about preventing cross contamination from the equipment and even from clothes team members were wearing. "There were a lot of precautions that had to be taken, otherwise we might have had false positives," Hastert explains. "For example, people doing the testing couldn't wear clothes cleaned with fabric so ener [because it o en contains PFAS]."

Results of the first round tests, which indicated a presence of PFAS, prompted the Water Board to request a second work plan for additional assessment. That plan was submitted in October 2020 and approved in July 2021. During the second round of tests, crews used a hollow-stem auger rig to drill and collect soil samples from a maximum depth of 70 feet, as approved by the Water Board. A "drive sampler" was lowered through the auger and driven into the soil to collect samples. "It drives ahead of the drill at selected depths to collect samples that haven't been touched by our equipment," explains Houser. "If those borings showed issues farther down, then we knew the next round of assessments would require deeper drilling."

Quality assurance/quality control samples help SCS confirm the effectiveness of its procedures. "So far, we have had no issues indicated by the QA/QC sampling and analysis, meaning our decontamination process and the sampling protocols we've used have been effective and that we've returned good data," Houser reports.


CHUCK HOUSER

During the second round of testing, the airport also installed seven groundwater monitoring wells where PFAS was detected during the first round of testing. That involved drilling along an active runway, so crews waited until a er the last flight of the evening to begin working.

"That was a very drawn-out process," recalls Hastert. "We didn't want to shut down a runway during the day, so all the work was done in the middle of the night."

Agricultural and community supply wells near the airport were also tested.

The results of second round tests, which documented traces of PFAS at several sites, were reported to the Water Board in November 2021. It then requested plans for a third round of assessment, which will be submitted by mid-October 2022.

Thus far, SMX has spent about $200,000 on testing—much less than if it had tested the entire property, notes Hastert. "We could have easily hired a consultant that wanted to drill and sample wells all around the airport, spread 100 feet apart from each other," he remarks. "Three quarters of them could have come up clean, and we would have had a better idea of where the PFAS was located; but we would have also wasted a lot of effort on those samples. Just focusing in on the certain areas and narrowing down specifics was a huge part of saving money for the airport."

Hastert says the sampling process is expensive, about $300 per analysis, because the Water Board requires analytical results that are detectable into the range of parts per trillion.

Houser notes that the ever-fluctuating groundwater level in the Santa Maria Basin presents a big challenge for the project. For example: During initial testing at the site of the gear-up aircra accident, groundwater was detected 3½ to 5 feet below grade. During the second round of assessment, when monitoring wells were installed in the same area about 19 feet deep, water was not encountered. "We consistently find perched water tables, and they can be transient," he explains.

Given such challenges, Houser stresses the importance of constant communication with state regulators. "Everything we have done so far has been approved by the Water Board," he says. "We didn't just go out there and start drilling holes. We came up with a plan and submitted it to the Water Board for their approval."

Finding PFAS in soil and groundwater is one thing; getting rid of it is an entirely different matter. Hastert reports that there are a few sites in the U.S. that will accept PFAS-tainted soil, but that merely transfers the pollutant from one location to another.

"We are continuing to do the testing," he says. "And we have trace detection of PFAS that will likely require cleanup."

That said, the FAA still requires SMX and other commercial airports to use aqueous film-forming foam that contains PFAS. "There is no alternative that is approved yet," laments Hastert. "So technically, if an airplane has an incident now, and we had to spray foam, we'd be opening up a new site to be added to a list of areas we need to monitor."

Despite the ongoing challenges, he remains hopeful that PFAS cleanup will eventually receive federal funding, like EPA Superfund sites. "There are a lot of unknowns right now," he reflects. "And the list will continue to grow and grow."

The PFAS issue does, indeed, extend far beyond airports and California. Consumer products that are grease-, stain- and/or water-resistant o en contain the problematic synthetic chemicals. Outdoor equipment such as tents, jackets, boots, etc. include PFAS to help keep users dry. Cosmetics, shampoos and soaps also o en contain PFAS. And the same goes for cleaning supplies and stain-resistant upholstery. Grease- and water-resistant food packaging is another common source.

"It's in almost everything, but it's not regulated," Hastert points out.

Developing ways to mitigate existing PFAS contamination is proving to be a challenge. "It's a difficult situation," Houser acknowledges. "They don't call it a 'forever chemical' for nothing. It doesn't react like a lot of other chemicals we deal with, although carbon filtration is showing promise. It's probably going to require more aggressive mitigation over a long period of time. We're all just trying to figure it out."

Learn how other airports are facing the PFAS issue by checking out the July/August 2019 and July/August 2021 issues of Airport Improvement magazine.