

There are three topics I would like to comment on regarding Deputy Mayor Baumel's PFAS update at the 12/18/23 meeting:

Orin Technologies remediation at Truax Field

Current EPA evaluation of PFAS toxicology

Fluorinated AFFF foam is still in use at Truax Field

Orin Technologies remediation at Truax Field

Dane County will almost certainly not actually propose full scale use of the Orin Technologies remediation at Truax Field although they have been claiming they will do so for many months. If they did so the DNR would certainly not approve it.

There are a few things you should understand about the background.

The new military specification for replacement non-fluorinated fire fighting foams was developed under a grant from SERDP, a federal agency which is a collaboration between EPA, Department of Defence and Department of Energy. This agency has also awarded millions of dollars in grant money to fund projects to find ways to destroy PFAS. The EPA held a [competition](#) to identify the most effective processes. The winner uses "high-temperature and high-pressure water to destroy PFAS compounds and minimize harmful byproducts". All of the top finishers had these characteristics:

- Groundwater to be treated must first be pumped to the surface ("pump-and-treat"), which uses significant electricity
- High energy cost to run the process
- Likely high capital cost

A viable in situ (underground) treatment with none of these problems would be showered with SERDP money. You should ask to see the Orin grant application to SERDP and how they evaluated it.

For the same reasons such a treatment working at full scale at hundreds of contaminated sites would be worth tens of millions in patent royalties. Orin Technologies has apparently not applied for a [patent](#) on their bacterial injection process.

When a high profile SERDP project is successfully concluded the results are submitted for publication to a peer reviewed journal. I have examined their methodology and their submission would be greeted with hysterical laughter for the reasons outlined by Prof Christy Remucal, world class PFAS researcher at UW-Madison, in a Wisconsin State Journal article on 10/5/2022:

But Remucal said there's little scientific evidence that biodegradation works on PFAS, whose strong molecular bonds make them difficult to break down and which tend to transform into other harmful substances. Remucal wants to see controlled lab studies before the technology is tested in the field. "You kind of need to see the data to see if that's really happening," Remucal said. "Microbes don't like to eat them. They're not a good food source."

I know the DNR would not approve a full scale treatment because the pilot did not meet the requirements set out in their approval letter ([20211117 99 Approval Letter.pdf](#)):

The summary report shall provide an opinion as to whether PFAS compounds were degraded by biodegradation or whether changes in PFAS from the start to the end of the project are different due to another process such as absorbing on to the BAM [activated carbon].

They made no attempt to satisfy this requirement - they only sampled the groundwater. Of course there was a 90+% reduction there because nearly all of the PFAS compounds (including PFOA) produced by the bacteria was adsorbed by the activated carbon they also injected.

At well 15 activated carbon is effective only because the carbon is periodically replaced with clean material and the contaminated material is sent to a processor licensed to deal with it. Here the contaminated carbon will remain in the ground, and over many years fresh rainwater will slowly leach the PFAS out into the groundwater table. So 100% of the PFAS will eventually be released into the groundwater, where it will make its way to well 15.

The initial plan was to follow up the pilot with a full scale remediation at the base. Since Bill Myer (National Guard Bureau) arrived I have only heard them claim that it would be done at the burn pits, which are the responsibility of Dane County and Madison. It would be interesting to ask Bill Myer what prompted this apparent change.

The only way I can make sense of the Orin relationship is that it's a means of deceiving the public by implying that meaningful actions are being taken by the county to address the problem. In reality effective measures are expensive - like the well 15 treatment system - and this would infringe on other budgetary priorities.

Orin has prior history at Truax.

Both principals at Orin are biologists. The company website says they deal with bad smells at sewage treatment plants. Their history at Truax begins with their stormwater filter, essentially a pillow stuffed with activated carbon mounted in a stormwater outfall. The filter removed 18% of PFOS and 4% of PFOA. When Bill Myer of the National Guard Bureau came for a presentation of the site investigation work plan at MATC (one hour and 19 minutes into the presentation [video](#)) I asked a rather long two-part question detailing this situation. The 115th and airport reps looked at each other, then both turned to look at Bill Myer. He had me repeat the question, then responded that "I can guarantee you that it's not going to be a biologist designing our surface water treatment system."

Current EPA evaluation of PFAS toxicology

The Safe Drinking Water Act (SDWA) requires EPA to [review](#) each national primary drinking water regulation at least once every six years. In 2016 this resulted in the 70 ppt health action limit (HAL). Six years later in spring 2022 they released new interim [health advisory levels](#).

- Interim updated Health Advisory for PFOA = 0.004 parts per trillion (ppt)
- Interim updated Health Advisory for PFOS = 0.02 ppt

These values are approximately 10,000 times lower than the previous value of 70 ppt.

In March 2023 EPA proposed an maximum contaminant level (MCL) of 4ppt for PFOS and PFOA. This is roughly 500 times the HAL values.

Why the huge difference? In this case the immediate problem is that analytical chemists can only measure down to the single digits, and you can only enforce what you can reliably measure.

Well 15 has roughly 5 ppt of both PFOS and PFOA but barely exceeds the DHS index. So the DHS index is roughly equivalent to the proposed EPA MCL, or about 500 times the EPA interim HAL. It is misleading to refer to it as a health level since it is not in line with current toxicology research.

This is not an academic distinction. I have not seen the Madison Water Utility say to what level they will treat well 15, much less the other PFAS-contaminated wells. Like the DHS health index, the Great Lake consortium fish advisories have not been updated in the nearly two years since the EPA interim HALs. Their [documentation](#) on the Minnesota state website is dated 2019.

Fluorinated AFFF foam is still in use at Truax Field

According to a WSJ [story](#):

"In May, the 115th Fighter Wing at Truax announced it was the first Air Force installation to stop using firefighting foam containing PFAS."

This is unintentionally misleading. I believe that Lucas (the reporter) misinterpreted this [press release](#), which refers to a project they completed in April 2023:

"The 115th Fighter Wing became the first U.S. Air Force base worldwide to terminate all use of foam-based fire suppression systems in its facilities, surpassing the Air Force's set date of October 2024."

The "gotcha" is that when they say 'facilities' they are referring to their aircraft hangars, where they installed a water-only fire suppression [system](#).

Their emergency response vehicles (ARFF) still have AFFF (fluorinated) foam and that's what will be used if there is an accident, although they are no longer doing training exercises with it.

The first non-PFAS foam was [approved](#) for use by the DoD and FAA in September.

"The first F3 product was qualified by NAVSEA and listed on the Qualified Products List in September 2023."

The DoD has selected a contractor to handle the upgrade. The process of cleaning and converting a single vehicle takes a week, and retraining will be required since the foam behaves differently. A single manufacturer will not be able to meet the demand, and there are several other products working their way through the approval pipeline. I am certain that when it happens at Truax we will see a press release.

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