Camp Davis (MCOLF) – Site 111 PFAS Review

January 2026 RAB Summary and Risk Context Analysis

Based on January 2026 Restoration Advisory Board (RAB) Minutes

Marine Corps Outlying Landing Field (MCOLF) – Camp Davis

I. Executive Summary

The January 2026 RAB minutes document confirmed PFAS contamination in the shallow (surficial) aquifer at Site 111, with maximum reported concentrations significantly exceeding current EPA drinking water standards.

The same minutes distinguish shallow groundwater impacts from deeper Castle Hayne aquifers, where reported concentrations remain below federal Maximum Contaminant Levels (MCLs) to date.

Risk modeling discussed in the RAB minutes indicates that **future residential potable use and cumulative construction worker exposure scenarios exceed target risk or hazard thresholds when exposures across multiple environmental media are combined.**

This report explains:

- The documented concentrations
- How those numbers relate to EPA limits
- What cumulative exposure modeling means
- How long-term multi-pathway exposure affects children, construction workers, and animals

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II. Key Concentration Data from January 2026 RAB Minutes

A. EPA Drinking Water Standard (2024 Final Rule)

- PFOA: **4 ng/L**
- PFOS: **4 ng/L**

(ng/L = ppt for water)

B. Surficial Aquifer (Shallow Groundwater)

Highest reported monitoring well concentration:

- PFOS: **29,200 ng/L**
- PFOA: **849 ng/L**

Comparison to EPA MCL:

- PFOS: 29,200 ÷ 4 = **7,300× the federal limit**
- PFOA: 849 ÷ 4 = **212× the federal limit**

These values were measured in monitoring wells within the shallow aquifer.

C. Upper Castle Hayne Aquifer (Deeper)

Highest reported:

- PFOS: 1.63 ng/L (J)
- PFOA: 3.06 ng/L (J)

Relative to EPA 4 ng/L MCL:

- PFOS: 41% of MCL
- PFOA: 76.5% of MCL

Below federal drinking water limits.

D. Lower Castle Hayne Aquifer

Highest reported:

- PFOS: 1.64 ng/L (J)

Approximately 41% of the EPA MCL.

III. What the RAB Minutes State About Risk

The January 2026 minutes indicate:

- Future residential potable groundwater use scenarios exceed target risk levels.
- Future construction worker exposure to combined soil + shallow groundwater + surface water exceeds non-cancer hazard thresholds.
- Individual exposure pathways alone do not exceed risk levels; cumulative exposure across multiple media does.

This distinction is critical.

IV. Understanding Long-Term Multi-Pathway Exposure

PFAS concerns are driven by **chronic accumulation over time**, not short-term contact.

PFAS compounds:

- Are persistent
- Bioaccumulate in blood
- Have multi-year biological half-lives (particularly PFOA and PFOS)

Repeated exposure increases total body burden.

V. Residential Multi-Pathway Exposure – Detailed Analysis

A. Children

Children are more vulnerable due to:

- Higher water intake per body weight
- Increased hand-to-mouth soil ingestion
- Greater dermal contact during outdoor play

- Developing endocrine and immune systems
- Longer lifetime exposure window

Potential exposure pathways:

1. Drinking water (if impacted)
2. Incidental soil ingestion while playing
3. Dermal contact with soil and surface water
4. Lawn sprinkler spray aerosolization
5. Home-grown produce uptake (if PFAS present in soil)
6. Pets tracking contaminated soil indoors

Repeated low-level ingestion over years increases serum concentration.

Because PFAS elimination from the body is slow, steady intake can result in accumulation over time even when daily doses appear small.

B. Lawn Irrigation / Sprinkler Systems

If shallow groundwater were used for irrigation:

- Sprinklers aerosolize water droplets
- Children and adults inhale mist
- PFAS deposits onto lawn surfaces
- Soil concentrations can increase
- Residue may transfer to hands, toys, pets

Repeated irrigation cycles increase environmental loading.

C. Indoor Tracking

PFAS-bound soil can:

- Be tracked indoors via shoes and pets
- Accumulate in dust
- Become available for ingestion, particularly in toddlers

Household dust ingestion is a documented exposure pathway.

D. Construction Workers

Construction increases exposure intensity:

- Trenching exposes shallow groundwater
- Soil disturbance increases dermal and inhalation contact
- Dewatering operations increase handling
- Repeated occupational contact over months or years

The RAB minutes indicate combined exposure modeling for construction workers exceeded non-cancer hazard thresholds.

E. Pets

Animals have:

- Higher soil ingestion rates
- Frequent ground-level exposure
- Smaller body mass relative to intake

Pets can:

- Drink from puddles
- Consume contaminated soil while grooming
- Track soil indoors

Repeated environmental contact can contribute to cumulative intake.

VI. Why the 7,300× Figure Matters

The 29,200 ng/L shallow groundwater PFOS value is:

- Not a drinking water supply well reading
- But a confirmed concentration in the shallow system

When compared to EPA's 4 ng/L drinking water standard:

29,200 ÷ 4 = 7,300×

This illustrates the magnitude difference between shallow plume concentrations and federal potable standards.

It does not mean residential wells currently contain that level.

It does show:

- Significant contamination exists in the shallow system.
- Exposure modeling must consider potential future use scenarios.

VII. Vertical Separation Context

Current documentation shows:

- Extremely elevated concentrations in the surficial aquifer.
- Much lower concentrations in deeper Castle Hayne aquifers.
- No reported exceedances of EPA MCLs in the deeper system to date.

This indicates vertical contrast at the time of reporting.

Continued monitoring is essential.

VIII. Technical Conclusion

The January 2026 RAB minutes demonstrate:

1. Significant PFAS contamination in shallow groundwater.
2. Deep aquifer concentrations below federal drinking water limits.
3. Risk modeling showing cumulative exposure exceedances under future residential and construction scenarios.
4. Movement toward pilot in-situ remediation.

The long-term concern centers on chronic, multi-pathway exposure and cumulative body burden, particularly for children and occupational workers.