



FORMER MCAS EL TORO

Sampling and Analysis Plan Expanded Site Inspection for PFAS at Installation Restoration Program Sites 1, 2, and 16 Former Marine Corps Air Station El Toro, Irvine, California

123rd Restoration Advisory Board Meeting

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Base Realignment and Closure (BRAC) Program Management Office West

San Diego, California

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Presentation Overview



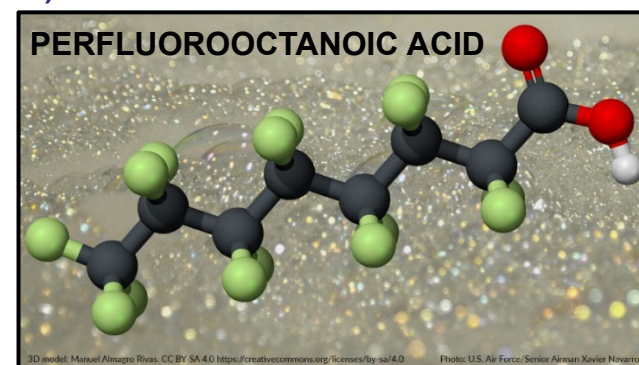
- **Background**
 - Per- and polyfluoroalkyl substances (PFAS)
 - Department of Defense (DoD) guidance
- **Program Status**
- **Expanded Site Inspection (ESI) Sampling and Analysis Plan (SAP)**
- **Summary**
- **Schedule**
- **Questions**

Background

PFAS



- Synthetic organofluorine compounds
- Thermally stable, hydrophobic, and lipophobic
- Decades of use in industrial and consumer products
 - *Firefighting foams (e.g., aqueous film-forming foam)*
 - *Metal plating operations (mist suppression)*
 - Stain-resistant/waterproof textiles (e.g., GORE-TEX®)
 - Nonstick cookware (e.g., Teflon™)
 - Cleaning products
 - Carpeting
 - Upholstery
 - Food wrappings
- Not currently regulated and no promulgated standards exist
- U.S. Environmental Protection Agency (U.S. EPA) considering designating PFAS as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)



Department of Defense Guidance (15 September 2021 Memorandum)



- PFAS cleanup conducted under the CERCLA process, despite current lack of regulation
- DoD screening levels (DoDSLs) were developed using the U.S. EPA Regional Screening Level calculator; applies factor of 0.1 when more than one PFAS is present
- Used to determine need to move into CERCLA Remedial Investigation (RI) phase

PFAS	Tap Water (ng/L)	Residential Soil (ng/kg)	Industrial Soil (ng/kg)
PFOA	40	130,000	1,600,000
PFOS	40	130,000	1,600,000
PFBS	600	1,900,000	25,000,000

Values assume more than one PFAS is present.
ng/kg = nanograms per kilogram (parts per trillion)
ng/L = nanograms per liter (parts per trillion)
PFAS = per- and polyfluoroalkyl substances

PFBS = perfluorobutanesulfonic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate

Program Status

Program Status



- **From 2016 to 2021, the Navy conducted a Preliminary Assessment/Site Inspection (PA/SI) that included research and multiple phases of groundwater sampling to assess the presence of PFAS**
 - 33 Areas of Interest, located in 7 Installation Restoration Program (IRP) sites and 1 crash site, were recommended for further investigation
 - 15 proceeding to RI
 - 3 proceeding to ESI
 - 15 on previously transferred property (coordinate with owners for possible additional investigation)

Program Status (cont.)



GW Results	Expected Impacts	CERCLA Status	Property Owner	Notify	SI	RI	Example
N/A	Unknown	N/A	Non-Navy	X			Plane Crash Site
N/A	Unknown	Closed	Navy			X	Site 12 (WWTP)
>DoDSL	Limited	Open	Navy		X		Site 1 (EOD)
≈DoDSL	Limited	Open	Non-Navy	X	X		Site 2 (LF)
>DoDSL	Limited	Open	Non-Navy	X	X		Site 16 (FFTA)
>DoDSL	Extensive	Closed	Navy			X	Site 9 (FFTA)
>DoDSL	Extensive	Open	Non-Navy	X		X	Site 18 (Pr. Aq.)
>DoDSL	Extensive	Open	Navy			X	Site 24 (SGU)
>DoDSL	Extensive	Open	Non-Navy	X		X	Site 24 (SGU)

≈ = approximately equal to

DoDSL = Department of Defense screening level

EOD = Explosive Ordnance Disposal Training Range

FFTA = Firefighter Training Area

GW = groundwater

LF = landfill

N/A = not available or not applicable

SGU = Shallow Groundwater Unit

SI = Site Inspection

RI = Remedial Investigation

WWTP = wastewater treatment plant

Program Status (cont.)



- IRP Sites 1, 2, and 16 each had a limited number of samples collected and it was determined that an ESI should be conducted before a determination could be made to proceed to the RI phase

IRP Site	Well ID	PFOA (ng/L)	PFOS (ng/L)	PFBS (ng/L)
	DoDSL	40	40	600
1	01-MW209	62.2	333	90 J
2	02DGMW59	31.8	11.6	11.6 J
16	16_MW04	5.21 J	5.21 J	3,280

Groundwater sample results presented above provide the rationale for an ESI.

Bold results exceed or are near DoDSL

DoDSL = Department of Defense screening level

J = estimated result

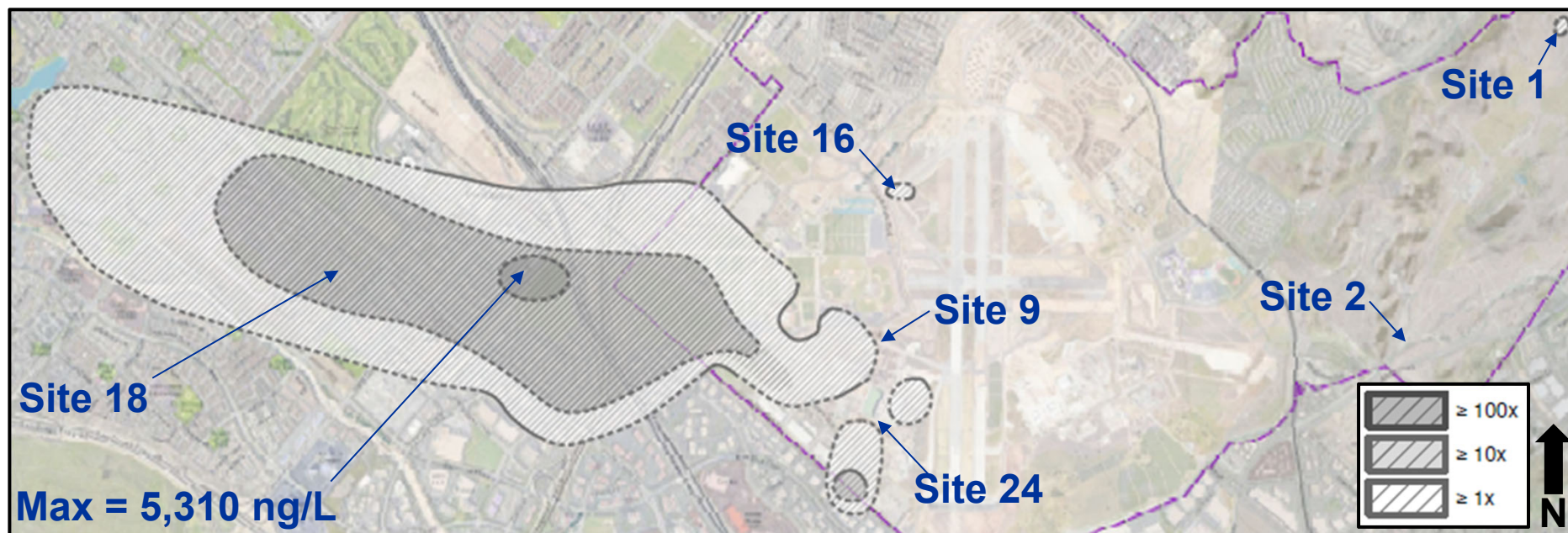
ng/L = nanograms per liter (parts per trillion)

PFBS = perfluorobutanesulfonic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

Estimated Extent of PFOA, PFOS, and/or PFBS in the SGU Exceeding DoDSLs



Note: Contour lines represent a unitless multiple where results exceed respective DoD screening levels and are dashed where inferred. Maximum concentrations were used where duplicate, split, or sequential sample results were available or when data from multiple depth intervals within the Shallow Groundwater Unit were available.

ng/L = nanogram per liter

PFBS = perfluorobutanesulfonic acid

PFOA = perfluorooctanoic acid

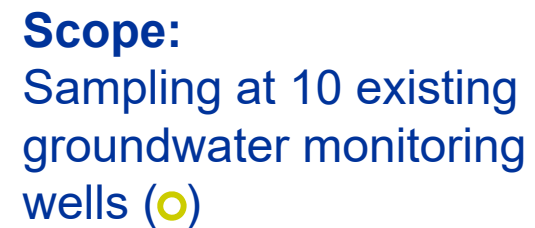
PFOS = perfluorooctane sulfonate

Expanded Site Inspection (ESI) Sampling and Analysis Plan (SAP)

ESI SAP



- *Draft Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) for Expanded Site Inspection for PFAS at IRP Sites 1, 2, and 16 (forthcoming later this month)*
- Objective is to collect additional groundwater samples at each site and initial soil samples at IRP Site 16 for PFAS analysis to support a CERCLA determination for each site of no further action or advancement to RI
- Data and determinations will be reported in an addendum to the *Final PA/SI Report* (November 2021)



- Previous results from monitoring well exceeded DoDSLs for PFOA and PFOS

No soil sampling at this time due to potential munitions issues and PFAS analysis will be included in future munitions investigations.

ESI SAP (cont.)

IRP Site 2



Scope:

Sampling at 7 existing groundwater monitoring wells (○)

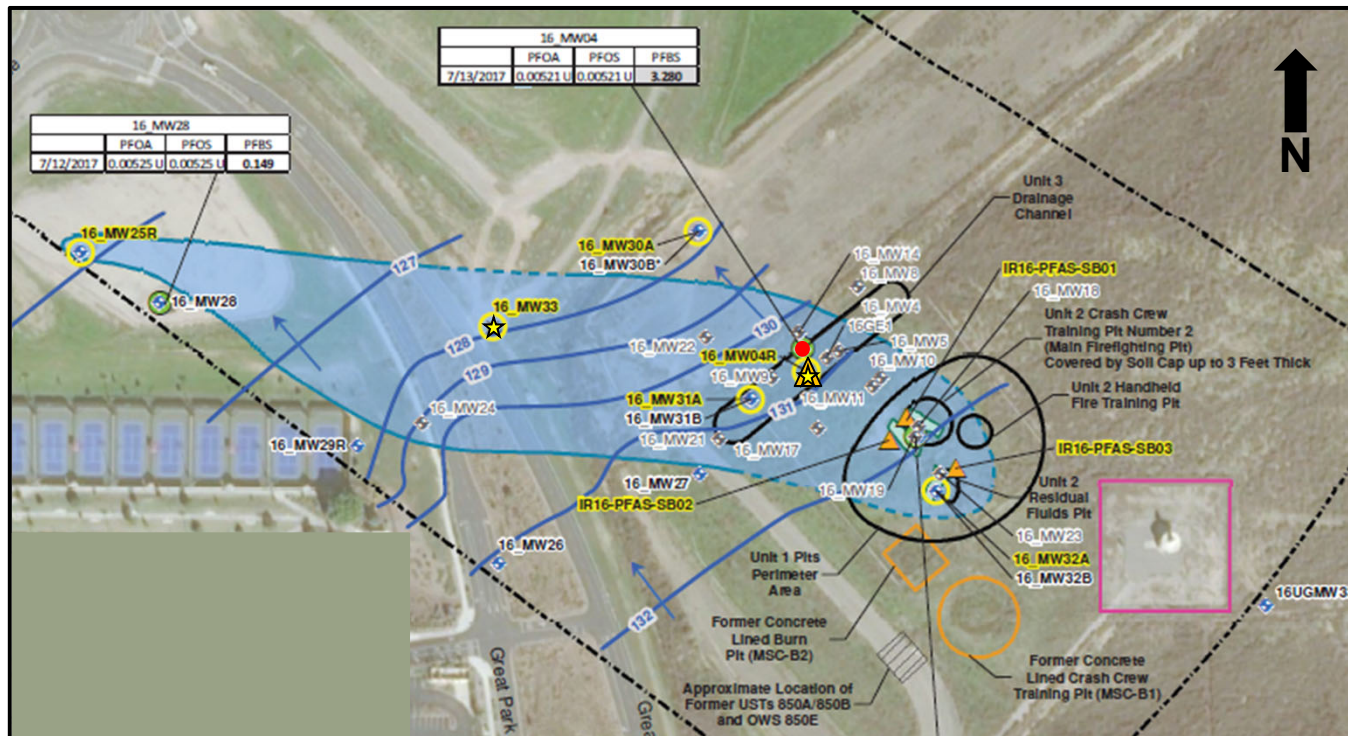
Note:

● Previous result from monitoring well near DoDSL for PFOA

No soil sampling planned since potential source area is a landfill with a protective cap and liner.

ESI SAP (cont.)

IRP Site 16



Scope:

Sampling at 4 existing groundwater monitoring wells (○); installation and groundwater sampling of 2 new wells (★) (one well will have soil sampling [▲]); drill and sample 3 soil boring locations (▲)

Note:

- Previous result from monitoring well exceeded DoDSL for PFBS

Summary

ESI SAP Summary



- 23 locations sampled for groundwater
- 4 locations sampled for soil
- 2 new well installations
- 9 groundwater and 3 soil quality assurance/quality control samples
- Total samples = 32 groundwater and 16 soil (quality assurance and quality control samples included)

Schedule

Approximate Schedule



- **Submit Draft SAP** (March 2022)
- **Submit Response to Agency Comments** (May 2022)
- **Submit Final SAP** (July 2022)
- **Conduct Fieldwork** (Late Summer 2022)
- **Submit Draft Addendum to the Final PA/SI Report** (Early 2023)

Questions?



Navy Contact Information



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Acronyms



BRAC – Base Realignment and Closure

CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act

DoD – Department of Defense

DoDSL – Department of Defense screening level

EOD – Explosive Ordnance Disposal

ESI – Expanded Site Inspection

FFTA – firefighter training area

GW – groundwater

J – estimated result

LF – landfill

N/A – not available or not applicable

Navy – U.S. Department of the Navy

ng/kg – nanograms per kilogram

ng/L – nanograms per liter

PA – Preliminary Assessment

PFAS – per- and polyfluoroalkyl substances

PFBS – perfluorobutanesulfonic acid

PFOA – perfluorooctanoic acid

PFOS – perfluorooctane sulfonate

RI – Remedial Investigation

SAP – Sampling and Analysis Plan

SGU – Shallow Groundwater Unit

SI – Site Inspection

U.S. EPA – United States Environmental Protection Agency

WWTP – wastewater treatment plant