RELATIVE RISK SITE EVALUATION

Boise Air National Guard Base, Idaho

Introduction

The Department of Defense (DoD) has identified certain per- and polyfluoroalkyl substances (PFAS) as emerging contaminants of concern which affected installations across the Air Force, which for these fact sheets includes the Air National Guard. These PFAS are perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorononanoic acid (PFNA), perfluorohexane sulfonate (PFHxS)are components of Aqueous Film Forming Foam (AFFF) that the Air Force began using in the 1970s as a firefighting agent to extinguish petroleum fires. The U.S. Environmental Protection Agency (EPA) has issued health based site specific Regional Screening Levels (RSLs) for surface soil and groundwater (drinking water)) for PFOS, PFOA, PFBS, PFNA, PFHxS and hexafluoropropylene oxide dimer acid (HFPO-DA, or Gen-X).

Site Inspections (SIs) were initiated to collect soil and groundwater samples and analyze those media for 16 different PFAS at the potential AFFF release areas that were identified in the PA. The intent of the SI is to determine if a release has occurred and determine if there are impacts to soil and/or groundwater. The next step in the process is the Relative Risk Site Evaluation (RRSE). The RRSE is a DoD-wide methodology to evaluate the relative risks posed by PFAS present at an installation in relation to other installations. The RRSE is a tool used to sequence funding for which installations have the highest priority to begin a Remedial Investigation (RI). The DoD premise in installation sequencing is “worst first,” meaning the DoD Component shall address installations that pose a relatively greater potential risk to public safety, human health, or the environment before installations posing a lesser risk.

The results of Boise Air National Guard Base remedial investigations PA and SI can be found at AFCEC Administrative Record (AR): ar.afcec-cloud.af.mil. Scroll to the bottom of the page and click on “Continue to site,” then select “Active,” scroll down the Installation List and click on Boise Air National Guard Base, then enter Not Applicable in the “AR #” field for the SI. For the Expanded Site Inspection (ESI) enter Not Applicable or the RI, enter Not Applicable, then click “Search” at the bottom of the page.

More information on the Air Force response to PFAS can be found at:
https://www.afcec.af.mil/WhatWeDo/Environment/Perfluorinated-Compounds/

Acronyms

AR - Administrative Record

AFFF - Aqueous Film Forming Foam

AST - Aboveground Storage Tank

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

CHF - Contaminant Hazard Factor

DoD - Department of Defense

EPA - US Environmental Protection Agency

FTA - Fire Training Area

HA - Health Advisory

HFPO-DA - hexafluoropropylene oxide dimer acid (HFPO-DA, or Gen-X)

MPF - Migration Pathway Factor

PA - Preliminary Assessment

PFAS - Per- and poly-fluoroalkyl substances

PFBS - Perfluorobutane sulfonate

PFHxS - perfluorohexane sulfonate (PFHxS)

PFNA - perfluorononanoic acid (PFNA)

PFOS - Perfluorooctane sulfonate

PFOA - Perfluorooctanoic acid

RCRA - Resource Conservation and Recovery Act

RF - Reception Factor

RI - Remedial Investigation

RRSE - Relative Risk Site Evaluation

RSL - Regional Screening Level

SI - Site Inspection

SWMU - Solid Waste Management Unit

RELATIVE RISK SITE EVALUATION

Boise Air National Guard Base, Idaho

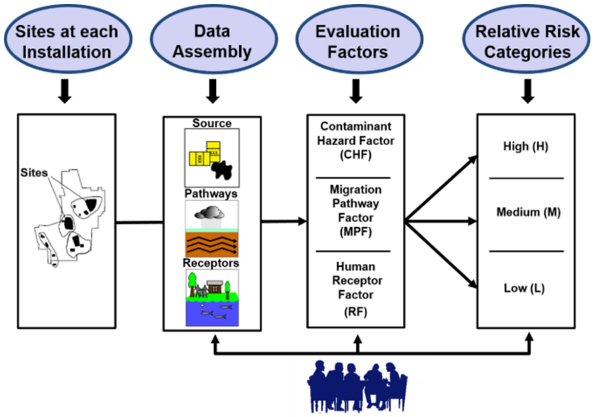
Q. What is the Relative Risk Site Evaluation (RRSE)?

A. RRSE is a methodology used by the Department of Defense (DoD) to sequence environmental restoration work . The DoD fundamental premise is "worst first," meaning the DoD Component shall address installations that pose a relatively greater potential risk to public safety, human health, or the environment before installations posing a lesser potential risk. Relative risk is not the sole factor in determining the sequence of environmental restoration work, but it is an important consideration in the sequencing process. The methodology is described in the DoD, Relative Risk Site Evaluation Primer, Summer 1997 Revised Edition denix.osd.mil/references/dod/policy-guidance/relative-risk-site-evaluation-primer/RRSE_Primer_Summer1997.pdf.

Q. What is the RRSE framework?

A. The RRSE framework provides a DoD-wide approach for evaluating the relative risks to human health and the environment posed by contamination present at component installations. The **Relative Risk Site Evaluation Concept Summary** (shown in the figure) illustrates the selection of sites, evaluation of the site data using three evaluation factors, and placement into high, medium, and low categories. The relative risk site evaluation framework is based on information fundamental to risk assessments: sources, pathways, and receptors, to sequence restoration work. However, the RRSE is not a baseline risk assessment or in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. Regulators and public stakeholders are provided the opportunity to participate in the process in accordance with the DoD Defense Environmental Restoration Program.

Relative Risk Site Evaluation Concept Summary

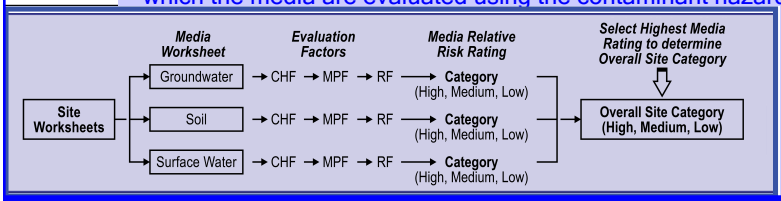


Regulator and Public Stakeholder Involvement in Technical Evaluation

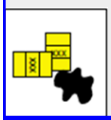
Sites at Each Installation

Q. What restoration sites are required to be evaluated in the RRSE process?

A. Restoration sites in CERCLA phases prior to remedy-in-place are evaluated in the RRSE process. Worksheets are developed for environmental media (such as, groundwater and surface soil) at each site. Environmental media lacking sufficient information to conduct a RRSE are assigned a "Not Evaluated" designation. The figure shows the process for which the media are evaluated using the contaminant hazard factor (CHF), the migration pathway factor (MPF), and the receptor factor (RF). Each media is scored to obtain a relative risk rating of High, Medium, or Low. The highest media-specific relative risk rating determines the Overall Site Category.



Q. How is the Contaminant Hazard Factor (CHF) calculated?



A. The **CHF** is calculated by dividing the maximum concentration of a contaminant by the approved screening value, or comparison value. Contaminant concentration ratios are totaled to arrive at the **CHF.** A CHF of greater than 100 earns a **High** rating. If the CHF is 2 to 100 it earns a **Moderate** rating. A **Minimal** rating is assigned when a CHF is less than **2.**

FOR MORE INFORMATION

Air Force Civil Engineer Center Environmental Restoration Program
www.afcec.af.mil

AFCEC CERCLA Administrative Record (AR)
ar.afcec-cloud.af.mil/

Q. How is the Migration Pathway Factor (MPF) determined?

A. The movement of contamination at a site is evaluated and assigned a **MPF** rating. Ratings for MPFs are designated as: **evident**, **potential**, or **confined** (for **High, Medium, and Low**). **Evident** exposure means the contamination is at a point where exposure to humans or the environment can occur, such as at a drinking water well. **Potential** ratings are given to sites where exposure may happen. A **confined** rating is given to sites where a low possibility for exposure may occur.

POINT OF CONTACT
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Q. How is the Receptor Factor (RF) determined?

A. The **RF** is determined by a receptor's, such as humans, potential to come into contact with contaminated media. **RFs** are designated as: identified, potential, or limited **(High, Medium, and Low). Identified** rating is given when receptors are in contact or threat of contact with contaminated media. **Potential** is given when receptor may contact contaminated media. **Limited** is given when there is little or no contact with contaminated media.

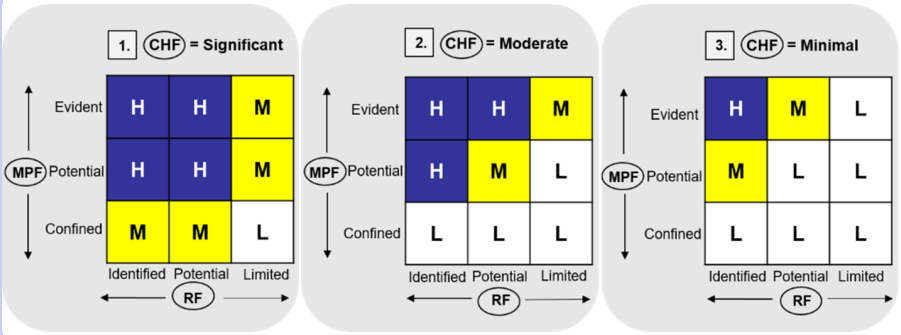
RELATIVE RISK SITE EVALUATION PROCESS, cont.

Media Relative Risk Rating

Q. How is the media-specific relative risk rating determined?

A. Use the charts on the right to determine the media-specific relative risk rating. Start by choosing the **CHF** result in the evaluation. If the **CHF** is **Significant**, use **box 1.** If the CHF is **Moderate**, use **box 2.** if the CHF is **Minimal**, use **box 3.** Then find the **MPF** and **RF** results and move to the square where the results meet. That square indicates the media-specific relative risk rating. For example, if the **CHF** is **Significant** - go to box 1**,** if the **MPF** is **Potential,** and the **RF** is **Identified**, then the rating is High (**H**).

Relative Risk Site Evaluation Concept Summary



CHF (Contaminant Hazard Factor) **MPF** (Migration Potential Factor) **RF** (Receptor Factor) **H** (High) **M** (Medium) **L** (Low)

Overall Site Category

Q. How do I determine the Overall Site Category?

A. The highest relative risk media rating becomes the **Overall Site Category** for the site. For example, if a site has a groundwater relative risk rating of **High**, and soil relative risk rating of **Low**, then the Overall Site Category rating for the site is **High**.

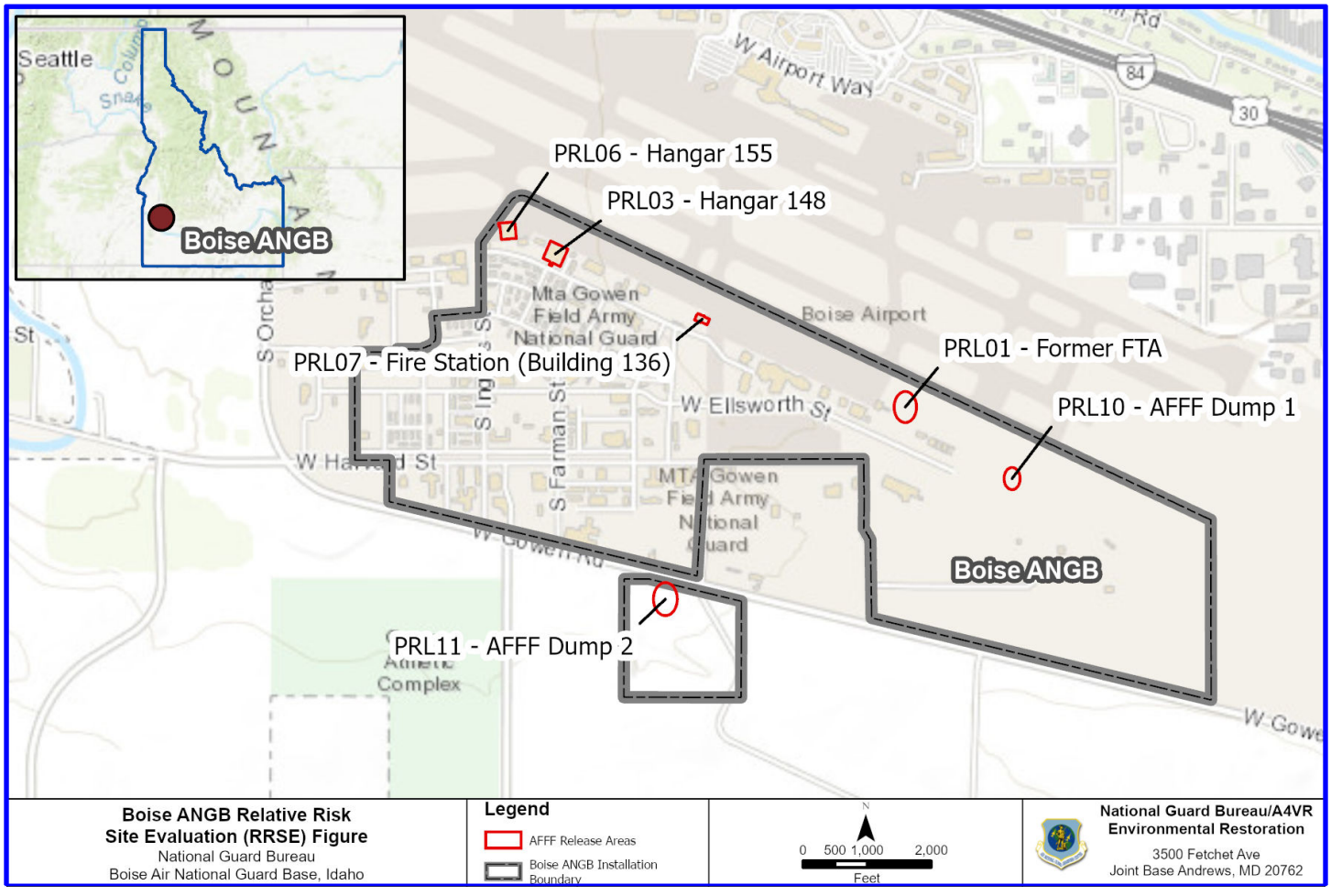
Regulatory and Stakeholder Involvement

Q. How do I participate as Stakeholder?

A. To offer opportunities to participate in the RRSE process, the Air Force announces a public comment period in your local newspaper. There is also opportunity to participate during installation Restoration Advisory Boards, where active. Installation Restoration Advisory Board meetings are announced in your local newspaper.

Relative Risk Site Evaluation Summary Boise Air National Guard Base

Overall Site Category	Site Name (Sites are shown on the map below and RRSE Worksheets are attached)
HIGH	Not Applicable
MEDIUM	FT001P-SUB
LOW	PRL 10 , PRL 11, PRL 3, PRL 6, PRL 7



Site Background Information			
Installation:	Boise Air National Guard Base	**Date:**	
Location:	Idaho	**Media Evaluated:**	GW
Site Name and ID:	AFFF 1 - Former Fire Training Area - FT001P-SUB	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Chris Babock	**Agreement Status (e.g., Federal Facility Agreement date signed):**	
OVERALL SITE CATEGORY: MEDIUM			

Site Summary	
Brief Site Description:	The Former fire training area (FTA) was located on the east end of the flightline just north of Building 1515 and is currently a grassy field. The 230-foot-diameter Former FTA was in use from 1974 to 1989. Upon closure, the soils directly impacted by the Former FTA were excavated and disposed of offsite. Soils from the active burn pit were disposed of at an off-Base landfill and soils from the area surrounding the burn pit were landfarmed offsite.
Brief Description of Pathways:	PRL 1 is a grassy field where impacted soils were excavated following closure of the FTA, so it is likely that dust emissions from surface soils would be limited. Groundwater flow in the southern portion of Gowen Field is to the northeast and north of Gowen Road the groundwater flow is to the east. Groundwater ranged from 161.75 feet (ft) below ground surface (bgs) to 209.15 ft bgs during the SI and flow was found to be to the east. Surface drainage at Gowen Field is controlled both by the local surface topography and a system of drainage ditches. The most important drainage ditch traverses the Base in an east to west direction with a flow direction toward the west. Fivemile Creek, an intermittent stream that is filled only during periods of heavy rainfall or snowmelt runoff, runs parallel to and south of West Gowen Road. Neither Fivemile Creek nor the secondary surface waters are used for drinking water. The Boise River is used for crop irrigation.
Brief Description of Receptors:	Approximately 870 groundwater wells are located within a 3-mile radius of the Former FTA, including private wells, Suez Water Idaho domestic water supply wells, and groundwater monitoring wells. Wells range in depth from approximately 90 feet bgs to more than 500 feet bgs. Suez Water Idaho owns and operates a well at the Boise ANGB which is approximately 2,700 feet upgradient from the Former FTA and has not been used since 2005. An additional off-Base well owned and operated by Suez Water Idaho is located approximately 4,000 ft west of the western boundary of Boise ANGB. The entire Suez Water Idaho system serves approximately 214,000 people, including Boise ANGB. It is unknown if any drinking supply wells are located downgradient of the Base. PRL 1 is located within the Base boundary fence with restricted access. Receptors would include authorized Base personnel and fire department personnel. PFAS including PFOA, PFOS, and PFBS have been detected at multiple on-site wells at varying concentrations.

Groundwater Worksheet

Installation: Boise Air National Guard Base

Site ID: FT001P-SUB **AFFF Release Area #:** PRL 1

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFBS	0.00110	0.6	0.00183
PFOA	0.00470	0.040	0.117
PFOS	0.290	0.040	7.25
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**7.37**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**M**

Migratory Pathway Factor

Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	M
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
	Groundwater Category	**MEDIUM**

Soil Worksheet

Installation: Boise Air National Guard Base

Site ID: FT001P-SUB **AFFF Release Area #:** PRL 1

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFBS		1.9	
PFOA		0.13	
PFOS		0.13	
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**NS**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	
Limited	No potential for receptors to have access to contaminated soil	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
	Soil Category	**NS**

Surface Water Worksheet

Installation: Boise Air National Guard Base

Site ID: FT001P-SUB **AFFF Release Area #:** PRL 1

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOA		307	
PFOS		22.6	
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**NS**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	

Migratory Pathway Factor		
Evident	Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure	
Potential	Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, OR Information is not sufficient to make a determination of Evident or Confined	
Confined	Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
Receptor Factor		
Identified	Receptors identified that have access to surface water or sediment to which contamination has moved or can move	
Potential	Potential for receptors to have access to surface water or sediment to which contamination has moved or can move	
Limited	Little or no potential for receptors to have access to surface water or sediment to which contamination has moved or can move	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
	Surface Water Category	**NS**

Site Background Information			
Installation:	Boise Air National Guard Base	**Date:**	
Location:	Idaho	**Media Evaluated:**	SS
Site Name and ID:	AFFF 3 - Hangar 148 - PRL 3	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Chris Babock	**Agreement Status (e.g., Federal Facility Agreement date signed):**	
OVERALL SITE CATEGORY: LOW			

Site Summary	
Brief Site Description:	Hangar 148 was constructed in the 1950s and is located on the west end of the flightline near the intersection of West Aeronca Street and South Ingalls Street. An aqueous film forming foam (AFFF) fire suppression system (FSS) was installed in 1982 and includes a 400-gal AFFF storage tank. The hangar bay drains to floor drains located in the middle of the bay. Liquids collected in the central floor drain pass through a control valve and ultimately to the City of Boise wastewater treatment system. The control valve is kept closed to control fluids flowing and is opened only when fluids do not contain any prohibited chemicals. AFFF is allowed to pass through the valve. After testing the FSS with AFFF, the foam is generally allowed to drain to the central floor drain and to the City of Boise wastewater treatment system. No reported AFFF spills have escaped the confines of the hangar.
Brief Description of Pathways:	PRL 3 consists of a hangar with cement floors and floor drains therefore access to contaminated surface soils would be limited. Groundwater flow in the southern portion of Gowen Field is to the northeast and north of Gowen Road the groundwater flow is to the east. Groundwater ranged from 161.75 ft bgs to 209.15 ft bgs during the SI and flow was found to be to the east. Surface drainage at Gowen Field is controlled both by the local surface topography and a system of drainage ditches. The most important drainage ditch traverses the Base in an east to west direction with a flow direction toward the west. Fivemile Creek, an intermittent stream that is filled only during periods of heavy rainfall or snowmelt runoff, runs parallel to and south of West Gowen Road. Neither Fivemile Creek nor the secondary surface waters are used for drinking water. The Boise River is used for crop irrigation.
Brief Description of Receptors:	Approximately 870 groundwater wells are located within a 3-mile radius of the Former FTA, including private wells, Suez Water Idaho domestic water supply wells, and groundwater monitoring wells. Wells range in depth from approximately 90 feet bgs to more than 500 feet bgs. Suez Water Idaho owns and operates a well at the Boise ANGB which is approximately 2,700 feet upgradient from the Former FTA and has not been used since 2005. An additional off-Base well owned and operated by Suez Water Idaho is located approximately 4,000 ft west of the western well boundary of Boise ANGB. The entire Suez Water Idaho system serves approximately 214,000 people, including Boise ANGB. It is unknown if any drinking supply wells are located downgradient of the Base. Hangar 148 (PRL 3) is located near the flightline (restricted access) in a mostly paved area, with small grass-covered areas on the south side of the building. Surface soil contact is expected to be limited to infrequent contact by Installation personnel and workers. PFAS including PFOA, PFOS, and PFBS have been detected at multiple on-site wells at varying concentrations.

Groundwater Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 3 **AFFF Release Area #:** PRL 3

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOA		0.040	
PFOS		0.040	
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**NS**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	

Migratory Pathway Factor		
Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
Receptor Factor		
Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
	Groundwater Category	**NS**

Soil Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 3 **AFFF Release Area #:** PRL 3

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOA	0.000670	0.13	0.00515
PFOS	0.00190	0.13	0.0146
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.0198**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	M
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	
Limited	No potential for receptors to have access to contaminated soil	L
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L
	Soil Category	**LOW**

Surface Water Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 3 **AFFF Release Area #:** PRL 3

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOA		307	
PFOS		22.6	
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**NS**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	

Migratory Pathway Factor		
Evident	Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure	
Potential	Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, OR Information is not sufficient to make a determination of Evident or Confined	
Confined	Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
Receptor Factor		
Identified	Receptors identified that have access to surface water or sediment to which contamination has moved or can move	
Potential	Potential for receptors to have access to surface water or sediment to which contamination has moved or can move	
Limited	Little or no potential for receptors to have access to surface water or sediment to which contamination has moved or can move	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
	Surface Water Category	**NS**

Site Background Information			
Installation:	Boise Air National Guard Base	**Date:**	
Location:	Idaho	**Media Evaluated:**	SS
Site Name and ID:	AFFF 6 - Hangar 155 - PRL 6	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Chris Babock	**Agreement Status (e.g., Federal Facility Agreement date signed):**	
OVERALL SITE CATEGORY: LOW			

Site Summary	
Brief Site Description:	Hangar 155 was constructed in the 1950s and is located on the west end of the flightline near the intersection of West Aeronca Street and South Gross Street. The building consists of two hangar bays, each with floor drains that lead to an oil/water separator (OWS) that discharges in the city of Boise wastewater treatment system. A valve on the downstream side of the OWS can contain all liquids if necessary and is opened only to drain the OWS when no prohibited chemicals are present. The original AFFF system (unknown installation date) was replaced with an high expansion foam (HEF) system in 2005. The 600-gal HEF tank was originally the AFFF tank but was converted to HEF in 2005. Each hangar bay has two HEF fans to blow the foam. No reported AFFF spills have escaped the confines of the hangar.
Brief Description of Pathways:	PRL 6 is located near the flightline in a mostly paved area, with small grass-covered areas on the south side of the building. It is likely that dust emissions from surface soils would be limited due to the vegetation present. Groundwater flow in the southern portion of Gowen Field is to the northeast and north of Gowen Road the groundwater flow is to the east. Groundwater ranged from 161.75 ft bgs to 209.15 ft bgs during the SI and flow was found to be to the east. Surface drainage at Gowen Field is controlled both by the local surface topography and a system of drainage ditches. The most important drainage ditch traverses the Base in an east to west direction with a flow direction toward the west. Fivemile Creek, an intermittent stream that is filled only during periods of heavy rainfall or snowmelt runoff, runs parallel to and south of West Gowen Road. Neither Fivemile Creek nor the secondary surface waters are used for drinking water. The Boise River is used for crop irrigation.
Brief Description of Receptors:	Approximately 870 groundwater wells are located within a 3-mile radius of the Former FTA, including private wells, Suez Water Idaho domestic water supply wells, and groundwater monitoring wells. Wells range in depth from approximately 90 feet bgs to more than 500 feet bgs. Suez Water Idaho owns and operates a well at the Boise ANGB that has not been used since 2005. An additional off-Base well owned and operated by Suez Water Idaho is located upgradient of the Base. That well is 525 feet deep and pumps 765 gallons per minute. The entire Suez Water Idaho system serves approximately 214,000 people, including Gowen Field. It is unknown if any drinking supply wells are located downgradient of the Base. Hangar 155 (PRL 6) is located near the flightline (restricted access) in a mostly paved area, with small grass-covered areas on the south side of the building. Surface soil and sediment contact is expected to be limited to infrequent contact by Installation personnel and workers. PFAS including PFOA, PFOS, and PFBS have been detected at multiple on-site wells at varying concentrations.

Groundwater Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 6 **AFFF Release Area #:** PRL 6

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS		0.040	
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**NS**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	
Migratory Pathway Factor			
Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)		
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined		
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)		
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).		
Receptor Factor			
Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)		
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)		
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)		
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).		
		Groundwater Category	**NS**

Soil Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 6 **AFFF Release Area #:** PRL 6

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.00130	0.13	0.0100
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.0100**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

Migratory Pathway Factor

Evident	Analytical data or observable evidence that contamination is present at a point of exposure	
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	M
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	
Limited	No potential for receptors to have access to contaminated soil	L
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L
	Soil Category	**LOW**

Surface Water Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 6 **AFFF Release Area #:** PRL 6

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS		22.6	
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**NS**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	
Migratory Pathway Factor			
Evident	Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure		
Potential	Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, OR Information is not sufficient to make a determination of Evident or Confined		
Confined	Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)		
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).		
Receptor Factor			
Identified	Receptors identified that have access to surface water or sediment to which contamination has moved or can move		
Potential	Potential for receptors to have access to surface water or sediment to which contamination has moved or can move		
Limited	Little or no potential for receptors to have access to surface water or sediment to which contamination has moved or can move		
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).		
		Surface Water Category	**NS**

Site Background Information			
Installation:	Boise Air National Guard Base	**Date:**	
Location:	Idaho	**Media Evaluated:**	GW, SS
Site Name and ID:	AFFF 7 - Fire Station (Building 138) - PRL 7	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Chris Babock	**Agreement Status (e.g., Federal Facility Agreement date signed):**	
OVERALL SITE CATEGORY: LOW			

Site Summary	
Brief Site Description:	The Fire Station (Building 138) was constructed in 1994 and is located on the corner of West Aeronca Street and Byrd Street. The building is surrounded by grass on the south and west sides, with a twin swath of grass on the north side leading to the paved flightline with additional paving on the east side. The Fire Station houses up to four fire engines that carried from 55 to 210 gal each of Class A foam, in containers ranging from 5- (not AFFF) to 55-gal drums of AFFF, which are all stored on containment decks within the main bay. Quarterly engine spray testing is conducted at the city of Boise fire training pit approximately 1 mile east of the ANGB except during the winter months. Vehicle washing takes place inside the main bay where the floor trench drains collect any liquids. The trench drains remain plugged at all times to ensure no chemicals escape and drain to the city of Boise wastewater treatment system. The plug is removed when the contents of the trench drain are allowed to pass through the city of Boise treatment system.
Brief Description of Pathways:	PRL 7 is surrounded by pavement and grass, so it is likely that dust emissions from surface soils would be limited due to the vegetation present. Groundwater flow in the southern portion of Gowen Field is to the northeast and north of Gowen Road the groundwater flow is to the east. Groundwater ranged from 161.75 ft bgs to 209.15 ft bgs during the SI and flow was found to be to the east. Surface drainage at Gowen Field is controlled both by the local surface topography and a system of drainage ditches. The most important drainage ditch traverses the Base in an east to west direction with a flow direction toward the west. Fivemile Creek, an intermittent stream that is filled only during periods of heavy rainfall or snowmelt runoff, runs parallel to and south of West Gowen Road. Neither Fivemile Creek nor the secondary surface waters are used for drinking water. The Boise River is used for crop irrigation.
Brief Description of Receptors:	Approximately 870 groundwater wells are located within a 3-mile radius of the Former FTA, including private wells, Suez Water Idaho domestic water supply wells, and groundwater monitoring wells. Wells range in depth from approximately 90 feet bgs to more than 500 feet bgs. Suez Water Idaho owns and operates a well at the Boise ANGB which is approximately 2,700 feet upgradient from the Former FTA and has not been used since 2005. An additional off-Base well owned and operated by Suez Water Idaho is located approximately 4,000 ft west of the western boundary of Boise ANGB. The entire Suez Water Idaho system serves approximately 214,000 people, including Boise ANGB. It is unknown if any drinking supply wells are located downgradient of the Base. PRL 7 is located on the flightline (restricted access) and is surrounded by pavement and grass. Surface soil and sediment contact is expected to be limited to Installation personnel and workers. PFAS including PFOA, PFOS, and PFBS have been detected at multiple on-site wells at varying concentrations.

Groundwater Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 7 **AFFF Release Area #:** PRL 7

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFBS	0.150	0.6	0.250
PFOA	0.00820	0.040	0.205
PFOS		0.040	
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.455**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

Migratory Pathway Factor

Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	M
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
	Groundwater Category	**LOW**

Soil Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 7 **AFFF Release Area #:** PRL 7

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFBS		1.9	
PFOA	0.000380	0.13	0.00292
PFOS	0.0180	0.13	0.138
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.141**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	M
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	
Limited	No potential for receptors to have access to contaminated soil	L
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L
	Soil Category	**LOW**

Surface Water Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 7 **AFFF Release Area #:** PRL 7

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOA		307	
PFOS		22.6	
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**NS**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	

Migratory Pathway Factor		
Evident	Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure	
Potential	Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, OR Information is not sufficient to make a determination of Evident or Confined	
Confined	Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
Receptor Factor		
Identified	Receptors identified that have access to surface water or sediment to which contamination has moved or can move	
Potential	Potential for receptors to have access to surface water or sediment to which contamination has moved or can move	
Limited	Little or no potential for receptors to have access to surface water or sediment to which contamination has moved or can move	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
	Surface Water Category	**NS**

Site Background Information			
Installation:	Boise Air National Guard Base	**Date:**	
Location:	Idaho	**Media Evaluated:**	GW, SS
Site Name and ID:	AFFF 10 - AFFF Dump #1 - PRL 10	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Chris Babock	**Agreement Status (e.g., Federal Facility Agreement date signed):**	
OVERALL SITE CATEGORY: LOW			

Site Summary	
Brief Site Description:	Historically, AFFF generated by testing the hangar FSS has been removed two ways. The primary way has been to allow the AFFF to dissipate and flow into the drains within the hangars, which then convey the liquids to the city of Boise wastewater treatment system. Less frequently, but a common practice, was to transport the AFFF by truck to one of two dumping areas and allow the AFFF to dissipate by either evaporation or infiltration. The two locations are the east end of the aircraft staging area (AFFF Dump #1) and within the shooting range (AFFF Dump #2). A conservative estimate is that dumping at AFFF Dump #1 has been ongoing over the past 5 years for a total of six separate occurrences. It is unknown how long or how frequently dumping at AFFF Dump #2 occurred.
Brief Description of Pathways:	PRL 10 is surrounded by grass, so it is likely that dust emissions from surface soils would be limited due to the vegetation present. Groundwater flow in the southern portion of Gowen Field is to the northeast and north of Gowen Road the groundwater flow is to the east. Groundwater ranged from 161.75 ft bgs to 209.15 ft bgs during the SI and flow was found to be to the east. Surface drainage at Gowen Field is controlled both by the local surface topography and a system of drainage ditches. The most important drainage ditch traverses the Base in an east to west direction with a flow direction toward the west. Fivemile Creek, an intermittent stream that is filled only during periods of heavy rainfall or snowmelt runoff, runs parallel to and south of West Gowen Road. Neither Fivemile Creek nor the secondary surface waters are used for drinking water. The Boise River is used for crop irrigation.
Brief Description of Receptors:	Approximately 870 groundwater wells are located within a 3-mile radius of the Former FTA, including private wells, Suez Water Idaho domestic water supply wells, and groundwater monitoring wells. Wells range in depth from approximately 90 feet bgs to more than 500 feet bgs. Suez Water Idaho owns and operates a well at the Boise ANGB which is approximately 2,700 feet upgradient from the Former FTA and has not been used since 2005. An additional off-Base well owned and operated by Suez Water Idaho is located approximately 4,000 ft west of the western boundary of Boise ANGB. The entire Suez Water Idaho system serves approximately 214,000 people, including Boise ANGB. It is unknown if any drinking supply wells are located downgradient of the Base. PRL 10is located on the flightline (restricted access) and is surrounded by grass. Surface soil contact is expected to be limited to Installation personnel and workers. PFAS including PFOA, PFOS, and PFBS have been detected at multiple on-site wells at varying concentrations.

Groundwater Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 10 **AFFF Release Area #:** PRL 10

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFBS	0.00140	0.6	0.00233
PFOA	0.00240	0.040	0.0600
PFOS	0.00400	0.040	0.100
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.162**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

Migratory Pathway Factor

Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	M
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
	Groundwater Category	**LOW**

Soil Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 10 **AFFF Release Area #:** PRL 10

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFBS		1.9	
PFOA	0.000960	0.13	0.00738
PFOS	0.0100	0.13	0.0769
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.0843**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	M
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	
Limited	No potential for receptors to have access to contaminated soil	L
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L
	Soil Category	**LOW**

Surface Water Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 10 **AFFF Release Area #:** PRL 10

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOA		307	
PFOS		22.6	
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**NS**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	

Migratory Pathway Factor		
Evident	Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure	
Potential	Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, OR Information is not sufficient to make a determination of Evident or Confined	
Confined	Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
Receptor Factor		
Identified	Receptors identified that have access to surface water or sediment to which contamination has moved or can move	
Potential	Potential for receptors to have access to surface water or sediment to which contamination has moved or can move	
Limited	Little or no potential for receptors to have access to surface water or sediment to which contamination has moved or can move	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
	Surface Water Category	**NS**

Site Background Information			
Installation:	Boise Air National Guard Base	**Date:**	
Location:	Idaho	**Media Evaluated:**	GW, SS
Site Name and ID:	AFFF 11 - AFFF Dump #2 - PRL 11	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Chris Babock	**Agreement Status (e.g., Federal Facility Agreement date signed):**	
OVERALL SITE CATEGORY: LOW			

Site Summary	
Brief Site Description:	Historically, AFFF generated by testing the hangar FSS has been removed two ways. The primary way has been to allow the AFFF to dissipate and flow into the drains within the hangars, which then convey the liquids to the city of Boise wastewater treatment system. Less frequently, but a common practice, was to transport the AFFF by truck to one of two dumping areas and allow the AFFF to dissipate by either evaporation or infiltration. The two locations are the east end of the aircraft staging area (AFFF Dump #1) and within the shooting range (AFFF Dump #2). A conservative estimate is that dumping at AFFF Dump #1 has been ongoing over the past 5 years for a total of six separate occurrences. It is unknown how long or how frequently dumping at AFFF Dump #2 occurred.
Brief Description of Pathways:	PRL 11 is surrounded by grass, so it is likely that dust emissions from surface soils would be limited due to the vegetation present. Groundwater flow in the southern portion of Gowen Field is to the northeast and north of Gowen Road the groundwater flow is to the east. Groundwater ranged from 161.75 ft bgs to 209.15 ft bgs during the SI and flow was found to be to the east. Surface drainage at Gowen Field is controlled both by the local surface topography and a system of drainage ditches. The most important drainage ditch traverses the Base in an east to west direction with a flow direction toward the west. Fivemile Creek, an intermittent stream that is filled only during periods of heavy rainfall or snowmelt runoff, runs parallel to and south of West Gowen Road. Neither Fivemile Creek nor the secondary surface waters are used for drinking water. The Boise River is used for crop irrigation.
Brief Description of Receptors:	Approximately 870 groundwater wells are located within a 3-mile radius of the Former FTA, including private wells, Suez Water Idaho domestic water supply wells, and groundwater monitoring wells. Wells range in depth from approximately 90 feet bgs to more than 500 feet bgs. Suez Water Idaho owns and operates a well at the Boise ANGB which is approximately 2,700 feet upgradient from the Former FTA and has not been used since 2005. An additional off-Base well owned and operated by Suez Water Idaho is located approximately 4,000 ft west of the western boundary of Boise ANGB. The entire Suez Water Idaho system serves approximately 214,000 people, including Boise ANGB. It is unknown if any drinking supply wells are located downgradient of the Base. PRL 11 is located on the shooting range (restricted access) and is surrounded by grass. Surface soil contact is expected to be limited to Installation personnel and workers. PFAS including PFOA, PFOS, and PFBS have been detected at multiple on-site wells at varying concentrations.

Groundwater Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 11 **AFFF Release Area #:** PRL 11

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFBS	0.00140	0.6	0.00233
PFOA	0.00240	0.040	0.0600
PFOS	0.0270	0.040	0.675
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.737**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

Migratory Pathway Factor

Evident	Analytical data or direct observation indicates that contamination in the groundwater has moved to a point of exposure (e.g., well)	
Potential	Contamination in the groundwater has moved beyond the source or insufficient information available to make a determination of Evident or Confined	M
Confined	Analytical data or direct observation indicates that the potential for contaminant migration from the source via groundwater is limited (possibly due to geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M

Receptor Factor

Identified	Impacted drinking water well with detected contaminants or existing downgradient water supply well within 4 miles and groundwater is current source of drinking water (EPA Class I or IIA groundwater)	
Potential	Existing downgradient drinking water well beyond 4 miles with no contaminant detection(s) or no known drinking water wells downgradient and groundwater is currently or potentially usable for drinking water (i.e., EPA Class I or II groundwater) or other beneficial use (e.g., agricultural)	M
Limited	No known water supply wells downgradient and groundwater is not considered potential drinking water source and is of limited beneficial use (Class III)	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
	Groundwater Category	**LOW**

Soil Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 11 **AFFF Release Area #:** PRL 11

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFBS	0.0180	1.9	0.00947
PFOA	0.00190	0.13	0.0146
PFOS	0.0170	0.13	0.131
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.155**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	
Potential	Contamination has moved beyond the source, could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined	M
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	M
Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	
Limited	No potential for receptors to have access to contaminated soil	L
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L
	Soil Category	**LOW**

Surface Water Worksheet

Installation: Boise Air National Guard Base

Site ID: PRL 11 **AFFF Release Area #:** PRL 11

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOA		307	
PFOS		22.6	
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**NS**
CHF > 100	**H (High)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	

Migratory Pathway Factor		
Evident	Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure	
Potential	Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, OR Information is not sufficient to make a determination of Evident or Confined	
Confined	Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)	
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
Receptor Factor		
Identified	Receptors identified that have access to surface water or sediment to which contamination has moved or can move	
Potential	Potential for receptors to have access to surface water or sediment to which contamination has moved or can move	
Limited	Little or no potential for receptors to have access to surface water or sediment to which contamination has moved or can move	
Receptor Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	
	Surface Water Category	**NS**