RELATIVE RISK SITE EVALUATION

Bangor Air National Guard Base, Maine

Introduction

The Department of Defense (DoD) identified certain per- and polyfluoroalkyl substances (PFAS) as emerging contaminants of concern which affected installations across the Air Force (when the term "Air Force" is used in this fact sheet, it includes Air National Guard [ANG]). Specifically, perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutanesulfonic acid (PFBS) are components of legacy 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) issued lifetime drinking water Health Advisories (HA) for PFOS and PFOA, and health-based regional screening levels for PFBS.

The Air Force has systematically evaluated potential AFFF releases on all Installations and former Installations. It began with the Preliminary Assessments, or PAs, that identified potential release areas. First responders, fire chiefs, and hangar staff were interviewed to determine where a release or a spill may have occurred on an Installation (for example, aircraft crash site or an accidental hangar AFFF release). Once the information in the PA was collected, we began Site Inspections, or SIs, to take soil and water samples and analyzed the media for PFAS compounds at the potential release areas. The intention of the SI was to determine if a release had occurred and to determine the impacts to soil and/or groundwater. The next step in the process is called the Relative Risk Site Evaluation, or RRSE, which is a tool used to sequence Sites/Installations to begin a Remedial Investigation, or RI. Air Force Installations are at the beginning of the more detailed investigative stage, the RI, to determine where action is needed and to identify remedial technologies.

The Bangor Air National Guard Base (ANGB) PFAS PA and SI can be found at the AFCEC Administrative Record (AR): https://ar.afcec-cloud.af.mil/ Scroll to the bottom of the page and click on “Continue to site”, then select Air National Guard, scroll down the Installation List and click on Bangor Int'l Airport, ME, then enter the AR Number 469951 in the “AR #” field for the PA. For the SI, enter the AR Number 571055. Then click “Search” at the bottom of the page. Click on the spy glass to view the document.

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

Acronyms

AFFF - Aqueous Film Forming Foam
ANG - Air National Guard
ANGB - Air National Guard Base
AR - Administrative Record
bgs - Below ground surface
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
CHF – Contaminant Hazard Factor
DoD - Department of Defense
EPA – US Environmental Protection Agency
FD - Fire Department
FSS - Fire Suppression System
GW - Groundwater
HA – Health Advisory
mg/kg - milligram per kilogram
MPF – Migration Pathway Factor
OWS - Oil/Water Separator
PA – Preliminary Assessment
PFAS - Per-and polyfluoroalkyl substances
PFBS – Perfluorobutanesulfonic acid
PFOA - Perfluorooctanoic acid
PFOS - Perfluorooctane sulfonate
PRL - Potential Release Location
RF – Receptor Factor
RI – Remedial Investigation
ROD - Record of Decision
RRSE – Relative Risk Site Evaluation
SI – Site Inspection
ug/L - microgram per liter

RELATIVE RISK SITE EVALUATION, cont.

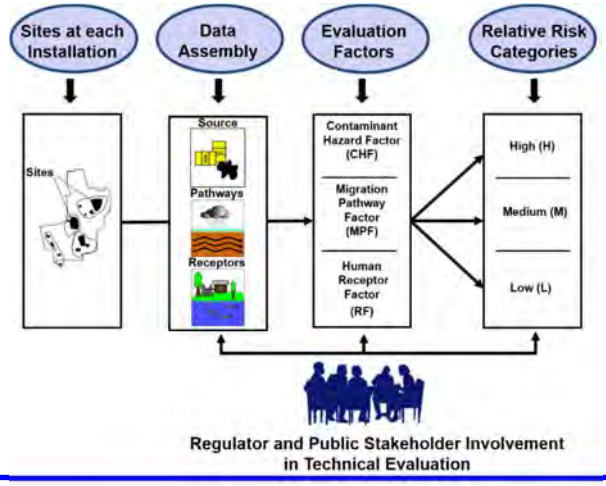
Q. What is the Relative Risk Site Evaluation (RRSE)?

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

Q. What is the RRSE framework?

A. The RRSE framework provides a DoD-wide approach for evaluating the relative risk to human health and the environment posed by contamination present at sites. 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 assessment: sources, pathways, and receptors to sequence restoration work. The RRSE is not a baseline risk assessment or health assessment in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. Regulators and public stakeholders in the environmental restoration process are provided the opportunity to participate in the process in accordance with the DoD Defense Environmental Restoration Program.

Relative Risk Site Evaluation Concept Summary

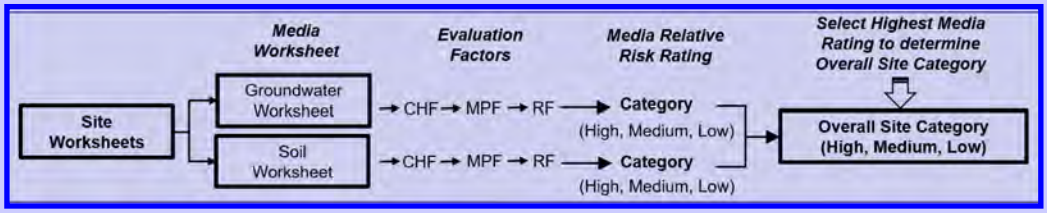


Sites at Each Installation

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 process. Worksheets are developed for environmental media at each site. For consistency across all the Installations, only surface soil (0-2 foot deep) and groundwater media were evaluated in the RRSE.

The figure shows the process for a media to be 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 rating determines the Overall Site Category.



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

A. The **CHF** is determined by dividing the maximum level for a contaminant at each site by the approved screening values (i.e., risk-based comparison values). Contaminant concentration ratios are totaled to arrive at a **CHF.** A CHF sum of greater than 100 earns a **Significant (High)** ranking. **Moderate (Medium)** is when the total is 2 to 100. **Minimal (Low)** is when a CHF is less than two.

FOR MORE INFORMATION

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

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

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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.

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).**

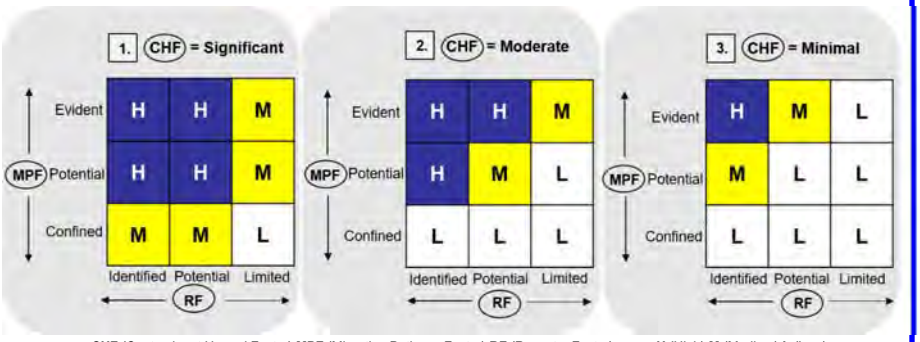
Identified rating is given when receptors are in contact or threat of contact with contaminated media. **Potential** is given when receptor may contact contaminated media. **Limited** is given when there is little or no contact with contaminated media.

RELATIVE RISK SITE EVALUTION, cont.

Media Relative Risk Rating

Q. How is the media relative risk rating determined?
A. Use the chart to determine the relative risk rating for each media evaluated. Start by choosing the **CHF** result of the evaluation. If the **CHF** is **Significant**, use **box 1.**; if **Moderate**, use **box 2.**; if **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 relative risk rating. For example, if the **CHF** is **Significant (go to box 1.)**, the **MPF** is **Potential** and the **RF** is **Identified**, then the rating is High (**H**).

Relative Risk Site Evaluation Matrix



CHF (Contaminant Hazard Factor) **MPF** (Migration Pathway 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**.

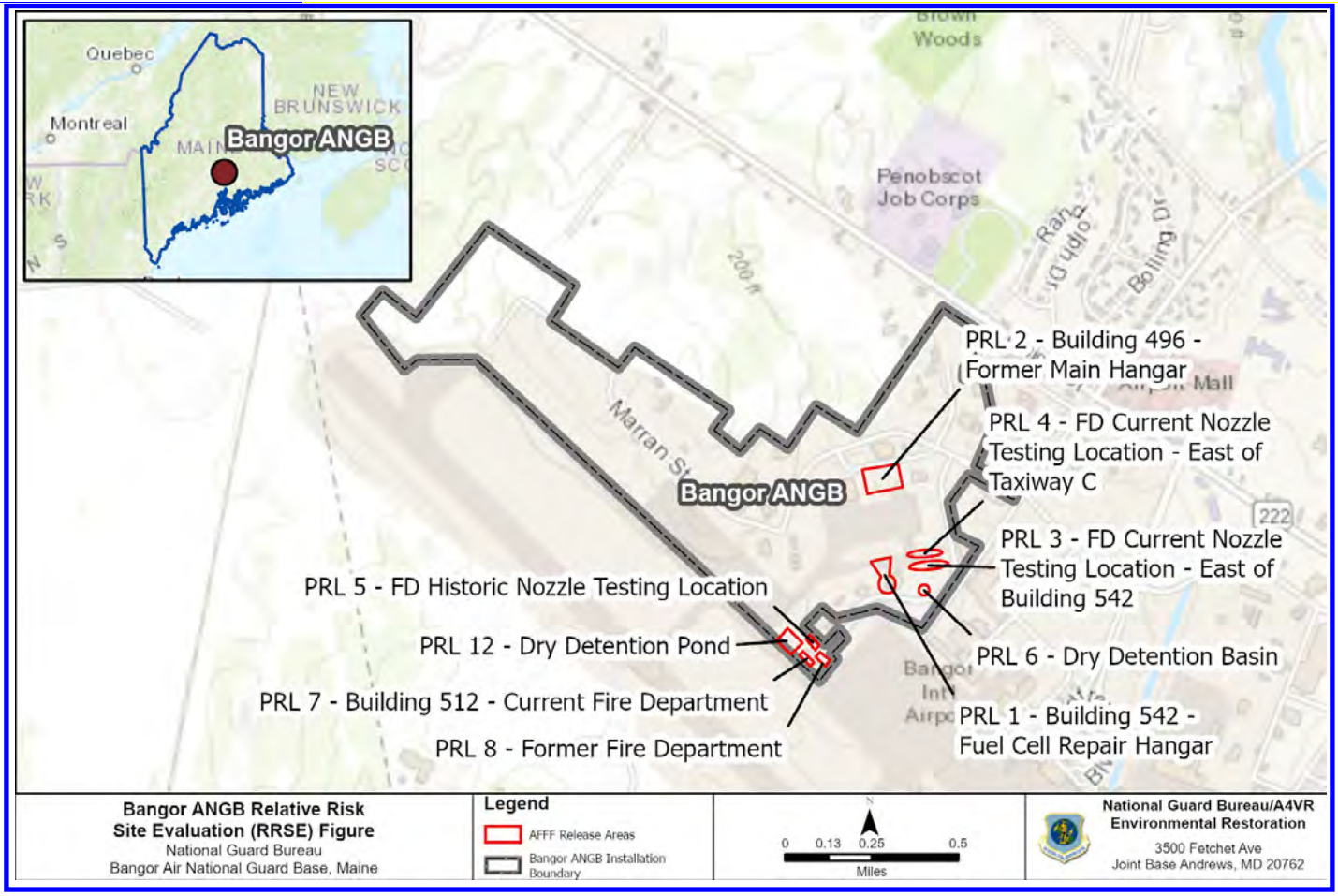
Regulatory and Stakeholder Involvement

Q. **How do I participate as Stakeholder?**

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

Relative Risk Site Evaluation Summary Bangor ANGB, ME

Overall Site Category	Site Name (Sites are shown on the map below and RRSE Worksheets are attached)
HIGH	PRL 2, PRL 3, PRL 4, PRL 5, PRL 6, PRL 7, PRL 8, PRL 12
MEDIUM	
LOW	PRL 1



Site Background Information			
Installation:	Bangor ANGB	**Date:**	08/02/2022
Location (State):	Maine	**Media Evaluated:**	Soil
Site Name and ID:	PRL 1 - Fuel Cell Repair Hangar Building 542	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Jenna Laube	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: LOW			

Site Summary	
Brief Site Description:	PRL 1 consists of Building 542, a fuel cell repair hangar which was constructed in 1996. According to the preliminary assessment (PA), Building 542 had an aqueous film forming foam (AFFF) fire suppression system (FSS) and interior drains that drained to the sanitary sewer via an oil/water separator (OWS). During FSS test events in Building 542, AFFF was discharged and allowed to flow into the building drains. Excess foam that was not captured by the drains was pushed out of the building to dissipate in the drive north of the building (Taxiway C). This general area drains to the Dry Detention Basin to the east of the building (PRL 6). One historical release was identified in the PA. During a test event in June 2015, a valve malfunctioned and foam flowed into the off-Base sanitary sewer manholes. Facility personnel stated that no AFFF was released to the storm sewer system during this incident. Fire Department (FD) personnel noted that vacuum trucks had been utilized in the past to remove foam from the building following testing (no specific dates were known); however, it was not known where they were emptied.
Brief Description of Pathways:	Subsurface soils encountered at the Base generally consist of clay to silty clay, silt, silty sand, or sand with trace to some gravel. During the 1997 investigation, bedrock was encountered at 4 to 16 feet (ft). below ground surface (bgs) in the borings that encountered bedrock, and during drilling groundwater was encountered at depths of 8 to 23 ft bgs. Wet fracture zones were also encountered. The water table appeared to be present in the overburden at the southern portion of the Base and in the bedrock at the northern end of the Base. Groundwater in overburden and bedrock appeared to constitute the same aquifer. Groundwater was encountered as shallow as 4.6 ft bgs during the 2018 Site Investigation (SI). Groundwater (GW) flow is southeast. Surface water at the Base flows through a series of interconnected storm drains and drainage ditches that flow into the detention basin located northwest of the current FD building. PRL 1 consists primarily of impervious surface, with previous investigation soil samples collected in grassy areas adjacent to the hangar and taxiways.
Brief Description of Receptors:	Four potable domestic water wells were identified downgradient and within a 4 mile radius of the Base. One well is located on the opposite side of the Penobscot River which acts as a hydrologic barrier. The remaining 3 wells are located within a 2 to 4 mile radius from the Base. Water at the Base is provided by the Bangor Water District. PRL 1 is located in an active runway area in a restricted portion of the base, and access is through a controlled gate. There is little or no potential for receptors to have access to contaminated soil.

Soil Worksheet

Installation: Bangor ANGB

Site ID: PRL 1 **AFFF Release Area #:** AFFF 1

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.0563	0.126	0.4
PFOA	0.00107	0.126	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.5**
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$

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	L
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L

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**

Site Background Information			
Installation:	Bangor ANGB	**Date:**	08/02/2022
Location (State):	Maine	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	PRL 2 - Former Main Hangar Building 496	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Jenna Laube	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	PRL 2 consists of the former Main Hangar Building 496, which was built in 1955 and demolished in 2015. The former Building 496 employed an AFFF FSS that was discharged every two to three years to test the system. Interior trench drains in the former building discharged to the sanitary sewer via an OWS. Foam that was not intercepted by the drain was reportedly pushed out of the former building to dissipate. Liquid runoff flowed into catch basins on the east, west, and north sides of the building. The catch basins flowed to a low-lying area off-Base, to the north of Maineiac Avenue.
Brief Description of Pathways:	Subsurface soils encountered at the Base generally consist of clay to silty clay, silt, silty sand, or sand with trace to some gravel. During the 1997 investigation, bedrock was encountered at 4 to 16 ft. bgs in the borings that encountered bedrock, and during drilling groundwater was encountered at depths of 8 to 23 ft bgs. Wet fracture zones were also encountered. The water table appeared to be present in the overburden at the southern portion of the Base and in the bedrock at the northern end of the Base. Groundwater in overburden and bedrock appeared to constitute the same aquifer. Groundwater was encountered as shallow as 4.6 ft bgs during the 2018 SI. Groundwater flow is southeast. Surface water at the Base flows through a series of interconnected storm drains and drainage ditches that flow into the detention basin located northwest of the current FD building. PRL 2 consists primarily of impervious surface, with previous investigation soil samples collected in grassy areas adjacent to the hangar and taxiways.
Brief Description of Receptors:	Four potable domestic water wells were identified downgradient and within a 4 mile radius of the Base. One well is located on the opposite side of the Penobscot River which acts as a hydrologic barrier. The remaining 3 wells are located within a 2 to 4 mile radius from the Base. Water at the Base is provided by the Bangor Water District. PRL 2 is located in an active runway area in a restricted portion of the base, and access is through a controlled gate. There is little or no potential for receptors to have access to contaminated soil.

Groundwater Worksheet

Installation: Bangor ANGB

Site ID: PRL 2 **AFFF Release Area #:** AFFF 2

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	2.75	0.04	68.8
PFOA	0.123	0.04	3.1
PFBS	0.0218	0.602	0.0

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	71.9
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)	H
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).	H
	Groundwater Category	**HIGH**

Soil Worksheet

Installation Bangor ANGB

Site ID: PRL 2 **AFFF Release Area #:** AFFF 2

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.0551	0.126	0.4
PFOA	0.0011	0.126	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.4**
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$

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	L
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L

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**

Site Background Information			
Installation:	Bangor ANGB	**Date:**	08/02/2022
Location (State):	Maine	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	PRL 3 - FD Current Nozzle Testing Location - East of Building 542	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Jenna Laube	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	PRL 3 consists of an annual FD nozzle testing area east of Building 542. According to Bangor ANGB personnel, an estimated 80 to 100 gallons of AFFF were discharged during each annual test. Weekly tests were also conducted and approximately 10 gallons of AFFF were discharged during the weekly tests. Monthly operational checks using AFFF had also been conducted at this PRL. During brief operational checks, reportedly only a small quantity of AFFF was discharged from the nozzle. After nozzle testing was completed, the AFFF system on the vehicle was flushed with water and the area was sprayed down. Runoff from vehicle flushing flows to the Dry Detention Basin (PRL 6).
Brief Description of Pathways:	Subsurface soils encountered at the Base generally consist of clay to silty clay, silt, silty sand, or sand with trace to some gravel. During the 1997 investigation, bedrock was encountered at 4 to 16 ft. bgs in the borings that encountered bedrock, and during drilling groundwater was encountered at depths of 8 to 23 ft bgs. Wet fracture zones were also encountered. The water table appeared to be present in the overburden at the southern portion of the Base and in the bedrock at the northern end of the Base. Groundwater in overburden and bedrock appeared to constitute the same aquifer. Groundwater was encountered as shallow as 4.6 ft bgs during the 2018 SI. Groundwater flow is southeast. Surface water at the Base flows through a series of interconnected storm drains and drainage ditches that flow into the detention basin located northwest of the current FD building. PRL 3 consists of a primarily grassy area, with previous investigation soil samples collected in areas with exposed soils.
Brief Description of Receptors:	Four potable domestic water wells were identified downgradient and within a 4 mile radius of the Base. One well is located on the opposite side of the Penobscot River which acts as a hydrologic barrier. The remaining 3 wells are located within a 2 to 4 mile radius from the Base. Water at the Base is provided by the Bangor Water District. PRL 3 is adjacent to an air taxiway in a restricted portion of the base, and access is through a controlled gate.

Groundwater Worksheet

Installation: Bangor ANGB

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

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	4.1	0.04	102.5
PFOA	1	0.04	25.0
PFBS	3.89	0.602	6.5

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	134.0
CHF > 100	H (High)		
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		

$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$

CHF Value	CHF VALUE	H

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)	H
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).	H
	Groundwater Category	**HIGH**

Soil Worksheet

Installation: Bangor ANGB

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

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.281	0.126	2.2
PFOA	0.00508	0.126	0.0
PFBS	0.00769	1.9	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**2.3**
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**M**

Migratory Pathway Factor		
Evident	Analytical data or observable evidence that contamination is present at a point of exposure	H
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).	H
Receptor Factor		
Identified	Receptors identified that have access to contaminated soil	
Potential	Potential for receptors to have access to contaminated soil	M
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).	M
	Soil Category	**HIGH**

Site Background Information			
Installation:	Bangor ANGB	**Date:**	08/02/2022
Location (State):	Maine	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	PRL 4 - FD Current Nozzle Testing Location – East of Taxiway C	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Jenna Laube	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	PRL 4 consists of an annual FD nozzle testing area at the east end of Taxiway C. Nozzle testing using AFFF was conducted from 2000 to 2015. Approximately 80 to 100 gallons of AFFF were discharged during each annual test. Weekly tests were also conducted and approximately 10 gallons of AFFF were discharged during the weekly tests. Monthly operational checks using AFFF had also been conducted at this PRL. During brief operational checks, only a small quantity of AFFF was discharged from the nozzle. After nozzle testing was completed, the AFFF system on the vehicle was flushed with water and the area was sprayed down. Runoff from vehicle flushing flowed to the Dry Detention Basin (PRL 6).
Brief Description of Pathways:	Subsurface soils encountered at the Base generally consist of clay to silty clay, silt, silty sand, or sand with trace to some gravel. During the 1997 investigation, bedrock was encountered at 4 to 16 ft. bgs in the borings that encountered bedrock, and during drilling groundwater was encountered at depths of 8 to 23 ft bgs. Wet fracture zones were also encountered. The water table appeared to be present in the overburden at the southern portion of the Base and in the bedrock at the northern end of the Base. Groundwater in overburden and bedrock appeared to constitute the same aquifer. Groundwater was encountered as shallow as 4.6 ft bgs during the 2018 SI. Groundwater flow is southeast. Surface water at the Base flows through a series of interconnected storm drains and drainage ditches that flow into the detention basin located northwest of the current FD building. PRL 4 consists primarily of impervious surface, with previous investigation soil samples collected in grassy areas adjacent to Taxiway C.
Brief Description of Receptors:	Four potable domestic water wells were identified downgradient and within a 4 mile radius of the Base. One well is located on the opposite side of the Penobscot River which acts as a hydrologic barrier. The remaining 3 wells are located within a 2 to 4 mile radius from the Base. Water at the Base is provided by the Bangor Water District. PRL 4 is located in an active taxiway in a restricted portion of the base, and access is through a controlled gate. There is little or no potential for receptors to have access to contaminated soil.

Groundwater Worksheet

Installation: Bangor ANGB

Site ID: PRL 4 **AFFF Release Area #:** AFFF 4

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	11.7	0.04	292.5
PFOA	1.57	0.04	39.3
PFBS	1.24	0.602	2.1

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	333.8
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	H

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)	H
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).	H
	Groundwater Category	**HIGH**

Soil Worksheet

Installation: Bangor ANGB

Site ID: PRL 4 **AFFF Release Area #:** AFFF 4

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.212	0.126	1.7
PFOA	0.00331	0.126	0.0
PFBS	0.000881	1.9	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**1.7**
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	
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	L
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L
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**

Site Background Information			
Installation:	Bangor ANGB	**Date:**	08/02/2022
Location (State):	Maine	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	PRL 5 - FD Historic Nozzle Testing Location	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Jenna Laube	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	PRL 5 consists of a former FD nozzle testing area in grass northwest of the former FD. Nozzle testing reportedly occurred beginning in approximately the year 2000 for an unknown duration. Approximately 80 to 100 gallons of AFFF were discharged during annual tests and approximately 10 gallons of AFFF were discharged during the weekly tests. The exact boundaries of the test area are not known. Runoff from this area discharges to the Dry Detention Pond.
Brief Description of Pathways:	Subsurface soils encountered at the Base generally consist of clay to silty clay, silt, silty sand, or sand with trace to some gravel. During the 1997 investigation, bedrock was encountered at 4 to 16 ft. bgs in the borings that encountered bedrock, and during drilling groundwater was encountered at depths of 8 to 23 ft bgs. Wet fracture zones were also encountered. The water table appeared to be present in the overburden at the southern portion of the Base and in the bedrock at the northern end of the Base. Groundwater in overburden and bedrock appeared to constitute the same aquifer. Groundwater was encountered as shallow as 4.6 ft bgs during the 2018 SI. Groundwater flow is southeast. Surface water at the Base flows through a series of interconnected storm drains and drainage ditches that flow into the detention basin located northwest of the current FD building. PRL 5 includes some asphalted and grassy areas with exposed soils with previous investigation soil samples collected in grassy areas adjacent to the roadways.
Brief Description of Receptors:	Four potable domestic water wells were identified downgradient and within a 4 mile radius of the Base. One well is located on the opposite side of the Penobscot River which acts as a hydrologic barrier. The remaining 3 wells are located within a 2 to 4 mile radius from the Base. Water at the Base is provided by the Bangor Water District. PRL 5 is located in an active taxiway in a restricted portion of the base, and access is through a controlled gate. There is little or no potential for receptors to have access to contaminated soil.

Groundwater Worksheet

Installation: Bangor ANGB

Site ID: PRL 5 **AFFF Release Area #:** AFFF 5

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	0.0976	0.04	2.4
PFOA	0.0962	0.04	2.4
PFBS	0.385	0.602	0.6

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	5.5
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)	H
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).	H
	Groundwater Category	**HIGH**

Soil Worksheet

Installation: Bangor ANGB

Site ID: PRL 5 **AFFF Release Area #:** AFFF 5

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.0482	0.126	0.4
PFOA	0.00244	0.126	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**0.4**
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$

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	L
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L

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**

Site Background Information			
Installation:	Bangor ANGB	**Date:**	08/02/2022
Location (State):	Maine	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	PRL 6 - Dry Detention Basin	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Jenna Laube	**Agreement Status (e.g., Federal Facility Agreement date**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	PRL 6 consists of the Dry Detention Basin, located in a low-lying area that received surface water drainage from Building 542 and the two current FD nozzle testing locations. The detention basin was re-graded into a gently sloped area during the earthwork activities around the PRL in the 2014 time frame. Previously existing detention basin bottom sediments were likely redistributed and/or buried via earthmoving.
Brief Description of Pathways:	Subsurface soils encountered at the Base generally consist of clay to silty clay, silt, silty sand, or sand with trace to some gravel. During the 1997 investigation, bedrock was encountered at 4 to 16 ft. bgs in the borings that encountered bedrock, and during drilling groundwater was encountered at depths of 8 to 23 ft bgs. Wet fracture zones were also encountered. The water table appeared to be present in the overburden at the southern portion of the Base and in the bedrock at the northern end of the Base. Groundwater in overburden and bedrock appeared to constitute the same aquifer. Groundwater was encountered as shallow as 4.6 ft bgs during the 2018 SI. Groundwater flow is southeast. Surface water at the Base flows through a series of interconnected storm drains and drainage ditches that flow into the detention basin located northwest of the current FD building. PRL 6 is a grassy area with exposed soils.
Brief Description of Receptors:	Four potable domestic water wells were identified downgradient and within a 4 mile radius of the Base. One well is located on the opposite side of the Penobscot River which acts as a hydrologic barrier. The remaining 3 wells are located within a 2 to 4 mile radius from the Base. Water at the Base is provided by the Bangor Water District. PRL 6 is located in a restricted portion of the base, and access is through a controlled gate. There is little or no potential for receptors to have access to contaminated soil.

Groundwater Worksheet

Installation Bangor ANGB

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

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	0.383	0.04	9.6
PFOA	0.343	0.04	8.6
PFBS	0.0601	0.602	0.1
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**18.2**
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)	H
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).	H
	Groundwater Category	**HIGH**

Soil Worksheet

Installation: Bangor ANGB

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

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.199	0.126	1.6
PFOA	0.00153	0.126	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**1.6**
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$

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	L
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L
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**

Site Background Information			
Installation:	Bangor ANGB	**Date:**	08/02/2022
Location (State):	Maine	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	PRL 7 - Current FD Building 512	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Jenna Laube	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	PRL 7 consists of Building 512, the current FD building which was constructed in 2001. According to the PA, firefighting vehicles that contained AFFF were stored in the engine bay of the FD and were also refilled with AFFF. AFFF foam trailers were stored outside the building during the warmer months. Two AFFF tanks in the Building 512 mezzanine were used to refill tanks. Building 512 has interior trench drains that discharge to an OWS and then to the sanitary sewer. According to the PA, minor releases of AFFF may have occurred during filling of equipment which would have been rinsed into trench drains.
Brief Description of Pathways:	Subsurface soils encountered at the Base generally consist of clay to silty clay, silt, silty sand, or sand with trace to some gravel. During the 1997 investigation, bedrock was encountered at 4 to 16 ft. bgs in the borings that encountered bedrock, and during drilling groundwater was encountered at depths of 8 to 23 ft bgs. Wet fracture zones were also encountered. The water table appeared to be present in the overburden at the southern portion of the Base and in the bedrock at the northern end of the Base. Groundwater in overburden and bedrock appeared to constitute the same aquifer. Groundwater was encountered as shallow as 4.6 ft bgs during the 2018 SI. Groundwater flow is southeast. Surface water at the Base flows through a series of interconnected storm drains and drainage ditches that flow into the detention basin located northwest of the current FD building. PRL 7 consists primarily of impervious surface, with previous investigation soil samples collected in grassy areas adjacent to Building 512.
Brief Description of Receptors:	Four potable domestic water wells were identified downgradient and within a 4 mile radius of the Base. One well is located on the opposite side of the Penobscot River which acts as a hydrologic barrier. The remaining 3 wells are located within a 2 to 4 mile radius from the Base. Water at the Base is provided by the Bangor Water District. PRL 7 is located in a restricted portion of the base, and access is through a controlled gate. There is little or no potential for receptors to have access to contaminated soil.

Groundwater Worksheet

Installation: Bangor ANGB

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

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	5.34	0.04	133.5
PFOA	0.49	0.04	12.3
PFBS	0.259	0.602	0.4

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	146.2
CHF > 100	H (High)		
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		

$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$

CHF Value	CHF VALUE	H

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)	H
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).	H
	Groundwater Category	**HIGH**

Soil Worksheet

Installation: Bangor ANGB

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

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.1	0.126	0.8
PFOA	0.00254	0.126	0.0
PFBS	0.00036	1.9	0.0

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	0.8
CHF > 100	H (High)		
100 > CHF > 2	M (Medium)	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
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	
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	L
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L

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**

Site Background Information			
Installation:	Bangor ANGB	**Date:**	08/02/2022
Location (State):	Maine	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	PRL 8 - Former FD	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Jenna Laube	**Agreement Status (e.g., Federal Facility Agreement date signed):**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	PRL 8 consists of the former FD built in 1958 and demolished in 2001. Vehicles containing AFFF were stored and refilled with AFFF inside the former building. According to the PA, FD personnel recalled that trench drains were inside the building and that minor releases of AFFF likely occurred during filling of equipment which would have been rinsed into the trench drains. The ultimate discharge point of the trench drains inside the former building is unknown. Review of the Base drainage map indicates that the trench drains at the former FD may have drained to the sanitary sewer via an OWS.
Brief Description of Pathways:	Subsurface soils encountered at the Base generally consist of clay to silty clay, silt, silty sand, or sand with trace to some gravel. During the 1997 investigation, bedrock was encountered at 4 to 16 ft. bgs in the borings that encountered bedrock, and during drilling groundwater was encountered at depths of 8 to 23 ft bgs. Wet fracture zones were also encountered. The water table appeared to be present in the overburden at the southern portion of the Base and in the bedrock at the northern end of the Base. Groundwater in overburden and bedrock appeared to constitute the same aquifer. Groundwater was encountered as shallow as 4.6 ft bgs during the 2018 SI. Groundwater flow is southeast. Surface water at the Base flows through a series of interconnected storm drains and drainage ditches that flow into the detention basin located northwest of the current FD building. PRL 8 consists primarily of impervious surface, with previous investigation soil samples collected in adjacent grassy areas. The former fire department is now an asphalted parking lot.
Brief Description of Receptors:	Four potable domestic water wells were identified downgradient and within a 4 mile radius of the Base. One well is located on the opposite side of the Penobscot River which acts as a hydrologic barrier. The remaining 3 wells are located within a 2 to 4 mile radius from the Base. Water at the Base is provided by the Bangor Water District. PRL 8 is located in a restricted portion of the base, and access is through a controlled gate. There is little or no potential for receptors to have access to contaminated soil.

Groundwater Worksheet

Installation: Bangor ANGB

Site ID: PRL 8 **AFFF Release Area #:** AFFF 8

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFOS	0.454	0.04	11.3
PFOA	0.29	0.04	7.2
PFBS	0.387	0.602	0.6

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	19.2
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)	H
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).	H
	Groundwater Category	**HIGH**

Soil Worksheet

Installation: Bangor ANGB

Site ID: PRL 8 **AFFF Release Area #:** AFFF 8

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFOS	0.221	0.126	1.8
PFOA	0.000705	0.126	0.0
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**1.8**
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**		
2 > CHF	**L (Low)**		
CHF Value		**CHF VALUE**	**L**

$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$

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	L
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L

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**

Site Background Information			
Installation:	Bangor ANGB	**Date:**	08/02/2022
Location (State):	Maine	**Media Evaluated:**	Groundwater, Soil
Site Name and ID:	PRL 12 - Dry Detention Pond	**Phase of Execution (e.g., RI, Record of Decision (ROD)):**	N/A
RPM's Name:	Jenna Laube	**Agreement Status (e.g., Federal Facility Agreement date**	N/A
OVERALL SITE CATEGORY: HIGH			

Site Summary	
Brief Site Description:	PRL 12 consists of the Dry Detention Pond, which receives drainage from the areas of the FD Former Nozzle Testing Location (PRL 8). According to BANGB personnel, the Dry Detention Pond also was historically used as a nozzle and foam testing location and ultimately discharges to Birch Stream located northeast of the Base.
Brief Description of Pathways:	Subsurface soils encountered at the Base generally consist of clay to silty clay, silt, silty sand, or sand with trace to some gravel. During the 1997 investigation, bedrock was encountered at 4 to 16 ft. bgs in the borings that encountered bedrock, and during drilling groundwater was encountered at depths of 8 to 23 ft bgs. Wet fracture zones were also encountered. The water table appeared to be present in the overburden at the southern portion of the Base and in the bedrock at the northern end of the Base. Groundwater in overburden and bedrock appeared to constitute the same aquifer. Groundwater was encountered as shallow as 4.6 ft bgs during the 2018 SI. Groundwater flow is southeast. Surface water at the Base flows through a series of interconnected storm drains and drainage ditches that flow into the detention basin located northwest of the current FD building. PRL 12 consists of a grassy area with exposed soils.
Brief Description of Receptors:	Four potable domestic water wells were identified downgradient and within a 4 mile radius of the Base. One well is located on the opposite side of the Penobscot River which acts as a hydrologic barrier. The remaining 3 wells are located within a 2 to 4 mile radius from the Base. Water at the Base is provided by the Bangor Water District. PRL 12 is located in a restricted portion of the base, and access is through a controlled gate. There is little or no potential for receptors to have access to contaminated soil.

Groundwater Worksheet

Installation: Bangor ANGB

Site ID: PRL 12 **AFFF Release Area #:** AFFF 12

Contaminant	Maximum Concentration (ug/L)	Comparison Value (ug/L)	Ratios
PFBS	2.97	0.602	4.9
PFOS	12.9	0.04	322.5
PFOA	2.42	0.04	60.5

CHF Scale	CHF Value	Contamination Hazard Factor (CHF)	387.9
CHF > 100	H (High)		
100 > CHF > 2	M (Medium)		
2 > CHF	L (Low)		

$$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$$

CHF Value	CHF VALUE	H

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)	H
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).	H
	Groundwater Category	**HIGH**

Soil Worksheet

Installation: Bangor ANGB

Site ID: PRL 12 **AFFF Release Area #:** AFFF 12

Contaminant	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
PFBS	0.00041	1.9	0.0
PFOS	0.154	0.126	1.2
PFOA	0.0077	0.126	0.1
CHF Scale	**CHF Value**	**Contamination Hazard Factor (CHF)**	**1.3**
CHF > 100	**H (High)**		
100 > CHF > 2	**M (Medium)**	$CHF = \sum \frac{\text{[Maximum Concentration of Contaminant]}}{\text{[Comparison Value for Contaminant]}}$	
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	
Confined	Low possibility for contamination to be present at or migrate to a point of exposure	L
Migratory Pathway Factor	DIRECTIONS: Record the single highest value from above in the box to the right (maximum value = H).	L
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**