



RELATIVE RISK SITE EVALUATION

Reno Air National Guard Base, Nevada

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, Site Inspections, or SIs, were initiated 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 Reno 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 Reno-Tahoe Int'l Airport, NV, then enter the AR Number 474877 in the "AR #" field for the PA. For the SI, enter the AR Number 580498. 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

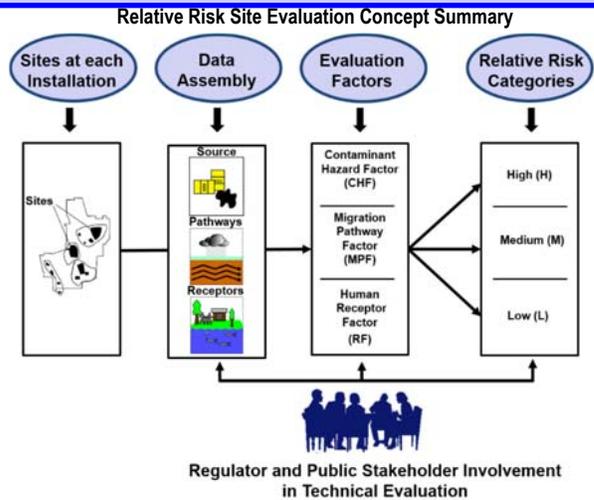
| | |
|--|---|
| AFFF - Aqueous Film Forming Foam | PA – Preliminary Assessment |
| ANG - Air National Guard | PFAS - Per-and polyfluoroalkyl substances |
| ANGB - Air National Guard Base | PFBS – Perfluorobutanesulfonic acid |
| CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act | PFOA - Perfluorooctanoic acid |
| CHF – Contaminant Hazard Factor | PFOS - Perfluorooctane sulfonate |
| DoD - Department of Defense | PRL - Potential Release Location |
| EPA – US Environmental Protection Agency | RCRA – Resource Conservation and Recovery Act |
| HA – Health Advisory | RF – Receptor Factor |
| MPF – Migration Pathway Factor | RI – Remedial Investigation |
| | RRSE – Relative Risk Site Evaluation |
| | SI – Site Inspection |

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/>

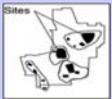
Q. What is the RRSE framework?

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.



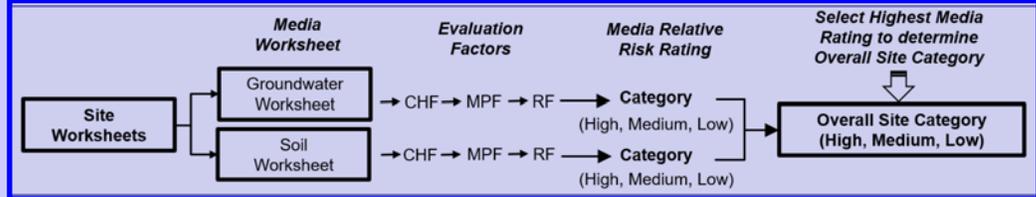
Sites at Each Installation

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

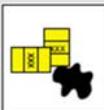


A. Restoration sites in CERCLA phases prior to remedy-in-place are evaluated in the process. Worksheets are developed for environmental media at each site. For consistency across all the Installations, only surface soil (0-1 foot deep) and groundwater media were evaluated in the RRSE.

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/>

POINT OF CONTACT
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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.

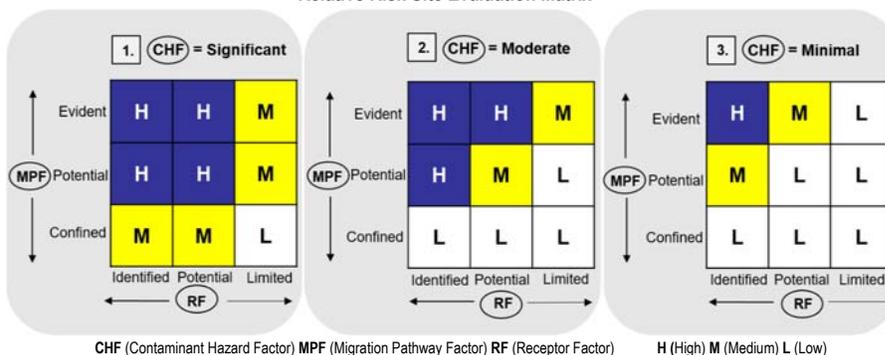
RELATIVE RISK SITE EVALUATION, cont.

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



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**.

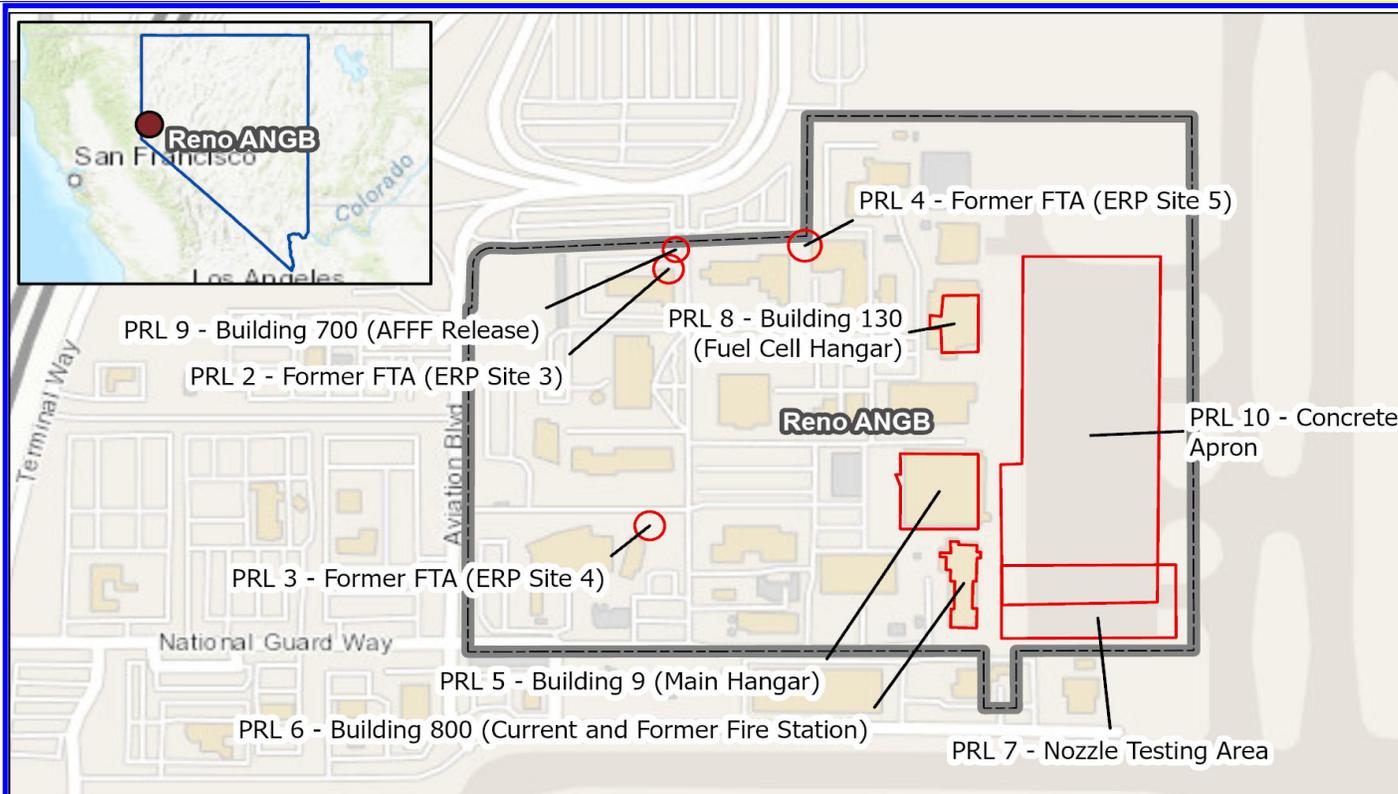
Regulatory and Stakeholder Involvement

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 Reno ANGB, NV

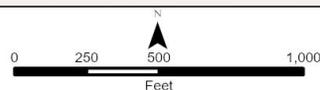
| Overall Site Category | Site Name (Sites are shown on the map below and RRSE Worksheets are attached) |
|-----------------------|---|
| HIGH | PRL 2, PRL 4, PRL 5, PRL 6, PRL 7, PRL 9, PRL 10 |
| MEDIUM | PRL 3, PRL 8 |
| LOW | N/A |



Reno ANGB Relative Risk Site Evaluation (RRSE) Figure
National Guard Bureau
Reno Air National Guard Base, Nevada

Legend

- AFFF Release Areas
- Reno ANGB Installation Boundary



National Guard Bureau/A4VR Environmental Restoration
3500 Fetchet Ave
Joint Base Andrews, MD 20762

AFFF Area is another term for Potential Release Location (PRL).

Site Background Information

| | | | |
|------------------------------------|---------------------------------|---|-------------------|
| Installation: | Reno-Tahoe IA | Date: | 10/14/2021 |
| Location (State): | Nevada | Media Evaluated: | Groundwater, Soil |
| Site Name and ID: | Former FTA - ERP Site 3 - PRL 2 | Phase of Execution (e.g., RI, Record of Decision (ROD)): | N/A |
| RPM's Name: | Aubrey Higginbotham | Agreement Status (e.g., Federal Facility Agreement date signed): | N/A |
| OVERALL SITE CATEGORY: HIGH | | | |

Site Summary

| | |
|--|---|
| Brief Site Description: | <p>ERP Site 3, a former fire training area (FTA) adjacent to the north gate of the Base, consisted of an unlined, slightly bermed, open earthen area where oils and other flammables were burned during fire training exercises. Fire training was generally conducted on a quarterly basis between 1964 and 1971. Based on burn data, the preliminary assessment (PA) reported that up to 6,300 gal of flammable liquids may have infiltrated into the ground during the 8 years this training area was active. There was no documented use of aqueous film forming foam (AFFF) at this location. Although Base personnel estimate AFFF use began on Base in the late 1970s/early 1980s, it is possible that it was used earlier, since the ANG began its use at some Bases circa 1970. The historical site investigations did not include PFAS analysis.</p> |
| Brief Description of Pathways: | <p>Three aquifers underlie Reno ANGB. These aquifers, in descending stratigraphic sequence, are the younger alluvium, the older alluvium, and the Truckee Formation. Most of the economically recoverable groundwater in the Truckee Meadows area occurs under artesian and water table conditions in the unconsolidated and partially consolidated younger and older alluvium. The Truckee Formation consists of porous deposits containing a large amount of groundwater in storage. Based on the potentiometric groundwater map, the general groundwater flow direction is to the east and southeast. Depth to the groundwater throughout the Base varies from 3 to 10 ft. below ground surface (BGS) due to the silty clay, creating a semi-confined aquifer. Groundwater at the Base occurs under unconfined conditions. The drainage ditches to the south and east serve as a groundwater barrier and drain. Drainage ditches along the north and south sides of the Base direct water to the east, across the airfield, and into Boynton Slough, which drains into Steamboat Creek, the sole major tributary to the Truckee River. PRL-2 is now covered by paved areas and limited landscaped areas covered with rock.</p> |
| Brief Description of Receptors: | <p>Most of the water supply in the Reno-Sparks area is diverted from the Truckee River; however, public water wells are used to supplement the supply. There are 432 water wells are within a 1-mile radius of the Base. Of these wells, one is listed as an active public water supply well located ¼ to ½ mile northwest (upgradient) of the Base. The report also shows five wells listed in the U.S. Geological Survey (USGS) database, all of which are listed under the Nevada Water Science Center. The remaining 426 wells are listed in the Nevada state database and appear to be mostly monitoring well installations and well abandonments. According to Base personnel, no drinking water wells are located at the Base. Potable water is supplied by the Truckee Meadows Water Authority.</p> <p>PRL-2 is located within the base boundary and access is limited to base personnel.</p> |

Groundwater Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 2

AFFF Release Area #: AFFF 2

| Contaminant | Maximum Concentration (ug/L) | Comparison Value (ug/L) | Ratios |
|-------------|------------------------------|-------------------------|--------|
| PFOS | 13 | 0.04 | 325.0 |
| PFOA | 1.3 | 0.04 | 32.5 |
| PFBS | 1.2 | 0.602 | 2.0 |

| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 359.5 |
|-----------|-----------|-----------------------------------|-------|
|-----------|-----------|-----------------------------------|-------|

| | | |
|---------------|------------|--|
| 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 | 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) | |
| 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

HIGH

Soil Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 2

AFFF Release Area #: AFFF 2

| Contaminant | Maximum Concentration (mg/kg) | Comparison Value (mg/kg) | Ratios |
|---------------------------------|--|--|------------|
| PFOS | 0.0062 | 0.126 | 0.0 |
| PFOA | 0.00023 | 0.126 | 0.0 |
| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 0.1 |
| 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 |
| <u>Migratory Pathway Factor</u> | | | |
| 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 |
| <u>Receptor Factor</u> | | | |
| 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 | | | LOW |

Site Background Information

| | | | |
|--------------------------------------|---------------------------------|---|-------------------|
| Installation: | Reno-Tahoe IA | Date: | 10/14/2021 |
| Location (State): | Nevada | Media Evaluated: | Groundwater, Soil |
| Site Name and ID: | Former FTA - ERP Site 4 - PRL 3 | Phase of Execution (e.g., RI, Record of Decision (ROD)): | N/A |
| RPM's Name: | Aubrey Higginbotham | Agreement Status (e.g., Federal Facility Agreement date signed): | N/A |
| OVERALL SITE CATEGORY: MEDIUM | | | |

Site Summary

| | |
|--|--|
| Brief Site Description: | <p>ERP Site 4, a former FTA located on land leased by ANG south of Building 88, is now covered by a paved roadway and landscaping. The FTA consisted of an unlined, slightly bermed, open earthen area used burn training exercises that were conducted one to two times per year from 1970 to 1973. During training exercises, a water base was applied to the FTA prior to each burn. An estimated 150 gal of flammable liquids were used per burn event. It is estimated that 900 gal of flammable liquids might have been used during the 3-year period the site was used as an FTA. There was no documented use of AFFF at this location. Although Base personnel estimate AFFF use began on Base in the late 1970s/early 1980s, it is possible that it was used earlier, since ANG began its use at some Bases circa 1970. The historical site investigations did not include PFAS analysis.</p> |
| Brief Description of Pathways: | <p>Three aquifers underlie Reno ANGB. These aquifers, in descending stratigraphic sequence, are the younger alluvium, the older alluvium, and the Truckee Formation. Most of the economically recoverable groundwater in the Truckee Meadows area occurs under artesian and water table conditions in the unconsolidated and partially consolidated younger and older alluvium. The Truckee Formation consists of porous deposits containing a large amount of groundwater in storage. Based on the potentiometric groundwater map, the general groundwater flow direction is to the east and southeast. Depth to the groundwater throughout the Base varies from 3 to 10 ft. BGS due to the silty clay, creating a semi-confined aquifer. Groundwater at the Base occurs under unconfined conditions. The drainage ditches to the south and east serve as a groundwater barrier and drain. Drainage ditches along the north and south sides of the Base direct water to the east, across the airfield, and into Boynton Slough, which drains into Steamboat Creek, the sole major tributary to the Truckee River. The PRL is now covered by asphalt; soil samples were collected in a landscaped lawn adjacent to the former FTA.</p> |
| Brief Description of Receptors: | <p>Most of the water supply in the Reno-Sparks area is diverted from the Truckee River; however, public water wells are used to supplement the supply. There are 432 water wells are within a 1-mile radius of the Base. Of these wells, one is listed as an active public water supply well for Crystal Peak Park located ¼ to ½ mile northwest (upgradient) of the Base. The report also shows five wells listed in the USGS database, all of which are listed under the Nevada Water Science Center. The remaining 426 wells are listed in the Nevada state database and appear to be mostly monitoring well installations and well abandonments. According to Base personnel, no drinking water wells are located at the Base. Potable water is supplied by the Truckee Meadows Water Authority.</p> <p>PRL-3 is located on base at the entrance to Building 400. The area would be accessible to base personnel and escorted visitors to Building 400.</p> |

Groundwater Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 3

AFFF Release Area #: AFFF 3

| Contaminant | Maximum Concentration (ug/L) | Comparison Value (ug/L) | Ratios |
|-------------|------------------------------|-------------------------|--------|
| PFOS | 0.66 | 0.04 | 16.5 |
| PFOA | 0.97 | 0.04 | 24.3 |
| PFBS | 0.37 | 0.602 | 0.6 |

| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 41.4 |
|-----------|-----------|-----------------------------------|------|
|-----------|-----------|-----------------------------------|------|

| | | |
|---------------|------------|--|
| 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 Reno-Tahoe IA

Site ID: PRL 3

AFFF Release Area #: AFFF 3

| Contaminant | Maximum Concentration (mg/kg) | Comparison Value (mg/kg) | Ratios |
|--|--|--|------------|
| PFOS | 0.084 | 0.126 | 0.7 |
| PFOA | 0.0011 | 0.126 | 0.0 |
| PFBS | 0.00012 | 1.9 | 0.0 |
| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 0.7 |
| 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 |
| <u>Migratory Pathway Factor</u> | | | |
| 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 |
| <u>Receptor Factor</u> | | | |
| 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 | | | LOW |

Site Background Information

| | | | |
|------------------------------------|---------------------------------|---|-------------------|
| Installation: | Reno-Tahoe IA | Date: | 10/14/2021 |
| Location (State): | Nevada | Media Evaluated: | Groundwater, Soil |
| Site Name and ID: | Former FTA - ERP Site 5 - PRL 4 | Phase of Execution (e.g., RI, Record of Decision (ROD)): | N/A |
| RPM's Name: | Aubrey Higginbotham | Agreement Status (e.g., Federal Facility Agreement date signed): | N/A |
| OVERALL SITE CATEGORY: HIGH | | | |

Site Summary

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|--|--|
| Brief Site Description: | <p>ERP Site 5, a former FTA located approximately 100 ft northwest of Building 76, consisted of an unlined, bermed, open earthen area. Jet fuel JP-4, spent solvents, waste oils, and other flammable liquids were the primary materials burned during the training exercises. In addition, a water base was applied to the FTA prior to all burning exercises. It is estimated that 8 to 10 training exercises and burns were conducted each year between 1970 and 1977. The PA recommended ERP Site 5 for further investigation. Soil remediation was performed at ERP Site 5 in 1997. Approximately 25 tons of potentially impacted soil were excavated at ERP Site 5 and transported to an offsite facility for treatment and disposal. Long-Term Monitoring (LTM) of the groundwater conducted at ERP Site 5 between 1992 and 2003. There was no documented use of AFFF at this location. Although Base personnel estimate AFFF use began on Base in the late 1970s/early 1980s, it is possible that it was used earlier, since ANG began its use at some Bases circa 1970. The historical site investigations did not include PFAS analysis.</p> |
| Brief Description of Pathways: | <p>Three aquifers underlie Reno ANGB. These aquifers, in descending stratigraphic sequence, are the younger alluvium, the older alluvium, and the Truckee Formation. Most of the economically recoverable groundwater in the Truckee Meadows area occurs under artesian and water table conditions in the unconsolidated and partially consolidated younger and older alluvium. The Truckee Formation consists of porous deposits containing a large amount of groundwater in storage. Based on the potentiometric groundwater map, the general groundwater flow direction is to the east and southeast. Depth to the groundwater throughout the Base varies from 3 to 10 ft. BGS due to the silty clay, creating a semi-confined aquifer. Groundwater at the Base occurs under unconfined conditions. The drainage ditches to the south and east serve as a groundwater barrier and drain. Drainage ditches along the north and south sides of the Base direct water to the east, across the airfield, and into Boynton Slough, which drains into Steamboat Creek, the sole major tributary to the Truckee River. PRL-4 includes areas that are covered by asphalt and buildings as well as bare soils.</p> |
| Brief Description of Receptors: | <p>Most of the water supply in the Reno-Sparks area is diverted from the Truckee River; however, public water wells are used to supplement the supply. There are 432 water wells within a 1-mile radius of the Base. Of these wells, one is listed as an active public water supply well for Crystal Peak Park located ¼ to ½ mile northwest (upgradient) of the Base. The report also shows five wells listed in the USGS database, all of which are listed under the Nevada Water Science Center. The remaining 426 wells are listed in the Nevada state database and appear to be mostly monitoring well installations and well abandonments. According to Base personnel, no drinking water wells are located at the Base. Potable water is supplied by the Truckee Meadows Water Authority.</p> <p>PRL-4 is located on the base, but is an otherwise uncontrolled area. PRL-4 is accessible by base personnel.</p> |

Groundwater Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 4

AFFF Release Area #: AFFF 4

| Contaminant | Maximum Concentration (ug/L) | Comparison Value (ug/L) | Ratios |
|-------------|------------------------------|-------------------------|--------|
| PFOS | 46 | 0.04 | 1150.0 |
| PFOA | 2.5 | 0.04 | 62.5 |
| PFBS | 0.94 | 0.602 | 1.6 |

| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 1214.1 |
|-----------|-----------|-----------------------------------|---------------|
|-----------|-----------|-----------------------------------|---------------|

| | | |
|---------------|-------------------|--|
| 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) | |
| 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

HIGH

Soil Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 4

AFFF Release Area #: AFFF 4

| Contaminant | Maximum Concentration (mg/kg) | Comparison Value (mg/kg) | Ratios |
|--|--|--|-------------|
| PFOS | 2.9 | 0.126 | 23.0 |
| PFOA | 0.29 | 0.126 | 2.3 |
| PFBS | 0.017 | 1.9 | 0.0 |
| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 25.3 |
| 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 |
| <u>Migratory Pathway Factor</u> | | | |
| 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 |
| <u>Receptor Factor</u> | | | |
| 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: | Reno-Tahoe IA | Date: | 10/14/2021 |
| Location (State): | Nevada | Media Evaluated: | Groundwater, Soil |
| Site Name and ID: | Main Hangar - Bldg 9 - PRL 5 | Phase of Execution (e.g., RI, Record of Decision (ROD)): | N/A |
| RPM's Name: | Aubrey Higginbotham | Agreement Status (e.g., Federal Facility Agreement date signed): | N/A |
| OVERALL SITE CATEGORY: HIGH | | | |

Site Summary

| | |
|--|---|
| Brief Site Description: | <p>The 64,000-sq ft Main Hangar was built in 1955 and formerly utilized an AFFF fire suppression system (FSS) from approximately the mid-1970s to the mid-1990s in concert with aircraft missions at the time. There are no documented releases of AFFF from the Main Hangar during this time period. There was a period of time from approximately the early 1990s to 2009 when the main hangar's AFFF FSS would likely have been inoperable. In approximately 2009, the AFFF FSS was removed and a high expansion foam (HEF) FSS was installed.</p> |
| Brief Description of Pathways: | <p>Three aquifers underlie Reno ANGB. These aquifers, in descending stratigraphic sequence, are the younger alluvium, the older alluvium, and the Truckee Formation. Most of the economically recoverable groundwater in the Truckee Meadows area occurs under artesian and water table conditions in the unconsolidated and partially consolidated younger and older alluvium. The Truckee Formation consists of porous deposits containing a large amount of groundwater in storage. Based on the potentiometric groundwater map, the general groundwater flow direction is to the east and southeast. Depth to the groundwater throughout the Base varies from 3 to 10 ft. BGS due to the silty clay, creating a semi-confined aquifer. Groundwater at the Base occurs under unconfined conditions. The drainage ditches to the south and east serve as a groundwater barrier and drain. Drainage ditches along the north and south sides of the Base direct water to the east, across the airfield, and into Boynton Slough, which drains into Steamboat Creek, the sole major tributary to the Truckee River. Soils collected from this area are covered by asphalt.</p> |
| Brief Description of Receptors: | <p>Most of the water supply in the Reno-Sparks area is diverted from the Truckee River; however, public water wells are used to supplement the supply. There are 432 water wells are within a 1-mile radius of the Base. Of these wells, one is listed as an active public water supply well for Crystal Peak Park located ¼ to ½ mile northwest (upgradient) of the Base. The report also shows five wells listed in the USGS database, all of which are listed under the Nevada Water Science Center. The remaining 426 wells are listed in the Nevada state database and appear to be mostly monitoring well installations and well abandonments. According to Base personnel, no drinking water wells are located at the Base. Potable water is supplied by the Truckee Meadows Water Authority.</p> <p>This PRL is located between the hangar and aircraft parking area and access would be restricted to flight personnel.</p> |

Groundwater Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 5

AFFF Release Area #: AFFF 5

| Contaminant | Maximum Concentration (ug/L) | Comparison Value (ug/L) | Ratios |
|--|--|--|--------------|
| PFOS | 23 | 0.04 | 575.0 |
| PFOA | 1.7 | 0.04 | 42.5 |
| PFBS | 1.9 | 0.602 | 3.2 |
| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 620.7 |
| 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 | | H |
| <u>Migratory Pathway Factor</u> | | | |
| 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 |
| <u>Receptor Factor</u> | | | |
| 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 | | | HIGH |

Soil Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 5

AFFF Release Area #: AFFF 5

| Contaminant | Maximum Concentration (mg/kg) | Comparison Value (mg/kg) | Ratios |
|--|--|--|------------|
| PFOS | 0.042 | 0.126 | 0.3 |
| PFOA | 0.0018 | 0.126 | 0.0 |
| PFBS | 0.00051 | 1.9 | 0.0 |
| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 0.3 |
| 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 |
| <u>Migratory Pathway Factor</u> | | | |
| 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 |
| <u>Receptor Factor</u> | | | |
| 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: | Reno-Tahoe IA | Date: | 10/14/2021 |
| Location (State): | Nevada | Media Evaluated: | Groundwater, Soil |
| Site Name and ID: | Current and Former Fire Stationn (Building 800) - PRL 6 | Phase of Execution (e.g., RI, Record of Decision (ROD)): | N/A |
| RPM's Name: | Aubrey Higginbotham | Agreement Status (e.g., Federal Facility Agreement date signed): | N/A |
| OVERALL SITE CATEGORY: HIGH | | | |

Site Summary

| | |
|--|---|
| Brief Site Description: | <p>Building 800 was constructed in 2011 and serves as the Current Base Fire Station. The Fire Department has the following vehicles at Building 800 that carry AFFF in the following amounts: P-19R: 210 gal, P-19: 130 gal, Rapid Intervention Vehicle: 30 gal, and Foam Trailer: 500 gal. The foam trailer is manually filled with AFFF from new storage containers (typically 5-gal pails) and the fire trucks are filled from the foam trailer with a pump and hose. No excess AFFF (such as 5-gal pails, drums, or totes) is stored at the Fire Station. Building 800 is equipped with floor drains in the concrete floor, which discharge to the sanitary sewer system via an oil/water separator (OWS). Base personnel were unaware of any releases of AFFF at this building, and there are no documented releases of AFFF. The footprint of Building 800 encompasses the former Building 12 – Former Fire Station. The 3,550-sq ft Building 12 was built in 1955 and served as the former Base Fire Station from then through 2011 when Building 800 was completed. Fire vehicles with AFFF were parked inside the building's bay area. There were no documented releases of AFFF from the Former Fire Station. Trench or floor drains within the former Fire Station drained to the storm drain.</p> |
| Brief Description of Pathways: | <p>Three aquifers underlie Reno ANGB. These aquifers, in descending stratigraphic sequence, are the younger alluvium, the older alluvium, and the Truckee Formation. Most of the economically recoverable groundwater in the Truckee Meadows area occurs under artesian and water table conditions in the unconsolidated and partially consolidated younger and older alluvium. The Truckee Formation consists of porous deposits containing a large amount of groundwater in storage. Based on the potentiometric groundwater map, the general groundwater flow direction is to the east and southeast. Depth to the groundwater throughout the Base varies from 3 to 10 ft. BGS due to the silty clay, creating a semi-confined aquifer. Groundwater at the Base occurs under unconfined conditions. The drainage ditches to the south and east serve as a groundwater barrier and drain. Drainage ditches along the north and south sides of the Base direct water to the east, across the airfield, and into Boynton Slough, which drains into Steamboat Creek, the sole major tributary to the Truckee River. Soil samples were collected from an area covered by asphalt.</p> |
| Brief Description of Receptors: | <p>Most of the water supply in the Reno-Sparks area is diverted from the Truckee River; however, public water wells are used to supplement the supply. There are 432 water wells are within a 1-mile radius of the Base. Of these wells, one is listed as an active public water supply well for Crystal Peak Park located ¼ to ½ mile northwest (upgradient) of the Base. The report also shows five wells listed in the USGS database, all of which are listed under the Nevada Water Science Center. The remaining 426 wells are listed in the Nevada state database and appear to be mostly monitoring well installations and well abandonments. According to Base personnel, no drinking water wells are located at the Base. Potable water is supplied by the Truckee Meadows Water Authority.</p> <p>This PRL is located between the hangar and aircraft parking area and access would be restricted.</p> |

Groundwater Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 6

AFFF Release Area #: AFFF 6

| Contaminant | Maximum Concentration (ug/L) | Comparison Value (ug/L) | Ratios |
|-------------|------------------------------|-------------------------|--------|
| PFOS | 16 | 0.04 | 400.0 |
| PFOA | 2.1 | 0.04 | 52.5 |
| PFBS | 3.4 | 0.602 | 5.6 |

| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 458.1 |
|-----------|-----------|-----------------------------------|-------|
|-----------|-----------|-----------------------------------|-------|

| | | |
|---------------|------------|--|
| 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) | |
| 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

HIGH

Soil Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 6

AFFF Release Area #: AFFF 6

| Contaminant | Maximum Concentration (mg/kg) | Comparison Value (mg/kg) | Ratios |
|--|--|--|-------------|
| PFOS | 1.8 | 0.126 | 14.3 |
| PFOA | 0.0092 | 0.126 | 0.1 |
| PFBS | 0.018 | 1.9 | 0.0 |
| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 14.4 |
| 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 |
| <u>Migratory Pathway Factor</u> | | | |
| 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 |
| <u>Receptor Factor</u> | | | |
| 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: | Reno-Tahoe IA | Date: | 10/14/2021 |
| Location (State): | Nevada | Media Evaluated: | Groundwater, Soil |
| Site Name and ID: | Nozzle Testing Area - PRL 7 | Phase of Execution (e.g., RI, Record of Decision (ROD)): | N/A |
| RPM's Name: | Aubrey Higginbotham | Agreement Status (e.g., Federal Facility Agreement date signed): | N/A |
| OVERALL SITE CATEGORY: HIGH | | | |

Site Summary

| | |
|--|---|
| Brief Site Description: | <p>Fire equipment and nozzle testing was typically conducted annually immediately east of the Former and Current Fire Stations, in the southeastern portion of the Base. Fire equipment and nozzle testing was discontinued in 2014 or earlier. The AFFF and water mixture would be allowed to dissipate on the concrete apron. In addition, Base personnel indicated that Fire Department vehicles were washed on the apron adjacent to the Former Fire Station. Runoff from this area has the potential to flow toward adjacent grassy areas.</p> |
| Brief Description of Pathways: | <p>Three aquifers underlie Reno ANGB. These aquifers, in descending stratigraphic sequence, are the younger alluvium, the older alluvium, and the Truckee Formation. Most of the economically recoverable groundwater in the Truckee Meadows area occurs under artesian and water table conditions in the unconsolidated and partially consolidated younger and older alluvium. The Truckee Formation consists of porous deposits containing a large amount of groundwater in storage. Based on the potentiometric groundwater map, the general groundwater flow direction is to the east and southeast. Depth to the groundwater throughout the Base varies from 3 to 10 ft. BGS due to the silty clay, creating a semi-confined aquifer. Groundwater at the Base occurs under unconfined conditions. The drainage ditches to the south and east serve as a groundwater barrier and drain. Drainage ditches along the north and south sides of the Base direct water to the east, across the airfield, and into Boynton Slough, which drains into Steamboat Creek, the sole major tributary to the Truckee River. Soil samples were collected from an area covered by asphalt.</p> |
| Brief Description of Receptors: | <p>Most of the water supply in the Reno-Sparks area is diverted from the Truckee River; however, public water wells are used to supplement the supply. There are 432 water wells are within a 1-mile radius of the Base. Of these wells, one is listed as an active public water supply well for Crystal Peak Park located ¼ to ½ mile northwest (upgradient) of the Base. The report also shows five wells listed in the USGS database, all of which are listed under the Nevada Water Science Center. The remaining 426 wells are listed in the Nevada state database and appear to be mostly monitoring well installations and well abandonments. According to Base personnel, no drinking water wells are located at the Base. Potable water is supplied by the Truckee Meadows Water Authority.</p> <p>This PRL is located on the aircraft parking area and access would be restricted.</p> |

Groundwater Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 7

AFFF Release Area #: AFFF 7

| Contaminant | Maximum Concentration (ug/L) | Comparison Value (ug/L) | Ratios |
|--|--|--|---------------|
| PFOS | 110 | 0.04 | 2750.0 |
| PFOA | 9.7 | 0.04 | 242.5 |
| PFBS | 2.5 | 0.602 | 4.2 |
| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 2996.7 |
| 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 | | H |
| <u>Migratory Pathway Factor</u> | | | |
| 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 |
| <u>Receptor Factor</u> | | | |
| 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 | | | HIGH |

Soil Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 7

AFFF Release Area #: AFFF 7

| Contaminant | Maximum Concentration (mg/kg) | Comparison Value (mg/kg) | Ratios |
|--|--|--|------------|
| PFOS | 0.17 | 0.126 | 1.3 |
| PFOA | 0.0016 | 0.126 | 0.0 |
| PFBS | 0.00023 | 1.9 | 0.0 |
| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 1.4 |
| 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 |
| <u>Migratory Pathway Factor</u> | | | |
| 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 |
| <u>Receptor Factor</u> | | | |
| 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: | Reno-Tahoe IA | Date: | 10/14/2021 |
| Location (State): | Nevada | Media Evaluated: | Groundwater, Soil |
| Site Name and ID: | Fuel Cell Hangar - Bldg 130 - PRL 8 | Phase of Execution (e.g., RI, Record of Decision (ROD)): | N/A |
| RPM's Name: | Aubrey Higginbotham | Agreement Status (e.g., Federal Facility Agreement date signed): | N/A |
| OVERALL SITE CATEGORY: MEDIUM | | | |

Site Summary

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|--|---|
| Brief Site Description: | <p>The 25,400-sq ft Building 130 was constructed in approximately 1998. An AFFF FSS was installed at that time and remains operational. The system includes two 700-gal AFFF storage tanks. Building 130 is equipped with floor drains that discharge to the sanitary sewer system. There are no documented releases of AFFF from this hangar. Building 130 was constructed on the site of a civilian airplane crash that occurred in approximately 1991. It is estimated that approximately 100 gal of AFFF were utilized during this plane crash incident to extinguish the fires that occurred. Both the ANG and Reno International Airport Fire Departments responded to this incident with both Fire Departments using AFFF during firefighting efforts.</p> |
| Brief Description of Pathways: | <p>Three aquifers underlie Reno ANGB. These aquifers, in descending stratigraphic sequence, are the younger alluvium, the older alluvium, and the Truckee Formation. Most of the economically recoverable groundwater in the Truckee Meadows area occurs under artesian and water table conditions in the unconsolidated and partially consolidated younger and older alluvium. The Truckee Formation consists of porous deposits containing a large amount of groundwater in storage. Based on the potentiometric groundwater map, the general groundwater flow direction is to the east and southeast. Depth to the groundwater throughout the Base varies from 3 to 10 ft. BGS due to the silty clay, creating a semi-confined aquifer. Groundwater at the Base occurs under unconfined conditions. The drainage ditches to the south and east serve as a groundwater barrier and drain. Drainage ditches along the north and south sides of the Base direct water to the east, across the airfield, and into Boynton Slough, which drains into Steamboat Creek, the sole major tributary to the Truckee River. Soil samples were collected from an area covered by asphalt.</p> |
| Brief Description of Receptors: | <p>Most of the water supply in the Reno-Sparks area is diverted from the Truckee River; however, public water wells are used to supplement the supply. There are 432 water wells within a 1-mile radius of the Base. Of these wells, one is listed as an active public water supply well for Crystal Peak Park located ¼ to ½ mile northwest (upgradient) of the Base. The report also shows five wells listed in the USGS database, all of which are listed under the Nevada Water Science Center. The remaining 426 wells are listed in the Nevada state database and appear to be mostly monitoring well installations and well abandonments. According to Base personnel, no drinking water wells are located at the Base. Potable water is supplied by the Truckee Meadows Water Authority.</p> <p>Soil samples were collected from an area between the fuel cell hangar and the aircraft parking area - access would be restricted.</p> |

Groundwater Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 8

AFFF Release Area #: AFFF 8

| Contaminant | Maximum Concentration (ug/L) | Comparison Value (ug/L) | Ratios |
|-------------|------------------------------|-------------------------|--------|
| PFOS | 0.73 | 0.04 | 18.3 |
| PFOA | 0.075 | 0.04 | 1.9 |
| PFBS | 0.024 | 0.602 | 0.0 |

| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 20.2 |
|-----------|-----------|-----------------------------------|-------------|
|-----------|-----------|-----------------------------------|-------------|

| | | |
|---------------|-------------------|--|
| 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) | |
| 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 Reno-Tahoe IA

Site ID: PRL 8

AFFF Release Area #: AFFF 8

| Contaminant | Maximum Concentration (mg/kg) | Comparison Value (mg/kg) | Ratios |
|--|--|--|------------|
| PFOS | 0.044 | 0.126 | 0.3 |
| PFOA | 0.00089 | 0.126 | 0.0 |
| PFBS | 0.000086 | 1.9 | 0.0 |
| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 0.4 |
| 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 |
| <u>Migratory Pathway Factor</u> | | | |
| 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 |
| <u>Receptor Factor</u> | | | |
| 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: | Reno-Tahoe IA | Date: | 10/14/2021 |
| Location (State): | Nevada | Media Evaluated: | Groundwater, Soil |
| Site Name and ID: | Building 700 - AFFF Release - PRL 9 | Phase of Execution (e.g., RI, Record of Decision (ROD)): | N/A |
| RPM's Name: | Aubrey Higginbotham | Agreement Status (e.g., Federal Facility Agreement date signed): | N/A |
| OVERALL SITE CATEGORY: HIGH | | | |

Site Summary

| | |
|--|--|
| Brief Site Description: | <p>A small AFFF release occurred at Building 700 (Vehicle Maintenance) in late 2015. Approximately 5 to 8 gal of AFFF were released to the paved ground surface during fire truck maintenance activities, which subsequently drained to the nearby storm drainage feature located just northeast of Building 700. The storm drainage feature at this location serves as a small infiltration catch basin. The captured water and AFFF mixture would have entered the gravel-covered catch basin.</p> <p>Groundwater samples from PRL 2 are co-located with PRL 9 and were used in the evaluation for this PRL.</p> |
| Brief Description of Pathways: | <p>Three aquifers underlie Reno ANGB. These aquifers, in descending stratigraphic sequence, are the younger alluvium, the older alluvium, and the Truckee Formation. Most of the economically recoverable groundwater in the Truckee Meadows area occurs under artesian and water table conditions in the unconsolidated and partially consolidated younger and older alluvium. The Truckee Formation consists of porous deposits containing a large amount of groundwater in storage. Based on the potentiometric groundwater map, the general groundwater flow direction is to the east and southeast. Depth to the groundwater throughout the Base varies from 3 to 10 ft. BGS due to the silty clay, creating a semi-confined aquifer. Groundwater at the Base occurs under unconfined conditions. The drainage ditches to the south and east serve as a groundwater barrier and drain. Drainage ditches along the north and south sides of the Base direct water to the east, across the airfield, and into Boynton Slough, which drains into Steamboat Creek, the sole major tributary to the Truckee River.</p> <p>Surface soil samples were collected from an area with exposed soils.</p> |
| Brief Description of Receptors: | <p>Most of the water supply in the Reno-Sparks area is diverted from the Truckee River; however, public water wells are used to supplement the supply. There are 432 water wells are within a 1-mile radius of the Base. Of these wells, one is listed as an active public water supply well for Crystal Peak Park located ¼ to ½ mile northwest (upgradient) of the Base. The report also shows five wells listed in the USGS database, all of which are listed under the Nevada Water Science Center. The remaining 426 wells are listed in the Nevada state database and appear to be mostly monitoring well installations and well abandonments. According to Base personnel, no drinking water wells are located at the Base. Potable water is supplied by the Truckee Meadows Water Authority.</p> <p>PRL-9 is located within the base, but is otherwise unrestricted. Area is accessible by base personnel.</p> |

Groundwater Worksheet

Installation: Reno-Tahoe IA

Site ID: PRL 9

AFFF Release Area #: AFFF 9

| Contaminant | Maximum Concentration (ug/L) | Comparison Value (ug/L) | Ratios |
|--|--|--|--------------|
| PFBS | 1.2 | 0.602 | 2.0 |
| PFOA | 1.3 | 0.04 | 32.5 |
| PFOS | 13 | 0.04 | 325.0 |
| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 359.5 |
| 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 | | H |
| <u>Migratory Pathway Factor</u> | | | |
| 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 |
| <u>Receptor Factor</u> | | | |
| 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 | | | HIGH |

Soil Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 9

AFFF Release Area #: AFFF 9

| Contaminant | Maximum Concentration (mg/kg) | Comparison Value (mg/kg) | Ratios |
|--|--|--|------------|
| PFOS | 0.032 | 0.126 | 0.3 |
| PFOA | 0.0038 | 0.126 | 0.0 |
| PFBS | 0.00023 | 1.9 | 0.0 |
| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 0.3 |
| 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 |
| <u>Migratory Pathway Factor</u> | | | |
| 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 |
| <u>Receptor Factor</u> | | | |
| 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 | | | LOW |

Site Background Information

| | | | |
|------------------------------------|-------------------------|---|-------------------|
| Installation: | Reno-Tahoe IA | Date: | 10/14/2021 |
| Location (State): | Nevada | Media Evaluated: | Groundwater, Soil |
| Site Name and ID: | Concrete Apron - PRL 10 | Phase of Execution (e.g., RI, Record of Decision (ROD)): | N/A |
| RPM's Name: | Aubrey Higginbotham | Agreement Status (e.g., Federal Facility Agreement date signed): | N/A |
| OVERALL SITE CATEGORY: HIGH | | | |

Site Summary

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|--|---|
| Brief Site Description: | <p>The concrete apron is located on the eastern side of the Base. Although no records of AFFF usage on the apron exist, the southern portion of the ramp has been used for nozzle testing for several years, and Buildings 9 and 130 (both hangars with current or historical AFFF FSSs) are located adjacent to the apron. Runoff from this area has the potential to flow toward adjacent grassy areas.</p> |
| Brief Description of Pathways: | <p>Three aquifers underlie Reno ANGB. These aquifers, in descending stratigraphic sequence, are the younger alluvium, the older alluvium, and the Truckee Formation. Most of the economically recoverable groundwater in the Truckee Meadows area occurs under artesian and water table conditions in the unconsolidated and partially consolidated younger and older alluvium. The Truckee Formation consists of porous deposits containing a large amount of groundwater in storage. Based on the potentiometric groundwater map, the general groundwater flow direction is to the east and southeast. Depth to the groundwater throughout the Base varies from 3 to 10 ft. BGS due to the silty clay, creating a semi-confined aquifer. Groundwater at the Base occurs under unconfined conditions. The drainage ditches to the south and east serve as a groundwater barrier and drain. Drainage ditches along the north and south sides of the Base direct water to the east, across the airfield, and into Boynton Slough, which drains into Steamboat Creek, the sole major tributary to the Truckee River. Soil samples were collected from an area covered by asphalt.</p> |
| Brief Description of Receptors: | <p>Most of the water supply in the Reno-Sparks area is diverted from the Truckee River; however, public water wells are used to supplement the supply. There are 432 water wells are within a 1-mile radius of the Base. Of these wells, one is listed as an active public water supply well for Crystal Peak Park located ¼ to ½ mile northwest (upgradient) of the Base. The report also shows five wells listed in the USGS database, all of which are listed under the Nevada Water Science Center. The remaining 426 wells are listed in the Nevada state database and appear to be mostly monitoring well installations and well abandonments. According to Base personnel, no drinking water wells are located at the Base. Potable water is supplied by the Truckee Meadows Water Authority.</p> <p>This PRL is located on the aircraft parking area and access would be restricted.</p> |

Groundwater Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 10

AFFF Release Area #: AFFF 10

| Contaminant | Maximum Concentration (ug/L) | Comparison Value (ug/L) | Ratios |
|-------------|------------------------------|-------------------------|--------|
| PFOS | 3.9 | 0.04 | 97.5 |
| PFOA | 1.1 | 0.04 | 27.5 |
| PFBS | 0.32 | 0.602 | 0.5 |

| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 125.5 |
|-----------|-----------|-----------------------------------|--------------|
|-----------|-----------|-----------------------------------|--------------|

| | | |
|---------------|-------------------|--|
| 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 | 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) | |
| 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

HIGH

Soil Worksheet

Installation Reno-Tahoe IA

Site ID: PRL 10

AFFF Release Area #: AFFF 10

| Contaminant | Maximum Concentration (mg/kg) | Comparison Value (mg/kg) | Ratios |
|--|--|--|------------|
| PFOS | 0.19 | 0.126 | 1.5 |
| PFOA | 0.01 | 0.126 | 0.1 |
| PFBS | 0.00021 | 1.9 | 0.0 |
| CHF Scale | CHF Value | Contamination Hazard Factor (CHF) | 1.6 |
| 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 |
| <u>Migratory Pathway Factor</u> | | | |
| 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 |
| <u>Receptor Factor</u> | | | |
| 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 |