

**Military Deployment**  
**Periodic Occupational and Environmental Monitoring Summary (POEMS):**  
**Forward Operating Base (FOB) Airborne (Wardak Provincial Reconstruction Team**  
**(PRT) and Combat Outpost (COP) Nerkh), Afghanistan: 2006 to 2011**

**AUTHORITY:** This periodic occupational and environmental monitoring summary (POEMS) has been developed in accordance with Department of Defense (DoD) Instructions 6490.03, 6055.05, and JCSM (MCM) 0028-07, See *REFERENCES*.

**PURPOSE:** This POEMS documents the Department of Defense (DoD) assessment of base camp level occupational and environmental health (OEH) surveillance data for FOB Airborne. It presents the identified health risks and associated medical implications. The findings are based on information collected from November 9, 2006 through April 1, 2011, including OEH sampling and monitoring data (e.g., air, water, and soil), field investigation and health assessment reports, as well as country and area-specific information on endemic diseases. While this assessment may reflect similar exposures and risks pertaining to historic or future conditions at this site, the underlying data is limited to the time period(s) and area(s) sampled and thus may not reflect fluctuations or unique occurrences. It also may not fully represent all fluctuations during the timeframe. To the extent data allow, this summary describes the general ambient conditions at the site and characterizes the risks at the *population-level*. While useful to inform providers and others of potential health effects and associated medical implications, it does not represent an individual exposure profile. Actual individual exposures and specific resulting health effects depend on many variables and should be addressed in individual medical records by providers as appropriate at the time of an evaluation of a unique exposure.

**SITE DESCRIPTIONS:** FOB Airborne was a former International Security Assistance Force Fire Base built in October 2007 near Kane-Ezzat in the Wardak province of Afghanistan. FOB Airborne is about 300 yards long by 175 yards wide and is located 8,400 feet above sea level near Highway One, the road that links Kabul to Kandahar. The main compound is guarded by bunkers and contains three brick and mortar buildings (two of which are occupied by US personnel), tents, armored vehicles, several latrines and mortar pits, and a helicopter landing zone. FOB Airborne houses a mix of Afghan interpreters and Afghan Army soldiers, American forces, French mountain infantrymen and Foreign Legionnaires, and a regiment infantry division. This POEMS also addresses Wardak PRT and COP Nerkh. Wardak PRT was opened on 9 November 2006 and was formed to assist Afghan authorities with reconstruction efforts and to enhance development and stability within the Wardak province. COP Nerkh is a combat outpost occupied by US forces and Afghanistan National Army forces and is located in Nerkh, a district of Wardak province southwest of Kabul.

**SUMMARY:** Summarized below are the health risks estimated to present a moderate or greater risk of medical concern and appropriate recommended follow-on medical actions, if any. The Table on the following page provides a list of all identified health risks at these locations. As indicated in the detailed Sections that follow the Table, controls that have been effectively established to reduce risk levels have been factored into this overall assessment. In some cases, (e.g., ambient air) specific controls are not routinely available/feasible.

**Short-term health risks & medical implications:** The following may have caused acute health effects in some personnel *during deployment at FOB Airborne (and the associated locations):*

Food/waterborne diseases (e.g., bacterial diarrhea, Hepatitis A, Typhoid fever, Brucellosis, diarrhea-cholera, diarrhea-protozoal, Hepatitis E); other endemic diseases (Malaria, Cutaneous leishmaniasis, Crimean-Congo hemorrhagic fever, Sandfly fever, Typhus-miteborne, Tuberculosis (TB), Rabies, Anthrax, Q fever); venomous animals and insects. For food/waterborne diseases (e.g., bacterial diarrhea, Hepatitis A, Typhoid fever, Brucellosis, diarrhea-cholera, diarrhea-protozoal, Hepatitis E), if ingesting food and water off post, the health effects can temporarily incapacitate personnel (diarrhea) or result in prolonged illness (Hepatitis A, Typhoid fever, and Brucellosis, Hepatitis E). Risks from food/waterborne diseases may have been reduced with preventive medicine controls and mitigation, which includes Hepatitis A and Typhoid fever vaccinations, and only drinking from approved water sources in accordance with standing CENTCOM policy. For other vector-borne endemic diseases (Malaria, Cutaneous leishmaniasis, Crimean-Congo hemorrhagic fever, Sandfly fever, Typhus-miteborne), these diseases may constitute a significant risk due to exposure to biting vectors; risk is reduced to low by proper wear of treated uniform, application of repellent to bed net and exposed skin, and appropriate chemoprophylaxis. For respiratory diseases (Tuberculosis (TB)), personnel in close-quarter conditions could have been at risk for person-to-person spread. Animal contact diseases (Rabies, Q fever, Anthrax) pose year-round risk. For venomous insects and animals (snakes and scorpions), if encountered, effects of venom vary with species from mild localized effects (e.g. *Platyceps rhodorachis*) to potentially lethal effects (e.g. *Echis multisquamatus*). Risk may be reduced with proper and timely treatment.

Air quality: Although there are not air sampling data available (typical sampling for particulate matter, heavy metals, and volatile organic compounds) for assessment, the area is located in a dusty desert environment. In addition, though no burn pit samples were available for assessment, there is a burn pit on the site. Inhalational exposure to high levels of dust and particulate matter, such as during high winds or dust storms, and for exposure to burn pit smoke, exposures may result in mild to more serious short-term health effects (e.g., eye, nose, throat and lung irritation) in some personnel while at this site, and certain subgroups of the deployed forces (e.g., those with pre-existing asthma/respiratory and cardio-pulmonary conditions) are at greatest risk of developing notable health effects. Although most effects from exposures to dust and particulate matter and burn pit smoke should have resolved post-deployment, providers should be prepared to consider the relationship between deployment exposures and current complaints. Some individuals may have sought treatment for acute respiratory irritation during their time at FOB Airborne (and the associated locations). Personnel who reported with symptoms or required treatment while at this site should have exposure/treatment noted in medical record on a Standard Form (SF) 600 (*Chronological Record of Medical Care*).

**Long-term health risks & medical implications:** The hazards associated with potential long-term health effects at FOB Airborne (and the associated locations) include Leishmaniasis-visceral infection. Leishmaniasis is transmitted by sand flies. Visceral leishmaniasis (a more latent form of the disease) causes a severe febrile illness, which typically requires hospitalization with convalescence over 7 days. The leishmaniasis parasites may survive for years in infected individuals. Consequently, this infection may go unrecognized until infections become symptomatic years later.

Air quality: Although there was no air sampling data available for assessment of particulate matter and long-term risk, the area is a dusty desert environment. In addition, though no burn pit samples were available for assessment, there is a burn pit on the site. For inhalational exposure to high levels of dust and particulate matter, such as during high winds or dust storms, and for exposure to burn pit smoke, it is considered possible that some otherwise healthy personnel who were exposed for a long-term period to dust and particulate matter and burn pit smoke could develop certain health conditions (e.g., reduced lung function, cardiopulmonary disease). Personnel with a history of asthma or cardiopulmonary disease could potentially be more likely to develop such chronic health conditions. While the dust and particulate matter exposures and exposures to burn pit smoke are acknowledged, at this time there are no specific recommended, post-deployment medical surveillance evaluations or treatments. Providers should still consider overall individual health status (e.g., any underlying conditions/susceptibilities) and any potential unique individual exposures (such as burn pits, occupational or specific personal dosimeter data) when assessing individual concerns. Certain individuals may need to be followed/evaluated for specific occupational exposures/injuries (e.g., annual audiograms as part of the medical surveillance for those enrolled in the Hearing Conservation Program; and personnel covered by Respiratory Protection Program and/or Hazardous Waste/Emergency Responders Medical Surveillance).

**Population-Based Health Risk Estimates – [FOB Airborne (and the associated locations), Afghanistan]<sup>1, 2</sup>**

Source of Identified Health Risk <sup>3</sup>	Unmitigated Health Risk Estimate <sup>4</sup>	Control Measures Implemented	Residual Health Risk Estimate <sup>4</sup>
<b>ENDEMIC DISEASE</b>			
Food borne/Waterborne (e.g., diarrhea-bacteriological)	Short-term: Variable: High (bacterial diarrhea, Hepatitis A, Typhoid fever) to Moderate (Diarrhea-cholera, diarrhea-protozoal, Brucellosis and Hepatitis E). If ingesting local food/water, the health effects could have temporarily incapacitated personnel (diarrhea) or resulted in prolonged illness (Hepatitis A, Typhoid fever, Brucellosis, Hepatitis E).	Preventive measures include Hepatitis A and Typhoid fever vaccination and consumption of food and water only from approved sources.	Short-term: Low to none
	Long-term: none identified		Long-term: No data available
Arthropod Vector Borne	Short-term: Moderate (Malaria, leishmaniasis-cutaneous, Crimean-Congo hemorrhagic fever, sandfly fever and typhus-miteborne), Low (West Nile fever, and Plague).	Preventive measures include proper wear of the treated uniform and application of repellent to exposed skin and bed net, and appropriate chemoprophylaxis.	Short-term: Low
	Long-term: Low (Leishmaniasis-visceral infection)		Long-term: No data available
Water-Contact (e.g. wading, swimming)	Short-term: Moderate (Leptospirosis)		Short-term: No data available
	Long-term: None identified		Long-term: No data available
Respiratory	Short-term: Moderate Tuberculosis (TB) and Low (meningococcal meningitis).	TB was evaluated as part of the PDHA (Post Deployment Health Assessment). A TB skin test was required post-deployment if potentially exposed.	Short-term: Low
	Long-term: None identified		Long-term: No data available
Soil-contact Diseases	Short term: Moderate for soil-transmitted helminths (hookworm, strongyloidiasis, and cutaneous larva migrans).		Short term: Moderate for soil-transmitted helminths (hookworm, strongyloidiasis, and cutaneous larva migrans).
	Long term: Moderate for soil-transmitted helminths (hookworm, and strongyloidiasis).		Long term: Moderate for soil-transmitted helminths (hookworm, and strongyloidiasis).
Animal Contact	Short-term: Moderate (Rabies and Q-fever), Low (Anthrax and H5N1 avian influenza)	General Order 1B mitigated rabies risk by prohibiting contact with, adoption, or feeding of feral animals.	Short-term: No data available
	Long-term: Low (Rabies)		Long-term: No data available
<b>VENOMOUS ANIMAL/ INSECTS</b>			

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Snakes, scorpions, and spiders	Short-term: Low to High: If encountered, effects of venom varied with species from mild localized swelling (e.g. widow spider) to potentially lethal effects (e.g. Haly's Pit Viper).	Risk reduced with proper and timely treatment.	Short-term: Low to High: If encountered, effects of venom varied with species from mild localized swelling (e.g. widow spider) to potentially lethal effects (e.g. Haly's Pit Viper).
	Long-term: None identified		Long-term: None identified
<b>HEAT/COLD STRESS</b>			
Heat	Short-term: None to Low: Risk could have been greater for susceptible persons including those older than 45, of low fitness level, unacclimatized personnel, or individuals with underlying medical conditions.	Risks from heat stress may have been reduced with preventive medicine controls such as proper hydration, work-rest cycles, and mitigation.	Short-term: None to Low: Risk could have been greater for susceptible persons including those older than 45, of low fitness level, unacclimatized personnel, or individuals with underlying medical conditions.
	Long-term: Low. Risk could have been greater for susceptible persons including those older than 45, of low fitness level, unacclimatized personnel, or individuals with underlying medical conditions.		Long-term: Low. Risk could have been greater for susceptible persons including those older than 45, of low fitness level, unacclimatized personnel, or individuals with underlying medical conditions.
Cold	Short-term: Low.	Risks from cold stress may have been reduced with protective measures such as use of the buddy system in cold weather, and proper wear of protective clothing.	Short-term: Low.
	Long-term: Low.		Long-term: Low.
<b>Unique Incidents/ Concerns</b>			
Burn Pits	Short-term: Low: Acute (short-term) symptoms (such as eye, nose, throat, and lung irritation) from short-term exposure to smoke may have occurred, more pronounced during peak days. More serious effects were possible in susceptible persons (e.g., those with asthma/existing respiratory diseases).	Control measures included locating burn pits downwind of prevailing winds, increased distance from working and living areas when possible, and improved waste management techniques	Short-term: Low: Acute (short-term) symptoms (such as eye, nose, throat, and lung irritation) from short-term exposure to smoke may have occurred, more pronounced during peak days. More serious effects are possible in susceptible persons (e.g., those with asthma/existing respiratory diseases).
	Long-term: Low. Little or no health impacts at the population level have been identified by DOD as of the date of publication of this summary.		Long-term: Low. Little or no health impacts at the population level have been identified by DOD as of the date of publication of this summary.

<sup>1</sup> This Summary Table provides a qualitative estimate of population-based short- and long-term health risks associated with the general ambient and occupational environment conditions at FOB Airborne and the associated locations. It does not represent a unique individual exposure profile. Actual individual exposures and health effects depended on many variables. For example, while a chemical may have been present in the environment, if a person did not inhale, ingest, or contact a specific dose of the chemical for adequate duration and frequency, then there may have been no health risk. Alternatively, a person at a specific location may have experienced a unique exposure, which could have resulted in a significant individual exposure. Any such person seeking medical care should have their specific exposure documented in an SF600.

<sup>2</sup> This assessment was based on specific data and reports obtained from the November 2006 through April 2011 timeframe. It was considered a current representation of general site conditions but may not reflect certain fluctuations or unique exposure incidents. Acute health risk estimates were generally consistent with field-observed health effects.

<sup>3</sup> This Summary Table is organized by major categories of identified sources of health risk. It only lists those sub-categories specifically identified and addressed at FOB Airborne and the associated locations. The health risks were presented as Low, Moderate, High or Extremely High for both acute and chronic health effects. The health risk level was based on an assessment of both the potential severity of the health effects that could be caused and probability of the exposure that would produce such health effects. Details can be obtained from the APHC/AIPH. Where applicable, "None Identified" was used when though a potential exposure was identified, no health risk of either a specific acute or chronic health effects were determined. More detailed descriptions of OEH exposures that were evaluated but determined to pose no health risk were discussed in the following sections of this report.

<sup>4</sup> Health risks in this Summary Table were based on quantitative surveillance thresholds (e.g. endemic disease rates; host/vector/pathogen surveillance) or screening levels, e.g. Military Exposure Guidelines (MEGs) for chemicals. Some previous assessment reports may have provided slightly inconsistent health risk estimates because quantitative criteria such as MEGs may have changed since the samples were originally evaluated and/or because this assessment made use of all historic site data while previous reports may have only been based on a select few samples.

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## 1 Discussion of Health Risks at FOB Airborne (and the associated locations) by Source

The major source categories of potential health risk evaluated at FOB Airborne (and the associated locations) are described below. The evaluation process includes identifying what, if any, specific sub-categories/health concerns are present. This initial step results in “screening out” certain sub-categories that pose no identifiable health risk (for example if all data is below screening levels). While this discusses sub-categories that have been determined to present no identifiable health risk, the Summary Table only contains those sub-categories that were determined to pose some level of potential health risk.

## 2 Air

### 2.1 Site-Specific Sources Identified

Potential sources of air contamination are through typical military operations at a FOB in theater including vehicular traffic, generators, and other local sources that contribute to the ambient environment at this location. However, no data were available to characterize potential environmental ambient air contamination sources.

### 2.2 PM<sub>10</sub>, PM<sub>2.5</sub>, metals, and chemical pollutants (gases and vapors)

#### 2.2.1 *Sample data/Notes:*

Currently, no air sampling data are available for FOB Airborne (and the associated locations) in review of the Defense Occupational and Environmental Health Readiness System (DOEHRS) and the Military Environmental Surveillance Library (MESL).

In a January 2008 field report, Soldiers complained of headaches, loss of concentration, and eye and throat irritation when working long hours in FOB Airborne’s Joint Operations Command (JOC) building. The symptoms were acute and went away after the Soldiers left the JOC to fresh outdoor air. The preventive medicine officer assumed that exposure to exhaust from the JOC’s military heater unit caused the symptoms. After three weeks, a new heater unit that did not produce visible exhaust replaced the faulty heater unit and symptoms noted by the Soldiers abated.

One indoor ambient air sample was collected in the three weeks when the faulty heat unit was in use. Analyzed pollutants included formaldehyde, carbon monoxide, gasoline, phosgene, sulfur dioxide, nitrogen dioxide, hydrogen sulfide, and total volatile organic compounds. Although one sample is not sufficient data with which to conduct a risk assessment, short-term health risk based on that one sample was completed with a resulting Low risk estimate for exposure to hydrogen sulfide and all of the other analyzed chemicals; all resulting chemical concentrations were below respective short-term MEGs. Based on the exposure duration, any long-term health risks were not expected. No follow-up samples were collected.

#### 2.2.2 *Short-term and long-term health risk:*

Not enough data are available to support a short-term or long-term health risk assessment.

## 3 Soil



### 3.1 Sample data/Notes:

Two soil samples were collected at FOB Airborne on 1 May 2008. Analytical data for these samples were assessed for the following groups: heavy metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polyaromatic hydrocarbons (PAHs), pesticides, herbicides and radionuclides. There is not enough data available to assess adequately the risk from exposure to soil. However, the contaminants that were detected in the two samples did not exceed their applicable 1-year Negligible MEGs.

### 3.2 Short-term and long-term health risks:

Not enough data are available to support a short-term or long-term health risk assessment.

## 4 Water

In order to assess the risk to US personnel from exposure to water in theater, the US Army Public Health Command (USAPHC) identified the most probable exposure pathways based on available information. At this time, the exposure pathways are defined as ingestion of drinking water and the use of water for non-drinking purposes (such as personal hygiene, food preparation, or incidental ingestion). A conservative (protective) assumption is that all personnel ingest 5-15 liters of water per day for up to 365 days. Non-drinking water exposures are characterized by ingestion of much less than 5-15 liters of water per day (assumed range of military ingestion rates). Analytical data for all drinking and non-drinking water samples were assessed for the following groups: metals, SVOCs, VOCs, polychlorinated biphenyls (PCBs), herbicides, and ions. Note that gross alpha and gross beta radiological results are not included in the health risks.

### 4.1 Drinking Water.

No drinking water samples were collected at FOB Airborne (or the associated locations); therefore, drinking water has not been evaluated to date.

### 4.2 Water: Used for Other Purposes (Personal Hygiene, Cooking, Showering, etc.)

This type of exposure would include water that is used for non-drinking applications such as water used for personal hygiene, laundry, cooking and showering. Two non-drinking water samples were collected at FOB Airborne, one non-drinking water sample was collected in Wardak Province, and one non-drinking water sample was collected at COP Nerkh. The sources of the non-drinking water samples from FOB Airborne were chlorinated river water (one sample collected in 2008) and filtered, untreated well water (one sample collected in 2010). The source of the non-drinking water sample (collected in 2006) from Wardak Province was a stream located off the camp. The source of the non-drinking water sample (collected in 2010) from COP Nerkh was disinfected fresh water. There is not enough data available to assess adequately the risk from exposure to water used for non-drinking applications. However, the contaminants detected in the four samples did not exceed their applicable 1-year Negligible MEGs.

#### 4.2.1 Short-term and long-term health risk:

Not enough data are available to support a short-term or long-term health risk assessment.

## 5 Military Unique

### 5.1 Chemical, Biological, Radiological, Nuclear (CBRN) Weapons:

The Military Environmental Surveillance Library (MESL) did not contain documentation of any specific CBRN hazard sources.

#### 5.2 Depleted Uranium (DU):

The MESL did not contain documentation of any specific DU hazard sources.

#### 5.3 Ionizing Radiation:

The MESL did not contain documentation of any specific ionizing radiation hazard sources.

#### 5.4 Non-Ionizing Radiation:

The MESL did not contain documentation of any specific non-ionizing radiation hazard sources.

### 6 Endemic Disease<sup>1</sup>

This document lists the endemic disease reported in the region, its specific risks and severity and general health information about the disease.

#### 6.1 Foodborne and Waterborne Diseases

Food borne and waterborne diseases in the area are transmitted through the consumption of local food and water. Sanitation is extremely poor throughout the country, including major urban areas. Local food and water sources (including ice) are heavily contaminated with pathogenic bacteria, parasites, and viruses to which most U.S. Service Members have little or no natural immunity. Effective disease surveillance does not exist within the country. Only a small fraction of diseases are identified or reported. Diarrheal diseases can be expected to temporarily incapacitate a very high percentage of personnel within days if local food, water, or ice is consumed. Hepatitis A and typhoid fever can cause prolonged illness in a smaller percentage of unvaccinated personnel. In addition, although not specifically assessed in this document, viral gastroenteritis (e.g., norovirus) and food poisoning (e.g., *Bacillus cereus*, *Clostridium perfringens*, and *Staphylococcus*) may cause significant outbreaks. Key disease risks are summarized below:

##### 6.1.1 Diarrheal diseases (bacteriological)

Diarrheal diseases can be expected to temporarily incapacitate a very high percentage of personnel (potentially over 50 percent per month) within days if local food, water, or ice is consumed. Field conditions (including lack of hand washing and primitive sanitation) may facilitate person-to-person spread and epidemics. Typically these result in mild disease treated in outpatient setting; recovery and return to duty in less than 72 hours with appropriate therapy. A small proportion of infections may require greater than 72 hours limited duty, or hospitalization.

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<sup>1</sup> NOTE: "Risk" level refers to both severity of disease (without controls, for example vaccinations) and probability of disease based on local rates/endemic status. Diseases described are those presenting greater risk when compared with U.S. conditions. Most identified disease risks can and are mitigated with military preventive medicine measures/policies.

### 6.1.2 *Hepatitis A, typhoid fever, and diarrhea-protozoal*

Hepatitis A, typhoid fever, and diarrhea-protozoa can cause prolonged illness. Hepatitis A and typhoid fever can cause prolonged illness in a small percentage of personnel, (less than 1 percent per month) and have a high risk estimate if no preventive medicine measures are taken. However, because all deployed U.S. Forces, including civilians and contractors, are supposed to be vaccinated for Hepatitis A and Typhoid fever, no risk is identified for U.S. Forces from Hepatitis A and Typhoid fever. Diarrhea-cholera and diarrhea-protozoal have a moderate risk estimate if no preventive medicine measures are taken although cases for all are rare. Though much rarer, other potential diseases in this area with a moderate risk estimate include; Hepatitis E, diarrhea-cholera, and brucellosis.

### 6.1.3 *Short-term and Long-term Health Risks:*

**Short-term health risks:** The overall short-term risk associated with foodborne and waterborne diseases at FOB Airborne is considered High (for bacterial diarrhea, hepatitis A, typhoid fever) to Moderate (for diarrhea-cholera, diarrhea-protozoal, brucellosis, hepatitis E) if local food or water is consumed. Preventive medicine measures such as vaccinations reduce the risk estimate to none (for Hepatitis A and Typhoid fever). Additionally, U.S. Forces are provided food and water from approved sources. Confidence in risk estimate is medium.

**Long-term health risks:** None identified based on available data. Confidence in the risk estimate is medium.

## 6.2 Arthropod Vector-Borne Diseases

During the warmer months, the climate and ecological habitat support populations of arthropod vectors, including mosquitoes, ticks, mites, and sandflies. Significant disease transmission is sustained countrywide, including urban areas. Malaria, the major vector-borne risk in Afghanistan, is capable of debilitating a high percentage of personnel for up to a week or more. In addition, other vector-borne diseases are transmitted at low or unknown levels and may constitute a significant risk.

### 6.2.1 *Malaria*

Malaria incidents are often determined based on the presence of agriculture activity, including irrigation systems, which provide breeding habitats for vectors. In the FOB Airborne region small number of cases (less than 1 percent per month attack rate) could occur among personnel exposed to mosquito bites. Malaria incidents can cause debilitating febrile illness typically requiring 1 to 7 days of inpatient care, followed by return to duty. Severe cases may require intensive care or prolonged convalescence, and fatalities can occur.

### 6.2.2 *Leishmaniasis*

Leishmaniasis is transmitted by sand flies. The disease risk is highest when sand flies are most prevalent in March through November. There are two forms of the disease—cutaneous (acute form) and visceral (a more latent form of the disease). The leishmaniasis parasites may survive for years in infected individuals and this infection may go unrecognized by physicians in the US when infections become symptomatic years later. However, in the FOB Airborne region there are only a small number of cases (less than 1 percent per month attack rate). Cutaneous infection is unlikely to be debilitating, though lesions can be disfiguring. Visceral leishmaniasis causes a severe febrile illness which typically requires hospitalization with convalescence over 7 days.

### 6.2.3 *Crimean-Congo hemorrhagic fever*

Crimean-Congo hemorrhagic fever most commonly occurs in rare cases (less than 0.1 percent per month attack rate) and is transmitted by tick bites or occupational contact with blood or secretions from infected animals. It is a very severe illness typically requiring intensive care with fatality rates from five to fifty percent. The risk is moderate but cases are rare.

### 6.2.4 *Sandfly fever*

Sandfly fever has a moderate risk although it is estimated that potential disease rates are from 1 percent to 10 percent of personnel could be affected per month under worst case conditions. It is transmitted by sandflies and occurs more commonly in children though adults still at risk. Incidents can result in debilitating febrile illness typically requiring 1-7 days of supportive care followed by return to duty.

### 6.2.5 *Plague*

Plague is present in rare cases and typically occurs in more urban areas. It is reservoirized by rats and transmitted by their flea populations; this disease is associated with a low risk estimate. Incidents can result in potentially severe illness which may require more than 7 days of hospitalization and convalescence.

### 6.2.6 *Typhus-miteborne*

Typhus-miteborne has a moderate risk estimate although it is estimated that potential disease rates are from 1 percent to 10 percent of personnel could be affected per month under worst case conditions. The disease is transmitted by the larval stage of trombiculid mites (chiggers), which are typically found in areas of grassy or scrubby vegetation. Debilitating febrile illness typically requiring 1 to 7 days of inpatient care, followed by return to duty.

### 6.2.7 *West Nile fever*

West Nile fever is present and is maintained by the bird population and mosquitoes that help to transfer the diseases from birds to humans. The majority of infections in young, healthy adults are asymptomatic although it can result in fever, headache, tiredness, and body aches, occasionally with a skin rash (on the trunk of the body) and swollen lymph glands. This disease is associated with a low risk estimate.

### 6.2.8 *Overall Risk Levels*

**Short-term health risks:** High (for Malaria), Moderate (for leishmaniasis-cutaneous (acute), Crimean-Congo hemorrhagic fever, Sandfly fever, typhus-miteborne); and Low (for the Plague and West Nile fever). Confidence in the risk estimate is medium.

**Long-term health risks:** Moderate (for leishmaniasis-visceral [chronic]). Confidence in the risk estimate is medium.

### 6.3 Water Contact Diseases

Areas along rivers and lakes are the primary risk areas for water contact diseases and the risk period is seasonal, typically April through November. Any tactical operations or recreational activities that involve extensive contact with surface water (lakes, streams, rivers, or flooded fields) may cause significant exposure to leptospirosis.

#### 6.3.1 *Leptospirosis*

Leptospirosis is present in Afghanistan but at unknown levels. Human infection occurs through exposure to water or soil contaminated by infected animals and has been associated with wading, and swimming in contaminated, untreated open water. The occurrence of flooding after heavy rainfall facilitates the spread of the organism because, as water saturates the environment, leptospirosis present in the soil pass directly into surface waters. Leptospirosis can enter the body through cut or abraded skin, mucous membranes, and conjunctivae. Ingestion of contaminated water can also lead to infection. The acute generalized illness associated with infection can mimic other tropical diseases (for example, dengue fever, malaria, and typhus), and common symptoms include fever, chills, myalgia, nausea, diarrhea, cough, and conjunctival suffusion. Manifestations of severe disease can include jaundice, renal failure, hemorrhage, pneumonitis, and hemodynamic collapse. Recreational activities involving extensive water contact may result in personnel being temporarily debilitated with leptospirosis.

#### 6.3.2 *Overall Risk Levels*

**Short-term health risks:** Low (for leptospirosis because FOB Airborne is in an area of barren desert, near no water areas). Confidence in the risk estimate is medium.

**Long-term health risks:** None identified based on available data. Confidence in the risk estimate is medium.

### 6.4 Respiratory Diseases

#### 6.4.1 *Tuberculosis (TB)*

Tuberculosis (TB) poses a moderate year round risk to U.S. personnel in Afghanistan. Tuberculosis is usually transmitted through close and prolonged exposure to an active case of pulmonary or laryngeal tuberculosis, but can also occur with incidental contact. The Army Surgeon General has defined increased risk in deployed Soldiers as indoor exposure to locals or third country nationals of greater than one hour per week in a highly-endemic active TB region.

#### 6.4.2 *Meningococcal meningitis*

Meningococcal meningitis poses a low risk and is transmitted from person to person through droplets of respiratory or throat secretions. Close and prolonged contact facilitates the spread of this disease.

#### 6.4.3 *Short-term and Long-term health risks:*

**Short-term health risks:** Moderate (for tuberculosis) to Low (for meningococcal meningitis). Confidence in the risk estimate is medium.

**Long-term health risks:** None identified. TB is evaluated as part of the Post Deployment Health Assessment (PDHA). A TB skin test is required post-deployment if potentially exposed, where it will be treated.

## 6.5 Animal-Contact Diseases

### 6.5.1 Rabies

Rabies poses a year-round moderate risk. Occurrence is well above U.S. levels due to the lack of organized vaccination control programs. Dogs are the primary sources of human exposure to rabies in Afghanistan, and canine rabies is the most common rabies strain. Rabies is transmitted by exposure to the virus-laden saliva of an infected animal, typically through bites, but could occur from scratches contaminated with the saliva. The time between exposure and the onset of symptoms—the incubation period—varies but averages two to twelve weeks in humans. In rare cases, symptoms may not appear for over one year.

### 6.5.2 Anthrax

Anthrax poses a year-round moderate risk, but cases are rare. Anthrax is a naturally occurring infection; cutaneous anthrax is transmitted by direct contact with infected animals or carcasses, including hides. Eating undercooked infected meat can result in contracting Gastrointestinal Anthrax. Pulmonary Anthrax is contracted through inhalation of spores and is extremely rare.

### 6.5.3 Q-Fever

Q-Fever poses a year-round moderate risk. Rare cases are possible among personnel exposed to direct contact with infected livestock and domesticated animals or contaminated manure straw or dust in areas where herd animals are sheltered and grazed. Significant outbreaks (affecting 1-50 percent) can occur in personnel with heavy exposure to barnyards or other areas where animals are kept. Unpasteurized milk may also transmit infection. The primary route of exposure is respiratory, with an infectious dose as low as a single organism.

### 6.5.4 H5N1 avian influenza

H5N1 avian influenza poses a year-round negligible risk. No illnesses were reported in U.S. personnel, however those who have close contact with birds or poultry have an increased risk of H5N1 infection.

### 6.5.5 Overall Risk Levels

**Short-term health risks:** Moderate (for rabies, anthrax, Q-fever) to Low (for H5N1 avian influenza) short-term risk due to rare occurrence. Confidence in the risk estimate is medium.

**Long-term health risks:** None identified based on available data. Confidence in the risk estimate is medium.

## 7 Venomous Animal/Insect

No specific hazard sources for FOB Airborne were documented in DOEHRs or MESL. A number of medically relevant venomous species have home ranges that overlap the location of FOB Airborne and may present a health risk if encountered by personnel.

### 7.1 Scorpions

*Androctonus amoreuxi*: Severe envenoming possible, potentially lethal. Severe envenoming may produce direct or indirect cardio toxicity, with cardiac arrhythmias, cardiac

failure. Hypovolaemic hypotension possible in severe cases due to fluid loss through vomiting and sweating.

*Scorpiops lindbergi*: Mild envenoming only, not likely to prove lethal. Stings by these scorpions are likely to cause only short lived local effects, such as pain, without systemic effects.

*Buthacus striffleri*, *Orthochirus afghanus*: Unknown; there are a number of dangerous Buthid scorpions, but also others known to cause minimal effects only. Without clinical data it is unclear where this species fits within that spectrum.

## 7.2 Snakes

*Echis multisquamatus*: Severe envenoming possible, potentially lethal. Bites may cause moderate to severe coagulopathy and haemorrhagins causing extensive bleeding

*Macrovipera lebetina* (subspecies: *obtuse* and *turanica*): Severe envenoming possible, potentially lethal. Bites may cause mild to severe local effects, shock & coagulopathy.

*Platyceps rhodorachis*: Mild envenoming only, not likely to prove lethal. Requires symptomatic treatment only.

*Hemorrhhis ravergeri* and *Psammophis lineolatus*: Unlikely to cause significant envenoming. Bites require symptomatic treatment only.

*Boiga trigonata*: Unlikely to cause significant envenoming. Likely to cause minimal to moderate local effects and no systemic effects.

## 7.3 Overall Risk Levels

**Short-term health risks:** Variable (Low to High): If encountered, effects of venom vary with species from mild localized effects (e.g. *Platyceps rhodorachis*) to potentially lethal effects (e.g. *Echis multisquamatus*). See effects of venom above. Risk can be reduced with proper and timely treatment. Confidence in the risk estimate is medium.

**Long-term health risk:** None identified. Confidence in the risk estimate is medium.

## 8 Heat/Cold Stress

The FOB Airborne is located 8,400 feet above mean sea level in the province of Wardak. This FOB is located in a semi-arid, continental climate. Precipitation primarily occurs during the winter (sometimes falling as snow) and spring months. Temperatures in Wardak province range from 23 degrees Fahrenheit to 73 degrees Fahrenheit.

### 8.1 Heat

Maximum daily temperatures in Wardak province where FOB Airborne is located are around 73 degrees Fahrenheit.

**Short-term health risks:** The short-term risk of heat injury is Low in unacclimated personnel. However, the risk may be greater to certain susceptible persons—those older (i.e., greater than 45 years), in lesser physical shape, or with underlying medical/health conditions. Long-term health implications from heat injuries are rare but can occur, especially from more serious injuries such as heat stroke. Risk is reduced further through preventive measures such as work-rest cycles, appropriate hydration, heat stress signs/symptoms education, uniform modification, application of sunscreen protection, and

minimizing of heavy work during peak temperature hours, when appropriate. It is possible that high heat in conjunction with various chemical exposures can increase long-term health risks, though specific scientific evidence is not conclusive.

**Long-term health risks:** The long-term risk is Low. Long-term health implications from heat injuries are rare but can occur—especially from more serious heat injuries such as heat stroke. However, the risk may be greater to certain susceptible persons—those older (i.e., greater than 45 years), in lesser physical shape, or with underlying medical/health conditions. Confidence in these risk estimates is medium.

## 8.2 Cold

Minimum daily temperatures in Wardak province where FOB Airborne is located are around 23 degrees Fahrenheit.

**Short-term and Long-term risks:** The risk of cold injury is low. Confidence in this risk estimate is medium.

## 9 Noise

### 9.1 Continuous:

No continuous noise evaluations were conducted at this location; thus, continuous noise was not evaluated for this POEMS.

**Short-term and Long-term risks:** Not Evaluated-no available continuous noise evaluation. No identified health risks.

### 9.2 Impulse:

No impulse noise evaluations were conducted at this location; thus, impulse noise was not evaluated for this POEMS.

**Short-term and Long-term risks:** Not Evaluated-no available impulse noise evaluation. No identified health risks.

## 10 Unique Incidents/Concerns

### 10.1 Fuel/petroleum products/industrial chemical spills

In August 2010, two water samples from a well at a site that had previously sustained a massive fuel spill in June 2010 were analyzed for benzene, toluene, ethylbenzene, xylenes, volatile and semi-volatile organic compounds, and toxic industrial chemicals and materials. No contaminants were identified in either of the samples.

**Short-term and Long-term risks:** Unknown. Although the evaluation indicates there are no fuel hazards in the sampled well water, there are too few samples with which to adequately estimate the potential risk.

### 10.2 Waste Sites/Waste Disposal:

All solid waste at FOB Airborne is collected and burned in the burn pit.

**Short-term and Long-term risks:** Please see section 10.6 for the evaluation of risks from burn pits.



#### 10.3 Asbestos:

No specific information was available to assess this hazard.

**Short-term and Long-term risks:** Unknown.

#### 10.4 Lead Based Paint:

No specific information was available to assess this hazard.

**Short-term and Long-term risks:** Unknown.

#### 10.5 Pesticides/Pest Control:

No specific information was available to assess this hazard.

**Short-term and Long-term risks:** Unknown.

#### 10.6 Burn Pits:

A burn pit is located at the northeastern corner of FOB Airborne and it is used for the disposal of solid waste at the FOB. The prevailing wind direction causes smoke from the burn pit to blow towards the FOB population.

**Short-term and Long-term risks:** Low.

While not specific to FOB Airborne, the consolidated epidemiological and environmental sampling studies on burn pits that have been conducted to date to address health risk generally show little or no health impact at the population level, several years post-deployment on the long-term health of personnel assigned to a burn pit location. The DoD recognizes that acute symptoms due to smoke exposure may occur, including reddened eyes, irritated respiratory passages, and cough that may persist for some time. While no long-term health risks have yet been identified at a population-level, it is plausible that a smaller number of Service Members may be affected by longer-term health effects, possibly due to combined exposures (such as sand/dust, industrial pollutants, tobacco, smoke and other agents) and individual susceptibilities such as preexisting health conditions or genetic factors.

## 11 References<sup>2</sup>

1. Casarett and Doull's Toxicology: the Basic Science of Poisons, Chapter 2- Principles of Toxicology; Fifth Edition, McGraw Hill, New York.
2. Defense Occupational and Environmental Health Readiness System (referred to as the DOEHRS-EH database) at <https://doehrs-ih.csd.disa.mil/Doehrs/>. Department of Defense (DoD) Instruction 6490.03, *Deployment Health*, 2006.
3. DoDI 6055.05, Occupational and Environmental Health, 2008.
4. DoD MESL Data Portal: <https://mesl.apgea.army.mil/mesl/>. Some of the data and reports used may be classified or otherwise have some restricted distribution.
5. JCSM (MCM) 0028-07, Procedures for Deployment Health Surveillance, 2007.
6. USA PHC TG230, June 2010 Revision.
7. USACHPPM 2008 Particulate Matter Factsheet; 64-009-0708, 2008.

## 12 Where Do I Get More Information?

<p>If a provider feels that the Service member's or Veteran's current medical condition may be attributed to specific OEH exposures at this deployment location, he/she can contact the Service-specific organization below. Organizations external to DoD should contact DoD Force Health Protection and Readiness (FHP &amp; R).</p>
<p><b>U.S. Army Public Health Command (USAPHC)</b>                  Phone: (800) 222-9698. <a href="http://phc.amedd.army.mil/Pages/default.aspx">http://phc.amedd.army.mil/Pages/default.aspx</a></p>
<p><b>Navy and Marine Corps Public Health Center (NMCPHC) (formerly NEHC)</b>                  Phone: (757) 953-0700. <a href="http://www-nehc.med.navy.mil">http://www-nehc.med.navy.mil</a></p>
<p><b>U.S. Air Force School of Aerospace Medicine (USAFSAM) (formerly AFIOH)</b>                  Phone: (888) 232-3764. <a href="http://www.brooks.af.mil/units/airforceinstituteforoperationalhealth/index.asp">http://www.brooks.af.mil/units/airforceinstituteforoperationalhealth/index.asp</a></p>

<sup>2</sup> NOTE. The DOEHRS-IH (EH) database was queried to obtain the available sample data for air, soil, and drinking and non-drinking water sources at FOB Airborne. The data are currently assessed using the June 2010 Revision of TG230 described above. The general method involves an initial review of the data which eliminates all chemical substances not detected above 1-yr negligible MEG. Those substances screened out are not considered acute or chronic health hazards so are not assessed further. For remaining substances, acute and chronic health effects are evaluated separately for air and water (soil is only evaluated for long term risk). This is performed by deriving separate short-term and long-term population exposure level estimates (referred to as population exposure point concentrations (PEPC) that are compared to MEGs derived for similar exposure durations. If less than or equal to negligible MEG the risk is Low. If levels are higher than negligible then there is a chemical-specific toxicity and exposure evaluation by appropriate SMEs, which includes comparison to any available marginal, critical or catastrophic MEGs. For drinking water 15 L/day MEGs are used for the screening while site specific 5-15 L/day are used for more detailed assessment. For non-drinking water (such as that used for personal hygiene or cooking) the 'consumption rate' is limited to 2 L/day (similar to the EPA) which is derived by multiplying the 5 L/day MEG by a factor of 2.5. This value is used to conservatively assess non-drinking uses of water.

**DoD Force Health Protection and Readiness (FHP & R)**

Phone: (800) 497-6261. <http://fhp.osd.mil>