

**Military Deployment**  
**Periodic Occupational and Environmental Monitoring Summary (POEMS):**  
**Camp Redleg, United Arab Emirates**  
**Calendar Years: 2017 to 2020**

**AUTHORITY:** This POEMS has been developed in accordance with Department of Defense Instructions (DoDI) 6490.03, and 6055.05. (References 1-2).

**PURPOSE:** This Periodic Occupational and Environmental Monitoring Summary (POEMS) documents the Department of Defense (DoD) assessment of occupational and environmental health (OEH) risk for Base camp Redleg, United Arab Emirates (UAE). It presents a qualitative summary of OEH risks identified at Camp Redleg and their potential medical implications. The POEMS is based on information collected from 01 January 2017 through 31 December 2020 to include deployment OEH surveillance 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.

This assessment assumes that environmental sampling at Camp Redleg during this period was performed at representative exposure points selected to characterize health risks at the population-level. Due to the nature of environmental sampling, the data upon which this POEMS is based may not be fully representative of all the fluctuations in environmental quality or capture unique occurrences. While one might expect health risks pertaining to historic or future conditions at this site to be similar to those described in this POEMS, the health risk assessment is limited to 01 January 2017 through 31 December 2020.

The POEMS can be useful to inform healthcare providers and others of environmental conditions and potential environmental exposures experienced by individuals during the period of this assessment. However, it does not represent an individual exposure profile. Individual exposures depend on many variables such as how long, how often, where and what someone is doing while working and/or spending time outside and the weather and climatic conditions. Individual outdoor activities and associated routes of exposure are extremely variable and cannot be identified from or during environmental area sampling. Individuals who sought medical treatment related to OEH exposures while deployed should have exposure/treatment noted in their medical records on a Standard Form (SF) 600 (Chronological Record of Medical Care).

**SITE DESCRIPTION:** Camp Redleg, was located within Al Minhad Air Base, 15 miles south of Dubai, and was the largest U.S. Army base in UAE. The base camp opened in 2012 and supported military training. The airfield had one runway and a parallel taxiway that were located on the base camp with infrequent flights. The camp was in a desert environment at an elevation of 172 feet above mean sea level. Camp Redleg contained semi-permanent buildings for UAE military and multi-national military use onsite.

According to the Occupational and Environmental Health Site Assessments (OEHSAs), the camp had a prime power location; however, most operations were powered by tactical generators which were located throughout the camp. The generators were loud and did not have barriers around them to damper the noise until 2020. Noise hazard signs were posted on most of the generators.

Municipal water was trucked into the camp and brought to the onsite reverse osmosis water purification unit (ROWPU) for treatment with chlorination. After it was treated, the drinking water was distributed throughout the camp.

The Defense Occupational and Environmental Health Readiness System (DOEHRS; Reference 3) was used to gather background information compiled from the OEHSAs; (References 4-8).

**SUMMARY:** Conditions that may pose a Moderate or greater health risk are summarized in Table 1. Table 2 provides population-based risk estimates for identified OEH conditions at Camp Redleg. As indicated in the detailed sections that follow Table 2, controls established to reduce health risk were factored into this assessment. In some cases (e.g., ambient air), specific controls are noted, but not routinely available/feasible. Table 3 provides the Disease Threat Assessment taken from the OEHSAs for Camp Redleg (Reference 4-8).

**Table 1: Summary of Occupational and Environmental Conditions with MODERATE or Greater Health Risk**

**Short-term health risks & medical implications:**

The following hazards may be associated with potential acute health effects in some personnel during deployment at Camp Redleg, United Arab Emirates:

Camp Redleg is within the Al Minhad Air Base and is slightly above sea level in a desert environment. The Dubai summers start around the last week of April and continue through the first week of October. This period is characterized by extremely hot weather, hot winds (with frequent dust storms) and high humidity (due to proximity near the sea), with scarce rainfall. During the summer, temperatures regularly rise above 38 °C (100 °F) and fall to around 26 °C (79 °F) overnight. The risk of heat stress injury is heightened during the hot season. Adverse health effects are greater for susceptible persons including those older than 45 years of age, of low fitness level, unacclimatized, or with underlying chronic medical conditions, and those under operational constraints (equipment, PPE, vehicles). Risks from heat stress may have been reduced with appropriate preventive medicine controls, including proper work-rest cycles, adequate hydration and nutrition, and other mitigation strategies. Heat stress injuries that may occur in hot arid conditions range in severity from heat rash, heat cramps, to heat exhaustion, to heat stroke. It is expected that heat exhaustion and heat stroke would have been annotated for evaluation and treatment in affected service members medical records, either on paper forms (SF-600) or in the electronic health record. The winter months around Dubai typically begin the last week of October and lasts until the beginning of April. Most of the precipitation takes place during their winter season. Strong thunderstorms are not uncommon and may be accompanied by strong winds and lower temperatures. The average daytime high during the winter season is around 22 °C (72 °F) with overnight lows of 12 °C (54 °F). Cold injuries may potentially occur if unprotected and unprepared.

Food and waterborne diseases and endemic diseases may occur when good preventive medicine measures are not practiced. Regarding food and waterborne disease, bacterial diarrhea, hepatitis A, protozoal diarrhea may arise if ingesting contaminated local food and water. The health effects can temporarily incapacitate personnel (e.g., diarrhea) or result in a prolonged illness (e.g., hepatitis A, typhoid). Mitigation measures include immunization (hepatitis A and typhoid vaccines) and only drinking from approved water sources. For vector-borne endemic diseases (e.g., Crimean-Congo hemorrhagic fever), these diseases may constitute a significant risk due to exposure to biting vectors; risk is reduced with proper wear of treated uniforms, application of repellent to exposed skin and use

**Table 1: Summary of Occupational and Environmental Conditions with MODERATE or Greater Health Risk**

of treated bed netting, and appropriate chemoprophylaxis (malaria). For water contact diseases (e.g., Leptospirosis) activities involving extensive contact with surface water (e.g., swimming) increase risk of infection. Animal contact diseases (e.g., Q fever), pose a year-round risk.

Air quality: Inhalable fine particulate matter less than 2.5 micrometers in diameter (PM<sub>2.5</sub>) from environmental dust is the most injurious size which may cause adverse health-effects. PM<sub>2.5</sub> has replaced the larger more coarse PM<sub>10</sub> particulate component of environmental dust. The Al Minhad Air Base is a dust-prone arid/desert climate region. However, the overall short-term risk was not evaluated due to either “no data” or “insufficient data” for analysis. To note is that ground vehicle traffic and aircraft emissions are other contributors to airborne particulate. In general, individual exposures to PM<sub>2.5</sub> may vary, as exposure and environmental conditions may vary, and may result in mild to more serious short-term health effects (e.g., eye, nose or throat and lung irritation) in some personnel. At this base camp exposures to high levels of dust may have occurred during high winds and/or dust storms. For PM<sub>2.5</sub>, certain subgroups of the deployed forces (e.g., those with pre-existing asthma/cardiopulmonary conditions) are at greatest risk of developing adverse health effects. Some individuals may have sought treatment for acute respiratory irritation while deployed to Camp Redleg. Personnel who reported to their medical units with symptoms or who required treatment would likely have had their clinical encounters and treatment noted in the medical record (e.g., electronic medical record and/or on a Standard Form (SF) 600 (Chronological Record of Medical Care)).

**Long-term health risks & medical implications:**

The following hazards may be associated with potential chronic health effects in some personnel during deployment at Camp Redleg, United Arab Emirates:

Air Quality: For inhalable PM<sub>2.5</sub> from environmental dust, the overall long-term risk was not evaluated for Camp Redleg due to “non-representative and insufficient data” for analysis. Camp Redleg is a hot, arid and dust-prone desert environment that is also subject to vehicle traffic and exposure and environmental conditions may have varied. For inhalational exposure to high levels of dust and particulate matter, such as during high winds or dust storms, it is possible that some otherwise healthy personnel who were exposed for a long-term period to dust and particulate matter could develop certain health conditions that resulted in chronic diseases (e.g., reduced lung function, cardiopulmonary disease). Personnel with a history of asthma or cardiopulmonary disease would be more likely to develop these chronic health conditions. While the PM exposures are documented and archived, at this time there are no specific recommended, post-deployment medical surveillance evaluations or treatments. Healthcare providers should consider the contribution of chronic dust exposure to an individual’s present health status, especially in those deployers with underlying conditions or susceptibilities (e.g., asthma, older age). Certain deployers might have had potential unique individual exposures (as due to their occupation) that might have been contributory to long-term adverse health outcomes. Some of these deployers might have had their occupational exposures captured by industrial hygiene sampling or personal dosimeters. There were no burn pits in use at Camp Redleg and hence, no resultant burn pit exposures.

**Table 2. Population-Based Health Risk Estimates – Camp Redleg, United Arab Emirates <sup>1, 2</sup>**

Source of Identified Health Risk <sup>3</sup>	Unmitigated Health Risk Estimate <sup>4</sup>	Potential Mitigation Measures	Residual Health Risk Estimate <sup>4</sup>
<b>AIR</b>			
Particulate matter less than 2.5 micrometers in diameter (PM <sub>2.5</sub> )	Short-term: Although there were not enough samples to quantify risk during the time period of this assessment, daily levels varied. Acute health effects (e.g., upper respiratory tract irritation) are more pronounced during peak days. More serious effects are possible in susceptible persons (e.g., those with asthma/pre-existing respiratory diseases).	Limiting strenuous physical activities during periods of high PM levels, and actions such as closing tent flaps, windows, and doors.	Short-term: Although there were not enough samples to quantify risk during the time period of this assessment, daily levels varied. Acute health effects (e.g., upper respiratory tract irritation) are more pronounced during peak days. More serious effects are possible in susceptible persons (e.g., those with asthma/pre-existing respiratory diseases).
	Long-term: Although there were not enough samples to quantify risk during the time period of this assessment, a small percentage of personnel may be at increased risk for developing chronic conditions, particularly those more susceptible to acute effects (e.g., those with asthma/existing respiratory diseases).		Long-term: Although there were not enough samples to quantify risk during the time period of this assessment, a small percentage of personnel may be at increased risk for developing chronic conditions, particularly those more susceptible to acute effects (e.g., those with asthma/existing respiratory diseases).
Metals	Short-term: Not enough samples to quantify risk.		Short-term: Not enough samples to quantify risk.
	Long-term: Not enough samples to quantify risk.		Long-term: Not enough samples to quantify risk.
Volatile Organic Compounds (VOCs)	Short-term: Not enough samples to quantify risk.		Short-term: Not enough samples to quantify risk.
	Long-term: Not enough samples to quantify risk.		Long-term: Not enough samples to quantify risk.
<b>SOIL</b>			
Metals, Organic Compounds, Inorganic Compounds	Short-term: No MEG available		Short-term: No MEG available
	Long-term: None identified based on available data.		Long-term: None identified based on available data.
<b>WATER</b>			
Drinking Water	No data to available determine a health risk.	Using approved bottled water and potable water only from approved water sources	No data to available determine a health risk.
Non-Drinking Water	Short-term: None identified based on available data.	Using water treated in accordance with standards applicable to its intended use	Short-term: None identified based on available data.
	Long-term: None identified based on available data.		Long-term: None identified based on available data.
<b>ENDEMIC DISEASE</b>			
Food borne/Waterborne (e.g.,	Country specific endemic disease information is provided in Section 6. When available in the OEHSA,	<b>Refer to Section 6 for preventive measures</b>	Country specific endemic disease information is provided in Section 6. When available in the OEHSA,

Camp Redleg, United Arab Emirates: 2017 to 2020

Source of Identified Health Risk <sup>3</sup>	Unmitigated Health Risk Estimate <sup>4</sup>	Potential Mitigation Measures	Residual Health Risk Estimate <sup>4</sup>
diarrhea-bacteriological)  Arthropod Vector Borne  Water-Contact (e.g., wading, swimming)  Respiratory  Animal Contact  Aerosolized Dust or Soil-contact	risk levels for particular endemic diseases are provided in Table 3.		risk levels for particular endemic diseases are provided in Table 3.
<b>VENOMOUS ANIMALS</b>			
Snakes, scorpions, and spiders	Short-term: Low; If encountered, effects of venom vary with species from mild localized swelling to potentially lethal effects.	Reduce risk by avoiding contact, proper wear of uniform (especially footwear), reducing suitable habitat, and proper and timely treatment.	Short-term: Low; If encountered, effects of venom vary with species from mild localized swelling to potentially lethal effects.
	Long-term: No data available		Long-term: No data available
<b>HEAT/COLD STRESS</b>			
Heat	Short-term: Variable; Risk of heat injury in unacclimatized or susceptible personnel is Extremely High for April – October, High for March and November, Moderate for February and December, and Low for January.	Work-rest cycles, proper hydration and nutrition, and Wet Bulb Globe Temperature (WBGT) monitoring.	Short-term: Variable; Risk of heat injury in unacclimatized or susceptible personnel is Extremely High for April – October, High for March and November, Moderate for February and December, and Low for January.
	Long-term: Low. The long-term 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: Low. The long-term 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.
Cold	Short-term: Low risk of cold stress/injury.	Reduce risks from cold stress with protective measures such as use of the buddy system, limiting exposure during cold weather, proper hydration and nutrition, and proper wear of	Short-term: Low risk of cold stress/injury.
	Long-term: Low. Long-term health implications from cold injuries are rare but can occur.		Long-term: Low. Long-term health implications from cold injuries are rare but can occur.

Camp Redleg, United Arab Emirates: 2017 to 2020

Source of Identified Health Risk <sup>3</sup>	Unmitigated Health Risk Estimate <sup>4</sup>	Potential Mitigation Measures	Residual Health Risk Estimate <sup>4</sup>
		issued protective clothing.	
<b>NOISE</b>			
Continuous (tactical generators)	Short-term: High to Low; High risk to individuals working near major noise sources without proper hearing protection.	Reduce risk by appropriate hearing protection used by personnel in higher risk areas (around major sources of continuous noise such as flight line and landing zone, and power production (e.g., generators).	Short-term: Low risk to the majority of personnel and to individuals working near major noise sources who use proper hearing protection.
	Long-term: High to Low; High risk to individuals working near major noise sources without proper hearing protection.		Long-term: Low risk to the majority of personnel and to individuals working near major noise sources who use proper hearing protection.
Impulse	None identified		None identified
<b>UNIQUE INCIDENTS/ CONCERNS</b>			
Burn Pits	Burn pits and/or incinerators were not present at Camp Redleg.		Burn pits and/or incinerators were not present at Camp Redleg.

<sup>1</sup>This Summary Table provides a qualitative estimate of population-based short- and long-term health risks associated with the occupational and environment health conditions at Camp Redleg. It does not represent an individual exposure profile. Actual individual exposures and health effects depend 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 result 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 is based on specific environmental sampling data and reports obtained from 01 January 2017 through 31 December 2020. Sampling locations are assumed to be representative of exposure points for the camp population but may not reflect all the fluctuations in environmental quality or capture unique exposure incidents.

<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 Camp Redleg. The health risks are presented as Low, Moderate, High, or Extremely High for both acute and chronic health effects. The health risk level is 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 DCPH-A (formerly known as APHC). Where applicable, "None Identified" is used when though a potential exposure is identified, and no health risks of either a specific acute or chronic health effects are determined. More detailed descriptions of OEH exposures that are evaluated but determined to pose no health risk are discussed in the following sections of this report.

<sup>4</sup>Health risks in this Summary Table are 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 provide 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 makes use of all historic site data while previous reports may have only been based on a select few samples.

## 1 Health Risk Assessment

The following sections provide additional information about the OEH conditions summarized above. All risk assessments were performed using the methodology described in the U.S. Army Public Health Command (USAPHC) Technical Guide 230, *Environmental Health Risk Assessment and Chemical Exposure Guidelines for Deployed Military Personnel* (Reference 9). All OEH risk estimates represent residual risk after accounting for preventive controls in place. Occupational exposures and exposures to endemic diseases are greatly reduced by preventive measures. For environmental exposures related to airborne dust, there are limited preventive measures available, and available measures have little efficacy in reducing exposure to ambient conditions.

## 2 Air

### 2.2 Site-Specific Sources Identified

Emissions from vehicular traffic and power generators contributed to the ambient air environment at Camp Redleg.

Inhalational exposure to high levels of particulate matter (PM), such as during high winds or dust storms, may result in mild to more serious short-term health effects (e.g., eye, nose or throat and lung irritation) in some personnel. Additionally, certain subgroups of the deployed forces (e.g., those with pre-existing asthma/cardiopulmonary conditions) are at greatest risk of developing notable health effects.

### 2.3 Particulate Matter (PM)

PM is a complex mixture of extremely small particles suspended in the air. The PM includes solid particles and liquid droplets emitted directly into the air by power plants, motor vehicles, aircraft, generators, construction activities, and fires, as well as resuspended material (e.g., natural windblown dust). The PM can include sand, soil, metals, volatile organic compounds (VOCs), allergens, and other compounds such as nitrates or sulfates that are formed by condensation or transformation of combustion exhaust. The PM composition and particle size vary considerably depending on the source. Generally, PM of health concern is divided into two fractions: PM<sub>10</sub>, which includes coarse particles with a diameter of 10 micrometers or less, and fine particles with a diameter less than 2.5 micrometers (PM<sub>2.5</sub>). The PM<sub>2.5</sub> can reach the deepest regions of the lungs when inhaled, therefore, it is the main focus in the air assessment. Exposure to excessive PM is linked to a variety of potential health effects.

### 2.4 Particulate Matter, less than 2.5 micrometers (PM<sub>2.5</sub>)

#### 2.4.2 Sample data/notes:

A total of eleven valid PM<sub>2.5</sub> air samples were collected at Camp Redleg from 2017 - 2019 (five samples in 2017, four samples in 2018, two samples in 2019, and no samples in 2020). When more than one sample was collected on a single day, which occurred on 12 July 2017, 7 May 2018, and 8 May 2017, the PM<sub>2.5</sub> concentrations were averaged to provide a daily

concentration. The range of 24-hour PM<sub>2.5</sub> concentrations was 43 µg/m<sup>3</sup> – 287 µg/m<sup>3</sup> in 2017, 72 µg/m<sup>3</sup> – 95 µg/m<sup>3</sup> in 2018, and 25 µg/m<sup>3</sup> – 29 µg/m<sup>3</sup> in 2019. Note that one additional sample in 2019 was collected but invalid due to equipment or laboratory errors.

#### 2.4.3 Short-term and Long-term health risks:

There is insufficient data to assess the health risks from exposure to PM<sub>2.5</sub>.

### 2.5 Airborne Metals

#### 2.5.1 Sample data/Notes:

A total of eight valid PM<sub>2.5</sub> airborne metal samples were collected at Camp Redleg from 2017 to 2019 to assess OEH health risk to deployed personnel. Chromium was detected in two samples collected in 2017 but did not exceed the 1-year Negligible MEG. No other metals were detected.

#### 2.5.2 Short-term and Long-term health risks

There is insufficient data to assess the health risks from exposure to PM<sub>2.5</sub> airborne metals.

### 2.6 Volatile Organic Compounds (VOCs)

#### 2.6.1 Sample data/Notes:

A single valid VOC sample was collected at Camp Redleg in 2017 to assess OEH health risk to deployed personnel. Only acrolein (1.3 µg/m<sup>3</sup>) exceeded its 1-year Negligible MEG (0.137 µg/m<sup>3</sup>) but did not exceed the 14-day Negligible MEG (45.9 µg/m<sup>3</sup>).

#### 2.6.2 Short-term and Long-term health risks:

A single sample is insufficient data to assess the health risks from exposure to airborne VOCs.

## 3 Soil

### 3.1 Site-Specific Sources Identified

The primary ways personnel were exposed to soil were through dermal contact and dust inhalation. Typical parameters analyzed for included semi-volatile organic compounds, heavy metals, polychlorinated biphenyls, radionuclides, pesticides, and herbicides. For the risk assessment, personnel are assumed to remain at this location for 6 months to 1 year.

### 3.2 Sample data/notes:

Two valid surface soil samples (one collected in 2017 and one collected in 2018) were collected at Camp Redleg to assess OEH health risk to deployed personnel.

### 3.3 Short-term health risks:

No MEGs are available to assess short-term exposures to soil.

### 3.4 Long-term health risks:

None identified based on available sample data. No parameters exceeded their respective 1-year Negligible MEGs.

## 4 Water

Deployed U.S. personnel may be exposed to hazards in water used for drinking and non-drinking purposes. Health risks associated with the water supply are evaluated based on the exposure pathways in DOEHRS and the information provided on the field data sheets that were submitted with the samples taken during the time period being evaluated.

### 4.1 Drinking Water

#### 4.1.1 Site-Specific Sources Identified

The OEHSAs for Camp Redleg indicated that bottled water was the only approved water supply for drinking and teeth brushing. The OEHSAs identified one approved bottled water brand, Emirates® that was provided for drinking.<sup>1</sup> However, there were no bottled water samples provided for evaluation.

#### 4.1.2 Short-term and Long-term health risks:

No available sample data to determine a health risk.

### 4.2 Non-Drinking Water

#### 4.2.1 Site-Specific Sources Identified

The non-drinking water supply was reported to be trucked into the base camp from Dubai city, processed through a ROWPU, and distributed around the camp via water trucks to all water points. Emergency water was stored in six 5000-gallon potable water tanks and seven 5000-gallon non-potable water tanks at the ROWPU site. Although the primary route of exposure for most microorganisms is the ingestion of contaminated water; dermal exposure to some microorganisms, chemicals, and biologicals may also cause adverse health effects.

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<sup>1</sup> Identification of a trademarked product does not imply endorsement by the Army.

#### 4.2.2 Sample data/Notes:

To assess the potential for adverse health effects to troops the following assumptions were made about dose and duration: All U.S. personnel at this location were expected to remain at this site for approximately 1 year. A conservative (protective) assumption is that personnel routinely consumed less than 5L/day of non-drinking water for up to 365 days (1-year). It is further assumed that control measures and/or personal protective equipment were not used.

A total of three treated non-drinking water samples were collected at Camp Redleg in 2017, 2018, and 2019. This water was used for personal hygiene, food preparation, and cooking. Eight additional samples were collected on the same day in 2019 (two from the municipal water truck, two from the municipal water tank, two from the treated water tank, and two from the dining facilities) and were only analyzed for perchlorate.

#### 4.2.3 Short-term and Long-term health risks:

None identified based on available sample data. All analyte concentrations were below their short- and long-term negligible MEGs.

## 5 Military Unique

### 5.1 Chemical, Biological, Radiological

No specific hazard sources were documented in the DOEHRS from 01 January 2017 through 31 December 2020 timeframe.

### 5.2 Depleted Uranium

No specific hazard sources were documented in the DOEHRS from 01 January 2017 through 31 December 2020 timeframe.

### 5.3 Ionizing Radiation

No specific hazard sources were documented in the DOEHRS from 01 January 2017 through 31 December 2020 timeframe.

### 5.4 Non-Ionizing Radiation

No specific hazard sources were documented in the DOEHRS from 01 January 2017 through 31 December 2020 timeframe.

## 6 Endemic Diseases

This document lists the endemic diseases reported in the region found on the Centers for Disease Control and Prevention (CDC) website (Reference 10). CENTCOM Modification (MOD) 13, 14, and 15 (References 11-13) lists deployment requirements, to include immunizations and chemoprophylaxis, in effect during the timeframe of this POEMS. Risk

estimates for various diseases were found under the Entomology (Disease Threats) section in the OEHSA(s) and are summarized in Table 3. The source(s) and method(s) used to generate the risk estimates were not specified in the OEHSA(s) for Camp Redleg (Reference 4-8).

**Table 3. Disease Threat Assessment from Camp Redleg OEHSA(s)**

<b>Disease Threat</b>	<b>Hazard Severity</b>	<b>Hazard Probability</b>	<b>Risk Estimate</b>
Crimean-Congo Hemorrhagic Fever	Critical	Unlikely	Low
Sand Fly Fever	Negligible	Unlikely	Low
Typhus (Murine)	Marginal	Unlikely	Low
Leishmaniasis (Cutaneous)	Negligible	Unlikely	Low
Leishmaniasis (Visceral)	Negligible	Unlikely	Low
West Nile Fever	Negligible	Unlikely	Low
Rabies	Critical	Occasional	High
Sindbis virus	Negligible	Unlikely	Low
Q-fever	Marginal	Unlikely	Low

## 6.1 Food borne and Waterborne Diseases

Foodborne and waterborne diseases in the area are transmitted through the consumption of local food and water. Local unapproved 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. Ingesting local food and water can temporarily incapacitate personnel (diarrhea) or result in prolonged illness (hepatitis A, typhoid/paratyphoid fever, brucellosis, hepatitis E). Risks from food/waterborne diseases may have been reduced with preventive medicine controls and mitigation, which includes vaccinations, frequent hand washing and general sanitation practices, and consuming food and water from approved sources in accordance with standing CENTCOM policy.

### 6.1.1 Diarrheal diseases (bacteriological)

Diarrheal diseases are expected to temporarily incapacitate a very high percentage of personnel 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, diarrheal diseases are a mild disease treated in an outpatient setting with 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.

### 6.1.2 Hepatitis A Virus (HAV), typhoid/paratyphoid fever, and diarrhea-protozoal

HAV, typhoid/paratyphoid fever, and diarrhea-protozoal disease may cause prolonged illness in a small percentage of unvaccinated personnel. HAV is transmitted through direct person to person contact or through ingestion of contaminated food or water. HAV can survive in the environment for prolonged periods of time, and it can be transmitted through ice and frozen foods. Individuals are most infectious 1-2 weeks before the onset of clinical signs and symptoms. Typhoid and paratyphoid fever are acquired through consumption of water or food

contaminated by feces of an acutely infected person. Hepatitis A and Typhoid can be prevented through immunization.

### 6.1.3 Diarrhea-cholera

Cholera is a bacterial disease usually spread through contaminated water which causes severe diarrhea and dehydration. Most symptomatic cases are mild, with recovery and return to duty in less than 72 hours with appropriate outpatient treatment. Severe cases may require 1-7 days of supportive or inpatient care, followed by return to duty. Mitigation strategies in place include consumption of approved food, water, and ice; hand washing; and applied food/water safety mechanisms.

### 6.1.4 Brucellosis

It is a common disease in cattle, sheep, goats, swine, and some wildlife species and is contracted via consumption of contaminated dairy products (or foods made with such products) or by occupational exposures to infected animals. Mitigation strategies in place include consumption of approved food (i.e., pasteurization of dairy products), and applied food/water safety mechanisms. With appropriate treatment, brucellosis is a febrile illness of variable severity, may require inpatient care, and convalescence is usually over 7 days even with appropriate treatment.

### 6.1.5 Hepatitis E

Hepatitis E occurs in four major genotypes. Genotypes 1 and 2 are found primarily in Africa and cause large numbers of sporadic cases, as well as large outbreaks. The most common source of exposure is fecal contamination of drinking water. Mitigation strategies in place include consumption of approved food and applied food/water safety mechanisms. Typical cases involve 1 to 3 weeks of debilitating symptoms and return to duty may require a month or more.

## 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. Mitigation strategies include a self-service station for dispensing of insect repellents. Personnel are also prescribed chemoprophylaxis. Mitigation strategies included proper wear of treated uniforms, application of repellent to exposed skin, and use of bed nets and chemoprophylaxis (when applicable). Additional methods included the use of pesticides, reduction of pest/breeding habitats, and environmental controls.

### 6.2.1 Crimean-Congo hemorrhagic fever (CCHF)

Crimean-Congo hemorrhagic fever is transmitted by Ixodid tick bites. The onset of CCHF is sudden, with initial signs and symptoms to include headache high fever, back pain, joint pain, stomach pain and vomiting. Treatment for CCHF is supportive care as there is no effective

medication to combat it. Recovery is slow and long-term effects are unknown. There is no safe and effective vaccine currently available for human use so preventive measures include tick repellent and screening for ticks.

#### 6.2.2 Leishmaniasis - cutaneous and visceral

Leishmaniasis is transmitted by sandflies typically at night. In groups of personnel exposed to heavily infected sandflies in focal areas. The most common symptom of cutaneous leishmaniasis is skin sores that can change in size and appearance over time. The symptoms of visceral leishmaniasis are fever, weight loss, enlarged spleen and liver, low red blood cell count, platelet count and white blood cell count. Some people may have no symptoms. Visceral disease can cause severe febrile illness which typically requires hospitalization with convalescence over 7 days. There is no vaccine for leishmaniasis so personnel must protect themselves using permethrin-treated clothing and insect repellent.

#### 6.2.3 Sand fly fever

Sand fly fever is transmitted by sandflies and occurs more commonly in children though adults are still at risk. Sand fly fever disease typically resulted in debilitating febrile illness requiring 1 to 7 days of supportive care followed by return to duty.

#### 6.2.4 West Nile fever

The disease is maintained in bird reservoirs and causes periodic outbreaks in humans and animals. Multiple species of *Culex* mosquitos can transmit the infection to humans. The majority of infections in young, healthy adults are asymptomatic although fever, headache, tiredness, body aches (occasionally with a skin rash on trunk of body), and swollen lymph glands can occur. In many parts of the world, even symptomatic cases typically are undiagnosed and unreported. A febrile illness requiring 1-7 days of inpatient care followed by return to duty is typical.

#### 6.2.5 Typhus-murine (flea borne)

Flea borne typhus is a significant cause of febrile illness in local populations that are exposed to rodents (particularly rats) and flea bites. Fleas can pass on the infection transovarially, which helps maintain the cycle of infection. The disease can cause debilitating febrile illness typically requiring 1 to 7 days of supportive care, followed by return to duty.

#### 6.2.6 Malaria

Malaria incidents are often associated with the presence of agriculture activity, including irrigation systems and standing water, which provide breeding habitats for vectors. A small number of cases may occur among personnel exposed to mosquito (*Anopheles* spp.) bites. Malaria incidents may 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.

### 6.2.7 Dengue Fever

Dengue fever is transmitted by *Aedes* spp. mosquitos, day-biting mosquitos that often breed in artificial containers, such as flower pots or discarded tires. Dengue fever is a debilitating febrile illness typically requiring 1 to 7 days of inpatient care, followed by return to duty. Some cases may require a longer recovery period.

### 6.2.8 Yellow Fever

Yellow fever is transmitted by *Aedes* spp. and other mosquitos may transmit infection between primates and humans. Yellow fever is a potentially severe disease that may require intensive care. Mortality rates may be 20-80% in hemorrhagic cases.

### 6.2.9 Chikungunya

Chikungunya is transmitted primarily by *Aedes aegypti* (a morning- and evening biting mosquito), and possibly *Aedes albopictus* (a day biting mosquito). Chikungunya causes a debilitating febrile illness typically requiring 1-7 days of inpatient care, followed by return to duty. In some cases, joint pain severe enough to limit activities may persist for weeks to months.

### 6.2.10 Zika

Zika is spread by daytime mosquitos, such as *A. aegypti* and *A. albopictus*. Zika causes a debilitating febrile illness typically requiring 1-7 days of inpatient care, followed by return to duty. Symptoms of Zika infection (e.g., fever, rash, joint and muscle pain, red eyes, and vomiting) may last for several days to a week. In some cases, severe neurological complications (Guillain-Barre) may occur.

### 6.2.11 Rickettsioses, tick-borne (spotted fever group)

Rickettsioses are transmitted by multiple species of hard ticks, including *Rhipicephalus* spp. and *Ixodes* spp. A debilitating febrile illness requiring 1 to 7 days of supportive care followed by return to duty is typical with appropriate treatment. More prolonged and severe infections may occur with rare fatalities.

### 6.2.12 Rift Valley Fever

Rift Valley Fever is transmitted by mosquitos (*Aedes* spp.) found in close proximity to livestock, typically in rural settings. Rift Valley Fever is a debilitating febrile illness typically requiring 1-7 days of supportive care, followed by return to duty. Retinopathy sometimes leading to blindness may occur in up to 10% of patients. Severe complications including hepatitis with hemorrhage, and encephalitis may occur, leading to fatalities.

### 6.2.13 Sindbis (and Sindbis-like viruses)

Sindbis is transmitted by mosquitos (*Culex* spp.), and risk is elevated during periods of

increased vector mosquito activity. Sindbis is a debilitating febrile illness often accompanied by rash, typically requiring 1 to 7 days of supportive care; significant arthralgia can persist for several weeks or more in some cases.

### 6.3 Water Contact Diseases

#### 6.3.1 Schistosomiasis

Waterborne transmission occurs when larval cercariae, found in contaminated bodies of freshwater, penetrate the skin. Humans are the principal reservoir for schistosomes and shed schistosome eggs in urine or feces. When water temperatures are at or above 68 degrees Fahrenheit (°F), the eggs hatch, releasing larvae. If a suitable freshwater snail species is present, the larvae penetrate the snail and, after a period of development, emerge as free-swimming cercariae. Cercariae infect human hosts by penetrating skin, usually while the person is wading or swimming. Mild infections of Schistosomiasis are generally asymptomatic. In very heavy acute infections, a febrile illness (acute schistosomiasis) may occur, especially with *S. japonicum* and *S. mansoni*, requiring hospitalization and convalescence over 7 days.

#### 6.3.2 Leptospirosis

Leptospirosis is a disease caused by bacteria that infected animals spread through their urine. Some people with leptospirosis will not have symptoms. When symptoms do occur, they can include fever, headache, chills, muscle aches, vomiting, jaundice, red eyes, stomach pain, diarrhea, and sometimes a rash. Without antibiotic treatment kidney and liver damage may occur. There is no vaccine approved in the United States to prevent leptospirosis. Prevention includes avoiding touching water or soil that has the potential to be contaminated and wearing footwear and other protective clothing.

### 6.4 Respiratory Diseases

Although not specifically assessed in this document, deployed U.S. Forces may be exposed to a wide variety of common respiratory infections in the local population. These include influenza, pertussis, viral upper respiratory infections, viral and bacterial pneumonia, and others. The U.S. military populations living in close-quarter conditions are at risk for substantial person-to-person spread of respiratory pathogens. Influenza is of particular concern because of its ability to debilitate large numbers of unvaccinated personnel for several days. Mitigation strategies included routine medical screenings, vaccination, enforcing minimum space allocation in housing units, implementing head-to-toe sleeping in crowded housing units, implementation of proper personal protective equipment (PPE) when necessary for healthcare providers and detention facility personnel.

#### 6.4.1 Tuberculosis (TB)

TB is a disease caused by bacteria that is spread in the air to others when coughing, speaking or singing. TB bacteria in the lungs can move through the blood to infect other parts of the body, such as the kidney, spine, and brain. Symptoms of TB disease in the lungs include a cough, pain, weakness, weight loss, chills, fever, and night sweats. Although a TB vaccine

does exist, it is not always recommended due to its variable effectiveness.

#### 6.4.2 Middle East Respiratory Syndrome (MERS)

The MERS coronavirus is genetically similar to bat coronaviruses and has been detected in camels in North Africa and the Arabian Peninsula. Evidence suggests that the virus can be spread from person to person among close contacts. Symptoms include acute and often severe respiratory compromise and may include chills, sore throat, myalgia, arthralgia, diarrhea, and vomiting. Since a vaccine does not exist, the CDC recommends frequent handwashing; avoid touching the eyes, nose, and mouth; and avoiding contact with sick people. The World Health Organization (WHO) recommends avoiding contact with camels, drinking raw camel milk or raw camel urine, and not consuming undercooked meat, particularly camel meat.

#### 6.4.3 COVID-19

According to the CDC, COVID-19 has a high level of infection. The incubation period for COVID-19 is 3-14 days from exposure. Symptoms can include fever, cough, shortness of breath, fatigue, muscle and body aches, headache, loss of taste or smell, nausea and diarrhea. As of December 2020, several effective vaccines have been authorized in the U.S. for decreasing the probability for severe symptoms, hospitalization, and death.

#### 6.4.4 Hantavirus

Hantavirus is spread through the air or by eating food contaminated with urine or droppings from rodents. Hantavirus can cause organ damage, especially to the kidneys and blood vessels. Complete recovery can take weeks to months. Symptoms of Hantavirus usually develop 3 to 4 weeks after infection but can occur as early as 1 week. Symptoms can include fatigue, fever, muscle aches, headaches, dizziness, chills, nausea, vomiting, diarrhea, and abdominal pain. There are no vaccines to prevent Hantavirus disease, but personnel can protect themselves by avoiding rodents.

#### 6.4.5 Measles

Measles is transmitted from person to person primarily by the airborne route as aerosolized droplet nuclei. Infected people are usually contagious from 4 days before until 4 days after rash onset. Measles is among the most contagious viral diseases known. Symptoms include prodromal fever that can rise as high as 105°F, conjunctivitis, coryza (runny nose), cough, and small spots with white or bluish-white centers on an erythematous base on the buccal mucosa (Koplik spots). A vaccine is available to prevent measles.

#### 6.4.6 Meningococcal meningitis

The disease is transmitted from person to person through droplets of respiratory or throat secretions. Close and prolonged contact facilitates the spread of this disease. Meningococcal meningitis is potentially a very severe disease typically requiring intensive care; fatalities may occur in 5-15% of cases. A vaccine is available to prevent meningococcal meningitis.

## 6.5 Animal-Contact Diseases

### 6.5.1 Rabies

Rabies is transmitted by exposure to the virus-laden saliva of an infected animal (e.g., dog, cat, or wildlife), typically through bites, but could occur from scratches contaminated with the saliva. Rabies affects the central nervous system. Without appropriate medical care, rabies causes brain disease and death. Symptoms include weakness or discomfort, fever, and headache. As time progresses an infected person may become delirious, hallucinate and become unable to swallow. A vaccine is available in the U.S. to prevent rabies.

### 6.5.2 Anthrax

Rare cases could occur among personnel with occupational-type exposure to livestock (e.g., cattle, sheep, goats, horses, pigs, water buffalo) or wild herbivores (e.g., antelopes, elephants, giraffes, zebras), or hides or wool products from these species, as well as handling or consumption of undercooked meat. Cutaneous anthrax (typically requiring 1 to 7 days of supportive care with return to duty) and gastrointestinal anthrax (typically requiring hospitalization, and fatality if untreated) are the most common forms of naturally occurring anthrax. The risk of naturally acquired inhalation (pulmonary) anthrax is remote. Inhalation anthrax is very severe, often requiring intensive care with potential fatalities occurring even in treated cases. Mitigation strategies in place include avoiding contact with livestock or consumption of undercooked meat.

### 6.5.3 H<sub>5</sub>N<sub>1</sub> avian influenza

Although avian influenza is easily transmitted among birds, bird-to-human transmission is extremely inefficient. Human-to-human transmission appears to be exceedingly rare, even with relatively close contact. Incidence could result in very severe illness with fatality rate higher than 50 percent in symptomatic cases. Mitigation strategies included avoidance of birds/poultry and proper cooking temperatures for poultry products.

## 6.6 Aerosolized Dust or Soil-contact Diseases

### 6.6.1 Soil-transmitted helminths (hookworm, strongyloidiasis, internal infestation, cutaneous larva migrans)

Soil-transmitted helminths (ascaris, whipworm, and hookworm) refer to the intestinal worms infecting humans that are transmitted through contaminated soil. Helminths live in the intestine and their eggs are passed in the feces of infected person. Ascaris and whipworm can also be transmitted by hand to mouth when hands are infected with contaminated dirt or by consuming vegetables or fruits that have not been cooked or washed. Heavy infections cause abdominal pain, diarrhea, blood and protein loss, and rectal prolapse. Soil-transmitted helminth infections are treatable with medication prescribed by a health care provider.

## 7 Venomous Animals

All information was taken directly from the Clinical Toxinology Resources web site from the University of Adelaide, Australia (Reference 14). The species listed below have home ranges that overlap the location of Camp Redleg and may present a health risk if they are encountered by personnel. See Section 10 for more information about pesticides and pest control measures.

### 7.1 Spiders

Most species of spiders found in UAE are not considered dangerous and rarely bite. However, the highly venomous redback spider (*Latrodectus hasselti*), which is indigenous to Australia, has been increasing in numbers in the UAE. The neurotoxic venom causes severe pain and is dangerous to humans.

### 7.2 Scorpions

*Androctonus crassicauda* (black scorpion): Severe envenoming possible and potentially lethal, however most stings cause only severe local pain and swelling.

*Hemiscorpius arabicus*: Clinical effects unknown, related to a medically important species so major envenoming cannot be excluded. *Hottentotta jayakari*: Moderate envenoming possible but unlikely to be lethal.

*Buthacus leptochelys*, *Buthacus yotvatensis*, *Compsobuthus arabicus*, *Compsobuthus maindroni*, and *Vachoniolus globimanus*: Clinical effects unknown; there are a number of dangerous Buthid scorpions, but there are also some known to cause minimal effects only. Without clinical data it is unclear where this species fits within that spectrum.

### 7.3 Snakes

*Astrotia stokesii*, *Hydrophis gracilis*, *Hydrophis lapemoides*, *Hydrophis spiralis*, *Hydrophis viperine*, *Lapemis curtus*: Clinical effects are unknown, but related to a medically important species; therefore, major envenoming cannot be excluded. *Cerastes*, *Cerastes gasperettii* (Gasperetti's horned viper), and *Walterinnesia morgani*: Potentially lethal envenoming, though unlikely.

*Echis omanensis*, *Echis sochureki*, *Enhydrina schistosa*, *Hydrophis cyanocinctus*, *Hydrophis ornatus*, *Pelamis platurus*: Severe envenoming possible, potentially lethal.

*Pseudocerastes persicus*: Unknown but unlikely to cause significant envenoming.

### 7.4 Short-term health risk:

**Low.** If encountered, effects of venom vary with species from mild localized swelling to potentially lethal effects. See effects of venom above. Mitigation strategies included avoiding contact, proper wear of uniform (especially footwear), and timely medical treatment.

## 7.5 Long-term health risk:

None identified.

## 8 Heat/Cold Stress

### 8.1 Heat

The UAE has a desert climate, characterized by mild winters and very hot, sunny summers. Summer (April – October) average monthly high temperatures range from 103 degrees Fahrenheit (°F) to 110°F with an average high temperature of 106°F based on historical climatological data from the Climates to Travel: World Climate Guide. The health risk of heat stress/injury based on temperatures alone is Low (< 78°F) in January, Moderate (78-81.9°F) in February and December, High (82-87.9°F) in March and November, and Extremely High (≥ 88°F) from April – October. However, work intensity and clothing/equipment worn introduce greater risk of heat stress/injury than environmental factors alone (Reference 15). Managing risk during hot weather operations included monitoring work/rest periods, proper hydration, and taking individual risk factors (e.g., acclimation, weight, and physical conditioning) into consideration. Risk of heat stress/injury was reduced with preventive measures.

#### 8.1.1 Short-term health risk:

**Low to High, mitigated to Low.** The risk of heat injury was reduced to low through preventive measures such as work/rest cycles, proper hydration and nutrition, and monitoring Wet Bulb Globe Temperature (WBGT). Risk of heat injury in unacclimatized or susceptible populations (older, previous history of heat injury, poor physical condition, underlying medical/health conditions), and those under operational constraints (equipment, PPE, vehicles) is extremely high from April - October. Confidence in the health risk estimate is low (Reference 9, Table 3-6).

#### 8.1.2 Long-term health risk:

**Low.** The long-term risk is Low. However, the risk may be greater for 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 may occur, especially from more serious injuries such as heat stroke. It is possible that high heat in conjunction with various chemical exposures may increase long-term health risks, though specific scientific evidence is not conclusive. Confidence in the health risk estimate is low (Reference 9, Table 3-6).

### 8.2 Cold

Winter (December – February) monthly mean daily minimum temperatures range from 57-61°F with an average temperature of 59°F. The risk assessment for Non-Freezing Cold Injuries (NFCI), such as chilblain, trench foot, and hypothermia, is low based on historical temperature and precipitation data. Frostbite is unlikely to occur because temperatures do not drop below

freezing. As with heat stress/injuries, cold stress/injuries are largely dependent on operational and individual factors instead of environmental factors alone.

#### 8.2.1 Short-term health risks:

**Low.** The health risk of cold injury is Low. Confidence in the health risk estimate is low (Reference 9, Table 3-6).

#### 8.2.2 Long-term health risks:

**Low.** The health risk of cold injury is Low. Confidence in the health risk estimate is low (Reference 9, Table 3-6).

## 9 Noise

For the protection of all military personnel and noise-exposed civilian personnel from hearing loss resulting from hazardous occupational and operational noise exposure, the DoD set forth a military noise standard for continuous and intermittent (i.e., steady state) noise exposure and for impulse noise (i.e., noise lasting less than one second) exposure. The standard for continuous and intermittent noise is 85 decibels on the A-weighted scale (dBA), as an eight-hour time-weighted average. The A-weighted scale of noise measurement is used because it mimics the human ear's response to sound. The standard for impulse noise sound pressure levels is 140 decibels peak (dBp). All personnel that are exposed to continuous and intermittent noise levels at or above 85 dBA for at least one day per year or to impulse noise 140 dBp sound pressure or greater must be enrolled in the hearing conservation program (Reference 16).

### 9.1 Continuous

Tactical generators were located about 10 – 20 meters from personnel and a noise level of 115 dBA was reported in 2017. A noise meter was not available in 2018. A noise meter was available in 2019 and 2020 and reported noise levels of 60 dBA about 30 meters from the generators. Although a prime power location existed on the base camp, tactical generators were used to run the overall load of the camp. Noise barriers were installed in 2020 around the tactical generators and prime power location to dampen the noise levels (References 4-8).

### 9.2 Impulse

No specific hazard sources were documented in the DOEHRs from 01 January 2017 through 31 December 2020 timeframe.

## 10 Unique Incidents/Concerns

### 10.1 Potential environmental contamination sources

DoD personnel are exposed to various chemical, physical, ergonomic, and biological hazards in the course of performing their mission. These types of hazards depend on the mission of the unit and the operations and tasks which the personnel are required to perform to complete

their mission. The health risk associated with these hazards depends on a number of elements including what materials are used, how long the exposure last, what is done to the material, the environment where the task or operation is performed, and what controls are used. The hazards can include exposures to heavy metal particulates (e.g., lead, cadmium, manganese, chromium, and iron oxide), solvents, fuels, oils, and gases (e.g., carbon monoxide, carbon dioxide, oxides of nitrogen, and oxides of sulfur). Most of these exposures occur when performing maintenance tasks such as painting, grinding, welding, engine repair, or movement through contaminated areas. Exposures to these occupational hazards can occur through inhalation (air), skin contact, or ingestion; however, exposures through air are generally associated with the highest health risk.

## 10.2 Waste Sites/Waste Disposal

Hazardous waste and regulated medical waste were collected on the base camp and transported off-site by a subcontractor (References 4-8).

## 10.3 Fuel/petroleum products/industrial chemical spills

Steel drums containing fuel were located on the base camp. No spills were documented in the OEHSAs (Reference 4-8).

## 10.4 Pesticides/Pest Control:

The health risk of exposure to pesticide residues is considered within the framework of typical residential exposure scenarios, based on the types of equipment, techniques, and pesticide products that have been employed, such as enclosed bait stations for rodenticides, various handheld equipment for spot treatments of insecticides and herbicides, and a number of ready-to-use (RTU) methods such as aerosol cans and baits. The control of rodents required the majority of pest management inputs, with the acutely toxic rodenticides staged as solid formulation lethal baits placed in tamper-resistant bait stations indoors and outdoors throughout cantonment areas. Nuisance insects, including biting and stinging insects such as bees, wasps, and ants, also required significant pest management inputs. Use of pesticides targeting against these pests generally involved selection of compounds with low mammalian toxicity and short-term residual using pinpoint rather than broadcast application techniques.

### 10.4.1 Rodenticides

Nothing was documented in the OEHSA(s) to control rodents.

### 10.4.2 Insecticides

Nothing was documented in the OEHSA(s) to control insects.

### 10.4.3 Herbicides

Nothing was documented in the OEHSA(s) to control weeds.

#### 10.5 Asbestos

No specific hazard sources were documented in the DOEHRS from 01 January 2017 through 31 December 2020 timeframe.

#### 10.6 Lead Based Paint

No specific hazard sources were documented in the DOEHRS from 01 January 2017 through 31 December 2020 timeframe.

#### 10.7 Burn Pit/Incinerator

No Burn pits or incinerators were present at Camp Redleg.

## 11 References

1. Department of Defense (DoD) Instruction 6490.03, *Deployment Health*, 19 June 2019.
2. DoDI 6055.05, Occupational and Environmental Health, 13 August 2018.
3. Defense Occupational and Environmental Health Readiness System (referred to as the DOEHRS-EH database) at <https://doehrs-ih.csd.disa.mil/Doehrs/>.
4. Occupational and Environmental Health Site Assessment (OEHSA). 172<sup>nd</sup> MED DET, Base Camp Redleg. March 2017.
5. OEHSA. 223 MED DET (PM), Base Camp Redleg. May 2018.
6. OEHSA. 926th MED DET, Base Camp Redleg. January 2019.
7. OEHSA. 898th MED DET, Base Camp Redleg. November 2019.
8. OEHSA. 3D MED CMD FWD, Base Camp Redleg. July 2020.
9. USAPHC 2013 TG230: Environmental Health Risk Assessment and Chemical Exposure Guidelines for Deployed Military Personnel. June 2013 Revision.
10. Center for Disease Control and Prevention (CDC), Travelers Health. <https://wwwnc.cdc.gov/travel/>
11. Modification 13 to United States Central Command Individual Protection and Individual Unit Deployment Policy, March 2017
12. Modification 14 to United States Central Command Individual Protection and Individual Unit Deployment Policy, October 2019.
13. Modification 15 to United States Central Command Individual Protection and Individual Unit Deployment Policy, April 2020.
14. Clinical Toxinology Resources: <http://www.toxinology.com>. University of Adelaide, Australia.
15. Goldman RF. 2001. Introduction to heat-related problems in military operations. In: Textbook of military medicine: medical aspects of harsh environments Vol. 1, Pandolf KB, and Burr RE (Eds.), Office of the Surgeon General, Department of the Army, Washington DC.
16. DoDI 6055.12, Hearing Conservation Program, 14 August 2019.

## 12 Where Do I Get More Information?

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 Centers for Public Health organization below. Organizations external to DoD should contact Deputy Assistant Secretary of Defense for Health Readiness Policy and Oversight (HRP&O).

**Defense Centers for Public Health – Aberdeen** Phone (USAPHC) Phone: (800) 222-9698. <http://phc.amedd.army.mil/>

**Defense Centers for Public Health – Portsmouth** Phone: (757) 953-0700.  
<http://www.med.navy.mil/sites/nmcphc/Pages/Home.aspx>

**Defense Centers for Public Health – Dayton** Phone: (888) 232-3764.  
<http://www.wpafb.af.mil/afrl/711hpw/usafsam.asp>

**DoD Health Readiness Policy and Oversight (HRP&O)** Phone: (800) 497-6261.  
<https://www.health.mil/About-MHS/OASDHA/HRPO>