

Military Deployment
Periodic Occupational and Environmental Monitoring Summary (POEMS):
Al Dhafra Air Base (ADAB), U.A.E.

AUTHORITY: This POEMS has been developed in accordance with Department of Defense (DoD) Instructions 6490.03, *Deployment Health*, 2006, 6055.05, Occupational and Environmental Health, 2008, and JCSM (MCM) 0028-07, *Procedures for Deployment Health Surveillance*, 2007.

NOTE: This is a correction to the POEMS dated January 2011. There was an error in the calculation for long term risk assessment for PM 2.5. The correction is reflected in this POEMS and the January 2011 version should be considered invalid.

PURPOSE: This POEMS documents the DoD assessment of base camp level occupational and environmental health (OEH) exposure data for ADAB. It presents the identified health risks and associated medical implications. The findings are based on information collected April 1999 through October 2010 to include 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 be fully representative of all the 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 DESCRIPTION: Al Dhafra Air Base (ADAB) is located in the Emirate of Abu Dhabi in the United Arab Emirates (UAE). The Base is approximately 47 km southwest of the City of Abu Dhabi. The nearest town is Mafrag, which is a small residential community 10 km to the northeast. ADAB has supported United States Air Force Central (USAFCENT) operations since August 1990. USAFCENT conducts aircraft operations in Ops/Mx Town, and forces are bed down at the Phantom East and West compounds. The Army operates its Patriot Missile Site in a location east of the main runway, south of the Phantom East area. The airfield has two runways and is used for Air Force refueling tankers, AWACS, high-altitude and unmanned ISR missions, Emirate fighters and rotary wing aircraft. There are approximately 350 structures on ADAB including barracks, administrative buildings, clinic, dining facilities, bunkers, aircraft hangars, warehouses, maintenance facilities, sprung for the theater and gymnasiums, swimming pool, and other buildings. It is home to approximately 2,000 military, civilian, and coalition personnel. Personnel deployed to Al Dhafra residents, are able to travel off base for recreational and work-related activities. Such travel includes trips to public facilities in Abu Dhabi and Dubai.

SUMMARY: The table on the following page provides a list of the overall identified health risks at ADAB. Summarized below are the key health risks estimated to present a Moderate or greater risk of medical concern along with recommended follow-on medical actions that providers should be aware. 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 noted but not routinely available/feasible. Public health resources used: <https://www.intelink.gov/ncmi/country.php?country=ARE> and <https://www.us.army.mil/suite/portal/index.jsp>.

Short-term health risks & medical implications: The following sources of health risk may have caused acute effects in some personnel during deployment at ADAB: inhalable coarse particulate matter less than 10 micrometers in diameter (PM₁₀); food/waterborne diseases (e.g., diarrhea); other endemic diseases, and heat stress.

If ingesting local food and water, food/waterborne disease resulting in diarrhea can temporarily incapacitate personnel. For heat stress, risk can be greater for susceptible persons including those older than 45, of low fitness level, or with underlying medical conditions. Risks from food/waterborne diseases, and heat stress can be reduced with preventive medicine controls and mitigation.

For PM₁₀, certain subgroups of the deployed forces (e.g., those with pre-existing asthma/cardio pulmonary conditions) are at greatest risk of developing notable health effects. Although most effects from exposure to PM₁₀ and chemical pollutants 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 ADAB. 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*) or equivalent.

Long-term health risks & medical implications: The types of hazards associated with potential long-term health effects at ADAB include inhalable fine particulate matter less than 2.5 micrometers in diameter (PM_{2.5}), and for certain populations, continuous noise.

For noise hazards, providers should consider any potential unique individual exposures (such as occupational or specific personal dosimeter data) when assessing individual concerns. For example, at all bases certain individuals 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).

| Where Do I Get More Information? | | | |
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| <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 & R).</p> | | | |
| <p>U.S. Army Public Health Command (USAPHC) Phone: (800) 222-9698 http://phc.amedd.army.mil/Pages/default.aspx</p> | <p>Navy and Marine Corps Public Health Center (NMCPHC) (formerly NEHC) Phone: (757) 953-0700 http://www-nehc.med.navy.mil</p> | <p>US Air Force School of Aerospace Medicine (USAFSAM) (formerly AFIOH) Phone: (888) 232-3764 https://kx.afms.mil/esoh</p> | <p>DoD Force Health Protection and Readiness (FHP & R) Phone: (800) 497-6261 http://fhp.osd.mil</p> |
| <p>Occupational and environmental sampling data are available in Defense Occupational and Environmental Health Readiness System (DOEHS) at https://doehrs-ih.csd.disa.mil/Doehrs/. Additional environmental health reports/information are in the DoD OEHS Data Portal: https://doehportal.apgea.army.mil/doehrs-oehs/. Regional/country info on endemic/infectious disease from National Center for Medical Intelligence (NCMI) is at https://www.intelink.gov/ncmi/index.php</p> | | | |

POEMS

Population-Based Health Risk Estimates – Al Dhafra Air Base, U.A.E. ^{1,2}

| Sources of Identified Health Risks ³ | Health Risk Assessment Summary ⁴ | |
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| | Short Term Health Risk | Long Term Health Risks |
| AIR | Airborne Substances – Overall Short Term Risks: Low to Moderate: | Airborne Substances – Overall Long-Term Risks: Moderate |
| Particulate matter (PM ₁₀) | Variable (Low to High). | Not evaluated-No available health guidelines. |
| Particulate matter (PM _{2.5}) | Low. | Low. |
| Metals | Low. | Low. |
| Chemical Pollutants | Not evaluated – No data available | Not evaluated – No data available |
| SOIL | Soil - Overall Short Term Risks: Not Evaluated | Soil - Overall Short Term Risks: Not evaluated – No data available |
| Metals, organic and inorganic compounds | Not evaluated per current USAPHC protocols. | Not evaluated – No data available |
| WATER | Waterborne Substances – Overall Short Term Risks Low: | Waterborne Substances – Overall Long Term Risks: Not evaluated – No data available |
| Used for Drinking | Not evaluated – No data available | Not evaluated – No data available |
| Used for Other Purposes | Not evaluated – No data available | Not evaluated – No data available |
| MILITARY UNIQUE | Military Unique – Overall Short Term Risks Low: | Military Unique – Overall Long Term Risks Low: |
| (e.g. CBRN; Depleted Uranium; Ionizing/Non ionizing radiation) | None Identified | None Identified |
| ENDEMIC DISEASE | Endemic Disease – Overall Short Term Risks Low to Moderate: | Endemic Disease – Overall Long Term Risks Low to Moderate: |
| Food borne/Waterborne (e.g., diarrhea- bacteriological) | Moderate: Off-base food or water: Diarrhea (bacterial and protozoal), Hepatitis A; | None Identified |
| Arthropod Vector Borne | Moderate Risk: Crimean-Congo Hemorrhagic Fever | None Identified |
| Respiratory | Low: Tuberculosis and meningococcal meningitis | A Tuberculosis skin test is required post-deployment if potentially exposed to TB. |
| Water-Contact (e.g. wading, swimming) | Moderate Risk: Leptospirosis | None Identified |
| Animal Contact | Low to Moderate Risk 1. Moderate Risk: Q Fever 2. Low Risk: Rabies | None Identified |
| VENOMOUS ANIMAL/INSECTS | Venomous Animals/Insects – Overall Short Term Risks: Low | Venomous Animals/Insects – Overall Long Term Risks Low: |
| Snakes, scorpions, and spiders | Snakes, scorpions, and venomous fish are all present in the UAE. | None Identified |
| HEAT/COLD STRESS | Heat/Cold – Overall Short Term Risks: Moderate to High | Heat/Cold – Overall Long Term Risks:Low |
| Heat | Variable (Low to High). Risk reduced to moderate with preventive medicine controls/mitigation | None Identified |
| NOISE | Noise – Overall Short Term Risks: Low | Noise – Overall Long Term Risks: Variable (Low to Moderate) |
| Continuous | Low. | Low for many personnel. Moderate: Those working flight line and in industrial shops who don't use hearing protection. |

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| Impulse | Low: Limited exposure. Impulse noise sources are limited to Security Forces, EOD, etc. Exposures are documented in DOEHRS. | Low |
| OTHER UNIQUE OCCUPATIONAL HAZARDS | Other – Overall Short Term Risks: Low | Other – Overall Long Term Risks: Low |
| (e.g. Pesticides, asbestos, lead-based paint, waste disposal) | Low | Low |
| UNIQUE INCIDENT/CONCERNS | Unique Incident/Concerns – Overall Short Term Risks: Low | Unique Incidents/Concerns– Overall Long Term Risks: Low |
| | None Identified | None Identified |

¹ 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 **ADAB**. It does not represent a unique individual exposure profile. Actual individual exposures and health effects depend on many variables. For example, while a chemical may be present in the environment, if a person does not inhale, ingest, or contact a specific dose of the chemical for adequate duration and frequency, then there may be no health risk. Alternatively, a person at a specific location may experience 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 or equivalent.

² This assessment is based on specific data and reports obtained through April 1999 - October 2010. It is considered a current representation of general site conditions but may not reflect certain fluctuations or unique exposure incidents. Acute health risk estimates are generally consistent with field-observed health effects.

³ 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 **ADAB**. The health risks are presented as Low, Moderate, High or Extremely High for both acute and chronic health effects. The 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 USAFSAM. Where applicable, “None Identified” is used when though an exposure was identified, no 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 are discussed in the following sections of this report.

⁴ 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 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.

REFERENCES: Al Dhafra Air Base, United Arab Emirates POEMS

POEMS developed according to:

1. DoDI 6490.03, Deployment Health, 2006.
2. DoDI 6055.05, Occupational and Environmental Health, 2008.
3. CJCS (MCM) 0028-07, Procedures for Deployment Health Surveillance, 2007.
4. Klaassen, C.D. Casarett & Doull's Toxicology: the Basic Science of Exposures, Chapter 2, Principles of Toxicology; Fifth Edition, McGraw Hill, New York.

Site description and baseline information obtained from:

5. ADAB Occupational and Environmental Health Site Assessment, dated Nov 2010.
6. Stanley Consultants Master Planning Submittal (Al Dhafra Air Base Master Plan – 90%), dated April 2010

Sampling data were obtained from the:

7. Defense Occupational and Environmental Health Readiness System (DOEHRS) at <https://doehrs-ih.csd.disa.mil/Doehrs/>. Some of the data may be classified or otherwise have some restricted distribution. See discussion below.

Additional environmental health reports/survey documents are from the:

8. DOD OEHS Data Portal: <https://doehportal.apgea.army.mil/doehrs-oehs/>. Some of the data and reports used may be classified or otherwise have some restricted distribution.

Chemical hazards (air, water, soil) evaluated based on military exposure guidelines (MEGs) and risk assessment methodology in:

9. USACHPPM TG230, (Jun 2010) Chemical Exposure Guidelines for Deployed Military Personnel TG230. For further information, contact USAPHC (Prov) Environmental Health Risk Assessment Program at: commercial 410-436-2953 or DSN 584-2953.
10. USACHPPM, Particulate Matter Factsheet No. 64-009-0708, 2008.

Regional/country information on endemic/infectious disease and heat/cold from the:

11. National Center for Medical Intelligence (NCMI) Web site is: <https://www.intelink.gov/ncmi/index.php>

NOTE. The DOEHRS database was queried to obtain the available sample data for air, soil, and drinking and nondrinking water sources at AASAB. The data are currently assessed using the TG 230, June 2010 Revision. The general method involves an initial check of the data which eliminates all chemical substances not detected above 1-year 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 health 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 subject matter experts, which includes comparison to any available marginal, critical, or catastrophic MEGs. For drinking water, 15 liters/day (L/day) MEGs are used for the screening while site specific 5–15 L/day are used for more detailed assessment. For nondrinking water (such as that used for personal hygiene or cooking) the consumption rate is limited to 2L/day (similar to the US Environmental Protection Agency (USEPA)), which is derived by multiplying the 5-L/day MEG by a factor of 2.5. This value is used to conservatively assess nondrinking uses of water.

Discussion of Health Risks at Al Dhafra Air Base (ADAB) by Source

The following tables describe the major source categories of potential health risk that were evaluated at ADAB. For each category, 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 these tables identify sub-categories that have been determined to present no identifiable health risk, the summary table on the previous page only contains those sub-categories that were determined to pose some level of potential health risk.

Limitations:

1. Sampling data used for this assessment is derived from USAPHC-Main only. Analyses conducted by USAPHC-Europe were not included due to database compatibility issues.
2. The health risk assessments are based on retrospective analysis of sampling data and limited field notes. Assumptions regarding representativeness and duration of exposure were necessary.
3. In general, samples weren’t collected with the intent of characterizing a mean and/or range of exposures. The data presented in the POEMS represents the mean of the existing sampling data, not the mean exposure. The same is true for the percentages at each risk level (i.e. The percentages do not indicate the percentage of days that exceeded a MEG. The percentages represent the number of samples collected that exceed the MEG.)

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| 1. AIR | | |
| Site-Specific SOURCES Identified (all those checked): | | |
| <input checked="" type="checkbox"/> Wind-blown Sand | <input type="checkbox"/> Commercial Industry | <input checked="" type="checkbox"/> Other: Vehicles |
| <input type="checkbox"/> Burn pits | <input type="checkbox"/> Agricultural | <input type="checkbox"/> Not Determined |
| Personnel deployed to ADAB are exposed to various airborne constituents. These have been identified through the Department of Defense Enhanced Particulate Matter Surveillance Program (EPMS) monitoring and sampling efforts between February 2006 and February 2007. Windblown dust, industrial pollution, and sand contribute to PM exposures above health-based Military Exposure Guidelines (MEGs). There are a number of local UAE industrial activities within 2 miles of the base, including petrochemical manufacturing, construction, water and wastewater treatment, and ADAB fuel storage and distribution, that may contribute to air contaminants. | | |
| Assessment of Data and Identified Risks | | |
| <i>Particulate matter, 10 microns (PM₁₀)</i> (see USACHPPM Fact Sheet No. 64-009-0708, Particulate Matter Air Pollution Exposures During Military Deployments, for more details) | Sample data/Notes: Exposure Guidelines: Short-term (24-hour) PM ₁₀ MEGs expressed in micrograms per cubic meter (µg/m ³): Negligible MEG=250, Marginal MEG=420, Critical MEG=600; Long-term (1-year) PM ₁₀ MEG: Not available (see long-term risk note). Degree of risk is estimated based on comparison of concentrations to specified MEGs. | |
| | The range of 24-hour PM ₁₀ concentrations in 39 samples from 2006 was 26 to 561 µg/m ³ . The average concentration was 261 µg/m ³ , the standard deviation was 155 µg/m ³ , and the median was 126.0 µg/m ³ . There was no sampling data available for all other years. | |
| | Short-Term Health Risk: Variable Low-High. Short term risk is based on comparison of daily concentrations to 24-hour MEGs. The variability in the risk is due to significant fluctuation in the daily concentration. This risk assessment only conducted for 2006 because there was no/insufficient data for all other years. | |
| For 2006, 36/39 (92%) sampling days had concentrations less than the 24 hr negligible MEG (LOW Risk), 0 sampling days had concentrations between the 24- | | |

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| | <p>hour negligible and marginal MEGs, 0 sampling days had concentrations between the 24-hour marginal and critical MEGs, and 3/39 (8%) samples is above the critical MEG (HIGH Risk), Confidence in this risk assessment is low -medium due to small sampling size and limitations in sampling data.</p> <p>Respiratory effects can increasingly impact real-time health and mission capabilities as daily concentrations exceed higher levels of MEGs. Acute effects to relatively healthy troops are mostly eye, nose, and throat irritation, and respiratory effects (sneezing, adaptive responses such as coughing, sinus congestion and drainage) that can be exacerbated by increased activity.</p> <p>Long-term health risk: Not Evaluated - No available health guidelines. The USEPA has retracted its long-term standard (National Ambient Air Quality Standards [NAAQS]) for PM10 due to an inability to clearly link chronic health effects with long-term PM10 exposure levels.</p> |
| <p><i>Particulate matter, 2.5 microns (PM_{2.5})</i></p> <p>(see USACHPPM 2008 PM factsheet; 64-009-0708 for more details)</p> | <p>Sample data/Notes: Exposure Guidelines: Short-term (24-hour) PM_{2.5} MEGs expressed in micrograms per cubic meter (µg/m³): Negligible MEG=65, Marginal MEG=250, Critical MEG=500; Long-term (1-year) PM_{2.5} MEG: Negligible MEG=15, Marginal MEG=65</p> <p>The range of 24-hour PM_{2.5} concentrations in unknown number of samples was 18 to 136 µg/m³. The average concentration was 52 µg/m³, the standard deviation was 33 µg/m³ and the median was 46.7 µg/m³.</p> <p>Short-Term Health Risk: Low. Short term risk is based on comparison of daily concentrations to 24-hour MEGs. This risk assessment is only conducted for 2006 due to insufficient data for all other years.</p> <p>Risk Assessment only conducted for 2006 due to insufficient data for all other years. For 2006 26/41 (63%) samples were below the 24 hr negligible MEG (LOW Risk); 15/41 (37%) samples were between the 24hr negligible and marginal MEGs (LOW Risk). Confidence in this risk assessment is low to medium due to the small data set and limitations in sampling data.</p> <p>During the highest levels of PM_{2.5}, a few personnel may experience mild effects. Preexisting health conditions (i.e. asthma or cardiovascular diseases) may be exacerbated. On most days, some or all of these same health effects could occur in some personnel, but at even lower amounts than those noted above during the highest levels of PM_{2.5}.</p> <p>Long-term health risk: Low. Long-term risk is based on comparison of the yearly average sample concentration to the long-term MEGs. This risk assessment is based on 2006 data only due to insufficient data from all other years. Unlike PM₁₀, long-term PM_{2.5} exposures are potentially associated with certain long-term health consequences.</p> <p>The average concentration for the 41 samples collected in 2006 is 60 ug/m³. This is greater than the 1-year negligible MEG, but less than the 1-year marginal MEG. Confidence in risk estimate is low due to limitations in field data and health effects data</p> <p>A small percentage of susceptible personnel may develop chronic conditions (such as reduced lung function or exacerbated chronic bronchitis, chronic obstructive pulmonary disease, asthma, atherosclerosis, or other cardiopulmonary diseases) increases. Those with a history of asthma or cardiopulmonary disease have a higher risk for developing these chronic conditions</p> |

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| <i>Metals</i> | <p>Sample Data/Notes: Exposure Guidelines: Short-term (14-day, 8-hour) cadmium MEGs expressed in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$): 14-day Negligible=0.0205, 8-hour Negligible=41; Long-term (1-year) cadmium MEG: Negligible= 0.00685</p> <p>Short-term (14-day) vanadium MEG expressed in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$): 14-day Negligible=0.0685; Long-term (1-year) vanadium MEG: Negligible= 0.548. Degree of risk is estimated based on comparison of concentrations to specified MEGs.</p> <p>48 samples were collected from February 2006 – July 2007. None of the analyzed metals were found at concentrations above a short or long term MEG. Three of the analyzed metals were detected above a long term MEG: beryllium, cadmium, and vanadium. The degree of risk is estimated based on the comparison of metals results to specified MEGs.</p> |
| | <p>Short-Term Health Risk: Low. All contaminants measured at concentrations below short term MEGs except for vanadium. 2/48 samples exceeded the 14-day negligible MEG of 0.548 $\mu\text{g}/\text{m}^3$.</p> <p>Few, if any, personnel are expected to have noticeable health effects during the mission. Personnel are likely to be exposed to levels that would result in a negligible severity. Confidence in this risk assessment is low based on limitations in sampling data and analytical limits of detection.</p> |
| | <p>Long-Term Health Risk: Low. Two metals were detected above the 1-year negligible MEG (cadmium, vanadium). The lab didn't report the detection limit for either of these metals. This means that it is difficult to determine the true concentration measured. For cadmium, the 1-yr negligible MEG is 0.00685 $\mu\text{g}/\text{m}^3$. 48/48 samples exceeded the MEG, with the peak concentration being 0.02 $\mu\text{g}/\text{m}^3$. The 1-year negligible MEG for Vanadium is 0.0685 $\mu\text{g}/\text{m}^3$. 31/48 samples had concentrations greater than the MEG, with the peak concentration being 0.88 $\mu\text{g}/\text{m}^3$.</p> <p>Few, if any, personnel are expected to have noticeable health effects during the mission. Personnel are likely to be exposed to levels that would result in a negligible severity. Confidence in this risk assessment is low based on limitations in sampling data and analytical limits of detection.</p> |
| <i>Chemical Pollutants (gases and vapors)</i> | <p>Sample data/Notes: No sampling data available.</p> |
| | <p>Short and Long-Term Health Risk: Not evaluated</p> |

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| 2. SOIL | | |
| Site-Specific SOURCES of Contaminants Identified (all those checked): | | |
| <input type="checkbox"/> Waste Site/Burn pits | <input type="checkbox"/> Commercial Industry _____ | <input checked="" type="checkbox"/> None |
| <input type="checkbox"/> Agricultural | <input type="checkbox"/> Other : vehicles | <input type="checkbox"/> Not Determined |
| No evidence of sources that could result in contaminated soil (no pre-existing hazardous waste sites/spills) | | |
| Assessment of Data and Identified Risks | | |
| <i>Analyses includes metals/inorganics as well as organics</i> | Sample data/Notes: No sampling data available | |
| | Short and Long-Term Health Risk: Not evaluated. | |

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| 3a. WATER: Drinking Water | | | |
| Identified Water Supplies | | | |
| <input checked="" type="checkbox"/> Bottled; Locally procured | <input type="checkbox"/> Military Bottled/Packaged (unknown) | <input type="checkbox"/> ROWPU | <input type="checkbox"/> Municipal Sources; Treated on base |
| Bottled drinking water is supplied from locally procured bottled water companies approved by US Army VETCOM (USAVETCOM) Services personnel. Two commercial vendors supply bottled drinking water to ADAB, Emirates Pure Spring Water Co. and Masafi Corp. The USAVETCOM approves drinking water sources. Initial testing is required prior to USAVETCOM approval, after which time, recurring routine field tests are conducted by USAVETCOM; approved water is distributed for DoD consumption by the Seven Seas Shipchangers LLC. When pallets of bottled water arrive at ADAB, bottles from the shipment are selected for routine testing by Bioenvironmental Engineering. Sampling is conducted in accordance with procedures outlined in TB Med 577 (including bacteriological, pH and other sanitation surveillance parameters). | | | |
| Assessment of Data and Identified Health Risks | | | |
| <i>Analyses include metals/inorganics as well as organics</i> | Sample data/Notes: No bottled water samples were submitted to USAPHC for analysis during the timeframe of this POEMS. | | |
| | Short and Long-Term Health Risk: Not evaluated | | |

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| 3b. WATER: Used for Drinking and Other Purposes(Personal Hygiene, Cooking, Showering, etc) | | | |
| Identified Water Supplies | | | |
| <input type="checkbox"/> Bottled; Locally procured | <input type="checkbox"/> Military Bottled/Packaged (unknown) | <input type="checkbox"/> ROWPU | <input checked="" type="checkbox"/> Municipal Sources; (Treated on base) |
| There are 12 sites throughout ADAB that produce potable water, which include 3 dining facilities, 3 Medical Group sinks, 5 ice machines (ECS, 363 Training Group, Thirsty Camel, Oasis), Subway. These sites use ADAB distribution water (see details in section below) which is filtered by multi-stage filters and disinfected by ultraviolet light. Water from these facilities is used for consumption, preparing food and drinks, washing dishes. | | | |
| Monthly field tests, to include bacteriological, free available chlorine (FAC), pH and other sanitation surveillance parameters per TB MED 577, are conducted by 380 EMDG/SGPB. | | | |
| Assessment of Data and Identified Health Risks | | | |
| <i>Analyses include metals/inorganics as well as organics</i> | Sample data/Notes: No samples were sent to USAPHC for analysis during the time frame of this POEMS. | | |
| | Short and Long-Term Health Risks: Not evaluated. | | |

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| 3b. WATER: Water for Other Purposes (Personal Hygiene, Cooking, Showering, etc) | | | |
| Identified Water Supplies | | | |
| <input type="checkbox"/> Bottled; Locally procured | <input type="checkbox"/> Military Bottled/Packaged (unknown) | <input type="checkbox"/> ROWPU | <input checked="" type="checkbox"/> Municipal Sources (untreated) |
| ADAB water is supplied by Abu Dhabi Water and Electricity Authority through the distribution company, Abu Dhabi Distribution Company. The source of this water is a desalination plant located near the bridges that cross on the city of Abu Dhabi. Water is transported from Abu Dhabi in a 900 mm main. A 600 mm branch main is used to supply water to the base. | | | |
| This Host Nation supply pipeline provides water to both the Ops/Mx Town area and to the Phantom East | | | |

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| <p>and West compounds. Other remote units such as the Patriot, POL distribution, ATOC and R-11 sites are connected directly to nearby Host Nation water supply pipelines.</p> <p>Host Nation water is distributed to the dormitories and work facilities for showers, toilets, personal hygiene, dust abatement, street cleaning, and washing of aircraft. Routine field tests conducted by Bioenvironmental Engineering include bacteriological, CBRN, FAC, and other sanitation surveillance parameters per TB Med 577.</p> | |
| <p>Assessment of Data and Identified Health Risks</p> | |
| <p><i>Analyses include metals/inorganics as well as organics</i></p> | <p>Sample data/Notes: In addition to the field monitoring described above, 8 water samples were collected from January 2005 – May 2010 and submitted to USAPHC for analysis. None of the analytes sampled were found at concentrations above a long term MEG.</p> |
| | <p>Short and Long-Term Health Risk: Not evaluated. Eight samples collected over 3 days in a period of 5 years do not provide sufficient data to perform an accurate health risk assessment.</p> |

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| <p>4. MILITARY UNIQUE</p> | |
| <p>Chemical Biological, Radiological Nuclear (CBRN) Weapons:</p> | |
| <p>There is no evidence of exposure to ADAB personnel.</p> <p>Short and Long-Term Health Risk: None Identified</p> | |
| <p>Depleted Uranium (DU):</p> | |
| <p>DU munitions are not stored or worked on at ADAB. The KC-10 Extender uses DU counterweights. There is no evidence of exposure to AASAB personnel.</p> <p>Short and Long-Term Health Risk: None Identified</p> | |
| <p>Ionizing Radiation:</p> | |
| <p>Medical radiography is utilized in the EMDG clinic. No personnel are enrolled in the thermoluminescent dosimetry (TLD) program. Permitted radioactive materials and generally licensed devices are used in CBRNE detection equipment. Semi-annually radioactive material leak tests were conducted as needed to ensure there is no leakage above the appropriate limits.</p> <p>Short and Long-Term Health Risk: Low</p> | |
| <p>Non-Ionizing Radiation</p> | |
| <p>EMF: Aircraft emitters have administrative processes in place to reduce the potential for exposures. Ground-based emitters have been evaluated and have administrative controls in place that ensure personnel are not within the uncontrolled environment hazard distance. Operators of these systems are aware to notify Bioenvironmental Engineering for any potential exposure to EMF radiation to be investigated and documented.</p> <p>Lasers: Aircraft are equipped with various lasers. Additionally, other hand held devices within Civil Engineering and Security Forces are equipped with lasers. Administrative procedures are in place to reduce incidents. The biggest risk is lasing of aircrews while flying. Between Jan – Jul 2010, 18 aircrew laser incidents reported IAW Air Force Occupational Safety and Health (AFOSH) Standard 48-139. Of the 18 cases, 2 cases reported individuals with immediate eye pain (approximately 30 minutes) and 1 case of blurred vision; however, no findings were made in any of the follow-up exams from Flight Medicine. In some cases, crews were able don Aircrew Laser Eye Protection within time and perform adequate procedures to avoid exposure. Laser exposures evaluations completed by the Flight Doctors are forwarded to the USAF School of Aerospace Medicine Help Desk for archiving and placed in the member’s medical record.</p> <p>Short and Long-Term Health Risk: Low</p> | |

5. ENDEMIC DISEASE

(based on NCMI Oct 2005 report) (<https://www.intelink.gov/ncmi/index.php>)

NOTE: “Risk” level refers to both severity of disease (without controls) and probability of disease based on local rates/endemic status. Diseases described are those presenting greater risk when compared with US conditions. Most identified disease risks can and are being mitigated with military preventive medicine measures/policies.

Food borne and Waterborne Diseases

Short and Long-Term Health Risk: Moderate

Diarrhea – bacterial — An operationally significant attack rate (potentially 11-50% per month) could occur among personnel consuming local food, water, or ice. Field conditions (including lack of hand washing and primitive sanitation) may facilitate person-to-person spread and epidemics. Reliable data for bacterial diarrhea are lacking; assessment of risk was based primarily on the inconsistent public health infrastructure to ensure safe food and water.

Diarrhea – protozoal -- A small number of cases (less than 1% per month attack rate) could occur among personnel consuming local food, water, or ice. Outbreaks affecting a higher percentage of personnel are possible with Cryptosporidium. Specific surveillance data for protozoal diarrhea are lacking; assessment of endemicity was based primarily on the inconsistent public health infrastructure to ensure safe food and water.

Hepatitis A - Rare cases (less than 0.1% per month) could occur among unvaccinated personnel consuming local food, water, or ice. Field conditions (including primitive sanitation, lack of hand washing) may facilitate outbreaks driven by person-to-person spread. Common source outbreaks are also possible. 2000, 417 cases (incidence rate 13.4 per 100,000 population) were officially reported. For comparison, the average U.S. incidence was approximately 10 per 100,000 from 1987-1997 prior to routine childhood vaccination, with rates in some western states as high as 20-50 per 100,000. In 2005 after introduction of widespread routine vaccination, incidence declined sharply to 1.5 per 100,000.

Arthropod Vector-Borne Diseases

Short and Long-Term Health Risk: Moderate

Crimean Congo Hemorrhagic Fever – Medium Health Risk - Rare cases (less than 0.1% per month) could occur among personnel exposed to tick bites. Direct contact with blood and body fluids of an infected animal or person may also transmit infection. In 2000, 10 cases of viral hemorrhagic fever (incidence rate 0.3 per 100,000 population) were officially reported. In September 1998, two suspected cases occurred in butchers in Abu Dhabi; one of the butchers died from the disease. Although incomplete, reported case data include a Crimean-Congo hemorrhagic fever seropositivity of 10 percent reported in 1996 among asymptomatic farm workers and patients hospitalized for other diseases. Approximately 50 suspected cases were identified between 1993 and 1995. All cases demonstrated hemorrhagic symptoms, and most cases were in expatriate workers in occupations involving contact with animals.

Water Contact Diseases

Short and Long-Term Health Risk: Moderate

Leptospirosis – Medium Health Risk - Risk present, level unknown. Although data are insufficient to assess potential disease rates, rare cases could occur among personnel wading or swimming in bodies of water such as lakes, streams, or irrigated fields. In groups with prolonged exposure to heavily contaminated foci, attack rates can be high (up to 50%). Because specific data are limited from this and neighboring countries, this assessment is an estimate based on overall regional conditions and disease distribution.

Respiratory Diseases

Short and Long-Term Health Risk: Low

Low risk for both TB and meningococcal meningitis. Risk comparable to the U.S. among unvaccinated personnel who have close contact with the local population.

Animal- Contact Diseases

Short and Long-Term Health Risk: Moderate

Q-fever - Medium Health Risk - Rare cases (less than 0.1% per month) could occur among personnel exposed to aerosols from potentially infected animals, with clusters of cases possible in some situations. Significant outbreaks (affecting 1-50%) can occur in personnel with heavy exposure to barnyards or other areas where animals are kept. Unpasteurized milk may also transmit infection. Country-specific data are unavailable, this assessment is based on data from neighboring countries with similar conditions.

6. VENEMOUS ANIMAL/INSECT

Snakes, scorpions, and spiders

Short and Long-Term Health Risk: Low

Sea snakes and jelly fish inflict painful stings; yellow scorpion has potent neurotoxin; black widow spider bite is considered life-threatening; bed bugs and the corresponding skin reactions have been identified (and treated) on base

7. HEAT/COLD STRESS

Heat

Summer: March through October have mean temperatures between 75-98 °F; mean daily max temperatures were from 88 °F to 111 °F; extreme daily temperatures were from 106-120 °F. The Wet Globe Temperature (WBGT) is utilized throughout the duration of the deployment; black flag heat stress condition is reached almost daily throughout summer. WBGT readings are delivered via command post and maintenance operation radio channels; as well as via daily pop-up messages on the local Intranet. In addition 380 OSS Weather applies Fighter and Heavy Index of Thermal Stress indices to the aircraft/ground crew operations. Heat injuries do occur sporadically; personnel are continually educated on heat stress, water intake and work/rest cycles. Temperature extremes can increase the potential for heat related injuries, including dehydration, heat exhaustion, and heat stroke. Early symptoms can include mild irritation, lethargy, and inability to concentrate. Measures are in place to mitigate more serious effects of this critical hazard.

Short and Long-Term Health Risk: Low to High. High in unacclimatized personnel. Risk is reduced to Low or Moderate through preventive measures. Chronic health implications from heat injury are rare but can occur—especially from more serious heat injuries such as heat stroke. 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. 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.

Cold

Winter: Lowest recorded temperature is 43 °F.

Short and Long-Term Health Risk: None Identified

8. NOISE

Continuous:

Power generation and flight operations taking place on ADAB create outdoor noise levels that occasionally fluctuate above the threshold level requiring single-level hearing protection (85 A-weighted decibels (dBA)). In addition, health effects of noise exposure as low as 80 dBA occurring the same time as exposures to certain chemicals (carbon monoxide, aircraft fuels, and industrial chemicals) can cause permanent hearing loss.

For the majority of personnel on this site, noise levels above the hearing protection threshold are for short durations and average daily exposures are below levels requiring participation in a hearing conservation program.

For those individuals working on or near the flight line there may be intermittent high level (>105 dBA) exposures, depending on sortie rates of fighter aircraft and takeoffs and landings of transport and other

aircraft. Individuals working or living near the flight line may also be exposed to low level 'nuisance' noise (< 85 dBA). Some flightline workers may require double hearing protection (ear plugs and ear muffs) when/where indicated. These continuous low level exposures may cause sleep loss, fatigue, increase stress levels and increased blood pressure. The health effects due to this 'nuisance' noise are undetermined at this time.

Short- and Long-term health risks: Low for the majority of personnel on this site. **Moderate** for individuals working on or near the flight line without proper hearing protection. Workplace-specific exposures are documented in DOEHRS.

Impulse:

Impulse noise sources are limited to certain specialties (i.e. Security Forces, Explosive Ordinance Disposal, etc.). These workplace-specific exposures are documented in DOEHRS.

Short and Long-Term Health Risk: Low

OVERALL RISKS, CONFIDENCE, CONTROLS, ADDITIONAL NOTES

Short and Long-Term Health Risk: None Identified

9. OTHER UNIQUE OCCUPATIONAL HAZARDS

Pesticide/Pest Control:

Much of the pest control at this site consists of trapping and small area treatment for ants, spiders, rodents with baits, glue boxes, and pyrethroids. Larvicides are used for mosquito larval control. Some limited area residual pest control is performed to control mosquitoes in isolated locations. Personnel may have been incidentally exposed to very low levels of pesticide during pest control operations.

Following pesticides are used: Organophosphate, Abamectin B1, Methoprene, N-Ethyl Perfluorooctanesulfonamide (Sulfluramid), WASP Freeze (petroleum distillate, d-trans allethrin), Chase Zill Zone House and Garden (d-trans allethrin, resmethrin); Pesticide Bait: Altosid pellets (methoprene), Rodenticide (bromadiolone), Starbar Quickstrike Fly Abatement Strip (Nithiazine).

Short and Long-Term Health Risk: Low

Asbestos and Lead-Based Paint:

No evidence of lead based paint is present. No specific exposure conditions of concern or health risks to personnel have been identified. Procedures have been established to mitigate potential exposures (i.e., reviewing work orders, checking suspected lead paint with lead check sticks).

Most facilities on ADAB have been constructed within the past 10 years. There is no suspected asbestos containing materials (ACM) with the Phantom Compound or Operations Town. Prior to demolition of US facilities in 2008, 380 ECES Environmental conducted ACM sampling in conjunction with BE. No samples contained ACM.

Short and Long-Term Health Risk: Low

10. Waste Sites/Waste Disposal:

Regulated hazardous medical waste (red-bagged) is collected and transported to an off-base Emirati hospital for disposal. Hazardous waste is collected in satellite accumulation points, turned in to 380 ECES/CEPV hazardous waste storage yard, and then disposed via contractor. Hazardous waste storage is generally limited to used petroleum, oil, and lubricant products, and small spill cleanup residue. Currently, proper handling, storage, and disposal of industrial waste generated on base are coordinated at the unit level with long term storage at the hazardous material/waste storage site.

Wastewater is directed into Host Nation sewage lines. Chemical latrines are pumped out by trucks and

waste is disposed of via off-base contractor.

No specific health risks associated with these waste management operations have been identified.

Short- and Long-term health risks: Not an identified source of health risk.