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Periodic Occupational and Environmental Monitoring Summary (POEMS) Program Analysis January 2017-October 2017

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1 Summary

1.1 Overview

A Department of Defense (DOD) goal is to ensure that Service members and their providers have access to the most current and applicable information about occupational and environmental health (OEH) exposures in deployed settings.[1,2,3] To meet this goal, each Service develops a series of population-level Periodic Occupational and Environmental Monitoring Summary (POEMS) documents for deployed locations. The U.S. Army Public Health Center (APHC) develops POEMS documents for Army locations and posts them, along with the other Services' POEMS documents, for distribution in the Defense Occupational and Environmental Health Readiness System (DOEHRS) and on the APHC public website.

Based on the findings of this analysis, it is widely acknowledged that POEMS documents are the most complete, publicly available resource for deployment OEH information. Furthermore, it is largely agreed upon that deployment OEH information is critical to medical providers and other populations for patient care, Department of Veterans Affairs (VA) disability claims adjudication efforts, and to help provide context for symptoms experienced by those who have deployed. POEMS documents are currently a crucial element to the future OEH exposure documentation efforts being worked, namely the Individual Longitudinal Exposure Record (ILER). Accordingly, POEMS documents will likely be around and used in a similar manner for the near future. Since POEMS documents will likely be a longstanding product, it is important to analyze how well they meet their intended purpose and determine what, if any, improvements can be made to the documents and their development process. Thus, the APHC Public Health Product Development Division (PPD) conducted a deliberate analysis of the POEMS program.

This report summarizes the findings and recommendations from the POEMS Program Analysis. Section 1 provides an overview of the POEMS, its purpose, and the key findings and recommendations of the POEMS Program Analysis. Section 2 details the references used in this report. Section 3 outlines the authority for conducting the POEMS Program Analysis. Section 4 provides information related to the POEMS requirement and problem statement. Section 5 outlines the methods and data collection tools used in the POEMS Program Analysis. Section 6 highlights the overall analysis findings and the gaps identified for POEMS content and format. Section 7 covers the POEMS Program Analysis limitations, and Section 8 details the recommendations, quick wins, and operational approach for Fiscal Year (FY) 18.

1.2 Purpose

The purpose of the POEMS Program Analysis was to evaluate the development process, completeness, coverage, programming/funding, and use of the current POEMS documents by medical providers and to make recommendations for product and process improvements.

The quality of OEH surveillance data used to develop a POEMS was beyond the scope of this evaluation. While these data are often extremely limited, they are crucial to the development of a complete and useful POEMS. The OEH exposure data collection employed in theater and the quality control of data input into DOEHRS are much larger than the POEMS and are being investigated through other projects.

1.3 Key Findings

While the current POEMS documents are useful and helpful to intended audiences, the analysis revealed areas where improvements can be made.

The findings were organized into four lines of effort (LOEs) where gaps between the current and desired end states existed. These LOEs included:

1. POEMS Content and Format,
2. POEMS Marketing and Education,
3. POEMS Development Process, and
4. POEMS Surveillance and Data Inputs.

It was determined that LOE 4 fell beyond the scope of this analysis.

General POEMS recommendations and quick wins were identified, and specific gaps and recommendations were developed for LOE 1. Future phases of the POEMS Program Analysis may address the remaining LOEs, if so directed.

1.3.1 POEMS Purpose and Audience

The purpose of POEMS documents at the onset of analysis was to document the estimated population-level short-term (during deployment) and long-term (post deployment) health risks and medical implications associated with identified OEH hazards at deployment sites, and to contextualize available data and risks for healthcare providers (DOD, VA, and private sector) and DOD personnel. The primary audience of POEMS documents was identified as healthcare providers from the DOD, VA, as well as the private sector, who are providing care to DOD personnel. Secondary audiences included Service members, Commanders, and Service Centers. Tertiary audiences included the legal community and VA disability claims adjudicators.

1.3.2 LOE 1: POEMS Content and Format

POEMS documents quantify and qualify deployment OEH risks based on available information about the deployed site and compile them into a single document. While there are many successes associated with POEMS documents, this analysis highlighted 11 gaps related to POEMS usability, length, navigation, and breadth of content.

1.3.3 LOE 2: POEMS Marketing and Education

The POEMS Program Analysis revealed an overall lack of awareness of and access to POEMS among active duty Army and Department of Army (DA) Civilian medical providers and other intended audience members. In addition, the analysis highlighted the need to educate medical providers on the intended use of POEMS documents and their applicability to individual patients.

1.3.4 LOE 3: POEMS Development Process

The analysis revealed a minimum of 41 process steps to complete a POEMS. Additionally, there was a degree of variability in the data sources and processes that writers used to develop a POEMS. A portion of the POEMS development process was beyond the control of APHC and instead fell on the Combatant Commands (CCMDs) and Joint Staff to complete. There was a standing operating procedure (SOP)

document for POEMS development; however, the current SOP is in draft form and has not been updated to reflect new processes being implemented by APHC Divisions.

1.4 Recommendations

1.4.1 General POEMS Recommendations

The following recommendations are based on the results of the POEMS Program Analysis and are provided to help guide improvement of POEMS. Further investigation and effort are needed to better define and implement these recommendations.

- Re-evaluate what has been defined as the purpose of POEMS in order to shape the future of the document into a more useful tool for end users.
- Increase the confidence in risk characterization in the POEMS by improving the quality of occupational health data collection in theater and its documentation in DOEHRS or other systems.
- Enhance the consistency of POEMS and decrease labor through changes to the POEMS content and format, development process, and further standardization of the writing process.

1.4.2 Quick Wins

The POEMS Program analysis revealed some shortfalls in the current POEMS that could be quickly addressed without extensive investigation and effort. These quick wins for the POEMS marketing/education and development process include:

- Identify channels through which to market the availability of POEMS to target audience members.
- Update existing POEMS marketing materials, to include the POEMS fact sheet.
- Offer informational presentations on POEMS to target audience groups either in-person or via distance learning opportunities.
- Update and finalize a POEMS development SOP for use by APHC personnel.
- Develop a list of available data sources for writers to reference when developing a POEMS.

1.4.3 Recommendations for LOE 1: POEMS Content and Format

The following specific recommendations are based on the results of the POEMS Program analysis and are provided to help guide improvement of POEMS content and format in the future. These recommendations require further data collection and vetting by both target audience members and subject matter experts prior to implementation.

1. Purpose Statement: In addition to listing the site(s) and timeframe covered by the POEMS document, include a clear, explicit definition of what a POEMS is, what its data mean, and how its data can be used. This definition should be short and easy to understand.
2. Site Description: Include a brief description of the site, to include its general location, environment type (e.g., desert, rural, urban), size, and mission. Add an executive summary to this description of the overall findings included in the POEMS (e.g., when Occupational Environmental Health Site Assessment (OEHSA) was initiated, number of exposure pathways with moderate or higher risk estimates identified, etc.). The section should be no longer than one brief paragraph in length or bulleted format.
3. Document Length: Generate a concise and easy to read summary with all pertinent information at the beginning of each POEMS to replace current tables 1 and 2. This should be in

table/graphic format as opposed to paragraph. Exclude or greatly reduce the background information section of POEMS. Develop various templates and get end user feedback to determine which format is most preferred.

4. Table 1: Combine the content from Tables 1 and 2 into one, easy to use table.
5. Table 2: Combine the content from Tables 1 and 2 into one, easy to use table.
6. POEMS Categories: Exclude the endemic disease, heat/cold, and venomous animals/insects sections from POEMS and only discuss climate briefly in the site description section, if at all.
7. Short-term Risk Estimates: Only include chronic/long-term risk estimates in the POEMS. Long-term risks would cover those hazards where principle outcomes are short-term, but where risk of long-term sequelae exist.
8. Mitigated Risk Estimates: Display only unmitigated risk estimates. Inclusion of mitigated risk estimates is often not verifiable and may be misleading.
9. Classified Data: No recommendation(s) identified at this time.
10. User Interface: On the APHC public website, create drop-down boxes or the ability to query POEMS documents based on site and/or time period (e.g., search alphabetically by site, type in site name and time period). End users must be able to identify all sites that a POEMS covers.
11. Typos and Grammatical Errors: Include the APHC Publications Management Division (PMD) in a technical review of final POEMS documents prior to publication.

2 References

See Appendix A for a listing of references used in this report.

3 Authority

This analysis was directed by the APHC Board of Directors and is authorized under U.S. Army Regulation 40-5, Section 2-19.[4] The APHC (formerly known as the U.S. Army Center for Health Promotion and Preventive Medicine in 2007 per current publication year of AR40-5) is responsible for providing support for Army preventive medicine activities, to include conducting periodic evaluations of regional and local preventive medicine programs and services in support of U.S. Army Medical Command (MEDCOM) oversight responsibilities. Furthermore, "Core public health functions as applied to military preventive medicine include assessment, policy development, and assurance. Assessment includes the key capabilities of general health evaluation of the beneficiary populations, medical surveillance, occupational and environmental health surveillance, investigation of outbreaks, and determination of risk factors and causes of major disease and injury syndromes…A key aspect of all public health practice is effective communication and education with all affected populations." [4]

4 Background and Introduction

4.1 POEMS Requirement and Problem Statement

The POEMS documents address DoD Instructions (DoDIs) 6490.03, 6055.05, and the Joint Chiefs of Staff Memorandum (MCM) 0028-07 requirements: "to ensure that appropriate environmental exposure information is available should Service members as well as their providers have exposure-related concerns (such as those that might be documented on Post Deployment Health Assessment (PDHA))." [1,2,3,5]

The utility of POEMS is reliant on its completeness and accessibility. The POEMS product has continued in its current form without formal review since 2010. Assumed successes and anecdotal shortcomings are without sufficient data to address if the current POEMS product is the most effective and efficient

means of communicating OEH information to medical providers and the patients they care for. A third-party analysis was required to definitively answer these questions.

5 Methods

The POEMS Program Analysis utilized the Army Design Methodology (ADM)[6] and a combination of qualitative and quantitative data inputs to assess POEMS and identify courses of action (COAs) for improving POEMS in the future.

5.1 Project Team

The POEMS Program Analysis project team was assembled by the lead POEMS analyst and included representatives from the APHC Clinical Public Health and Epidemiology, Product Management (PDM), and Environmental Health Sciences and Engineering Directorates. Contractors from Battelle also supported the completion of the POEMS Program Analysis.

5.2 Army Design Methodology

The ADM provides a framework focused on the "critical and creative thinking abilities of leaders and teams to understand and solve problems."[6] The ADM was used to establish and conduct the four steps of this evaluation:

1. Define the current state,
2. Define the desired end state,
3. Frame the problem, and
4. Define the operational approach to get from the current state to the desired end state.

5.2.1 Step 1: Defining the Current State

Step 1 of the POEMS Program Analysis, defining the current state, involved documenting the purpose of POEMS, how well POEMS met that purpose, the process to develop and publish POEMS, the resources spent on POEMS development, and end user access to and experiences with POEMS documents. Several tools were used to collect these data, including an online POEMS needs assessment survey, interviews, group discussions, the Joint Environmental Surveillance Working Group (JESWG) POEMS Subgroup Workshop (Workshop 1), development of a process map and completeness tracker, and collection of time and cost data related to POEMS development at APHC.

5.2.2 Step 2: Defining the Desired End State

Step 2 of the POEMS Program Analysis, defining the desired end state, involved capturing the needs and wants of end users, writers and developers, and policy makers regarding the utility and usability of future POEMS. The tools used to collect these data were the online POEMS needs assessment survey, interviews, group discussions, and Workshop 2: Defining the Future State.

5.2.3 Step 3: Framing the Problem

Step 3 of the POEMS Program Analysis, framing the problem, involved identifying the gaps between the current and future states, as well as the obstacles and barriers preventing the current state from becoming the desired end state.[7] In this step, the data collected during steps 1 and 2 were grouped into four LOEs and analyzed to determine the pros, cons, gaps, and quick wins for each. This information was then shared with the three APHC Directors whose personnel work on POEMS and the PDM

Occupational Medicine Physician, who, along with the lead POEMS analyst, ranked the LOEs in order of priority for development of COAs. These individual rankings were averaged to determine the group's top priority; however, this method resulted in all LOEs being prioritized identically. Consequently, the Director of PDM made an executive decision to proceed with the focus on first addressing LOE1: Content and Format.

5.2.4 Step 4: Defining the Operational Approach

Step 4 of the POEMS Program analysis, defining the operational approach to achieving the desired end state, involved analyzing the POEMS content and format gaps identified in step 3 and generating recommendations and specific tasks for ways to address those gaps.

5.3 Data Inputs and Collection Tools

5.3.1 POEMS Needs Assessment Survey

The POEMS needs assessment survey (see Appendix B) was developed by APHC PPD personnel, in coordination with APHC's Decision Support Division, Environmental Medicine Division (EMD), and Environmental Health Risk Assessment Division (EHRAD), and approved as public health practice for dissemination to Army active duty personnel and Civilian employees by the APHC Public Health Review Board. The needs assessment survey was designed to evaluate Army active duty and Civilian medical provider and Soldier perceptions of the content, development process, distribution, and look and feel of POEMS documents. The survey contained questions about demographics, reach, usefulness, expectations, and the need for deployment OEH information.

The survey was programmed using Verint® software and a link to the needs assessment was disseminated via a MEDCOM tasker targeting medical treatment facilities and an e-mailed request from the APHC Director, to The Surgeon General (TSG) Area of Concentration (AOC) consultants for further dissemination to their groups. The survey was deployed on 20 March 2017 and closed on 5 May 2017.

A report summarizing survey questions and responses was generated using Verint and analyses were performed using Minitab. The Verint report and Minitab outputs were submitted to Battelle for further interpretation and summary.

5.3.2 Interviews and Group Discussions

A total of 28 individual interviews and five group discussions were conducted by APHC personnel with assistance from Battelle between January 2017 and July 2017. The purposes of the interviews and group discussions were to—

- Identify the successes, shortcomings and purpose/audience of POEMS,
- Document recommendations for ways to improve POEMS in the future, and
- Identify available data sources for completion of POEMS and those sources currently being used by POEMS writers.

5.3.3 Workshop 1: JESWG POEMS Subgroup Workshop

The JESWG POEMS Subgroup Workshop was conducted by APHC with the assistance of Battelle at the April 2017 JESWG meeting in Falls Church, Virginia. The workshop objectives included:

- Determining the official audience of POEMS,

- Determining the official purpose of POEMS,
- Determining the current effectiveness of POEMS, and
- Recommending future changes for POEMS.

There were 13 attendees at the Workshop, including APHC, Battelle, U.S. Air Force School of Aerospace Medicine, Air Force, and Army personnel. A handout was provided to attendees to aid in the discussion (see Appendix C). Voice recordings of the workshop were generated and transcribed using an existing APHC contract. Notes from the workshop were consolidated and formatted by Battelle and then reviewed by APHC PPD personnel to ensure the inclusion of all important items and documentation of appropriate findings and conclusions.

5.3.4 Process Map

Group discussions and individual interviews were conducted to determine the steps taken by APHC personnel when developing POEMS documents for the U.S. Central Command (CENTCOM) and the U.S. Africa Command (AFRICOM). The steps were defined and the responsible parties for each step were identified. The processes conducted by the CCMDs and Joint Staff were documented but segregated as being outside of APHC's control in terms of development and execution. Differences in the processes for CENTCOM and AFRICOM POEMS development were highlighted when not in alignment with one another. A process map diagram was developed in Microsoft Office Visio by APHC's PPD and Business Operations Directorate personnel and then reviewed by EMD and EHRAD personnel for accuracy.

5.3.5 Completeness Tracker

The lead POEMS analyst assessed each POEMS document (n=82) for completeness by looking at the 25 categories for which risk assessments were conducted. A determination of whether sufficient data, limited data, or insufficient data were available was made for each category of every POEMS based on the POEMS writers' assessment summaries. The percentage of completeness, as defined by the number of categories with sufficient and limited data divided by the 25 total categories, was calculated and averaged. The completeness of each of the 25 sections, as defined by the number of POEMS with sufficient and limited data for that category divided by the 82 POEMS, was also calculated.

5.3.6 Data Source Matrix

Group discussions with POEMS writers and data subject matter experts were conducted in order to identify the available sources of data that could be used to support POEMS development and to discover which of those data sources the writers were using during the development process. A matrix was developed that listed the available and utilized data sources in two separate columns (see Appendix D).

5.3.7 Workshop 2: Defining the Future State

Workshop 2 was conducted remotely by APHC with assistance from Battelle. Three sessions were scheduled, two in August and one in September 2017. The workshop objectives were to—

- Determine what medical providers need to diagnose and treat patients with deployment-related health concerns,
- Determine what medical providers want from an OEH risk assessment/summary document to facilitate a patient encounter with deployment-related health concerns, and
- Identify communication channels to market POEMS to medical providers.

There were five participants across two workshop sessions, with no participants attending the third session. Participants included Army and VA personnel. A handout was provided to attendees to aid in the discussion (see Appendix E). Voice recordings of the workshop were generated and transcribed using an existing APHC contract. Notes from Workshop 2 were consolidated and formatted by Battelle and then reviewed by APHC PPD personnel.
Requests for assistance with recruitment of participants for Workshop 2 were sent to—

- The Preventive Medicine and Occupational Health TSG AOC Consultants,
- The Director of the Post-9/11 Era Environmental Health Program,
- The Director of the Preventive Medicine Residency Program at Walter Reed Army Institute of Research, the APHC's Science Advisor,
- The APHC's Environmental Health Engineering Division Chief,
- A representative from the APHC Public Health Service Line, and
- A representative from MEDCOM Public Health Command-Central.

Prospective participants were asked to contact the lead POEMS analyst, who forwarded invitations detailing the link and dial-in information for the workshop to them.

6 Findings

The findings of the POEMS Program analysis are divided into three sections: 1) those related to the current state of POEMS, 2) those related to the desired end state of POEMS, and 3) the gaps between the current and desired end states of POEMS.

6.1 Current POEMS Description, as of January 2017

6.1.1 POEMS Purpose

The purpose of POEMS at the onset of analysis was to:

Document the estimated population-level short-term (during deployment) and long-term (post deployment) health risks and medical implications associated with identified OEH hazards at deployment sites, and to contextualize available data and risks for healthcare providers (DOD, VA, and private sector) and DOD personnel. Specifically, the goals to meet the purpose of POEMS include:

- Incorporate all pertinent information (sampling data and documents) available for the location being assessed.
- Uniformly assess and document environmental exposures and associated health effects for each location.
- Ensure that medical providers have access to the most current and applicable information when addressing the post-deployment exposure-related health concerns of their patients. Service members should also have access to this information as a secondary audience.
- Provide this information in an unclassified and publicly available way.

6.1.2 POEMS Audience

The primary audience of POEMS was identified as healthcare providers from the DOD, VA, as well as the private sector, who are providing care to DOD personnel. Secondary audiences included Service members, Commanders, and Service Centers. Tertiary audiences included the legal community and VA disability claims adjudicators.

6.1.3 POEMS Content and Format

The POEMS summarized available sampling data and documents for each site being assessed. POEMS documents included purpose statement, site description, and summary sections that feature health risk estimates. In addition, 10 specific categories were evaluated for each site, including:

1. Air,
2. Soil,
3. Water,
4. Military unique (i.e., depleted uranium, chemical, biological, radiological nuclear, and so forth),
5. Endemic diseases,
6. Venomous animals/insects,
7. Heat/cold stress,
8. Noise,
9. Other unique occupational hazards (i.e., pesticides, asbestos, lead-based paint, hazardous waste, and so forth), and
10. Unique incidents/concerns at the site.

Each category was assessed for potential acute and chronic health risks, as well as the medical implications of those risks[8].

The POEMS was formatted as a portable document format (PDF) document (see Appendix F for a generic POEMS template) and posted to the DOEHRS and the APHC public website. On average, the POEMS documents were 25.8 pages in length, with a range from 14 to 38 pages and a mode of 26 pages.

6.1.4 POEMS Completeness

The quality of POEMS was reliant on the completeness and quality of the environmental sampling data and additional OEH documentation available for each site, as well as the writer's ability to locate and access these data. There was significant variability among sites with regards to the number of samples and documents available for analysis. The availability of data "often depends on the size of the basecamp, the troop population, how long the site has been operational, and the preventive medicine assets available to conduct OEH surveillance activities. The larger, more populated, older camps with more preventive medicine staff tend to have the most data available." [8]

At the time of analysis, there were 82 POEMS documents covering 885 sites in Afghanistan, Iraq, Djibouti, Saudi Arabia, Kuwait, Jordan, Kyrgyzstan, Oman, Qatar, United Arab Emirates, and Uzbekistan. Each POEMS document provided risk assessments for 25 categories, which included:

- Air PM_{10},
- Air $PM_{2.5}$,
- Air metals,
- Air VOC,
- Air chemical pollutants,
- Various soil analytes,
- Soil metals,
- Soil organic compounds,
- Soil inorganic compounds,
- Drinking water,
- Water for other purposes,

- Endemic diseases (food/waterborne disease, arthropod/vector borne disease, water contact disease, respiratory disease, animal contact disease, and aerosolized dust disease),
- Arthropods,
- Heat,
- Cold,
- Military unique incidents and concerns,
- Other unique occupational hazards, and
- Unique incidents and concerns.

No POEMS was 100% complete with all categories having sufficient data to perform a risk assessment. One POEMS was 100% complete when also including those categories with limited data for making a risk assessment. On average, the 82 POEMS were 80% complete when including those categories with sufficient and limited data for making a risk assessment (range is 48–100%). When including only those categories with sufficient data for making a risk assessment, the POEMS were, on average, 57% complete (range is 36–84%).

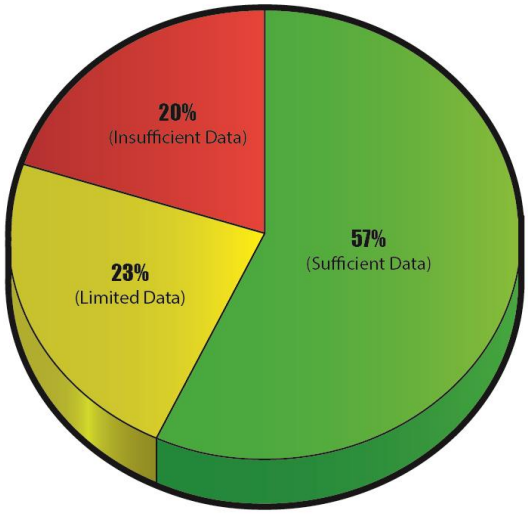

Figure 1. Average POEMS Completeness

It is also important to note that few, if any, occupational health data, corresponding medical implications, or specific military unique incidents were included in the POEMS documents. This is largely the result of data availability, quality, and classification. The vast majority of included data were related to environmental health only.

6.1.5 Awareness of and Access to POEMS

The POEMS documents were available on DOEHRS for those with access to the system and publicly from the APHC public website (http://phc.amedd.army.mil/topics/envirohealth/hrasm/Pages/POEMS.aspx). Table 1 below indicates the number of POEMS downloads per month from December 2015, when POEMS were first hosted on the APHC public website, through January 2017, when the POEMS Program analysis began.

Table 1. POEMS Document Downloads from APHC Public Website

Date	Dec 2015	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016	Jan 2017	TOTAL
Downloads	222	737	496	628	1,014	670	580	767	888	764	718	687	881	1,000	**10,052**

There are some limitations to the download data shown in Table 1. First, it was not possible to identify who users are, first-time versus returning users, where users were located, and for what organization they worked. It was also possible that a number of downloads indicated in the table above may have captured web crawlers as opposed to individual users.

While the download numbers above may seem high at first glance, the POEMS Needs Assessment survey indicated that POEMS documents were likely not reaching their primary target end users and were not easy to access or use, with only four percent of survey respondents in the target audience indicating that they had accessed a POEMS (see Figure 2). For additional information about findings from the POEMS Needs Assessment survey, contact APHC PPD at usarmy.apg.medcom-aphc.mbx.pdm-ppd.

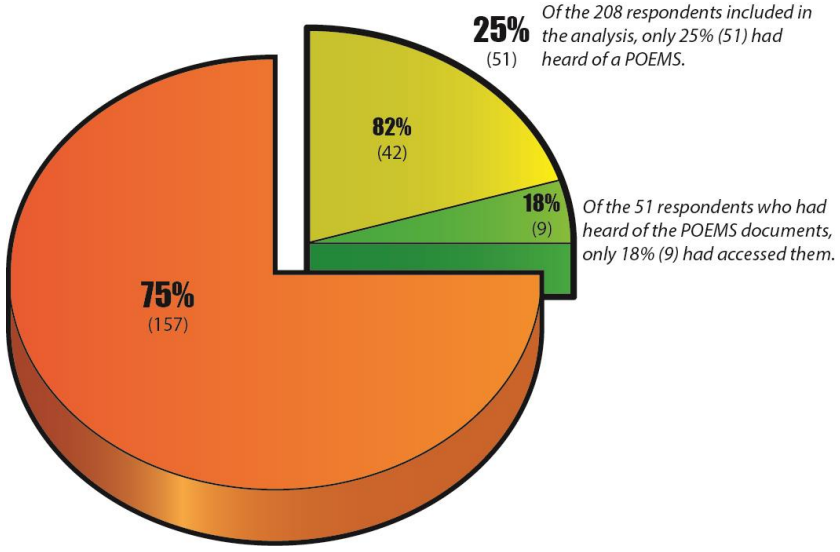

Figure 2. Awareness of and Access to POEMS by Surveyed Medical Providers

6.1.6 POEMS Program Description and Process Map

Three APHC Divisions (EHRAD, Public Health Preparedness and Response (PHPRD), and EMD), CENTCOM, AFRICOM, and Joint Staff worked together to develop POEMS documents. There were a minimum of 41 steps to complete a POEMS. While the processes were similar, the APHC processes varied slightly for CENTCOM and AFRICOM POEMS development, particularly concerning the review processes at the CCMD and Joint Staff levels.

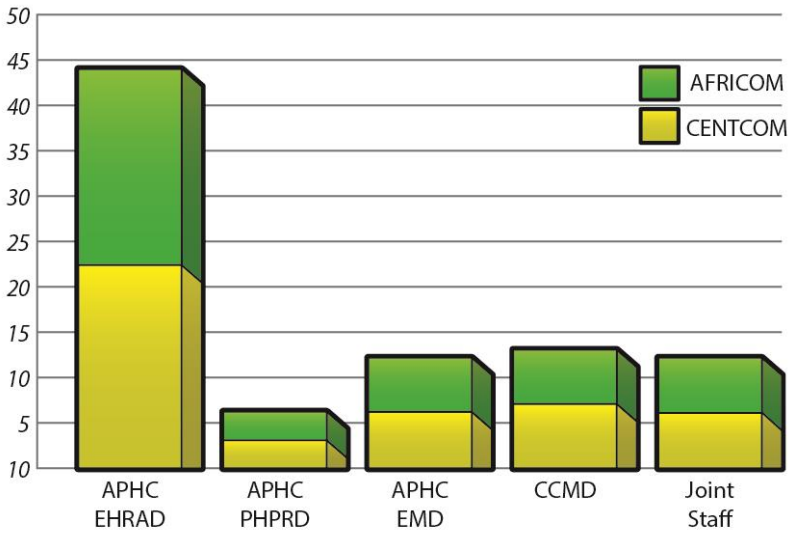

Figure 3. Number of Steps to Produce a POEMS by Organizational Element

The number of hours and the financial costs charged to POEMS development tasks at APHC increased significantly from FY13 to FY16 despite the number of personnel charging time to POEMS work breakdown structure (WBS) elements remaining largely consistent (see Table 2). While there are a number of potential reasons for the increased costs of developing POEMS, the most likely is that the number of deployment sites aggregated in each POEMS document increased during FY15 and FY16.

Table 2. APHC Costs Associated with POEMS Development

Fiscal Year	Number Reviewed by CCMD	Hours Charged*	Number of Personnel Charging Time to POEMS WBSs	$ Amount Charged*
FY 13	15	6,174	14	$353,468
FY 14	4	6,044	15	$318,328
FY 15	26	8,625	16	$554,414
FY16	10	9,003	13	$593,737
TOTAL	**55**	**29,846**		**$1,819,947**

Note: *Time and cost values are for APHC only.

6.2 Desired End State of POEMS

Throughout the data collection process, a picture of a long-term, ideal state for POEMS emerged. Achievement of this state is extremely reliant on improvements in OEH surveillance/sampling and the documentation of those activities in deployed locations. While not feasible in the near-term, it is important to document the gold standard for what a POEMS document could and should become. Based on stakeholder feedback, the ideal purpose of POEMS was to document the OEH exposures experienced by a clearly defined population (or individual) while deployed and the medical implications of those exposures. This information should be made available to healthcare providers (DOD, VA, and private sector) and DOD personnel. Specifically, the goals to meet the purpose of POEMS include:

- The POEMS product is optimized to provide an efficient and effective resource to assist medical providers in understanding and communicating OEH risks and possible medical implications with their patients.
- Primary and other audience members are aware of POEMS, how to access POEMS, and how to appropriately use POEMS during patient care.
- The internal APHC processes are streamlined and standardized to improve POEMS quality and consistency and reduce labor.
- Comprehensive, exposure-based surveillance data are available to systematically and periodically assess deployment OEH risks.

Movement toward this long-term state of POEMS is being worked through the development of the ILER, which will likely supersede the need for POEMS documents in the future. The ILER is an effort that supports enhanced individual exposure assessment methods, which will ultimately shape the future of military medicine[9].

At the April 2017 JESWG meeting, POEMS subgroup members defined the purpose of POEMS as being "to document the estimated population-level short-term (during deployment) and long-term (post deployment) health risks and medical implications associated with identified OEH hazards at deployment sites, and to contextualize available data and risks for healthcare providers (DOD, VA, and private sector) and DOD personnel." This definition was determined to also serve as the interim purpose of POEMS moving forward.

While movement toward achieving the long-term state of POEMS is critical and should be (and is being) further explored, there are a number of efforts that can be developed and implemented to significantly improve POEMS in the short-term. Consequently, and with consideration to the development of the ILER, the findings and recommendations in the remainder of this report focus on enhancing the current state while a longer-term solution is being worked elsewhere.

6.3 Identified Gaps for LOE 1: POEMS Content and Format

There are numerous areas where the current POEMS fails to meet its intended purpose. A total of 11 gaps between the current and interim desired end states of POEMS content and format were identified through the analysis. These gaps included:

1. Purpose Statement: A definition of POEMS is included in the current template. Interviews with medical providers highlighted the need for a shorter, more direct purpose section in POEMS that clearly defines POEMS, what the data mean, and how they can be used.
2. Site Description: The current site description includes a geographic and topographic description of the site(s) and often includes a great deal of information related to the mission

and populations present at the site. Audience members indicated they would prefer the site description be shortened.

3. Document Length: The average POEMS document is 25.8 pages long. Audience members indicated the desire for a document or document summary no longer than 1-2 pages in length.
4. Table 1: Table 1 is dense and written in paragraph form. Audience members indicated the need for a format that provides all pertinent information at a quick glance.
5. Table 2: Table 2 is often lengthy and is not quickly understandable. Audience members indicated the need for a format that provides all pertinent information at a quick glance.
6. POEMS Categories: POEMS includes 10 categories, and for some there are no data collected at the sites (endemic disease, heat/cold, venomous animals/insects). Audience members indicated a preference for only categories that presented data associated with both ambient and point sources presenting health threats at the site during the specified time period.
7. Short-term Risk Estimates: POEMS documents highlight short- and long-term risk estimates. Most short-term medical implications resolve during deployment, so such information is likely not useful except to in-theater providers. Also, it is likely that individuals who experienced acute symptoms related to exposures sought medical treatment while deployed. These individuals should have exposure/treatment noted in their medical record on a Standard Form (SF) 600 (Chronological Record of Medical Care). Audience members indicated that it was unnecessary to include short-term medical implications in the POEMS.
8. Mitigated Risk Estimates: Both mitigated and unmitigated risk estimates are included in POEMS. The mitigation measures employed at deployment sites are often poorly documented, leaving a degree of uncertainty concerning the actual measures employed at a site or the fidelity with which they were employed. These included mitigated risk estimates can also cause personnel preparing to deploy to believe that the OEH risk is lower at the site than it actually is. Audience members indicated a desire for data depicting the conditions at the site during the specified time period, which, in the absence of documented mitigation efforts, should reflect unmitigated risks at the site.
9. Classified Data: A portion of the data related to OEH exposures, particularly to historical events and mitigation efforts, is classified. Since the POEMS is a document approved for public release, the inability of the writers to include such data potentially creates shortfalls and gaps in the OEH picture at a site during a specific time period. Likewise, if an individual possesses personal knowledge of an event or set of circumstances and that knowledge is not otherwise documented, this information may or may not be included in a POEMS. Audience members would benefit from all the relevant incidents and data related to OEH exposure at deployed sites being documented in a POEMS.
10. User Interface: The current user interface for accessing POEMS on the APHC public website is difficult to navigate, making it hard to locate the correct POEMS document. Audience members indicated the desire for a quick search function to identify applicable POEMS documents.
11. Typos and Grammatical Errors: POEMS documents contain a number of typos and grammatical errors. Audience members indicated the desire for POEMS documents with few/no typos or inconsistencies.

7 Discussion

7.1 Analysis Limitations

A number of limitations were associated with the POEMS Program Analysis largely due to time, resource, and data collection methodology constraints. The primary limitations associated with this analysis include:

- Online needs assessment survey respondents represented only a small subset of all Army medical providers; however, findings remained consistent when more closely examining responses from those in specialties more likely to be aware of and use POEMS (e.g., occupational medicine, preventive medicine, and family medicine providers).
- Due to human protections policies and guidance, the online needs assessment survey was limited to collecting data from only Army active duty and civilian personnel. This prevented capturing input from individuals from other Services, the private sector, or the VA via the survey.
- Interviews were not transcribed verbatim; therefore, data may have been lost due to interpretation and the ability of the note taker to capture interviewees' comments.
- Time constraints prevented adequate lead time for recruitment of participants who actively see patients for Workshop 2.
- The small number of interview and workshop participants may not have resulted in saturation of data to the point of redundancy.
- Time and resource constraints, paired with the overall complexity of the POEMS product and process, limited phase 1 of the POEMS Program analysis to pursuing fully only one LOE. Comprehensive analysis of the additional LOEs should be explored further in the future.

8 Conclusions and Recommendations

POEMS documents are the most complete, publicly available resource for deployment OEH information. While there are many successes associated with POEMS documents and their use by intended audiences, this analysis highlighted areas where improvements to the POEMS can be made.

8.1 Conclusions

8.1.1 POEMS Purpose and Audience

The purpose of POEMS documents at the onset of analysis was to document the estimated population-level short-term (during deployment) and long-term (post deployment) health risks and medical implications associated with identified OEH hazards at deployment sites, and to contextualize available data and risks for healthcare providers (DOD, VA, and private sector) and DOD personnel. The primary audience of POEMS documents was identified as healthcare providers from the DOD, VA, as well as the private sector, who are providing care to DOD personnel. Secondary audiences included Service members, Commanders, and Service Centers. Tertiary audiences included the legal community and VA disability claims adjudicators.

8.1.2 LOE 1: POEMS Content and Format

POEMS documents quantify and qualify deployment OEH risks, which is based on available information and compile a great deal of data in a single location. While there are many successes associated with POEMS documents, this analysis highlighted 11 gaps related to POEMS usability, length, navigation, and breadth of content.

8.1.3 LOE 2: POEMS Marketing and Education

The POEMS Program analysis revealed an overall lack of awareness of and access to POEMS among active duty Army and DA Civilian medical providers and other intended audience members. In addition, the analysis highlighted the need to educate medical providers on the appropriate use of POEMS and its applicability to individual patients.

8.1.4 LOE 3: POEMS Development Process

There were a minimum of 41 process steps to complete a POEMS. Additionally, there was a degree of variability in the data sources and processes that writers used to develop a POEMS. A portion of the POEMS development process was beyond the control of APHC and instead fell on the CCMDs and Joint Staff to complete. There was a SOP document for POEMS development; however, the current SOP is in draft form and has not been updated to reflect new processes being implemented by APHC Divisions.

8.2 Recommendations

8.2.1 General POEMS Recommendations

While a thorough gap analysis was not conducted for LOEs 2 or 3, some gaps did become apparent during steps 1 and 2 of the POEMS Program Analysis. Based on these findings, the following recommendations were generated:

- Re-evaluate what has been defined as the purpose of POEMS in order to shape the future of the document into a more useful tool for end users.
- Increase the confidence in risk characterization in the POEMS by improving the quality of occupational health data collection in theater and its documentation in DOEHRS or other systems.
- Enhance the consistency of POEMS and decrease labor through changes to the POEMS content and format, development process, and further standardization of the writing process.

8.2.2 Quick Wins

While generating recommendations to improve POEMS content and format was prioritized for this analysis, a number of quick wins for POEMS marketing/education and development process were identified.

- Identify channels through which to market the availability of POEMS to target audience members.
- Update existing POEMS marketing materials, to include the POEMS fact sheet.
- Offer informational presentations on POEMS to target audience groups either in-person or via distance learning opportunities.
- Update and finalize a POEMS development SOP for use by APHC personnel.
- Develop a list of available data sources for writers to reference when developing a POEMS.

8.2.3 Recommendations for Improving LOE1: POEMS Content and Format

A total of 11 gaps pertaining to POEMS content and format were identified through the analysis. The following recommendations are designed to address each of those gaps, with the exception of one, in an effort to improve the POEMS product. Further analysis and piloting of these recommendations are needed prior to their implementation.

1. Purpose Statement: In addition to listing the site(s) and timeframe covered by the POEMS document, include a clear, explicit definition of what a POEMS is, what its data mean, and how its data can be used. This definition should be short and easy to understand.
2. Site Description: Include a brief description of the site, to include its general location, environment type (e.g., desert, rural, urban), size, and mission. Add an executive summary to

this description of the overall findings included in the POEMS (e.g., when OEHSA was initiated, number of exposure pathways with moderate or higher risk estimates identified, etc.). The section should be no longer than one brief paragraph in length or bulleted format.

3. Document Length: Generate a concise and easy to read summary with all pertinent information at the beginning of each POEMS to replace current tables 1 and 2. This should be in table/graphic format as opposed to paragraph. Exclude or greatly reduce the background information section of POEMS. Develop various templates and get provider feedback to determine which format is most preferred.
4. Table 1: Combine the content from Tables 1 and 2 into one, easy to use table.
5. Table 2: Combine the content from Tables 1 and 2 into one, easy to use table.
6. POEMS Categories: Exclude the endemic disease, heat/cold, and venomous animals/insects sections from POEMS and only discuss climate briefly in the site description section, if at all.
7. Short-term risk estimates: Only include chronic/long-term risk estimates in the POEMS. Included long-term risks would cover those hazards where principle outcomes are short-term, but where risk of long-term sequelae exist.
8. Mitigated Risk Estimates: Display only unmitigated risk estimates as inclusion of mitigated risk estimates is often not verifiable and may be misleading.
9. Classified Data: No recommendation(s) identified at this time.
10. User Interface: On the APHC public website, create drop-down boxes or the ability to query POEMS documents based on site and/or time period (e.g., search alphabetically by site, type in site name and time period). End users must be able to identify all sites that a POEMS covers.
11. Typos and Grammatical Errors: Include the APHC Publications Management Division (PMD) in a technical review of final POEMS documents prior to publication.

8.3 Operational Approach for FY18

In order to pursue implementation of the recommendations resulting from the POEMS Program Analysis, the following tasks have been identified for completion in FY18.

8.3.1 Operational Approach for LOE 1: POEMS Content and Format

Pending available resources, the following tasks related to LOE 1: Content and Format was identified for completion in FY18.

- Continue to collect and analyze data pertaining to end user needs and wants related to POEMS content and format.
- Develop sample POEMS template drafts to pilot among end users.
- Improve the user interface for accessing POEMS on the APHC public website.
- Work through subject matter experts and the JESWG POEMS Subgroup to approve and implement an updated POEMS template.

8.3.2 Operational Approach for LOE 2: POEMS Marketing and Education

While a thorough gap analysis was not conducted for LOE 2: Marketing and Education, the POEMS Program Analysis findings highlighted a significant lack of awareness and education pertaining to the appropriate use of POEMS documents by those medical providers comprising the primary audience of POEMS. This gap between audience members' current awareness of and access to POEMS and the goal set forth in the desired end state was very apparent and, pending available resources, the following tasks related to LOE 2: Marketing and Education was identified for completion in FY18.

- Work to identify channels for POEMS marketing to target audiences.

- Work to identify gaps in audience member knowledge pertaining to the appropriate use of POEMS.
- Query existing OEH education materials and courses for providers.
- Develop and begin implementing a comprehensive POEMS marketing plan.
- Begin generating and compiling content and materials for a POEMS education plan.

Appendix A: References

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Appendix B: POEMS Needs Assessment Survey

A primary Department of Defense (DOD) goal is to ensure that Service members and their medical providers have access to the most current and applicable information available about occupational and environmental health exposures in deployed settings. To meet this goal, each service develops a series of population-level Periodic Occupational and Environmental Monitoring Summary (POEMS) documents for deployed locations. Physicians, Physician's Assistants, Nurse Practitioners, other medical providers, Veterans Affairs (VA) representatives, Service members, and veterans are the audiences for this information.

The U.S. Army Public Health Center (APHC) is evaluating Active Duty (AD) Army physician, AD Army medical provider, AD Service member, and DA Civilian experiences with the use, components, and format of the Periodic Occupational Environmental Summary (POEMS). This survey will ask questions related to the usefulness, relevance, accuracy, completeness, and accessibility of POEMS and its components. Please note responses to this survey will be confidential and will not be tied to your name or personal identity. This survey should take approximately 10 minutes to complete.

If you have any questions or problems completing this survey, please contact Public Health Program Development at usarmy.apg.medcom-aphc.mbx.pdm-ppd@mail.mil

Section A. Demographics

1. What best describes your affiliation?

- ❍ Army
- ❍ Navy
- ❍ Air Force
- ❍ Marines
- ❍ Coast Guard
- ❍ Veterans Health Administration

8. Have you served on Active Duty?

- ❍ Yes, currently
- ❍ Yes, previously

❍ No

Are you currently a DA Civilian?

❍ Yes

❍ No

(End of Page 1)

If not Active Duty Army, sent to page 10 message

This Page is Conditionally Shown if: (1 = Army AND8 = Yes)

2. Are you a physician or medical provider?

- ❍ Yes
- ❍ No

9. Have you ever deployed?

- ❍ Yes
- ❍ No

(End of Page 2)

This Page is Conditionally Shown if: (2 = Yes AND1 = Army AND8 = Yes)

3. What type of medical provider best describes you?

- ❍ Physician
- ❍ Physician's Assistant or Nurse Practitioner
- ❍ Medical provider other than physician, assistant, or nurse practitioner
- ❍ Other _____

This Question is Conditionally Hidden if: (3 = Physician)

4. How long has it been since you completed training for your current clinical duties?

❍ 3 or fewer years ❍ 4 or more years

This Question is Conditionally Shown if: (3 = Physician)

5. How would you classify your current stage of medical practice?

- ❍ Intern
- ❍ Resident
- ❍ Fellow
- ❍ 3 or fewer years in practice
- ❍ 4 or more years in practice

17. How would you classify your specialty? Select all that apply.

- ❑ Family medicine
- ❑ Internal medicine
- ❑ Internal medicine sub-specialty (e.g. pulmonology, cardiology, endocrinology)

- ❑ Preventive medicine
- ❑ Occupational medicine
- ❑ Mental and behavioral health
- ❑ Surgeon
- ❑ Pediatrician
- ❑ Other _____

6. Are you assigned to a Table of Organization and Equipment (TOE) slot?

- ❍ Yes
- ❍ No
- ❍ Not Applicable

7. How often do you see patients with deployment exposure concerns?

- ❍ Everyday
- ❍ A few times per month
- ❍ Once per month
- ❍ Once per quarter
- ❍ Every six months
- ❍ Annually
- ❍ Never

(End of Page 3)

This Page is Conditionally Shown if: (1 = Army AND8 = Yes)

Section B. Awareness and Use of POEMS

10. Have you heard of the Periodic Occupational and Environmental Monitoring Summary (POEMS)?

- ❍ Yes
- ❍ No

(End of Page 4)

This Page is Conditionally Shown if: (10 = No AND1 = Army AND8 = Yes)

11. Do you currently use a resource to access information about occupational and environmental health exposures in deployed settings?

- ❍ Yes, please specify: _____
- ❍ No

12. Would a resource containing information about occupational and environmental health exposures in deployed settings be useful to you?

- ❍ Yes
- ❍ No

This Question is Conditionally Shown if: (12 = Yes)

13. What topics would you find most useful in a resource covering occupational and environmental health exposures in deployed settings? Select all that apply.

- ❑ All topics are equally useful
- ❑ Air
- ❑ Soil
- ❑ Water
- ❑ Military unique (e.g.i.e., depleted uranium, chemical, biological, radiological nuclear)
- ❑ Endemic diseases
- ❑ Venomous animal/insect
- ❑ Heat/cold stress
- ❑ Noise
- ❑ Unique incidents/concerns

❑ None of the topics listed are useful

This Question is Conditionally Shown if: (12 = Yes)

14. Please list any additional topics you would like to see in a resource covering occupational and environmental health exposures in deployed settings. (optional)

_____

_____

_____

This Question is Conditionally Shown if: (12 = Yes)

15. How would you like to see information pertaining to occupational and environmental health exposures in deployed settings presented?

❍ PDF document

❍ Web-based information

❍ Online form to request specific information

❍ Mobile application

❍ Other _____

37. If you would like to provide any additional comments about how a resource like POEMS could be marketed to patients or medical providers there is a comment box below. (optional)

_____

_____

_____

Destination: **Untitled Custom Page 3** (Set in 37)

(End of Page 5)

This Page is Conditionally Shown if: (10 = Yes AND1 = Army AND8 = Yes)

During my medical/clinical education is Conditionally Shown if: (2 = Yes)
CME/CEU training to maintain credentials is Conditionally Shown if: (2 = Yes)
A patient or their family member is Conditionally Shown if: (2 = Yes)
A colleague, friend, or family member is Conditionally Shown if: (2 = No)

44. How did you learn about POEMS?

- ❑ During my medical/clinical education
- ❑ Military training course
- ❑ CME/CEU training to maintain credentials
- ❑ Word of mouth from a physician or medical provider
- ❑ A patient or their family member
- ❑ A colleague, friend, or family member
- ❑ Handout or flyer
- ❑ Briefing
- ❑ Web search
- ❑ Other _____

18. Do you know how to access the POEMS documents?

- ❍ Yes
- ❍ No

This Question is Conditionally Shown if: (18 = Yes)

19. Have you ever accessed POEMS?

❍ Yes

❍ No

25. Have you ever contacted the Army Public Health Center Environmental Medicine Consult Service for assistance with POEMS?

❍ Yes

❍ No

(End of Page 6)

This Page is Conditionally Shown if: (19 = Yes AND1 = Army AND8 = Yes)

20. On average, how often have you accessed POEMS in the last calendar year?

- ❍ Everyday
- ❍ A few times per month
- ❍ Once per month
- ❍ Once per quarter
- ❍ Once every six months
- ❍ One per year
- ❍ Never

To get more information about a patient's occupational/environmental exposures during deployment, without the presence of symptoms is Conditionally Shown if: (2 = Yes)
As part of pre-/post-deployment risk assessment for a patient is Conditionally Shown if: (2 = Yes)
To investigate symptoms and/or disease experienced by a patient is Conditionally Shown if: (2 = Yes)
To prepare for a medical appointment is Conditionally Shown if: (2 = No)
45. For what purpose(s) do you access POEMS? Select all that apply.

- ❑ To investigate symptoms and/or disease personally experienced
- ❑ To get more information about a patient's occupational/environmental exposures during deployment, without the presence of symptoms
- ❑ As part of pre-/post-deployment risk assessment for a patient
- ❑ To investigate symptoms and/or disease experienced by a patient
- ❑ To get more information about my own occupational/environmental exposures during deployment, without the presence of symptoms
- ❑ As part of pre-/post-deployment risk assessment for myself
- ❑ To prepare for a medical appointment

❑ Other _____

22. Please rate the following statements about the POEMS documents:

	Never	2	3	4	5	6	7	8	9	Always	N/A
It was easy to locate the POEMS document that you needed.	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
The amount of time spent accessing the POEMS documents does not effect your ability to care for patients in a timely manner.	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
A POEMS document was available for the location where you or your patient deployed.	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
A POEMS document was available for the time period when you or your patient deployed.	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

CME/CEU training is Conditionally Shown if: (2 = Yes)
E-mail from Deputy Commander of Clinical Services, Specialty Consultant, AMEDD leadership, or Army Public Health Center's Environmental Division is Conditionally Shown if: (2 = Yes)

43. How would you prefer to receive updates about POEMS in the future? Select all that apply.

❑ CME/CEU training

❑ Word of mouth from a physician or medical provider

❑ E-mail from Deputy Commander of Clinical Services, Specialty Consultant, AMEDD leadership, or Army Public Health Center's Environmental Division

❑ Web-based training

❑ Face-to-Face training

- ❑ Military training course
- ❑ Other _____

Section C. POEMS Content

29. What sections currently published in the POEMS documents do you find most useful? Select all that apply.

- ❑ All sections are equally useful
- ❑ Purpose/Site Description/Summary
- ❑ Summary of Occupational and Environmental Conditions with MODERATE or Greater Health Risk
- ❑ Population-Based Health Risk Estimates
- ❑ Discussion on Health Risks by Source (e.g. air, soil, water)
- ❑ None of the sections are useful

30. What topics currently elaborated upon in the POEMS document body do you find most useful? Select all that apply.

- ❑ All topics are equally useful
- ❑ Air
- ❑ Soil
- ❑ Water
- ❑ Military unique (e.g. i.e., depleted uranium, chemical, biological, radiological nuclear)
- ❑ Endemic diseases
- ❑ Venomous animal/insect
- ❑ Heat/cold stress

- ❑ Noise
- ❑ Unique incidents/concerns
- ❑ None of the topics are useful

31. Please list any additional topics you would like to see covered in the POEMS documents if data are available. (optional)

_____

_____

_____

Section D. POEMS Format

This Question is Conditionally Shown if: (2 = Yes)

32. Please rate the following statements about the POEMS documents.

	Strongly Disagree	2	3	4	5	6	7	8	9	Strongly Agree	N/A
POEMS contains all of the information I need in order to provide patient care.	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
A POEMS document has improved my ability to provide patient care.	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

This Question is Conditionally Shown if: (2 = No)

46. Has a POEMS document influenced your medical care?

❍ Yes

❍ No

This Question is Conditionally Shown if: (46 = Yes)

47. To what degree has POEMS influenced your medical care?

	Greatly hindered my care	2	3	4	5	6	7	8	9	Greatly improved my care	N/A
POEMS Influence on medical care	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

33. Overall, the way information in a POEMS document is organized and presented is easy to understand.

	Extremely Difficult	2	3	4	5	6	7	8	9	Extremely Easy	N/A
Navigation of POEMS	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

48. How would you like to see the information contained in POEMS presented?

- ❑ PDF document (current)
- ❑ Website
- ❑ Online form to request specific information
- ❑ Mobile application
- ❑ Other _____

(End of Page 7)

This Page is Conditionally Shown if: (25 = Yes AND1 = Army AND8 = Yes)

26. For what purpose(s) did you contact the Army Public Health Center Environmental Medicine Division Consult Service regarding POEMS? Select all that apply.

- ❑ To obtain a POEMS document
- ❑ For assistance interpreting a POEMS document
- ❑ For information on the data sources used to develop POEMS
- ❑ For information on the quality of POEMS
- ❑ Other _____

27. Please rate the statements about your experience when you contacted the Army Public Health Center Environmental Medicine Division Consult Service.

	Strongly Disagree	2	3	4	5	6	7	8	9	Strongly Agree	N/A
It was easy to find the contact information for the Consult Service.	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
I received a response from the consult service in a timely manner.	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
The person I contacted at the Consult Service was very knowledgeable.	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
The Consult Service provided me with the information I requested.	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

(End of Page 8)

This Page is Conditionally Shown if: (1 = Army AND8 = Yes)

Section E. Additional Comments

This Question is Conditionally Shown if: ((27 (A) [It was easy to find the contact information for the Consult Service.] < 7 OR27 (A) [I received a response from the consult service in a timely manner.] < 7 OR27 (A) [The person I contacted at the Consult Service was very knowledgeable.] < 7 OR27 (A) [The Consult Service provided me with the information I requested.] < 7) AND(25 = Yes))

28. What could have been done to improve your experience when contacting the Army Public Health Center Environmental Medicine Division Consult Service?

_____

_____

_____

This Question is Conditionally Shown if: (19 = Yes)

35. Please write any additional comments regarding what about POEMS is currently successful.

_____

_____

_____

This Question is Conditionally Shown if: (19 = Yes)

36. Please write any additional comments regarding suggested improvements for POEMS.

_____

_____

_____

This Question is Conditionally Shown if: (18 = No OR19 = No)

49. Is there a reason that you have never accessed POEMS (not received training, had difficulty with website, heard it was no useful, etc.)

_____

_____

_____

Destination: **Untitled Custom Page 3** (Set in 49)

(End of Page 9)

This survey is designed only for Active Duty Army Personnel at this time. Other military services and civilian personnel will be surveyed in the future. You are exiting the survey. Thank you for your time.

(End of Page 10)

Appendix C: Handout for Workshop 1

POEMS – Defining Future State

Workshop 1

Ginn White – APHC
Essie Pfau – APHC
Greg Durand – Battelle
Jonathan Elliott – Battelle

Purpose of the POEMS Analysis

- *Deliverables*
  - A comprehensive and integrated programmatic solution by early **1QFY2018**.
  - COAs to achieve the desired end-state for the POEMS that addresses production process, data-completeness, coverage, resourcing, and utility to Customers.
- *Scope*
  - This project will analyze the POEMS process from the receipt of request at APHC from the CCMD/Joint Staff to publication on the APHC public website.
  - Includes internal-APHC prioritization, funding/programming, and accessibility and use by intended audiences (medical providers and Service members).
  - Excludes CCMD/Joint Staff processes, Joint Service-specific processes, and OEH surveillance methods.
  - The project deliverable will include progress reports defining the current state, proposed end-state, and recommendations to the Board of Directors (BOD).

Key Tasks for POEMS Analysis

Task	Status
Form the team	In Progress
Deploy survey	Deployed on 21 March and will remain open until 1 May
Facilitate JESWG POEMS sub-group meeting	In Progress; 11 April
Complete group discussions/interviews with SMEs	In Progress
Define current state of POEMS to include expectations, process to develop the document, and visibility and use by intended audiences.	In Progress
Analyze survey findings	Estimated Completion: 15 May
Finalize POEMS purpose statement	Estimated Completion: 15 May
Define the desired end state of POEMS to include expectations, process to develop the document, and visibility and use by intended audiences	Estimated Completion: 1 June
Identify gaps and potential and real barriers to achieving the desired end state	Estimated Completion: 30 June
Facilitate second workshop	Estimated Completion: 30 June
Develop recommended a course(s) of action for achieving the desired end state	Estimated Completion: 1 September
Communicate solution to APHC Board of Directors	Estimated Completion: 30 September

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Metrics for Evaluation of Current State

- Completeness (topics, data sources, breadth/depth)
  - Interviews
  - Group Discussions/Workshops
  - Needs Assessment Survey
- Timeliness
  - Needs Assessment Survey
  - Interviews
  - Group Discussions/Workshops
- Accessibility by End Users
  - Needs Assessment Survey
  - Web Downloads Query
- Funding/Programming and Production Process
  - Process Mapping
  - BUSOPS query (WBS elements and estimated costs)

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APHC Labor Hours and Cost FY13-16

Fiscal Year	Sum of Charged Hours <Time>	Sum of Amount Charged <Detail>
13	6,173.5	$353,468.32
14	6,044	$318,328.31
15	8,624.5	$554,413.75
16	9,002.75	$593,736.6
TOTAL	29,844.75	$1,819,946.98

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Document Downloads

POEMS document download numbers from APHC public website from Dec 2015-Jan 2017

Date	Dec 2015	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016	Jan 2017	TOTAL
Downloads	222	737	496	628	1,014	670	580	767	888	764	718	687	881	1,000	10,052

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Next Steps

- Market survey and analyze data
- Execute JESWG POEMS subgroup workshop
- Complete additional interviews/group discussions
- Conduct process mapping exercise
- Finalize definition of current and end states and purpose statements
- Frame the problem and identify gaps and barriers
- Design and conduct second workshop
- Generate potential solutions and COAs

Questions

Workshop 1 Objectives

- Determine official Audience of POEMS
- Determine official Purpose of POEMS
- Determine current effectiveness of POEMS
- Proposed future changes?

POEMS Guidance

- 8 main reference documents
  - DODI 6490.03 (2011)
  - POEMS Technical Information Paper (2009)
  - POEMS Fact Sheet (2012)
  - OASD Health Affairs (2014)
  - CCR 40-2 (2016)
  - NMCPHC SOP (2015)
  - AFCENT Guidance (2016)
  - APHC SOP (draft)

Definition of POEMS

- TIP 64-002-1110 "The **official** multi-Service-approved document that summarize the DOD **medical interpretation** of **OEH exposure** information/data for **deployment sites**."
- Fact Sheet 64-010-0414 "POEMS is an **official, provider focused**, DOD technical document that describes **OEH exposures** and their associated **health implications for a deployment location** during a **specific time**."
- OASD Health Affairs "POEMS are unclassified **OEH monitoring summaries** and **population based** risks for individuals assigned or deployed to **contingency locations**."
- CCR 40-2 "POEMS are the **official** DoD approved documents that summarize **population based** health risks and associated **medical implications** resulting from **OEH exposures** identified at major **contingency bases** (e.g. base camps) **over a period of time**."
- AFCENT "POEMS describes the general ambient conditions at the **deployment site** and surrounding area, and characterizes the risks at the **population-level**."
- APHC "POEMS describes the overall **OEH health risks** associated with a **deployment location** during a **specific period of time**."

Audience of POEMS

- TIP 64-002-1110 "The primary audience of the POEMS is **military public health personnel** and **healthcare providers** (military, VA, as well as private sector)."
- Fact Sheet 64-010-0414 "POEMS are developed as a resource for **Medical Providers** and available for **Service Members** (Active duty, NG, and RC), **Veterans and retirees**."
- OASD Health Affairs "Audience for POEMS is **medical providers, Service members, veterans,** civilian employees, their families, **VA claims adjudicators**, and the general public."
- CCR 40-2 "The primary audience of the POEMS is **military public health personnel** and **health care providers** (military, VA, as well as private sector)."
- AFCENT "The primary audience of the POEMS is **military public health personnel** and **health care providers** (military, VA, as well as private sector)."
- APHC "The primary audience of the POEMS is **military public health personnel** and **healthcare providers** from the DOD, the Veterans Administration as well as private sector providers who are treating an active duty service member or a veteran in a private setting."

- **Proposed Audience** "The primary audience of the POEMS is healthcare providers from the DOD, the Veterans Administration as well as private sector providers who are treating an active duty service member or a veteran in a private setting, and Service members."

Purpose of POEMS

- TIP 64-002-1110 "POEMS was created to document the estimated **short-term** (during deployment) and **long-term** (post deployment) health risks and medical implications associated with identified **OEH exposures at major deployment sites**."
- Fact Sheet 64-010-0414 "Intent of POEMS is to provide a **health care provider** or returning deployed Service Member an official summary of what is known about **OEH exposures at a particular location**.
- Fact Sheet 64-010-0414 "The goal of the POEMS is to ensure that **medical providers** have access to the most current and applicable information when addressing **post deployment exposure related health concerns**."
- OASD Health Affairs "POEMS are intended for use by **health care providers** (military, VA, and private health care providers) and are a resource for Service members and veterans to help address **deployment** health-related questions and **concerns associated with environmental hazards**."
- AFCENT "The intent of POEMS is to satisfy the need for such population-level health surveillance information to be available, should service personnel have **OEH exposure-related concerns**."
- APHC "A POEMS is created to **document the health risks** and medical implications associated with identified **OEH exposures at major deployment sites**."
- APHC "The POEMS attempts to document, assess and communicate the **OEH health risks** identified during a **deployment** to DoD **health care providers** or other public health personnel associated with a service member."

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Purpose of POEMS

- **Proposed Purpose** "The purpose of POEMS is to document the estimated population-level short-term (during deployment) and long-term (post deployment) health risks and medical implications associated with identified OEH exposures at deployment sites, and to contextualize available data for health care providers (military, VA, and private sector) and Service members."

- Specific Goals
  - Incorporate all pertinent information (sampling data and documents) available for the location being assessed
  - Uniformly assess and document environmental exposures and associated health effects for each location
  - Ensure that medical providers have access to the most current and applicable information when addressing the post-deployment exposure-related health concerns of their patients. Service members should also have access to this information as a secondary audience
  - Provide this information in an unclassified and publicly available way

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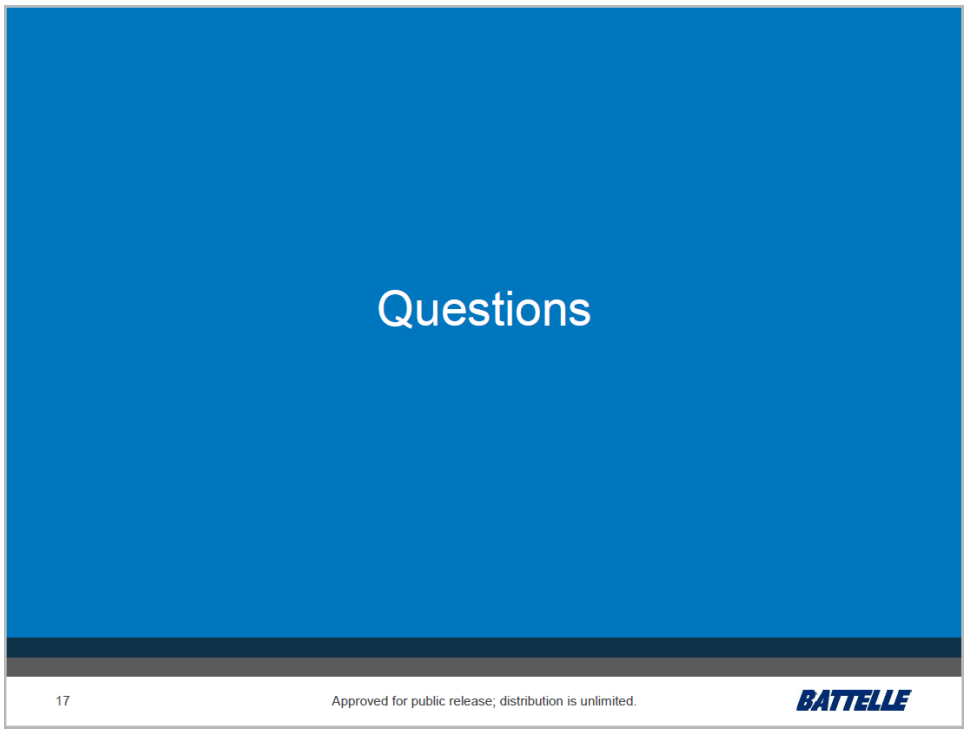
Effectiveness/Future of POEMS

- How well do POEMS meet this purpose?
- How could POEMS better meet this purpose?
- What is being done that should be sustained?
- Are there changes that should be made?
- Who is final governing authority?

Follow on Workshop 1 Objectives

- *Proposed Dates*
  - *May 4th*
  - *May 9th*
- Determine future purpose of POEMS if not completed during face-to-face workshop
- Are there differences in the perception of POEMS (successes, shortcomings, purpose, process metrics) based on Service affiliation?
- What are the different approaches to POEMS based on Service affiliation?
- What is the ideal POEMS and how does it look?
- Determine additional key players to talk to


Questions
17
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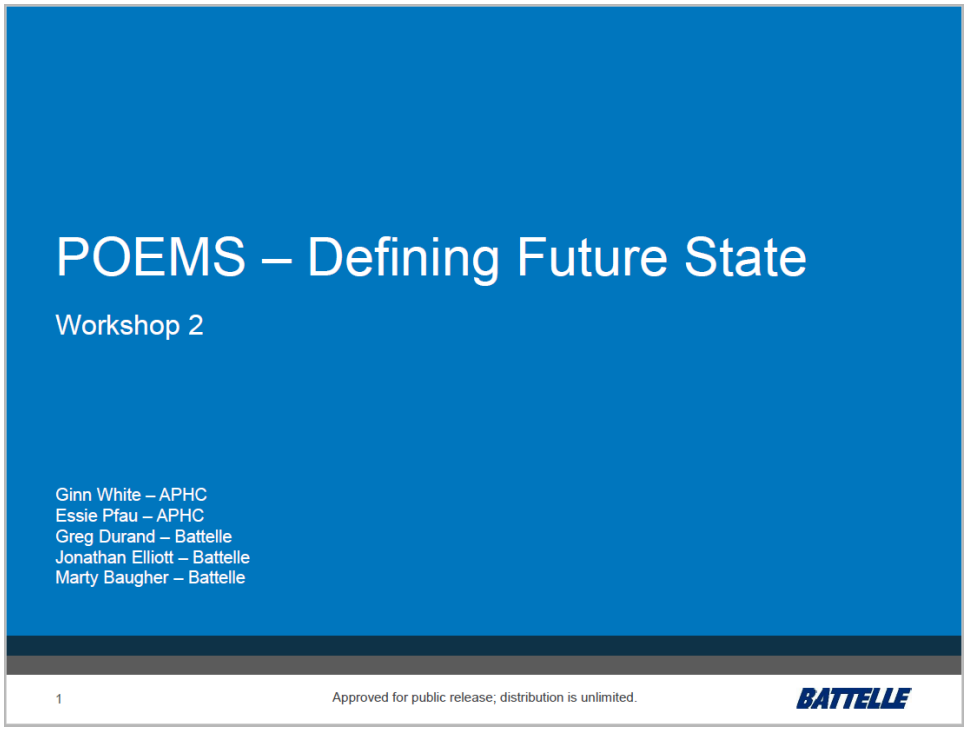
Appendix D: Data Source Matrix

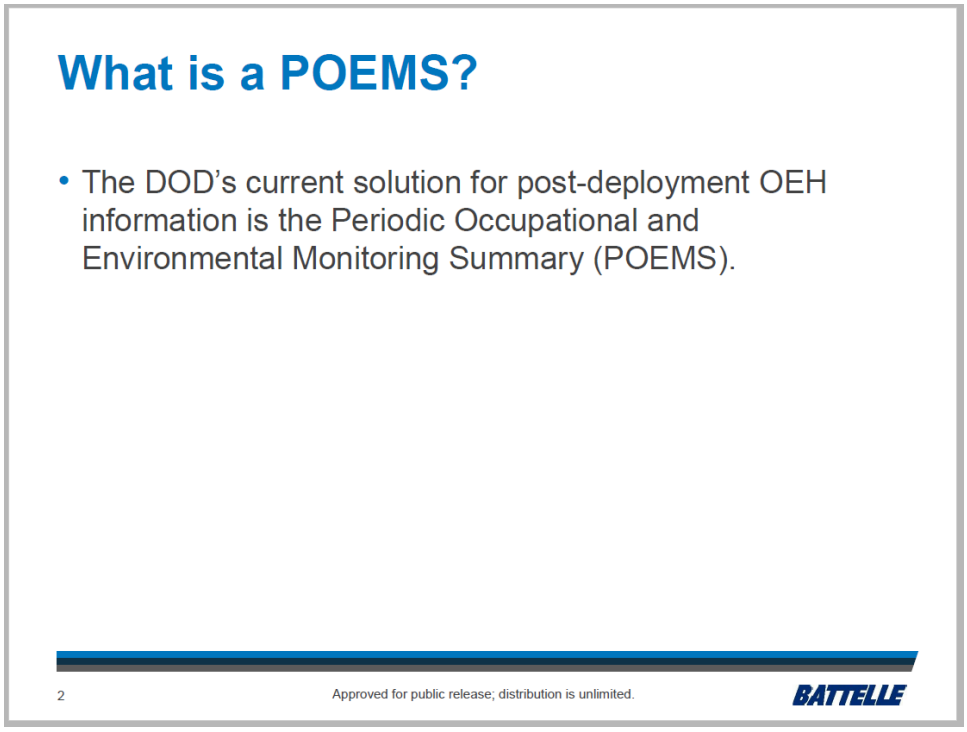
Available Data Sources	Data Sources Currently being Utilized
Ambient Air	Ambient Air
- DOEHRS - Enhanced Particulate Matter Study (EPMS) - IOM Review of EPMS - WHO data - Allied Forces data - Mobile Ambient Air Monitoring Station (MAAMS) data - MESL, which may or may not be in DOHERS - Air Force Institute of Technology (AFIT) - EPA - NASA satellite data - Drum data - Host Nation data - Army public health data (we cannot get to)	- **DOEHRS** - **MESL** - Enhanced Particulate Matter Study (EPMS) – can use part of it for some locations - Allied Forces data – site specific and only available if you know a POC - Mobile Ambient Air Monitoring Station (MAAMS) data – location specific - Host Nation data – site specific and only available if you know a POC
Soil	Soil
- DOEHRS - Pre-deployment host nation data, which is unlikely but may be available for locations in Eastern Europe - PHC-Europe may be doing baseline assessments, which may be captured in DOHERS - Army Corps of Engineers - Chem RECON data	- **DOEHRS** - **MESL** - Pre-deployment host nation data, which is unlikely but may be available for locations in Eastern Europe – only if you have a contact who knows about the availability of data - PHC-Europe may be doing baseline assessments, which may be captured in DOHERS – only if you have a contact who knows about the availability of data
Water	Water
- DOHERS - Host nation data - WHO/UN data - NGO data - DRSi has some waterborne illness reports	- **DOEHRS** - **MESL** - Veterinary site for approved sources – not always used/available - Host nation data - site specific and only available if you know a POC
Military Unique (depleted uranium, CBRNE related incidents)	Military Unique (depleted uranium, CBRNE related incidents)
- MESL - Past experiences of DESP project officers or other personnel during the POEMS initiation activities. - Information reported by deployed personnel. - Significant Activities Reports (SARs – also SIGACTS) from the theater/CIDNE (CENTCOM Incident trackers – more than just CENTCOM, all other COCOMS)	- **DOEHRS** - **MESL** - **Significant Activities Reports (SARs) from the theater/CIDN (CENTCOM Incident trackers) (classified)** - Past experiences of DESP project officers or other personnel during the POEMS initiation activities. - Information reported by deployed personnel

Available Data Sources	Data Sources Currently being Utilized
(classified) - NBC RECON - PEO CBD Office - Jupiter portal (classified) - COCOM Intel Shops and COCOM Engineers (classified)	– site specific and only available if you know a POC
Endemic Disease	Endemic Disease
- MESL - NCMI infections disease risk assessment for that time period - Info gathered during the initial characterization activities - DRSi – patchy and poor quality…limited deployment data available, the majority is STIs, followed by foodborne/waterborne illness - WHO - Host nation medical data – limited - ProMED – outbreak info (some historic info, seemingly from late 1990s) - Health Map Global (healtmap.org) – news based	- **DOEHRS** - **MESL** - **NCMI infections disease risk assessment for that time period** - WHO – data summaries without context - Host nation medical data - site specific and only available if you know a POC
Venomous Animals/Insects	Venomous Animals/Insects
- MESL - NCMI - APHC Ento Division - Armed Forces Pest Management Board - Clinical toxinology .com - University Adelaide of Australia - CDC	- **MESL** - **NCMI** - **Armed Forces Pest Management Board** - **Clinical toxinology .com** - **University Adelaide of Australia**
Heat/Cold Injuries	Heat/Cold Injuries
- MESL - NCMI country assessment and historical weather info - DRSi – this is a good source of deployment heat/cold injury data - Looking at monthly weather data - 14th weather squadron (less useful recently) - USARIEM	- **MESL** - **NCMI country assessment and historical weather info** - **Looking at monthly weather data**
Noise	Noise
- MESL - DOEHRS-IH - DOEHRS-HC - OEHSA - Periodic PM inspections of the base camp - Engineer basecamp assessment	- **MESL** - **DOEHRS** - DOEHRS-IH – very location specific
Occupational hazards, hazardous waste or hazardous materials	Occupational hazards, hazardous waste or hazardous materials
- MESL	- **DOEHRS**

Available Data Sources	Data Sources Currently being Utilized
- DOEHRS-IH - OEHSA - EHSA - Periodic PM inspections of the base camp - Engineer basecamp assessment	- **MESL**
Unique Incidents	Unique Incidents
- MESL - DOEHRS (incident reporting module, which sometimes works) - SARS from the COCOM/CIDN - Specific requests from the past	- **MESL** - **DOEHRS** (incident reporting module, which sometimes works) - **SARS from the COCOM/CIDN – SIPR**
SIPR Sources	
- SIPR MESL – contains classified and unclassified documents, is a spreadsheet with links to the documents, someone deployed sends the doc to APHC and then it is uploaded (may just be captured on the SIPR P:) - APHC SIPR site – should contain a lot of OEHSAs but might be out of date. May also contain other documents - SIPR P: - somewhat searchable - CIDNE - Intelink- Enterprise Search (https://search.ces.smil.mil) - MSAT - ARCENT Surgeons - COCOMS may have SharePoint sites	- **SARS from the COCOM/CIDNE – SIPR** - **Significant Activities Reports (SARs) from the theater/CIDN (CENTCOM Incident trackers) (classified)** - **SIPR MESL**

Appendix E: Handout for Workshop 2





Purpose of the POEMS Analysis

- To define the current state of POEMS and shape the desired state for POEMS, as well as courses of action to achieve and sustain the desired state.

Metrics for POEMS Analysis

- Completeness (topics, data sources, breadth/depth)
  - Interviews
  - Group Discussions/Workshops
  - Needs Assessment Survey
- Timeliness
  - Needs Assessment Survey
  - Interviews
  - Group Discussions/Workshops
- Accessibility by End Users
  - Needs Assessment Survey
  - Web Downloads Query
- Funding/Programming and Production Process
  - Process Mapping
  - BUSOPS query (WBS elements and estimated costs)

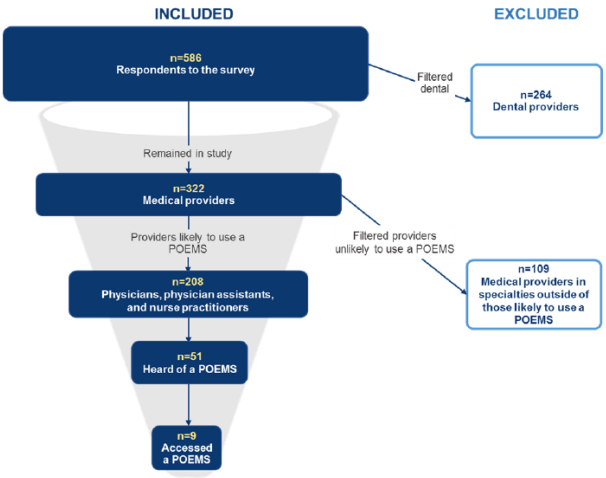
Finding Highlights

Workshop 1

- POEMS Primary Audience
  - **"The primary audience of the POEMS is healthcare providers from the DOD, the Veterans Administration, as well as private sector who are providing care to DOD personnel."**
- POEMS Purpose
  - **"The purpose of POEMS is to document the estimated population-level short-term (during deployment) and long-term (post deployment) health risks and medical implications associated with identified occupational and environmental health (OEH) hazards at deployment sites, and to contextualize available data and risks for healthcare providers (DOD, VA, and private sector) and DOD personnel."**

Finding Highlights

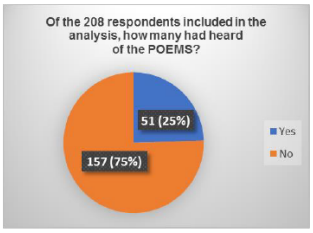
Needs Assessment Survey Results

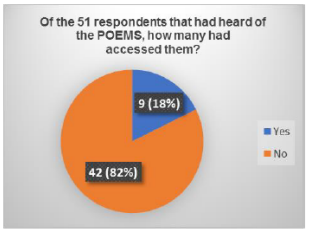


Finding Highlights

Needs Assessment Survey Results

- Conclusions
  - POEMS not reaching target end users (e.g., medical providers) and few have accessed POEMS.





Lines of Effort for Future Focus Based on POEMS Analysis Findings

	LOE 1: POEMS Content and Format	LOE 2: POEMS Marketing and Education	LOE 3: POEMS Development Process
Desired End State	The POEMS product is optimized to provide an efficient and effective resource to assist medical providers in understanding and communicating OEH risks and possible medical implications with patients.	Audience members are aware of POEMS, how to access POEMS, and how to appropriately use POEMS during patient encounters.	The internal APHC processes are streamlined and standardized to improve POEMS quality and consistency and reduce labor.

The decision was made to focus on LOE 1 moving forward.

Workshop 2 Objectives

- Overall Objective: Define the POEMS content and format to meet the needs of medical providers treating patients with deployment-related health concerns.
  - Determine what medical providers **NEED** to diagnose and treat patients with deployment-related health concerns
  - Determine what medical providers **WANT** from an OEH risk assessment/summary documentation to facilitate a patient encounter with deployment-related health concerns
  - Identify communication channels to market POEMS to medical providers

Need for POEMS Content

- How often do you see patients with deployment-related health concerns?
- Do you as a provider look at patient symptoms and suggest/decide to investigate whether or not they may be linked to a deployment?
- What do you use to investigate whether or not patient symptoms are linked to a deployment?

POEMS Content

- When patients express deployment-related health concerns, what type of exposure concerns are most often communicated?
- What information would you need in order to optimally care for a patient with deployment-related health concerns?

POEMS Format

- The current POEMS provides health risk estimate associated with particular hazards. Would the background data used to make those health risk estimates beneficial to you as a provider?
- How much time would/could you spend researching and reading deployment-related health risk information?

POEMS Format

- How would you like to see deployment-related health risk information presented?
- When accessing information about deployment-related health risks, where/how would you like to access it?
- How should the availability of this information be marketed to ensure it reaches those that need it?

Questions

Appendix F: POEMS Template, as of September 2017

The following is a template for creating a POEMS document.

Military Deployment

Periodic Occupational and Environmental Monitoring Summary (POEMS):

Base camp and vicinity, Country

Calendar Years: (XXXX to XXXX)

AUTHORITY: This periodic occupational and environmental monitoring summary (POEMS) has been developed in accordance with Department of Defense (DoD) Instructions 6490.03, 6055.05, and JCSM (MCM) 0028-07 (References 1-3).

PURPOSE: This POEMS documents the Department of Defense (DoD) assessment of occupational and environmental health (OEH) risk for Base camp and vicinity that includes: Camp XXX, Camp XXX, and Camp XXX. It presents a qualitative summary of OEH risks identified at this location and their potential medical implications. The report is based on information collected from Day Month Year through Day Month Year 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 Base camp and vicinity 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 report 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 report, the health risk assessment is limited to Day Month Year through Day Month Year.

The POEMS can be useful to inform healthcare providers and others of environmental conditions experienced by individuals deployed to Base camp and vicinity 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. Individual outdoor activities and associated routes of exposure are extremely variable and cannot be identified from or during environmental sampling. Individuals who sought medical treatment related to OEH exposures while deployed should have exposure/treatment noted in their medical record on a Standard Form (SF) 600 (Chronological Record of Medical Care).

SITE DESCRIPTION:

Add general site description. If data are scarce, include statement e.g. "…risk level is for general area and may not be specific to particular base camps".

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 Base camp and vicinity. 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 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 Base camp and vicinity that includes Camp XXX, Camp XXX, and Camp XXX: To be entered by A Medical Provider
Long-term health risks & medical implications: The following hazards may be associated with potential chronic health effects in some personnel during deployment at Base camp and vicinity that includes Camp XXX, Camp XXX, and Camp XXX: To be entered by A Medical Provider

EXAMPLE TABLE (delete sections with no identified health risk)

Table 2. Population-Based Health Risk Estimates - Base camp and vicinity that includes Camp XXX, Camp XXX, and Camp XXX [1, 2]

Source of Identified Health Risk[3]	Unmitigated Health Risk Estimate[4]	Control Measures Implemented	Residual Health Risk Estimate[4]
AIR			
Particulate matter less than 10 micrometers in diameter (PM_{10})	Short-term: Risk level. Daily levels vary, acute health effects (e.g., upper respiratory tract irritation) more pronounced during peak days. More serious effects are possible in susceptible persons (e.g., those with asthma/existing respiratory diseases).	Limiting strenuous physical activities when air quality is especially poor; and actions such as closing tent flaps, windows, and doors.	Short-term: Risk level. Daily levels vary, acute health effects (e.g., upper respiratory tract irritation) more pronounced during peak days. More serious effects are possible in susceptible persons (e.g., those with asthma/existing respiratory diseases).
	Long-term: No health guidelines		Long-term: No health guidelines
Particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$)	Short-term: Risk level. A majority of the time mild acute (short term) health effects are anticipated; certain peak levels may produce mild eye, nose, or throat irritation in some personnel and pre-existing health conditions (e.g., asthma, or cardiopulmonary diseases) may be exacerbated.	Limiting strenuous physical activities when air quality is especially poor; and actions such as closing tent flaps, windows, and doors.	Short-term: Risk level. A majority of the time mild acute (short term) health effects are anticipated; certain peak levels may produce mild eye, nose, or throat irritation in some personnel and pre-existing health conditions (e.g., asthma, or cardiopulmonary diseases) may be exacerbated.
	Long-term: Risk level. 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: Risk level. 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: Risk level		Short-term: Risk level
	Long-term: Risk level		Long-term: Risk level
Volatile Organic Compounds (VOC)	Short-term: Risk level		Short-term: Risk level
	Long-term: Risk level		Long-term: Risk level

Source of Identified Health Risk[3]	Unmitigated Health Risk Estimate[4]	Control Measures Implemented	Residual Health Risk Estimate[4]
SOIL			
Metals	Short-term: Not an identified source of health risk.		Short-term: Not an identified source of health risk.
	Long-term: Risk level		Long-term: Risk level
Organic Compounds	Short-term: Not an identified source of health risk.		Short-term: Not an identified source of health risk.
	Long-term: Risk level		Long-term: Risk level
Inorganic Compounds	Short-term: Not an identified source of health risk.		Short-term: Not an identified source of health risk.
	Long-term: Risk level		Long-term: Risk level
WATER			
Consumed Water (Water Used for Drinking)	Short-term: Risk level	U.S. Army Public Health Center (USAPHC) former U.S. Army Veterinary Command (VETCOM) approved bottled water and potable water only from approved water sources	Short-term: Risk level.
	Long-term: Risk level		Long-term: Risk level
Water for Other Purposes	Short-term: Risk level	Water treated in accordance with standards applicable to its intended use	Short-term: Risk level
	Long-term: Risk level		Long-term: Risk level
MILITARY UNIQUE			
Ionizing Radiation	Short-term: Risk level		Short-term: Risk level
	Long-term: Risk level		Long-term: Risk level
Non-ionizing Radiation	Short-term: Risk level		Short-term: Risk level
	Long-term: Risk level		Long-term: Risk level
ENDEMIC DISEASE			
Foodborne/Waterborne (e.g., diarrhea-bacteriological)	Short-term: Risk level. List risk level(s) and disease(s) at that risk level(s).	Preventive measures include Example regional specific disease vaccination and consumption of food and	Short-term: Risk level. List risk level(s) and disease(s) at that risk level(s).
	Long-term: Risk level. List risk		Long-term: Risk level. List risk

Source of Identified Health Risk[3]	Unmitigated Health Risk Estimate[4]	Control Measures Implemented	Residual Health Risk Estimate[4]
	level(s) and disease(s) at that risk level(s).	water only from approved sources.	level(s) and disease(s) at that risk level(s).
Arthropod Vector Borne	Short-term: Risk level. List risk level(s) and disease(s) at that risk level(s).	Preventive measures include proper wear of treated uniform, application of repellent to exposed skin, bed net use, minimizing areas of standing water and appropriate chemoprophylaxis.	Short-term: Risk level. List risk level(s) and disease(s) at that risk level(s).
	Long-term: Risk level. List risk level(s) and disease(s) at that risk level(s).		Long-term: Risk level. List risk level(s) and disease(s) at that risk level(s).
Water-Contact (e.g., wading, swimming)	Short-term: Risk level. List risk level(s) and disease(s) at that risk level(s).	Recreational swimming in surface waters not likely in this area of Afghanistan during this time period.	Short-term: Risk level. List risk level(s) and disease(s) at that risk level(s).
	Long-term: Risk level. List risk level(s) and disease(s) at that risk level(s).		Long-term: Risk level. List risk level(s) and disease(s) at that risk level(s).
Respiratory	Short-term: Risk level. List risk level(s) and disease(s) at that risk level(s).	Providing adequate living and work space; medical screening; vaccination	Short-term: Risk level. List risk level(s) and disease(s) at that risk level(s).
	Long-term: Risk level. List risk level(s) and disease(s) at that risk level(s).		Long-term: Risk level. List risk level(s) and disease(s) at that risk level(s).
Animal Contact	Short-term: Risk level. List risk level(s) and disease(s) at that risk level(s).	Prohibiting contact with, adoption, or feeding of feral animals IAW U.S. Central Command (CENTCOM) General Order (GO) 1B. Risks are further reduced in the event of assessed contact by prompt post-exposure rabies prophylaxis IAW The Center for Disease Control's (CDC) Advisory Committee on Immunization Practices guidance.	Short-term: Risk level. List risk level(s) and disease(s) at that risk level(s).
	Long-term: Risk level. List risk level(s) and disease(s) at that risk level(s).		Long-term: Risk level. List risk level(s) and disease(s) at that risk level(s).
Soil-transmitted	Short-term: Risk level. List risk level(s) and disease(s) at that risk	Risk was reduced to Low by limiting exposure to soil contaminated with human	Short-term: Risk level. List risk level(s) and disease(s) at that

Source of Identified Health Risk[3]	Unmitigated Health Risk Estimate[4]	Control Measures Implemented	Residual Health Risk Estimate[4]
	level(s).	or animal feces (including sleeping on bare ground, and walking barefoot).	risk level(s).
	Long-term: Risk level. List risk levels(s) and disease(s) at that risk level(s).		Long-term: Risk level. List risk levels(s) and disease(s) at that risk level(s).
VENOMOUS ANIMALS			
List categories of venomous/poisonous animals	Short-term: Risk level. If encountered, effects of venom vary with species from mild localized swelling (e.g., *Example species*) to potentially lethal effects (e.g. *Example species*).	Risk reduced by avoiding contact, proper wear of uniform (especially footwear), and proper and timely treatment.	Short-term: Risk level. If encountered, effects of venom vary with species from mild localized swelling (e.g., *Example species*) to potentially lethal effects (e.g. *Example species*).
	Long-term: No data available		Long-term: No data available
HEAT/COLD STRESS			
Heat	Short-term: Variable; Risk of heat injury is Risk level for Month-Month, and Low for all other months.	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 Risk level for Month-Month and Low for all others.
	Long-term: Risk level. The long-term risk was Risk level. However, the risk may be greater to certain susceptible persons–those older (i.e., greater than 45 years), in lesser physical shape, or with underlying medical/health conditions.		Long-term: Low, The long-term risk is Low. However, the risk may be greater to certain susceptible persons–those older (i.e., greater than 45 years), in lesser physical shape, or with underlying medical/health conditions.
Cold	Short-term: Risk level risk of cold stress/injury.	Risks from cold stress reduced with protective measures such as use of the buddy system, limiting exposure during cold weather, proper hydration and nutrition, and proper wear of issued protective clothing.	Short-term: Risk level risk of cold stress/injury.
	Long-term: Low. Long-term health implications from cold injuries are rare but can occur, especially from more serious injuries such as frost bite.		Long-term: Low. Long-term health implications from cold injuries are rare but can occur, especially from more serious injuries such as frost bite.

Source of Identified Health Risk[3]	Unmitigated Health Risk Estimate[4]	Control Measures Implemented	Residual Health Risk Estimate[4]
NOISE			
Continuous (Flightline, Power Production)	Short-term: Risk level	Hearing protection used by personnel in higher risk areas	Short-term: Risk level
	Long-term: Risk level		Long-term: Risk level
Impulse	Short-term: Risk level		Short-term: Risk level
	Long-term: Risk level		Long-term: Risk level
UNIQUE INCIDENTS/ CONCERNS			
Waste Sites/Waste Disposal	Short-term: Risk level		Short-term: Risk level
	Long-term: Risk level		Long-term: Risk level
Fuel/petroleum products/ industrial chemical spills	Short-term: Risk level		Short-term: Risk level
	Long-term: Risk level		Long-term: Risk level
Pesticides/Pest Control	Short-term: Risk level	See Section 10.4	Short-term: Risk level
	Long-term: Risk level		Long-term: Risk level
Asbestos	Short-term: Risk level		Short-term: Risk level
	Long-term: Risk level		Long-term: Risk level
Lead Based Paint	Short-term: Risk level		Short-term: Risk level
	Long-term: Risk level		Long-term: Risk level
Burn Pits	Short-term: Burn pits and/or incinerators might have existed Camp XXXX and vicinity (for example, burn pits used by the local population); however, there are no reports or sampling data to indicate their presence or absence. Consequently, the PM_{10} and the $PM_{2.5}$ overall short-term health risks specifically for burn pits were not evaluated. See Section 10.7. A majority of the time mild acute (short term) health effects are anticipated; certain peak levels may produce mild eye, nose, or throat	Risks reduced by limiting strenuous physical activities when air quality was especially poor; and action such as closing tent flaps, windows, and doors. Other control measures included locating burn pits downwind of camps, increased distance from troop populations, and improved waste segregation and	Short-term: Burn pits and/or incinerators might have existed Camp XXXX and vicinity (for example, burn pits used by the local population); however, there are no reports or sampling data to indicate their presence or absence. Consequently, the PM_{10} and the $PM_{2.5}$ overall short-term health risks specifically for burn pits were not evaluated. See Section 10.7. A majority of the time mild acute (short term) health effects are anticipated;

Source of Identified Health Risk[3]	Unmitigated Health Risk Estimate[4]	Control Measures Implemented	Residual Health Risk Estimate[4]
	irritation in some personnel and pre-existing health conditions (e.g., asthma, or cardiopulmonary diseases) may be exacerbated.	management techniques.	certain peak levels may produce mild eye, nose, or throat irritation in some personnel and pre-existing health conditions (e.g., asthma, or cardiopulmonary diseases) may be exacerbated.
	Long-term: Burn pits and/or incinerators might have existed at Camp XXXX and vicinity (for example, burn pits used by the local population); however, there are no reports or sampling data to indicate their presence or absence. Consequently, the PM_{10} and the $PM_{2.5}$ overall long-term health risks specifically for burn pits were not evaluated. Section 10.7. Exposure to burn pit smoke is variable. Exposure to high levels of PM_{10} and $PM_{2.5}$ in the smoke may be associated with some otherwise healthy personnel, who were exposed for a long-term period, possibly developing certain health conditions (e.g., reduced lung function, cardiopulmonary disease). Personnel with a history of asthma or cardiopulmonary disease could potentially be more likely to develop such chronic health conditions.		Long-term: Burn pits and/or incinerators might have existed at Camp XXXX and vicinity (for example, burn pits used by the local population); however, there are no reports or sampling data to indicate their presence or absence. Consequently, the PM_{10} and the $PM_{2.5}$ overall long-term health risks specifically for burn pits were not evaluated. See Section 10.7. Exposure to burn pit smoke is variable. Exposure to high levels of PM_{10} and $PM_{2.5}$ in the smoke may be associated with some otherwise healthy personnel, who were exposed for a long-term period, possibly developing certain health conditions (e.g., reduced lung function, cardiopulmonary disease). Personnel with a history of asthma or cardiopulmonary disease could potentially be more likely to develop such chronic health conditions.

Source of Identified Health Risk[3]	Unmitigated Health Risk Estimate[4]	Control Measures Implemented	Residual Health Risk Estimate[4]

Notes:

[1]This Summary Table provides a qualitative estimate of population-based short- and long-term health risks associated with the occupational environment conditions at Base camp and vicinity that includes Camp XXX, Camp XXX, and Camp XXX. 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.

[2] This assessment is based on specific environmental sampling data and reports obtained from Day Month Year through Day Month Year. 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.

[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 Base camp and vicinity. 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 Army Public Health Center (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.

[4]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 Discussion of Health Risks at Camp XXXX, Country by Source

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 Center (USAPHC) Technical Guide 230, *Environmental Health Risk Assessment and Chemical Exposure Guidelines for Deployed Military Personnel* (Reference 4). 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.

The ProUCL version 5.0 software package was used for statistical analyses (Reference 5). Means are followed by standard deviation (SD). Risk characterization was based on the 95 percent upper confidence level of the arithmetic mean (95% UCL) or the arithmetic mean depending on the quality and quantity of the data being evaluated. The sample mean is an uncertain estimate of the true mean of the population exposure point concentration (PEPC). The 95% UCL reduces the uncertainty inherent in the sample mean and states with a higher level of confidence that the mean PEPC is no greater than the 95% UCL.

2 Air

2.1 Site-Specific Sources Identified

Camp XXXX is situated in a Describe the general environment and climate conditions and how that may impact soldier health.

2.2 Particulate matter

Particulate matter (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 sources such as: power plants, motor vehicles, aircraft, generators, construction activities, fires, and natural windblown dust. The PM can include sand, soil, metals, volatile organic compounds (VOC), 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_{10}, which includes coarse particles with a diameter of 10 micrometers or less, and fine particles less than 2.5 micrometers ($PM_{2.5}$), which can reach the deepest regions of the lungs when inhaled. Exposure to excessive PM is linked to a variety of potential health effects.

2.3 Particulate matter, less than10 micrometers (PM_{10})

2.3.1 Exposure Guidelines:

Short Term (24-hour) PM_{10} (micrograms per cubic meter, $\mu g/m^3$):

- Negligible MEG = 250

Long-term PM_{10} MEG ($\mu g/m^3$):

- Not defined and not available.

- Marginal MEG = 420
- Critical MEG = 600

2.3.2 Sample data/Notes:

A total of XX valid PM_{10} air samples were collected from XXXX – XXXX. The range of 24-hour PM_{10} concentrations was XX µg/m^3 – XXX µg/m^3 with an average concentration of XXX µg/m^3.

Camp XXXX: A total of XX valid PM_{10} air samples were collected from Day Month Year to Day Month Year. The range of 24-hour PM_{10} concentrations was XX µg/m^3 – XXX µg/m^3 with an average concentration of XXX µg/m^3.

Camp XXXX: A total of XX valid PM_{10} air samples were collected from Day Month Year to Day Month Year. The range of 24-hour PM_{10} concentrations was XX µg/m^3 – XXX µg/m^3 with an average concentration of XXX µg/m^3.

Camp XXXX: A total of XX valid PM_{10} air samples were collected from Day Month Year to Day Month Year. The range of 24-hour PM_{10} concentrations was XX µg/m^3 – XXX µg/m^3 with an average concentration of XXX µg/m^3.

2.3.3 Short-term health risks:

Low/Moderate/High/Extremely High: The short-term PM_{10} health risk assessment is Low/Moderate/High based on average and peak PM_{10} sample concentrations, and the likelihood of exposure at these hazard severity levels. A Low/Moderate/High/Extremely High health risk assessment is expected to have tactical risk definition (Reference 4, Table 3-2). Daily average health risk levels for PM_{10} show no hazard for XX%, low health risk for XX%, moderate health risk for X%, and high health risk for X% of the time. Confidence in the short-term PM_{10} health risk assessment is low/medium/high (Reference 4, Table 3-6).

The hazard severity for average PM_{10} concentrations in samples was negligible/marginal/critical. The results indicate that hazard severity definition and associated effects of exposure (Reference 4, Table 3-11).

For the highest observed PM_{10} sample concentration, the hazard severity was negligible/marginal/critical. During peak exposures at the negligible/marginal/critical hazard severity level, hazard severity definition and associated effects of exposure (Reference 4, Table 3-11).

2.3.4 Long-term health risk:

Not Evaluated-no available health guidelines. The U.S. Environmental Protection Agency (EPA) has retracted its long-term standard (National Ambient Air Quality Standards, NAAQS) for PM_{10} due to an inability to clearly link chronic health effects with chronic PM_{10} exposure levels.

2.4 Particulate Matter, less than 2.5 micrometers (PM2.5)

2.4.1 Exposure Guidelines:

Short Term (24-hour) $PM_{2.5}$ (µg/m^3):

- Negligible MEG = 65
- Marginal MEG = 250
- Critical MEG = 500

Long-term (1year) $PM_{2.5}$ MEGs (µg/m^3):

- Negligible MEG = 15
- Marginal MEG = 65.

2.4.2 Sample data/Notes:

Camp XXXX: A total of XX valid $PM_{2.5}$ air samples were collected from Day Month Year to Day Month Year. The range of 24-hour $PM_{2.5}$ concentrations was XX µg/m^3 – XXX µg/m^3 with an average concentration of XXX µg/m^3.

Camp XXXX: A total of XX valid $PM_{2.5}$ air samples were collected from Day Month Year to Day Month Year. The range of 24-hour $PM_{2.5}$ concentrations was XX µg/m^3 – XXX µg/m^3 with an average concentration of XXX µg/m^3.

Camp XXXX: A total of XX valid $PM_{2.5}$ air samples were collected from Day Month Year to Day Month Year. The range of 24-hour $PM_{2.5}$ concentrations was XX µg/m^3 – XXX µg/m^3 with an average concentration of XXX µg/m^3.

2.4.3 Short-term health risks:

Low/Moderate/High/Extremely High: The short-term $PM_{2.5}$ health risk assessment is Low/Moderate/High based on average and peak $PM_{2.5}$ sample concentrations, and the likelihood of exposure at these hazard severity levels. A Low/Moderate/High/Extremely High health risk assessment is expected to have tactical risk definition (Reference 4, Table 3-2). Daily average health risk levels for $PM_{2.5}$ show no hazard for XX%, low health risk for XX%, moderate health risk for X%, and high health risk for X% of the time. Confidence in the short-term $PM_{2.5}$ health risk assessment was low/medium/high (Reference 4, Table 3-6).

The hazard severity was negligible/marginal/critical for average $PM_{2.5}$ sample concentrations. The results indicate that hazard severity definition and associated effects of exposure (Reference 4, Table 3-11).

For the highest observed $PM_{2.5}$ exposure, the hazard severity was negligible/marginal/critical. During peak exposures at the negligible/marginal/critical hazard severity level, hazard severity definition and associated effects of exposure (Reference 4, Table 3-11).

2.4.4 Long-term health risks:

Low/Moderate/High/Extremely High: The long-term health risk assessment is Low/Moderate/High/Extremely High based on average $PM_{2.5}$ concentration, and the likelihood of exposure at this hazard severity level. A Low/Moderate/High health risk level suggests that long-term exposure to $PM_{2.5}$ is expected to have lifecycle risk definition (Reference 4, Table 3-3). Confidence in the long-term $PM_{2.5}$ health risk assessment is low/medium/high (Reference 4, Table 3-6).

The hazard severity was negligible/marginal/critical (XX µg/m^3 – XXX µg/m^3) for average $PM_{2.5}$ sample concentrations. The results suggest that with repeated exposures above the negligible/marginal/critical hazard severity threshold, hazard severity definition and associated effects of exposure (Reference 4, Table 3-12).

2.5 Airborne Metals

2.5.1 Exposure Guidelines:

2.5.2 Sample data/Notes:

A total of XX valid PM_{10} airborne metal samples were collected at Camp XXX from Day Month Year to Day Month Year.

2.5.3 Short-term health risks:

Low/Moderate/High/Extremely High: Metal analyte had an average (XXX ug/m^3) and peak (XXX ug/m^3) sample concentration that exceeded the short-term 14 day negligible/marginal/critical MEG (XXX ug/m^3). The short-term health risk assessment for PM_{10} airborne metal analyte sample concentrations is Low/Moderate/High/Extremely High. Confidence in the health risk assessment is low/medium/high (Reference 4, Table 3-6).

2.5.4 Long-term health risks:

None identified based on the available sampling data.

2.6 Volatile Organic Compounds (VOC)

2.6.1 Exposure Guidelines:

2.6.2 Sample data/Notes:

The health risk assessment is based on average and peak concentration of XX valid volatile organic chemical (VOC) air samples collected from Day Month Year to Day Month Year., and the likelihood of exposure. None of the analyzed VOC pollutants were found at concentrations above short or long-term MEGs.

2.6.3 Short and long-term health risks:

None identified based on the available sampling data. No parameters exceeded 1-year Negligible MEGs.

3 Soil

3.1 Site-Specific Sources Identified

3.2 Sample data/Notes:

A total of XX valid surface soil samples were collected from Day Month Year to Day Month Year, to assess OEH health risk to deployed personnel. The primary soil contamination exposure pathways are dermal contact and dust inhalation. Typical parameters analyzed for included semi volatile organic compounds (SVOCs), heavy metals, polychlorinated biphenyls (PCBs), pesticides, and herbicides. If the contaminant was known or suspected, other parameters may have been analyzed for (i.e., total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH) near fuel spills). The percent of the population exposed to soil and associated dust in the sampled areas was > 75% for X samples, 50 – 75% for X sample, 25 <50% for X samples, 10 > 25% for X sample, and < 10% for X samples. For the risk assessment, personnel are assumed to remain at this location for 6 months to 1 year.

3.3 Short-term health risk:

Not an identified source of health risk. Currently, sampling data for soil are not evaluated for short term (acute) health risks**.**

3.4 Long-term health risk:

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

4 Water

In order to assess the health risk to U.S. personnel from exposure to water in theater, the APHC identified the most probable exposure pathways. These are based on the administrative information provided on the field data sheets submitted with the samples taken over the time period being evaluated. Based on the information provided from the field, all samples for untreated water samples were associated with source water for treatment and no exposure pathways were associated with those samples. Therefore, untreated samples are not assessed as potential health hazards. It is assumed that 100% of all U.S. personnel at Camp XXXX will be directly exposed to reverse osmosis water purification unit (ROWPU) treated, disinfected fresh bulk water, bottled water, and untreated well water since this classification of water is primarily used for personal hygiene, showering, cooking, and for use at vehicle wash racks. Field data sheets indicate that bottled water is the only approved source of drinking water.

4.1 Drinking Water: Bottled or Packaged Water

4.1.1 Site-Specific Sources Identified

There were multiple bottled water brands sampled at Camp XXXX. These samples included XXX, XXX, XXX, and XXX brands of bottled water

4.1.2 Sample data/Notes:

To assess the potential for adverse health effects to troops, the following assumptions were made about dose and duration: A conservative (protective) assumption was that personnel

routinely ingested 5 L/day of bottled water for up to 365 days (1-year). It was further assumed that control measures were not used.

A total of X valid bottled water samples were collected from Day Month Year to Day Month Year.

4.1.3 Short-term and long-term health risk:

None identified based on available sample data. All collected samples were below the short and long-term Negligible MEGs.

4.2 Non-Drinking Water: Disinfected

4.2.1 Site-Specific Sources Identified

Although the primary route of exposure for most microorganisms is ingestion of contaminated water, dermal exposure to some microorganisms, chemicals, and biologicals may also cause adverse health effects. Complete exposure pathways would include drinking, brushing teeth, personal hygiene, cooking, providing medical and dental care using a contaminated water supply or during dermal contact at vehicle or aircraft wash racks.

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 XX disinfected bulk water (Non-Drinking) samples from XXXX to XXXX were evaluated for this health risk assessment. No chemicals were detected at levels above the short or long-term MEGs.

4.2.3 Short and long-term health risks:

None identified based on available sample data. All collected samples were below the short and long-term Negligible MEGs.

5 Military Unique

5.1 Chemical Biological, Radiological Nuclear (CBRN) Weapons

Describe documented hazard source or state: No specific hazard sources were documented in the Defense Occupational and Environmental Health Readiness System (DOEHRS) or the Military Exposure Surveillance Library (MESL) from Month Year to Month Year timeframe (References 1 and 6).

5.2 Depleted Uranium (DU)

Describe documented hazard source or state: No specific hazard sources were documented in the DOEHRS or MESL from Month Year to Month Year timeframe (References 1 and 6).

5.3 Ionizing Radiation

Describe documented hazard source or state: No specific hazard sources were documented in the DOEHRS or MESL from Month Year to Month Year timeframe (References 1 and 6).

5.4 Non-Ionizing Radiation

Describe documented hazard source or state: No specific hazard sources were documented in the DOEHRS or MESL from Month Year to Month Year timeframe (References 1 and 6).

6 Endemic Diseases

This document lists the endemic diseases reported in the region, its specific health risks and severity and general health information about the diseases. Appropriate COCOM deployment guidance e.g. CENTCOM Modification (MOD) 12 (Reference 7) lists deployment requirements, to include immunizations and chemoprophylaxis, in effect during the timeframe of this POEMS.

6.1 Foodborne and Waterborne Diseases

Describe the general situation with regard to food and water in the region, the potential impacts to soldiers and mitigation strategies employed.

6.1.1 Disease

Risk level: Describe disease, impact to individual soldier and unit, mitigation strategies employed and how those strategies affect risk level.

6.1.2 Short-term Health Risks:

Risk level: The overall unmitigated short-term risk associated with foodborne and waterborne diseases is considered list diseases at each risk level. Preventive Medicine measures reduced the risk to Risk level. Confidence in the health risk estimate is confidence level.

6.1.3 Long-term Health Risks:

Risk level: The overall unmitigated long-term risk associated with foodborne and waterborne diseases is considered list diseases at each risk level. Preventive Medicine measures reduced the risk to Risk level. Confidence in the health risk estimate is confidence level.

6.2 Arthropod Vector-Borne Diseases

Describe the general situation with regard to arthropod and vector-borne diseases in the region, the potential impacts to soldiers and mitigation strategies employed.

6.2.1 Disease

Risk level: Describe disease, impact to individual soldier and unit, mitigation strategies employed and how those strategies affect risk level.

6.2.2 Short -term health risks:

Risk level: The overall unmitigated short-term risk associated with arthropod and vector-borne diseases is considered list diseases at each risk level. Preventive Medicine measures reduced the risk to Risk level. Confidence in the health risk estimate is confidence level.

6.2.3 Long-term health risks:

Risk level: The overall unmitigated long-term risk associated with arthropod and vector-borne diseases is considered list diseases at each risk level. Preventive Medicine measures reduced the risk to Risk level. Confidence in the health risk estimate is confidence level.

6.3 Water Contact Diseases

Describe the general situation with regard to water contact diseases in the region, the potential impacts to soldiers and mitigation strategies employed.

6.3.1 Disease

Risk level: Describe disease, impact to individual soldier and unit, mitigation strategies employed and how those strategies affect risk level.

6.3.2 Short-term health risks:

Risk level: The overall unmitigated short-term risk associated with water contact diseases is considered list diseases at each risk level. Preventive Medicine measures reduced the risk to Risk level. Confidence in the health risk estimate is confidence level.

6.3.3 Long-term health risks:

Risk level: The overall unmitigated long-term risk associated with water contact diseases is considered list diseases at each risk level. Preventive Medicine measures reduced the risk to Risk level. Confidence in the health risk estimate is confidence level.

6.4 Respiratory Diseases

Describe the general situation with regard to respiratory diseases in the region, the potential impacts to soldiers and mitigation strategies employed.

6.4.1 Disease

Risk level: Describe disease, impact to individual soldier and unit, mitigation strategies employed and how those strategies affect risk level.

6.4.2 Short-term health risks:

Risk level: The overall unmitigated short-term risk associated with respiratory diseases is considered list diseases at each risk level. Preventive Medicine measures reduced the risk to Risk level. Confidence in the health risk estimate is confidence level.

6.4.3 Long-term health risks:

Risk level: The overall unmitigated long-term risk associated with respiratory diseases is considered list diseases at each risk level. Preventive Medicine measures reduced the risk to Risk level. Confidence in the health risk estimate is confidence level.

6.5 Animal-Contact Diseases

6.5.1 Disease

Risk level: Describe disease, impact to individual soldier and unit, mitigation strategies employed and how those strategies affect risk level.

6.5.2 Short-term health risks:

Risk level: The overall unmitigated short-term risk associated with animal-contact diseases is considered list diseases at each risk level. Preventive Medicine measures reduced the risk to Risk level. Confidence in the health risk estimate is confidence level.

6.5.3 Long-term health risks:

Risk level: The overall unmitigated long-term risk associated with animal-contact diseases is considered list diseases at each risk level. Preventive Medicine measures reduced the risk to Risk level. Confidence in the health risk estimate is confidence level.

6.6 Soil-transmitted helminths (list organisms in the region)

Risk level: Describe disease, impact to individual soldier and unit, mitigation strategies employed and how those strategies affect risk level.

6.6.1 Short-term health risks:

Risk level: The overall unmitigated short-term risk associated with soil-transmitted helminths is considered list diseases at each risk level. Preventive Medicine measures reduced the risk to Risk level. Confidence in the health risk estimate is confidence level.

6.6.2 Long-term health risks:

Risk level: The overall unmitigated long-term risk associated with soil-transmitted helminths is considered list diseases at each risk level. Preventive Medicine measures reduced the risk to Risk level. Confidence in the health risk estimate is confidence level.

7 Venomous/Poisonous Animals

All information was taken directly from the Armed Forces Pest Management Board (Reference 8) and the Clinical Toxinology Resources web site from the University of Adelaide, Australia (Reference 9). The species listed below have home ranges that overlap the location of Camp XXXX and vicinity, and may present a health risk if they are encountered by personnel. See Section 9 for more information about pesticides and pest control measures.

7.1 Organism group (e.g Spiders)

- Organism: Describe effects of venom/poison.

7.2 Short-term health risk:

Risk level: If encountered, effects of venom/poison vary with species from mild localized swelling (e.g. example organism from list) to potentially lethal effects (e.g., example organism from list). See effects listed above. Mitigation strategies included avoiding contact, proper wear of uniform (especially footwear), and timely medical treatment. Confidence in the health risk estimate is low (Reference 4, Table 3-6).

7.3 Long-term health risk:

None identified.

8 Heat/Cold Stress

8.1 Heat

Summer (Month - Month) monthly mean daily maximum temperatures range from XX degrees Fahrenheit (°F) to XXX °F with an average temperature of XX °F based on historical climatological data from the U.S. Air Force Combat Climatology Center, 14th Weather Squadron. The health risk of heat stress/injury based on temperatures alone is Low (< 78 °F) from month – month, Moderate (78-81.9°F) from month – month, high (82-87.9°F) from month – month, and extremely high (≥ 88°F) from month – month. However, work intensity and clothing/equipment worn pose greater health risk of heat stress/injury than environmental factors alone (Reference 10). Managing risk of 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 High from month – month, Moderate from month – month, and Low from month – month. Confidence in the health risk estimate is low (Reference 4, 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 these risk estimates is medium (Reference 4, Table 3-6).

8.2 Cold

8.2.1 Short-term health risks:

Winter (Month - Month) mean daily minimum temperatures range from XX °F to XX °F with an average temperature of XX °F based on historical climatological data from the U.S. Air Force Combat Climatology Center, 14th Weather Squadron. Because even on warm days a significant drop in temperature after sunset by as much as 40 °F can occur, there is a risk of cold stress/injury from month - month. The risk assessment for Non-Freezing Cold Injuries (NFCI), such as chilblain, trench foot, and hypothermia, is Risk Level based on historical temperature and precipitation data. Frostbite is unlikely to occur because temperatures rarely drop below freezing. However, personnel may encounter significantly lower temperatures during field operations at higher altitudes. As with heat stress/injuries, cold stress/injuries are largely dependent on operational and individual factors instead of environmental factors alone (Reference 9).

Low: The health risk of cold injury is Low. Confidence in the health risk estimate is medium.

8.1.2 Long-term health risk:

Low: The health risk of cold injury is Low. Confidence in the health risk estimate is medium (Reference 4, Table 3-6).

9 Noise

9.1 Continuous

Describe documented hazard source or state: No specific hazard sources were documented in the DOEHRS or MESL from Month Year to Month Year timeframe (References 1 and 6).

9.2 Impulse

Describe documented hazard source or state: No specific hazard sources were documented in the DOEHRS or MESL from Month Year to Month Year timeframe (References 1 and 6).

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 task 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

Describe documented hazard source or state: No specific hazard sources were documented in the DOEHRS or MESL from Month Year to Month Year timeframe (References 1 and 6).

10.3 Fuel/petroleum products/industrial chemical spills

Describe documented hazard source or state: No specific hazard sources were documented in the DOEHRS or MESL from Month Year to Month Year timeframe (References 1 and 6).

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. No specific hazard sources were documented in DOEHRS or MESL data portal. A total of XX monthly pesticide

application reports in the MESL data portal for Camp XXXX (month year to month year) list the usage of pesticides on the site. For each pesticide product applied during this period, the EPA approved label has been archived, providing a framework how each pesticide handled and applied (see below).

10.4.1 Rodenticides

XXXX were used to control rodents.

10.4.2 Insecticides

Insecticides used to control ants, bees, crickets, fleas, flies, lice, mosquitoes, spiders, termites, and wasps include: *XXXX*.

10.4.2 Herbicides

XXXX was used to control weeds.

10.4.3 Short-term and Long-term health risks

Low: Long term health risk is Low. Confidence in the health risk assessment is medium (Reference 4, Table 3-6).

10.5 Asbestos

Describe documented hazard source or state: No specific hazard sources were documented in the DOEHRS or MESL from Month Year to Month Year timeframe (References 1 and 6).

10.6 Lead Based Paint

Describe documented hazard source or state: No specific hazard sources were documented in the DOEHRS or MESL from Month Year to Month Year timeframe (References 1 and 6).

10.7 Burn Pit

While not specific to Camp XXXX, the consolidated epidemiological and environmental sampling and studies on burn pits that have been conducted as of the date of this publication have been unable to determine whether an association does or does not exist between exposures to emissions from the burn pits and long-term health effects (Reference 11). The Institute of Medicine committee's (Reference 12) review of the literature and the data suggests that service in Iraq or Afghanistan (i.e., a broader consideration of air pollution than exposure only to burn pit emissions) may be associated with long-term health effects, particularly in susceptible (e.g., those who have asthma) or highly exposed subpopulations, such as those who worked at the burn pit. Such health effects would be due mainly to high ambient concentrations of PM from both natural and anthropogenic sources, including military sources. If that broader exposure to air pollution turns out to be relevant, potentially related health effects of concern are respiratory and cardiovascular effects and cancer. Susceptibility to the PM

health effects could be exacerbated by other exposures, such as stress, smoking, local climatic conditions, and co-exposures to other chemicals that affect the same biologic or chemical processes. Individually, the chemicals measured at burn pit sites in the study were generally below concentrations of health concern for general populations in the United States. However, the possibility of exposure to mixtures of the chemicals raises the potential for health outcomes associated with cumulative exposure to combinations of the constituents of burn pit emissions and emissions from other sources.

10.7.1 Particulate matter, less than10 micrometers (PM_{10})

10.7.2 Exposure Guidelines:

Short Term (24-hour) PM_{10} ($\mu g/m^3$):
- Negligible MEG = 250
- Marginal MEG = 420
- Critical MEG = 600

Long-term PM_{10} MEG ($\mu g/m^3$):
- Not defined and not available.

10.7.2.1 Sample data/Notes:

A total of XX valid PM_{10} air samples were collected from XXXX – XXXX. The range of 24-hour PM_{10} concentrations was XX $\mu g/m^3$ – XXX $\mu g/m^3$ with an average concentration of XXX $\mu g/m^3$.

10.7.2.2 Short-term health risks:

Low/Moderate/High/Extremely High: The short-term PM_{10} health risk assessment was Low/Moderate/High based on average and peak PM_{10} concentrations, and the likelihood of exposure at these hazard severity levels. A Low/Moderate/High/Extremely High health risk assessment for typical and peak exposure concentrations suggests that short-term exposure to PM_{10} at Camp XXXX was expected to have tactical risk definition (Reference 9, Table 3-2). Daily average health risk levels for PM_{10} show no hazard for XX%, low health risk for XX%, moderate health risk for X%, and high health risk for X% of the time. Confidence in the short-term PM_{10} health risk assessment was low/medium/high (Reference 4, Table 3-6).

The hazard severity was negligible/marginal/critical for average PM_{10} exposures. The results indicate that hazard severity definition and associated effects of exposure (Reference 4, Table 3-11).

For the highest observed PM_{10} exposure, the hazard severity was negligible/marginal/critical. During peak exposures at the negligible/marginal/critical hazard severity level, hazard severity definition and associated effects of exposure (Reference 4, Table 3-11).

10.7.2.3 Long-term health risk:

Not Evaluated-no available health guidelines. The EPA has retracted its long-term NAAQS for PM_{10} due to an inability to clearly link chronic health effects with chronic PM_{10} exposure levels.

11 References

1. Defense Occupational and Environmental Health Readiness System (referred to as the DOEHRS-EH database) at https://doehrs-ih.csd.disa.mil/Doehrs/. Department of Defense (DoD) Instruction 6490.03, *Deployment Health*, 2006.

2. DoDI 6055.05, Occupational and Environmental Health, 2008.

3. Joint Staff Memorandum (MCM) 0017-12, Procedures for Deployment Health Surveillance, 2012.

4. USAPHC TG230, June 2013 Revision.

5. Singh, A. and Singh, A.K. 2013. ProUCL Version 5.0. 00 Technical Guide-Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations. EPA: Washington, WA, USA.

6. DoD MESL Data Portal: https://mesl.apgea.army.mil/mesl/.Some of the data and reports used may be classified or otherwise have some restricted distribution.

7. COCOM deployment requirements document e.g. Modification 12 to United States Central Command Individual Protection and Individual Unit Deployment Policy, 02 December 2013.

8. Armed Forces Pest Management Board: http://www.afpmb.org/content/venomous-animals-country#Afghanistan. U.S. Army Garrison - Forest Glen, Silver Spring, MD.

9. Clinical Toxinology Resources: http://www.toxinology.com/. University of Adelaide, Australia.

10. 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.

11. IOM (Institute of Medicine). 2011. Long-term health consequences of exposure to burn pits in Iraq and Afghanistan. Washington, DC: The National Academies Press.

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 Service-specific organization below. Organizations external to DoD should contact Deputy Assistant Secretary of Defense for Health Readiness Policy and Oversight (HRP&O).
Army Public Health Center Phone: (800) 222-9698. http://phc.amedd.army.mil/
Navy and Marine Corps Public Health Center (NMCPHC) (formerly NEHC) Phone: (757) 953-0700. http://www.med.navy.mil/sites/nmcphc/Pages/Home.aspx

U.S. Air Force School of Aerospace Medicine (USAFSAM) (formerly AFIOH) 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. http://fhpr.dhhq.health.mil/home.aspx

Glossary

Abbreviations and Acronyms

ADM
Army Design Methodology

AFRICOM
U.S. Africa Command

AOC
Area of concentration

APHC
U.S. Army Public Health Center

CCMD
Combatant Command

CENTCOM
U.S. Central Command

COA
Course of action

DA
Department of Army

DOD/DoD
Department of Defense

DoDI
Department of Defense Instruction

DOEHRS
Defense Occupational and Environmental Health Readiness System

EHRAD
APHC Environmental Health Risk Assessment Division

EMD
APHC Environmental Medicine Division

FY
Fiscal year

ILER
Individual Longitudinal Exposure Record

JESWG
Joint Environmental Surveillance Working Group

LOE
Line of effort

MCM
Memorandum issued in the name of the Chairman of the Joint Chiefs of Staff

MEDCOM
U.S. Army Medical Command

NCMI
National Center for Medical Intelligence

OEH
Occupational environmental health

OEHSA
Occupational Environmental Health Site Assessment

PHPRD
APHC Public Health Preparedness & Response Division

PMD
APHC Publications Management Division

POEMS
Periodic Occupational Environmental Monitoring Summary

PDF
portable document format

PDHA
Post Deployment Health Assessment

PDM
Product Management

PHPR
APHC Public Health Preparedness and Response Division

PPD
Product Development Division

SOP
Standing operating procedure

SVOC
Semi-volatile organic compound

TSG
The Army Surgeon General

U.S.
United States of America

VA
Department of Veterans Affairs

VOC
Volatile organic compound

WBS
work breakdown structure