



Medical Assessment of Air Quality at Narhwan Brick Factory and FOB Hammer in Iraq (2008-9)

FACT SHEET 64-023-0412

Purpose: This fact sheet documents the medical interpretation of air quality data in the area of Forward Operating Base (FOB) Hammer to include the nearby Narhwan Brick Factory. This documentation is intended to address the post-deployment questions of potentially exposed military personnel and their providers.

Background- Conditions on FOB Hammer:

FOB Hammer, also called Butler Range, was situated on Besmaya Range Complex East of Baghdad in a rural agricultural area near the Narhwan Brick Factory. The Narhwan Brick Factory is actually part of a large complex of about 120 total factories which in 2008, were producing up to 3.7 million bricks per day. Brick factory operations generally burn heavy residual oils that generate smoke and cement kiln dust, which is a fine grained, highly alkaline material. Personnel living on FOB Hammer indicated that smoke plumes emitted by the factories in the Narhwan Factory Complex often blew over the camp.

Some of the Soldiers based out of FOB Hammer and Patrol Base Sallie, a camp near FOB Hammer, were responsible for conducting security patrols in and around the factory complex itself. This mission was typically conducted for several hours daily.

Air Quality Characterization

In response to health concerns regarding the air quality in this area, U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), now the U.S. Army Public Health Command (USAPHC) supported two types of sampling efforts in the area. This included general ambient air monitoring at the FOB and personal air sampling of select personnel who conducted patrols in the vicinity of the brick factory:

Ambient Air Sampling: Since as early as 2004 ambient air samples were collected from the vicinity of FOB Hammer as a means to characterize the air quality as well as potential impacts to the health of soldiers in this area. This ambient data is archived in Defense Occupational and Environmental Health Readiness System-Environmental Health (DOEHRS-EH). The USAPHC supports Department of Defense (DOD) requirements to review and monitor data over time and then develop base camp-specific Periodic Occupational and Environmental Monitoring Summaries (POEMS). [At publication time of this fact sheet, the POEMS for FOB Hammer and its vicinity were still being developed.]

Data from FOB Hammer was collected in 2007 and 2008 by preventive medicine personnel on site and submitted for laboratory analysis. The samples were analyzed at the USAPHC laboratories for particulate matter less than 10 microns in diameter (PM₁₀) and less than 2.5 microns in diameter (PM_{2.5}), 10 different heavy metals, and volatile organic compounds (VOCs). PM₁₀ and PM_{2.5} concentrations were consistent with those levels found at many of the base camps in Iraq. USAPHC assumes that the measured particulate matter is due to dust and vehicles as well as the combustion emissions from the Narhwan Brick Factory. In addition to the PM₁₀ and PM_{2.5}, detected concentrations of the metals lead and vanadium were also

identified, but when compared to health based screening levels, were determined to present a low risk. VOCs were not detected above health based screening levels in any of the samples.

Personal Air Sampling: In February 2008, the USAPHC Industrial Hygiene Program coordinated with field preventive medicine personnel who conducted personal sampling of four selected Soldiers. This effort was intended to characterize potential airborne exposures experienced by personnel nearest the brick factory complex. The selected Soldiers performed 4-hour patrols in and around the complex on a daily basis. These Soldiers were considered to represent a more highly exposed Similar Exposure Group (SEG) than other Soldiers in the general vicinity of the complex and FOB Hammer. The Soldiers were fitted with sampling devices during each of 10 daily patrols conducted from 2-11 February 2008. Several sampling devices were used to obtain quantitative estimates of metals, total dust, formaldehyde, as well as certain gases and VOCs (reference 1). Follow-on review of the data, conducted by USAPHC industrial hygiene experts (reference 1), determined that dust sample results were not valid due to sampling errors. The results for the gases, metals, and organic vapors were validated. The analyses of the valid personal air sampling data set indicated that exposure levels were below the most applicable standards and therefore no medical surveillance of personnel was recommended.

Medical Assessment

The results from the personal sampling data from the group of Soldiers considered to be representative of those most highly exposed to the brick factory emissions do not indicate that metals or VOCs pose a long term health risk to personnel that would require medical surveillance. While the personal dust sample data were not validated, the collection and monitoring of ambient levels of particulate matter from the area are consistent with those found at many other base camps in Iraq. These particulate levels have been reflected in various base camp POEMS, which are available through the website below. These levels of PM₁₀ and PM_{2.5} are typically considered to represent a moderate risk of acute effects (e.g., coughing and respiratory irritation). These symptoms are commonly reported in areas in Iraq and thus are not attributed to unique brick factory exposures. More importantly, the PM_{2.5} levels are characterized as posing a moderate long term risk, meaning that some persons may be at increased risk for developing chronic conditions (particularly those who are more susceptible to acute effects like asthma or cardiopulmonary disease). Again this hazard is very common in the CENTCOM area of operation and is therefore not specifically associated with the brick factory. The USAPHC's current position regarding chronic respiratory conditions and military deployment exposures are described in the Summary of Evidence statement cited below.

References

1. USAPHC Information Paper: Subject: Industrial Hygiene Assessment of Personal Air samples from Soldiers Patrolling In/Around the Narhwan Brick Factory Complex, Iraq in 2008. MCHB-TS-O, 07 Feb 2012 -available in:
2. Military Exposure Surveillance Library (MESL) at: <https://mesl.apgea.army.mil/mesl/>
3. Defense Occupational and Environmental Health Readiness System – Environmental health (DOEHRs-EH), <https://doehrs-ih.csd.disa.mil/Doehrs/>.
4. USAPHC FACT SHEET 64-018-1111 SUMMARY OF EVIDENCE STATEMENT: Chronic Respiratory Conditions and Military Deployment, Nov 2011.

If you have questions regarding health concerns associated with this location please contact:
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