

Just the Facts...

Balad Burn Pit

Purpose: This fact sheet is provided for Service members and their health care providers to better understand exposures to, and potential health risks from, smoke created by open burning of solid waste at Joint Base Balad (JBB, formerly Balad Air Base), Iraq. It also serves to address concerns arising from a draft document from 2007 that contained errors, as well as various media reports of potential health problems for personnel at JBB. A series of fact sheets on open burning, burning of trash, and health effects from dioxin exposure are available on-line in the Deployment Health and Family Readiness Library (see links at end of this fact sheet). These fact sheets apply to burn pits in general and not specifically JBB.

Key Points:

1. Based on U.S. Environmental Protection Agency (USEPA) guidance, long-term health effects are not expected to occur from breathing the smoke at JBB.
2. The Defense Health Board has reviewed and validated this assessment.
3. Anyone with health concerns should see a health care provider.

Background: Open burning of solid waste at JBB has generated complaints and health concerns amongst Service Members since 2003. Once conditions on the ground allowed for air sampling using more robust equipment, samples for a wide array of chemicals were collected downwind of the burn pit. Initial sampling occurred in August 2004, July 2005, and January, March, and August 2006. The results indicated the occasional presence of dioxins, polyaromatic hydrocarbons, and volatile organic compounds. These chemicals are commonly associated with open burning of trash and consequently were assumed to be due to the burn pit. However, the potential short- and long-term risks were estimated to be low due to the infrequent detections of these chemicals. In September 2006, the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) in conjunction with the U.S. Air Force School of Aerospace Medicine (USAFSAM, which now includes the former Air Force Institute for Operational Health, AFIOH) developed a more formal sampling plan to characterize air quality due to the burn pit. From January to April 2007 a total of 163 air samples were collected at JBB and analyzed for a comprehensive list of potential chemicals associated with open burning. Another 107 air samples were collected from the previously sampled locations on JBB in October and November 2007 and analyzed for the same compounds. All samples on JBB to date have been collected by already deployed preventive medicine personnel. To help reduce burn pit smoke, two incinerators were brought into operation in May 2007 followed by a third incinerator in April 2008. Shortly thereafter, separation of wastes and a program to eliminate plastic water bottles from the burn pit began. These combined efforts have reduced the volume of waste disposed in the burn pit by approximately 50%.

Results and Risk Assessment: The samples collected from January to April 2007 showed that expected chemicals of potential concern found in smoke from open pit burning of solid waste throughout the world, including metals, volatile organic compounds, dioxins, furans, and polycyclic aromatic compounds, were within acceptable standards (Military Exposure Guidelines or MEGs). One substance, particulate matter (PM), was found at levels above its MEG. These levels are typical of those found both at other points on JBB and throughout the U.S. Central Command area of responsibility due to blowing sand and dust. A screening health risk assessment was prepared by USACHPPM and USAFSAM in May 2008. The potential health risk was evaluated two ways: 1) using USEPA guidance, the potential risks for cancer and non-cancer outcomes were within the "acceptable" range; and 2) using military risk assessment methodology, the occupational and environmental health (OEH) risk estimate for exposure to the smoke was low. In addition, serum fat samples from a sample of Service members who had been deployed to JBB for at least one year were analyzed. This pilot serum study concluded that dioxin from the smoke was not accumulating (called bioaccumulating) in the body. The screening health risk assessment results and conclusions were validated by the Defense Health Board (DHB) in June 2008. The DHB is an independent board comprised of experts from private industry and recognized universities. The DHB concluded that the screening health risk assessment provides an accurate determination of exposure levels, stating that no significant short- or long-term health risks and no elevated cancer risks are likely among personnel deployed to Balad Air Base/JBB. A screening risk assessment based on the October and November 2007 samples is expected to be finalized in January 2009.

Reported Concerns: An initial draft version of the screening health risk assessment, dated December 2007, inadvertently contained incorrect dioxin concentrations due to a software calculation error. That led to a preliminary conclusion that greatly overestimated dioxin exposures and the resulting cancer risk. Both the Army and Air Force apologize for the incorrect results being prematurely circulated outside the technical review process. The calculation error was quickly identified and corrected. As an extra measure, the DHB was asked to review the corrected assessment to ensure accuracy. The recalculated dioxin results and cancer risk estimate were found to be within “acceptable” ranges based on MEGs and USEPA methodology; this was verified by the DHB. Regrettably, the initial, incorrect draft report findings continue to circulate in various media publications.

Although no chemical concerns or significant health risks have been identified, smoke from any source, including burning trash, can still cause temporary irritation effects in personnel regardless of their health condition. These effects may include coughing and irritation of the eyes and nose. Prolonged breathing of smoke can temporarily increase production of mucous in the lungs which results in coughing. It may cause chest tightness or shortness of breath, even in healthy individuals. Personnel with preexisting serious conditions such as asthma, heart disease, or lung disease might experience more serious health effects (e.g., wheezing, unusual fatigue, chronic bronchitis, chest pain/tightness, irregular heartbeat, possible heart attacks). It would be unusual for irritation effects like coughing to persist as a result of breathing smoke. Personnel are advised to see a health care provider if they believe they are experiencing health problems due to their deployment or any other reason.

Future Actions: A follow-up screening health risk estimate based on sample results from October and November 2008 is expected to be final in early 2009. Starting in February 2009, additional samples will be collected from the previously sampled locations and analyzed for the same chemicals. Results of this effort will be used to develop a new screening risk assessment. As long as DOD Service members are deployed to JBB, preventive medicine personnel will continue to perform their force health protection mission and employ the health risk assessment process.

Contacts:

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<http://chppm-www.apgea.army.mil>

DOD Force Health Protection & Readiness (FHP&R) Program
Phone: (800) 497-6261
<http://www.ha.osd.mil/FHPR/default.cfm>

DOD Deployment Health Clinical Center (DHCC)
Phone: (866) 559-1627
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USAF School of Aerospace Medicine (formerly Air Force Institute for Operational Health (AFIOH))
Phone: (888) 232-3764
<http://www.wpafb.af.mil/afri/711hpw/usafsam.asp>

Navy & Marine Corps Public Health Center (NMCPHC)
Phone: (757) 953-0700
<http://www-nmcphc.med.navy.mil>

Reference Documents/Websites:

Deployment Health and Family Readiness Library,
<http://deploymenthealthlibrary.fhp.osd.mil/home.jsp>

Burning Trash and Human Waste Exposures for Service Members and Their Families,
<http://deploymenthealthlibrary.fhp.osd.mil/accessLog.jsp?prodid=313>

Health Effects of Dioxin Exposure for Service Members,
[http://deploymenthealthlibrary.fhp.osd.mil/products/Health%20Effect%20of%20Dioxin%20Exposure%20\(314\).pdf](http://deploymenthealthlibrary.fhp.osd.mil/products/Health%20Effect%20of%20Dioxin%20Exposure%20(314).pdf)

Open Pit Burning, General Facts and Information,
[http://deploymenthealthlibrary.fhp.osd.mil/products/Open%20Pit%20Burning%20\(55\).pdf](http://deploymenthealthlibrary.fhp.osd.mil/products/Open%20Pit%20Burning%20(55).pdf)

Defense Health Board
<http://www.ha.osd.mil/dhb/>

Health Effects Institute
<http://www.healtheffects.org/about.htm>

U.S. Environmental Protection Agency (EPA) Air Quality
<http://www.epa.gov/oar/oaqps/cleanair.html>

National Research Council
Health Risks from Dioxin and Related Compounds:
Evaluation of the EPA Reassessment
<http://www.ejnet.org/dioxin/nas2006.pdf>

World Health Organization
“Dioxins and their effects on human health”
<http://www.who.int/mediacentre/factsheets/fs225/en/index.html>