



## Public Health Implications of Worker Exposure to Surface and Subsurface Soil at the Denver Federal Center Parcel B Property (St. Anthony Hospital)

August 2012

The Hazardous Materials and Waste Management Division (HM&WMD) of the Colorado Department of Health and Environment (CDPHE) requested assistance from the Colorado Cooperative Program for Environmental Health Assessments (CCPEHA) to evaluate the potential health hazards with respect to workers' exposures at the Denver Federal Center Parcel B property (St. Anthony hospital). This evaluation addresses the potential health risks associated with incidental ingestion and dermal exposure to low levels of Polycyclic Aromatic Hydrocarbons (PAHs) in soil while conducting maintenance and construction work on the St. Anthony's hospital in Lakewood, Colorado. .

### Site Background

- The Parcel B Property is the site of the St. Anthony's West Hospital, which is located in Lakewood, Jefferson County, CO. Parcel B was a component of the Denver Federal Center (DFC) until the land was transferred to St. Anthony's Hospital in 2007.
- The DFC is a federal government facility that is currently used by over 25 federal bureaus and agencies. Prior to becoming the DFC, the site was known as the Denver Ordnance Plant, a facility that manufactured small arms ammunition during World War II. In 2007, the DFC began releasing portions of the DFC property for public and private development. Parcel B was transferred to St. Anthony's hospital as part of this redevelopment effort,

### What are past activities conducted at the site?

- In 1998, the GSA began the process of identifying potential sources of contamination throughout the DFC.
- In the area that will become Saint Anthony's Hospital, CH2MHILL began phase 1 of the Resource Conservation and Recovery Act Facility Investigation (RFI) in January 2003. Soil, groundwater, and sediment samples were collected from various depths at site features associated with potential contamination. The samples were analyzed for a wide array of chemical constituents including the contaminants that were expected from previous site activities. The primary contaminants of concern to be remediated included polycyclic aromatic hydrocarbons (PAHs) and asbestos found in building materials used in the construction of DOP and DFC era buildings.
- From 2004 to 2005, public meetings conducted by GSA were held to get public opinion about the proposals of transforming Parcel A and B into the Federal Center RTD Station and St. Anthony Hospital, respectively.
- From 2006 to 2010, all the lots with contaminated soil were excavated and disposed of. The entire area was re-graded and offsite soil was brought in to fill any remaining voids. Shortly thereafter, crews began prepping the site for construction. Three main Investigation Areas from former activities at the DOP and DFC comprise Parcel B: 1) Investigation Area 12S (Former Outdoor Storage Area), 2) South Investigation Area 10W (Open Storage Area), and 3) the southwestern portion of South Investigation Area 6 (DOP Primer Production Area).

### What did CCPEHA find in the Health Consultation?

Based on the soil data and exposure pathways evaluated in this health consultation, CCPEHA has reached one conclusion regarding current and future worker exposures to residual soil contamination at the Parcel B/St. Anthony Hospital:

*Contacting residual soil contamination is not expected to harm the health of current and future construction workers and maintenance workers.* This conclusion was reached because the estimated doses for both workers from exposure to soil in the Parcel B/St. Anthony Hospital are well below a level of concern for non-cancer and cancer health effects. Specifically, the estimated cancer risks from PAHs which are considered the primary site-related contaminants of potential concern are just above (i.e., 3 or 4 in a million) the low-end of the acceptable cancer risk range of 1 in a million to 100 in a million. It is important to note that the cumulative cancer risk estimates of 5.14E-06 and 5.32E-06 for construction and maintenance workers, respectively are associated with a large uncertainty (i.e., overestimation of risk) since the soil data used in this evaluation was

collected before and after remediation. Thus, it is likely that the actual exposure point concentrations are lower than what was used in this evaluation.

### **What's next?**

- Based on the results of this evaluation, no further actions are necessary at this time to protect worker's health from exposure to residual contamination in soil at the Federal Center Parcel B/St. Anthony's Hospital.
- If necessary, CCPEHA will conduct the appropriate level of health education to address any concerns regarding the findings of this health consultation.

## **FREQUENTLY ASKED QUESTIONS**

**What is a health consultation?** A health consultation provides advice on a specific public health issue related to real or possible human exposure to toxic material. A Health Consultation is a way for CDPHE to respond quickly to a need for health information on toxic substances and to make recommendations for actions to protect the public's health. Health Consultations may consider: 1. the levels (or "concentrations") of hazardous substances; 2. If and how people might be exposed to contamination (through "exposure pathways" such as breathing air, drinking or contacting water, contacting or eating soil, or eating food); 3. The harm the substances might cause to people (or the contaminants' "toxicity"); 4. If and how working or living nearby might affect people's health; and 5. Other dangers to people, such as unsafe buildings, abandoned mine shafts, or other physical hazards.

### **Where can I find this health consultation?**

An electronic copy of the consultation can be found at: <http://www.cdphe.state.co.us/dc/envtox/ccpehasites.html>

To request a free copy of the health consultation, or for more information on the health consultation, feel free to contact Thomas Simmons, Health Assessor, at 303-692-2961.

### **What are polycyclic aromatic hydrocarbons (PAHs)?**

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

### **What are the health effects associated with (PAHs) exposure?**

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. However, it is not known whether these effects occur in people. In addition, animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. Again, these effects have not been seen in people.

### **Can polycyclic aromatic hydrocarbons (PAHs) cause cancer?**

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogenic. Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer (lung cancer) in laboratory animals when breathing air containing PAHs, ingesting PAHs in food (stomach cancer), or having PAHs applied to their skin (skin cancer). More information is available at <http://www.atsdr.cdc.gov/PHS/PHS.asp?id=120&tid=25>.