



FACT SHEET ON VAPOR ISSUE AT HANFORD

Prepared by Hanford Challenge

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- The Hanford Nuclear Site, located in southeastern Washington state, is a former nuclear weapons production facility owned by the U.S. Department of Energy (DOE), and operated by private companies.
- The legacy of Hanford's plutonium production operations is a large quantity of deadly high-level radioactive and chemical byproducts, the worst of which, an estimated 53 million gallons of nuclear waste, are stored in 177 underground tanks. The tanks are arranged into eighteen farms, known as "tank farms," and managed primarily by DOE contractor CH2M Hill Hanford Group, Inc. (CHG). On October 1, 2008, a new contractor (Washington River Protection Solutions) will take over the tank farms operation contract.
- The high level radioactive waste forms toxic vapors in the headspace of the tanks, which must vent to the atmosphere to prevent pressure buildup, possible explosion, or tank rupture.
- Over 1400 chemicals have been documented in the vapors contained within Hanford's tank headspaces which escape through various tank equipment. Workers exposed to the tank vapors have suffered numerous health effects: nosebleeds, persistent headaches, tearing eyes, burning skin and lungs, coughing, sore throats, the need to constantly clear their throats, expectorating, dizziness, nausea, and increased heart rates. More serious health impacts resulting from exposure to tank vapors may be long term in nature. Some workers are on long-term disability resulting from chemical vapor exposure at Hanford.
- The vapor exposure controversy is historical. Numerous oversight investigations were conducted by the DOE, Congress and the Inspector General in the early 1990's after 16 exposure incidents took place over a 4 ½ year period. The resulting reports found gross mismanagement and potentially criminal activity in failing to protect workers from known hazards, and reforms were briefly instituted. In 2003, the Nuclear Oversight Program of the Government Accountability Project issued a report documenting numerous worker injuries and illnesses resulting from chemical vapor exposures. This led to three separate government oversight investigations in 2004 by the DOE, NIOSH and the State of Washington.

- The 2004 reports led to the shutdown of the tank farms work and the institution of required supplied air (Supplied Containerized Breathing Apparatus) for workers in the tank farm area. Subsequently, in 2006, CH2M Hill Hanford issued a report called the Industrial Hygiene Chemical Vapor Technical Basis. This report was reviewed by *Hanford Challenge* and concerns were raised. The issue was brought by *Hanford Challenge* and CH2M Hill Hanford to the Hanford Concerns Council for an independent review.
- The Concerns Council appointed an Expert Panel to conduct the review of the Technical Basis report, which was given to the contractor and *Hanford Challenge* in July 2008. That review is available at www.hanfordconcernscouncil.org.
- A key conclusion of the Expert Panel included: “[T]he committee is unable to conclude that the protective measures are sufficiently conservative to protect worker health. There are several areas in the Technical Basis where there is significant uncertainty in sampling data. One area in particular deals with the impact of waste disturbing activities on the emission characteristics of a tank over time. The committee has identified several opportunities where the approach outlined in the Technical Basis document could be made more conservative, i.e., more protective of workers, by reducing uncertainty” (p. 4, Executive Summary).
- CHG’s chemical vapor monitoring equipment can only accurately test for a small fraction of the over 1400 chemicals potentially coming out of the tanks and monitoring occurs only a small fraction of the time workers are in the field. Currently, only two to three chemicals are monitored by Industrial Hygiene Technicians: ammonia and nitrous oxide, and, sometimes, total organic carbons.
- Based upon recommendations by the Expert Panel, *Hanford Challenge* is urging that the vapor control zones be expanded around known emission points, that the contractor expand the number of chemicals for which it monitors, and that engineered solutions to the vapor issue be explored, including a proposal to divert chemical vapors to a remote area of the site, away from workers.
- The new contractor, Washington River Protection Solutions, DOE and *Hanford Challenge* are in agreement that the Hanford Concerns Council should continue to play a role in studying the vapor issue and assisting with issues related to implementation of worker protection procedures, policies and equipment.

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