



Final Response Action Selected to Address Arsenic and Lead Contamination in Soil at the Proposed Kea`au Hotel Site

Where is the site and what is proposed?

Kea`au Hospitality Group, LLC has proposed to build a hotel on a 4.4 acre parcel of commercially-zoned property adjacent to the Kea`au Shopping Center in the Puna district on Hawai`i Island. The parcel is currently vacant and heavily vegetated. The land is owned by W.H. Shipman, Ltd., but Kea`au Hospitality Group has negotiated a sale agreement to purchase the property, contingent on a Hawai`i Department of Health (HDOH) decision regarding cleanup of soil contamination at the site.

What is the soil contamination issue at the proposed hotel site?

Elevated levels of arsenic and lead in soil were first documented at the site in late 2003. The source of the arsenic in soil is believed to be from use of arsenic-containing herbicides in the sugarcane industry during the 1920s -1940s. Elevated arsenic in soil has also been found to be an "area-wide" issue around the Kea`au vicinity. The lead contamination is presumed to be from lead paint or lead-containing products that could have been used in homes that were on the property in the past. Lead contamination of soil has not been found to be an area-wide issue around Kea`au.

Additional soil investigations occurred at the site during 2004 and a plan to address the soil contamination was approved by HDOH in July 2004. This plan was not carried out due to financial and technical considerations of the site owner. A decision was later made to conduct additional site investigations as well as a detailed risk assessment to further evaluate the site and develop options for addressing the soil contamination, as necessary. These additional investigations and assessments were completed in 2005 and 2006. Results of the investigations and risk assessments are documented in reports on file with HDOH. A summary of the site investigations and assessments, as well as the remedy selected to address the contamination, is provided in the HDOH *Final Response Action Memorandum (Final RAM)* dated July 21, 2006.

What did the more recent site investigation and risk assessment find?

For these additional investigations, the site was divided into four areas to look at the distribution of the soil arsenic and lead contamination in more detail. Also, both total and "bioaccessible" arsenic and lead concentrations were determined in the soil from the four areas of the site. Bioaccessible arsenic and lead is the fraction of the total arsenic and lead estimated to be available for absorption in the body, if ingested. Accidental or incidental ingestion of very small amounts of soil is the primary means by which a person would be exposed to arsenic or lead from the soil.

The assessment estimated the risk of health impacts (cancer and non-cancer risks for arsenic exposure, and non-cancer health effects for lead exposure) based on the average levels of arsenic and lead documented in the four areas of the site, and

“conservative” assumptions regarding daily exposure to bare soil, ingestion of certain amounts of soil daily, and regular exposure to ingested soil over the working lifetime of a potential hotel employee or gardener at the site.

These investigations and risk assessments determined one of the four areas of the site had unacceptably high levels of bioaccessible arsenic in soil, assuming commercial use of the property and potential exposures over a working lifetime to a hotel worker or a hotel gardener. Potential hotel guests (adults or children) were not determined to have a significant health risk at the site (even for the area with the highest arsenic levels) due largely to the limited time they would be expected to spend on the site. The area determined to have arsenic levels that are too high was targeted for cleanup.

How will the area identified with high arsenic in soil be handled?

A number of options were evaluated to eliminate or reduce exposure to the high arsenic levels in soil on the targeted portion of the site. The evaluation criteria for each option included: effectiveness, how well each option could be implemented at the site, and cost. Three options considered were selected for more detailed analysis:

1. Removal of contaminated soil and disposal at the West Hawai`i landfill,
2. Isolation of some contaminated soil under proposed buildings on the site and some soil to be disposed at the West Hawai`i landfill, and
3. Burial and management of all contaminated soil on the site, either beneath buildings or isolated and covered with a soil cap in an open area.

Based on the evaluation criteria as well as additional information and consideration of comments received from the public, HDOH decided to approve burial and long-term management of the contaminated soil on the site. This will involve removal of the top one foot of soil from the targeted contaminated area, burial in another area of the site, then covering the contaminated soil with a heavy barrier material and at least one foot of soil from the areas of the site without high contamination. The soil cap over the contaminated soil will be landscaped to hold the soil in place. In addition, as an added measure of protection, the entire site will be landscaped to eliminate areas of bare soil.

With the targeted soil buried and covered, potential exposure to the high soil contamination will be eliminated. The arsenic and lead contaminants bind very tightly to soil and “leaching” by rainfall towards groundwater under this site (or throughout the Kea`au vicinity) has not been documented to be a concern.

To ensure that the selected remedy for management of the contaminated soil on-site is effective over the long-term, the area(s) where contaminated soil is buried will be professionally surveyed and identified on a site map. In addition, a long-term soil management plan will be developed to address:

- Awareness of the contaminated soil by future management and staff at the site,
- Importance of maintaining the integrity of the soil cap,
- Need for periodic inspections, and
- Avoidance of intrusive activities near the isolated soil.

Finally, a legal covenant/deed restriction will be placed on the property, referencing the long-term soil management plan and restricting use of the site to commercial or industrial purposes.

What happens next?

Individuals who provided comments on draft materials regarding the remedy for soil contamination at the site, and any others who have expressed interest in the soil contaminant investigations at this site will be informed of the HDOH decision regarding the final response action. An implementation work plan for the final response action will need to be approved by HDOH before work on the site begins. Confirmation soil sampling will be required to ensure the contaminated soil is removed and isolated appropriately. HDOH will provide oversight for the response action and make sure it has been conducted, documented, and implemented as planned.

A copy of the complete *Final RAM* and final implementation work plan will be provided to the Kea`au Library and posted on the HDOH, Hazard and Emergency Response Office (HEER Office) website at:

<http://www.hawaii.gov/health/environmental/hazard/index.html>

Public comments received on the *Draft RAM* were carefully considered in decisions for the *Final RAM*, and specific responses to the public comments can be found in the "Responsiveness Summary" section of the *Final RAM*.

Assuming the implementation plan is carried out to HDOH satisfaction, in the end a "no further action" letter would be provided to the owner/operator of the site. However, if new evidence were to become available at a later date indicating contaminants at the site pose a threat to public health or the environment, HDOH may require additional investigation and cleanup work.

Who can I call or e-mail for further information regarding this site?

You can call or e-mail John Peard, the HDOH project manager providing oversight for the project, for questions or further information. He can be reached at the Department of Health's Hazard Evaluation and Emergency Response Office toll free at 974-4000 x64249 in Honolulu, or e-mail at: john.peard@doh.hawaii.gov