

Honolulu Board of Water Supply
 Red Hill Groundwater Study – Toxicology Study Results
 Summary and Frequently Asked Questions
 December 2016

Introduction

Since 2005, the Navy has been testing the groundwater underneath and near the Red Hill tanks. These tests show various amounts of petroleum hydrocarbon chemical contaminants present in the water. The Honolulu Board of Water Supply (BWS) contracted toxicology experts from Exponent and INTERA, Inc. (INTERA) to evaluate whether the contaminant levels present are potentially harmful to human health.

How was the study performed?

Exponent and INTERA, working independently of each other, used U.S. Environmental Protection Agency (EPA) approved methods to derive screening levels that are protective of public health for total petroleum hydrocarbon as diesel fuel (TPH-d).

What were the findings?

The screening levels derived by Exponent and INTERA are shown below. A screening level is that concentration below which the substance poses no unacceptable threat to human health or the environment. The Exponent and INTERA results are considered similar and comparable under EPA’s method for determining levels safe to human health and the environment.

Exponent	TPH-d Screening level	210 ppb
INTERA	TPH-d Screening level	162 ppb

The Exponent and INTERA screening levels were also compared to environmental action levels (EALs) established by the Hawaii Department of Health (DOH) and TPH drinking water limits set by other states. The DOH and other state values are shown below.

Hawaii DOH	TPH-d Gross contamination EAL	100 ppb	100 ppb is the level that affects the taste or odor of drinking water
Hawaii DOH	TPH-d Drinking water toxicity EAL	160 ppb	Drinking water toxicity limit (updated Nov. 2016)

Massachusetts	TPH Drinking water guideline	200 ppb	Ref. 2016 Standards & Guidelines for Contaminants in Massachusetts Drinking Water
Minnesota	TPH Drinking water criteria	200 ppb	Ref. Minnesota Department of Agriculture's Drinking Water Criteria Summary, Oct. 2013

A review of these values indicate the following:

1. The Exponent and INTERA screening levels (210 ppb and 162 ppb, respectively) are similar and consistent with the Hawaii DOH drinking water toxicity EAL of 160 ppb TPH-d.
2. The Exponent and INTERA screening levels are also similar with drinking water limits for TPH established by Massachusetts and Minnesota.
3. Screening levels are developed to be protective of public health and are used as the first step in assessing potential impacts on health from the groundwater contamination.

What are the risks associated with drinking water containing contaminants above screening levels?

Based on research studies in animals, the health effects of high levels of TPH-d can cause changes in red blood cell counts and noncancerous liver and kidney changes. Consuming water containing TPH-d levels at or below the screening level is not expected to produce toxic effects because this level includes a safety factor of 10,000. This safety factor accounts for differences between animals used in the studies and humans, including different age groups and variability in the population.

Conclusions

Based on the study results, the DOH gross contamination EAL of 100 ppb is protective of public health. BWS strongly urges the DOH to require clean-up of the groundwater underneath and surrounding the Red Hill tanks and to use the gross contamination EAL of 100 ppb as the minimum clean-up level. This EAL is based on a taste and odor threshold and concurrently provides protection of public health.