Red Hill Water Sampling Programs

Drinking Water Source Sampling

Routine regulatory samples are collected semi-annually from drinking water wells/shafts prior to entering the drinking water distribution system. Samples are analyzed for regulated drinking water chemicals and evaluated for exceedances of health-based standards or MCLs. Under the **Drinking Water Long-Term Monitoring** (March 2022 – March 2024) and **Extended Drinking Water Monitoring** (April 2024 – March 2025) programs, samples are collected from active sources each monitoring period for regulated drinking water chemicals as well as TPH and other analytes (napthalenes, Total Organic Carbon -TOC).

Tap Water Sampling

Tap samples are also collected from buildings and residences as part of the Drinking Water Long-Term Monitoring and Extended Drinking Water Monitoring. A total of **65%** of the residences will have been sampled at least once by March 2024. The remaining **35%** of residences will be sampled under Extended Drinking Water Monitoring. Sample locations are to be geo-spatially distributed throughout each zone of the water system.

Groundwater Sampling

Groundwater samples are collected as part of the environmental investigation and represent specific locations and depths in the aquifer. Currently, samples are collected every one to three months from **37 groundwater monitoring wells** to provide information about the extent and magnitude of contamination in the aquifer and help inform where and what types of remediation should occur.

Fact Sheet Updated: March 21, 2024

What is Navy sampling for in the water?

		Drinking Water Source Sampling	Tap Water Sampling	Groundwater Sampling
TPH	• Gasoline Range • Diesel Range • Oil Range	Yes	Yes	Yes
Fuel Constituents	• Benzene, • Toluene, • Ethylbenzene, • Xylenes, • Naphthalene, • Benzo[a]pyrene	Yes	Yes	Yes
Fuel Additives	• EDB • EDC	Yes	No	Yes, EDB in some samples
De-Icer	• 2-(2-methoxyethoxy) ethanol	Yes, Red Hill Shaft only	No	Yes, in some samples
Metals	• Lead • Arsenic • Chromium • Mercury	Yes, except for lead	Yes	No, except for lead in some samples
General Water Quality Parameters	• Total Coliform (bacteria) • Chlorine • Ferrous Iron • Nitrate • Chloride	No, except for nitrate	Yes, except iron, chlorides	No, except for nitrate and chloride

Note: This table includes the most critical compounds. Additional compounds are included in each sampling program.

This table will be updated for **Extended Drinking Water Monitoring** (starting April 2024) when the plan is finalized.

What is TPH?

Total Petroleum Hydrocarbons (TPH) refers to hydrocarbons from a petroleum source such as crude oil. The term is used in the context of chemical analyses performed by laboratories on soil, water and air samples. There are thousands of individual petroleum compounds ranging from gases such as butane, to solids such as tar used to produce asphalt.

How to interpret results

If the laboratory detects a chemical when analyzing samples, regulators compare the results to one or more of the following numbers:

Non-Detect (ND): a “non-detect” result indicates that the chemical in question was not measured in the sample above the lowest level the analytical method can see. This is known as a detection limit. It is not possible to have a **ZERO result**. Every lab method has a detection limit.

Screening Criteria – Incident Specific Parameters (ISPs): for the Drinking Water Long-Term Monitoring Plan, the Hawai‘i Department of Health (DOH) set a Red Hill ISP for Total Petroleum Hydrocarbons (TPH) in drinking water, currently set at **266 ppb**. Sample concentrations above this threshold indicate that additional evaluation of potential health risk is required.

Screening Criteria – Environmental Action Levels (EALs): are published by DOH and are used to screen concentrations of contaminants in soil, soil gas, and groundwater to help expedite the identification and evaluation of potential environmental concerns at contaminated sites.

Screening Criteria – Regional Screening Levels (RSLs): are published by EPA for more than **850 contaminants**. They are used to evaluate human health risks from exposure to contamination in soil, tap water, and air and for making environmental cleanup decisions. They represent the most current and best available science with respect to chemical toxicity.

Drinking Water Standard – Maximum Contaminant Levels (MCLs): are a legally enforceable drinking water standard under the Safe Drinking Water Act. EPA has established MCLs for approximately **80 contaminants**.

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What do TPH methods measure?

Laboratory methods for measuring TPH in the environment look for chemical compounds derived from petroleum However, laboratory methods can mis-identify natural organic substances such as those associated with decaying vegetation as TPH.

Is all TPH toxic?

Petroleum compounds vary greatly with respect to properties such as their toxicity. Benzene, a component of gasoline, is highly toxic and a known human carcinogen. In contrast, petroleum jelly is composed of compounds that are considered completely benign. Using TPH measurements to evaluate risk carries uncertainties because these measurements do not identify specific petroleum chemicals that are present. To determine the presence of specific petroleum compounds requires the use of more targeted chemical analyses.

How much is a Part Per Billion?

A way to visualize one part per billion (ppb) in water is to think of it as one drop in one billion drops of water or about one drop of water in a swimming pool. One part per million is about one cup of water in a swimming pool.