Kailua Wastewater Treatment Plant Meeting

August 2024

State of Hawaii, Department of Health, Clean Water Branch

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Topics

- DOH CWB
- NPDES Permit
- Beach Monitoring Program
- FAQs
- Questions?

Department of Health (DOH)
Clean Water Branch (CWB)

- Regulates discharges of pollutants to State surface waters.
- Administers National Pollutant Discharge Elimination System (NPDES) Permit Program in Hawaii. DOH received Environmental Protection Agency approval to run program in Hawaii.
- Administers federal Beaches Environmental Assessment and Coastal Health (BEACH) Act monitoring program in Hawaii.

NPDES Permits

NPDES Permits

- Federal permitting program to regulate point source water pollutant discharges to State surface waters.
- Tool to implement federal and State water pollution control requirements, including State's Water Quality Standards, to help protect human health and environment.
- Contain limits on what can be discharged, monitoring and reporting requirements, and other provisions to ensure discharge does not hurt water quality or people's health.

NPDES Permits

- Imposes water pollution control requirements on Permittees (entities to which permit has been issued).
- Permittees legally obligated to comply with all requirements specified in issued NPDES permit.
- Violations of permit requirements punishable by requiring specific changes to facility or operations, fines, or other enforcement actions based on nature of violation.
- Water pollution control occurs through issuance of NPDES permit.

NPDES Permits

- Effluent Limits – Primary mechanism in NPDES permit for controlling pollutant discharges.
- 2 Types: Technology Based Effluent Limits (TBEL) and Water Quality Based Effluent Limit (WQBEL)
- Federal NPDES regulations require WQBELs in NPDES permits for all pollutant parameters that have a reasonable potential to cause or contribute to an excursion of State's Water Quality Standards (WQS). Note: Hawaii's WQS in Hawaii Administrative Rules, Chapter 11-54.

NPDES Permits

Kailua WWTP Enterococci WQBEL

- Enterococci:
  - EPA recommended fecal indicator bacteria found in high concentrations in intestinal tract of humans and warm-blooded animals.
  - Generally, not considered pathogens (disease causing).
  - Mimics fate and transport of most common gastrointestinal pathogens as it goes through wastewater treatment plant. If indicator not found after treatment process, safe to assume pathogens will also not be found. Most pathogens do not survive well in environment.
- Hawaii's Enterococci WQS (recreational criteria designed to protect public from exposure to harmful levels of pathogens while participating in water-contact activities):

  Not to exceed 35 CFU/100 mL geometric mean over any 30 day interval and

  Not to exceed 130 CFU/100 mL statistical threshold value in more than 10% of samples taken within same 30 day interval geometric mean calculated.

NPDES Permits

Kailua WWTP Enterococci WQBEL (continued)

- Discharge consists of treated sewage which may contain pathogens at elevated concentrations, if not properly disinfected. Reasonable potential exist that discharge could exceed WQS criteria for enterococci.
- Permit establishes WQBEL for enterococci to ensure human health protection.
- WQBEL for Enterococci:
  - Monthly geometric mean = WQS geometric mean x average initial dilution

    25,655 CFU/100 mL = 35 CFU/100 mL x 733:1
  - Single sample maximum = WQS statistical threshold value x minimum initial dilution (cannot be exceeded in more than 10% of samples taken within same 30 day interval in which geometric mean was calculated

    57,850 CFU/100 mL = 130 CFU/100 mL x 445:1

NPDES Permits

Kailua WWTP Enterococci WQBEL (continued)

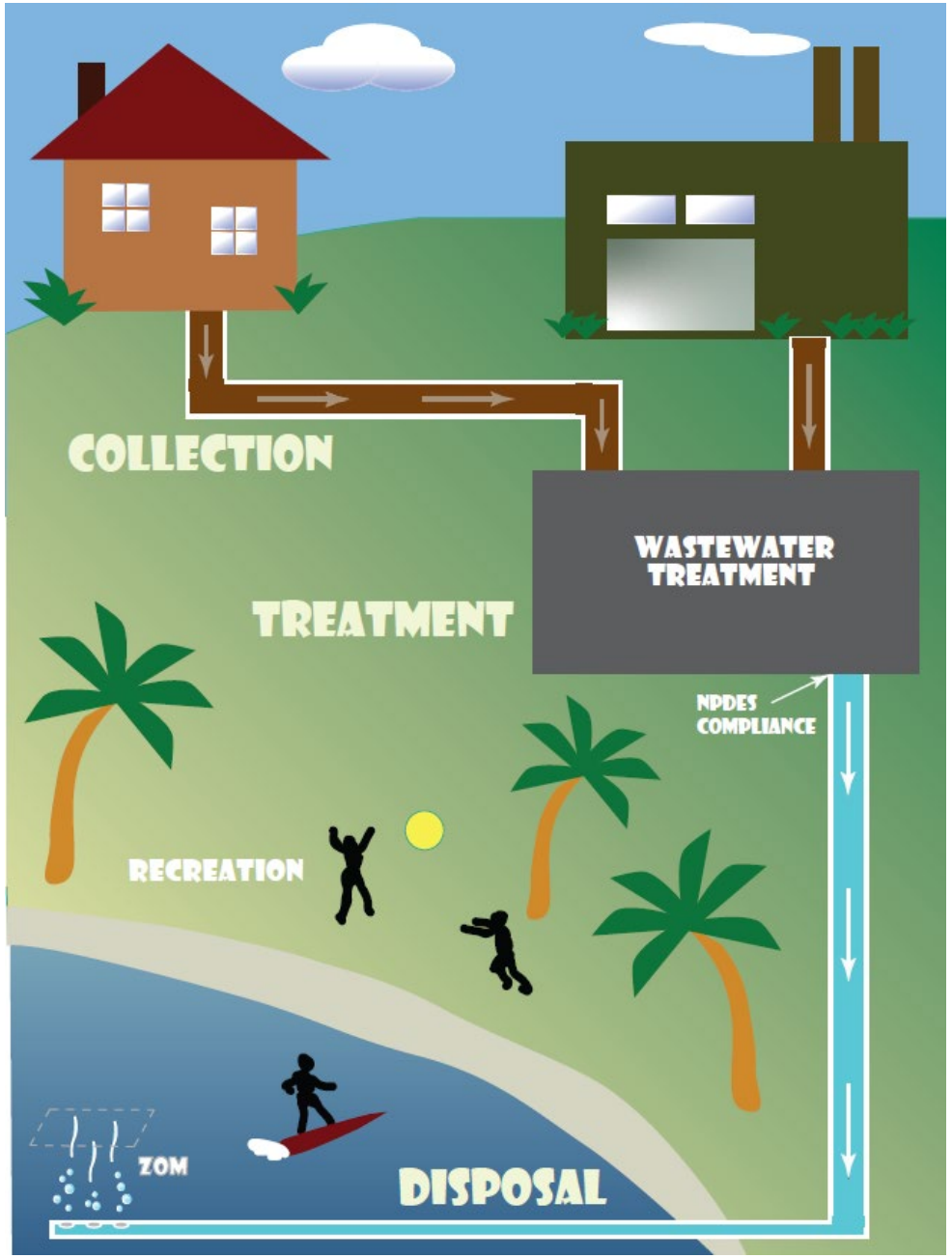
- What is the dilution in the WQBEL calculation?
  - Dilution refers to the mixing process when the wastewater effluent combines with ocean water through the outfall diffusers.
  - Zone of Mixing (ZOM) = Defined area around discharge where some, or all, WQS criteria may not be met. NPDES permit tool to allow for assimilation of a discharge. Requires computer modeling and assessments. Defined based on regulations and implementation policies.

NPDES Permits

Kailua WWTP Enterococci WQBEL (continued)

- WQBEL "back calculated" per federal regulations.
  - WQS criteria multiplied by applicable dilution and compliance assessed at facility after treatment
  - Shows what is coming from facility and how well facility treating wastewater.
  - Eliminates issues sampling in ocean for effluent limit compliance - sample collection safety issues and pollution contributions from other sources.
- Issued NPDES permits and fact sheets, including Kailua WWTP, available at:

  https://health.hawaii.gov/cwb/final-individual-permits/



NPDES Permits

- NPDES permit regulates treated wastewater quality.
- Compliance required after treatment and before commingling with other discharges.
- WQBEL "back calculated" using dilution within ZOM.
- WQS criteria must be met at ZOM.
- Exceedance of WQBEL means WQS criteria violated beyond ZOM, violation of Clean Water Act and Hawaii water pollution control statutes.

Beach Monitoring Program

Beach Monitoring Program

- Beaches Environmental Assessment and Coastal Health (BEACH) Act:
  - Established national standard criteria for coastal recreational water monitoring and public notification of possible pollution within coastal recreational waters (beaches).
  - Authorized EPA to provide funding to eligible states to implement a water monitoring and public notification program.

Beach Monitoring Program

- DOH receives EPA funding for the Hawaii Beach Monitoring Program.
- Goal of Hawaii's Beach Monitoring Program is to reduce risk of illness to users of Hawaii's beaches due to sewage pollution by issuing advisories when warranted for public health protection.
- As a condition of the EPA grant, DOH must monitor beaches within the State for fecal indicator bacteria (Enterococci) and provide public notification when Enterococci levels exceed a threshold level (130 CFU/100 mL) or is likely to exceed the threshold.

Beach Monitoring Program

How does CWB Notify the Public of High Enterococci Monitoring Results?

The CWB has an automated CWB Water Quality Notification and Advisories website that has an automated subscription service the public can use to receive automated email notifications whenever a water quality notification or advisory is issued or terminated.

Go to: https://eha-cloud.doh.hawaii.gov/cwb/#!/landing to subscribe for email notifications.

Beach Monitoring Program

Advisories and notifications issued on CWB Water Quality Notification and Advisories website:

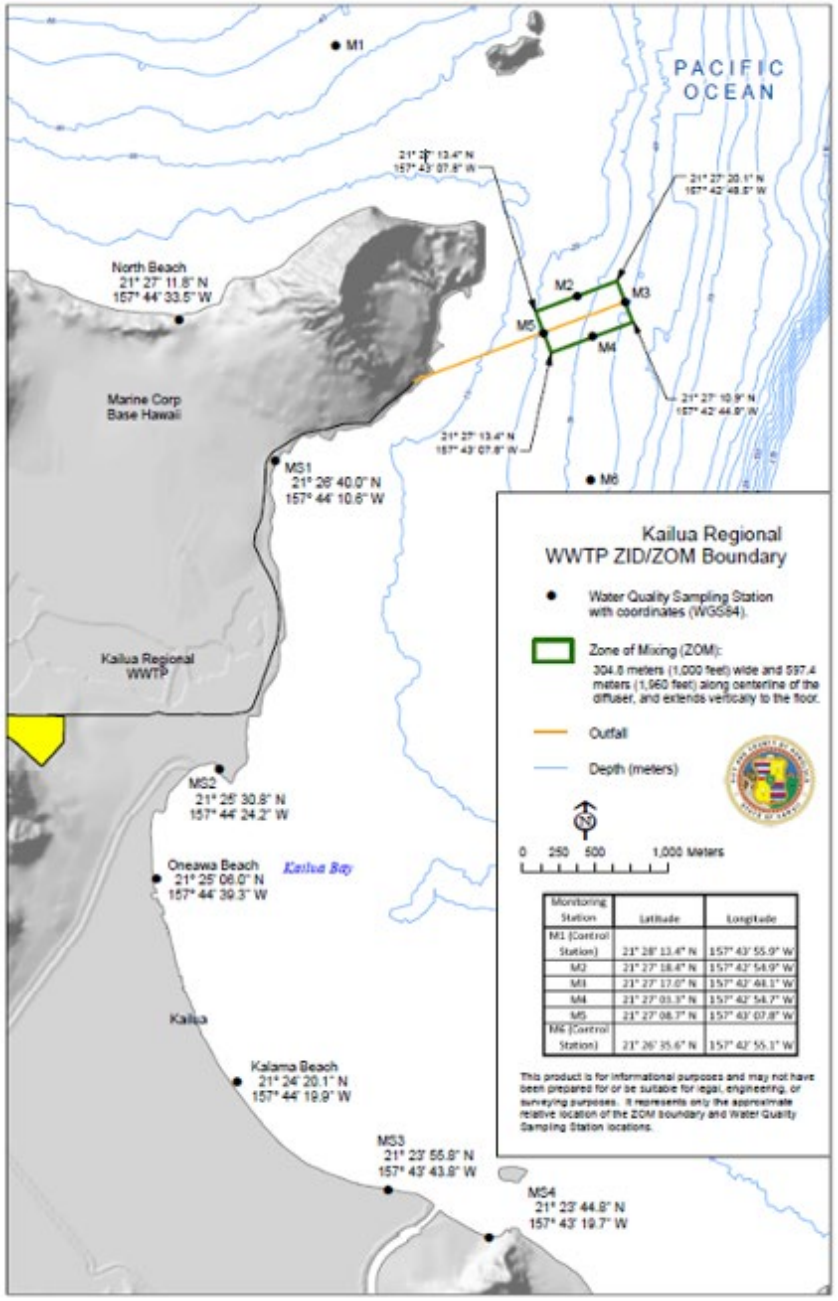
- Beach Notification – Routine beach sample exceeds threshold (130 CFU/100 mL). Informs public that beach will be re-tested if CWB uncertain about representativeness of sample if beach historically met threshold and no known source of fecal contamination.
- Beach Advisory – Re-test of beach sample exceeds threshold.
- Brown Water Advisory – Heavy rainfall leads to surface runoff into ocean causing water to become discolored or turbid as determined by CWB field staff.
- Spill Advisory – Notification of sewage spill that enters State waters. Responsible party may be required to post signs along affected waterbody, collect water quality samples, and issue press release.
- Permit Exceedance Advisory – Notification of a discharge from wastewater treatment plant that exceeds NPDES permit effluent limit. Facility responsible for issuing press release, posting warning signs and monitoring water quality along affected shoreline.

Beach Monitoring Program

Enterococci

- EPA recommended fecal indicator found in intestinal tract of humans and other warm-blooded animals. Note: indicator used since environment contains billions of bacteria and source and levels cannot be identified.
- Testing is relatively easy and cost effective.
- Notification threshold for Beach Monitoring Program is 130 CFU/100 mL. Associated with illness rate of 36 illnesses per 1000 swimmers.
- Enterococci levels greater than 130 CFU/100 mL indicates increased probability of risk of illness due to pathogens that cause gastrointestinal illness (GI). Does not mean you will become ill, but there is increased probability.
- There is never zero risk of contracting GI illness while recreating at a beach, only low or high risk.
- Enterococci levels only give rough glimpse of potential of contracting GI illness. Does not give insight into potential risk of any other types of illnesses which may be contracted from other hazards, contaminants, or pathogens present in the environment.

Frequently Asked Questions



Where does Kailua Regional Wastewater Treatment Plant discharge?

- Provides wastewater treatment for 94,000 people.
- Treated wastewater (15 MGD design flow) discharged to ocean via deep ocean outfall with diffuser 3500 feet from shore at a depth of 105 feet below surface of water.
- Outfall shared with Kaneohe Marine Corps Base.
- NPDES permit allows for ZOM (green box on map) for dilution of treated wastewater from outfall.
- NPDES permit requires monitoring for various parameters at boundary of ZOM.
- NPDES permit requires shoreline monitoring for Enterococci 5 times a month at locations identified on map as MS1, MS2, MS3, MS4, Kalama Beach, North Beach, and Oneawa Beach.

What does an Enterococci NPDES permit limit exceedance at the Kailua Regional Wastewater Treatment Plant mean?

A NPDES permit limit (WQBEL) exceedance means WQS criteria violated.

- Purpose of WQS criteria is to achieve designated use of water body (State's desired goal of waterbody). Exceedance of WQS criteria means designated use has been impaired.
- If effluent limit is a WQBEL, an exceedance is a violation of WQS, CWA, and Hawaii water pollution control statutes.
- Effluent limit back calculated so WQS met at boundary of ZOM. If effluent limit exceeded, WQS not being met at boundary of ZOM.
- Wastewater was not adequately treated.

What is a permitted facility required to do when there is an exceedance of a NPDES Permit limit?

- Permittees are required to notify the CWB of any permit exceedances, usually at the time that the Permittee becomes aware that the exceedance has occurred, but no later than 24-hours after the event.
- Permittees required to submit to CWB a follow-up written report describing cause of exceedance and steps planned or taken to reduce, eliminate, and prevent reoccurrence.
- For wastewater treatment facilities, there may also be additional monitoring, notification to news services, and sign posting requirements within the affected area.
- Violations of permit limits are enforceable violations which may subject the Permittee to enforcement action including required corrective actions and administrative fines.

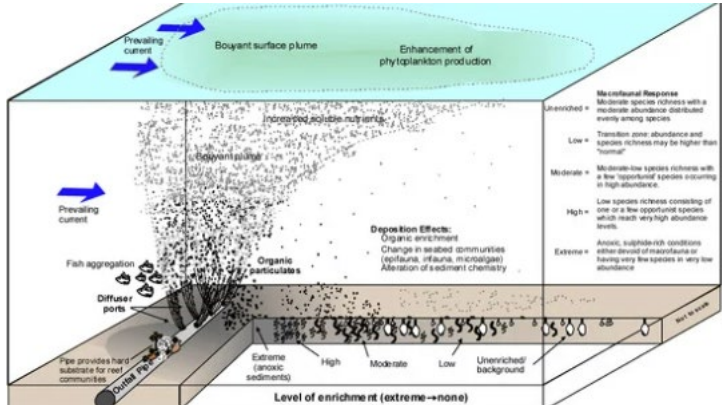
How does CWB notify the public of exceedances of Enterococci NPDES Permit limits?

- CWB issues a variety of advisories and notifications on our website at: https://eha-cloud.doh.hawaii.gov/cwb/#!/viewer.
- For Kailua Beach, the CWB has issued an advisory covering the majority of Kailua Bay when there are permit exceedances from the Kailua Regional Wastewater Treatment Plant.
- While the outfall is relatively far from the Kailua Beach area, the area that is included in the Permit Exceedance advisory is large out of an abundance of caution, because CWB does not know exactly which way the discharge plume may drift.

What is the thought process behind the permit exceedance advisory maps from CWB?

- WQS not being met at edge of ZOM. We don't know the extent (how far beyond the ZOM) at the time of violation.
- Since it is unknown when an effluent limit will be exceeded, it is impossible to predict the time of day, current, wind speed, and recreational users in the area at the time. Recreation occurs in ocean in vicinity of ZOM as well as beach.
- Weather issues – CCH can't always sample at the ZOM due to safety.
- Need to notify public out of abundance of caution to protect public health.
- Notification allows public to make their own informed decision to determine whether to recreate in water or not. Notification is not a prohibition. CWB cannot close beaches.
- Effluent limit exceedances at MCBH handled in same way.

Why do CWB Enterococci shoreline sampling values not always correspond with NPDES Permit exceedances from the Kailua Regional Wastewater Treatment Plant?



Example outfall diffuser illustration

- Dilution/mixing – The outfall is located 3500 feet from shore at a depth of 105 feet below surface. Outfall was designed with a diffuser to induce rapid dilution. Wastewater effluent is freshwater mixing with salt water.
- Factors such as wind direction, current, and tides affect the direction of the plume from the facility discharge. As such, these factors may cause the plume to move either towards or away from the shoreline which would affect what (if any) impacts from the discharge are observed at the shoreline.
- UV radiation also affects the level of enterococci in the water, as prolonged exposure to UV radiation (i.e., long periods of exposure to sunlight) tends to reduce the level of enterococci in the water .

Where can I find CWB's monitoring data?

Normally, the CWB makes all BEACH Act monitoring program data available on our website for the public to view and download. The CWB is in a transitional period where our current system is in the process of being upgraded. The system was old and parts of it were no longer functional, and the entire website posed an IT security risk for the department therefore was taken offline. Unfortunately, the new upgraded system was not operational prior to the required shutdown of our current system, therefore there is no publicly available site to download our data.

If you would like to request sampling results from the CWB, please email CleanWaterBranch@doh.hawaii.gov with your request and the CWB will provide the data to you.

Where does CWB conduct sampling for Kailua Beach?

As Kailua Beach is a Tier 1 beach, the CWB conducts regular weekly monitoring for enterococci at the Kailua Beach Park (see map).

- CWB sampling station located near mouth of Kaelepulu Stream.
- Location chosen since stream captures majority of drainage in area and collects pollution from area.
- Focus limited resources to strategic locations.

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Do near-shore areas habitually exceed the Enterococci threshold when there is brown water from opening Kaelepulu Stream or general storm water runoff?

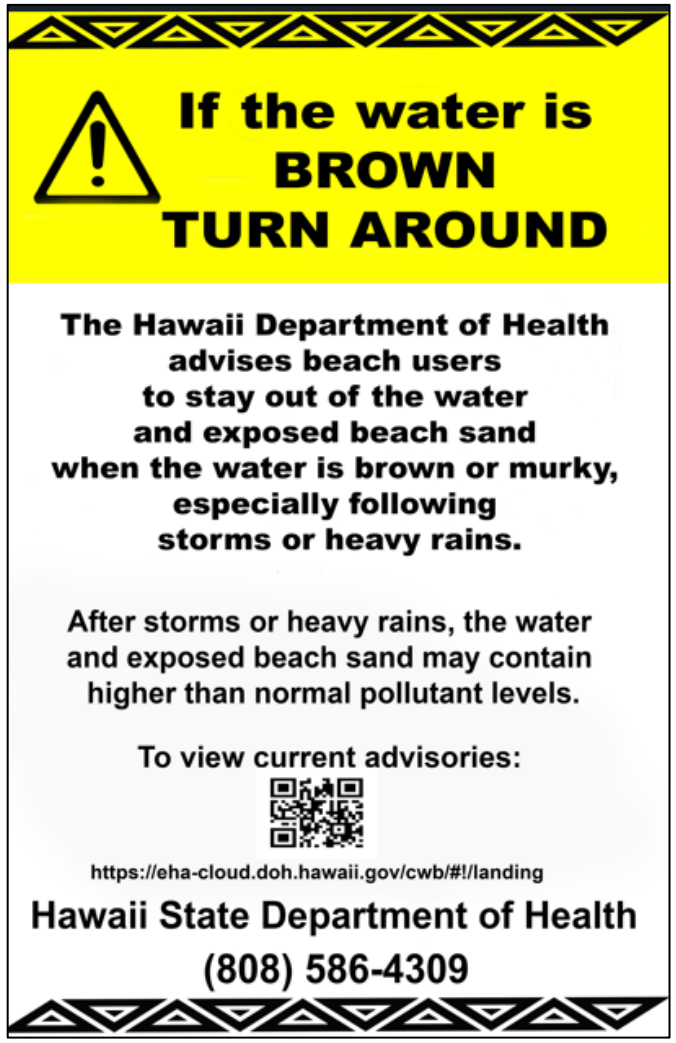
- Across State, large storm events, rough surf, strong wind causes coastal waters to turn brown. Enterococci threshold is exceeded more often than not.
- If Kaelepulu stream mouth not open, Enterococci threshold typically not exceeded.
- CCH-DFM does maintenance at Kaelepulu Stream and removes sand plug.
    - Work done in accordance with Army Corps permit and associated Water Quality Certification from DOH. Includes pollution control requirements and monitoring plan.
    - Installs yellow tape and signs. (See picture at right for CCH's sign.)
    - Army Corps and DOH are notified prior to commencement of work.
    - Maintenance typically takes 3 days.
    - Prior to dredging, CCH removes litter, floating debris, and trash.
    - Turbidity barriers placed to allow sediment settling.
    - Dredged sand plug from stream mouth dewatered on land and used for beach replenishment.
    - Stream mouth typically stays open for a few days then sand plug forms again.

What affects water quality besides NPDES Permit limit exceedances?

All human activity affects water quality.

- Water pollution is either point or non-point source. Point source has NPDES permits and WQC (Kailua WWTP, MCBH WWTP, stream maintenance). Non-point source is everything else.
- Non-point source pollution from homes, cesspools, storm drains, dog waste, and other human activities. Examples include sediment from construction and agricultural lands; heavy metals from vehicles; excess fertilizers, herbicides, and insecticides from residential and agricultural areas; oil, grease, toxic chemicals, trash, pet waste from urban runoff; bird and feral animal waste; and sediment from eroding streambanks.
- Pollution is not always sewage.
- Picture of cesspool map near Kailua Bay

What does the new signage from the DOH warning the public about brown water say?



- See the image on the left for the permanent Brown Water Signs.
- DOH is working with City Parks Department on sign locations and installation.

Is there a warning system for bacterial exceedances that will also be used as part of the signage?

- If the CWB encounters an Enterococci threshold exceedance during routine monitoring, we will post our Beach Advisory signs (see image).
- The CWB also issues advisories when there is a permit exceedance. This advisory is posted on the CWB Water Quality Advisories website and sent via email notifications to all subscribers.

Will the signs be placed only at beach parks or at all beach access points and public right of ways?

- CWB's Beach Advisory signs

  Posted near the CWB sampling station near Kaelepulu Stream mouth after Enterococci threshold exceedance – in the parking lot and on the opposite side of Kaelepulu Stream facing the sampling point.

- CWB's permanent Brown Water signs

  Placement of permanent Brown Water signs will be determined by the City Parks Department. Likely to be placed near access points and restroom facilities.

How will the City work with the State to streamline consistent messaging for the general public and our visitors?

- CWB posts signs whenever Enterococci threshold is exceeded during normal routine monitoring. The signs say “High Bacteria Levels Found Here.”
- City posts signs in response to NPDES permit Enterococci WQBEL exceedances at Kailua Treatment Plant. Enterococci levels at NPDES permit shoreline monitoring stations may or may not be exceeded due to reasons previously discussed (distance, mixing/dilution, current, wind, UV, etc.).
- CWB and City signages have different messages.
  - For CWB, source of Enterococci threshold exceedances rarely known since samples collected in ocean, therefore signs are cautionary.
  - City posts signs that say “High bacteria levels possible” because wastewater plume may not have reached the shoreline. See image of City’s sign on right.

Will the City and County signs reflect what the State's signs say? (Will there be one universal sign used by both agencies for water quality status and risks to public health)?

It is unlikely that both CWB and the City will have similar signage because the messaging is likely to be different.

Would it be possible to implement a QR code system on each of the beach access points and at the beach parks where the public can scan a QR code and learn through a water quality dashboard about the water quality at the beach for that day?

CWB signs contain QR codes on both the permanent Brown Water signs and the temporary Beach Advisory signs.

What are best practices for safer recreation?

Follow the recommended safe practices below to help reduce health risks when recreating:

- Stay informed. Check the CWB Water Quality Advisories website for current beach advisories at: https://eha-cloud.doh.hawaii.gov/cwb/#!/viewer.
- There is always a certain degree of risk associated with recreating at the beach. Some people are at greater risk of becoming ill (young children, elderly, pregnant women, and people with chronic illness or weakened immune systems). This group of individuals should take extra precautions.
- People at higher risk should stay out of the water whenever notifications are issued or whenever signs are posted.
- Avoid swimming at beaches during or immediately after heavy rain.
- Do not enter the water if it looks brown or turbid, even if a Brown Water Advisory has not been issued by the CWB.
- Avoid swimming and bathing in streams or on beaches near stream mouths, drainage pipes or canals, or storm drains. Streams are often the source of high enterococci in beach waters.
- Swimming with your head underwater (in any natural waterbody) increases your risk of infection through the eyes, nose, and mouth.
- Do not drink or swallow stream or ocean water.
- Do not step on coral at beaches; coral cuts may become infected by naturally occurring pathogenic bacteria that inhabit the coral. These organisms are not detected by the current indicator and their presence do not indicate any type of pollution.
- Do not enter the water if you have open cuts or wounds.
- Practice good personal hygiene; wash off thoroughly with fresh water after swimming or recreating at the beach. This includes thoroughly washing off under rash guards, wet suits, and other impermeable clothing that can trap seawater against the skin.
- Consider the risk factors and make an informed decision.
- If in doubt, stay out.

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Where can I find additional information and how can I contact the CWB?

- More information on NPDES permits and Hawaii's Beach Monitoring program can be found on our website at: https://health.hawaii.gov/cwb/. See recent update on common water pollution complaints perceived to be from illicit discharges but are naturally occurring.

- The CWB can be contacted by email at: CleanWaterBranch@doh.hawaii.gov. The CWB can also be contacted by phone at (808) 586-4309, Monday through Friday (excluding State holidays) from 7:45 a.m. until 4:30 p.m.

- Address:
  State of Hawaii
  Department of Health
  Clean Water Branch
  2827 Waimano Home Road #225
  Pearl City, Hawaii 96782

Thank You!

Questions?