

# Budget, Finance, and Economic Development Committee (2023-2025) on 2023-04-04 9:00 AM

Meeting Time: 04-04-23 09:00

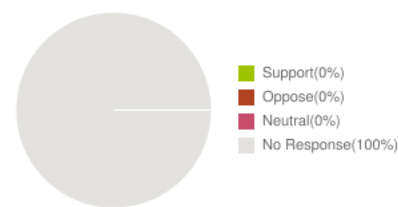
## eComments Report

| Meetings                                                                              | Meeting Time   | Agenda Items | Comments | Support | Oppose | Neutral |
|---------------------------------------------------------------------------------------|----------------|--------------|----------|---------|--------|---------|
| Budget, Finance, and Economic Development Committee (2023-2025) on 2023-04-04 9:00 AM | 04-04-23 09:00 | 2            | 2        | 0       | 0      | 0       |

### Sentiments for All Meetings

The following graphs display sentiments for comments that have location data. Only locations of users who have commented will be shown.

#### Overall Sentiment

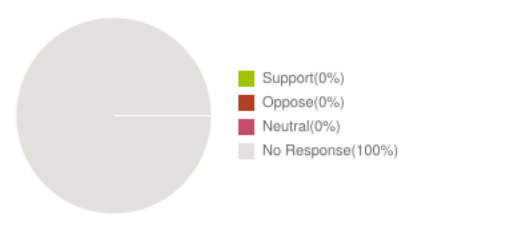


| Agenda Name                                                                     | Comments | Support | Oppose | Neutral |
|---------------------------------------------------------------------------------|----------|---------|--------|---------|
| A G E N D A                                                                     | 1        | 0       | 0      | 0       |
| BFED-1 FY 2024 PROPOSED FISCAL YEAR 2024 BUDGET FOR THE COUNTY OF MAUI (BFED-1) | 1        | 0       | 0      | 0       |

Sentiments for All Agenda Items

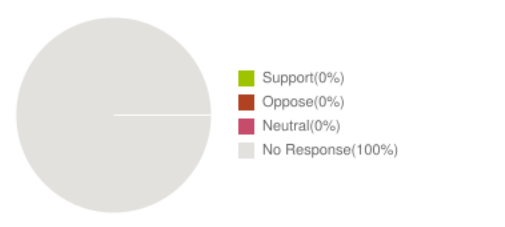
The following graphs display sentiments for comments that have location data. Only locations of users who have commented will be shown.

Overall Sentiment



Agenda Item: eComments for A G E N D A

Overall Sentiment



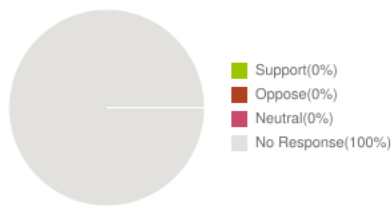
BFED Committee

Location:  
Submitted At: 3:54pm 04-04-23

Testimony from Travis Liggett

Agenda Item: eComments for BFED-1 FY 2024 PROPOSED FISCAL YEAR 2024 BUDGET FOR THE COUNTY OF MAUI (BFED-1)

Overall Sentiment



**BFED Committee**

Location:

Submitted At: 1:27pm 03-30-23

Testimony received through 03/30/2023

## BFED Committee

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**From:** Tamara A. Paltin  
**Sent:** Wednesday, March 29, 2023 2:45 PM  
**To:** BFED Committee  
**Subject:** Fwd: Budget amendment for UV disinfection in Kahului  
**Attachments:** Maui wastewater disinfection references.pdf

Get [Outlook for iOS](#)

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**From:** travis liggett <travis@reefpowermaui.com>  
**Sent:** Wednesday, March 29, 2023 2:34:27 PM  
**To:** Tasha A. Kama <Tasha.Kama@mauicounty.us>; Yukilei Sugimura <Yukilei.Sugimura@mauicounty.us>; Alice L. Lee <Alice.Lee@mauicounty.us>  
**Cc:** Keani N. Rawlins <Keani.Rawlins@mauicounty.us>; Gabe Johnson <Gabe.Johnson@mauicounty.us>; Tamara A. Paltin <Tamara.Paltin@mauicounty.us>; Shane M. Sinenci <Shane.Sinenci@mauicounty.us>; Nohe M. Uu-Hodgins <Nohe.Uu-Hodgins@mauicounty.us>; Thomas M. Cook <Thomas.Cook@mauicounty.us>  
**Subject:** Budget amendment for UV disinfection in Kahului

Aloha Council Members,

I am writing to first thank you for voting to refer Bill 52 mandating municipal wastewater disinfection to the ADEPT Committee. I appreciate your commitment to restoring the health of our nearshore ecosystems and recreation areas located close to municipal injection well discharges in Kihei and Kahului that remain untreated with respect to disinfection.

I am also writing to ask Budget Committee Chair Sugimura and other committee members to consider introducing and passing an amendment to pay for installation of UV disinfection of injection well discharges at the Kahului WWRF.

Through a FOIA response, DEM stated it would be around \$6,000,000 to install UV disinfection in Kahului, based on the cost of a similar past upgrade in Lahaina. I encourage you to inquire with DEM for an updated estimate to install UV in Kahului.

Lahaina has employed UV disinfection for all effluent since 2015. Kihei has never had consistent disinfection, but DEM disclosed through a FOIA response that they are a few months away from activating a new UV channel for the injection well discharges in Kihei to achieve 100% municipal wastewater disinfection in South Maui in the near future.

This leaves only Kahului with no solid plans to install reef-safe UV disinfection. Passing Bill 52 would mandate this, but our community also needs funding to implement the hardware upgrades required to comply with a new law

It would be really neat if Member Kama or Chair Lee with Kahului or Wailuku constituencies who flush into the Kahului Wastewater Reclamation Facility would include such a budget amendment on their funding priority list. There can be no better legacy for a Council Member auntie than protecting the keiki from infections.

If the funding for upgrades necessary to comply with a new wastewater disinfection Bill 52 is already included in the budget when the legislation is up for discussion later this spring in the ADEPT Committee, the Council will be well positioned to make universal municipal wastewater disinfection in Maui a reality. This will be real progress toward mediating the human and ecological harm from injection wells.

Hawaii is the US state with the highest incidence of staph infections, and studies show that "children, native Hawaiians and Pacific Islanders are disproportionately affected by CA-MRSA infection." Maui Memorial saw "record breaking" demand for medical care in early 2023, and a lot of those patients are in to treat skin & tissue infections. Eliminating the wastewater discharges, untreated with respect to disinfection, flowing into nearshore recreation areas as a source of contamination in the community can reduce hospital patient numbers.

I attached supporting information such as reports of fecal indicator bacteria exceedances at places like Cove Park in Kihei, Kahului Harbor and Baby Beach in Sprecklesville.

Thank you for your public service work especially during the budget season! We are so lucky to have leaders like you who are willing to sit through all those hearings to make sure our community stays on the right track.

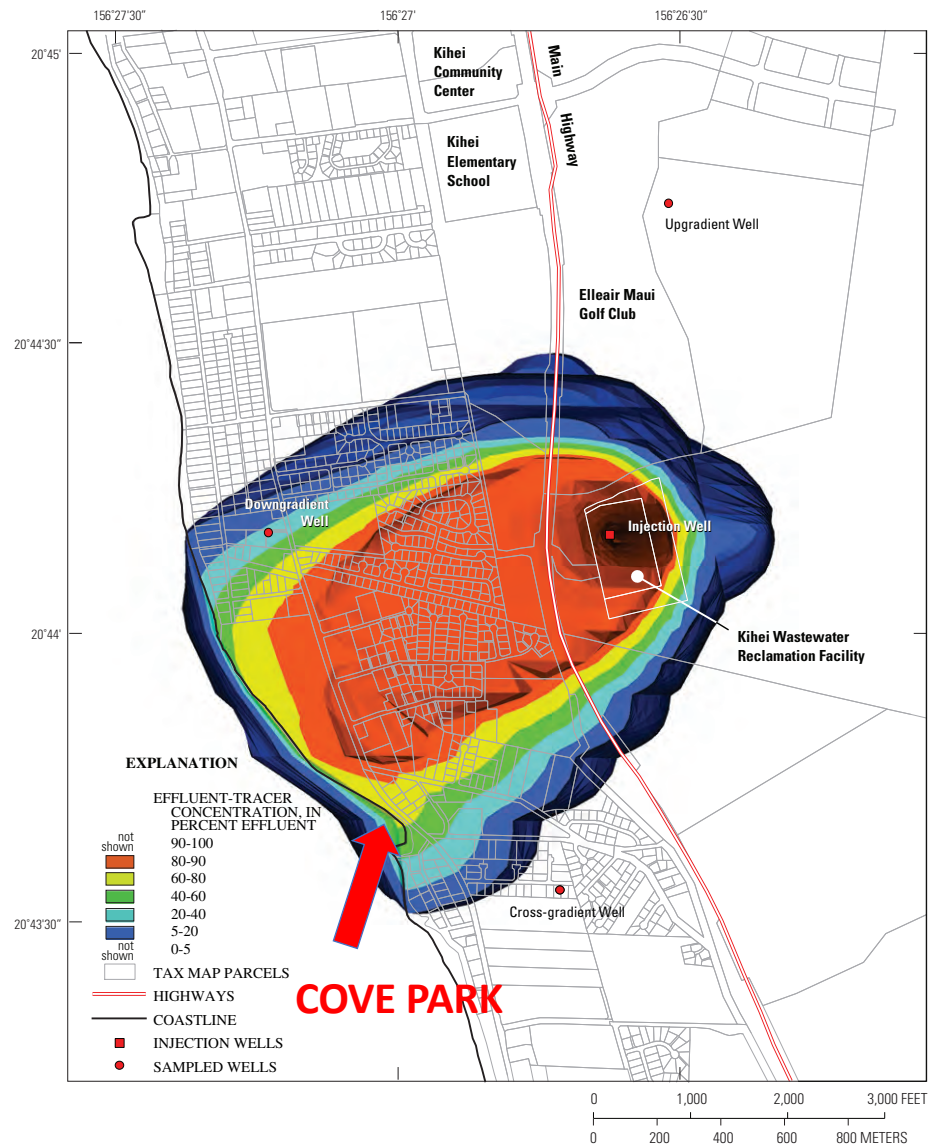
Call (808) 757-5984 to discuss.

Mahalo nui loa!

Travis Liggett  
President, Reef Power LLC  
[Instagram.com/reefpowermaui](https://www.instagram.com/reefpowermaui)  
[FlushAware.com](https://www.FlushAware.com)

Anticipated Bill 52 CD1 language:

***"Municipal wastewater effluent discharged or reused by the County must meet Hawaii state R-1 reuse standards for fecal coliform bacteria; the County must allocate sufficient funding for the implementation of this subsection so that its implementation does not cause any increases in sewage rates for residents."***



[Hunt 2007 link](#)

**We charted indicator bacteria measurements made by the Hawaii Department of Health at Cove Park in Kihei during the past 2 years, from 2021 - 2023.**

**The Beach Action Value for enterococcus is 4921 Most Probable Number of Colony Forming Units per gallon. This is the level at which the Clean Water Branch will take appropriate beach management actions.**

**Over the course of 72 samples or about 3 measurements per month, Cove Park results had the following properties.**

**4 out of 72 samples or 5.6% of readings exceed the Beach Action Value with the highest of 13,779 colony forming units of indicator bacteria per gallon of seawater measured on 8/17/22 (this is off the charts as shown). That's a 1 out of 18 chance that the water is deemed unsafe by the Clean Water Branch at Cove Park on any given day, or 40 days out of 2 years.**

**13 out of 72 or 18% of samples had greater than 1000 Colony Forming Units of indicator bacteria per gallon sea water, almost one out of 5 days.**

**22 out of 72 or 30.6% of samples had greater than 700 Colony Forming Units of indicator bacteria per gallon sea water, almost one out of 3 days.**

**35 out of 72 or 48.6% of samples had greater than 350 Colony Forming Units of indicator bacteria per gallon sea water, almost one out of 2 days.**

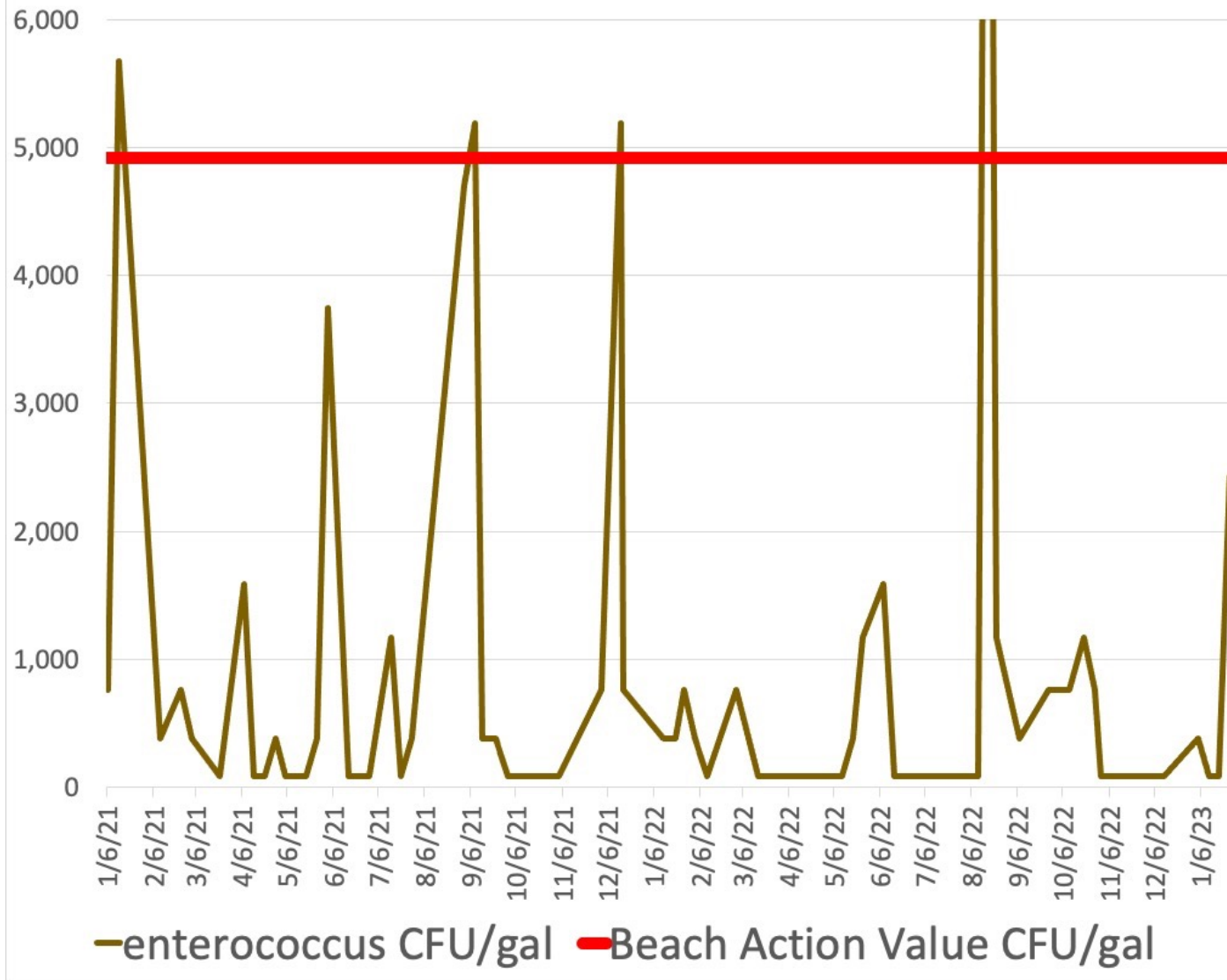
**Cove Park is located \*inside\* the injection well plume from the Kihei municipal wastewater reclamation facility, where the County of Maui injects untreated wastewater with respect to disinfection into the ocean via groundwater, causing hazards for ocean recreation at Cove Park. As much as 80% of groundwater discharging into coastal waters near Cove Park consists of infected secondary effluent (swipe for model diagram).**

**The County is working to install UV disinfection for injection wells in Kihei anticipated as soon as Summer 2023**

**Mahalo HI DOH for the indicator bacteria data**

**[cwb.doh.hawaii.gov/CleanWaterBranch/WaterQualityData](http://cwb.doh.hawaii.gov/CleanWaterBranch/WaterQualityData)**

Kihei Cove Park *enterococcus* indicator bacteria  
Colony Forming Units per gallon ocean water (CFU/gal)  
HI DOH January 2021 - January 2023



# High Bacteria Count at Cove Park, Maui

September 9, 2021, 5:16 PM HST

[Article link](#)



PC: file photo by Wendy Osher

The public is advised of a water quality exceedance of enterococci at Cove Park, Maui. Levels of 137 per 100 mL have been detected during routine beach monitoring.

The Department of Health Clean Water Branch provides beach monitoring and notification through its beach program.

The advisory for this beach is posted because testing for enterococci indicate that potentially harmful microorganisms such as bacteria, viruses, protozoa, or parasites may be present in the water. The department advises that wimming at beaches with pollution in the water may make you ill.

## Maui News

# High bacteria count advisory issued for Cove Park, Maui

August 19, 2022, 8:26 AM HST

Article [link](#)

13

COMMENTS



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A water quality exceedance of enterococci was recorded at Cove Park, Maui, resulting in an advisory from the State Department of Health, Clean Water Branch.

Levels of 364 per 100 mL have been detected during routine beach monitoring. That's beyond the threshold limit of 130 enterococci per 100 mL.

The advisory is posted because testing for enterococci indicate that potentially harmful microorganisms such as bacteria, viruses, protozoa, or parasites may be present in the water. The DOH advises that swimming at beaches with pollution in the water may make you ill.

“Children, the elderly, and people with weakened immune systems are the most likely populations to develop illnesses or infections after coming into contact with polluted water, usually while swimming. Fortunately, while swimming-related illnesses can be unpleasant, they are usually not very serious – they require little or no treatment or get better quickly upon treatment, and they have no long-term health effects,” according to the advisory.

## LIST OF PATHOGENIC (ILLNESS-CAUSING) LIFE FORMS COMMONLY FOUND IN INFECTED WASTEWATER, SUCH AS R-3 INJECTED IN KIHAI AND KAHULUI

The list of pathogenic microbial species commonly found in non-disinfected wastewater is long and alarming, shown in the [U.S. NIH list](#) below.

[Respiratory infections such as COVID-19](#) and [skin infections](#) can be caused by water borne pathogens.

*The major pathogens of concern in municipal wastewater and diseases or illness associated with them:*

| <u>Name of pathogen</u> | <u>Major disease or symptoms</u>                                                 |
|-------------------------|----------------------------------------------------------------------------------|
| <b>Bacteria</b>         |                                                                                  |
| Campylobacter jejuni    | Gastroenteritis                                                                  |
| Escherichia coli        | Gastroenteritis                                                                  |
| Salmonella spp.         | Salmonellosis, typhoid, paratyphoid                                              |
| Shigella spp.           | Bacillary dysentery                                                              |
| Staphylococcus          | Skin Infections, bacteremia, toxic shock syndrome, septic arthritis              |
| Streptococcus           | Cellulitis, Pink eye, meningitis, pneumonia, endocarditis, necrotizing fasciitis |
| Vibrio cholerae         | Cholera                                                                          |
| Yersinia spp.           | Gastroenteritis                                                                  |
| <b>Viruses</b>          |                                                                                  |
| Adenovirus              | Upper respiratory infection and gastroenteritis                                  |
| Astrovirus              | Gastroenteritis                                                                  |
| Coxsackie virus         | Meningitis, pneumonia, fever                                                     |
| Echovirus               | Meningitis, paralysis, encephalitis, fever                                       |
| Hepatitis virus         | Infectious hepatitis, miscarriage, and death                                     |
| Human calicivirus       | Epidemic gastroenteritis with severe diarrhea                                    |
| Polio virus             | Poliomyelitis                                                                    |
| Reovirus                | Respiratory infections, gastroenteritis                                          |
| Rotavirus               | Acute gastroenteritis with severe diarrhea                                       |
| TT hepatitis            | Hepatitis                                                                        |
| COVID-19                | Acute respiratory illness                                                        |
| <b>Protozoa</b>         |                                                                                  |
| Balantidium coli        | Balantidiasis                                                                    |
| Cryptosporidium spp.    | Cryptosporidiosis                                                                |
| Entamoeba histolytica   | Acute amoebic dysentery                                                          |
| Giardia duodenalis      | Giardiasis                                                                       |
| Toxoplasma gondii       | Toxoplasmosis                                                                    |

# Risk factors for community-associated *Staphylococcus aureus* skin infection in children of Maui

Gayle J Early <sup>1</sup>, Steven E Seifried

Affiliations + expand

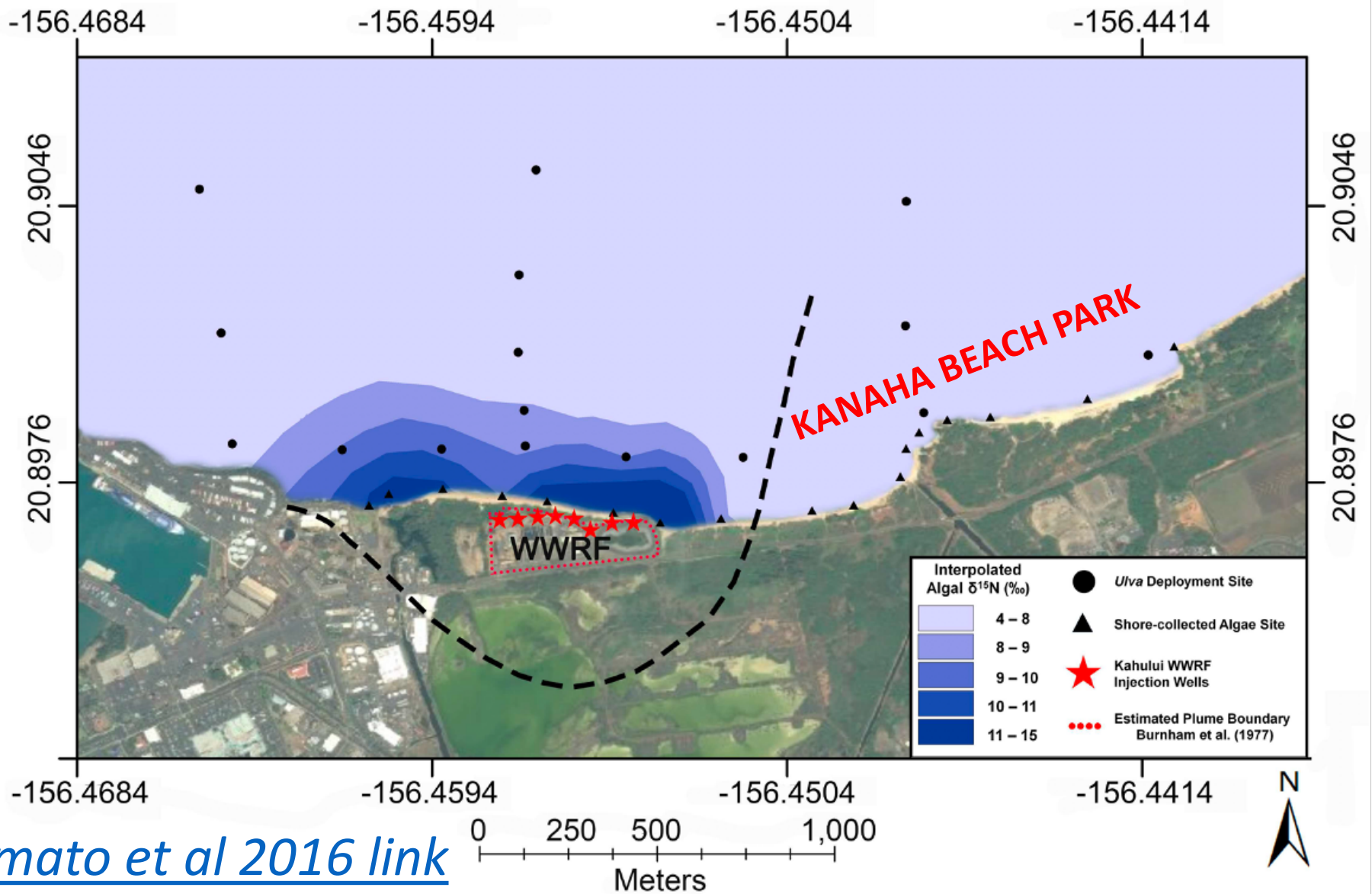
PMID: 22900237    PMCID: [PMC3419822](#)

**Free PMC article**

## Abstract

[Article link](#)

The prevalence of community-associated methicillin-resistant *Staphylococcus aureus* (CA-MRSA) infection, and *Staphylococcus aureus* (*S. aureus*) infection overall, has dramatically increased in the past 10 years. Children and Native Hawaiians and Pacific Islanders (NHPI) are disproportionately affected by CA-MRSA infection. The purpose of this case-control study was to identify risk factors for CA-*S. aureus* skin infections in children of Maui, Hawai'i, as a foundation for reducing the transmission of these infections. Survey data were obtained from patients in pediatric



[Amato et al 2016 link](#)

# High bacteria count posted at Kanaha Beach

LOCAL NEWS

NOV 9, 2019

The Maui News



SHARE



TWEET



High levels of bacteria have been detected at Kanaha Beach, the state Department of Health announced Friday morning.

During routine beach monitoring, the department's Clean Water Branch detected enterococci levels of 364 per 100 milliliters, indicating that potentially harmful microorganism such as bacteria, viruses, protozoa or parasites may be present in the water.

The advisory will remain in effect until water sample results no longer exceed the threshold level of 130 enterococci per 100 ml.

Swimming at beaches with pollution in the water may lead to illness, the department said.

Children, the elderly and people with weakened immune systems are the most likely to develop illnesses or infections after coming into contact with polluted water, usually while swimming. The department said that while swimming-related illnesses can be unpleasant, they are usually not very serious, requiring little or no treatment or improving quickly upon treatment, and they have no long-term health effects.

The most common illness associated with swimming in water polluted by fecal pathogens is gastroenteritis. It occurs in a variety of forms that can have one or more of the following symptoms: nausea, vomiting, stomachache, diarrhea, headache or fever. Other minor illnesses associated with swimming include ear, eye, nose and throat infections. In highly polluted water, swimmers may occasionally be exposed to more serious diseases.

[Article link](#)

# High Bacteria Count Notification East of Hoaloha Park in Kahului, Maui

December 4, 2020, 5:00 AM HST

[Article link](#)



The Hawai'i State Department of Health has issued a high bacteria count notification and is retesting water at Kahului Harbor east of Hoaloha Park.

The department reports that bacteria levels of 1625 per 100 mL were detected during routine beach monitoring, but is uncertain about the representativeness of the first sample.

“This beach has historically met the acceptable beach [threshold](#) level, and there is no known source of fecal contamination. Therefore, DOH has collected another sample and is retesting the site,” according to a department notification.

# Surfrider Foundation records high bacteria levels at Kahului, Haneo'o, Maliko, Baby Beach

August 15, 2022, 8:56 AM HST  
\* Updated August 15, 9:07 AM

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1 minute

4  
COMMENTS  
A A A



Maui water quality testing. PC: Surfrider Foundation

August 10 2022 indicator  
bacteria exceedances  
article [link](#)

The Surfrider Foundation's Blue Water Task Force recorded high bacteria levels this month at Kahului Harbor, Haneo'o in East Maui, Maliko Bay, and Baby Beach on the North Shore.

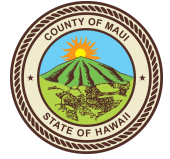
The citizen science water testing program conducted the tests on Aug. 10, 2022.

This is the second month in a row that Kahului Harbor had high levels of Enterococcus bacteria, with results showing a count of 2400 MPN/100mL. It was the third month in a row for high levels at Haneo'o, which had 454 MPN/100mL, down from the month before when rates were 1152 MPN/100mL. Baby Beach recorded a rate of 175 MPN/100mL, marking the first time this year that the location had high bacteria levels in the monthly report.

Mendium-high levels were recorded at several popular swimming beaches including: Baldwin Beach, Kū'au, East Ho'okipa, and Hāna Bay.

The group plans to add Mā'alaea to its sample sites in the near future, due to injection wells at the location, as well as symptoms reported by surfers in the area. The task force reported medium levels at Mā'alaea, and anticipates having a full report in the near future.

## County of Maui not planning to invest in disinfection of injected effluent in Kahului until FY2026. Estimated cost of UV disinfection install in Kahului \$6M



### **Wailuku-Kahului Wastewater Reclamation Facility (WWRF) Upgrade to R-1 (CBS-1169)**

The plan to upgrade the Kahului/Wailuku WWRF to R-1 is only in the preliminary planning stages. We do not have any preliminary plans, or formal cost estimates at this time. The preliminary estimate in the six year CIP was based on the one channel expansion in Lahaina that cost approximately \$6 million. An actual cost estimate will be prepared once we get closer to design contracts.

We have listed it as a potential project on our six year Capital Improvement Program. At this point in time it is not required until the recycled water force main (CBS-1171) and pump station (CBS-5034) projects are constructed to transfer water to the central valley and the water could be used by customers. These other projects are also on the six year schedule and have design contracts issued and the EIS is in process. The current time line is our best estimate, it is not required to be completed by FY2028. It is dependent on other projects as well as other approvals (mayor's office, County Council, etc.) Note that funding for projects is only approved on a year to year basis during the County Budget process.

**County of Maui**  
**Fiscal Year 2022-2027 Capital Improvement Program**

CBS No: CBS-1169

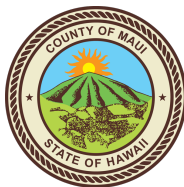
Project Name: Wailuku-Kahului Wastewater Reclamation Facility (WWRF)  
Upgrade to R-1

Department: Department of Environmental Management

District: Wailuku-Kahului

Project Type: Sewer

Anticipated Life: 30 years



| Prior Years | Appr    | Ensuing | Subsequent Years |         |         |           |         | Total     |
|-------------|---------|---------|------------------|---------|---------|-----------|---------|-----------|
| Expend/Encb | FY 2021 | FY 2022 | FY 2023          | FY 2024 | FY 2025 | FY 2026   | FY 2027 | 6-Year    |
| 0           | 0       | 0       | 0                | 0       | 0       | 1,800,000 | 0       | 1,800,000 |

**PROJECT DESCRIPTION**

The primary objective for this project is to modify the Wailuku-Kahului Wastewater Reclamation Facility to produce a R-1 quality reclaimed water for the Wailuku-Kahului service area. This includes construction of ultraviolet disinfection basins, on-site storage, a pump station and all related piping and electrical to connect to the proposed force main.

**PROJECT JUSTIFICATION**

Use of reclaimed water will result in the conservation of potable water resources, preservation of brackish water resources and reduction of treated effluent discharged into injection wells.

**STRATEGIC PLAN ALIGNMENT**

| Department's Strategic Plan                                                                                              | Countywide Priority Results                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Sustain Reliable Wastewater Infrastructure<br>Ensure Facilities Meet Future Needs<br>Provide Reliable Wastewater Service | A Suitable Public Infrastructure<br>A Strong, Diversified Economy<br>A Prepared, Safe, and Liveable County<br>A Healthy and Sustainable Community |

**Operating Impact Narrative**

Addition of this treatment capability will require an additional position to manage the system, and extra costs for electricity and materials to operate the disinfection system and pumps.

# Wailuku-Kahului WWRF

## R-1 Recycled Water Study

Prepared for  
County of Maui, Wastewater Reclamation Division, Wailuku, HI  
August 2015

[2015 Reuse study #1 link](#)

[2015 Reuse study #2 link](#)

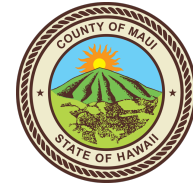
**Table 5-6. DOH Reuse Guidelines - Disinfection Requirements**

| Item                                                                                       | Requirement                                                                                                                                       |
|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General Disinfection</b>                                                                |                                                                                                                                                   |
| Inactivation of F-specific bacteriophage MS2 or poliovirus                                 | 5-log or 99.99% removal                                                                                                                           |
| Fecal coliform bacteria concentration                                                      | <2.2 colony forming units (CFU)/100 mL 7-day median, and<br>>23 CFU/100 mL in no more than one sample in 30 days, and<br><200 CFU/mL at all times |
| <b>Disinfection via UV</b>                                                                 |                                                                                                                                                   |
| UV dose                                                                                    | 100,000 $\mu$ Ws/cm <sup>2</sup> (for non-membrane filtration)                                                                                    |
| Minimum UV transmittance                                                                   | 55 percent                                                                                                                                        |
| Post-filtration turbidity                                                                  | Automatic diversion from reuse if >2 NTU                                                                                                          |
| Measurements for flow rate, UV intensity, UV transmittance, turbidity, operational UV dose | Continuous                                                                                                                                        |
| UV System Redundancy                                                                       | Required such that PWWF can be handled when one bank of lamps (in each channel) is offline                                                        |

**Table 6-3. UV Disinfection Design Criteria**

| Description                     | Value                                                                         |
|---------------------------------|-------------------------------------------------------------------------------|
| Filtered water UV transmittance | 55 percent minimum <sup>a</sup>                                               |
| Minimum UV dose                 | 100,000 $\mu\text{Ws}/\text{cm}^2$                                            |
| UV technology                   | Trojan UV3000+                                                                |
| Lamp type                       | Low pressure high output, in quartz sleeves                                   |
| End of lamp life factor         | 0.98                                                                          |
| Lamp fouling factor             | 0.95                                                                          |
| Lamp cleaning system            | Automatic                                                                     |
| Number of channels              | 3                                                                             |
| Number of banks per channel     | 5 (1 redundant bank per channel)                                              |
| Total number of banks           | 15 (12 duty, 3 redundant)                                                     |
| Number of modules per bank      | 18 <sup>a</sup>                                                               |
| Number of lamps per module      | 8                                                                             |
| Total number of UV lamps        | 2,160 <sup>a</sup>                                                            |
| Lamp power draw                 | 254 watts/lamp                                                                |
| Maximum power draw              | 540 kW <sup>a</sup>                                                           |
| Water level control             | Fixed weirs                                                                   |
| Instrumentation                 | Continuous UV intensity monitoring<br>Continuous UV transmissivity monitoring |
| Energy conservation             | Automatic lamp dimming                                                        |

# UV costs for parts & power in the \$100K's per year



|                                           |                                      | FY2021        | Estimated<br>FY2022 | Estimated<br>FY2023 |
|-------------------------------------------|--------------------------------------|---------------|---------------------|---------------------|
| <b>POWER COST:</b> (per 2 MGD)            |                                      |               |                     |                     |
| Lahaina WWRF                              | UV System                            | \$ 112,958.36 | \$ 137,875.65       | \$ 144,037.99       |
| Kihei WWRF                                | UV System                            | \$ 68,107.25  | \$ 85,134.06        | \$ 140,608.51       |
| Electrical Cost per KWH                   | HECO                                 | \$ 0.31       | \$ 0.31             | \$ 0.32             |
|                                           | S POWER (PV)                         | \$ 0.21       | \$ 0.21             | \$ 0.21             |
| <b>Estimated Annual UV Power Cost</b>     |                                      | \$ 181,065.61 | \$ 223,009.71       | \$ 284,646.50       |
| <b>MATERIALS/SUPPLIES:</b>                |                                      |               |                     |                     |
| Lahaina WWRF                              | UV lamps, sleeves, modules, parts    | \$ 127,217    | \$ 132,340          | \$ 135,000          |
| Kihei WWRF                                | UV lamps, replacement modules, parts | \$ 51,538     | \$ 121,400          | \$ 128,000          |
| <b>Estimated Annual UV Equipment Cost</b> |                                      | \$ 178,756    | \$ 253,741          | \$ 263,000          |



# REUSE GUIDELINES

## Volume 1: Recycled Water Facilities

Prepared by  
Hawai'i State Department of Health  
Wastewater Branch  
January 2016  
(Replaces May 15, 2002 Version)

### D. R-1 Recycled Water

In order to be classified as R-1 recycled water, wastewater must be oxidized, filtered and disinfected as follows:

#### 3. Disinfection

The disinfection process, when combined with filtration, must have demonstrated inactivation and/or removal of 99.999 percent of the plaque-forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least resistant to disinfection as the polio virus may be used for purposes of demonstration.

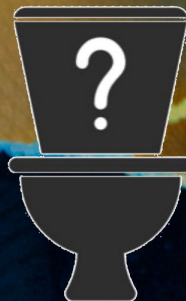
##### b. UV Disinfection

- 1) When using media filtration:
  - a) The design UV dose shall be 100 mJ/cm<sup>2</sup> or greater under maximum daily flow; and
  - b) The filtered UV transmittance shall be 55 percent or greater at 254 nanometers (nm).
- 2) When using membrane filtration:
  - a) The design UV dose shall be 80 mJ/cm<sup>2</sup> or greater under maximum daily flow; and
  - b) The filtered UV transmittance shall be 65 percent or greater at 254 nanometers (nm).
- 3) The minimum acceptable design requirements and commissioning of new UV disinfection systems shall comply with the *NWRI UV Guidelines*.
- 4) A UV system that is Title 22 certified by California is acceptable to the DOH.

#### 4. Fecal Coliform

- a. The median density measured in the disinfected effluent shall not exceed 2.2/100 milliliters using the bacteriological results of the last seven days for which analyses have been completed;
- b. The density shall not exceed 23/100 milliliters in more than one sample in any 30-day period; and
- c. No sample shall exceed 200/100 milliliters.
- d. Frequency of sampling and analysis:
  - 1) Sampling and analysis shall be done daily for fecal coliform when R-1 is being used as allowed (i.e. not directly disposed).
  - 2) If approved by the Director, sampling frequency may be reduced to weekly sampling based on:
    - a) Use of R-1 when a lower class of recycled water is allowed;
    - b) Volume of R-1 used;
    - c) Disinfection or filtration method used;
    - d) Demonstrated disinfection quality and reliability;
    - e) Sampling location; and
    - f) Other factors as determined by the DOH.

[Hawaii DOH 2016 Reuse Guidelines link](#)



**FlushAware**

Do you know what happens to the water that goes  
down the toilet and drain?

Learn About Your Maui Island Wastewater Disposal Method

[FlushAware.com](https://FlushAware.com)