



**PUAKŌ FOR REEFS**

# A Community Dedicated to Saving Puakō Reef

**Return the reef to its historic 70% coral coverage from its existing 7%.**

[www.Puakō4reefs.org](http://www.Puakō4reefs.org)

## Sewer System in Puakō Update – August 2024

### Puakō for Reefs Mission

Puakō for Reefs (PFR) is a nonprofit organization dedicated to the protection and revitalization of the South Kohala Coast and the Puakō reef by addressing its land and water-based threats in the face of climate change: wastewater, flooding, over-fishing, and fire. Its current priority is removing wastewater from the reef by installing a community sewer system.

### In this newsletter

Community engagement \* Experts answer YOUR questions \* Fund Raising \* What you can do NOW to save our reef.

### Community Engagement

We have hosted and supported eight community meetings in 2024 to educate the community on the advantages and realities of building a sewer system in Puakō.

- January 25 [Puakō for Reefs and Carollo](#): Update and plan for year
- February 19 [Seattle Aquarium](#): Annual study of Puakō Reef.
- April 8 [County Meeting](#): Master Plan for Cesspool Conversion
- April 30 [Mayor Mitch Roth in Puakō](#)
- May 17 [Steve Colbert, Tracy Weigner, University of Hawaii](#): The Health of Puakō reef Through the Ages.
- June 7 [Orenco Systems](#): A Low-Pressure Collection System
- July 11 [Dr. Greg Asner](#): Reef restoration and science behind degradation as well as restoration.
- July 25 [Carollo Engineers](#): Basis of Design Report for Puakō
- August 1 [E One](#): A Grinder Pump Collection System
- Coming in the fall: State Representative Nicole Lowen

Did you miss some of these sessions? Go to the Become Informed and Involved page of the Puako for Reefs website to watch the video recordings!

### Experts answer YOUR questions

Below are questions from the community which our experts have answered. [If you have questions, please email the PFR volunteer team. We will work with the experts to find answers.](#)

- 1. The goal of improving from 7% coverage to 70% coverage will not be accomplished by any one effort. What is the reasonable goal for the impact of a Puakō Sewer Line?**

*Dr. Asner:* This is hard to answer with tight quantitative clarity. Given that the County is working to remediate sedimentation, and if the community connects to a sewer system for effluent, Puakō waters will be much cleaner. This will allow us to move forward on reef restoration interventions which will need to include outplanting of adult/parent corals from the nursery plus coral larval injections to get thousands of new small corals growing. However, we are unable to do this outplanting work without improving water quality first otherwise we would be exposing new corals to the same conditions that killed them in the first place.

- 2. Can't we just eliminate all cesspools in Puakō and reverse the decline of the reef, or do we need to eliminate septic tanks and aerobic systems as well?**

*PFR:* University of Hawaii scientists Dr. Steve Colbert and Dr. Tracy Weigner presented the answer to this question in their presentation on May 17. They conducted dye tests from houses on the mauka and makai sides of the street with all



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three types of individual wastewater systems: septic, aerobic and cesspools. The results showed that harmful nutrients flowed from ALL of them onto the reef at similar rates, from a few hours to a couple of days. Therefore, to reverse the reef's decline and give it a chance to recover, all wastewater must be removed from the reef using a sewer system.

### 3. How would the scientists estimate the various contributions to the reef degradation here in Puakō ?

*Dr. Colbert:* Department of Aquatic Resources in Hawaii (DAR) has measured coral loss at Puakō .

[https://dlnr.hawaii.gov/dar/files/2019/01/Continued\\_long-term\\_decline\\_PuakōPauoa\\_West\\_HI1979-2008.pdf](https://dlnr.hawaii.gov/dar/files/2019/01/Continued_long-term_decline_PuakōPauoa_West_HI1979-2008.pdf)

DAR identified two causes for the decrease in coral cover. 1) "increased discharge of wastewater and sewage-associated nutrients" and 2) loss of herbivorous fish from overfishing; these fish keep the algae in check, allowing space for coral and coralline algae to grow. Warming and sediments were not seen as concerns. Since 2008, we've had major coral bleaching events in 2015, 2019 from warming and major storm events that have added lots of sediment and further stressed and killed corals.

The 2015 coral bleaching event was really bad for Puakō (90% of coral were bleached). We can't stop warming and coral bleaching, but what we can do is improve the conditions that allow corals to recover from coral bleaching. DAR developed a management plan for helping corals recover from bleaching. The highest recommendation was to prevent additional damage to coral by "reduction of harmful sediment, nutrients, and other pollutants." The second recommendation was to control algal overgrowth by protecting herbivores. So, removing nutrients and pollutants from the ocean not only helps the coral, but removing the nutrients also limits the growth of algae. It's a win-win for the corals.

[https://dlnr.hawaii.gov/reefresponse/files/2016/09/CoralBleachingRecoveryPlan\\_final\\_newDARlogo.pdf](https://dlnr.hawaii.gov/reefresponse/files/2016/09/CoralBleachingRecoveryPlan_final_newDARlogo.pdf)

### 4. What kind of substrate does Puakō sit on. Porous lava mostly, or blue rock mostly and how does that affect the reef?

*Drs. Asner and Colbert:* Puakō sits on well drained substrate formed from volcanic ash and basaltic lava alluvium. It is situated on the northern-most lava flow from Mauna Loa. It is very porous and permeable, with water very easily flowing through it, which is part of the problem. We could see this from 12 dye tracer tests, where dye from cesspools, septic, and ATUs all showed up at the shoreline in a matter of hours to days. Unfortunately, there is essentially no natural treatment of sewage before it reaches the shoreline. (The Waialea Bay community sits on older Mauna Kea lava flows, which may be different.)

### 5. Is the County or State going to disallow septic tank installations based on Greg's information?

*Dr. Colbert:* The County is moving towards disallowing septic tanks on coastal, well-drained volcanic substrate in NEW building construction.

*PFR:* This will require a change in government policy which happens when scientists and communities work together to inform and encourage local politicians. This is why the volunteers at PFR are working so closely with our Mayor, council person, state and federal representatives. We need this change to occur and we the people, need to drive it.

### 6. How much is this going to cost homeowners?

*PFR:* The PFR team continues to work on answering this most important question. We are getting closer as we begin to understand costs for the different parts of the systems, but it will take more time. The Carollo Engineers Basis of Design Report confirmed that the cost to install a traditional gravity fed system is unaffordable and therefore inappropriate for Puakō. The engineering firm we will be hiring soon to create engineering plans for the collection system will therefore



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focus on a low-pressure system, such as Orenco's, or a grinder pump solution, like EOne's, for the Puakō collection system. It is still unclear whether a separate package plant in Puakō is possible given our proximity to the water. The engineering firm will do more work on this. American Waters has confirmed it is technically possible to connect to its plant and that the price to process Puakō's waste would be reasonable. Once we decide which systems we will use, reasonable cost estimates can be developed.

## Fund Raising

**THANK YOU** to community members for their generosity to the efforts of the volunteers at Puakō for Reefs. Our community wide fund-raising request raised \$140,000. These funds will be used to upgrade our website, invest in a contact management system, pay for meeting venues and materials, place a downpayment on engineering plans, and hire other experts.

We also raised \$160,000 in matching fund pledges from community members to be used when we secure a \$1.3M grant or donation which will be used to complete the planning portion of the Puakō sewer project. Large grants usually come with a matching fund requirement. We have asked community members to pledge \$20,000 now to match the grant, to show granting organizations the commitment of the Puakō community. Our matching fund goal is \$250,000. **If you are able to participate in the matching pledge fund, please contact Karen Anderson. We would really appreciate your generosity.**

## What Can you do NOW to protect our reef?

1. Curb your plastic use.
2. Use less water overall. All water eventually finds its way to the ground water and the ocean.
3. For sun protection the best solution is to wear sun protection clothing. The second choice is to wear r sunscreen with zinc oxide or titanium oxide as the principal agent and put it on 15 minutes before entering the water.
4. Use biodegradable bar soap with its minimal packaging and avoid phosphorus.
5. When fishing, only catch what you can reasonably eat before freezing.
6. Only eat sustainable, in season, seafood.
7. Use native plants for landscaping and be judicious in fertilizer use.

*Thank you all for your continued support and participation. Let us know how you would like to become more involved. We could use your help!*

Sincerely,

*Your Puakō for Reefs Volunteer team*

Barbara, George, Marie, John, Karen, Dave, Jovan, Andy, Diane, Rich

***A 'ohe hana nui ke alu 'ia***

***No task is too big when done together by all.***