



CORAL REEF ALLIANCE

Community Perceptions toward Wastewater Management Issues and Proposed Solutions in Puakō, Hawai'i and Beyond

Introduction

This report captures community perception of wastewater issues in Hawai'i by summarizing public testimony and expressed support of two initiatives at the state and local level: Hawai'i Administrative Rules, Title 11, Chapter 62 (HAR 11-62) wastewater system revisions, and the *Clean Water for Reefs* Puakō project. This report describes community perceptions on wastewater management issues and their possible solutions as documented by Coral Reef Alliance (CORAL) relating to these two specific initiatives. A key lesson learned for success in managing Hawai'i's wastewater impacts, is the importance of securing community buy-in for proposed solutions. Findings documented in this report will be used to inform and guide future efforts.

Background

Hawai'i is known for its beautiful white sand beaches, turquoise blue waters and endemic marine life. It is also known to be the cesspool capital of the United States, housing over 88,000 cesspools statewide, with approximately 55,000 located on Hawai'i Island alone.

Cesspools are an outdated method of waste disposal. They do not treat sewage before directly releasing it into the ground. Due to Hawai'i's unique geology of porous volcanic rock and expansive lava tubes, wastewater eventually flows into the groundwater making its way to the sea or other waterways. Untreated wastewater leaching from residential cesspools is a significant source of land-based pollution negatively impacting Hawai'i's nearshore environment and has been identified as a priority in multiple management action plans including the South Kohala Conservation Action Plan (SK-CAP, 2012). Approximately 55 million gallons/day of raw sewage makes its way to Hawai'i's ground water, carrying with it disease-causing pathogens, nutrients such as nitrates and phosphorus, household chemicals and pharmaceuticals; all which contaminate waterways (DOH, 2015a). Ingestion, inhalation, digestion or direct contact with wastewater may result in infections, hepatitis, and gastroenteritis (Pinto 1999; EPA 2011). Thus, this pollution is both a direct threat to marine ecosystems and public health.

Hawai'i's management of wastewater is a long-standing concern for ocean users and residents. Despite the availability of treatment technologies that can address this issue, efforts to solve this problem have been minimal to date and implementation of identified solutions have fallen short due to inadequate availability of capital to cover significant upfront infrastructure and ongoing maintenance costs. In

Wai'Opae, Hawai'i, dye tracer studies conducted by the Department of Health (DOH) found that residential wastewater was being transported to the nearshore tide pools within 20 minutes (DOH 1984). Subsequent studies done by the University of Hawai'i have confirmed this pollution concern (for example, Scout, 2004). These results indicated that cesspools are an immediate hazard to the health of recreational users in the area. As a result, from 2007-2009 the County of Hawai'i contracted an engineering firm to conduct a feasibility study, comparing the costs of a centralized wastewater treatment option to a decentralized system for the area. The consultant recommended a County-owned and maintained low-pressure sewer system with an aerated lagoon and constructed wetlands treatment system. Funding from the County and State government was not offered to the community for the proposed management, and the State Government did not want to own new land along the shoreline, leaving the financial burden to the homeowners. As a result, the community did not support the plan (Engineering Concepts, Inc., 2010). At that time, Kapoho Kai Water Association enacted community bylaws requiring homeowners requesting water to upgrade their cesspools to meet current State requirements for new construction (Article 3, Section 3, 2010) leading the State's first community charge to transition away from cesspools.

In 2014, two initiatives emerged to address the problem of cesspools and wastewater management for Hawai'i. One locally, within the South Kohala community of Puakō and one at the State Level. At the State level, DOH Wastewater Division set out to rid the islands of cesspools and announced proposed changes to Hawai'i Administrative Rule (HAR), Chapter 11-62 wastewater systems (DOH, 2014). These revisions outlined a complete statewide replacement process for all existing cesspools, and a total ban for any future construction. Alongside these efforts CORAL launched the *Clean Water for Reefs* project in Puakō to work with local residents and conservation groups and address wastewater pollution.

Community Perceptions

HAR 11-62

Between 2014-2015 concerns around wastewater management reached their peak making headline news across the islands. Concerns rose over current methods of collection, treatment and reuse of effluent that is threatening water sources, human health and the near shore environment provided the rationale for change. Hawai'i's DOH publicly announced the proposed rule package HAR 11-62 and accepted public testimony across the State in September 2014 for the following amendments:

- Total ban of all new cesspools
- Identified 88,000 cesspools be upgraded within 180 days after the properties point of sale
- Reduce the number of lots, from 50 to 15, allowed within a new proposed subdivision permitted for individual wastewater systems to require a package plant treatment system

The public testimony period was the first opportunity for Hawai'i residents to weigh-in on the proposed amendments. Across the State residents voiced concerns around the lack of financial support, the short timeline of the 180 day transition, the burden on homeowners, the lack of assistance from State divisions, and their inability to keep up with infrastructure demands with the limited number of contractors' available on-island. Additionally, concerns around the impact to the housing market for the point-of-sale

clause were high. Residents generally felt they had not been included in the process that led to the amendments. They were given no voice in identifying a solution but had been handed the financial burden of solving the problem.

Despite these concerns, a complete ban of *new* cesspools was supported and identified as a need by residents in Hawai'i. Residents want safe drinking water, healthy reefs and do not want Hawai'i to be the cesspool capital of the US (DOH, 2015b). Unfortunately, due to lack of financial assistance and multiple concerns around impacts to financial markets the proposed HAR 11-62 was not uniformly supported and 88,000 existing cesspools continue to pollute waterways and coral reef ecosystems.

During the 2nd Annual Joint Government Water Conference in August 2015, almost exactly one year after the public testimony period, DOH released an update for HAR 11-62 and modifications were made after taking into account the testimony received. These changes and modifications along with the public concerns that initiated these changes can be found in the following table:

Date	Rule Change Proposal	Summary Changes	Remarks
September 2014	Original Amendments	<ul style="list-style-type: none"> • Ban all new cesspools • All 88,000 cesspools be upgraded within 180 days after property sale • Reduce from 50 to 15 lots the size of new proposed subdivisions allowed to use individual wastewater systems (IWS) rather than package treatment 	<p>Little opposition</p> <p>Objection from realtors</p> <p>Some developer opposition</p>
November 2014	Revised Amendments (Following Public Comment Period)	<ul style="list-style-type: none"> • Ban all new cesspools • Require 19,800 cesspools be upgraded within 365 days after property sale • Reduce from 50 to 15 lots the size of new proposed subdivisions allowed to use IWS rather than package treatment 	<p>Little opposition</p> <p>Objection from realtors</p> <p>Some developer opposition</p>
May 2015	DOH withdraw rules from Governor's office		
2015	Proposed 2015 Major Amendments	<ul style="list-style-type: none"> • Ban new cesspools • Delete: Require 19,800 cesspools be upgraded within 365 days after property sale 	Public Comment Period Pending

		<ul style="list-style-type: none"> • Delete: Reduce from 50 to 15 lots the size of new proposed subdivisions allowed to use IWS rather than package treatment • Implement Act 120: Home income tax credit for converting 	
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Unfortunately, opposition from realtors, developers, and homeowners, resulted in watered down regulations, which do not mandate a shift to replace existing cesspools with better technology. This means that any replacement of cesspools continues to be voluntary. Legislators hope that Act 120: Home income tax credit (DOH, 2015c) will incentivize homeowners to make these transitions on their own.

Clean Water for Reefs Puakō

CORAL launched the *Clean Water for Reefs Puakō* project in September 2014 to address water quality issues facing their nearshore reef. Central to this work is addressing sources of land-based pollution such as wastewater making its way to the marine environment from nearby cesspools. The Puakō and neighboring Waialea Bay communities are located in South Kohala, Hawai‘i Island, near Waimea. These two communities contain 222 lots, which include an estimated 58 cesspools and 74 septic systems (Schott, 2010). The discharge from these systems leaches into the groundwater. Due to the high water tables and porous lava rock, the polluted groundwater flows very quickly into the ocean. Following several years of engagement with the community, we initiated this project in Puakō in response to community concerns and a request for help addressing their wastewater problem.

The *Clean Water for Reefs Puakō* project is a grassroots, collaborative, community-based management project with the goal of replacing ineffective wastewater treatment systems with better technology. Acknowledging the importance of effective community engagement to achieving project goals, CORAL designed the project process to be inclusive and transparent. Regular communications via website updates (coral.org/Puakō), email, mail, door-to-door and community meetings are implemented to provide project updates to homeowners and to seek feedback to ensure project strategies, process and plans are in line with the community’s needs and priorities.

CORAL established the *Clean Water for Reefs* Advisory Committee to ensure all options and issues for cesspool replacement are investigated and addressed thoroughly and efficiently. The committee comprises experts and representatives from County regulatory bodies, academia, the Puakō community, and representatives from the construction, civil engineering and non-profit sectors.

The first key step for this project was to identify the best technical solution to the community’s wastewater problem CORAL, the advisory committee, and the Puakō Community Association examined a wide array of wastewater treatment systems and identified potential alternatives. CORAL contracted AQUA Engineering (AQUA) to conduct a feasibility study and preliminary engineering report for Puakō. The

alternatives investigated were: (1) Installation of Aerated Treatment Unit (ATU); (2) Collection system with dedicated treatment facility; (3) Collection system connecting to Kalahuipua'a Lagoon Facility. In April 2015, CORAL held a *Feasibility Study Launch Event* in Puakō to provide an opportunity for community members to meet with AQUA and ask questions.

An online survey was sent out in mid-2015, to understand community perceptions around the cesspool problem, their preferred solution based upon the three options identified and sought feedback on questions or concerns. Of 22 respondents, 21 said that they believe cesspools are a source of pollution impacting the marine environment; seven highlighted their concern about the cost of replacing cesspools. The desire for an immediate solution though was prevalent in the results. Other issues highlighted included the perspective that homeowners should be responsible for safe disposal of their own waste and concerns that some community members will chose to not participate in this process, when full community participation is critical for project success. Based upon these surveys, six respondents were in favor of individual treatment units, 13 in favor of the connection to the Kalahuipua'a Lagoon Facility and two in favor of an onsite community treatment plant.

AQUA completed the feasibility study in August 2015 and recommended option two (2) an onsite treatment facility because they found this option would provide the highest environmental return by eliminating wastewater pollution from reaching the ocean and it also has the least expensive monthly cost, calculated to cover operations, maintenance and cost recovery over a 20-year period. With the support of the PCA, the advisory committee and AQUA Engineering, CORAL made this recommendation to the community and requested their input via a public meeting, email, mail and an online survey posted to a project website.

In September 2015, CORAL sent out a mass mailing which included an executive summary of the feasibility study, frequently asked questions and identified next steps along with a second survey to gauge interest in the suggested solution. A survey was created to ask whether the community supported the recommended onsite treatment plan, whether they need more information before they can support this recommendation or whether they do not support the recommendation. Seventy-four responses have been received since September. Fifty percent of these respondents (37) support the recommendation, 17 require additional information and 20 do not support the treatment plant at this time. Fourteen respondents listed cost as a concern, with several respondents concerned that they were being asked to pay when other polluters (for example from outside of the community) were not. Other concerns raised include the management and maintenance of an onsite treatment plant, location and odor, the time it would take to implement, permitting challenges and whether the plant would affect the community in a negative way. Two respondents were concerned that the pollution problem was coming from elsewhere and their investment would not solve the problem. Of the respondents who said they do not support the plant, seven supported other wastewater treatment options and two did not believe there was a pollution problem from their wastewater.

Since this project commenced, CORAL has communicated with approximately 50% of the properties in Puakō and to date, 112 individuals have requested to receive emails with project updates and

communication. Continued efforts are currently underway to connect with the full community of homeowners in order to identify the level of support for the onsite treatment plant specifically and address the questions and concerns that community members have about how this recommendation and project will affect them.

Community feedback is critical to enable CORAL and partners to appropriately design an implementation plan for infrastructure ownership, management, maintenance and financing that the community supports. CORAL is currently researching implementation options and will hold educational workshops that provide an opportunity for community members to learn about the different implementation design options and engage with experts to answer questions. Feedback received through these events and broader communication efforts will continue to guide the design of the cesspool replacement implementation plan to ensure maximum community support and participation.

Through the course of this project, CORAL has engaged with a number of stakeholders in South Kohala. This engagement has highlighted that multiple communities have requested assistance to solve this problem, including Wai'opae or Kapoho Community, Keaukaha Community and Hawaiian home lands community. But unfortunately financial assistance from State and County agencies has not been forthcoming.

Conclusion

Research supports the need to transition away from cesspools to protect water sources, the marine environment and ocean users alike. Our engagement with stakeholders in South Kohala has highlighted that multiple communities have requested assistance to solve this problem, but they have been left to do so alone and with little financial assistance from State and County agencies. The feedback received from the Puakō community members to date highlights the importance of both designing a wastewater solution that is financially acceptable to community members, and providing clear scientific information that outlines the source of pollution and its environmental and health impacts.

It is clear that communities want to address this problem due to the threat to human and coral reef health. Therefore statewide policy is necessary to incentivize widespread cesspool replacement. But results from the initial attempt to implement the HAR 11-62 demonstrate the importance of improving how stakeholders are engaged in the design of policy changes to ensure there is support for implementation. Specifically, policies must provide a mechanism to alleviate the financial burden from homeowners. Without financial assistance, change will be slow and efforts will stall, and ongoing pollution will continue to devastate Hawai'i's coral reefs. The *Clean Water for Reefs* Puakō project illustrates the significant effort required to engage diverse stakeholders around wastewater issues, but failure to implement effective policy to date highlights that effective engagement is essential to ensuring efforts are not wasted and a successful solution can be found.

There is time to save Hawai'i's coral reefs as long as we act now. Urgent improvements must be made to sewage treatment and disposal management. Through the *Clean Water for Reefs* Puakō project, CORAL

aims to demonstrate how a community can unite to replace their cesspools, and lay out the regulatory, financial and logistical path to successful implementation. CORAL hopes that this project can serve as an educational tool for other communities to make this transition, but also hopes that it will serve as a catalyst for increased support from government to address the barriers that prevent wider action. Hawai'i must show leadership and support communities taking action to protect its coral reefs.

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