

**Draft Environmental Information Document**  
- Subject to Change -

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# **PĀHALA LARGE CAPACITY CESSPOOL CLOSURE**

**Pāhala, Big Island, Hawai'i**  
**November 2023**

**Prepared For:**  
County of Hawai'i Department of Environmental Management

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# 1. Introduction

## 1.1 Background

The Revised Administrative Order on Consent (AOC) (Docket No. SDWA-UIC-AOC-2017-0002, effective date August 22, 2022 Large Capacity Closure (LCC) requirements for Pāhala outlines that an Environmental Information Document (EID) must be prepared by the County of Hawai'i for US Environmental Protection Agency (EPA) approval within 180 days of the approval of the Pāhala Preliminary Engineering Report (PER), to meet Federal Environmental Review Requirements.

The Revised AOC §31.a. requires evaluation of four feasible options:

1. A package plant and new collection system (Alternative 1)
2. A package plant connected to the existing collection system (Alternative 2)
3. A maintenance contract model Individual Wastewater System (IWS) program (Alternative 3)
4. A County issued voucher program with an operating permit model IWS program (Alternative 4)

In addition, to meet the requirements of the EPA, this EID will include:

5. A No Action alternative.

Unlike the previous AOC, which was initiated on June 22, 2007, the Revised AOC no longer requires the WWTP provide secondary treatment of the sewage. As such, the IWS alternatives provide a method to close the two LCCs without providing a secondary treatment process. The package plant discussed below will provide the secondary treatment WWTP.

This document is intended to address State and Federal Environmental Review Requirements of the Revised AOC, including the feasible options and a No Action alternative under the direction of the County of Hawaii (County) Department of Environment (DEM). The environmental review is to be consistent with requirements of the National Environmental Policy Act (NEPA) 42 U.S.C. § *et seq.* and documented in the EID, including the necessary consultation compliance with Section 7 of the Endangered Species Act and Section 106 of the National Historic Preservation Act which will be updated for the Selected Alternative.

Supporting additional studies include Archaeological and Cultural documentation as well as Botanical / Faunal Surveys and regulatory coordination as part of this EID. It is understood, the County will coordinate with the State of Hawai'i Department of Health (DOH) to ensure timely review of studies, documents, and necessary concurrences by the State of Hawai'i State Historic Preservation Division (SHPD) and the US Fish and Wildlife Service.

## 1.2 Previous Environmental Documentation

In February 2020, the EPA and the DEM issued the *Final Environmental Assessment (EA) for the Pāhala Large Capacity Cesspool Replacement Project* which was published in the March 8, 2020 issue of the Environmental Review Program's *The Environmental Notice*. The Final EA discussed the proposed wastewater collection system that would be located within five streets in the



western portion of the community (Maile, 'Ilima, Huapala, Hīnano, and Hala Streets) and three streets in the eastern portion of the community (Puahala, Pīkake, and Kamani Streets). The Final EA also discussed the County's process for identifying alternative sites for the WWTP and the selection of the preferred project site for the WWTP and effluent disposal system. A total of 9 alternative sites were identified and assessed before selecting the 14.9-acre project site as preferred alternative. The development was to consist of a headworks and an odor control unit, an operations building, four lined aerated lagoons, a subsurface flow constructed wetland to remove nitrogen and an adjacent disinfection system to remove pathogens and four slow-rate land treatment basins for disposal of the treated effluent. As set forth in the AOC dated June 22, 2017, the County was to provide an industry standard wastewater collection system and a secondary treatment and disposal facility.

The February 2020 Final EA found no significant impacts are anticipated from construction and use of the collection system and wastewater treatment and disposal facility. On February 24, 2020, by letter to the State of Hawaii Office of Environmental Quality Control (Environmental Review Program) the County DEM issued a Finding of No Significant Impact Notice (Joint NEPA/HEPA) Pahala Large Capacity Cesspool Replacement Project. The letter stated a Finding of No Significant Impact (FONSI) is determined for this project. The basis for this determination is set forth in the Final EA Section 8.1.1, which follows the significance criteria set forth in HAR, Title 11, Chapter 200, Section 12.

Subsequent to the findings of the Final EA/FONSI, as part of the engineering design work, additional geophysical/geotechnical investigations identified and confirmed a large subsurface lava tube extended under the proposed aerated lagoons. Further, the community had not been receptive to the aerated lagoon technology with large open lagoons and the potential for odors to affect the community.

Based on these considerations, the DEM has determined not to proceed with implementation of the wastewater treatment and disposal plant concept as previously proposed and to undertake analysis of the four (4) options / alternatives as set forth in the Revised AOC and the No Action alternative be evaluated for implementation in the Pāhala community.

This project may be funded by the State of Hawai'i Department of Health (DOH) Clean Water State Revolving Fund (CWSRF) Program. Under the CWSRF program, the project consists of two parts: Pāhala Large Capacity Cesspool Conversion and Pāhala Wastewater Collection System. The CWSRF Program was created by the federal Water Quality Act of 1987 and authorizes low interest loans for the construction of publicly owned wastewater treatment works. In 1988, the Hawai'i State Legislature passed Act 365, now Chapter 342D of the Hawai'i Revised Statutes (HRS), to establish the State Water Pollution Control Revolving Fund to receive the federal capitalization grant. HRS 342D, Part V (Water Pollution Control Financing), and, more specifically, HRS § 342D-81 set forth that the State's policy is to promote water pollution prevention and control, including the use of recycled water, by financing eligible projects consistent with applicable federal and state laws. The State Revolving Fund receives annual funding from EPA, which the State of Hawai'i DOH is then responsible for allocating among eligible projects.



### 1.3 Project Location

The community of Pāhala is located about 52 miles southwest of Hilo, in the Kaʻū District, Island of Hawaiʻi. The residential area of Pāhala is located west (mauka) of Māmalahoa Highway (State Route 11) and about 3.8 miles from the shoreline. Most of the community lies between 980 feet above mean sea level (msl) on the western end and approximately 800 feet above msl on the eastern end. Figure 1 shows the Pāhala location map.

Even though Kaʻū was one of the originally settled areas in the Hawaiian Islands, it remains a vast remote area. Only a fraction of a percent of the Kaʻū District has been developed with residential properties, and the remainder is largely used for agricultural purposes or remains undeveloped. The Kaʻū District covers about 922 square miles (approximately 590,000 acres), with over 80 miles of virtually undeveloped coastline. Nearly two-thirds of its total land area is in the Conservation District. The Kaʻū District consists of several communities, including the Pāhala community, which has a population of approximately 2,210 persons according to the US Census Bureau American Community Survey, 2021. The distance to the communities of Hilo and Kailua-Kona means that the Kaʻū District is relatively isolated from the major infrastructure systems found in those communities, including wastewater treatment and disposal facilities.

The Project Area includes approximately 200 parcels (in whole or in part) and portions of multiple County of Hawaiʻi roadways in Pāhala. The Proposed WWTP Site is located adjacent to the intersection of Maile Street and Hawaiʻi Belt Road within a 14.9-acre portion of Tax Map Key (TMK): (3) 9-6-002-018. The Proposed Collection System Area will include five streets in the western portion of the community (Maile, ʻIlima, Huapala, Hinano, and Hala Streets) and three public streets in the eastern portion of the community (Puahala, Pikake, and Kamani Streets). The two LCCs slated for closure are located within TMKs (3)9-6-002:024 (por.) and 9-6-016:041 (por.).

### 1.4 Purpose and Need

A portion of the Pāhala community is serviced by a sewer system that was privately built, owned, and operated by the C. Brewer Company (C. Brewer). The C. Brewer built sewer system discharges sewage into two (2) large capacity “gang” cesspools. Around 2006, C. Brewer requested that the County construct and maintain a new and improved community sewer system. A County Council Resolution approved the C. Brewer request. In anticipation of C. Brewer's dissolution, C. Brewer proposed, and the County agreed, to enter into a formal agreement to not only construct and maintain a new and improved community sewer system but to assume ownership of the existing system including the LCC's by April 30, 2010.

As part of this agreement, for the majority of Pāhala and Nāʻālehu properties connected to the LCCs, C. Brewer committed to complete the line (called a lateral) between the residences and the property line at the edge of the public right-of-way adjacent to the new collection system.<sup>1</sup> It was agreed, if the County did not complete its portion of the work by April 30, 2010, the County would assume pending and unfinished obligations to connect the new laterals installed by C. Brewer to the residences and new collection system when complete. Thus, because that date has passed and the County has not completed installation of the new collection system, this project includes connecting these C. Brewer laterals, which may now need to be replaced, or installing private laterals for currently connected properties if authorized by the property owner and approved by County Council.



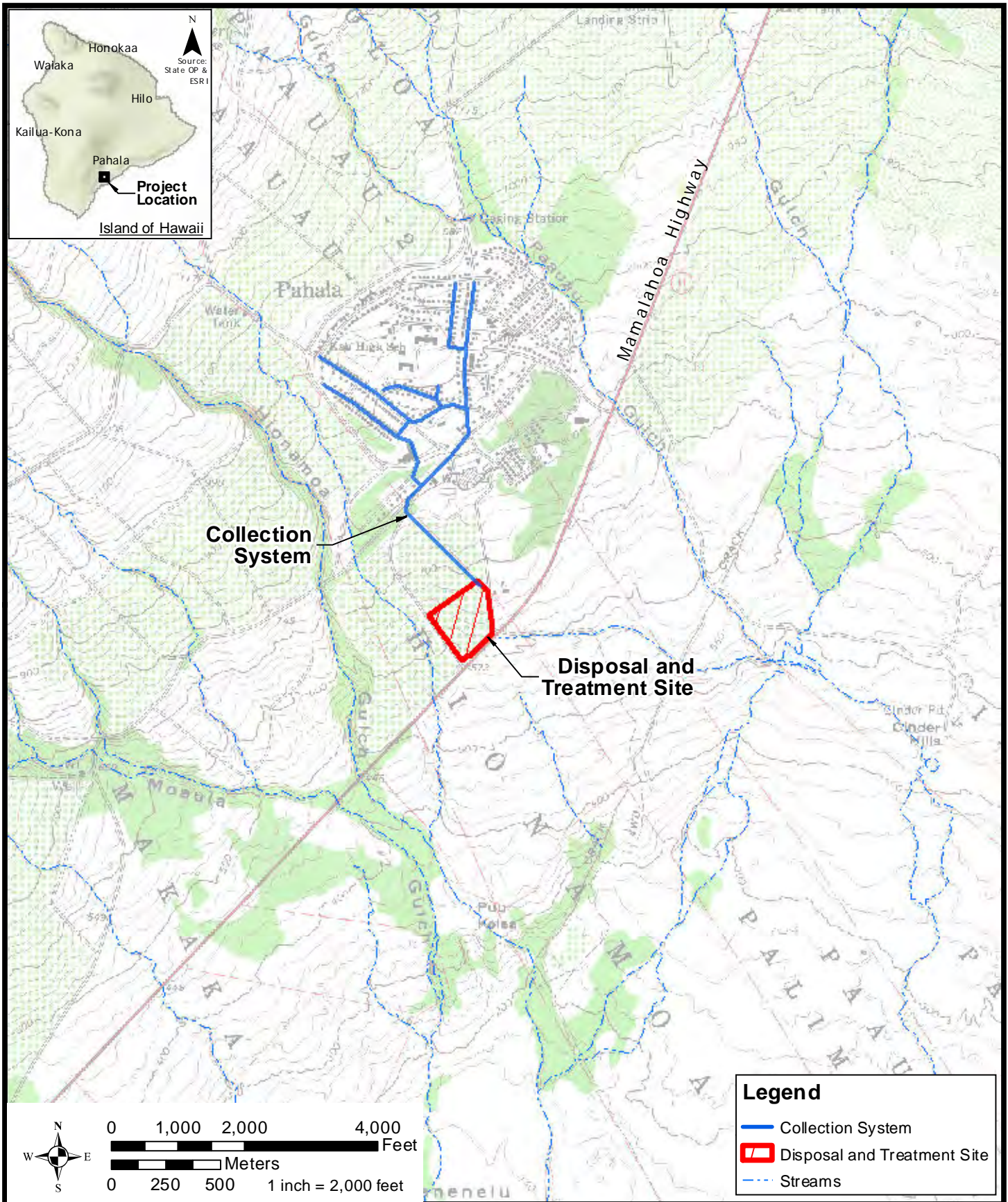


FIGURE 1  
PROJECT LOCATION MAP



In 1998, the U.S. Environmental Protection Agency (USEPA), promulgated regulations, 40 Code of Federal Regulations (CFR) 144.14, that require the elimination of large capacity "gang" cesspools (LCCs). In 1999, EPA issued regulations under the Safe Drinking Water Act's (SDWA) Underground Injection Control (UIC) Program which prohibited the construction of new LCCs as of April 2000 and required the closure of all existing LCCs by April 5, 2005 (40 C.F.R. § 144.88). Under federal regulations, an LCC is a cesspool which serves multiple dwellings, or for non-residential facilities has the capacity to serve 20 or more persons per day.

In June 2017, EPA and the County entered into an Administrative Order on Consent (AOC) to close the LCCs serving the Pāhala community by June 2021. Options considered by the County to close the LCCs include construction of a new sewer collection system located within public right-of-way (ROW) and replacement of the existing LCCs with a wastewater treatment plant (WWTP) to address the wastewater treatment and disposal needs of the Pāhala community. The recently revised AOC that became effective on August 22, 2022 requires the LCCs to be closed no later than July 21, 2026.

As of August 22, 2022, the County of Hawai'i and the EPA voluntarily entered into a Revised Administrative Order of Consent (AOC) for the purpose of bringing the County into compliance with the requirements of the Safe Drinking Water Act (SDWA), 42 U.S.C. § 300f, et seq.

EPA has determined that the County, as the current owner and/or operator of two (2) Large Capacity Cesspools ("LCCs") that serve approximately 109 private residences in the community of Pāhala and three (3) LCCs that serve approximately 164 private residences in the community of Nā'ālehu, violated and continues to violate the SDWA and its Underground Injection Control program requirements for existing LCCs.

A "cesspool" is a "drywell," which in turn is a "well," as those terms are defined in 40 C.F.R. § 144.3. LCCs include "multiple dwelling, community or regional cesspools, or other devices that receive sanitary wastes, containing human excreta, which have an open bottom and sometimes perforated sides.

Based on the above, the County has outlined that the purpose and need for the Proposed Action is to comply with the requirements and mandates of the SDWA and AOC, and to ultimately close the two LCCs that serve Pāhala. Thus, the core purpose of this exercise is to evaluate, gather community input, and make an informed decision on selecting an option or alternative that will allow the County to close the LCCs, and provide a new, SDWA compliant solution for handling wastewater generated by the Pāhala Community. Closure of the LCCs will eliminate the disposal of untreated sewage into the subsurface which will serve County's mission to protect underground drinking water sources.



## 2. Project Description and Alternatives

### 2.1 Proposed Action

The Proposed Action is to construct facilities which would allow the County to close the 2 LCCs in Pāhala and thereby meet the compliance requirements of the Revised AOC and the applicable portions of the Clean Water Act. The Proposed Action would be achieved by any of the 4 alternatives set forth in the Revised AOC and described below.

#### *2.1.1 Alternative 1: Package Plant New Collection System*

Under this alternative, the County of Hawai'i would perform the following actions:

1. Acquire, or otherwise obtain the right to develop and use, a portion of the Tax Map Key: 9-6-002:018, a 42.5-acre parcel currently owned by B. P. Bishop Estate Trustees (commonly known as Kamehameha Schools), then construct a new secondary wastewater treatment and disposal facility within a 14.9-acre portion of the parcel; (See Figure 2)
2. Construct a wastewater collection system, primarily within the public right-of-way (ROW) and three segments within easements in the Pāhala community, to collect and convey sanitary waste from the currently connected and accessible (in accordance with Hawai'i County Code) properties to the new treatment and disposal facility;
3. Close and abandon two LCCs, according to DOH closure procedures; and
4. Abandon the existing wastewater collection system in place.

These actions will be applicable to Alternative 1 and Alternative 2.

#### *Package Plant*

The Revised AOC allows for a Package Plant to be constructed to treat and dispose sewage currently being disposed in the 2 LCCs. The following sections describe the components and facilities which would comprise the package plant to treat the sewage and dispose the treated effluent which would be applicable to Alternative 1 and Alternative 2.

The April 2023, Preliminary Engineering Report (PER) provides the technical information related to analysis used by the County to select the package plant to be used to treat incoming sewage flows and a method to be used for disposal of effluent from the wastewater treatment plant (WWTP). As described in the PER, the WWTP and effluent disposal method would be accommodated within the 14.9-acre Proposed WWTP Site located near the intersection of Maile Street and Kamehameha Highway (State Route 11). For more information, see Appendix A.

The PER indicated accurately quantifying flow projections for the Pāhala community is necessary to design an appropriately sized wastewater treatment and disposal facility. The WWTP design will need to provide sufficient capacity for the existing parcels within the service area, including newly accessible parcels reflecting currently developed portions of the Pāhala community. This will allow the County to close the LCCs. The design will provide sufficient area with the WWTP site for future expansion.





HAR Section 11-62-24(b) requires Counties to use their adopted wastewater flow standards to develop flow projections for WWTPs. Counties are to use the City and County of Honolulu (CCH) flow standards if they have not adopted their own standards. The County of Hawai'i has not adopted its own flow standards, so wastewater flow projections were developed using the current CCH (2017) wastewater standards. However, flow projections based the current wastewater standards based on urban Honolulu are likely overly conservative for rural communities like Pāhala.

The PER indicates the amount of wastewater generated within a residence will not exceed the amount of potable water used by the occupants. Therefore, potable water use records can be used to estimate wastewater generation rates within existing communities where no combined sewers are present. The County of Hawaii Department of Water Supply (DWS) provided potable water use records from January 2015 through June 2021 for the parcels located within the service area. Analysis of the potable water use records indicates that a 40,000 gpd monthly wastewater generation rate would reflect the current needs of the service area. Using a 2.5 peaking factor to estimate the maximum wastewater flow into the collection system results in a maximum wastewater flow of 100,000 gpd.

As stated in the PER, groundwater can infiltrate into wastewater collection systems during dry weather, increasing flows to the WWTP. The 2017 CCH standards specify a dry weather infiltration and inflow (I/I) allowance of 35 gallons per capita per day (gpcd). The previous CCH standards (dated 1993) specified a dry weather I/I allowance of 5 gpcd for properties located above the groundwater table. Through the County's experience at Honokaa evaluating dry weather I/I for a rural collection system located in Hawai'i Island's well-drained geology, at elevations hundreds of feet above sea level and a significant distance from the shoreline, continued use of the 1993 standard for dry weather I/I is appropriate for Pahala and using the 2017 standard would be overly-conservative.

The 2017 CCH standards specify a wet weather I/I allowance of 3,000 gallons per acre per day (gpad). Due to larger parcels within the Pahala service area, wet weather I/I estimates are modified as permitted by the 2017 CCH standards. The modified flows are based on a 50-foot-wide corridor of sewer laterals from existing or assumed building foundations on the property. These assumptions significantly reduce the wet weather I/I estimates for the collection system.

The PER evaluated the effluent flow records at the County Honokaa WWTP to provide an appropriate analysis of the wet weather peaking factors expected at the Pahala facility. The results of the Honokaa WWTP effluent flow analysis have determined that a peak day wet weather peaking factor of 6.5 is recommended for the Pahala WWTP design.

HAR 11-62-23.1(i) requires the initiation of a facility planning process when the actual wastewater flows reach 75 percent of the design capacity of the WWTP, and implementation of the facility plan must be initiated when actual wastewater flows reach 90 percent of the design capacity. In anticipation of future development within the Pāhala community, the PER recommend the WWTP design be rated to treat an average dry weather flow of 95,000 gpd (approximately twice the projected average dry weather flow) to avoid the potential of having to initiate a facility plan shortly after the project is constructed. Note, the biological processes in the mechanical WWTP will need to be sized to treat the peak day dry weather flow of 108,000 gpd, not the average dry weather flow.



Based on the above analysis the County applied to DOH for a variance from HAR Section 11-62-24(b). On January 26, 2002, the DOH granted the variance, which must be renewed every five years. The variance contains the following conditions:

1. As a minimum, the Pahala Wastewater Treatment Plant (WWTP) shall be designed using an average dry weather flow of 95,000 gallons per day.
2. Plans for the proposed Pahala WWTP shall be designed in accordance with applicable requirements of HAR Chapter 11-62 and be submitted to the Wastewater Branch for review and approval. In addition, the WWTP shall be approved in writing before it may be used.
3. There is no automatic renewal. Should the applicant wish to renew this variance application, the applicant must submit an Application for Variance for renewal, 180 days prior to expiration date.

The PER provides a description of the package treatment facility to be implemented at Pāhala. The site plan for Pāhala WWTP would occupy a 14.9-acre area within an existing macadamia orchard and 1,500-foot long by 25-foot wide utility easement within the 42.5-acre parcel near the intersection of Maile Street and Mamalahoa Highway, (State Route 11, Hawai'i Belt Road). About 4.0 acres of the 14.9-acre area would require removal of the existing macadamia nut orchard to accommodate the facilities needed to construct the package plant and related facilities. Thus, about 10.0+ acres would remain as the macadamia orchard which would be available subsurface disposal of the treated effluent. A security fence would surround the 14.9-acre site. Figure 3 shows the site plan for the WWTP.

The 4.0-acre package plant includes the headworks, grit drying bed, potable water tank, utility building which includes a blower room, an emergency generator room, electrical room with a monitor control center, a maintenance and storage room, and restroom, an above ground fuel storage tank, and an irrigation control tank. Figure 4 shows the operations building floor plan.

As discussed below, the Pāhala package plant will include preliminary treatment, odor control and secondary treatment, and disposal of the treated effluent. The preliminary treatment system will include influent flow measurement, influent sampling, screening and grit removal.

Influent flow measurement is recommended in the PER to allow assessment of flows and loads to the biological treatment process, and to assess the biological treatment process performance. A Parshall flume will be provided upstream of the screening system to continuously record influent flow rates.

An automatic refrigerated composite sampler is recommended to allow influent composite samples to be collected. Influent composite samples, when combined with influent flow measurement, can be used to calculate influent mass loading rates to the WWTP to assess the treatment performance and to optimize aeration rates in the biological treatment process.

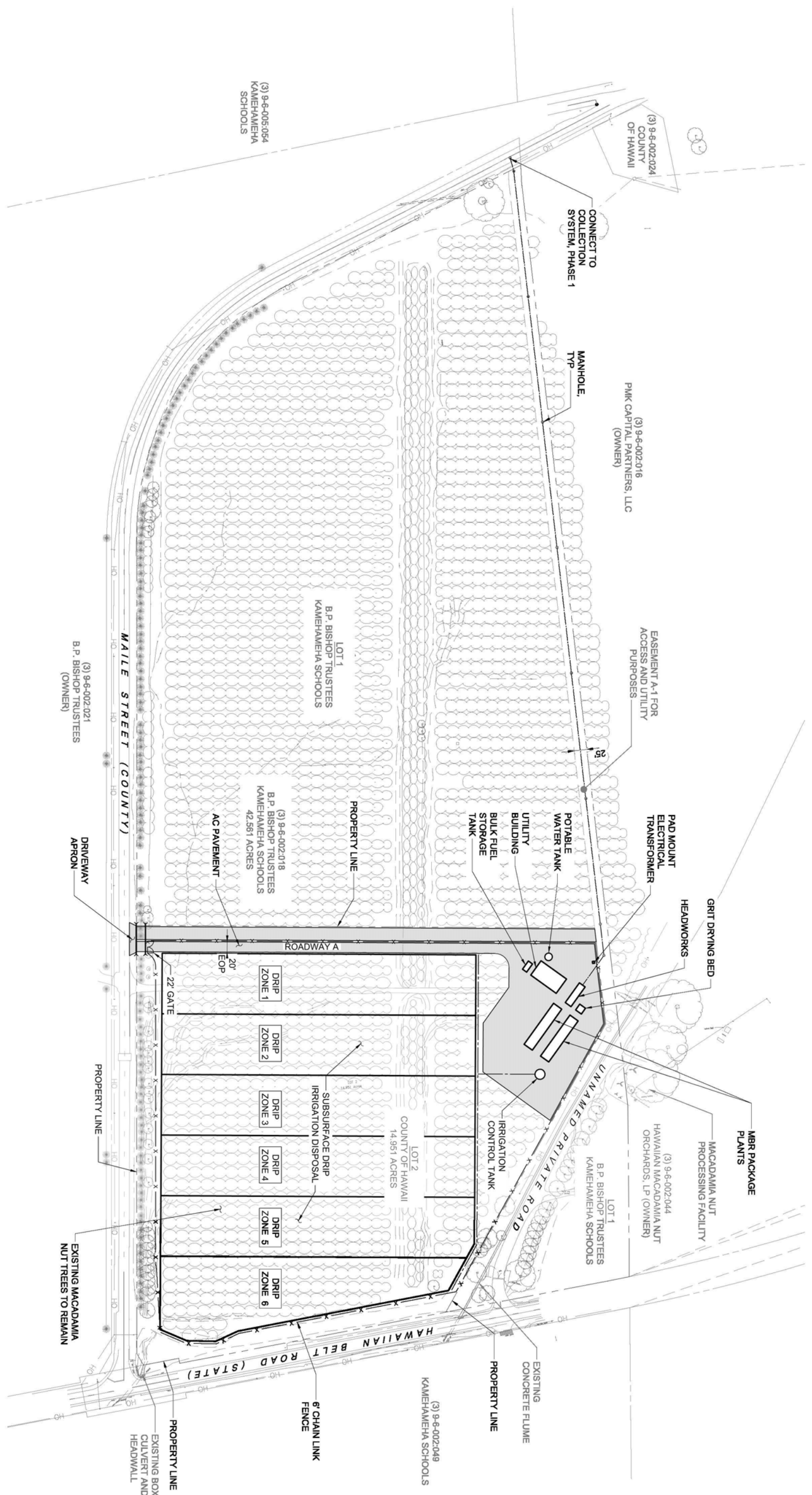
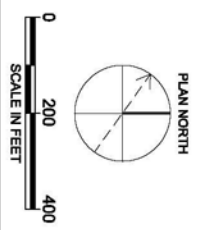
Screening is recommended to protect the downstream system operations from large objects, debris, wipes, and rags that can be present in wastewater. The industry trend is towards finer screening systems that remove greater amounts of debris from the waste stream; screens with 6-millimeter (mm) (¼-inch) openings are frequently used for activated sludge treatment systems.

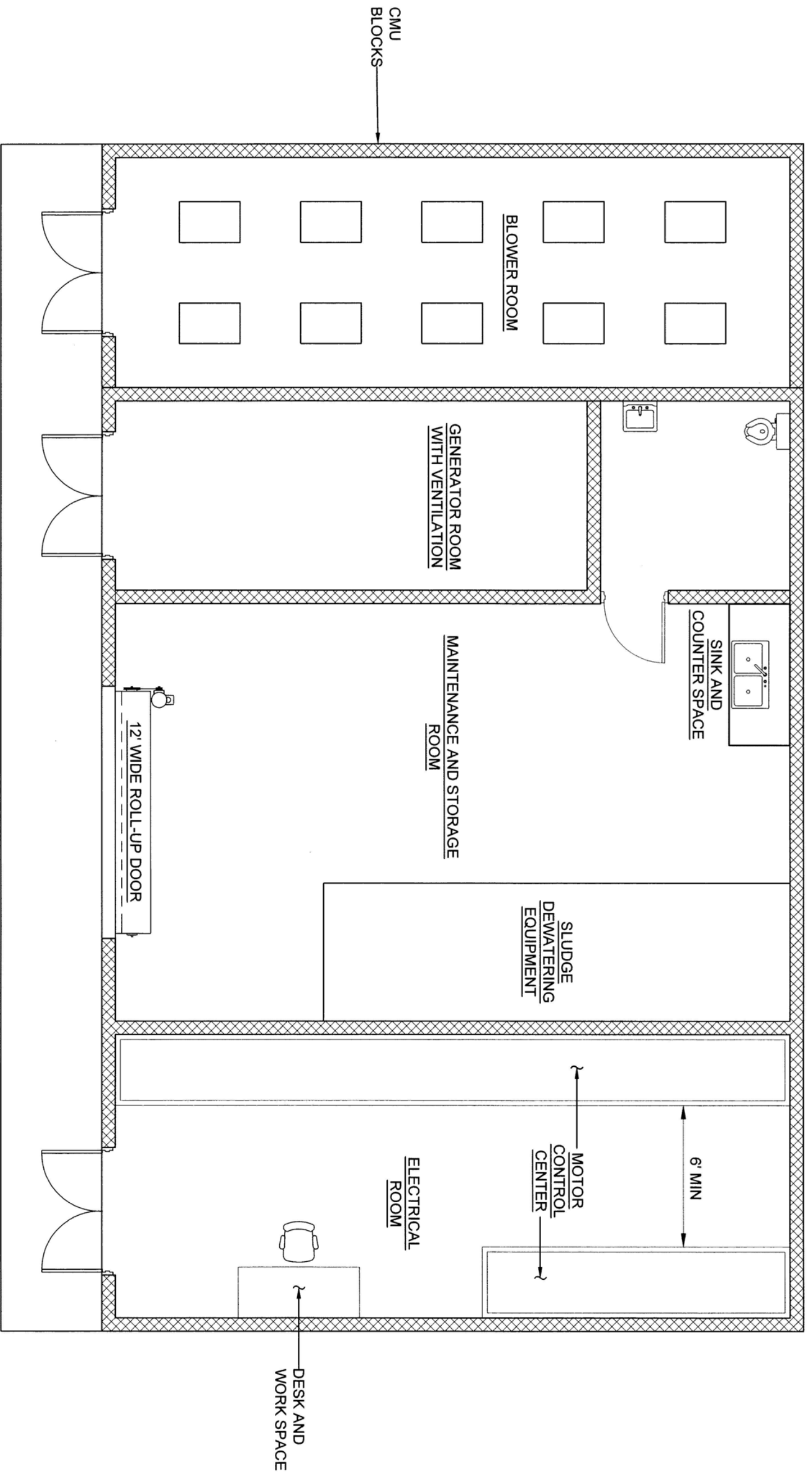




SCALE: 1" = 200'  
JOB NO: 152964

PAHALA WASTEWATER TREATMENT PLANT  
OVERALL SITE PLAN





SCALE: 3/16" = 1'-0"  
JOB NO: 152964

PAHALA WASTEWATER TREATMENT PLANT  
OPERATIONS BUILDING PRELIMINARY FLOOR PLAN

FIGURE

4

Finer screens are used upstream of membrane bioreactors to remove hair that can foul the membranes.

The PER recommended an in-channel cylindrical screen for this installation. The in-channel cylindrical screen combines screening, screenings washing, dewatering, compacting, and bagging/disposal within a single unit as shown in Figure 5. For this installation, the headworks will include one in-channel cylindrical screen, plus a bypass channel with manually cleaned bar rack.

The PER stated, removal of grit is very important to help prevent wear to downstream equipment, costly service interruptions and repair. Grit is comprised of particles that are heavier than the organic biodegradable matter in wastewater. Grit particles can consist of sand, gravel, pebbles, silt, cinders, ground bone, eggshells, coffee grounds, and other materials. Grit in the wastewater collection and treatment system causes abrasive wear to mechanical equipment, piping, and appurtenances. Grit can also form deposits in pipelines, channels, and tanks, which reduces hydraulic capacity and can damage equipment.

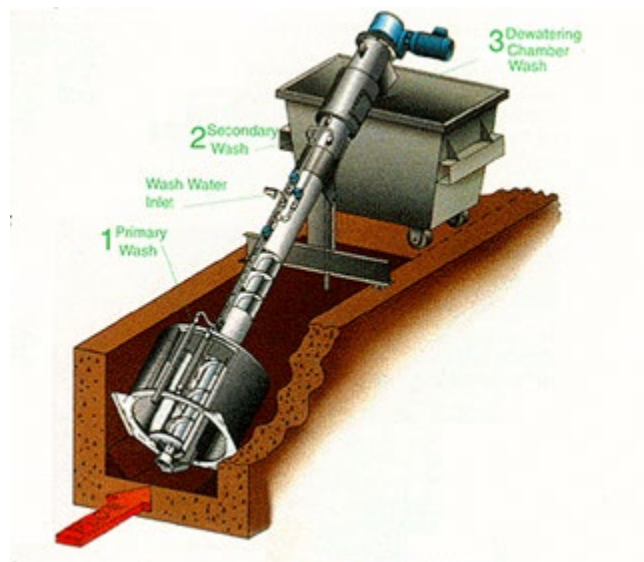


Figure 5: In-Channel Cylindrical Screen  
Source: PER, 2023

The PER recommended use of aerated grit chambers which are tanks that function specifically to remove inorganic solids from the wastewater stream as shown in Figure 6. Aerated grit tanks are designed to induce sufficient vertical velocity to separate organic and inorganic solids. In theory, inorganic solids have a higher specific gravity than organic solids, and therefore require higher vertical velocities to keep them in suspension.

Air diffusers placed near one longitudinal tank wall induce a roll in the contents of the grit tank. This roll creates maximum velocities near the walls and lower velocities at the surface and bottom of the tank. The lower transverse horizontal velocities allow inorganic particles to settle out and be transported to the grit hopper by shear-induced currents.



Aerated grit chamber design is based on providing sufficient hydraulic detention time during peak wet weather flow conditions. The PER stated it is necessary to provide at least 10 minutes of detention time to achieve satisfactory grit removal.

Aerated grit tanks can provide excellent grit removal with minimal headloss, but the chambers themselves require a larger footprint than induced vortex systems. Proper operation of aerated grit tanks can be difficult under varying hydraulic loads due to the need to make fine adjustments to the air diffusers.

The headworks is a notorious location for foul odor at a wastewater treatment plant. This odor is caused by hydrogen sulfide ( $H_2S$ ), which is formed under anaerobic conditions found in the wastewater collection system. Due to  $H_2S$  low solubility in wastewater, when there is an excessive concentration of  $H_2S$  or if there is turbulence,  $H_2S$  gas escapes into the atmosphere. This release produces a distinct rotten egg smell. In addition to  $H_2S$ , there are other foul odorous compounds that can be released from wastewater, such as ammonia, amines, diamines, mercaptans, skatole, and organic sulfides.

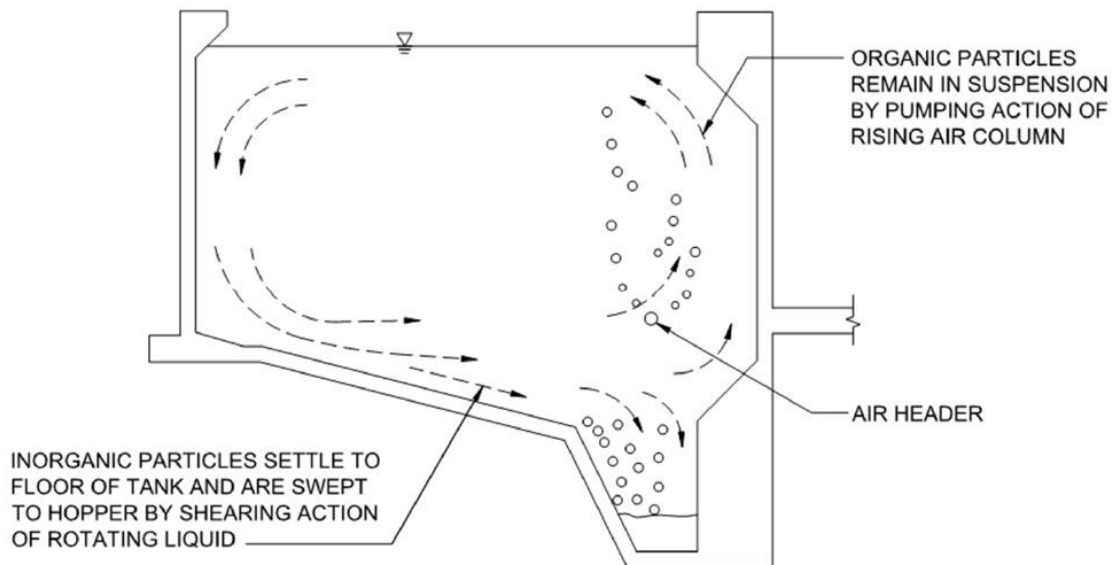


Figure 6: Aerated Grit Chamber  
Source: PER, 2023

The PER recommended a granular activated carbon (GAC) scrubber be used at the Pahala WWTP headworks as shown in Figure 7. A GAC scrubber passes odorous air through a bed of activated carbon, which absorbs the odorous constituents within the pore spaces of the carbon.

Chemical oxidation or reduction of some compounds can also occur. As pore spaces become occupied, efficiency degrades, and the carbon must be replaced or regenerated. Carbon is most effective on higher molecular weight molecules such as the organic sulfur compounds, which



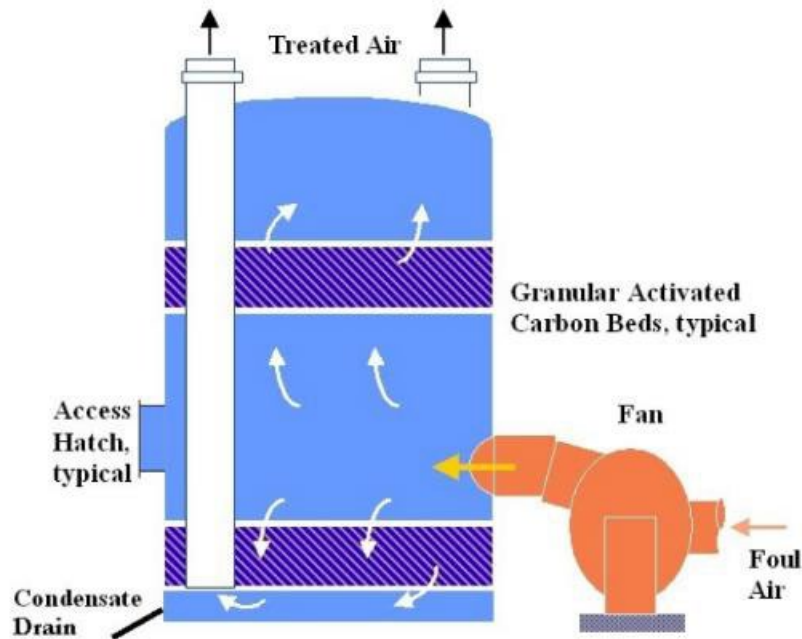


Figure 7: Granular Activated Carbon Scrubber

Source: PER, 2023

makes it the technology of choice. Package GAC scrubbers are available for small headworks and vessels can be situated vertically, horizontally or radially to optimize footprints and reduce structure elevation profiles. The County currently operates GAC scrubbers at other facilities and purchases the GAC media in bulk, which reduces costs.

Secondary treatment process provides 5-day biochemical oxygen demand (BOD<sub>5</sub>), total suspended solids (TSS) and nutrient removal via biological treatment.

The PER provided descriptions of various secondary treatment options including advantages, disadvantages and applicability to the Pahala WWTP. Further, the treatment options were screened to identify technologies for further evaluation. Based on the analysis, the PER selected membrane bioreactor (MBR), activated sludge with anoxic selector, and recirculating gravel filter for use as the Pāhala WWTP.

A membrane bioreactor (MBR) has the smallest footprint of the various biological treatment systems available and provides the highest quality effluent. An MBR basically combines an aeration basin with membrane filtration, eliminating the need for tertiary treatment if a very high-quality effluent is desired for water reuse purposes.

Membranes provide an absolute barrier to large particles; total suspended solids (TSS) concentrations of the effluent (also known as “filtrate”) are typically less than 1 mg/L. Effluent from an MBR process can meet stringent water recycling turbidity requirements without an additional filtration process.



The main difference between MBRs and other biological treatment technologies is the method of separating the bacteria from the clean water. MBRs have thin membranes with many thousands of micro-perforations. Depending on the manufacturer, these perforations are 0.04 to 0.2 microns (4 to 20 hundred-thousandths of a millimeter) in diameter, too small for the passage of most microorganisms or other particles present in the wastewater, but large enough to allow the passage of water molecules.

The MBR facility has a small footprint and the process would produce a high quality effluent. However, an MBR facility has a relatively high overall capital cost, operation and maintenance cost and lifecycle costs. Notwithstanding these considerations, the County will use an MBR package plant at Pāhala.

The proposed effluent management system (subsurface drip irrigation disposal) does not require a disinfection process to protect human health and the environment because the treated effluent is dispersed below the ground surface. However, periodic maintenance chlorination of the subsurface drip system will be required to reduce biofilm fouling within the drip lines.

Calcium hypochlorite is the solid form of hypochlorite used for disinfection. It can be found as a powder, granules, pellets, or as tablets in concentrations up to 70 percent. Calcium hypochlorite will degrade in strength at a rate of 3 to 5 percent per year. Once applied to the wastewater, the chemistry is similar to that for sodium hypochlorite. Calcium hypochlorite decomposes in an exothermic reaction if exposed to moisture. Figure 8 shows a typical calcium hypochlorite feed system.

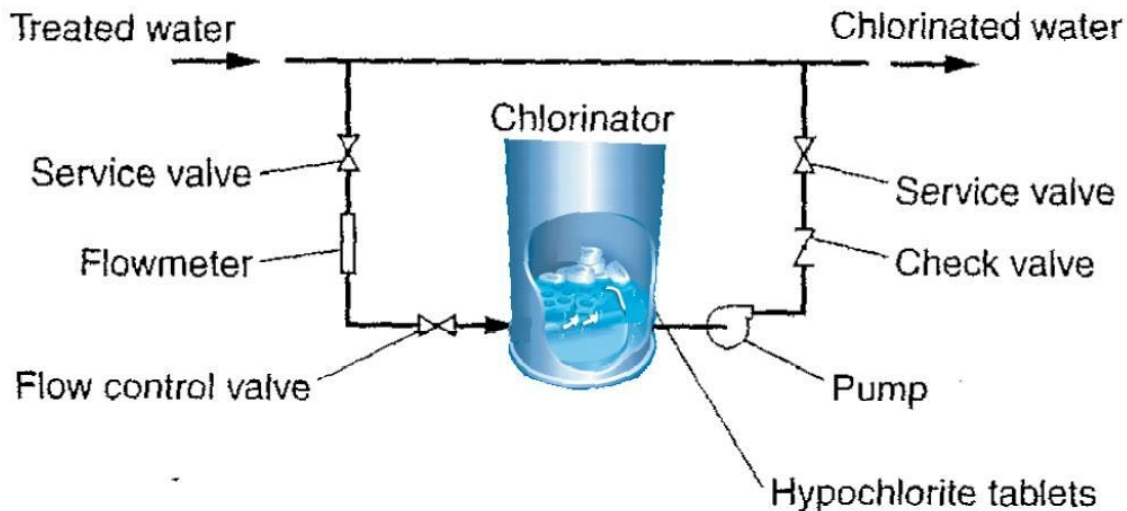


Figure 8: Calcium Hypochlorite Feed System  
Source: PER, 2023

Solid calcium hypochlorite is typically applied directly to wastewater at very small WWTPs due to its ease of use. Specifically, solid calcium hypochlorite is widely available in concentrated form as powder, pellets, or tablets – consequently, transportation and storage of solid calcium hypochlorite disinfectant is optimal for small WWTPs such as at Pāhala. Moreover, the County



utilizes solid calcium hypochlorite as a disinfectant at other plants, so existing supply chain logistics may be leveraged.

Disposal of effluent is an important consideration at any WWTP. Although the PER discusses ocean discharge, use of injection wells, water recycling and slow rate land treatment. The methods were not deemed feasible due to regulatory issues and high costs, including the need to remove and dispose all the macadamia trees growing on the 14.9-acre site.

Based on the selected MBR treatment process, use of subsurface drip irrigation of the existing macadamia orchard for disposal of the treated effluent, as described below, will be used at Pāhala.

The PER indicated the results of the effluent management investigation have determined that a subsurface drip irrigation system as the recommended method of effluent disposal for the Pahala WTP.

This concept would retain the existing site topography along with the macadamia nut tree orchard and use subsurface drip irrigation technology to apply the effluent. Subsurface drip irrigation would be used to apply effluent to the existing macadamia nut trees within the effluent disposal area. The use of subsurface drip irrigation technology to disperse effluent at the site will allow the County to retain the existing mature macadamia nut trees, and will significantly reduce the amount of clearing, grubbing, and grading required to construct the facility. In addition, retaining the existing mature orchard is expected to effectively block views of the facility from both the Hawaii Belt Road and Maile Street.

Drip irrigation technology has evolved to the point where non-clog emitters are available for subsurface applications of effluent. Non-clog subsurface emitters decrease the potential for the irrigation components to be clogged by roots. Drip tubing with integral emitters is buried 6 to 9 inches below ground. Effluent emitters are typically designed to operate at a flow rate of 1 gallon per hour (gph) and are typically spaced every 2 feet along a drip line. Pressure compensating drip systems typically operate under pressures ranging from 10 to 45 pounds per square inch (psi). Figure 9 shows the subsurface drip concept.

The effluent disposal system will be sized to handle the peak day wet weather flow of 312,000 gpd. An irrigation equalization and control tank are proposed to equalize higher peak flows and to allow discrete dosing of the orchard in irrigation zones; constant application of water would be detrimental to the health of the trees.

HAR 11-62 requires a fully redundant subsurface disposal system. The design criteria are based on providing a subsurface drip system that is two times larger than needed in order to satisfy the HAR 11-62 requirement for redundancy. The drip system will be divided into two separate systems so that the peak day wet weather flow can be disposed on the site using one system while the second system is out of service for maintenance.

The subsurface drip lines are to be located between the existing row of trees and spaced to disperse effluent evenly throughout the orchard. During high flow conditions the irrigation control system will open multiple irrigation zones to accommodate the disposal needs.



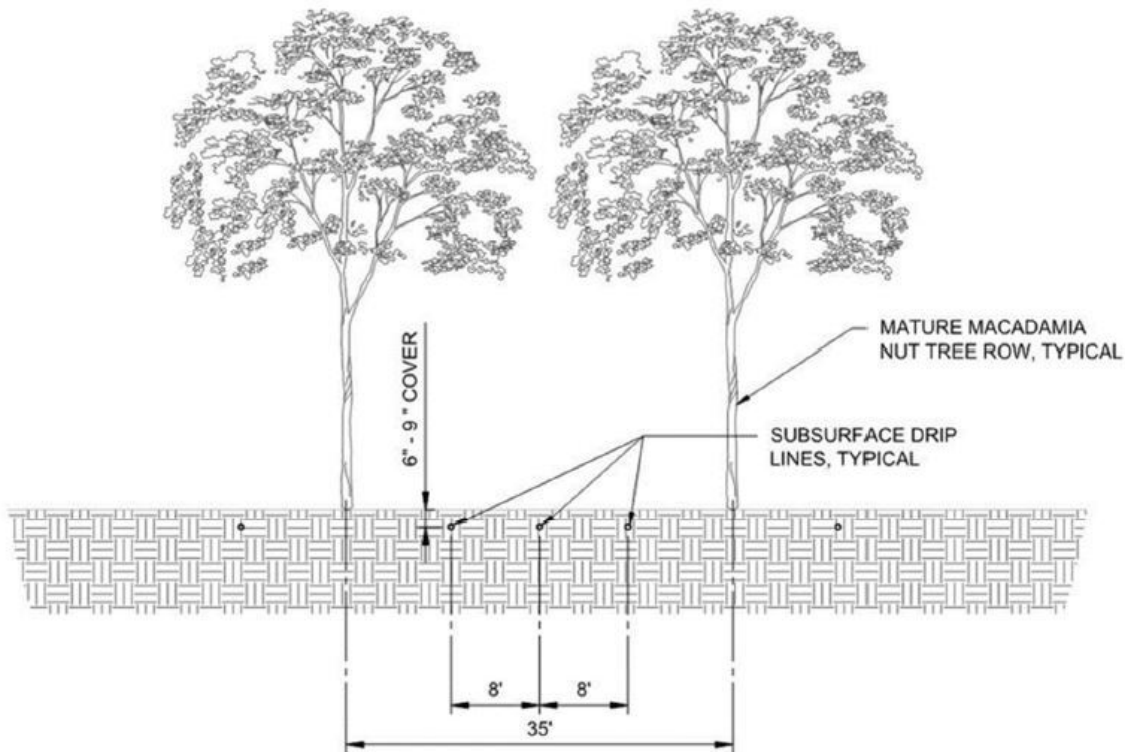


Figure 9: Subsurface Drip Concept for Pāhala  
 Source: PER, 2023

Additional drip lines will need to be added when the WWTP capacity is expanded. The minimum spacing between drip lines is 2 feet, so there will be sufficient space between the initial drip lines to add additional drip lines as part of future expansion project(s).

The PER conducted water balance and nutrient balance to determine the expected nitrogen use by the macadamia nut orchard. The analysis showed the orchard of mature macadamia nut trees is expected to use up to 400 lbs. of nitrogen per acre per year (University of Hawaii Agricultural Experiment Station, January 1959). The effluent will supply approximately 289 lbs./acre/year of total nitrogen, assuming an effluent concentration of 10 mg/L. Although the nitrogen uptake of the orchard is expected to be greater than the total mass of nitrogen applied by the effluent, the predominant nitrogen species in the effluent is expected to be nitrate, which is soluble and readily transportable through the soil profile. The trees will only be able to use the nitrate contained within water that is transpired. The percolate volume is expected to contain approximately 8.5 mg/L of nitrogen as nitrate, because soil denitrification losses of 15 percent can be expected. Therefore, the land treatment system is expected to remove approximately 21 percent of the total nitrogen applied to the site from the WWTP effluent.

The PER stated drip irrigation technology has evolved to the point where non-clog emitters are available for subsurface applications of effluent. Non-clog subsurface emitters decrease the potential for the irrigation components to be clogged by roots. Tubing with integral emitters is buried 6 to 9 inches below ground. Effluent emitters are typically designed to operate at a flow rate of 1 gallon per hour (gph) and are typically spaced every 2 feet along a drip line. Pressure



compensating drip systems typically operate under pressures ranging from 10 to 45 pounds per square inch (psi).

Subsurface drip irrigation technology incurs greater operation and maintenance cost than a surface irrigation system. The County will need to periodically flush the drip lines to remove debris. As described below, a significant number of drip lines will be necessary to accommodate peak flow rates. In addition, periodic chlorination will be required to remove biological growth from the drip lines. These operations and maintenance tasks will need to be completed on a regular schedule, because the drip system will be buried and not readily accessible or observable. During periods of dry soil conditions, the County will need to inspect the orchard for patches of wet soil that would indicate a localized failure that requires repair. Flow and pressure monitoring will also be useful tools for validating the status of the subsurface drip system. The land treatment area would be divided into multiple irrigation zones, allowing a zone to be taken out of service for maintenance purposes. A fence will be constructed around the site to deter entry by humans and ungulates.

### ***Collection System***

Under Alternative 1, the County would construct a new sewer collection system in the Pāhala community to replace the existing system of substandard gravity lines that convey sewage to the two LCCs and connect it to the proposed wastewater treatment and disposal facility. The new collection system would consist of a total of approximately 11,500 linear feet (LF) (2.2 miles) of corrosion-resistant polyvinyl chloride (PVC) piping almost entirely within the public ROW of eight public streets. This includes five streets in the western portion of the community (Maile, 'Ilima, Huapala, Hīnano, and Hala Streets) and three public streets in the eastern portion of the community (Puahala, Pīkake, and Kamani Streets). The new collection system would service a total of 174 lots (109 existing or previously connected lots, plus 65 newly accessible lots as described later in this subsection). The specific number being dependent on the results of the topographic survey and the design of the collection system that will convey sewage to the new wastewater treatment and disposal facility.

Similar to the treatment and disposal facility, the collection system would be designed not to preclude expansion to meet the requirements of Policy 120 of the *Ka'ū Community Development Plan*.

The County would construct the collection system in two phases to ensure that residential units can maintain access to the sewer system all times. Phase 1 would construct segments totaling approximately 1,400 LF of 12-inch line and 700 LF of 8-inch line to divert sewage flows from the existing LCC collection system to the new treatment and disposal facility and extend laterals to individual properties making them accessible to this portion of the new collection system. Specifically, Phase 1 would include the following:

1. A new 1,400-LF, 12-inch diameter line within the Maile Street ROW to intercept flows from the existing system serving 'Ilima, Huapala, Hīnano, and Hala Streets and convey sewage to the new wastewater treatment and disposal facility. This new line would be sized to accommodate the future flows from the entire community.
2. A new 700-LF, 8-inch diameter line partially within the Pīkake Street ROW that would connect the existing collection system above LCC 2 to the new line on Maile Street



described above. A 350-LF portion of this line would run through an easement on a privately owned parcel (TMK 9-6-005:044) to access Maile Street from Huapala Street.

3. Phase 2 would complete the new collection system by constructing segments totaling approximately 9,400 LF of 8-inch line throughout Pāhala, installing pumps on selected properties, making individual properties accessible to the new collection system and re-connecting individual properties currently serviced by the existing collection system to the new collection system. These main lines would range from a 14-inch line on Pīkake Street to mostly 8-inch lines on the remaining streets and would run primarily within County ROWs for ease of access. However, an approximately 1,100-LF segment would follow the existing system alignment in the industrial area between 'Ilima and Maile Streets. The property (TMK 9-6-005:036) is owned by Edmund Olsen and leased to M L Macadamia Orchards. The County would obtain an easement for the work proposed within this area. Construction of the new collection system would involve temporary impacts within the public ROWs of eight streets.

The streets within the community are under the jurisdiction of the County, with the exception of a privately owned portion of Pīkake Street for which the County would obtain an easement. The streets have been improved with asphaltic concrete (AC) surfaces approximately 22 to 24 feet wide (plus shoulders), and do not have curbs or gutters. Most of the streets have two travel lanes and have overhead utility poles are located outside the travel lanes. Residential lots along the streets have driveways with direct access to the travel lanes. Most shoulder areas have been improved or consist of grassy swales.

Typical sewer trenches would be about 3 feet wide and at least 6 feet deep to allow the placement of the lines to meet County standards. The existing pavement would be sawcut, the trench would be excavated (which could require removal of bedrock), the PVC pipe installed, and then the trench would be backfilled and compacted. The cut portion of the AC pavement would then be resurfaced with new AC material. Additional resurfacing may be required where trenches parallel the streets. The collection system would be installed with the proper horizontal and vertical clearances from existing water system facilities and concrete jacketing at waterline crossings, where necessary, as recommended by the County of Hawai'i DWS Water System Standards.

4. In April 2007, the County entered into an agreement with C. Brewer to eliminate LCCs from the existing community sewer systems and connect properties discharging to them to new County collection, treatment, and disposal system. Once the actual costs are determined, County Council action is still required to approve the expenditure of funds on private property for existing connections.

All accessible properties would be required to connect to the new wastewater collection system in accordance with Hawai'i County Code, HCC, § 21-5. The new collection system would be subject to HCC 21 (Sewers). Specifically, HCC § 21-5 states the following:

*"(a) Owners of all dwellings, buildings, or properties used for human occupancy, employment, recreation, or other purposes, which are accessible to a sewer are required at their expense to connect directly with the public sewer within 180 days after date of official notice.*



*(b) If, due to rock, wastewater collection system depth, or other construction problems, a building cannot be practically served, the owner shall install, operate and maintain a residential pumping station.*

*(c) The director may grant a variance/exemption of the foregoing connection requirements to owners of single-family dwellings existing at the time of installation of the public wastewater system, if the following is found:*

*(1) There are special or unusual circumstances applying to the subject real property which exist that render the ability to connect to a wastewater system an extreme physical or financial hardship; and*

*(2) There are no other reasonable alternatives; and*

*(3) The variance is consistent with the general purpose of the chapter and will not be materially detrimental to public health, safety, or welfare."*

Accordingly, additional newly accessible lots in Pāhala would be required to connect to the new wastewater collection system after it becomes operational. These other lots are near the existing service area and are presently connected to individual wastewater systems or cesspools. The design of the new collection system would include stub-outs to accommodate the eventual connection of these newly accessible lots. However, the respective lot owners would be responsible for the design and completion of these connections and for the proper closure of their individual wastewater systems.

The State of Hawai'i Department of Education (DOE) would connect the Ka'ū High School and Pāhala Elementary School and the recently completed Ka'ū Gymnasium and Shelter to the new collection system. As stated in Section 4.7.2 of the County of Hawai'i, Department of Public Works, *Final Environmental Assessment and Finding of No Significant Impact, Ka'ū Gym and Shelter, Pāhala, Ka'ū District*, April 2012: "In accordance with Section 21-5, Hawai'i County Code (HCC), Ka'ū High and Pāhala Elementary School, including the Ka'ū District Gym and Shelter, will be required to connect to the County sewer system when access becomes available. The State Department of Education will be responsible for coordinating and constructing the connection to the sewer system via a branch main on Hala Street and properly closing their onsite system."

#### 2.1.2 *Alternative 2: Package Plant Existing Collection System*

Alternative 2 would construct a new package plant and effluent disposal system, as previously described, and then connect the existing collection system to the package plant. (The package plant would be the same as previously described in Alternative 1.)

#### ***Existing Collection System***

In 2004, C. Brewer Company contracted M&E Pacific to perform a sewer system evaluation for the town of Pāhala. The scope of the study was to investigate and evaluate the physical condition of the system, compliance with County sewer standards and identify problems associated with the existing Pāhala system. The findings were documented in *The Ka'ū Sewer System Evaluation* dated December 2004. Figure 10 shows the existing collection system.





The 2004 study stated, it was estimated that the existing sewer system was built around the 1940s, or over 80+ years ago. The system consists mainly of cast iron pipes and the manholes of square concrete boxes. The 2004 study found the residential laterals connect to 4-inch lines which discharge into 6-inch lines that transmit the sewage to the LCCs. The system has 3 to 5 manholes on Maile Street and Pikake Street and one on the commercial parcel on Pikake Street. The system does not contain pump stations and does not collect storm water.

The 2004 study indicates the Pāhala community sewer system consists of about 3,058 linear feet of 6-inch diameter and 10,000 linear feet of 4-inch diameter pipelines. The house laterals in Pāhala connect to the 4-inch lines which discharge into the 6-inch lines that transmit the untreated sewage to the LCCs. The relatively steep grades of the residential subdivision means the lines are laid at shallow depths. Further, the results of the investigation determined that the existing sewer lines and manholes do not conform to the County sewer design standards.

As part of the investigation, a smoke test was conducted of the existing system to determine the location of any fractures, open joints, holes and sources of inflow. Smoke testing involves the blowing of smoke into the sewers normally through a manhole or other accessible junction. The smoke used is a non-toxic substance that will not harm humans, pets, food, plants or other material goods. It will be visible from manhole covers, roof vents and from the ground where sewer line tweaks or defects may exist. The purpose of the smoke is to assist in locating pipe defects and the entry points of storm and other surface waters into the sewers. Residents of the specific area for testing were notified via a public notice at least one week prior to the actual testing.

The results of a smoke test performed during the 2004 sewer system evaluation identified 14 locations of line breaks and/or pipe defects and 7 household units with defective sewer vents. Also, there is evidence of wastewater spill occurring from a manhole located directly downstream of the commercial property on Pikake Street. The manhole contained some accumulation of debris in the well and evidence of wastewater overflow on the adjacent ground by the existence of particles of tissue and other solids on the ground surrounding the manhole. The owner of the residential lot directly downstream of the commercial property confirmed the occasional overflow of wastewater from the subject manhole.

The 2004 report did not discuss any subsequent work related to repairs or other corrections to the reported findings.

The April 2023 PER, indicated the existing sewer system is over 80 years old, long surpassing its expected lifespan of the system. Further, if chosen to be reused, the system will require extensive repair and rehabilitation. The recommended alternative, which received overwhelming support from Pāhala voters in 2004, consists of constructing a new sewer system in the streets to meet the County sewer standards and to allow the collection system to be owned and operated by the County.

Nearly 20 years have passed since the 2004 study was completed. In order to reuse the existing collection system in the future, an updated condition assessment study is recommended to further identify system deficiencies. Substantial improvements will likely be necessary due to the age of the system. Also, reusing the existing collection system would require constructing the Phase 1 collection system project described above to tie into the WWTP and close the LCCs.



The April 2023 PER stated, although reusing the existing collection system appears to incur lower life-cycle costs than the other alternatives, reusing the system is not recommended for implementation. The advanced age of the existing collection system this option means the County would incur substantial financial and other risks:

- The piping is at the end of its useful service life, and catastrophic failures are likely to increase in frequency, creating increased risk to public health and the environment.
- Most of the system is located in backyard easements, making it difficult to access and maintain.
- The option does not address the AOC requirement to connect additional properties, that are currently not connected to the collection system, to the WWTP.
- System expansion to accommodate sewer flows in additional areas of the town (in accordance with the Kau Community Development Plan) would not be feasible.

## 2.2 *Alternative 3 – Individual Wastewater System-Maintenance Contract Model*

Hawai'i Revised Statutes, Title 14, Taxation, Chapter 235, Income Tax Law, § 235-16.5 defines a septic system as an IWS that typically consists of a septic tank, piping, and a drainage field where there is natural biological decontamination as wastewater discharged into the system is filtered through soil.

The April 2023 PER, stated the State DOH Wastewater Branch is responsible for regulating IWS systems. The Revised AOC sets forth that the County Hawai'i must administer a more active management strategy than is typically found in Hawai'i IWS. The Revised AOC states either a Model 2 (Maintenance Contract) or a Model 3 (Operating Permit) must be used IWS systems at Pahala. Figure 11 shows the site plan for both Alternative 3 and 4.

The April 2023 PER indicates for a Model 2 Alternative, the County is to:

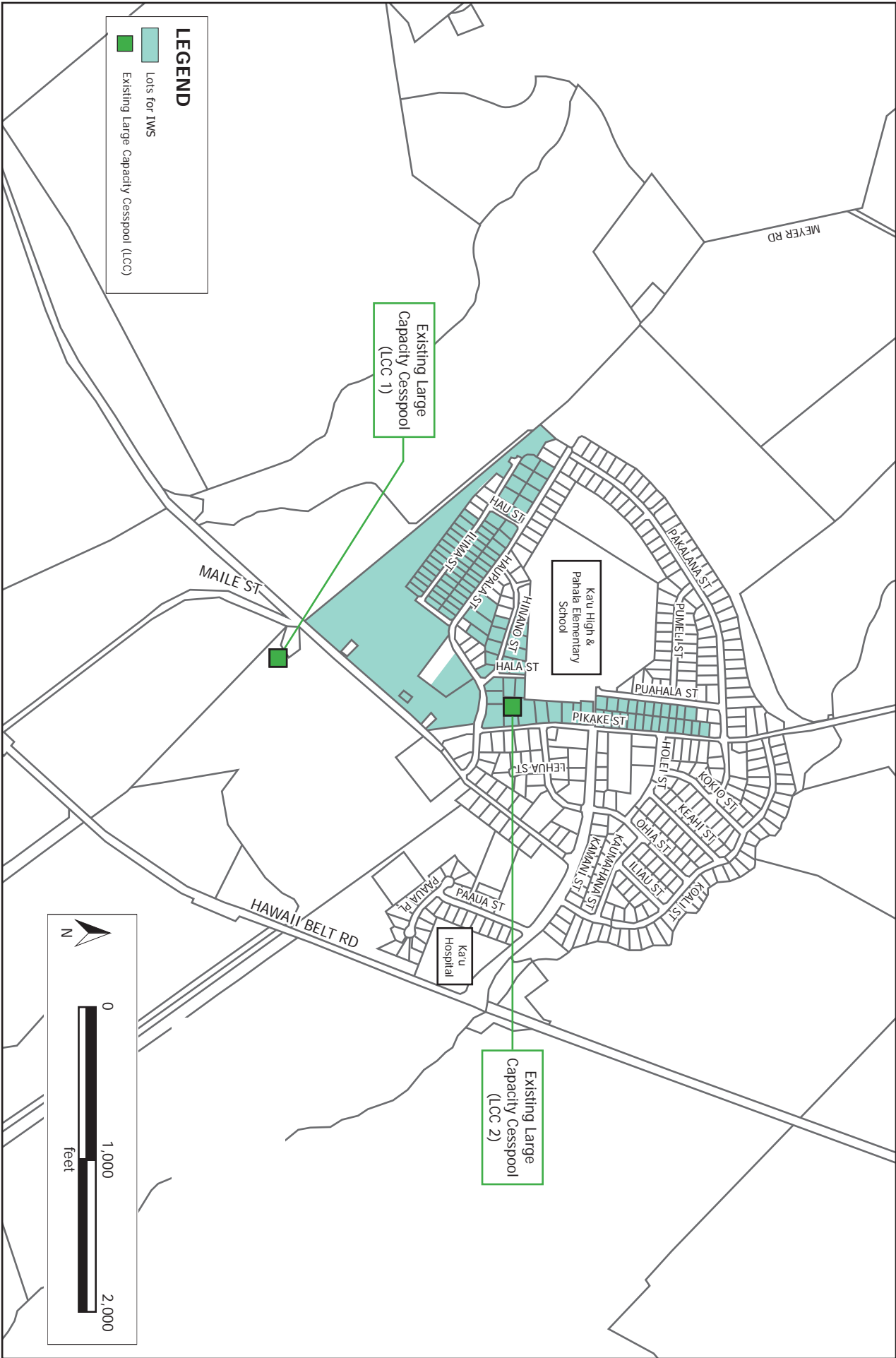
- Fund design and manage project construction of the IWS systems;
- Administer and manage a maintenance program for IWS,
  - The maintenance program would entail establishing rules and regulations for monthly fees/penalties, County monitoring and reporting, and IWS educational information for homeowners.
- Conduct routine maintenance and operate system, and respond to any related trouble calls; and
- Prepare and submit related notices and reports.

## 2.2 *Alternative 4 – Individual Wastewater System-Operating Permit to Homeowners*

The April 2023 PER indicates for a Model 3 Alternative, the County is to:

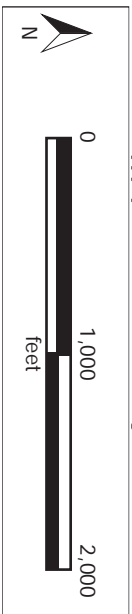
Figure 11 – Alternative 3 and 4 Site Plan





**LEGEND**

- Teal rectangle: Lots for IWS
- Green square: Existing Large Capacity Cesspool (LCC)



# ALTERNATIVES 3 & 4 SITE PLAN

PĀHALA LARGE CAPACITY CESSPOOL CLOSURE PROJECT

FIGURE 11

- Fund design and construction of the IWS systems;
- Administer an operating permit program for the IWS system to the homeowners;
- Issues maintenance notice to the homeowner.

Under Alternative 4, the homeowners would be responsible for maintenance scheduling, contracting and paying for a service provider to conduct the necessary maintenance and/or responding to trouble calls, monitoring and record keeping of maintenance.

Under Alternative 4, County is evaluating the possibility of either completing the project as a conventional Design/ Bid/ Build process, or under a voucher program, which the County would administer. This voucher program the County will grant homeowners with funds to hire Professional Engineer to design new IWS and, then hire a Contractor to construct IWS. Under the voucher program homeowners will be responsible to hire and coordinate with Professional engineer for placement of IWS and overall design of IWS.

Based on the above, regardless of the maintenance responsibility, the County will fund the design of the IWS systems for Pāhala. The PER identifies two key considerations to ensure the IWS functions as intended;(1) system size, including the number of bedrooms or flow rate and (2) site considerations including soil type, slope, drainage patterns and accessibility to the IWS site.

The PER indicated the median residential parcel in Pāhala is about 10,500 square feet (0.24 acres), with some as small as 5,200 square feet (0.12 acres). HAR 11-62-3.1 (2)(A) states 10,000 square feet (0.23 acres) of usable land must be available for each IWS. Of the 174 properties to be served in this project, 81 have less than 10,000 square feet of total area. Space available for IWS installation on these properties may be further limited by the presence of existing structures.

Further, the actual placement of the IWS system is limited by setback requirements from property lines of 5 to 9 feet and structure walls of 5 feet. From a system design perspective, the PER recommended that systems should also be a minimum of 20 feet from any cut-face slopes present on a site to avoid surfacing of treated effluent. This is a particularly a constriction to heavily sloped sites.

The PER noted the Pāhala has a roughly 10 percent grade, although the slopes will vary from parcel to parcel. HAR 11-62-34 states absorption beds shall not be installed on lands with a slope gradient of greater than 8 percent. Absorption trenches are permitted on slopes of up to 12 percent. Generally, the various setback and slope requirements mean that the IWS system will need to be specifically designed for each parcel.

The PER noted it is generally not good practice to install an IWS under an area with traffic loads or covered with a concrete covered. The presence of traffic loads or concrete pavement will compress the soil in distribution/effluent disposal system and affects the accessibility of the system for maintenance. However, it is sometimes unavoidable particularly on parcels with limited space. In these instances, a system may be installed underneath a driveway or patio provided the system is designed with traffic rated treatment components. These may include products such as concrete septic tanks and/or H-20 traffic related chambered disposal beds.



## Septic Tanks

The PER stated septic tanks are the most common conversion treatment technology installed in Hawai'i. A septic tank is an underground chamber made of concrete, fiberglass reinforced polyester, or plastic, and used for treating and disposing of household wastewater. The tank contains a mixture of untreated sewage and anaerobic bacteria, which break down the waste and separate it into three layers: a top layer of scum, a middle layer of liquid effluent, and a bottom layer of sludge. Septic tanks operate without the need for electrical power. Contractors are familiar with the process of installing IWS systems.

The septic tank can have two chambers with sewage flows from the home flowing into the first chamber where the heavy solids will settle to the bottom as sludge and the remaining liquid and lighter solids floating to the top as scum. The floating liquid will flow to the second chamber through an opening in the wall where any remaining solids will settle to the bottom and then effluent will flow to disposal system. Access to the tank will be sealed to retain the anerobic conditions which will help to control odor.

The liquid effluent flows out of the tank and into a means of disposal, where it is further treated and dispersed into the soil. According to the PER, the sludge and scum remain in the tank and must be periodically pumped out by a professional septic service approximately once every three to five years, depending on usage. Figure 12 shows a typical septic tank.

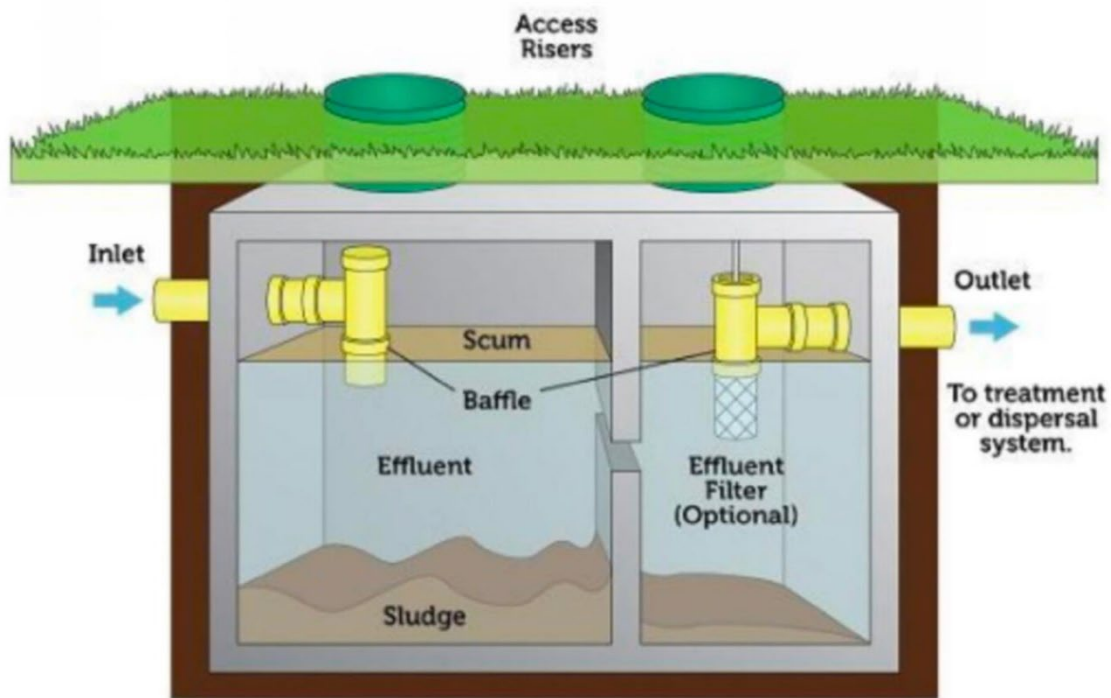


Figure 12: Typical Septic Tank System  
Source: PER, 2023

The April 2023 PER stated there are several types of septic tanks from suppliers in Hawai'i. The tanks can be made from concrete, plastic, and reinforced fiberglass polyester which come at a variety of price points, each with a set of advantages and disadvantages and materials. Where a



septic tank is located beneath a vehicular traffic area, a traffic rated concrete septic tank can be used or a structural concrete slab designed for H-20 loading spanning a non-traffic tank may be used.

Concrete tanks are durable and less susceptible to collapse. However, concrete tanks can be more expensive than plastic or reinforced fiberglass tanks and typically require a crane for installation and can corrode from the effects of acidic sewer gases.

Plastic or polyethylene tanks are less expensive than concrete; resistant to corrosion and may not require a crane for installation. However, plastic tanks may deform and, if not properly installed, can float if flooded.

Fiberglass reinforced polyester (FRP) tanks are less expensive than precast concrete tanks, primarily due to lower shipping and installation costs, typically resistant to corrosion, more rigid than plastic tanks, and may not require use of a crane for installation.

The April PER indicated the choice of septic tank material will depend on availability, budget, and site constraints. At a minimum, septic tanks in Hawai'i must comply with International Association of Plumbing and Mechanical Officials (IAPMO) material and property standards for septic tanks. Further, sizing and installation criteria are regulated by HAR 11-62-33. The minimum septic tank capacity is 1,000 gallons for a household of 4 bedrooms or less and 1,250 gallons minimum for households of 5 bedrooms. Septic tanks serving households greater than 5 bedrooms will require a variance from the DOH.

The PER discusses two commonly used IWS effluent disposal methods found in Hawai'i, absorption bed and absorption trench. Absorption beds are the most common form of IWS disposal method installed in Hawai'i today. The absorption bed will require excavation of 6 to 7 feet below grade to accommodate the network of perforated pipes, each a maximum of 100 feet long and laid in trenches 1.5-3 feet below the finished grade 4-6 feet apart. Each line is laid level to allow the gravity dispersal of the treated effluent through the length of the pipe before it filters out and percolates down into the soil. A minimum of 6 inches of gravel is provided below each pipe. If the percolation rate is faster than one minute per inch, a 3-foot soil replacement layer is installed under the entire absorption bed. The soil replacement is to be washed #4 sand or cinder-soil mix with a percolation rate not faster than one minute per inch. The excavated material from the absorption bed will need to be removed off the site.

These systems are easy to maintain when connected to an effective treatment system and will rely on microorganisms in the soil for an added degree of treatment to the effluent as it filters through the upper oxic layers of the soil matrix. However, absorption beds have a significant space requirement with current Hawaiian regulations requiring a minimum of 350 square feet for a 4-bedroom home. This space requirement increases with decreasing hydraulic conductivity of the soil. Additionally, absorption beds can only be installed on a grade of less than 8 percent.

An absorption trench is a type of subsurface wastewater disposal system that utilizes a trench filled with gravel or other porous material to filter and distribute wastewater effluent into the ground. Wastewater is distributed into the trench through a network of pipes, typically made of PVC or other durable materials. The gravel in the trench acts as a natural filter, allowing the water to slowly seep into the surrounding soil while also removing impurities with adsorbed beneficial



bacteria. The trench may be lined with a layer of filter fabric to prevent the gravel from becoming clogged with soil or other debris. Figure 13 shows typical IWS site plan with absorption bed.

The PER indicated, although not as common as an absorption bed or trench, use of a seepage pit should be considered for use in Pāhala. Seepage pits are a vertical means of achieving the percolation area requirements for a disposal system. These systems typically consist of a 15-30-foot-deep pit lined with stacked precast perforated concrete rings or CMUs, to an internal diameter of 6-8 ft. Seepage pits are both less land area intensive and less expensive than absorption beds. Figure 14 shows typical IWS site plan with seepage pit.

A seepage pit must include a cover which extends at least 12 inches beyond the seepage pit excavation or over a provided concrete lining. An access hatch must be provided in the concrete cover to allow inspection and maintenance of the pit. The seepage pit may be designed to be traffic rated by providing the sufficient strength required in the design of the concrete lining and cover.

The effective area of the seepage pit is equal to the vertical wall area corresponding to the effective depth of the pit. Slow percolation rates translate to a larger required absorption area or deeper pit.

While seepage pits are an approved means of disposal in Hawai'i, they are often only permitted when it can be demonstrated that an alternative means of disposal was not possible, i.e. insufficient land area, steep terrain (greater than 12 percent) or very slow percolation rates (less than 60 min/inch). Where slow percolation rates present, seepage pits will need to be dug through the basalt rock layer to reach more porous soils or a variance will be required from HAR 11-62-34 d(1)b:

Seepage pits shall not be constructed in soils having a percolation rate slower than ten minutes per inch (weighted average) or where rapid percolation through such soils may result in contamination of water-bearing formations or surface water.

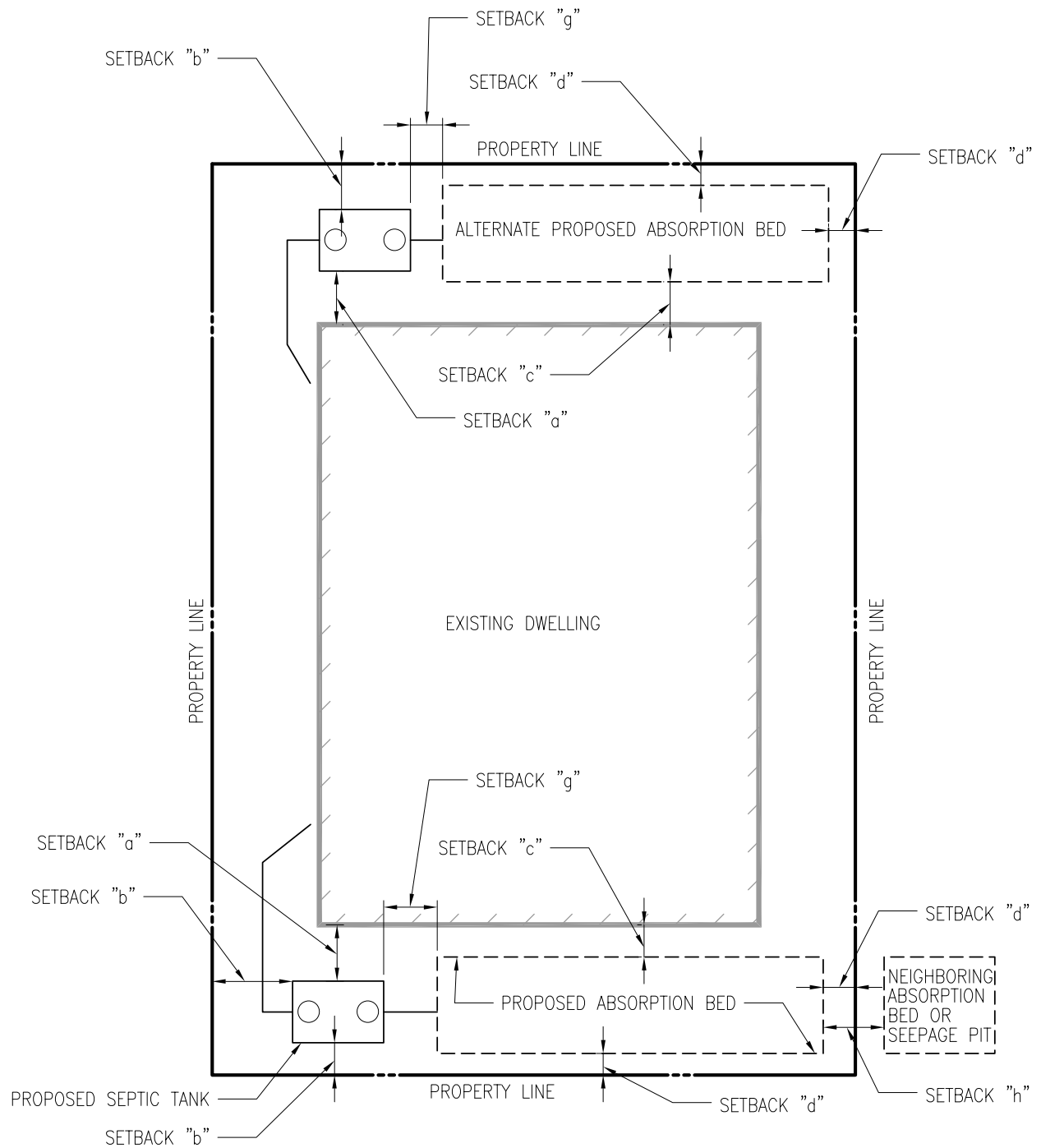
The PER provides information related to land area needed for IWS systems, which is affected by the percolation rate of the soil. The information shows the slower the percolation rate, the larger the land area needed for the IWS system, or in the case of a seepage pit, the deeper the pit required. The total area for a septic tank and absorption field ranges from about 480 to 765 square feet. In comparison, the land area for septic tank and seepage pit would be about 120 square feet. The Table 1.1 below from the PER shows the percolation rate and the affected area required for an IWS system.



Percolation Rate (min/in)	4	12	20
Infiltration Area Required (ft <sup>2</sup> )	345	525	630
Possible Absorption Field Length (ft) (W = 15 ft)	23	35	42
Possible Seepage Pit Dimension (Diameter = 6 ft)	12	19	22
Septic Tank Area Required (ft <sup>2</sup> )	60	60	60
Total Footprint with Absorption Field (ft <sup>2</sup> )	480	660	765
Total Footprint with Seepage Pit (ft <sup>2</sup> )	120	120	120

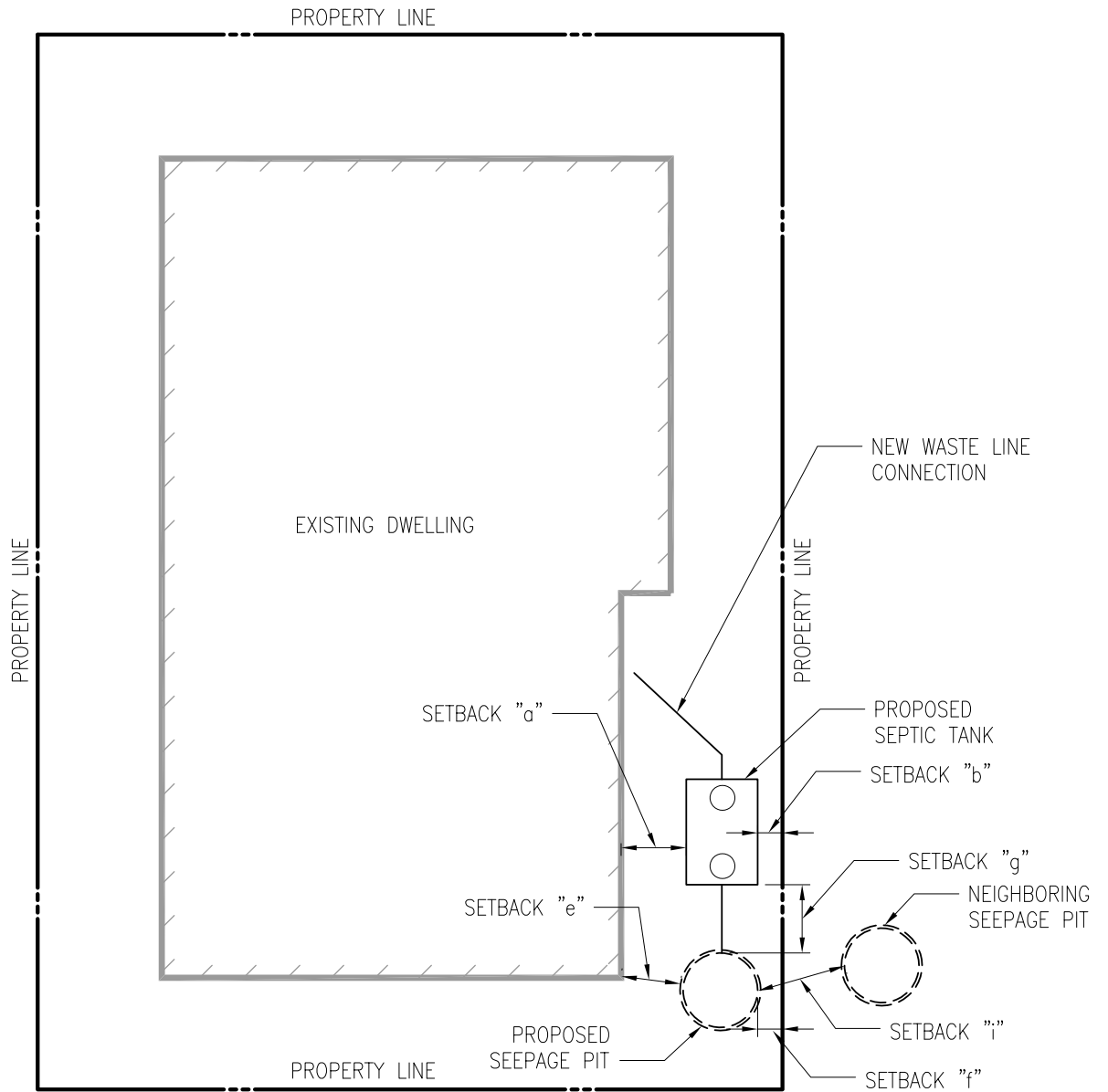
*Table 1.1: IWS Percolation Rate and Required Area*





**TYPICAL IWS LAYOUT PLAN WITH ABSORPTION BED**

SOURCE: ENGINEERING PARTNERS



**TYPICAL IWS LAYOUT PLAN WITH SEEPAGE PIT**

SOURCE: ENGINEERING PARTNERS



**FIGURE 14**

The PER discussed the installation of an IWS can be a relatively invasive process requiring large equipment like excavators and cranes. Accommodating this equipment often requires the removal of fencing, destruction of existing trees, landscaping and, in some cases, small structures. Building footprints as well as overhanging soffits need to be considered in the design and placement of the IWS. Also, the access path to the IWS needs to be considered when selecting appropriate IWS system design as well as for future maintenance activities.

Opportunities/methods to resolve access issue include:

- Placement of the IWS system in the front-yard is recommended for parcels without sufficient paths to accommodate equipment access into the backyard.
- The use of a large crane can be avoided by specifying cast-in-place concrete traffic slab with a plastic tank instead of a precast traffic-rated concrete tank, especially for inaccessible locations and vehicle traffic is anticipated.
- Also, it might be possible to access a backyard from a neighbors' property by temporarily removing an adjoining fence.

The PER identified a number of cost implications from an IWS system that a homeowner will face:

- Homeowners currently connected to the LCCs are paying a reduced sewer fee of about 50 percent of the standard sewer rate (Hawai'i County, 2023). An IWS will either introduce a full-rate monthly sewer fee or a bill for private maintenance provider to maintain their new system. It is quite likely that some homeowners don't see a need to upgrade from the current system. However, initial opposition to the project has largely been addressed through the County's engagement efforts.
- Most homeowners are protective of their private property. Homeowner permission is not trivial for a project that poses a risk to their landscaping, fences and buildings. Homeowner satisfaction with the project will be closely linked with the speed and care with which their properties are upgraded and restored to pre-construction conditions or better.



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### 3. Legal Framework and Regulatory Authorities

As described above, the County may use CWSRF for construction of the Pahala Large Capacity Closure project. Since the State Revolving Fund receives annual funding from EPA, the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. §§ 4321 – 4347), requires a federal agency proposing to undertake a project to consider the potential environmental impacts of the proposed project. Use of federal funds for a project is among the criteria set forth in NEPA that require preparation of environmental review documentation under NEPA and procedural requirements at 40 CFR Parts 1500-1508 (Council on Environmental Quality (CEQ) regulations), and 40 CFR Part 6 (U.S. Environmental Protection Agency (EPA) regulations). This Environmental Information Document (EID) has been prepared under these guidelines.

The following regulatory requirements apply to this EID and to federal cross cutting regulations necessary for compliance with the CWSRF program.

#### **3.1 National Environmental Policy Act (NEPA) of 1969 (as Amended)**

NEPA was passed in 1969 “to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment.” NEPA requires all federal agencies to prepare Environmental Information Documents (EIDs), Environmental Assessments (EA) and/or Environmental Impact Statements (EISs) to assess environmental impacts from project alternatives.

The purpose of NEPA is “to declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man, to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality,” Sec. 2 [42 USC § 4321].

According to NEPA, it is the continuing responsibility of the federal government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate federal plans, functions, programs, and resources. NEPA, as amended in 1970, requires federal agencies to: (a) utilize a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man’s environment; (b) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by Title II of this Act, which will ensure that presently un-quantifies environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations; and (c) include in every recommendation a detailed statement on the environmental impact of the Proposed Action; any adverse environmental effects which cannot be avoided should the proposal be implemented; alternatives to the Proposed Action; the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity, and; any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented, Sec. 102 [42 USC § 4332].

This project may be funded by federal funds provided by U.S. Environmental Protection Agency (EPA) through the State of Hawai‘i’s Clean Water State Revolving Fund (CWSRF) Program. As such, the State of Hawai‘i Department of Health (DOH) must conduct an environmental review of



projects funded under the CWSRF as required under the Code of Federal Regulations (CFR), using the EPA-approved State Environmental Review Process. In addition, the State must comply with the federal cross-cutting authorities set forth in 40 CFR § 35.3145 for the CWSRF.

The CWSRF requirements are set forth as “cross cutters” described as follows.

In addition to the cross cutters required by the EPA-approved State Environmental Review Process, EPA guidance for conducting environmental reviews, and the Clean Water Act have been included.

### **3.2 Archaeological and Historic Preservation Act (54 U.S.C. § 312502)**

The Archaeological and Historic Preservation Act (AHPA), also known as the Archaeological Recovery Act and the Moss-Bennett bill, was passed and signed into law in 1974. It amended and expanded the Reservoir Salvage Act of 1960. The AHPA built upon the national policy, set out in the Historic Sites Act of 1935, *“to provide for the preservation of historic American sites, buildings, objects, and antiquities of national significance.”* The AHPA expanded the policy by focusing attention on significant resources and data but does not require that they be shown to be of “national” significance. The AHPA required that federal agencies provide for *“...the preservation of historical and archeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of...any alteration of the terrain caused as a result of any Federal construction project of federally licensed activity or program.”*

54 United States Code (U.S.C.) § 312502 (a)(1) states: “When any Federal agency finds, or is notified, in writing, by an appropriate historical or archeological authority, that its activities in connection with any Federal construction project or federally licensed project, activity, or program may cause irreparable loss or destruction of significant scientific, prehistorical, historical, or archeological data, the agency shall notify the Secretary, in writing, and shall provide the Secretary with appropriate information concerning the project, program, or activity.”

54 U.S.C. § 312502 (b)(1) states: “When any Federal agency provides financial assistance by loan, grant, or otherwise to any private person, association, or public entity, the Secretary, if the Secretary determines that significant scientific, prehistorical, historical, or archeological data might be irrevocably lost or destroyed, may, with funds appropriated expressly for this purpose -

*(A) Conduct, with the consent of all persons, associations, or public entities having a legal interest in the property, a survey of the affected site; and*

*(B) Undertake the recovery, protection, and preservation of the data (including analysis and publication).”*

The proposed collection system will be constructed primarily within existing County streets and two short segments within private easements in the Pāhala community that have been previously disturbed when the streets were constructed. Preliminary analysis shows the proposed treatment and disposal facility will be constructed in an area that does not contain archaeological resources. In 2018/2019, an Archaeological Inventory Survey (AIS), which included subsurface testing, was conducted for the previously design of the project.. The AIS served to confirm the presence/absence of archaeological resources on the proposed 14.9-acre site for the Pāhala WWTP and Sewer System project. The AIS confirmed no significant artifacts or cultural deposits



were observed on the ground surface within the Proposed WWTP Site as the area experiences ongoing disturbance by macadamia harvesting operations and stormwater runoff. Further, no cultural deposits or lava tubes were encountered during the subsurface trenching.

In 2023, an Archeological Literature Review Report was conducted to determine the likelihood that historic properties may be affected by the project and, based on the findings, consider cultural resource management recommendations. The literature review concluded that surface pre-Contact sites are not expected within the Project Area given the known traditional land use in this area and the impacts of continued agricultural and residential development. The modern development of the macadamia nut orchard has likely also obliterated any plantation-era sites once present in that part of the Project Area. Historic surface features associated with the sugar plantation and associated village may be present. Furthermore, there is potential for pre- or post-Contact subsurface archaeological features within the Project Area, which may or may not be located within lava tubes. It should be noted that the literature review is intended to support the project's historic and environmental review process; however, the report does not fulfill the requirements of an archeological inventory survey investigation as set forth in federal and State of Hawai'i historic preservation review requirements. For more information, please refer to Appendix B.

The contract drawings will state that, should archaeological sites such as walls, platforms, pavements or mounds, or remains such as artifacts, burials, concentrations of shell or charcoal be encountered during construction activities, work shall cease immediately and the find shall be protected from further damage. The contractor shall immediately contact the State Historic Preservation Division (SHPD), who will assess the significance of the find and recommend an appropriate mitigation measure, if necessary.

### **3.3 *Bald and Golden Eagle Protection Act (16 U.S.C. § 668-668c)***

The Bald Eagle Protection Act (16 U.S.C. § 668-668c) prohibits any act to take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or in any manner any bald eagle commonly known as the American eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof of the foregoing eagles.

No bald or golden eagles are found in Hawai'i.

### **3.4 *Clean Air Act (42 U.S.C. § 7401 et seq.)***

Over the years, there have been a series of legislations affecting air quality and a number amendments adopted related to air quality. The Air Pollution Control Act of 1955 was the first federal legislation involving air pollution and was followed by the Clean Air Acts of 1963 and 1970. The Clean Air Act of 1970 (1970 CAA, 42 U.S.C. § 7401 et seq.) authorized the development of comprehensive federal and state regulations to limit emissions from both stationary (industrial) sources and mobile sources.

The 1970 CAA set forth four major regulatory programs affecting stationary sources: the National Ambient Air Quality Standards (NAAQS), State Implementation Plans (SIPs), New Source Performance Standards, and National Emission Standards for Hazardous Air Pollutants. In Hawai'i, the DOH, Clean Air Branch, Air Quality program is defined by Hawai'i Administrative Rules (HAR) 11-60.1 and serves as the SIP approved by EPA.



The State DOH maintains 10 air monitoring stations on the island of Hawai'i. Established in 2007, the DOH maintains a monitoring station on the grounds of the Ka'ū High School and Pāhala Elementary School to monitor SO<sub>2</sub> and PM<sub>2.5</sub> (in terms of micrograms per cubic meter (µg/m<sup>3</sup>)) from emissions from volcanic activities.

In September 2023, the DOH issued the Annual Summary 2022 Air Quality Data report which provides the results from the network of air quality monitoring stations. In 2022, Pāhala was in violation of the 1-hour SO<sub>2</sub> NAAQS standard. The 2022 report stated volcanic eruptions are considered natural events and therefore EPA may exclude the exceedances of the 1-hour NAAQS from attainment determinations.

The quality of air in the general Pāhala area is considered "Good." The rural nature of the Pāhala area has no major stationary sources of air pollution. Existing sources of air pollution are emissions from motor vehicles traveling along Māmalahoa Highway and on the streets in the community; the low level of vehicle traffic tends to limit mobile sources of emissions.

Potential short-term effects from dust and exhaust due to construction activities will be minimized with BMPs such as water sprinkling and proper equipment maintenance. No long-term impacts on air quality resulting from operation of the collection system, the wastewater treatment and disposal facility, or the IWS are anticipated.

The DOH operates a network of air quality monitoring stations at various locations around the state. In September 2023, the DOH issued the Annual Summary 2022 Air Quality Data report (the most recent report) which provides the results from the network of air quality monitoring stations. The DOH maintains a monitoring station on the grounds of the Ka'ū High and Pāhala Elementary School. Established August 2007, the station was placed to monitor SO<sub>2</sub> and PM<sub>2.5</sub> from volcanic emissions. In 2022, Hawai'i was in attainment of the state annual SO<sub>2</sub> standard. In 2015, Hawai'i was in attainment with the annual NAAQS for particulate matter with a diameter of 2.5 micrometers or less (PM<sub>2.5</sub>).

Volcanic eruptions are considered natural events and therefore EPA may exclude the exceedances of the 1-hour NAAQS from attainment determinations.

The quality of air in the general Pāhala area is considered "Good." The rural nature of Pāhala area has no major stationary sources of air pollution. Existing sources of air pollution are emissions from motor vehicles traveling along Māmalahoa Highway and on the streets in the community; the low level of vehicle traffic tends to limit mobile sources of emissions.

Potential short-term effects from dust and exhaust due to construction activities will be minimized with BMPs such as water sprinkling and proper equipment maintenance. No long-term impacts on air quality resulting from operation of the collection system, the wastewater treatment and disposal facility, or the IWS are anticipated.

### **3.5 Coastal Barrier Resources Act (16 U.S.C. § 3501)**

In 1982, Congress passed the Coastal Barrier Resources Act (CBRA) (16 U.S.C. § 3501) to minimize the loss of human life; wasteful expenditure of federal revenues; and the damage to fish, wildlife, and other natural resources associated with the coastal barriers along the Atlantic and Gulf coasts and along the Great Lakes by restricting future federal expenditures and financial



assistance which have the effect of encouraging development of coastal barriers, such as federal flood insurance through the National Flood Insurance Program.

The Coastal Barrier Resources Reauthorization Act of 2000 reauthorized the CBRA and directed the U.S. Fish and Wildlife Service (FWS) to complete a Digital Mapping Pilot Project that includes digitally produced draft maps for up to 75 John H. Chafee Coastal Barrier Resources System (CBRS) areas and a report to Congress that describes the feasibility and costs for completing digital maps for all CBRS areas.

Based on its location, the CBRA is not applicable to Hawai'i.

### **3.6 Coastal Zone Management Act (16 U.S.C. § 1451)**

The Coastal Zone Management Act of 1972 (CZMA) (16 U.S.C §§ 1451-1464) was passed to establish a national policy to preserve, protect, develop, and where possible, restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations and to encourage coastal states to develop and implement coastal zone management (CZM) programs. Each federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved state management programs. Each federal agency carrying out an activity subject to the Act shall provide a consistency determination to the relevant state agency designated under § 1455(d)(6) of this title at the earliest practicable time.

In 1977, Hawai'i enacted HRS 205A (Coastal Zone Management). The CZM area encompasses the entire state, including all marine waters seaward to the extent of the state's police power and management authority, including the 12-mile U.S. territorial sea and all archipelagic waters. The objective and policies of the CZM Program are set forth in HRS § 205A-2 and detailed below:

#### (1) Recreational Resources

##### Objective:

- (A) Provide coastal recreational opportunities accessible to the public.

##### Policies:

- (A) Improve coordination and funding of coastal recreational planning and management; and
  - (i) *Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by: Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;*
  - (ii) *Requiring replacement of coastal resources having significant recreational value, including but not limited to surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the state for recreation when replacement is not feasible or desirable;*



- (iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;*
- (iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;*
- (v) Ensuring public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;*
- (vi) Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters.*
- (vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and*
- (viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.*

All project locations are at least 3.3 miles from the shoreline and, as such, the Proposed Action will not affect coastal recreational resources under any of the Proposed Alternatives.

## (2) Historic Resources

### Objective:

- (A) Protect, preserve and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.*

### Policies:

- (A) Identify and analyze significant archaeological resources;*
- (B) Maximize information retention through preservation of remains and artifacts or salvage operations; and*
- (C) Support state goals for protection, restoration, interpretation, and display of historic resources.*

Under Alternative 1 and 2, The proposed wastewater collection system will be constructed along the existing County streets and two short segments within easements in the Pāhala community that have been previously disturbed when the streets were constructed. Preliminary analysis shows the treatment and disposal facility will be constructed in an area that does not contain archaeological resources. An AIS, which included subsurface testing, was conducted to confirm the presence or absence of archaeological resources on the proposed collection system area. The AIS confirmed no significant artifacts or cultural deposits were observed on the ground surface



within the Proposed WWTP Site as the area experiences ongoing disturbance by macadamia harvesting operations and stormwater runoff. Further, no cultural deposits or lava tubes were encountered during the subsurface trenching.

In 2023, an Archeological Literature Review Report was conducted to determine the likelihood that historic properties may be affected any of the Proposed Alternatives and based on the findings, consider cultural resource management recommendations. The literature review concluded that surface pre-Contact sites are not expected within the Project Area given the known traditional land use in this area and the impacts of continued agricultural and residential development. The modern development of the macadamia nut orchard has likely also obliterated any plantation-era sites once present in that part of the Project Area. Historic surface features associated with the sugar plantation and associated village may be present. Furthermore, there is potential for pre- or post-Contact subsurface archaeological features within the Project Area, which may or may not be located within lava tubes. It should be noted that the literature review is intended to support the project's historic and environmental review process; however, the report does not fulfill the requirements of an archeological inventory survey investigation as set forth in federal and State of Hawai'i historic preservation review requirements. For more information, please refer to Appendix B.

The contract drawings will state that, should archaeological sites such as walls, platforms, pavements or mounds, or remains such as artifacts, burials, concentrations of shell or charcoal be encountered during construction activities, work will cease immediately, and the find will be protected from further damage. The contractor will immediately contact SHPD, who will assess the significance of the find and recommend an appropriate mitigation measure, if necessary.

### (3) Scenic and Open Space Resources

#### Objective:

- (A) Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

#### Policies:

- (A) Identify valued scenic resources in the coastal zone management area;
- (B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;
- (C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and
- (D) Encourage those developments which are not coastal dependent to locate in inland areas.

All project locations are at least 3.3 miles from the shoreline and, as such, coastal scenic and open space resources will not be affected under any of the Proposed Alternatives.



#### (4) Coastal Ecosystems

##### Objective:

- (A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

##### Policies:

- (A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
- (B) Improve the technical basis for natural resource management; \
- (C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;
- (D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and
- (E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

All project locations are at least 3.3 miles from the shoreline and, as such, coastal ecosystems will not be adversely affected under any of the Proposed Alternatives.

#### (5) Economic Uses

##### Objective:

- (A) Provide public or private facilities and improvements important to the State's economy in suitable locations.

##### Policies:

- (A) Concentrate coastal dependent development in appropriate areas;
- (B) Ensure that coastal dependent developments such as harbors and ports, and coastal related development such as visitor facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and
- (C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:



- (i) Use of presently designated locations is not feasible;
- (ii) Adverse environmental effects are minimized; and
- (iii) The development is important to the State's economy.

All project locations are at least 3.3 miles from the shoreline. The collection system and the treatment and disposal facility will be sited in suitable locations to serve the Pāhala community.

## (6) Coastal Hazards

### Objectives:

- (A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

### Policies:

- (A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
- (B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint pollution hazards;
- (C) Ensure that developments comply with requirements of the Federal Flood Insurance Program;
- (D) Prevent coastal flooding from inland projects.

All project locations are at least 3.3 miles from the shoreline and at least 580 feet above mean sea level (msl). Based on the location, the Proposed Action will not be subject to (and will not exacerbate) coastal hazards and do not include improvements related to tsunami, storm waves, stream flooding erosion, subsidence and pollution under any of the Proposed Alternatives.

## (7) Managing Development

### Objective:

- (A) Improve the development review process, communication, and public participation in the management of coastal resource and hazards.

### Policies:

- (A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
- (B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and



- (C) Communicate the potential short- and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

In December 2017, a total of five community outreach sessions were conducted in the Pāhala community. A public information meeting for the Draft EA was held in October 2018. A total of five community outreach sessions to discuss the Revised AOC were conducted in the Pahala and Naalehu communities between March 2022 and September 2023. The fifth session, held on September 28, 2023, was conducted specifically to inform the community of the preparation of this EID and the criteria of its analysis. A recording of the meeting and the presentation slides are available for viewing on the CoH-DEM website.

The Project Area is located at least 3.3 miles from the coast, at least 580 feet above msl, and do not involve management of coastal resources and hazards under any of the Proposed Alternatives.

## (8) Public Participation

Objective:

- (A) Stimulate public awareness, education, and participation in coastal management.

Policies:

- (A) Promote public involvement in coastal zone management processes;
- (B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and
- (C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

In December 2017, a total of five community outreach sessions were conducted in the Pāhala community. A public information meeting for the Draft EA was held in October 2018. A total of five community outreach sessions to discuss the Revised AOC were conducted in the Pahala and Naalehu communities between March 2022 and September 2023. The fifth session, held on September 28, 2023, was conducted specifically to inform the community of the preparation of this EID and the criteria of its analysis. A recording of the meeting and the presentation slides are available for viewing on the CoH-DEM website.

## (9) Beach Protection

Objective:

- (A) Protect beaches for public use and recreation.



Policies:

- (A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;
- (B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and
- (C) Minimize the construction of public erosion-protection structures seaward of the shoreline.

All project locations are at least 3.3 miles from the shoreline. Proposed Action does not include improvements that would affect public use beaches under any of the Proposed Alternatives.

(10) Marine Resources

*Objective:*

- (A) Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

- (A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;
- (B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;
- (C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;
- (D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and
- (E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

All project locations are at least 3.3 miles from the shoreline. The Proposed Action does not include improvements that would affect development of marine and coastal resources under any of the Proposed Alternatives.



### 3.7 Endangered Species Act (16 U.S.C. § 1531)

On December 28, 1973, the Endangered Species Act (16 U.S.C. § 1531) was passed and, over the years, has been amended a number of times. The stated purpose of the original Act was to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of various related treaties and conventions. The provisions of the Act are administered by the FWS and the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS). The FWS has primary responsibility for terrestrial and freshwater organisms, while NOAA/NMFS is mainly responsible for marine wildlife.

Section 7 of the Act, Interagency Cooperation (16 U.S.C. § 1536), states each federal agency shall, in consultation with and with the assistance of the Secretary of the Interior, ensure that any action authorized, funded, or carried out by such agency (an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined, after consultation as appropriate with affected states, to be critical, unless such agency has been granted an exemption for such action.

In August 2018, a biological resources field survey was conducted on the 14.9-acre WWTP Site and the collection system. The results of the survey show that, due to the proposed alignment of the collection system along existing roadways, vegetation in the collection system area consists entirely of maintained yards with ornamental plants.

The field survey of the 14.9-acre WWTP Site indicates that the site is comprised of a macadamia nut orchard of mature trees, unmaintained areas outside the orchard dominated by Guinea grass, lanes of windbreak trees oriented between orchard units, and (mostly) mowed road verge areas. A total of 52 species of vascular plants: two ferns, one gymnosperm, and 49 species of angiosperms (flowering plants) were identified during the survey. Only two species (4 percent) identified during the survey are regarded as native to the Hawaiian Islands and both are indigenous (native, but also distributed elsewhere in the Pacific). Being widely distributed indigenous species, neither is listed as threatened or endangered or of any special concern.

The August 2018 field survey included assessment of mammalian species. With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or 'ōpe'ape'a as it is known locally, all terrestrial mammals currently found on the Island of Hawai'i are alien species, and most are ubiquitous. The field survey reported no mammalian species within the survey area. This also included no indication that pigs (*Sus scrofa*) utilize the survey area.

The field survey also included an assessment of avian species, and recorded a total of 175 individual birds of 13 species, representing nine separate families, during station counts. Avian diversity and densities were very low, in keeping with the current usage of the site as a mature macadamia nut orchard, with minimal ground cover and few weedy or shrubby species. All of the avian species recorded during the course of the survey are established alien species. No native avian species were recorded during the course of the survey. The field survey recorded no species of plants or animals currently listed or proposed for listing under either the federal or State of Hawai'i endangered species statutes.



On December 21, 2018, the designated non-federal representative for consultations under Section 7 of the Endangered Species Act, on behalf of EPA and the County of Hawai'i, requested concurrence from the FWS that the Pāhala LCC Replacement Project is not likely to adversely affect federally listed threatened and endangered species or critical habitat located within the Project Area.

On February 15, 2019, the FWS provided a letter that concluded: "The Service has analyzed potential impacts to listed species due to the implementation of [the] project. Based on the inclusion of the avoidance and minimization measures listed above, the Service anticipates that any potential impacts will be discountable or insignificant and therefore we concur that the Pāhala LCC Replacement Project may affect, but is not likely to adversely affect the endangered Hawaiian hoary bat, Hawaiian Hawk, Hawaiian goose, Hawaiian Petrel, Band-rumped Storm-Petrel, Hawaiian Stilt, and Hawaiian Coot, and the threatened Newell's Shearwater" (See Appendix C-1 of the FEA). The Proposed Action will incorporate the avoidance and minimization measures cited in the FWS letter, including (but not limited to) avoiding impacts to potential Hawaiian hoary bat habitat during the bat birthing and pup rearing season; conducting a Hawaiian hawk nest survey prior to any work during the nesting season; avoiding activities near active nests; and avoiding nighttime construction during the seabird fledging period.

### **3.8 Environmental Justice Executive Order 12898**

Executive Order 12898, Environmental Justice (full title Federal Actions to Address Environmental Justice to Minority and Low Income Populations), was signed on February 11, 1994. The intent of Executive Order 12898 is to avoid disproportionately high adverse human health or environmental effects of projects on minority and low income populations. Executive Order 12898 also requires federal agencies ensure that minority and low-income communities have adequate access to public information related to health and the environment.

The 2021 American Community Survey (ACS) (5-Year Estimates) is the most recent information related to socioeconomic conditions in the state and County. The 2021 ACS includes Hawai'i Geographic Area Profiles – Census Designated Places: Neighbor Islands. The ACS noted it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

For purposes of this assessment, and to correspond with the available ACS demographic characteristics data, "low income" is defined as having a household income of less than \$24,999; "minority" is defined as any race population other than White; and "children" is defined as the "Under 5 to 19" age category.

Pāhala has more households in the "less than \$24,999" income bracket (25.0 percent) than the County as a whole (18.9 percent).

Overall, Pāhala is characterized by a racial composition that includes a greater proportion of minorities ( 82.4 percent non-White) than the County at large (67.4 percent non-White). The racial distribution includes a much lower proportion of White residents, a much higher proportion of Filipino residents, and lower populations of other minority groups, including Native Hawaiians when compared to the County. There are also more residents of two or more races in Pāhala than in the County.



Pāhala has a similar age distribution to Hawai'i County, although Pāhala has a higher proportion of individuals in the "Under 5 to 19" age category (33.0 percent) compared to the County as a whole (23.6 percent).

Based on the above, Pāhala has a higher proportion of low-income, minority, and children residents as compared to the County as a whole. However, the Proposed Action will not result in disproportionately high and adverse human health or environmental effects on these sensitive populations under any of the Proposed Alternatives. The design and location of the WWTP facility will minimize odor and air quality impacts. Construction of the wastewater collection system will result in intermittent and unavoidable noise from construction vehicles and equipment within the Pāhala community, including noise associated with the removal of bedrock. However, construction activities within the community will comply with provisions of HAR 11-46 (Community Noise Control). This includes obtaining a noise permit for any activities that will generate noise exceeding the permissible sound levels specified in HAR 11-46. The permit will limit excessive noise sources to daytime hours; will require the use of best available control technology to control noise levels from excessive noise sources; and will require the applicant to notify affected members of the public in advance of any planned nighttime construction activity (which must not exceed the permissible sound levels). Overall, the Proposed Action is expected to result in positive human health and environmental effects to Pāhala residents by providing a cleaner and longer-lasting wastewater treatment system.

### **3.9 Farmland Protection Policy Act (7 U.S.C. § 4201)**

The Agriculture and Food Act was passed in 1981 and contained the Farmland Protection Policy Act (FPPA) (7 U.S.C. § 4201). The stated purposes of the FPPA are to: 1) minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses; and 2) assure that federal programs are administered in a manner that, to the extent practicable, will be compatible with state, unit of local government, and private programs and policies to protect farmland. "Farmland" subject to FPPA requirements does not have to be currently used for cropland.

The FPPA is administered by the U.S. Department of Agriculture (USDA), National Resources Conservation Service (NRCS). "Farmland", as used in the FPPA, includes prime farmland, unique farmland, and land of statewide or local importance, as defined by the State of Hawai'i Department of Agriculture.

Per the Agricultural Lands of Importance to the State of Hawai'i (ALISH) Classification System, the collection system is located in "unclassified" lands and the proposed WWTP package plant and effluent disposal facility will be located on approximately 20 percent "prime", 40 percent "other" and 40 percent "unclassified" land.

Under Alternatives 1 and 2, The proposed collection system will be located primarily within the streets and shoulders in Pāhala and therefore will not affect farmlands. The 14.9-acre WWTP package plant and effluent disposal facility is located within an existing macadamia nut orchard. The 2012 Census Agriculture shows about 17,378 acres in the County are planted with macadamia nuts. As such, the removal of the 14.9-acre area required for the Pāhala WWTP Site will not significantly affect macadamia nut production in the state or the County. Additionally, the construction of the IWS under Alternatives 3 and 4 would occur on a total of 174 residential lots and would not affect macadamia nut production in the state or the County.



In accordance with the implementation procedures for the FPPA site assessment criteria (7 CFR 658), EPA is coordinating with the local NRCS field office to complete a Farmland Conversion Impact Rating Form for the Pāhala LCC Closure Project. This form is used to assess the potential adverse effects on the protection of farmland; support the consideration of alternative actions; and assess compatibility with state and local programs and policies to protect farmland. After the alternative is selected, EPA will finalize the document and provide a copy of the form to the NRCS field office in accordance with 7 CFR 658.4(g).

### **3.10 Fish and Wildlife Coordination Act (16 U.S.C § 661)**

The Fish and Wildlife Coordination Act (16 U.S.C § 661), enacted on March 10, 1934, was amended on August 12, 1958. The purpose of the Act is to recognize the vital contribution of wildlife resources to the Nation, the increasing public interest and significance, and to provide that wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation. The Act defines wildlife and wildlife resources as birds, fishes, mammals and all other classes of wild animals, and all types of aquatic and land vegetation upon which wildlife is dependent (16 U.S.C. § 666b).

The Secretary of the Interior is authorized (1) to provide assistance to, and cooperate with, federal, state, and public or private agencies and organizations in the development, protection, rearing, and stocking of all species of wildlife, and their habitat; in controlling losses of the from disease or other causes; in minimizing damages from overabundant species; and in providing public shooting and fishing areas, including easements across public lands; (2) to make surveys and investigations of the wildlife of the public domain, including lands and waters acquired or controlled by any agency; and (3) to accept donations of land and contributions of funds in furtherance of the purposes of the Act.

Specifically, the Act states that “whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the United States, or by any public or private agency under Federal permit or license, such department or agency first shall consult with the United States Fish and Wildlife Service” (16 U.S.C. § 662(a)). The consultation may result in a report of recommendations by FWS that should be adopted to prevent the loss of or damage to wildlife resources. The provisions of the Act do not apply to impoundments of water less than 10 acres.

The Proposed Action does not include any impoundment of water and therefore a Fish and Wildlife Coordination Act review and/or consultation pursuant to 16 U.S.C. § 662 is not required under any of the Proposed Alternatives.

### **3.11 Floodplain Management (Executive Order 11988, as amended by Executive Orders 12148 and 13690)**

Executive Order 11988, Floodplain Management, dated May 24, 1977 requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.



In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities."

The Proposed Action is not located within a 100-year floodplain area, will incorporate stormwater BMPs to manage runoff in accordance with state requirements, and will be designed to ensure sufficient capacity for assimilation of peak effluent flow rates and precipitation from the design storm event. The Proposed Action therefore will not have an adverse impact on floodplains and will minimize the risk of flood-related impacts on surrounding properties under any of the Proposed Alternatives.

### **3.12 Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801)**

The 1996 Sustainable Fishery Act amendments to the Magnuson-Stevens Fishery Conservation and Management Act and subsequent Essential Fish Habitat (EFH) Regulatory Guidelines (NOAA, 2002) describe provisions to identify and protect habitats of federally managed marine and anadromous fish species. Under the various provisions, federal agencies that fund, permit, or undertake activities that may adversely affect EFH are required to consult with the NMFS.

Congress defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." EFH is further defined by the existing regulations (NOAA-NMFS, 2007; NOAA, 2002). "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

All project locations are at least 3.3 miles from the shoreline. The Proposed Action will not adversely impact EFH under any of the Proposed Alternatives.

### **3.13 Marine Mammal Protection Act (16 U.S.C. §§ 1361 et seq.)**

The Marine Mammal Protection Act (MMPA) (16 U.S.C. §§ 1361 et seq.), protects all marine mammals. The MMPA includes a general moratorium on the taking and importing of marine mammals, and prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S. Jurisdiction for MMPA is shared by the FWS and NMFS. The FWS Branch of Permits is responsible for issuing take permits when exceptions are made to MMPA. Under the exception for incidental taking, the FWS or the NMFS must find that the total taking over the five-year period will have a "negligible impact" and will not adversely affect the availability of the marine mammal species or stock for subsistence use by natives.

All project locations are at least 3.3 miles from the shoreline. The Proposed Action will not adversely impact marine mammal communities and will not encourage any "take" of marine mammals under any of the Proposed Alternatives



### **3.14 Migratory Bird Treaty Act (16 U.S.C. §§ 703 et seq.)**

The Migratory Bird Treaty Act (MBTA) and Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) provide for the protection of migratory birds. The MBTA of 1918, as amended (16 U.S.C. §§ 703-712) makes it unlawful to, among other things, pursue, hunt, take, capture, kill, transport or import any species listed under the Act. The Act implements conventions between the U.S., Great Britain, Mexico, Japan, and the former Soviet Union.

Executive Order 13186 was issued to assist federal agencies with their efforts to comply with the MBTA. It should be noted that the Executive Order does not constitute any legal authorization that in any way supersedes the requirements outlined in the MBTA. The Executive Order directs federal agencies undertaking actions that have or are likely to have a measurable adverse impact on migratory bird populations to develop and implement a Memorandum of Agreement with the FWS addressing the conservation of these populations.

The initial field survey at the collection system and the 14.9 acre WWTP site found a total of 175 individual birds of 13 species, none of which are native to the Hawaiian Islands. Avian diversity and densities were very low, which is consistent with the current site use as a mature macadamia nut orchard with limited ground cover and few weedy or shrubby species. The field survey did indicate that endemic Hawaiian Petrel (*Pterodroma sandwichensis*) and Newell's Shearwater (*Puffinus newell*) have been recorded flying over the general area between April and the end of November each year. Impact avoidance and minimization measures will be implemented, including down-shielding of lights and avoiding nighttime construction during the seabird fledging period. The Proposed Action will also avoid impacts to potential Hawaiian hoary bat habitat (woody plants greater than 15 ft tall) during the bat birthing and pup rearing season (June 1 through September 15), which in turn will also reduce the potential take of migratory birds due to tree clearing during that period.

A secondary field survey of the Project Area in 2023 noted that one additional species, the Hawaiian Hawk (*Buteo solitarius*) was recorded as an incidental observation. It is recommended that a nesting hawk survey be conducted by a qualified biologist within three days that any large stature trees are trimmed or felled to ensure that no active nest is disturbed. It is presently unclear if any such action will occur as part of this Project.

### **3.15 National Historic Preservation Act (54 U.S.C. § 300101)**

The National Historic Preservation Act (NHPA) of 1966 (54 U.S.C. § 300101) requires a federal agency undertaking an action/project consider of the effect of the project on any historic property defined as a district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places.

Section 106 of the NHPA (54 U.S.C. § 306108) requires a federal agency having direct or indirect jurisdiction over a federal or federally assisted undertaking to take into account the effect of the undertaking on any historic property. An "undertaking" includes a "project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency" (54 U.S.C. § 300320). Because the Pāhala LCC Replacement Project will be funded using federal funds, it is considered an "undertaking" and is subject to the NHPA.



The Act requires the federal agency's preservation-related activities to be carried out in consultation with other federal, state, and local agencies, Indian tribes, Native Hawaiian organizations (54 U.S.C § 306102).

The proposed collection system will be constructed along the existing County streets and two short segments within private easements in the Pāhala community that have been previously disturbed when the streets were constructed. Preliminary analysis shows the proposed treatment and disposal facility will be constructed in an area that does not contain archaeological resources. An AIS, which included pedestrian surveys and subsurface testing, was conducted to confirm the presence or absence of archaeological resources on the 14.9-acre WWTP Site and Collection System Area. Based on the AIS, no properties eligible for inclusion on the National Register of Historic Places are present within the area of potential effects for the 14.9-acre WWTP Site and Collection System Area, and no significant artifacts or cultural deposits on the ground surface and no cultural deposits or lava tubes were encountered during subsurface testing.

Based on the above and in accordance with 36 CFR § 800.4(d), EPA reached a finding of "no historic properties affected for the project or undertaking." On September 26, 2019, EPA sent a letter to SHPD to document their determination that no historic properties will be affected by the undertaking and to request concurrence from SHPD. The potential for encountering unexpected archeological resources within the Proposed WWTP Site is low due to historical ground modifications and ongoing harvesting activities; however, the Proposed Action will incorporate appropriate mitigation measures should archeological resources be discovered during construction. Specifically, the contract drawings will state that, should archaeological sites such as walls, platforms, pavements or mounds, or remains such as artifacts, burials, concentrations of shell or charcoal be encountered during construction activities, work will cease immediately and the find will be protected from further damage. The contractor will immediately contact SHPD, who will assess the significance of the find and recommend appropriate mitigation measures, if necessary.

As part of previous Environmental Assessment efforts, the County conducted an AIS of the 14.9-acre treatment and disposal facility, including subsurface testing of the effluent disposal area. To carry out this AIS, SHPD approved an AIS plan. To meet this requirement, the County submitted the AIS plan to SHPD on March 22, 2018. On April 25, 2018, SHPD requested clarification, and responses, including findings from the 2016 field survey report and a map of the proposed wastewater treatment and disposal facility, were submitted to SHPD on July 31, 2018. SHPD approved the AIS plan on August 20, 2018, and the County conducted the AIS of the 14.9-acre WWTP in September 2018.

In addition to the AIS, the County is obligated to comply with the National Historic Preservation Act (NHPA). On March 29, 2018, the County initiated consultation for this project in accordance with Section 106 of the NHPA. Consultation letters were sent to various Native Hawaiian Organizations, totaling 15 letters, inviting comments from organizations that may attach religious or cultural significance to properties affected by the proposed actions. A letter dated February 20, 2020 from the SHPD provides concurrence that no historic properties at the Proposed WWTP Site shall be affected, under HRS 63-8 and section 106. The AIS and NHPA Section 106 consultation correspondence can be found in Appendix D and Appendix D-1 of the FEA, respectively.

As NHPA requirements have been completed under Alternatives 1 and 2, it is advised that the County seek to consult with SHPD in regards to Alternatives 3 and 4 in accordance with HRS



Chapter 6E requirements, and in relation to Section 106 of the National Historic Preservation Act (NHPA) – if triggered – and, to incorporate additional impact avoidance and minimization measures if required for the construction of the IWS.

### **3.16 Protection of Wetlands (Executive Order 11990 (1977), as amended by Executive Order 12608 (1997))**

Executive Order 11990, Protection of Wetlands, dated 1977 requires federal agencies to avoid, preserve, or mitigate effects of new construction projects on lands which have been designated wetlands. Executive Order 11990 states in order to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative, it is hereby ordered as follows: Section 1. (a) Each agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of federal lands and facilities; and (2) providing federally undertaken, financed, or assisted construction and improvements; and (3) conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

The National Wetlands Inventory (NWI) Wetlands Mapper and U.S. Geological Survey (USGS) topographic maps identify no wetland features or streams within the Proposed WWTP Site, at the two LCCs, or within the Proposed Collection System Area. Biological and archeological field survey reports do not indicate any standing water or evident wetland vegetation within the area. On August 2018, a biological field survey was conducted at the 14.9-acre WWTP Site and results of the field work indicated that no wetlands were observed on the site (See Appendix C of the FEA). The man-made drainage feature along Māmalahoa Highway along the edge of the parcel conducts flow generated from surface runoff underneath the highway and downslope to the east. Conditions within the ditch itself close to or on the 14.9-acre project site will not likely satisfy the hydric soil requirement to be defined as a wetland. Streams in the Pāhala area do not flow all the way to the sea, but terminate on Keone'ele'ele Flat to the southwest. Based on this information, the Proposed Action is not expected to impact wetland resources under any of the Proposed Alternatives.

### **3.17 Rivers and Harbors (33 U.S.C. § 403)**

Originally enacted on March 3, 1899, the Rivers and Harbors Appropriation Act of 1899 affects navigable waters of the U.S. Section 10 of the Act states the creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any of the waters of the United States is prohibited; and it shall not be lawful to build or commence the building of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in any port, roadstead, haven, harbor, canal, navigable river, or other water of the United States, outside established harbor lines, or where no harbor lines have been established, except on plans recommended by the Chief of Engineers and authorized by the Secretary of the Army; and it shall not be lawful to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor or refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the United States, unless



the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army prior to beginning the same (33 U.S.C. § 403).

All project locations are at least 3.3 miles from the shoreline. The Pāhala WWTP package plant and effluent disposal facility is situated about 1,500 feet east of the center line of Hiʻonamoa Gulch. The USGS topographic map shows the gulch stops about 5,500 feet from the shoreline. The Proposed Action will not affect any streams or gulches. Based on this, Proposed Action will not affect navigable waters under any of the Proposed Alternatives.

### **3.18 Safe Drinking Water Act (42 U.S.C. § 300f)**

The Safe Drinking Water Act (SDWA) of 1974 (42 U.S.C. § 300f) was established to protect the quality of all waters actually or potentially designed for drinking use from both underground and aboveground sources. The SDWA authorizes EPA to establish minimum standards to protect potable water with which all owners or operators of public water systems must comply; to oversee the agencies which can be approved to implement these rules on EPA's behalf, such as state governments; and to encourage attainment of secondary standards (nuisance-related). Section 1424(e) of the SDWA of 1974 (Public Law 93-523, 42 U.S.C. 300 et. seq) also established the Sole Source Aquifer program which states that no commitment for federal financial assistance (through a grant, contract, loan guarantee, or otherwise) may be entered into for any project which the EPA Administrator determines may contaminate such aquifer through a recharge zone so as to create a significant hazard to public health.

The Proposed Action does not establish a drinking water system, and no Sole Source Aquifers are present on the Island of Hawaiʻi. The Proposed Action will provide the infrastructure necessary to enable the County to comply with the SDWA by replacing the existing outdated and federally banned wastewater systems that pose a threat to underground sources of drinking water.

### **3.19 Wild and Scenic Rivers Act (16 U.S.C. §§ 1271-1287)**

The Wild and Scenic Rivers Act, 16 U.S.C. §§ 1271-1287, declares that certain selected rivers with their immediate environments, which possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historical, cultural, or other similar values, shall be preserved in their free-flowing condition for the enjoyment of present and future generations. The State of Hawaiʻi has no designated wild and scenic rivers.

The Wild and Scenic Rivers Act is not applicable to this project.

### **3.20 Clean Water Act (33 U.S.C. § 1251 et seq.)**

The Clean Water Act established the basis for regulating discharges of pollutants into waters of the U.S. Enacted in 1948, it was originally called the Federal Water Pollution Control Act but became known as the Clean Water Act with the amendments of 1972. Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into waters of the U.S. and adjacent wetlands from development, water resource projects, mining or other infrastructure projects. Activities are regulated through a permit process that is administered under the responsibility of the U.S. Army Corps of Engineers. Permits may be issued as either Individual Permits for projects with potentially significant impacts or general permits for projects with only minimal adverse effects.



The NWI Wetlands Mapper and USGS topographic maps identify no wetland features or streams within the WWTP Site, at the two LCCs, within the Proposed Collection System Area, or within the future IWS lots. Biological and archeological field survey reports do not indicate any standing water or evident wetland vegetation within the WWTP Site and Collection System Area. On August 2018, a biological field survey was conducted for the proposed WWTP and collection system and results of the field work indicated that no wetlands were observed on the site. The man-made drainage feature along Māmalahoa Highway along the edge of the parcel conducts flow generated from surface runoff underneath the highway and downslope to the east. Conditions within the ditch itself close to or on the property would not likely satisfy the hydric soil requirement to be defined as a wetland.

Because no wetland resources are present and no impacts to wetlands are anticipated due to the nature and design of the WWTP and collection, a Clean Water Act Section 404 permit is not required.

In addition to the above, the Clean Water Act was amended by the Federal Water Quality Act of 1987 which established provisions for a Clean Water State Revolving Fund (33 U.S.C. § 1383), a financial assistance program for water infrastructure projects. The program capitalizes on a partnership between EPA and states to provide loans to eligible recipients through state programs that act as environmental infrastructure banks providing low-interest loans. As stated in Section 2.1.2, the Pāhala LCC Replacement Project is being funded in part by the State of Hawai'i DOH Clean Water State Revolving Fund.



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## 4. Existing Environment, Impacts, and Mitigation Measures

### 4.1 Climate

Climate on the Island of Hawai'i and more broadly throughout the state can be characterized as having low day-to-day and month-to-month variability. Differences in the climate of various areas are generally attributed to local differences in geology and topography that create microclimates with different temperature, humidity, wind, and rainfall, and associated local ecosystems (Department of Geography, 1998).

The climate of Pāhala is typical of the predominantly dry condition found in the Ka'ū District. The National Oceanic and Atmospheric Administration (NOAA) designates the Ka'ū area as a Humid Tropical Zone with transitional lowland areas in locations between windward and leeward regions. The area receives less orographic rainfall since it is not oriented normal to trade wind flow and exhibits a distinctive summer dry season.

Temperatures in the Ka'ū District generally range between 70 and 80 degrees Fahrenheit during daylight hours and between 60 and 70 degrees Fahrenheit during night hours. The National Weather Service maintains a rainfall gauge at Pāhala.

Prevailing trade winds in the Ka'ū District area are from the southeast and usually dominate from April to November. Wind speeds average about 15 miles per hour and vary between approximately 10 to 20 miles per hour. Winds from the southwest occur less frequently, mainly during the winter associated with "Kona" storms (Department of Geography, 1998).

Climate conditions in the Ka'ū District are most likely to change in coming decades. Average annual precipitation is also likely to change, but climate models are uncertain in projections for Hawai'i. Based on ensemble model projections available through the U.S. Environmental Protection Agency's (EPA's) Climate Resilience Evaluation and Awareness Tool (CREAT) Climate Scenarios Projection Map, Projections for the area surrounding the Pāhala range from a minor decrease in annual precipitation to up to considerable increases in annual precipitation by 2060, depending on the model scenario (hot/dry vs. warm/wet). Other climate concerns include sea level rise to coastal areas.

#### **Impacts and Mitigation Measures:**

##### *Alternatives 1 and 2 - Package Plant:*

Under these alternatives, the construction phase may result in temporary greenhouse gas emissions due to heavy equipment operations and the transportation of supplies to the WWTP project site and along the streets for the new collection system. However, these emissions will be temporary during the construction period.

Regarding long-term climate impacts, the project's wastewater treatment and disposal facility does not discharge to surface water sources, and therefore, it is unlikely to significantly affect local temperature or precipitation patterns. Climate models suggest some variability in precipitation, but this is not expected to be substantially influenced by the project.



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The project's design takes into consideration the potential for increased storm intensity due to climate change. Berms will be constructed at the 14.9-acre WWTP project site to contain stormwater during intense weather events, ensuring the facility's resilience to changing storm patterns.

*Alternatives 3 and 4 - Individual Wastewater System Program:*

Alternatives 3 and 4 involves the implementation of an IWS Maintenance Contract Model or Operating Permit model. This alternative would require construction activities on individual parcels including measures to contain storm water runoff during storm events.

The climate impacts are like those in Alternatives 1 and 2, with the project not significantly affecting local climate conditions. The design includes measures to address potential changes in storm intensity, ensuring the facility's resilience.

*No-Action Alternative:*

Under the No-Action Alternative, the existing LCCs continue to operate without any modifications. These LCCs are at risk of impacts due to climate change, specifically changes in precipitation patterns, increased storm intensity, and potential sea level rise.

Climate change-related impacts on the existing LCCs could result in risks to groundwater and surface water quality. Increased storm intensity and altered precipitation patterns may exacerbate the challenges of managing wastewater in these LCCs, potentially leading to overflows or groundwater contamination.

It is important to note that the No-Action Alternative does not involve any mitigation measures to address these climate-related risks.

## **4.2 Physiography**

### **4.2.1 Topography**

The Pāhala community is situated on the slope of Mauna Loa, located west (mauka) of Māmalahoa Highway. The community encompasses an area of approximately 0.61 square miles. The developed region of Pāhala exhibits a gradual slope, sloping at approximately 6 percent from the northwest to the southeast. The community spans from an elevation of 1,000 feet above mean sea level (msl) to 800 feet above msl, covering a horizontal distance of roughly 3,500 feet.

The streets within the community are designed to conform to the natural contours of the terrain, maintaining level or appropriately sloped grades to facilitate vehicular travel. Consequently, on certain streets, residential lots on the downhill side of the road are situated several feet below the road surface, while those on the uphill side are elevated several feet above it.



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The existing topography in Pāhala is characterized by these gently sloping to moderately steep terrains, which play a significant role in the community's layout and land use patterns.

### **Impacts and Mitigation Measures:**

#### Alternatives 1 and 2 - Package Plant:

The topographical conditions under Alternative 1 are consistent with the existing conditions. Construction activities for the new collection system and treatment facility will involve grading and earthwork primarily at the 4.0-acre package plant site. Erosion control measures will be implemented to prevent soil erosion and maintain the existing of the topographic conditions. Excavation depths of 4 to 10 feet would be needed to place the various components of the package plant. The effluent disposal facility would require excavation of trenches of up to 3 to 4 feet would be needed to place the drip irrigation lines. The affected areas would be restored to approximately existing conditions.

The wastewater collection system would be constructed within the right-of way of the public streets plus three segments within easements. The trenches typically be about 3 feet wide and at least 6 feet deep. Due to the existing topography, several parcels may require installations of pumps to pump the flows to the street level. Once the line is placed in the trench, the affected area would be backfilled to restore area to existing conditions which means minimal affect the topographic conditions of the area. Proper erosion control measures will be implemented to prevent potential soil erosion and maintain the topography.

#### Alternatives 3 and 4 - Individual Wastewater System Program:

The topography for Alternatives 3 and 4 aligns with the existing conditions in Pāhala. Construction activities for the IWS will involve excavation for placement of the septic tank and absorption bed. Once the tank and effluent disposal system have been put into place, grading will be needed to restore the affected area. Adequate erosion control measures will be implemented during construction to prevent runoff during storm events and soil erosion and protect the existing topography of the surrounding area.

#### No-Action Alternative:

Under the No-Action Alternative, the existing LCCs are situated within the existing topography. There are no modifications or construction activities associated with this alternative, and the topography remains unchanged.

Proper erosion control measures will be implemented to minimize potential impacts on the topography during construction activities, ensuring its preservation. Overall, the topography in the Pāhala area is not anticipated to undergo significant alterations as a result of the proposed project alternatives.

## **4.2.2 Geology**



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The Island of Hawai'i was formed by the activity of five shield volcanoes. These shield volcanoes are Kohala (extinct), Mauna Kea (has had activity during recent geologic time), Hualalai (last erupted in 1801), and Mauna Loa and Kilauea (both of which are still active).

The project site is situated at the eastern end of the island and on the lower, southeastern flank of the Mauna Loa Volcano. This volcano appears to be made up of at least two huge shield volcanoes built around two separate eruptive centers, referred to as the Mauna Loa shield. The Mauna Loa shield has been built principally by eruptions along two rift zones that extend in a southwest and east-northeast direction from the caldera. Rift zones are elongated areas of ground fissures where volcanic activity such as earthquakes and volcanic eruptions are concentrated. In contrast, few eruptions have taken place along the lower northeast rift zone.

Pāhala is situated on the slopes of Mauna Loa. The surrounding area consists of several inter-stratified beds of volcanic ash that sit upon the exposed bedrock. The Pāhala area is known to contain lava tubes, which often occur in many places around the Island of Hawai'i. Generally, a lava tube is a natural conduit or a void that forms when molten lava flows beneath the hardened surface of a previous lava flow. When the volcanic eruption stops, and the lava drains out, a lava tube forms in the void. Lava tubes can range in size from a few inches to more than 25 feet in diameter. The tubes are generally not visible from the surface, and the diameter and length can usually be identified only through subsurface probing or geophysical surveys.

### **Impacts and Mitigation Measures:**

#### Alternatives 1 and 2 - Package Plant:

A geotechnical investigation of the 14.9-acre WWTP project site showed the presence of a lava tube on a portion the plant site. However, the approximately 4.0-acre package plant has been sited to avoid the lava tube. The effluent irrigation system would only require relatively shallow excavation for placement of the effluent disposal lines which would not affect the geological characteristics of this area of Pāhala.

Grading, excavating, and fill activities during construction of the WWTP package plant and effluent disposal facility and the new collection system would occur no deeper than approximately 10 feet below grade and thus would not have significant impacts on the geology in the Pāhala area. If/when bedrock is encountered during excavation for the proposed actions, removal would be accomplished using excavators or hydraulic and/or pneumatic hammers consistent with other construction activities on the Hawaiian Islands. Alternatives 3 and 4 - Individual Wastewater System Program:

Alternatives 3 and 4 involves the installation and maintenance of the IWS. While this alternative may require construction activities that could disturb deeper geological layers (possibly up to 8 to 10 feet), this depth of excavation should not affect the geology of the Pāhala area.

#### No-Action Alternative:



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Under the No-Action Alternative, the existing LCCs continue to operate without any modifications. This alternative does not involve any construction activities or modification to the existing conditions, and therefore would not cause any impacts to geology in the Pāhala area.

### 4.2.3 Soils

According to the U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) Soil Survey of the island, soils types within the Pāhala area possess moderately high to high permeability characteristics and consist of well-drained soils formed of volcanic ash. Specifically, the area includes the following soil profiles:

- Map Unit Symbol (MUSYM) 521 – Nā’ālehu medial silty clay loam, 3 to 10 percent slopes
- MUSYM 522 – Nā’ālehu medial silty clay loam, 10 to 20 percent slopes
- MUSYM 567 – Pu’u’eo – Nā’ālehu complex, 3 to 10 percent slopes

#### **Impacts and Mitigation Measures:**

##### *All Proposed Alternatives*

Construction of the new collection system would occur below the travelways or shoulders of the streets in the Pāhala community. As these areas were previously disturbed upon construction of the streets, the collection system would not create adverse impacts to soils in the area.

Construction of the any of the alternatives would require vegetation removal, clearing, and excavation. These activities would involve subsurface and surface disturbance to the soils of the affected areas. . These impacts can be mitigated through incorporating appropriate stormwater and erosion control measures to ensure that soil erosion and transport during construction activities are minimized. Typically, the construction plans and documents would include erosion control plans which the construction contractor would need to follow.

##### *No-Action Alternative*

Under the No-Action Alternative, the existing LCCs would continue to operate without any modifications. This alternative does not involve any construction activities or modification to the existing conditions, and therefore would not cause any impacts to soils in the Pāhala area.

## 4.3 Water Resources

### 4.3.1 Surface Waters



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The Pāhala community is situated between two surface water sources, with Pā'au'au Gulch to the north and east and an unnamed branch of Hionamoia Gulch to the south and west. According to USGS topographic maps, the flows from Pā'au'au Gulch terminate about 6,500 feet from the coast, while the unnamed branch joins Hionamoia Gulch approximately 3,000 feet southwest of Maile Street. The flows from Hionamoia Gulch also cease about 6,000 feet from the coast.

Water resources in the area are crucial for both the existing wastewater treatment systems and the local community. Groundwater and surface water sources play a vital role in sustaining the environment and supporting agriculture.

According to the April 2023 PER, the DOH Wastewater Branch has assigned three-priority levels to each of the 88,000 cesspools across the state of Hawai'i. These priority levels ranged from Priority 1: Significant Risk of Human Health Impacts, Drinking Water Impacts, or Draining to Sensitive Waters to Priority 4: Impacts Not Identified. Priority 1 and 2 areas would be required to upgrade sooner and to higher levels of treatment. Under this priority classification system, the Pāhala area fell under Priority 4, the lowest of those available, as an area for which health and environmental risks had not been assessed or appeared low. Subsequently, a more comprehensive 2021 study that explored Hawai'i's cesspool prioritization, factoring in a total of 15 risk factors, reached a similar conclusion.

### **Impacts and Mitigation Measures:**

#### *Alternatives 1 and 2 - Package Plant:*

Under Alternative 1, construction activities may temporarily impact water resources. The cumulative areal extent of disturbance for the wastewater treatment and disposal facility and the new collection system would require coverage under a National Pollutant Discharge Elimination System (NPDES) construction stormwater permit. Normally, this permit would mandate the implementation of best management practice (BMP) measures, such as silt fences, filter socks, and sediment traps to control sediment runoff. Since the NPDES permit requires detail information about the means and method of construction, the selected contractor would need to submit the plans and documents to the DOH.

Construction trenches would be designed not to extend deeper than approximately 10 feet below grade when feasible, minimizing disturbance to the geology in the Pāhala area. It should be noted that construction trenches may need to exceed 10 feet in depth in some design locations. A Site-Specific Construction BMP plan would be developed to prevent stormwater runoff along the collection system during construction.

The on-site drainage plan, as per Hawai'i County Code, Chapter 27, Section 20, would ensure that runoff caused by the construction activities in the 14.9-acre package plant and effluent disposal area would need to account for expected one-hour, ten-year storm event, is retained within the site boundaries. Landscape buffers with dirt berms would act as secondary containment during large storm events, further safeguarding against adverse impacts on adjacent or downstream properties.



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Overall, construction-related impacts on surface water resources under Alternatives 1 and 2 are expected to be temporary, with BMPs effectively minimizing potential impacts.

*Alternative 3 - Individual Wastewater System-Maintenance Contract Model:*

Alternative 3 entails the implementation of an IWS Maintenance Contract Model which, when properly designed and operated, can be an effective means of wastewater management; however, IWS that are poorly designed and maintained have been nationally recognized as having high failure rates. In order to ensure that the systems function as intended, the design must take into account a variety of technical considerations including system size, site conditions, location, subsurface soil characteristics, influent characteristics, and level of treatment.

Should the IWS begin to fail, untreated sewage containing pathogens (e.g., E. coli), nutrients and other harmful substances could be discharged into the groundwater or into nearby surface waters.

In the event that the County opts to pursue the IWS Alternatives, the implementation of BMP measures, including silt fences, filter socks, and sediment traps, would be required during construction at each IWS site to control sediment runoff. Construction trenches would generally not extend deeper than approximately 10 feet below grade.

Overall, construction-related impacts on surface water resources under Alternative 3 are anticipated to be temporary and localized, with BMPs effectively minimizing potential impacts.

*Alternative 4 - Individual Wastewater System-Operating Permit to Homeowners:*

Alternative 4 involves the implementation of an IWS Operating Permit model. As noted under Alternative 3, a properly designed and operated IWS can be an effective means of wastewater management; however, IWS that are poorly designed and maintained have been nationally recognized as having high failure rates and have been linked to contaminated groundwater resources. Under Alternative 4, the homeowner will be responsible for operating and maintaining the IWS while the County is responsible for issuing maintenance notifications to the homeowner.

Like the other alternatives, construction activities may temporarily impact water resources. The implementation of BMP measures, including silt fences, filter socks, and sediment traps, would be required during construction to control sediment runoff. Construction trenches would generally not exceed approximately 10 feet below grade.

Construction-related impacts on surface water resources under Alternative 4 are expected to be temporary and localized, with BMPs effectively minimizing potential impacts.

*No-Action Alternative:*



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Under the No-Action Alternative, which involves the continued operation of the existing LCCs without modifications, there would be no construction activities or modifications to existing conditions. Therefore, this alternative would not cause any impacts to geology or surface water resources in the Pāhala area.

It's important to note that the No-Action Alternative does not involve any mitigation measures to address potential stormwater-related risks associated with the existing LCCs.

### **4.3.2 Groundwater**

Groundwater occurs within portions of geologic formations where aquifers receive and store water. Depending on the geologic conditions of the area, many communities and areas on the island rely on groundwater wells to obtain drinking water. To protect the quality of underground sources of drinking water from contamination by subsurface disposal of fluids, Hawai'i has adopted the Underground Injection Control (UIC) program administered by the DOH Safe Drinking Water Branch. Hawai'i Revised Statutes (HRS) 340 E and Hawai'i Administrative Rules (HAR) 11-23 (Underground Injection Control) set forth the requirements related to protection of underground sources of drinking water.

Under HAR 11-62, Appendix F, a minimum separation of 1,000 feet from existing wells is required for wastewater treatment sites.

On April 3, 2018, in response to the previously issued Draft EA pre-assessment notification, the DOH Safe Drinking Water Branch indicated that the proposed WWTP Site is located above the UIC line and, as such, on top of underground sources of drinking water. To avoid impacts to drinking water wells, sewage injection wells cannot be constructed above the UIC line.

The State of Hawai'i Department of Land and Natural Resources (DLNR) Commission on Water Resource Management (CWRM) maintains information on various types of wells throughout the state. The CWRM indicated that one County and one private well are located in the Pāhala area. The CWRM confirmed that the County well and storage tank are located approximately 5,300 feet north of the WWTP Site. The tank lies at about 1,120 feet above msl, which is approximately 480 feet higher in elevation than Pāhala WWTP site. A private well is located within TMK 9-6-002:016, the parcel that contains the existing LCC 1 and lies adjacent to the WWTP Site. The CWRM has indicated this well is used for agricultural purposes, not for domestic purposes.

### **Impacts and Mitigation Measures**

#### *Alternatives 1 and 2 - Package Plant:*

The approximately 6-foot trenches needed to support the collection system would be relatively shallow in relation to groundwater resources in the Pāhala area. Thus, construction of the collection system would not affect groundwater resources in the area.

The separation (both elevation and horizontal distance) between the Pāhala WWTP site and the upgradient location of the County drinking water well, would mean construction



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and operation of the treatment and disposal facility would not affect potable groundwater resources in the Pāhala area.

While use of the two existing LCCs has not resulted in documented impacts to groundwater or drinking water resources, abandonment of the LCCs would remove a potential source of such impacts. Abandonment of the existing wastewater collection system would not affect groundwater within the affected areas.

*Alternative 3 and 4 - Individual Wastewater System Program:*

Alternatives 3 and 4 entail the implementation of an IWS program which, when properly designed and operated, can be an effective means of wastewater management; however, IWS that are poorly designed and maintained have been nationally recognized as having high failure rates. To ensure that the systems function as intended, the design must take into account a variety of technical considerations including system size, site conditions, location, influent characteristics, and level of treatment.

Should the IWS begin to fail, untreated sewage containing pathogens (e.g., E. coli), nutrients and other harmful substances can be discharged into the groundwater or into nearby surface waters.

In the event that the County opts to pursue the IWS Alternatives, the implementation of BMP measures would be required at each site, including silt fences, filter socks, and sediment traps to control sediment runoff.

Overall, construction-related impacts on groundwater water resources under Alternatives 3 and 4 are anticipated to be temporary and localized, with BMPs effectively minimizing potential impacts.

*No-Action Alternative:*

The No-Action Alternative has the potential to adversely impact groundwater resources due to the continued operation of the existing LCCs. EPA regulations mandate the closure of LCCs to prevent potential impacts on groundwater resources

#### **4.4 Agricultural Lands**

On November 1965, the Land Study Bureau (LSB) at the University of Hawai'i issued L.S. Bulletin No. 6, *Detailed Land Classification—Island of Hawai'i*. The LSB compiled and interpreted data on geology, topography, climate, water resources, soils, and crops and conducted field investigations to create a land classification for the island. Bulletin No. 6 assigned two types of ratings for each land type: the overall or master productivity rating, which reflects degree of overall suitability for agricultural use, ranging from A (Very Good) to E (Very Poor); and selected use ratings, which indicate the degree of suitability for selected use alternatives. Bulletin No. 6 has not been revised or re-issued and remains as the reference document for lands classified by the LSB.

In addition to the LSB rating, the State of Hawai'i has developed the Agricultural Lands of Importance to the State of Hawai'i (ALISH) Classification System. This system was developed



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and compiled in 1977 by the State Department of Agriculture with assistance from the NCRS, U.S. Department of Agriculture (formerly the Soil Conservation Service) and the College of Tropical Agriculture at the University of Hawai'i as part of a national effort to inventory important farmlands. Lands not considered for classification within this system are developed urban lands (over ten acres), natural or artificial bodies of water (over ten acres), public use lands, forest reserves, lands with slopes in excess of thirty-five percent, and military installations (except undeveloped areas over ten acres). The ALISH Classification System identifies the following three categories of land (equivalent NRCS categories in parentheses):

- Prime Agricultural Lands (Prime Farmlands) – Land that has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed according to modern farming methods.
- Unique Agricultural Lands (Unique Farmlands) – Land that has a special combination of soil quality, location, growing season, and moisture supply, and is used to produce sustained high-quality yields of a specific crop when treated and managed according to modern farming methods.
- Other Important Agricultural Land (Additional Farmland of Statewide and Local Importance) – Land other than Prime or Unique Agricultural Land that is also of statewide or local importance to agricultural use.

The 2017 US Census Bureau, Census of Agriculture-County Data provides the most recent information related to acreage planted for various fruits and nuts across the state and for each county. The 2017 data show a total of 18,170 acres of macadamia nuts were planted in the state, with 17,504 acres planted in the County, comprising about 96.3 percent of the state total.

## **Impacts and Mitigation Measures**

### *Alternatives 1 and 2 – Package Plant*

The LSB rating indicates the collection system project site as “not rated”, the rating assigned to developed communities, and a master productivity rating of “D 129” (poor) for about 50 percent of the proposed wastewater treatment and disposal facility at the WWTP Site, with the remainder “B” (good). D 129 includes soils from the Māmalahoa series, deep depth, volcanic ash, stony, well drained, and very poorly suited for mechanical agitation / tilling. The ALISH map shows the collection system is located in “unclassified” lands. The ALISH map shows the proposed wastewater treatment and disposal facility would be located on approximately 20 percent “prime”, 40 percent “other” and 40 percent “unclassified” land.

Construction of the collection system within the County roads would not affect agricultural lands or the acreage utilized for the macadamia nut orchard.

Construction of the Pāhala WWTP package plant would require removal of approximately 4.0-acres of macadamia nut trees. Although the remaining macadamia nut orchard would not be removed, use of the trees for effluent disposal means the lands could not be used as a productive macadamia orchard. This removal would amount to less than 0.1 percent



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of the total County lands planted with macadamia nut trees, which would not substantially affect the total macadamia nut acreage in the state or the County.

Abandonment of the two LCCs would reduce the potential for contamination of groundwater that is used for irrigation of agricultural lands. Otherwise, abandonment of the LCCs and the existing wastewater collection system would not affect agricultural lands within the affected areas.

*Alternatives 3 and 4 – Individual Wastewater System Program:*

As indicated by the LSB rating system, the lots identified for the IWS installation are “not rated” which is assigned to developed communities. Installation of the IWS would not affect agricultural lands.

*No-Action Alternative*

The No-Action Alternative would not impact agricultural lands. Continued operation of the existing LCCs could introduce pathogens and other contaminants to groundwater sources used for irrigation of agricultural lands.

## **4.5 Natural Hazards**

The Disaster Mitigation Act of 2000, (Federal Emergency Management Agency (FEMA), 44 Code of Federal Regulations, Hazards Mitigation Planning required States and Counties to have approved hazard mitigation plans as of November 1, 2004 to receive Pre-Disaster Mitigation funding. The development of State and local hazard mitigation plans is critical for maintaining eligibility for future FEMA mitigation and disaster recovery funding.

Given Hawai'i's vulnerability to natural hazards and history of disasters, the State has maintained and implemented a comprehensive, multi-hazard mitigation strategy to reduce loss of life and property damage. This strategy is embodied in the *2018 State Multi-Hazard Mitigation Plan*. This plan identifies the major natural hazards that affect the state's population, property, and infrastructure to the specific hazard, and recommends actions that can be taken to reduce the risk and vulnerability to the hazard. The State Hazard Mitigation Plan also contains a description of programs, policy, statutes, and regulations applicable to hazard mitigation. It should be noted that the 2023 update to this plan has begun and is expected to be released at the end of 2023.

Identified major natural hazards that could affect the State, as well as the County are Climate Change Effects (including sea level rise (SLR)/coastal erosion), floods, tsunamis, strong, windstorms/hurricanes, earthquakes, landslides/rockfalls, volcanic activity, and wildfires.

### **4.5.1 Sea Level Rise**

Sea level is rising at increasing rates due to global warming of the atmosphere and oceans and melting of the glaciers and ice sheets. Rising sea level and projections of stronger and more frequent El Niño events and tropical cyclones in waters surrounding Hawai'i indicate a growing



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vulnerability to coastal flooding and erosion. The Hawai'i Sea Level Rise Vulnerability and Adaptation Report (2017) modeled exposure to chronic coastal flooding and erosion using projections from the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report (IPCC, 2014) where the high-end scenario was up to 3.2-ft of sea level rise by the end of the century (Courtney et al., 2020).

**Impacts and Mitigation Measures:**

*All Proposed Alternatives*

No short- or long-term impacts are anticipated during the construction or operation of any of the alternatives. The Pāhala community is located approximately 3.3 miles from the nearest coastline and at elevation from 500 to 1,500 feet above Mean Sea Level (MSL). The community is not anticipated to be impacted by sea level rise under any of the proposed alternative.

**4.5.2 Flood and Tsunami Threat**

The Pāhala community is located between two surface water sources, Pā'au'au Gulch to the north and east, and an unnamed branch of Hi'onamoa Gulch to the south and west. The USGS topographic map shows flows from Pā'au'au Gulch end about 6,500 feet from the coast, while the unnamed branch flows into Hi'onamoa Gulch about 3,000 feet southwest of Maile Street. Flows from Hi'onamoa Gulch end about 6,000 feet from the coast. Figure 3.1 illustrates the known streams and gulches within the Pāhala area.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), Community Panel No. 155166 1800F, effective date September 29, 2017, shows no special flood hazard areas present in the Pāhala WWTP site and that most of the Pāhala area is located in *Zone X*, which designates areas determined to be outside the 0.2- percent annual chance (500-year) floodplain. A small portion of the community of Pāhala, including some land within the collection system project site, is located within *Zone X – Other Flood Areas*, indicating areas within the 0.2-percent annual chance (500-year) floodplain, or areas with a 1-percent annual chance of flooding with average flood depths less than 1 foot.

According to the FIRM, both existing LCCs are also located within *Zone X*. However, LCC 1 is very close to the edge of the 500-year floodplain.

**Impacts and Mitigation Measures:**

*All Proposed Alternatives*

Based on the above, no significant impacts on flood hazards are anticipated to occur within the Pāhala region as a result of any alternative considered.

**4.5.3 Hurricane and Wind Hazard**

The Hawaiian Islands are seasonally affected by Pacific hurricanes from the late summer to early winter months. The State has been affected once by the significant hurricanes (rated Category



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3 and higher) Iniki in 1992. Not all identified hurricane and strong wind storm threats make landfall in Hawai'i, and actual hurricane strikes in Hawai'i are relatively rare in modern record. More commonly, near misses that generate large swell and moderately high winds causing varying degrees of damage are the hallmark of hurricanes passing close to the islands.

During hurricanes and storm conditions, high winds cause strong uplift forces on structures, particularly on roofs. Wind-driven materials and debris can attain high velocity and cause devastating property damage and harm to life and limb. Along the coastline, a surge of water, topped by battering waves can move ashore into low lying coastal areas. Due to differences in atmospheric pressure, tidal stage, coastal topography, and location relative to the eye of the hurricane it is difficult to predict how hurricane-induced storm surge may impact a specific location. It is difficult to predict these natural occurrences, but it is reasonable to assume that future events will occur. The Project Area is, however, no more or less vulnerable than the rest of the island to the destructive winds and torrential rains associated with hurricanes.

### **Impacts and Mitigation Measures:**

#### *All Proposed Alternatives*

While rare, the threat of hurricanes is present across the State of Hawai'i. Construction activities could potentially exacerbate the effect of hurricanes if loose materials are not secured prior to the event of a storm and become flying debris. To minimize this hazard, construction materials and equipment would be stored properly when not in use, consistent with construction best management practices.

To safeguard against hurricane damage in the long-term, proposed action improvements would be designed in compliance with American Society of Civil Engineers and International Building Code standards for wind exposure.

### **4.5.4 Seismic Hazard**

Seismic hazards are those related to ground shaking. Landslides, ground cracks, rock falls and tsunamis are all seismic hazards. Thousands of earthquakes occur every year in the State of Hawai'i. Earthquakes in the Hawaiian Islands are associated with volcanic eruptions or tectonic movements. Most of these earthquakes are closely related to volcanic processes and are so small they can only be detected by seismometers. Volcanic hazards in the area are of particular concern given to the active status of the islands volcanoes. One of the larger and more recent earthquakes occurred offshore of Puakō, Hawai'i in 2006. The earthquake measured 6.7 on the Richter Scale and caused minor damages to structures and buildings.. Although difficult to predict, an earthquake of sufficient magnitude causing structural or other property damage may occur in the future.

### **Impacts and Mitigation Measures:**



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All Proposed Alternatives:

Hawai'i County Code (HCC) § 5A indicates the "International Building Code, 2006 Edition" (IBC) – copyrighted and published in 2018 by the International Code Council, Incorporated – is adopted by the County. Chapter 5 is the applicable code for the construction of buildings, structures, and facilities in the County. The purpose of the seismic provisions in the IBC is primarily to safeguard against major structural failures and loss of life; limiting damage or maintaining functions is not a primary purpose. At a minimum, structures are to be designed and constructed to resist the effects of ground motions from seismic events. The seismic hazard characteristics described in the IBC are based on the seismic zone and proximity of the site to active seismic sources.

The proposed improvements would be designed and constructed to meet the requirements of the 2016IBC and HCC Chapter 5 and would comply with seismic loadings established for the County of Hawai'i. This would minimize the potential for an uncontrolled release of untreated or partially treated sanitary wastewater, or diesel fuel from the tank being held for the emergency generator during a seismic event. The County would also develop a facility management plan in accordance with applicable rules and regulations.

No-Action Alternative:

The No-Action Alternative includes no construction or modification to existing conditions, and therefore would not impact seismic hazards in the Pāhala area.

#### **4.5.5 Volcanic Hazard**

The US Geologic Survey (USGS) prepared a volcanic hazard zone map for the island of Hawai'i which was last updated in 1997. The map shows lava flow hazard zones for the five on-island volcanoes. The map utilizes a 9-point ranking system which classifies zones ranked from 1 (highest hazard) through 9 (lowest hazard) based on the probability of coverage by lava flows.

Pāhala area has been assigned a rating of Zone 3. This designates areas which are less hazardous due to their distance from recently active vents. One to five percent of areas within the Zone 3 rating have been covered by eruptions since 1800, and 15 to 75 percent have been covered within the past 750 years.

#### **Impacts and Mitigation Measures:**

All Proposed Alternatives

Based on the volcanic hazard map, the potential for damage to buildings and structures is moderate, given the distance between the Pāhala community and active vents and hazards. At this time, the County has no construction restrictions in Zone 3 areas. Thus, the volcanic hazard designation would not affect the construction and operation of the collection system or the treatment and disposal facilities. Although the potential for volcanic activity in or around Pāhala is present, the likelihood of that impact is relatively



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small. In the event of a volcanic eruption that threatens the Pāhala area, it is likely that damage would occur to residences, the treatment and disposal facility, the collection system, and other assets in the area. There are no mitigation measures to prevent the potential impacts from volcanic activity, and the impacts would be similar regardless of the location of the treatment and disposal facility or treatment system employed.

#### No-Action Alternative

The No-Action Alternative includes no construction or modification to existing conditions, and therefore would not impact volcanic hazards in the Pāhala area.

### **4.5.6 Wildfire Hazards**

Wildfires can threaten life and property, but they can also harm the environment and threaten important natural resources such as endangered species. While sometimes caused by lightning, nine out of ten wildfires are human-caused. Put simply, "wildfire" is the term applied to any unwanted and unplanned fire burning in forest, shrub or grass regardless of whether it is naturally or human induced (DEM, 2020).

All of the Hawaiian Islands are susceptible to wildfires, especially during prolonged drought and high winds. In recent years, the average annual cost to suppress wildfires in Hawai'i is about \$1,100,000 - making it a Statewide risk (DEM, 2020). The greatest danger of fire is where wildlands borders urban areas. Through August, 2018, wildfires in Hawai'i have burned 30,000 acres (about double the annual average). Historically, the majority of these fires have been directly caused by humans, either directly or by negligence. The Project Site is not located in an at risk area for wildfires; however, the community to the north of the Project Site is noted as a High Risk area for wildwire which may potentially impact the Project Area in the event of a wildfire . As further evidenced by recent events in West Maui, wildfires pose a significant threat to health and human safety, and must be taken very seriously.

#### **Impacts and Mitigation Measures:**

##### Alternatives 1 and 2

While the proposed alternatives are not anticipated to have impacts that could result in wildfire events, the Pāhala area is considered to be an area that is at high risk for wildfires. The State Department of Land and Natural Resources-Division of Forestry and Wildlife (DLNR-DOFAW) has adopted a Fire Management Handbook, which specifies its standards for prevention, pre-suppression, and suppression. The document provides a structured approach in providing for public/firefighter safety and minimizing damage to Hawai'i's environment. Funding for the fire management program is provided by the State's general fund and federal cost share programs through the U.S. Forest Service. These programs include the Rural Community Fire Protection and Rural Fire Protection and Control programs. Additionally, the DLNR-DOFAW is a key agency within the State who can trigger provisions of the Stafford Act (Fire Suppression Assistance), which



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provides for FEMA funding assistance in situations where forest and grass fires on public or private lands threaten a major disaster to communities and economies.

The package plant and related facilities would be designed according to National Fire Prevention Association (NFPA) 820 “Standard for Fire Protection in Wastewater Treatment and Collection Facilities.” In accordance with Hawai‘i Fire Department requirements, Fire Department access and water supply to the proposed WWTP site would be designed to comply with Chapter 18 of NFPA 2006 Uniform Fire Code as amended by the County.

#### Alternatives 3 and 4

The IWS systems do not include construction of facilities which would be susceptible to fire hazards.

#### No-Action Alternative

The No-Action Alternative includes no construction or modification to existing conditions, and therefore would not impact wildfire hazards in the Pāhala area.

## **4.6 Flora and Fauna**

The Pāhala community and its surrounding areas contain a variety of vascular plant species. An initial botanical field study conducted in August 2018 at the Proposed WWTP site indicated the presence of various plant species, including ornamental plants in maintained yards. Among the species observed, only two species (*Ipomoea indica* and *Waltheria indica*) are regarded as native to the Hawaiian Islands, both of which are indigenous and widely distributed. These indigenous species are not listed as threatened, endangered, or of any special concern. Additionally, the macadamia nut orchards in the area are valuable commercial botanical resources but are not considered environmentally sensitive. Cook pines (*Araucaria columnaris*) lining Maile Street along the western border are considered important elements of the local landscape.

In October 2023, a second botanical survey was conducted in the Project Area. This survey started on Maile Street near the intersection with Maoula Road and proceeded along the route of the proposed IWS lots. For the streets occupied by residential lots, the botanists walked the streets noting the plants observable in the yards to create a separate list (of mostly landscape species) to support a conclusion that few if any sensitive species are likely to occur on the Project Area. Consistent with the 2018 survey, the 2023 survey indicated the presence of various plant species, including ornamental plants in maintained yards. Among the species observed, only two species (*Ipomoea indica* and *Waltheria indica*) are regarded as native to the Hawaiian Islands, both of which are indigenous and widely distributed. The survey establish that listed species, indeed native species as only were observed are unlikely to be encountered in areas subjected to disturbance during the construction of the Proposed Action.

The general area surrounding Pāhala supports a limited range of mammalian and avian species. An initial biological field survey conducted in August 2018 at the proposed WWTP site identified terrestrial mammalian species, with the exception of the endangered Hawaiian hoary bat



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(*Lasiurus cinereus semotus*), as alien species, most of which are widespread and ubiquitous on the Island of Hawai'i. The survey did not record any mammalian species within the surveyed area. The community reported occasional use of the area for pig hunting, but there was no indication of pig (*Sus scrofa*) presence during the survey.

In October 2023, a second biological field survey was conducted for the Project Area. During this study, sign of pigs were encountered in the undeveloped area just west of the town along Maile Street. Additionally, in 2023, the study heard and observed numerous dogs (*Canis lupus familiaris*) across the neighborhood area. It is likely that one or more of the four Muridae (rats and mice) found on the Island—roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), Polynesian rat (*Rattus exulans hawaiiensis*), and European house mouse (*Mus musculus domesticus*) use resources within the general Project Area on a seasonal basis. These introduced rodents are deleterious to native ecosystems and native faunal species.

The initial avian survey conducted in August 2018 at the Proposed WWTP site identified avian species in the general area. The survey recorded a limited diversity of avian species, primarily consisting of established alien species. No native avian species were recorded during the survey. The general area occasionally witnesses the presence of endemic Hawaiian Petrel (*Pterodroma sandwichensis*) and Newell's Shearwater (*Puffinus newelli*) flying over, mainly between April and the end of November each year. These seabirds are listed as endangered and threatened, respectively, under both Federal and State endangered species statutes and are susceptible to adverse impacts from outdoor lighting, which can lead to disorientation, fallout, and injury or mortality.

The second avian survey conducted in 2023 identified total of 129 individual birds of 14 species, representing 10 separate families, was recorded during station counts. One additional species, Hawaiian Hawk (*Buteo solitarius*) was recorded as an incidental observation. The remaining 14 species recorded are commonly encountered established introduced species. The avian diversity and densities observed during the surveys are consistent with the habitats present in the area and usage of the properties. Four species—House Sparrow (*Passer domesticus*), Zebra Dove (*Geopilia striata*), Northern Cardinal (*Cardinalis cardinalis*), and Japanese White-eye (*Zosterops japonicus*)—accounted for 44% of all birds recorded during station counts over the course of the two surveys. The most frequently recorded species was House Sparrow, which accounted for 12% of the total number of individual birds recorded during station point-counts.

It is possible that the endangered Hawaiian hoary bat (*Lasiurus semotus*) uses resources within the Project vicinity. This bat is regularly seen in the Project area (David, 2023) and tall trees suitable for roosting are present here. This bat species is solitary and rare but with a widespread distribution on Hawai'i. Island. However, the bat uses multiple roosts within a home territory (Bonaccorso, 2015), so the disturbance associated with removal of any particular tree would be minimal. An exception might be during the pupping season if a female bat carrying a pup or an unattended pup is in a tree being felled, these individuals could be unable to flee the tree.

### **Impacts and Mitigation Measures:**



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*All Proposed Alternatives:*

Based on the findings of the botanical and biological field surveys, construction activities associated with the new collection system and wastewater treatment and disposal facility are not anticipated to result in adverse impacts to botanical and faunal resources in the Pāhala area.

The operations building in the 4.0-acre package plant will feature down-shielded light fixtures to minimize the potential for adverse impacts on avian species.

Prior to finalization of this EID and the selection of a preferred alternative for implementation by DEM, the DOH will conduct , consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to Section 7 of the Endangered Species Act should it be necessary. Additional impact avoidance and minimization measures recommended by FWS would consequently be incorporated in accordance with Section 7 Consultation.

It should be noted that for Alternatives 3 and 4, the area of disturbance for the proposed action will take place on private residential property. However, it is expected that Alternatives 3 and 4 will result in no impacts to botanical and faunal resources.

Generally speaking, minimization measures discussed herein are intended to minimize any potential impacts on flora and fauna that could result from the construction and operation of the wastewater treatment and disposal facility and associated infrastructure. The proactive consultation with relevant authorities ensures compliance with regulations and protection of sensitive species. Additionally, the note regarding Alternatives 3 and 4 acknowledges the unique context of disturbance on private residential property while anticipating minimal impacts.

***Seabirds***

- The Project can minimize or avoid risks to protected night-flying seabirds by not conducting night-time construction and ensuring that all associated outdoor lighting is fully shielded (Night sky compliant; HDLNR-DOFAW, 2016).

***Hawaiian Hawk***

- It is recommended that a nesting hawk survey be conducted by a qualified biologist within three days that any large stature trees are trimmed or felled to ensure that no active nest is disturbed. It is presently unclear if any such action will occur as part of this Project.

***Hawaiian Hoary Bat***

- Potential adverse impacts to Hawaiian hoary bat can be avoided or minimized by not clearing woody vegetation taller than 4.6 m (15 ft) between June 1 and September 15, the bat pupping season.



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No-Action Alternative:

The No-Action Alternative involves no modifications to the existing LCC system is not expected to impact flora or fauna.

#### **4.7 Cultural, Historical, and Archaeological Resources**

A 2016 survey of available information identified the presence of one historic site is in the vicinity of the proposed wastewater collection system. Iin Pāhala, -- the Ka'ū High and Pāhala Elementary School, is listed on the State of Hawai'i register of historic places. No other historic sites are found within the areas designated for improvements.

In November 2016, as part of the initial planning for LCC closure, a one-day archaeological field inspection was conducted on the 42.5-acre parcel, which includes the 14.9-acre area for the wastewater treatment and disposal facility. The inspection involved pedestrian sweeps of the entire 42.5-acre parcel to determine the presence of historic properties or significant archaeological features. The inspection report indicated that ground modifications carried out during the plantation period had destroyed evidence of pre-contact agriculture or settlement activities. The bulldozing associated with the creation of the macadamia nut orchard appeared to have leveled any plantation-era land features.

The 2016 inspection identified one surface artifact as the only evidence of past human activity on the 42.5-acre parcel. This surface artifacts included a single traditional artifact and numerous late post-contact artifacts. The single traditional artifact, a crudely-shaped discoidal hammerstone, was found on the ground surface near the northern edge of the plant site near Maile Street. No other cultural material, either traditional or post-contact, was observed in this area, suggesting that the hammerstone reflects an isolated artifact rather than a buried cultural deposit. Although historical ground modifications have likely limited the archaeological potential of the site, the discovery of both pre- and post-contact surface artifacts within the 42.5-acre plant parcel, as well as evidence from plantation-era documents indicating the opening of a lava tube containing human remains once existed in the southeastern corner of the parcel, suggests that further archaeological studies may be necessary before any development can commence. The 2016 inventory report recommended at least an Archaeological Inventory Survey (AIS) to fully document, map, date, and collect surface artifacts. It may also be necessary to test for the presence of subsurface cultural deposits through hand excavation or mechanical trenching.

As part of previous Environmental Assessment efforts, the County conducted an AIS of the 14.9-acre treatment and disposal facility, including subsurface testing of the effluent disposal area. To carry out this AIS, SHPD approved an AIS plan. To meet this requirement, the County submitted the AIS plan to SHPD on March 22, 2018. On April 25, 2018, SHPD requested clarification, and responses, including findings from the 2016 field survey report and a map of the proposed wastewater treatment and disposal facility, were submitted to SHPD on July 31, 2018. SHPD approved the AIS plan on August 20, 2018, and the County conducted the AIS of the 14.9-acre WWTP in September 2018.

In addition to the AIS, the County is obligated to comply with the National Historic Preservation Act (NHPA). On March 29, 2018, the County initiated consultation for this project in accordance



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with Section 106 of the NHPA. Consultation letters were sent to various Native Hawaiian Organizations, totaling 15 letters, inviting comments from organizations that may attach religious or cultural significance to properties affected by the proposed actions. A letter dated February 20, 2020 from the SHPD provides concurrence that no historic properties at the Proposed WWTP Site shall be affected, under HRS 63-8 and section 106

In 2023, an Archeological Literature Review was conducted to determine the likelihood that historic properties may be affected by the project and, based on the findings, consider cultural resource management recommendations. The literature review concluded that surface pre-contact sites are not expected within the project area given the known traditional land use in this area and the impacts of continued agricultural and residential development. The modern development of the macadamia nut orchard has likely also obliterated any plantation era sites once present in that part of the project area. Historic surface features associated with the sugar plantation and associated village may be present. Furthermore, there is potential for pre- or post-Contact subsurface archeological features within the project area, which may or may not be located within lava tubes. It should be noted that the literature review is intended to support the projects historic and environmental review process; however, the report does not fulfill the requirements of an archeological inventory survey investigation as set forth in federal and State Hawai'i historic preservation review requirements.

### **Impacts and Mitigation Measures:**

#### *All Proposed Alternatives:*

Construction activities associated with the Proposed Action may potentially disturb archaeological and cultural resources in the project area. An Archeological Inventory Survey was conducted to assess potential impacts. Potential impacts may be avoided or minimized further by performing subsurface testing to confirm the presence or absence of resources on the wastewater treatment and disposal facility site. Archaeological monitoring should also be implemented during IWS installation and maintenance.

If any archaeological sites or remains are encountered during construction, work shall cease immediately, and SHPD shall be contacted to assess the significance of the find and recommend appropriate mitigation measures, if necessary.

A letter dated February 20, 2020 from the SHPD provides concurrence that no historic properties shall be affected, under HRS 63-8 and section 106. It is advised that the County seek to consult with SHPD in regard to Alternatives 3 and 4 in accordance with HRS Chapter 6E requirements, and in relation to Section 106 of the National Historic Preservation Act (NHPA) – if triggered – and, to incorporate additional impact avoidance and minimization measures if required for the construction of the IWS.

#### *No-Action Alternative:*

The No-Action Alternative does not involve any new construction or disturbance of land, and therefore, it does not result in impacts on archaeological and cultural resources.



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No specific mitigation measures related to archaeological and cultural resources are required for this alternative.

These revised mitigation measures address the potential impact of archaeological and cultural resources for all five alternatives, including the need for Archaeological Inventory Surveys (AIS) and archaeological monitoring in Alternatives 3 and 4. Please let me know if you need further adjustments or information.

## **4.8 Air Quality and Odors**

The project area falls within the purview of ambient air quality standards (AAQS) at both national (NAAQS) and state levels, encompassing the criteria pollutants, including carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, ozone, and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>). It is noteworthy that the State of Hawaii has standards that align with national standards in terms of stringency. The Hawaii Department of Health (DOH) operates an extensive network of air quality monitoring stations across the state, ensuring that criteria pollutant levels have consistently remained below both federal and state AAQS thresholds throughout the state, including the Pāhala area.

Existing air quality within the Pāhala area is primarily influenced by various sources of air pollutants, encompassing vehicular emissions, industrial activities, natural processes, and agricultural practices. Additionally, the region is subject to periodic air quality fluctuations resulting from volcanic emissions originating from Kīlauea Volcano. The concentration of volcanic smog, locally known as "vog," within the area hinges on several factors, including the volume of sulfur dioxide (SO<sub>2</sub>) emissions from Kīlauea, wind patterns, and prevailing atmospheric conditions. It is pertinent to note that volcanic emissions are categorized as natural events, and in certain circumstances, exceedances of the 1-hour NAAQS attributable to volcanic emissions might be excluded from considerations regarding air quality attainment.

The Pāhala area, characterized by its rural nature, does not feature major stationary sources of air pollution. Furthermore, the relatively low volume of vehicular traffic along Māmalahoa Highway and within the community itself serves to limit the contribution of mobile sources of emissions to air quality concerns.

### **Impacts and Mitigation Measures:**

#### ***Alternatives 1 and 2 - Package Plant:***

During the construction phase of the wastewater collection system and treatment facility associated with Alternative 1, short-term impacts on air quality may manifest as fugitive dust emissions resulting from construction activities. These emissions would be effectively managed through the implementation of a comprehensive dust control plan. Measures within this plan would encompass the application of water to active work areas, the use of wind screens, vigilant maintenance of adjacent roads to prevent dust buildup, and the covering of open-bodied trucks. It is plausible that exhaust emissions from mobile construction equipment, in conjunction with traffic disruptions associated with construction activities, could exert a minor influence on air quality during this phase.



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As previously discussed, the PER recommended a granular activated carbon (GAC) scrubber be used at the Pahala WWTP headworks. A GAC scrubber passes odorous air through a bed of activated carbon, which absorbs the odorous constituents within the pore spaces of the carbon.

Chemical oxidation or reduction of some compounds can also occur. As pore spaces become occupied, efficiency degrades, and the carbon must be replaced or regenerated. Carbon is most effective on higher molecular weight molecules such as the organic sulfur compounds, which makes it the technology of choice. Package GAC scrubbers are available for small headworks and vessels can be situated vertically, horizontally or radially to optimize footprints and reduce structure elevation profiles. The County currently operates GAC scrubbers at other facilities and purchases the GAC media in bulk, which reduces costs.

Once construction has been completed, emissions will occur from the daily visits to the WWTP by a plant operator who could be based at the Hilo WWTP or at the Kealakehe WWTP in Kona. Also, emissions would occur from trucks used to haul the solids to the County West Hawai'i Sanitary Landfill at Puuanahulu, located north of Kailua Kona. These trips are not expected to exceed federal or state ambient air quality standards for criteria pollutants. The presence of an emergency standby diesel-powered generator, operated periodically for testing and during power outages, is unlikely to have a significant adverse impact on air quality.

*Alternatives 3 and 4 - Individual Wastewater System Program:*

Air quality impacts for Alternatives 3 and 4 primarily relate to the installation and maintenance of the IWS by homeowners. These activities may yield minor emissions associated with construction equipment and vehicles. However, any potential air quality impacts would be transient and localized to specific residential areas. Additionally, there is a slight risk of odors emanating from maintenance activities or system breakages within the IWS. Homeowners would be responsible for managing and mitigating these potential odors.

*No-Action Alternative:*

The No-Action Alternative entails no modifications to the existing LCC system and, therefore, is not projected to introduce new air quality impacts to the Pāhala area. Historical air quality records indicate that the area has consistently met ambient standards during the operation of the existing LCCs.

## **4.9 Noise**

The existing noise environment in the Pāhala area is primarily characterized by the natural sounds of the rural surroundings, which include ambient sounds from vegetation, wildlife, and intermittent vehicular traffic on Māmalahoa Highway and local streets. Noise levels in rural areas like Pāhala are typically lower than in urban or industrial areas.



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## Impacts and Mitigation Measures

### Alternatives 1 and 2 - Package Plant:

During the construction of the wastewater treatment facilities and collection systems, it is anticipated that there will be an increase in noise levels associated with the operation of heavy machinery, construction equipment, and from potential increased vehicle traffic. These construction activities can generate temporary noise impacts in the project area.

To minimize construction-related noise impacts, the project can implement standard noise control measures such as scheduling construction activities during daytime hours, avoiding noisy activities during quiet hours (e.g., evenings and weekends), and employing noise barriers or sound-reducing equipment where feasible.

While construction may introduce short-term noise, the continuous operational noise from these facilities is generally localized and can be controlled with noise-reducing measures. Transportation noise may be minimal as wastewater can be treated onsite.

The operational phase of the wastewater treatment facilities may introduce continuous noise sources, such as equipment operation, pumps, and mechanical systems. While these noise sources are generally not excessively loud, they can contribute to ambient noise levels in the immediate vicinity of the facilities.

To address operational noise, the project can consider noise-reducing designs for the treatment facilities, such as noise barriers or acoustic enclosures for noisy equipment. Additionally, maintenance schedules can be optimized to minimize noisy activities during sensitive times.

Vehicle traffic associated travel to the Pāhala WWTP by plant operators and with trucks needed to remove solids, based on the location of package plant would not affect noise in the residential areas.

### Alternatives 3 and 4 - Individual Wastewater System Program:

During construction of the IWS, it is anticipated that there will be an increase in noise levels associated with the operation of heavy machinery, construction equipment, and due to vehicle traffic. These construction activities can generate temporary noise impacts in the project area.

To minimize construction-related noise impacts, the project can implement standard noise control measures such as scheduling construction activities during daytime hours, avoiding noisy activities during quiet hours (e.g., evenings and weekends), and employing noise barriers or sound-reducing equipment where feasible.

The installation and maintenance of the IWS may result in localized noise during construction and maintenance activities. However, these impacts are distributed across multiple resident properties.



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No-Action Alternative:

This alternative maintains the existing LCC system. While it avoids construction-related noise, it may not address long-term noise concerns associated with the aging infrastructure.

## **4.10 Energy and Natural Resources**

### **4.10.1 Energy Sources**

The Pāhala area relies on a mix of energy sources for electricity, including fossil fuels (e.g., oil) and renewable sources (e.g., solar and wind). The specific energy mix can vary over time and may be influenced by state and county policies promoting renewable energy.

Although the integration of renewable energy sources to reduce reliance on fossil fuels and promote sustainability can be considered, WWTP facilities typically rely on a consistent source power. Also, the package plant site plan has been designed to minimize the affected land area. Renewable energy sources would require a greater land area which would mean removal of additional macadamia nut trees.

### **Impacts and Mitigation Measures**

All Proposed Alternatives:

The construction and operation of wastewater treatment facilities will require energy inputs. Construction equipment, pumps, aeration systems, and other mechanical components consume energy during installation and operation.

Implementing energy-efficient technologies and practices during facility construction and operation can help reduce energy consumption.

Additionally, the feasibility of incorporating renewable energy systems into the wastewater treatment facilities to reduce carbon emissions and energy costs should be evaluated.

No-Action Alternative:

This alternative maintains the existing LCC system which may not address long-term energy consumption associated with the aging infrastructure.

### **4.10.2 Land Use and Land Use Plans**

The existing land use in the project area includes residential, agricultural, and undeveloped land. Agricultural activities, such as macadamia nut farming, are important for the local economy. The Project Area is located within the Urban and Agricultural State Land Use Districts. As such, the



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Proposed Action would be required to comply with the regulations set forth in the State Land Use Law (HRS, Chapter 205).

Furthermore, the County of Hawai'i General Plan calls for the preparation of community development plans (CDPs) "to translate the broad General Plan statement to specific actions as they apply to specific geographical areas."

The Ka'ū CDP is one of nine CDPs for Hawai'i County. On October 17, 2017, the Ka'ū CDP was adopted as Ordinance No. 2017-66. The purpose of CDPs is to implement the broad goals within the General Plan on a regional basis and to translate the broad General Plan statements into specific actions. CDPs are the forum for community input into managing growth and coordinating the delivery of government services to the community. CDPs designate detailed development patterns and direct physical development and public improvements by detailing land use policies and infrastructure priorities.

Section 5 of the CDP prioritizes improvements in infrastructure, facilities, and services, including Section 5.8 applicable to Environmental Management which states:

"Environmental management facilities, including expanded sewer lines, the Ocean View transfer station, green waste facilities, and improvements in the Pāhala transfer station

Policy 120 Extend the primary wastewater collection lines in Pāhala and Nā'ālehu so that infill development projects can connect wastewater systems built for new subdivisions to the County systems."

The collection system will be consistent with Policy 120 as the improvements for the Pāhala LCC Replacement Project have been designed not to preclude expansion to accommodate the Pāhala community. Similarly, the wastewater treatment and disposal facility has been designed not to preclude expansion to accommodate the future needs of the Pāhala community. Future subdivisions would be accommodated, as capacity allows, on a first-come, first-served basis.

### **Impacts and Mitigation Measures**

#### ***Alternative 1 – Package Plant:***

Construction activities will result in land disturbance, affecting natural habitats and agricultural areas. Minimizing the affected area will act to footprint of construction activities and implementing erosion control measures can help mitigate land disturbance impacts. These centralized facilities may require significant energy inputs for treatment and transportation of wastewater. However, they offer opportunities for energy efficiency improvements and the integration of renewable energy sources.

The collection system has been designed allow flows from additional residential areas to the north and east to reach the treatment and disposal facilities. The package plant site plant has been designed to allow additional treatment capacity. Thus, Alternative 1 would be consistent with the Ka'ū CDP.



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### *Alternative 2*

Although the package plant in Alternative 2 would allow additional facilities, use of existing collection system would not allow flows from the residential areas to the north and east to connect to the package plant and treatment disposal system.

### *Alternatives 3 and 4 – Individual Wastewater System Program:*

Construction activities can result in land disturbance, affecting natural habitats and will affect the residential parcels, including affecting existing buildings, structures and landscaping. Minimizing the footprint of construction activities and implementing erosion control measures can help mitigate land disturbance impacts.

These alternatives are designed to use gravity flows which will mean lower energy demands compared to centralized facilities.

### *No-Action Alternative:*

The existing LCC system will not require energy consumption. No significant changes in energy use are anticipated with this alternative.

## **4.11 Roadways and Traffic**

The existing roadway and traffic conditions in the Pāhala area provide essential context for assessing the impacts and mitigation measures associated with the proposed wastewater treatment project. Key considerations include:

**Road Network:** Pāhala is served by a network of roadways which are under the jurisdiction of the County and include Māmalahoa Highway, a state facility. The local streets provide access to residences, businesses, and community facilities.

**Traffic Volume:** The traffic volume on Māmalahoa Highway and local roads in Pāhala is generally low, reflecting the rural nature of the area. Limited vehicular traffic contributes to low levels of congestion and a relatively peaceful road environment.

**Access to Project Sites:** The proposed project sites, including the preferred location for the wastewater treatment and disposal facility, are accessible via the existing road network. Consideration of the impact of construction and operational traffic on local roads is necessary.

**Safety:** Road safety is a critical concern in the area. Ensuring the safety of residents, commuters, and workers during construction and operation is a primary focus. Safety measures may include signage, flaggers, and traffic control measures as needed.

### **Impacts and Mitigation Measures:**

#### *Alternatives 1 and 2 – Package Plant:*



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During the construction phase of the wastewater treatment project, temporary disruptions to traffic flow on local roads may occur. Mitigation measures include the development of traffic management plans to minimize construction-related traffic impacts. These plans may include designated construction access points, scheduling work during off-peak hours, and flaggers to ensure safe traffic flow.

The influx of construction vehicles, equipment, and workers to the project sites may result in increased traffic volume on local roads. To mitigate this, construction logistics planning should aim to minimize the impact on existing road users and ensure the safety of all road users.

Safety measures, such as signage, temporary speed limits, and traffic control personnel, will be employed as necessary during construction activities to maintain the safety of both workers and the local community.

As part of the project, any necessary upgrades or improvements to local roads or intersections impacted by construction activities will be considered and implemented. This may include road repairs, resurfacing, or other enhancements to ensure the continued integrity of roadways.

During the operation of the wastewater treatment facility, regular visits by facility operators are expected. While these visits would introduce minimal traffic, safety remains a priority, and any potential traffic impacts will be mitigated through adherence to established safety protocols.

Continuous monitoring of traffic conditions and adherence to traffic management plans will be essential to address any unforeseen issues promptly. Compliance with local traffic regulations and safety standards will be enforced throughout the project's lifecycle.

In summary, the existing road network in Pāhala serves as the backdrop for assessing potential impacts and mitigation measures associated with the proposed wastewater treatment project. During both the construction and operation phases, careful planning, safety measures, and infrastructure improvements will be implemented to minimize disruptions and maintain the safety and functionality of local roadways.

Additionally, the new collection system or methods of integration with the existing collection system may require careful planning and engineering to ensure compatibility and minimize impacts on the existing infrastructure.

*Alternatives 3 and 4 - Individual Wastewater System Program:*

Unlike the centralized package plant options, this alternative involves the installation and maintenance of the IWS at each residence within the service area. Logistically, this can be challenging due to the need for coordination with numerous property owners.

Obtaining access to private properties and ensuring compliance with installation and maintenance requirements for IWS may pose logistical hurdles. Coordinating schedules



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and ensuring proper installation and maintenance become complex tasks; however, it should be noted that septage trucks would only need to visit each property every three to five years to pump the septic tanks.

The ongoing operation and management of multiple individual systems can be logistically complex. Ensuring that all systems meet required standards and addressing any issues promptly is a continuous endeavor.

No-Action Alternative:

**Maintenance of Existing Infrastructure:** Under the No-Action Alternative, there would be no changes to the existing infrastructure. While this avoids the logistical challenges of new construction, it doesn't address potential issues with the aging LCC system.

**Long-Term Considerations:** Continuing with the existing system may provide short-term stability, but it may not be a sustainable long-term solution for wastewater treatment in the area.

## **4.12 Hazardous Materials**

The existing conditions in Pāhala regarding hazardous materials primarily pertain to the operation of the Pāhala LCCs, which historically managed wastewater treatment for the community. No chemicals are currently being used for treatment at the Pāhala LCCs, however, wastewater treatment processes generate residual waste, including sludge and biosolids. Proper management and disposal of these materials are essential to prevent environmental contamination.

Impacts and Mitigation Measures:

All Proposed Alternatives

The impacts and mitigation measures related to hazardous materials are primarily associated with the closure of the Pāhala LCCs and the transition to alternative wastewater treatment methods:

- As the LCCs cease operation, residual waste, such as sludge and biosolids, must be managed appropriately. Mitigation involves planning for the safe removal and disposal of these materials to prevent adverse environmental impacts.
- Depending on the condition of the LCC sites, remediation efforts may be required to address any soil or groundwater contamination resulting from historical operations. Remediation plans and measures will ensure that the sites are restored to acceptable environmental standards.



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- For proposed alternative wastewater treatment methods, any hazardous materials or chemicals used in the new treatment processes would be subject to stringent safety protocols, handling procedures, and storage requirements. Mitigation measures include compliance with safety regulations and ongoing staff training.

Continuous monitoring of the environment by the homeowners, including soil and water quality, will be essential to detect any potential impacts related to hazardous materials. Mitigation measures involve the implementation of robust monitoring programs to promptly address any issues that may arise.

The closure of the Pāhala LCCs and the transition to alternative wastewater treatment methods in Pāhala require careful management of hazardous materials and chemicals to prevent adverse environmental impacts. Proper disposal, remediation, and adherence to safety protocols are crucial mitigation measures to ensure the safe and responsible handling of hazardous materials throughout the project's lifecycle.

*No-Action Alternative:*

The No-Action Alternative does not involve any new construction or modification of the existing sewage system; however, this would not allow the County to meet the requirements of the AOC and SDWA.

#### **4.13 Socioeconomics & Environmental Justice**

In December 2022, the State of Hawai'i Department of Business, Economic Development and Tourism released 2021 population estimates for the state and counties. This analysis estimates that Hawai'i County had a resident population of 200,648 persons in 2021, which represents an annual increase of 1.01 percent from the 2016 population.

The U.S. Census Bureau provides the American Community Survey (ACS) for Census Designated Places, which updates selected demographic, social, and economic information for various years. The ACS shows age distribution, racial composition, and economic information, including employment and household income by Census Designated Place for various locations in Hawai'i County. The version of the ACS referenced is the 2021 5-Year Estimates, released in December 2022. See Table 4.1 below.

The ACS shows the Pāhala population has a much younger age distribution compared to Hawai'i County, especially in the proportion of individuals in the "Under 5 to 19" age category, 33.0 percent compared to 23.6 percent for the County. This proportion applies to all age groups, except for the 35 to 59 and the 60 to 74 age groups. The median age for Pāhala is 27.0 years compared to 43.0 years for the County.

Overall, Pāhala is characterized by a racial composition that includes a greater proportion of minorities compared to the County. The Pāhala racial distribution includes a much lower proportion of White residents, a much higher proportion of Filipino residents, and lower



populations of other minority groups, including Native Hawaiians when compared to the County. There are also more residents of two or more races in Pāhala than in the County.

**Table 4.1  
Demographic, Economic and Social Characteristics of Pāhala and Hawai'i County**

Item	Pāhala		Hawai'i County	
	Total	Percent	Total	Percent
<b>Demographic Characteristics</b>				
Total Population	2,210		200,468	
Under 5 to 19 years	730	33.0	47,349	23.6
20 to 34 years	602	27.2	33,056	16.5
35 to 59 years	493	22.3	61,169	30.5
60 to 74 years	285	12.9	43,854	21.9
75 years and older	100	4.5	15,040	7.9
Median age	27		43	
<b>Race</b>				
White	388	17.6	65,306	32.6
African American (inc American Indian/Alaska Native)	0	0.0	2,608	1.3
Chinese	0	0.0	2,911	1.5
Filipino	555	25.1	19,111	9.5
Japanese	46	2.1	16,179	8.1
Korean	0	0.0	888	0.4
Other Asian	60	2.7	5,172	2.6
Native Hawaiian	65	2.9	18,333	9.1
Other Pacific Islander	33	1.5	5,765	2.9
Some other race	0	0.0	4,586	2.3
2 or more races	1,063	48.1	59,754	29.8
<b>Social/Educational Characteristics</b>				
Less than 9th grade	78	6.2	3,289	2.3
High School to High School Graduate	526	42.1	49,116	34.3
Some college to associate degrees	386	30.9	47,704	33.3
Bachelor degree	227	18.2	27,845	19.4
Graduate/professional degree	32	2.6	15,395	10.7
<b>Household Income Characteristics</b>				
Less than \$24,999	129	25.0	13,462	18.9
\$25,000 to \$49,999	106	20.5	13,039	18.3
\$50,000 to \$99,999	156	30.2	21,696	30.4
\$100,000 to \$199,999	91	17.6	17,775	24.9
\$200,000 or more	35	6.8	5,430	7.6
Median household income	\$54,293		\$68,399	
<b>Employment Characteristics</b>				
Agriculture, forestry, fishing and mining	268	32.4	4,357	4.9
Construction	14	1.7	7,051	7.9
Manufacturing and wholesale trade	188	22.7	3,920	4.4
Retail trade	37	4.5	10,881	12.2
Transportation, warehousing, and utilities	19	2.3	3,679	4.1
Information tech, finance, insurance and real estate	31	3.7	6,140	6.9



Professional, scientific and technical services	41	5.0	10,366	11.6
Education and health care	117	14.1	19,354	21.7
Arts, entertainment and recreation	100	12.1	14,078	15.8
Other services, public administration	12	1.5	9,493	10.6

Pāhala has a higher proportion of residents that have completed high school and some college than the County overall, but a slightly lower proportion with college degrees (bachelor's and graduate or professional degrees). From an economic perspective, Pāhala generally has more households in lower income brackets than the County, and a lower median household income.

Lastly, Pāhala had a higher proportion of employment in agriculture, forestry, fishing, hunting, and construction (32.4 percent), and in manufacturing and wholesale trade (22.7 percent) compared to the County (4.9 percent) and 4.4 percent respectively. Pāhala had a lower proportion in education and health care (14.1 percent), compared to the County (21.7 percent).

A subset of social resources is environmental justice. Environmental justice considers sensitive populations, such as children, minorities, and low-income communities. Sensitive populations are identified in two Executive Orders (EOs):

- EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, serves to avoid the disproportionate placement of adverse environmental, economic, social, or health impacts from federal actions and policies on minority and low-income populations.
- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, states that federal agencies will identify and address environmental health and safety risks from their activities, policies, or programs that may disproportionately affect children.

As noted above and in Table 4.1, Pāhala has a higher proportion of low-income, minority, and children residents as compared to the County as a whole. For purposes of this assessment, and to correspond with the available ACS demographic characteristic data, "low income" is defined as having a household income of less than \$24,999; "minority" is defined as any race population other than White; and "children" is defined as the "Under 5 to 19" age category.

*Alternatives 1 and 2 - Package Plant:*

In the short term, construction projects would require a number of contractors and their subcontractors. Construction contract documents would reference HRS 103B, which requires the contractor (including subcontractors) to include not less than 80 percent Hawai'i residents in the work force. This would limit the importation of workers from outside the local area and the associated increase in demand for local housing.



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The Alternative 1 would generate employment as the contractor would need workers to undertake construction of the improvements for the wastewater collection system and the WWTP and effluent disposal facility. This employment would generate wages and salaries paid to the contractor and subcontractor work forces. The wages and salaries paid to the work force would in turn generate purchases of goods and services, which would result in taxes paid to the State of Hawai'i. In addition, the contractor and their subcontractors would need to purchase equipment, supplies, and materials, some of which would be purchased from local suppliers and vendors. Direct purchases of equipment, supplies, and materials by the contractor would also generate taxes. Overall, Alternative 1 would result in positive employment benefits which would result in higher levels of income and overall economic benefits to the local economy.

The Alternative 1 is not likely to directly impact long-term employment or education trends since the wastewater plant operator would likely be based in Hilo or Kona, meaning the project would not involve long-term relocation of any staff to Pāhala. Additionally, Alternative 1 wastewater collection system and treatment and disposal facility would not be designed to encourage or accommodate substantial population growth in Pāhala.

*Alternatives 3 and 4 - Individual Wastewater System Program:*

Construction of the IWS would also create the need for workers construct the septic system including the absorption bed or seepage pits. Since the IWS would not involve the complex treatment processes, the level of employment could be lower than Alternative 1 or 2. However, to construct over 100 IWS would require multiple crews or contactors. Overall, the economic impact may be similar to Alternatives 1 and 2.

*No-Action Alternative:*

The No-Action Alternative does not involve any new construction or modification of the existing sewage system, and therefore, it is not expected to impact socioeconomic or demographic conditions in the Pāhala area.

No specific mitigation measures related to socioeconomic characteristics are required for this alternative.

These adapted impacts and mitigation measures address the potential socioeconomic impacts for all five alternatives, emphasizing employment and economic benefits while considering sensitive populations. Please let me know if you need further adjustments or information.

*All Proposed Alternatives:*

Despite the relatively high proportions of low-income, minority, and children residents in Pāhala compared to the County overall, the proposed alternatives would not result in disproportionately high and adverse human health or environmental effects on the minority or low income populations. The design and location of the proposed wastewater treatment and disposal facility would minimize odor and air quality impacts. Construction



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of the wastewater collection system would result in intermittent and unavoidable noise from construction vehicles and equipment within the Pāhala community, including noise associated with the removal of bedrock. However, as discussed in Section 3.18.2, construction activities within the community would comply with provisions of HAR 11-46 (Community Noise Control). This includes obtaining a noise permit for any activities that would generate noise exceeding the permissible sound levels specified in HAR 11-46. The permit would limit excessive noise sources to daytime hours; would require the use of best available control technology to control noise levels from excessive noise sources; and would require the applicant to notify affected members of the public in advance of any planned nighttime construction activity (which must not exceed the permissible sound levels). Overall, the proposed alternatives are expected to result in positive human health and environmental effects to Pāhala residents by providing a cleaner and longer-lasting wastewater treatment system.

Concerns regarding the financial impact of the project on individual newly accessible property owners (due to the requirement to connect to the new wastewater collection system, per HCC § 21-5) were raised by the community during the December 2017 public meetings and also echoed at the the October 2018 public meeting for the previous Draft EA. Although not required by HAR 11-200, the County voluntarily convened an additional public meeting on March 21, 2019 to gain further input from newly accessible property owners and fulfill a County commitment made in October 2018 to research and provide financing options available to owners of parcels that would become newly accessible to the County collection system. Available programs discussed included:

- U.S. Department of Housing and Urban Development (HUD) with County of Hawai'i Office of Housing and Community Development Residential Repair Program – Community Block Grant Program, and
- U.S. Department of Agriculture – Rural Development (USDA-RD) Program.

As noted during the March 2019 presentation, these programs may change in the coming years and additional options may be added to this preliminary list. Hawai'i Legislature, Senate Bill 221 SD1, which could amend HRS 342D to establish a low-interest loan program offering financial assistance to cesspool owners to connect to wastewater treatment systems approved by the DOH, was also discussed; however, this bill was subsequently not passed during the 2019 legislative session.

Abandonment of the two LCCs, and abandonment of the existing wastewater collection system would have no impact on socioeconomic resources within Pāhala.

#### **4.14 Sustainability**

The concept of sustainability is vital in understanding the environmental, economic, and social conditions in Pāhala and its surrounding areas. Sustainability encompasses the balance between meeting the needs of the present without compromising the ability of future generations to meet their own needs. In the context of Pāhala, several factors influence the existing conditions related to sustainability:



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Pāhala's environmental sustainability is influenced by its unique natural surroundings, including its proximity to the Kīlauea Volcano and the potential impact of volcanic activity on air and water quality. The region's lush vegetation and agricultural activities contribute to its environmental diversity.

The local economy in Pāhala is characterized by agriculture, including macadamia nut farming, which has been a significant contributor to the region's economic sustainability. Additionally, employment opportunities in education and healthcare play a role in the local economy.

Pāhala's community is diverse, with residents from various racial backgrounds, including a significant Filipino population. The region's social sustainability is influenced by factors such as education levels, access to healthcare services, and community engagement.

### **Impacts and Mitigation Measures:**

#### *Alternatives 1 and 2 - Package Plant:*

The construction of a new wastewater collection system and treatment facility may have short-term environmental impacts, such as soil disturbance and potential disruption of local ecosystems. Mitigation measures include adherence to environmental regulations and best construction practices to minimize ecological disturbances.

The construction phase is expected to generate employment opportunities, contributing positively to economic sustainability in the short term. Long-term economic impacts include the potential for increased economic activity due to improved wastewater infrastructure.

Minimal direct social impacts are expected during construction. The long-term social benefits include improved access to wastewater services, contributing to the overall quality of life and social sustainability.

#### *Alternative 3: Individual Wastewater System-Maintenance Contract Model*

The installation and maintenance of the IWS may have minimal environmental impacts, mainly related to construction activities. Mitigation measures involve adherence to environmental regulations during installation.

This alternative provides opportunities for local residents to participate in the installation and maintenance of IWS, potentially benefiting economic sustainability at the community level.

The social impacts are localized, involving homeowners and their immediate surroundings. The long-term social benefit includes improved wastewater systems for individual households, enhancing overall social sustainability.

#### *Alternative 4 - Individual Wastewater System-Operating Permit to Homeowners:*



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Similar to Alternative 3, this alternative's environmental impacts are mainly related to the installation and operation of the IWS. Mitigation measures include compliance with environmental regulations.

The economic impacts are similar to Alternative 3, with opportunities for local participation in IWS installation and maintenance, supporting economic sustainability at the community level.

The social impacts are localized, involving homeowners and their immediate communities. The long-term social benefit includes improved wastewater systems for individual households, enhancing social sustainability.

*No-Action Alternative:*

This alternative maintains the existing conditions, resulting in minimal changes to the environment.

The economic impacts of the No-Action Alternative are limited, as it does not involve new construction or economic development related to wastewater infrastructure.

This alternative does not introduce significant social changes, as it maintains the status quo in terms of wastewater services and community conditions.

Overall, each alternative has varying short-term and long-term impacts on environmental, economic, and social sustainability in Pāhala. Mitigation measures and adherence to regulations are essential to minimize adverse effects and enhance the region's overall sustainability.

#### **4.15 Human Health And Safety**

In Pāhala, as in any community, access to adequate wastewater treatment services is a fundamental necessity for maintaining public health and environmental quality. Existing conditions reveal the following:

- Proper wastewater treatment is vital for safeguarding public health. Inadequate treatment can result in the contamination of groundwater and surface water, posing risks to drinking water sources and recreational areas. It can also lead to the spread of waterborne diseases.
- Effective wastewater treatment is essential for preserving the local environment. Uncontrolled discharge of untreated sewage can harm aquatic ecosystems, damage coral reefs, and degrade coastal waters, impacting the region's biodiversity and natural beauty.
- Reliable wastewater treatment infrastructure contributes to the overall well-being of the community. It ensures that residents can enjoy a safe and healthy environment and minimizes nuisances such as foul odors and unsightly conditions associated with inadequate treatment.

*The Closure of the LCCs and Improved Services*



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The closure of the LCCs and the proposed wastewater treatment alternatives aim to address existing challenges and improve wastewater treatment services in Pāhala:

- The closure of the LCCs signifies a shift towards more modern and effective wastewater treatment methods. The proposed alternatives include advanced treatment processes that can remove a higher percentage of contaminants from wastewater, resulting in cleaner effluent.
- Improved wastewater treatment aligns with the community's commitment to environmental stewardship. By ensuring that treated effluent meets stringent quality standards, the closure of the LCCs supports the conservation of local ecosystems and marine life.
- The closure of the LCCs and the adoption of alternative wastewater treatment methods provide significant public health benefits. Treated wastewater reduces the risk of waterborne diseases and protects the health of residents and visitors.
- Adequate wastewater treatment services contribute to community satisfaction and quality of life. Residents can enjoy a cleaner and healthier environment, which, in turn, can have positive social and economic impacts on the community.

The closure of the LCCs represents a critical step toward enhancing wastewater treatment services in Pāhala. It reflects the community's commitment to protecting public health, conserving the environment, and improving overall community well-being. The proposed alternatives offer modern and effective solutions to ensure that wastewater is treated to the highest standards, addressing the pressing need for adequate wastewater treatment in the area.

## **Impacts and Mitigation Measure**

### *All Proposed Alternatives*

The Pāhala LCC Closure project would not result in construction of new above-ground infrastructure within the 500-year floodplain. Although a small portion of the proposed collection system is located within the 500-year floodplain, the associated trenching operations would be temporary and would not alter the 500-year floodplain. Thus, no impacts to the existing floodplain are expected from the Proposed Action. For information related to stormwater management and impacts, please refer to Section 3.23.

Abandonment of the two LCCs and the existing wastewater collection system would not affect floodplains within the affected areas.

### *No-Action Alternative*

The No-Action Alternative, specifically the continued operation of LCC 1, could lead to impacts during a flooding event. LCC 1 is located very close to an area mapped as within the 0.2-percent annual chance (500-year) floodplain. The existing collection system is substandard and in poor condition. A large flood could potentially cause the collection system and/or LCC to overflow as a result of stormwater inflow and result in an



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uncontrolled release of raw sewage, thus potentially contaminating flooded areas and creating a public health hazard.

#### **4.16 Unresolved Issues**

This EID serves to assess the anticipated environmental impacts of each alternative on various environmental resources; however, there are still several unresolved issues that may affect the completion of the project under any of the Proposed Alternatives.

##### *Construction Feasibility*

Many of the lots in Pahala may be too small to construct individual septic systems, and for those that could accommodate a septic tank, the soils may have percolation rates that are too slow to allow for seepage pits based on HAR 11-62-34 regulations. Residents with insufficient space for a seepage pit may need to import fill soil to create elevated mound systems or convert to household aerobic treatment units.

Additionally, as discussed throughout the EID, the IWS recommended by the PER also requires the installation of a septic tank with an absorption bed. The PER further outlines that this absorption shall not be installed on lands with a slope gradient of greater than 8 percent. In light of this, some lots may be better served by an IWS featuring a seepage pit which may only be permitted when it can be demonstrated that an alternative means of disposal was not possible.

##### *Access to Properties*

Under Alternative 3, the County will fund, design, and manage project. Obtaining Right of Entry (ROE) to private properties for various purposes, such as infrastructure development or land surveys, can present several challenging issues. The process often involves negotiation, legal considerations, and respect for property rights. Failing to clarify these issues can lead to legal disputes and project delays. The most straightforward way to gain ROE is through the voluntary consent and permission of property owners. However, some property owners may be unwilling to grant access due to concerns about privacy, property damage, or other reasons.



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## 5. References

- Atlas of Hawaiian Watersheds & Their Aquatic Resources, Island of Hawaii, Bishop Museum & Division of Aquatic Resources. 1262 p. (3 volumes). Parham, J.E., G. R. Higashi, E. K. Lapp, D.G. K. Kuamo'o, R. T. Nishimoto, S. Hau, J. M. Fitzsimons, D. A. Polhemus, and W. S. Devick. 2008.
- County of Hawai'i, Planning Department. County of Hawai'i General Plan. Ordinance No. 05-025. February 2005.
- County of Hawai'i, Planning Department. Ka'ū Community Development Plan, Draft for Public Review. March 2015.
- County of Hawai'i, Planning Department. 2017 Ka'ū Community Development Plan, Ordinance 2017-66. October 2017.
- County of Hawai'i, Department of Environmental Management. Final Environmental Assessment – Finding of No Significant Impact, the Nā'ālehu-Pāhala Large Capacity Cesspool Conversion. August 2007.
- US Environmental Protection Agency and County of Hawai'i, Department of Environmental Management. Final Environmental Assessment for the Pāhala Large Capacity Cesspool (LCC) Replacement Project, EPA Grant XP-96942401. February 2020.
- County of Hawai'i, Department of Environmental Management. Pāhala Large Capacity Cesspool Closure Project, Revised Preliminary Engineering Report. April 2023.
- County of Hawai'i, Department of Public Works. Final Environmental Assessment and – Finding of No Significant Impact, Ka'ū Gym and Shelter, Pāhala, Ka'ū District. April 2012.
- Executive Order No. 11990, 42 FR 26961, 3 CFR, p. 121, 1977, as amended by Executive Order No. 12608, 52 FR 2923, 1987.
- Executive Order No. 11988, 42 FR 26951, 3 CFR, p. 117, 1977, as amended by Executive Order Nos. 12148, 44 FR 43239, 3 CFR, p. 412, 1979 and 13690, 81 FR 57401, 44 CFR 9, p. 57401, 2016.
- Executive Order No. 12898, 59 FR 7629. 1994.
- Hawai'i County Code 1983 (2016 Edition, as amended). Chapter 21. Sewers Hawai'i County Code 1983 (2016 Edition, as amended). Chapter 25. Zoning Hawai'i Revised Statutes, Chapter 205, Land Use Commission. 2017.
- National Oceanic and Atmospheric Administration (NOAA). 2002. Department of Commerce, National Oceanic and Atmospheric Administration. 50 CFR 600. Magnuson-Stevens Act Provisions; Essential Fish Habitat (EFH). Federal Register Volume 67, Number 12 (Thursday, January 17, 2002) 2343-2483.
- National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NOAA-NMFS). 2007. Magnuson-Stevens Fishery Conservation and Management Act, Public Law 94- 265, as amended by the Magnuson-Stevens Fishery Conservation and Management



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- Reauthorization Act (P.L. 109-479), an act to provide for the conservation and management of the fisheries, and for other purposes. 16 U.S.C. § 1801-1884.
- State of Hawai'i. Department of Agriculture. 2012 Census of Agriculture – County Data 2012.
- State of Hawai'i. Department of Health. Annual Summary 2015 Air Quality Data. December 2016.
- State of Hawai'i. Department of Health. Noise Reference Manual – Big Island Edition. Revised July 2017.
- State of Hawai'i. Hawai'i Administrative Rules, Title 11 (Department of Health), Chapter 23 (Underground Injection Control). October 11, 2011.
- State of Hawai'i. Hawai'i Administrative Rules, Title 11 (Department of Health), Chapter 46 (Community Noise Control). September 1996.
- State of Hawai'i. Hawai'i Administrative Rules, Title 11 (Department of Health), Chapter 54 (Water Quality Standards). Revised November 15, 2014.
- State of Hawai'i. Hawai'i Administrative Rules, Title 11 (Department of Health), Chapter 62 (Wastewater Systems). March 21, 2016.
- University of Hawai'i at Hilo, Department of Geography. 1998. Atlas of Hawaii. Third Edition.
- U.S. Census Bureau, 2012-2016 American Community Survey. U.S. Census Bureau's American Community Survey Office, 2017. Web. August 1, 2018.
- U.S. Department of Agriculture Soil Conservation Service. Ka'ū River Basin Study, County of Hawai'i. February 1994.
- U.S. Environmental Protection Agency (EPA). Process Design Manual: Land Treatment of Municipal Wastewater Effluents. EPA/625/R-06/016. Office of Research and Development. Cincinnati, Ohio. September 2006.
- U.S. Environmental Protection Agency (EPA). Climate Resilience Evaluation and Awareness Tool (CREAT) Climate Scenarios Projection Map. Web. Accessed February 6, 2020.
- US Environmental Protection Agency:
- 7 U.S.C. § 4201. 1981.
  - 16 U.S.C. §§ 1271-1287. 1968.
  - 16 U.S.C. §§ 1361 et seq. 1972.
  - 16 U.S.C. §§ 1451-1464. 1972.
  - 16 U.S.C. § 1531. 1973.
  - 16 U.S.C. § 1801. 1976.
  - 16 U.S.C. § 3501. 1982.
  - 16 U.S.C. § 661. 1934.



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16 U.S.C. § 668-668c. 1940. 16

U.S.C. § 703 et seq. 1918.

33 U.S.C. § 403. 1899.

33 U.S.C. § 1251 et seq. 1948.

42 U.S.C. § 300f. 1974.

42 U.S.C. § 7401 et seq. 1970.

54 U.S.C. § 300101. 1966.

54 U.S.C. § 312502. 1974.





**Environmental Information Document**  
**Pāhala Large Cesspool Closure**

