



Water has no substitute.....Conserve it

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FEB 8 2013

County of Kauai
Department of Water
4398 Pua Loke St.
Lihue, HI 96766
January 23, 2013

Mr. Gary Gill, Acting Director
Office of Environmental Quality Control
Department of Health, State of Hawai'i
235 S. Beretania Street, Room 702
Honolulu, Hawai'i 96813

RECEIVED
13 JAN 25 8:36
OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

Dear Mr. Gill:

The County of Kauai, Department of Water, has determined that there may be significant environmental impacts to construct a horizontal directionally drilled well on the island of Kauai at the 800-1,200-foot elevation in the Lihue District. With this letter, we hereby transmit the Environmental Impact Statement Preparation Notice (EISPN) for publication in the next edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form, two copies of the EISPN, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

If there are any questions, please contact, the County of Kauai, Department of Water, Dustin Moises at (808) 245-5459 or by email at dmoises@kauaiwater.org.

Sincerely,

David Craddick, Manager and Chief Engineer

Enclosures

**APPLICANT ACTIONS
SECTION 343-5(C), HRS
PUBLICATION FORM (JULY 2012 REVISION)**

Project Name:

Kauai Water System Energy Conservation, Job No. PLH-03, Kahili Horizontal Directional Drilled Well

Island: Kauai

District: Lihue

TMK: Various

Permits: Possible permits include:

1. Well Drilling Permit from the State Department of Land and Natural Resources (DLNR), Commission on Water Resources Management (CWRM)
2. Amendment to the Interim Instream Flow Standard from the from the State Department of Land and Natural Resources (DLNR), Commission on Water Resources Management (CWRM)
3. Stream Channel Alteration Permit from the from the State Department of Land and Natural Resources (DLNR), Commission on Water Resources Management (CWRM)
4. Conservation District Use Permit (CDUP) from the State DLNR, Office of Coastal and Conservation Lands (OCCL)
5. Noise Variance, State Department of Health (DOH)
6. National Pollutant Discharge Elimination System Permits (NPDES), DOH
7. Section 404 Clean Water Act Permit from the U.S. Army Corps of Engineers
8. Section 401 Water Quality Certification (WQC), DOH
9. Grading and Grubbing Permit, County of Kauai
10. Section 106 Approval for National Historic Preservation

Approving Agency:

Mr. Randall Nishimura, Chair
County of Kauai, Department of Water
P.O. Box 1706
4398 Pua Loke St.
Lihue, HI 96766
Phone: (808) 245-5408

Applicant:

Mr. David Craddick, Manager and Chief Engineer
County of Kauai, Department of Water
P.O. Box 1706
4398 Pua Loke St.
Lihue, HI 96766
Phone: (808) 245-5408

Consultant:

Ms. Joanne Hiramatsu
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96816
Phone: (808) 531-3017

Status (check one only):

- DEA-AFNSI Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqc@doh.hawaii.gov); a 30-day comment period ensues upon publication in the periodic bulletin.
- FEA-FONSI Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqc@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
- FEA-EISPN Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to oeqc@doh.hawaii.gov); a 30-day consultation period ensues upon publication in the periodic bulletin.
- Act 172-12 EISPN Submit the approving agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqc@doh.hawaii.gov). NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.
- DEIS The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the DEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.
- FEIS The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
- Section 11-200-23 Determination The approving agency simultaneously transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the applicant. No comment period ensues upon publication in the periodic bulletin.
- Statutory hammer Acceptance The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it failed to timely make a determination on the acceptance or nonacceptance of the applicant's FEIS under Section 343-5(c), HRS, and that the applicant's FEIS is deemed accepted as a matter of law.
- Section 11-200-27 Determination The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is not required. No EA is required and no comment period ensues upon publication in the periodic bulletin.
- Withdrawal (explain)

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page):

The County of Kaua'i, Department of Water, is looking at conserving energy for their water system to reduce the dependency on fossil fuels by drilling a horizontal gravity flow well. This project will focus on the Līhu'e-Kapa'a water system. The location for directionally drilled exploratory well will be explored at the 800 to 1,200-foot elevation in the ahupua'a of Wailua, Hanamā'ulu and Haiku. At this high elevation, the water can flow by gravity and has the potential to produce energy through the development of a hydroelectric plant. The alternatives that will be evaluated as part of the Environmental Impact Statement (EIS) are several locations for a directionally drilled well and the no action alternative.

Environmental Impact Statement Preparation Notice Kaua'i Water System Energy Conservation

(Job No. PLH-03, Kāhili Horizontal Directional Drilled Well)
Kaua'i, Hawai'i



Prepared for:
County of Kaua'i
Department of Water



Prepared by:
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, Hawai'i 96813

February 2013





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EXECUTIVE SUMMARY

Name of Project: Kaua'i Water System Energy Conservation
(Job No. PLH-03, Kāhili Horizontal Directional Drilled Well)

Island: Kaua'i, Hawai'i

Proposed Action: The County of Kaua'i, Department of Water, is looking at conserving energy for their water system to reduce the dependency on fossil fuels by drilling a horizontal gravity flow well. This project will focus on the Lihu'e-Kapa'a water system. The location for directionally drilled exploratory well will be explored at the 800 to 1,200-foot elevation in the ahupua'a of Wailua, Hanama'ulu and Haiku. At this high elevation, the water can flow by gravity and has the potential to produce energy through the development of a hydroelectric plant. The alternatives that will be evaluated as part of the Environmental Impact Statement (EIS) are several locations for a directionally drilled well and the no action alternative. Preliminarily, the locations include:

1. Location south of Waikoko Stream
2. Location in the vicinity of Waiaka and Ili'ili'ula Streams
3. Location in the vicinity of 'Iole and Waiahi Streams
4. Location near Kamo'oloa and Haili Streams
5. No Action Alternative

Studies that will be conducted for this project include:

1. Biological – Aquatic, Insects, Plants, and Animals
2. Cultural Impact Assessment
3. Archaeological Inventory Survey
4. Hydrogeologic Study
5. Energy Conservation Feasibility Analysis for the existing water system
6. Geophysical Testing

Proposing Agency: Department of Water, County of Kaua'i

Accepting Authority: County of Kaua'i, Department of Water, Board Chair

Purpose and Need for the Project: The source water for the County of Kaua'i's potable water system consists mainly of surface water diversion; treatment and storage; relatively high level tunnels; and low elevation deep (vertical) wells that are pumped to above ground storage tanks. The energy used for the water treatment facility and pumping costs is roughly \$2.5 million annually. The Kauai Department of Water (KDOW) will be looking to develop replacement water sources at a high elevation that will reduce the dependency on energy and possibly produce energy to operate and maintain the potable water system because of the rising cost of oil for long-term sustainability of the potable water system for future generations. A location for a directionally drilled horizontal exploratory well will be explored. This project is intended to reduce the dependency on oil and develop a potable water system that will depend on a gravity system to reduce electrical costs and possibly to generate energy to power the system. This project would provide the KDOW with more resilience in the event of another hurricane or other disaster that will have long power outages. By



having a potable water system that can flow by gravity to service the Lihu'e-Kapa'a area, no electricity will be required. This project implements one of the recommendations from the Water Plan 2020. The project number in the Water Plan 2020 is PLH-3, Drill and Develop Horizontal Wells for the Lihu'e-Kapa'a water systems.

1. INTRODUCTION AND BACKGROUND

The County of Kaua'i (County), Department of Water (KDOW), is looking at replacing the existing vertical wells to conserve energy by developing a high level directionally drilled exploratory well that can flow by gravity and possibly produce power for the Līhu'e-Kapa'a area. The existing sources of water include surface water, vertical wells, and high level water from tunnels. KDOW currently uses surface water, which must be treated, and vertical wells, which must be pumped and transported to higher elevation storage reservoirs and ultimately distributed via pressure lines to the customers.

The location of any new source development will be in the Wailua, Hanamā'ulu or Haiku Ahupua'a above where Līhu'e is located, which is the major center of commerce for the island (see Figure 1-1). There are 9 water systems on the island that are not interconnected. The Līhu'e-Kapa'a water systems are currently connected and include the former Puhi-Līhu'e-Hanamā'ulu Water System and the Wailua-Kapa'a Water System.

As part of this project the County is looking at energy conservation measures to reduce the high cost of fuel to pump and treat water for human consumption. The new water source would flow by gravity to reduce pumping costs. The water should be relatively pristine to reduce treatment costs. Integrated energy generation options such as hydroelectric generation to power the existing water system will be investigated.

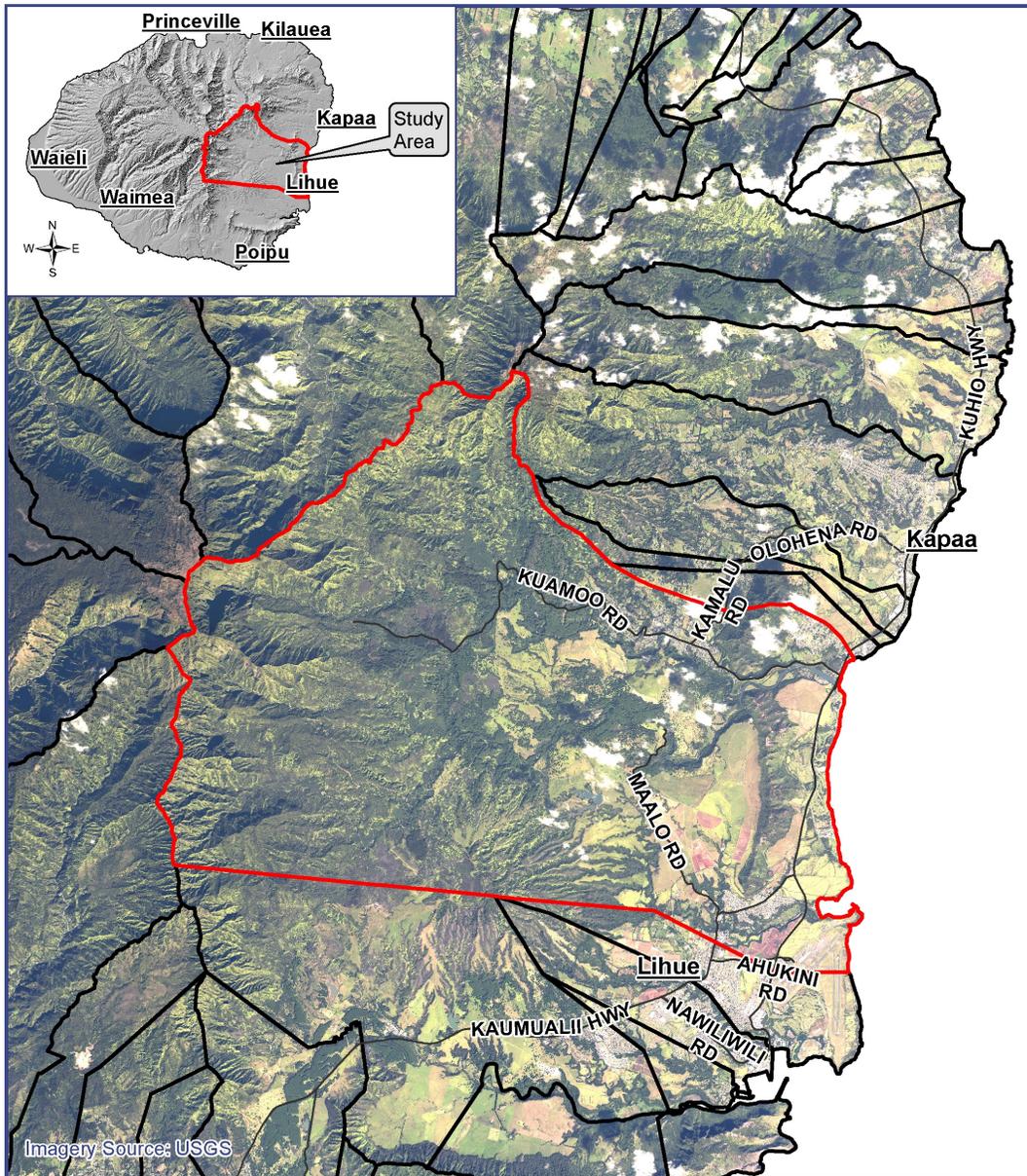
Funding for this project is 50 percent grant from the Drinking Water State Revolving Fund Program that was established by Congress in 1996 as part of the passage of Federal amendments to the Safe Drinking Water Act (Public Law 104-182). The Environmental Protection Agency (EPA) Administrator awards capitalization grants to States for the purpose of establishing a loan program to finance drinking water infrastructure projects necessary for public water systems. The other 50 percent is from KDOW funds through a loan from the State Revolving Fund. This Preparation Notice is prepared in accordance with the Hawaii Revised Statutes (HRS), Chapter 343. Once all the environmental studies are completed a Draft EIS, then a Final EIS will be prepared.

1.1 Proposed Alternatives

KDOW will be looking at several locations in the 800- to 1,200-foot elevation. Preliminarily, the locations are:

1. Location south of Waikoko Stream
2. Location in the vicinity of Waiaka and Ili'ili'ula Streams
3. Location in the vicinity of 'Iole and Waiahi Streams
4. Location near Kamo'oloa and Haili Streams
5. No Action Alternative

These four locations, based on mapping information, appear to have access via established roads and relatively flat topography that will be needed for drilling site. Approximately 0.5 to 1.0 acres will be needed for the drilling equipment and disposal of the slurry and cuttings that will be generated by the drilling process. A typical drilling site is shown in Figure 1-2. Site visits to each of these areas will be conducted to identify the feasibility of these sites to accommodate a directionally drilled well.



**LOCATION
MAP**

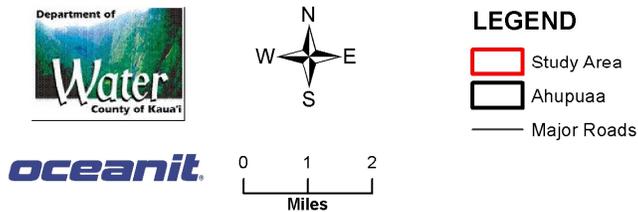


Figure 1-1. Location Map

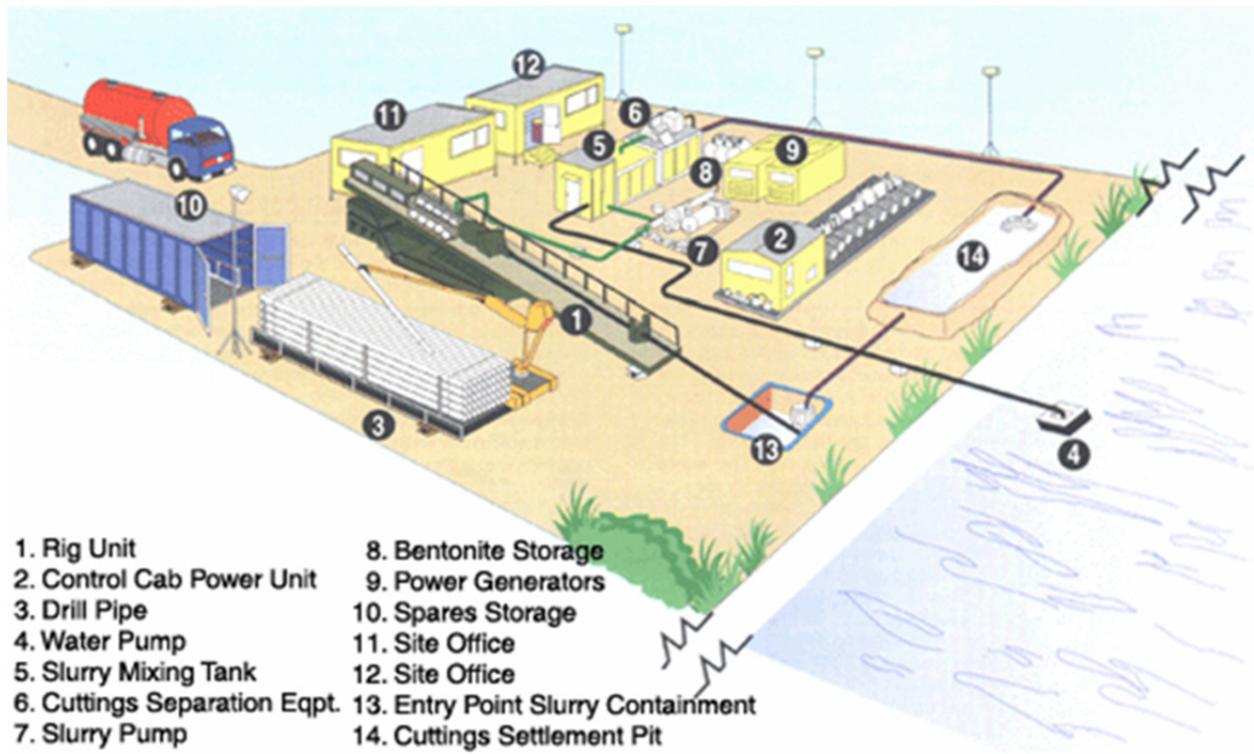


Figure 1-2. Typical Drill Site Configuration

1.2 Purpose of the Preparation Notice

This Environmental Impact Statement Preparation Notice (EISPN) was prepared in accordance with the Hawai'i Administrative Rules (HAR) Title 11, Chapter 200, which implements Hawai'i Revised Statutes (HRS) Chapter 343 and the National Environmental Policy Act (NEPA) of 1969. The purpose of the EISPN is to inform interested parties that we anticipate an EIS for this project and will be seeking agency and public input on issues or resources of concern to include in the EIS. All relevant information received during this period will be used to develop the Draft EIS (DEIS). The action will be funded with State and County of Kaua'i funds. The State funding is from Drinking Water State Revolving Funds (SRF) administered by the State of Hawaii, Department of Health (DOH). The SRF receives funds from the United States Environmental Protection Agency (EPA). The KDOW funding was obtained via a loan from the SRF.

1.3 Purpose and Need for the Project

The KDOW has nine potable water systems operating on the island of Kaua'i. The water systems consist of a water treatment plant, vertical well water that is pumped to higher elevation water tanks and a few tunnels that flow by gravity which then distribute potable water to the communities. The Department of Water will be exploring higher level water sources to reduce the cost of energy consumption by having the water flow by gravity to the water service area. The higher level water source being considered is a directionally drilled horizontal exploratory well that may also provide an opportunity to generate power through the construction of a hydroelectric power plant. If sufficient water is found from this high level source, the wells and water treatment facilities will be shut down

or mothballed for backup purposes. If insufficient water is found, the well will be plugged and other alternatives to the potable water system will be explored.

The KDOW currently pays \$1 million annually for electricity to power the Lihu'e-Kapa'a Water System. An additional \$1.5 million annually is paid for the water treatment system, for a total cost of \$2.5 million. The cost is expected to rise with the price of oil.

One of the goals of the Water Plan 2020 is to meet changing State and Federal water quality standards. There is concern about our existing lower-level pumped wells. These wells are showing traces of TCP (trichloropropane). Rigorous State and Federal standards proposed for TCPs in drinking water will result in increased water treatment costs. Capital cost for treating Lihu'e-Kapa'a wells alone is estimated at \$6 million. Water from a high-level horizontal well will be free of these contaminants.

Another goal of the Water Plan 2020 is to maximize the reliability of the water supply. Minimizing energy cost also minimizes dependence on external energy sources. A high-level well would eliminate the need for pumping. Long term, when paid off, this will be the cheapest water available for generations to come.

During any natural disasters, the high level wells and the tunnels will still be able to produce water to service the community, provided that the distribution system is still intact. Should the distribution system be inoperable, other means, such as trucking, could be used to distribute water to the consumers for emergency purposes.

1.4 Consultation

The following people and organizations they represent have been consulted to date. This includes those that attended the October 17, 2012 informational meeting.

1. Mayor Bernard Carvalho, Mayor, County of Kaua'i
2. Beth Tokioka, Mayor's office
3. Gary Heu, Mayor's office
4. Wanda Shibata, Governor's representative on Kaua'i
5. Larry Dill, County of Kaua'i, Department of Public Works
6. Ben Sullivan, County of Kaua'i, Office of Economic Development
7. Glenn Sato, County of Kaua'i, Office of Economic Development
8. Jay Furfaro, Kaua'i County Council
9. JoAnn Yukimura, Kaua'i County Council
10. Tim Bynum, Kaua'i County Council
11. Dickie Chang, Kaua'i County Council
12. KipuKai Kualii, Kaua'i County Council
13. Nadine Nakamura, Kaua'i County Council
14. Mel Rapozo, Kaua'i County Council
15. Gary Hooser, Kaua'i County Council
16. Derek Kawakami, State Representative, District 14
17. Ron Kouchi, State Senator, District 7
18. Dee Morikawa, State Representative, District 16
19. Jimmy Tokioka, State Representative, District 15



20. U.S. Geological Survey, Pacific Islands Water Science Center, Scot Izuka
21. Charles Spitz, County of Kaua'i, Office of Economic Development
22. Chad Deal, Kaua'i Board of Realtors
23. Karen Ono, Kaua'i Board of Realtors
24. Kelley Haneberg, Kaua'i Backcountry Adventurers
25. Adam Asquith, Taro Farmer
26. Ted Blake, Community Organizer
27. Laurel Brier, Apollo Kaua'i
28. Joan Conrow, Kaua'i Eclectic
29. Makaala Kaaumoana, Hanalei Watershed Hui
30. Keone Kealoha, Malama Kaua'i
31. Trae Menard, The Nature Conservancy
32. Rayne Regush, Wailua-Kapaa Neighborhood Association
33. Tom Shigemoto, A&B Properties
34. Kapua Sproat, Professor, Richardson School of Law
35. Stacy Sproat-Beck, Waipa Foundation
36. Chipper Wickman, National Tropical Botanical Garden
37. Diane Zachary, Kaua'i Planning & Action Alliance
38. Juan Wilson, Island Breath (Informational Meeting)
39. Shawn Shimabukuro, Resident (Informational Meeting)
40. Debbie Lee-Jackson, Huleia Farm LLC (Informational Meeting)
41. John Wehrheim (Informational Meeting)
42. Joe Pattillo, Joe Pattillo Plumbing (Informational Meeting)
43. Judy Dalton (Informational Meeting)
44. Canen Hookauo (Informational Meeting)
45. Trevor Juttman (Informational Meeting)
46. Alan Hoffman (Informational Meeting)
47. Don Heacock, Kaua'i DLNR, DAR, NBWC (Informational Meeting)
48. Kawai Warren (Informational Meeting)
49. Healani Tremboth (Informational Meeting)
50. Angela Hughes (Informational Meeting)
51. Carl Berg, Surfrider (Informational Meeting)
52. Steve Carvalho (Informational Meeting)
53. Robert Lober (Informational Meeting)
54. Hope Kallai, Malama Moloaa (Informational Meeting)
55. Michael Seeley (Informational Meeting)
56. Laurie Cicotello, The Garden Island (Informational Meeting)
57. Ruby Pap (Informational Meeting)
58. Steve Glass (Informational Meeting)
59. Sharry Glass (Informational Meeting)
60. E. Ignacio Neumillor (Informational Meeting)
61. Katherine Muzik (Informational Meeting)
62. Mary Lu Kelly (Informational Meeting)
63. Rayne Regush, Sierra Club (Informational Meeting)
64. Keith Blake (Informational Meeting)
65. Ken Taylor (Informational Meeting)



66. Steve Rapozo (Informational Meeting)
67. Tek Nickerson (Informational Meeting)
68. Debra Kikaua lua (Informational Meeting)
69. Elaine Dunbar (Informational Meeting)
70. Doug Wilmore (Informational Meeting)
71. Pamilei Utanisei, Kanaka Hui Lands (Informational Meeting)
72. Felicia Cowden (Informational Meeting)

2. PROJECT DESCRIPTION

The purpose of the Project is to drill a directionally drilled exploratory horizontal well that will have a sufficient sustainable yield to replace many of the existing wells and the surface water treatment plant and have the ability to conserve energy. The project number from the Water Plan 2020 is PLH-03 to Drill and Develop a Horizontal Well in the Līhu'e-Kapa'a water system. The KDOW potable water supply system currently consists of surface water diversion, tunnels, and vertical wells. The existing average day demand for the Līhu'e-Kapa'a system is 6 million gallons a day (MGD) and the maximum day demand is 9 MGD. The surface water in the Līhu'e area is diverted from streams and treated at a water treatment facility near Līhu'e. This project will look at sites within the Haiku, Hanamā'ulu, and Wailua Ahupua'a at the 800 to 1,200-foot elevation for a potential horizontally drilled exploratory well site. Four potential sites have been preliminarily identified for new high level directionally drilled exploratory well so that the water can flow by gravity to the existing distribution system and possibly generate power through the construction of a hydroelectric plant. These four sites located near the 1,000-foot elevation. These sites, including the "No Action Alternative", are:

1. Location south of Waikoko Stream
2. Location in the vicinity of Waiaka and Ili'ili'ula Streams
3. Location in the vicinity of 'Iole and Waiahi Streams
4. Location near Kamo'oloa and Haili Streams
5. No Action Alternative

The project will only include the Līhu'e-Kapa'a water distribution system. It will consider space requirements to accommodate equipment needed to drill the directionally drilled exploratory well. Other requirements for the site include access and a relatively flat area of approximately 0.5 to 1.0 acres.

The directionally drilled exploratory well will extend a maximum of 12,000 feet or about 2.27 miles maximum distance in an effort to find dike-impounded groundwater within the mountain (see Figure 2-1). If sufficient water is found before reaching 12,000 feet into the mountain, then the drilling will stop. The wellhead will have a control valve that will stop any water from exiting in the event groundwater is discovered. Similar to a vertical well, the horizontal well will be tested for the estimated sustainable yield to determine the quantity of water the well could produce. The well drilling process and well will be designed to withstand high pressures. This test will determine whether to proceed to develop the exploratory well or not. If the sustainable yield is insufficient to serve as a replacement for much of the existing wells serving the area, the exploratory well will be plugged and other alternatives for energy conservation in the potable water system will be explored. If the sustainable yield test shows that there is sufficient water, then the exploratory well will be developed into a production well.

2.1 Site Characteristics

The proposed site of the horizontal directional drilling exploratory well is expected to be in the higher elevations above Līhu'e town between the 800-1,200-foot elevation. One reason for a higher elevation water source is to reduce the dependency on energy cost to transport the water to lower elevations by gravity flow. Depending on the location of the proposed site, energy production could be part of the water system to generate power to run the water system.

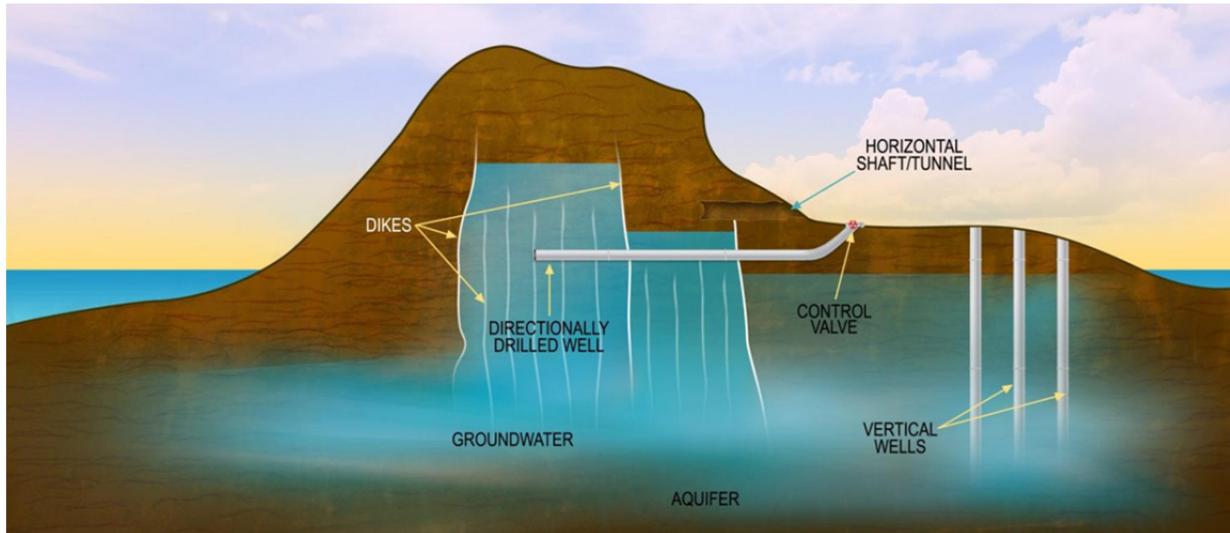


Figure 2-1. Conceptual Diagram Showing the Directionally Drilled Well

As part of the EIS, the project team will be conducting surveys of the flora and fauna, including insects and aquatic life. These studies will identify sites that will have the least amount of impacts on the biological environment. The site size will be between 0.5 to 1.0 acres. Historical information on archaeological sites and cultural practices will be collected to identify potential sites that will not impact these resources. The purpose of these studies is to identify potential water source sites that have minimal impact on the environment. A more comprehensive survey of the environmental resources of the specific sites will also be conducted.

As part of the project, a study will also be conducted to look at existing water sources and identify the potential to use alternative energy to power the pumps or treat surface water. The alternative energy solution must be able to provide adequate power to augment the current operating conditions. Some of the criteria for alternative energy include:

- a. Space requirements to provide adequate photovoltaic panels, or wind power.
- b. The ability to retrofit existing or new upgrades to accommodate power requirements.
- c. The capital costs to retrofit existing or upgrading equipment for better efficiency
- d. The ability for an alternative energy system to survive natural hazards, such as hurricanes.
- e. Long-term maintenance requirements.
- f. The ability of the horizontally drilled water sources to produce hydroelectric energy.

The existing water system facilities are located in already urbanized locations, therefore very little, if any, environmental impacts are expected. The one exception is the migratory Newell's Shearwater birds. The Shearwater birds are endemic to the Hawaiian Islands and about 90 percent of the population breeds only on the island of Kaua'i. The Newell's Shearwater bird is listed as "threatened" on the Federal and State endangered species list. The International Union for Conservation of Nature (IUCN) has the shearwaters listing on their "Red List" of threatened species. As a result, wind turbines may not be a viable alternative as birds have been struck and killed by windmills.

2.2 Construction Activities

A drilling rig will be used to construct a horizontal well with a maximum length of 12,000 feet (2.27 miles). Construction will require equipment transport via heavy trucks or helicopters. The well will be drilled in the Wailua, Hanamā'ulu, or Haiku Ahupua'a between the 800 and 1200 feet elevation contours. The goal of the drilling is to locate dike-impounded groundwater. If water is found before reaching the 12,000-foot distance, testing will be conducted to determine the capacity of the well. If there is insufficient capacity, the drilling could continue to the 12,000-foot distance. Each time more groundwater is found, the well capacity will be tested again. For any exploratory well development project there is no guarantee that sufficient water will be found. If water is discovered, the well will be tested for its sustainable yield. Equipment and facilities used at the drilling site is listed and shown on Figure 1-2. If water is discovered and has the sustainable yield to replace the existing water system, a possible supplemental or new EIS would be required to examine the environmental impacts of the roadway access and pipeline corridors.

Horizontal drilling or directional drilling is a complex process that involves several interrelated operations. The goal of and benefit of this type of drilling is to allow access to an underground target (water source) from a drill site that is located in an acceptable location. The drill site may be several thousands of feet from the target. It is not necessary to drill from a point at the surface that is vertically above the target.

Drilling a borehole is accomplished by cutting through the soil or rock with a drill bit. The soil or rock material that is cut from the formation is known as "cuttings" which need to be removed from the borehole. Cuttings are removed by the drilling fluid which flows back along the drilled borehole to the surface where the cuttings are separated from the fluids.

The drill rig that will be used for drilling the borehole will be capable of drilling at a shallow angle from horizontal and will employ conventional or reverse circulation methods. Because of the probable positive groundwater pressure that will be encountered, reverse circulation may be the preferred method. This method allows the fluids and cuttings to be withdrawn through the center of the drill pipe rather than along the annular space between the drill pipe and borehole wall.

As noted earlier, drilling fluids are necessary to remove cuttings from the borehole. This is an extremely important requirement. The drilling fluid can take many forms from plain water to bentonite-based and polymer mixtures. All of these materials are commonly used to drill drinking water wells and many are NSF (National Sanitation Foundation) approved for this use. Foam and surfactants are also available and many are NSF approved. Foam drilling fluids typically look like thick shaving cream and are very effective in suspending rock cuttings.

The site requirements for this project will need to accommodate drilling equipment, water/fluid/solids separation, water storage, generators, and other support equipment and facilities. The site area is expected to be in the range of 0.5 to 1.0 acres. Site preparation will be necessary, the extent of which depends on the slope, material, and vegetation present.

The equipment used for this project will be powered by diesel generators. Typically, several hundred gallons of fuel are stored on-site, however depending on the selected site; a greater storage volume may be required due to site access limitations. Regardless of the actual storage volume, appropriate storage containers, containment measures, and management practices will be used in accordance

with regulations and approved permit requirements. Engine oil, hydraulic fluid, and lubricants will also be used to operate and maintain equipment.

To control dust and noise generated by the drilling operations a large enclosure (sound wall) could be erected around the site. Other noise control measures include mufflers on equipment and maintaining the equipment to perform at optimum operations. Dust can be controlled through the frequent watering of soil areas that can produce dust.

2.3 Project Schedule

An initial public informational meeting was held on October 17, 2012 to introduce the project and project team. This meeting informed the public of the project and the various alternatives that will be explored, the roles of each of the consultants, the studies that will be conducted, and the project schedule. There are several tasks that will need to be completed before any alternatives can be developed. These tasks include:

1. Community meetings with various agencies, organizations, and individuals. These meetings are intended to get feedback on the project components. A scoping meeting will be held with the community as part of the community outreach.
2. Flora, fauna, entomology, and aquatic surveys of the proposed sites.
3. Archaeological inventory surveys
4. Cultural impact assessment. This assessment will include interviews with kūpuna or other native Hawaiians on the cultural significance of the proposed sites.
5. A hydrogeologic study will be conducted to determine the best location for an exploratory well. This will entail several days of light vehicle and pedestrian field work at the 1,000 to 1,200-foot elevation.
6. A preliminary geophysical study will be conducted to obtain information on the geologic soil and rock properties for hydrogeologic and construction purposes.

Generally, the steps will be as follows:

1. Public Informational Meeting (held October 17, 2012)
2. Submit Preparation Notice
3. EIS Public Scoping Meeting
4. Special Studies to begin
5. Analysis to identify possible locations for a directionally drilled well
6. More detailed special studies at identified locations
7. Alternatives Development
8. Environmental assessment of each site
9. Analysis of Alternatives (Pros and Cons)
10. Public Meeting to discuss alternatives
11. Draft EIS
12. Respond to Comments
13. Final EIS
14. Approval/denial of EIS

The target date for completion of the Draft EIS is the third quarter of 2013, with the final being completed in the third quarter of 2014.

3. NATURAL ENVIRONMENT

The EIS will include discussion on whether the proposed project will have a positive or negative effect on the natural environment. For the most part, the resources that are anticipated to be potentially impacted are water and cultural and biological resources. However, if the new water source development site has a large sustainable yield and reduces the dependency on power from fuel-based power sources, existing wells and water treatment facilities that require a lot of power to operate will be shut down and used as a back-up source or mothballed.

3.1 Topography, Climate, Rainfall, and Natural Disasters

The topography of the island varies from relatively flat coastal plains to steep mountainous terrain. Mount Wai'ale'ale is 5,148 feet in elevation. Kaua'i is the oldest of the major Hawaiian islands at about 5 million years old.

Hawai'i climate is one of moderate temperatures and humidity with northeast trade winds that blow nearly year round, except during southeastern storms known as Kona weather. The "summer" season occurs from May through September, while the "rainy" season occurs from October through April.

The island of Kaua'i has one of the wettest spots in the world with an average annual rainfall of 444 inches at the summit of Mount Wai'ale'ale. The average annual rainfall is shown in Figure 3-1. Kaua'i island was severely impacted by Hurricane Iniki in September 1992. This hurricane was the most devastating hurricane recorded in Hawai'i history. Property damages totaled over \$3 billion and the hotel and condominium units decreased by 40 percent in the first year after the hurricane. In 1982 Hurricane 'Iwa also caused significant damage to Kaua'i.

Kaua'i is less prone to earthquakes or volcanic activity than other parts of Hawai'i. Therefore, minimal threats from earthquakes or volcanic activity are expected.

Tsunamis are a threat to coastal areas in all Hawaiian Islands and are generally caused by earthquakes around the Pacific Ocean. These earthquakes in the Pacific Ocean are mainly caused by movements in the earth's crust at fault zones. Tsunami can also be generated by underwater landslides or volcanic eruptions.

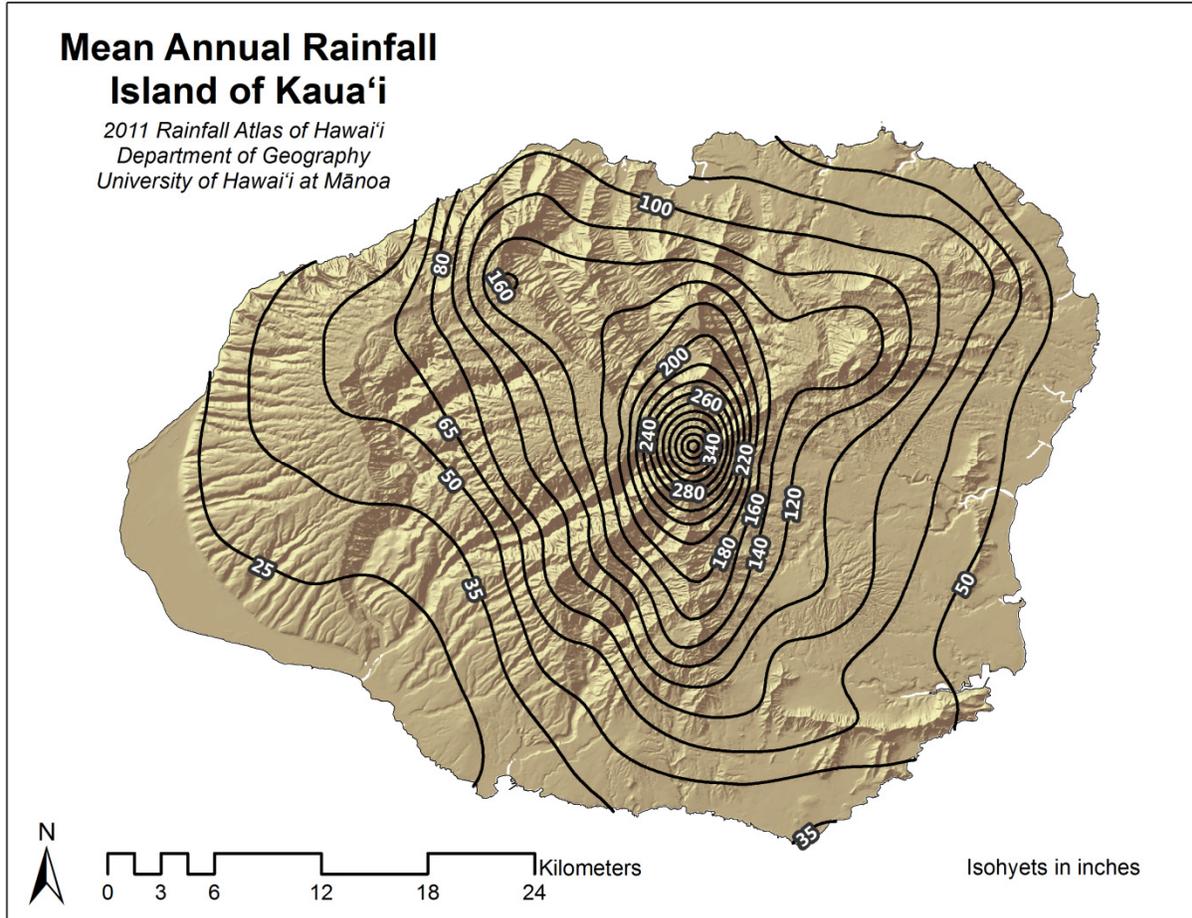


Figure 3-1. Rainfall Map of Kaua'i
SOURCE: Rainfall Atlas of Hawai'i 2011 website

3.2 Geology and Soils

For the most part, Kaua'i consists of a single deeply eroded shield volcano. The large shield volcano is composed of the Waimea Canyon Basalt. (Macdonald 1983). The proposed project site is on the west side of the Līhu'e Basin. The western side of the Basin is bordered by the high central mountains of Kaua'i, including Mount Wai'ale'ale and Mount Kawaikini. These mountains are the target area for the groundwater exploration. The geologic history and hydrogeology of much of Kaua'i including Līhu'e Basin area is hotly debated but general statements can still be made. Most of the Līhu'e Basin is composed of the Kōloa Formation. This formation is relatively impermeable and often does not yield enough water to be satisfactory for municipal water supply wells. Parts of the Basin are also filled with both recent and old alluvium. The alluvium also does not yield large amounts of water but it acts as a confining member and can affect well construction.

The central mountains of Kaua'i are mostly composed of the Waimea Canyon Basalt with scattered occurrences of the Kōloa Formation. There are two members of the Waimea Canyon Basalt in the vicinity of the project area, the Nāpali Member and the Olokele Member. The Nāpali Member is composed of relatively thinly bedded a'a and pāhoehoe lava flows and usually is an excellent aquifer.

The Olokele member is composed of thicker ponded lava flows and is considerably less permeable. The Olokele Member is found in the upper elevation areas of the central Kaua'i mountains. This low permeable layer supports the large wetlands on the mountain tops.

The purpose of this exploratory well is to develop high-level water. High-level water must be impounded by a relatively impermeable formation. In Hawai'i the most common high level aquifers are perched and dike-impounded. Perched water is impounded by horizontal low-permeability layers such as ash or soils. These aquifers are usually relatively small. Dike confined aquifers are often very large and are found in the central mountains of all major Hawaiian Islands. Dikes are tabular, horizontal intrusive bodies of basalt. They are formed when magma is forced up through existing lava flows from the underlying magma chamber. They tend to be much less permeable than the surrounding lavas and subsequently act as "dams" and can impound groundwater to several thousand feet above sea level. Dike impounded water has been extensively developed on Oahu. In most cases this water was developed by boring horizontal tunnels into the mountainside. Geologists located the tunnel sites by mapping springs and exposed dikes. The dike impounded water of the Waimea Canyon Basalt of Kaua'i has not been extensively developed or explored.

The soil associations in which a new potable water source will be developed consist mainly of rough mountainous land-rough broken land-rock outcrop association, and Kapa'a-Pooku Hali-Makapili association. The rough mountainous lands soils can be shallow or deep and is moderately sloping to very steep. The soils are well drained and have a medium to fine textured subsoil. These soils developed from weathered volcanic ash and basic igneous rock. This soil association makes up about 9 percent of the island.

The Kapa'a-Pooku-Hali-Makapili soil association are deep, well to moderated well drained soils on level to steep land. The subsoil is fine or moderately fine textured that developed from basic igneous rock. This soil association makes up about 10 percent of the island.

3.3 Groundwater, Surface Water, and Hydrology

According to the Commission on Water Resource Management (CWRM), the island of Kaua'i is broken up into three sectors: Hanalei, Lihu'e, and Waimea. The Hanalei sector is estimated to have a sustainable yield of 86 MGD, the Lihu'e sector 131 MGD, and Waimea sector 95 MGD. The entire island, therefore, has an estimated sustainable yield of 312 MGD (see Figure 3-2).

As part of this project, the specific aquifer systems of the Lihu'e area to be investigated will include Anahola, Wailua, and Hanama'ulu. These three sub-sectors have a total sustainable yield of 96 MGD. The maximum day demand for potable water for these sectors is 9 MGD and the average day demand is 6 MGD.

The biological team will conduct an initial assessment of a corridor at about the 800 to 1,200-foot elevation in the Wailua, Hanamā'ulu, and Haiku Ahupua'a to identify an area of minimal impact to plants and animals. Once this initial survey is completed, AECOS will determine to best site to conduct a detailed survey of the proposed site.

It is not anticipated that the existing water system facilities will require extensive biological investigations because these systems are already located in urbanized areas. If additional land is required for adding new facilities to existing sites to incorporate energy conservation measures, these new land areas may be subject to further investigation.

3.5 Archaeological, Cultural, and Historical Resources

An archaeological survey and cultural assessment of historic resources will be conducted by Cultural Surveys Hawai'i. Like the biological studies, Cultural Surveys Hawai'i will conduct an initial background research on the upper portion of Haiku, Hanamā'ulu, and Wailua Ahupua'a to address the feasibility of a selected site to minimize any archaeological or cultural impacts. When the proposed site is determined a more detailed investigation will be conducted. The archaeological inventory survey report will be submitted for review and approval to the State Historic Preservation Division, Department of Land and Natural Resources to meet the requirements of Section 106 of the National Historic Preservation Act.

For the cultural assessment, the team will first conduct a background research of historical documents, Land Commission Awards, and historic maps with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits as may be indicated in the historic records. The team will review existing archaeological information pertaining to archaeological sites within the study area to reconstruct traditional land use activities and to identify and describe the cultural resources, practices, and beliefs associated with the parcel and identify present uses, if appropriate. Interviews with persons knowledgeable about the past and present cultural practices in the project area and its surrounding area will be conducted. These interviews will be conducted in person or by telephone.

Unless additional land is required for existing water system facilities, no additional archaeological or cultural impacts at these facilities will be required. If new land area is needed, additional studies for the new site may be required.

3.6 Visual Resources

Because of the terrain for proposed location of a directional drilling site, which is in a rather remote area, we do not expect any visual impacts. However, once a preferred site has been identified, a visual analysis study may be conducted to see if the site will have any negative visual impacts.

3.7 Air and Noise Quality

For the directionally drilled well, only short term air pollution is expected from exhaust from equipment. Short Term noise pollution is also expected from the drilling operations and the possibility of using helicopters to transport supplies to the site. Noise pollution from the drill site can be mitigated through the use of an enclosure placed around the site. Other methods, such as mufflers on equipment can help to reduce noise impacts. The noise impacts will be temporary and only occur during construction. After the well is developed, very little impacts from noise will occur.



Depending on the equipment used, a noise variance may be required if the equipment used will exceed the 78 decibel (dBA) levels. If the noise levels are expected to exceed 78dBA, an approved Community Noise Permit will be required for construction. Noise monitors may be required to ensure that the noise levels do not exceed 78 dBA.

4. SOCIO-ECONOMIC SETTING

The socio-economic environment will include population and economic statistics based on the most current census information of 2010 for the island of Kaua'i. Projections of the socio-economic environment will also be calculated based on current growth rates, potable water demand, and the plans and policies of the County of Kaua'i. These plans include, but are not limited to the Kaua'i General Plan, the Development Plans for Lihu'e and Kapa'a, Water Plan 2020, Kaua'i Economic Development Plan, Hawai'i State Plan, and Functional Plans.

Past trends will be compared with projected growth in population and economy based on Kaua'i Planning documents. These projections will also be the basis for projecting potable water demand for the future. Historical data on population and the economy is from the Hawaii State Data Book, census data, and the Kauai County statistics.

4.1 Population

The 2010 census population for the island of Kauai was 66,921 people. The population growth from 1970 to 1990 was relatively significant with an increase of 31 percent per decade. However, from the period 1990 to 2010, the population increased nearly half the amount of the previous two decades at 14 percent per decade. It could be speculated that hurricane Iniki in 1992 was a factor in the dramatic decline in population growth.

The Kauai County General Plan is currently being updated. Projections on population growth may be completed before the Draft Environmental Impact Statement is completed. If so, those population projection numbers will be used to plan for water demand for the Lihu'e - Kapa'a area.

4.2 Economics

The County of Kauai has the smallest civilian labor force of all the major four islands with an estimated 33,700 people in the labor force, compared to Oahu's 460,650 labor force (State of Hawai'i Data Book, 2011). Kaua'i County had the second highest unemployment rate of 8.8 percent with Hawai'i County having the highest unemployment rate of 9.9 percent. The majority of the labor force on Kaua'i is in the non-agricultural field, such as leisure and hospitality; trade, transportation and utilities; professional and business services, education and health services; and government. Agricultural jobs total 600. The average annual wage, including government, for Kauai County is \$37,461, compared to the State average of \$41,681.

5. PUBLIC FACILITIES AND SERVICES

This section of the EIS will focus primarily on potable water and electricity, but will include a discussion of wastewater, drainage, communications, fire protection, and solid waste.

An economic feasibility study will be conducted to provide KDOW and the public with realistic costs to assess three alternatives for reducing power consumption in the Lihue-Kapaa water system. It is not expected that any of the three alternatives will supply all of KDOW's energy needs for the water system. The first alternative will be to retrofit the existing water system with a viable and realistic system of more efficient pumps/electrical systems and renewable energy. Some, but not all of the renewable energy systems to consider are solar, biomass, biodiesel, and wind. The second alternative will be to convert the water system to surface water treatment by enlarging the Waiahi Water Treatment Plant and decommissioning or mothballing the existing wells. The plant would be powered in a viable and realistic manner with renewable energy. Some, but not all of the renewable energy systems to consider are solar, biomass, biodiesel, and wind. The third alternative will be the construction of a horizontal well. The gravity flow, horizontal well may also have the capability to provide hydroelectric power. The amount of hydroelectric energy produced from the 8 million gallon per day gravity flow well will be analyzed as part of this alternative.

In the event the directionally drilled well does not produce sufficient water required for the Lihue and Kapa'a service area, one or more of the alternatives in the feasibility study may be selected to reduce electrical costs for the water system.

The KDOW currently spends \$1M on electricity annually for the Lihue and Kapa'a. If a new directionally drilled well is developed with electric generation, the electrical requirements for the Lihue-Kapa'a systems will be reduced by about \$1M and additional electricity could be produced via a hydroelectric plant installation. An additional \$1.5M annually is spent on the water treatment facility. The water treatment plant could be mothballed saving \$1.5M in electrical costs.

Access to a directional drilled site is currently via winding dirt roads and/or on foot. Once the preferred directional drilled site is determined, alternatives for access and pipeline alignment will need to be determined. However, access to the site and the pipeline route will not be determined until after the directional drilled well has been developed and tests indicate that the water from this directional well will be able to handle existing water demand and projected future water demand. If the directional well has adequate capacity to accommodate future growth, existing wells will be shut down. The well will be monitored for long term sustainability. As shown in Figure 5-1 we will not be developing new water, but we will be getting the water from a higher elevation. The lower elevation wells contain traces of TCP's (Trichloropropane) from pesticides used in agricultural production, while a higher elevation well should not have TCPs.

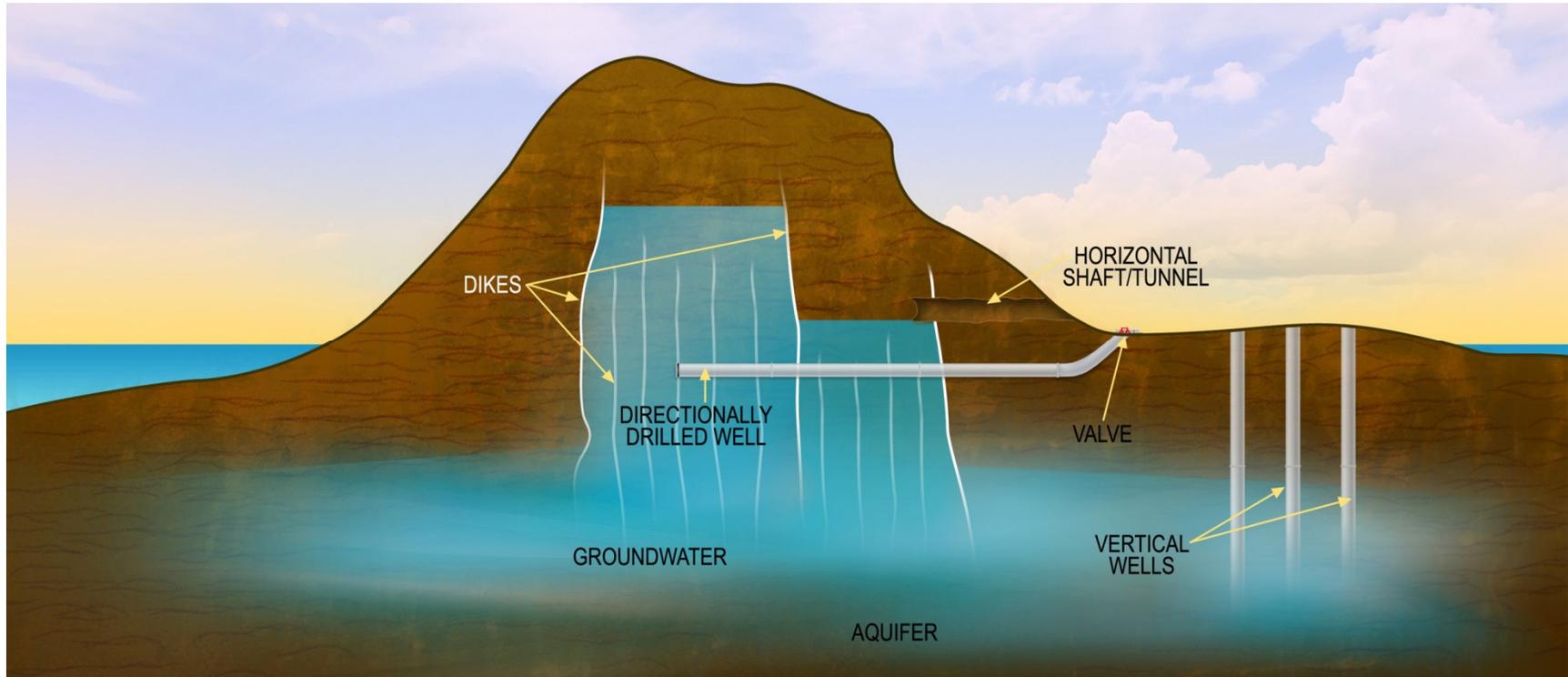


Figure 5-1. Ground Water Concept

6. RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS

All of the alternatives will be evaluated based on existing County and State plans and policies, but not limited to the following.

1. Hawai'i State Plan
2. State Functional Plans
3. State Land Use Plan
4. Agricultural Lands of Importance in the State of Hawai'i
5. Kaua'i General Plan
6. Līhu'e Development Plan
7. County Zoning
8. Kaua'i County Water Plan 2020
9. Kaua'i Water Use and Development Plan

The EIS will evaluate the goals and objectives of the above plans to see if the alternatives are compatible with these plans.

7. PERMITS AND APPROVALS

The following permits will potentially be necessary:

1. Well Drilling Permit from the State Department of Land and Natural Resources (DLNR), Commission on Water Resources Management (CWRM)
2. Amendment to the Interim Instream Flow Standard from the from the State Department of Land and Natural Resources (DLNR), Commission on Water Resources Management (CWRM)
3. Stream Channel Alteration Permit from the from the State Department of Land and Natural Resources (DLNR), Commission on Water Resources Management (CWRM)
4. Conservation District Use Permit (CDUP)from the State DLNR, Office of Coastal and Conservation Lands (OCCL)
5. Noise Variance, State Department of Health (DOH)
6. National Pollutant Discharge Elimination System Permits (NPDES), DOH
7. Section 404 Clean Water Act Permit from the U.S. Army Corps of Engineers
8. Section 401 Water Quality Certification (WQC), DOH
9. Grading and Grubbing Permit, County of Kauai
10. Section 106 Approval for National Historic Preservation

8. AGENCIES, ORGANIZATIONS, AND INTERESTED PARTIES CONSULTED AND TO BE CONSULTED

The following have been consulted to date:

1. Governor's Representative, Wanda Shibata
2. Kaua'i Mayor, Bernard Carvalho
3. Beth Tokioka, Mayor's office
4. Gary Heu, Mayor's office
5. Kaua'i County Councilmembers: Jay Furfaro, JoAnn Yukimura, Tim Bynum, Dickie Chang, Nadine Nakamura, KipuKai Kualii, Mel Rapozo
6. State Senator, District 7, Ron Kouchi
7. State Representative, District 16, Dee Morikawa
8. State Representative, District 15, Jimmy Tokioka
9. State Representative, District 14, Derek Kawakami
10. Larry Dill, County of Kaua'i, Department of Public Works
11. Ben Sullivan, County of Kaua'i, Office of Economic Development
12. Glenn Sato, County of Kaua'i, Office of Economic Development
13. Charles Spitz, County of Kaua'i, Office of Economic Development
14. Gary Hooser, Kaua'i County Council
15. Chad Deal, Kaua'i Board of Realtors
16. Karen Ono, Kaua'i Board of Realtors
17. Kelley Haneberg, Kaua'i Backcountry Adventurers
18. Adam Asquith, Taro Farmer
19. Ted Blake, Community Organizer
20. Laurel Brier, Apollo Kaua'i
21. Joan Conrow, Kaua'i Eclectic
22. Makaala Kaaumoana, Hanalei Watershed Hui
23. Keone Kealoha, Malama Kaua'i
24. Trae Menard, The Nature Conservancy
25. Rayne Regush, Wailua-Kapaa Neighborhood Association
26. Tom Shigemoto, A&B Properties
27. Kapua Sproat, Professor, Richardson School of Law
28. Stacy Sproat-Beck, Waipa Foundation
29. Chipper Wichman, National Tropical Botanical Garden
30. Diane Zachary, Kaua'i Planning & Action Alliance

On October 17, 2012 a public informational meeting was held on Kaua'i at King Kaumuali'i Elementary School Cafeteria. The following people showed up for the meeting:

1. Juan Wilson, Island Breath
2. Shawn Shimabukuro, Resident
3. Debbie Lee-Jackson, Huleia Farm LLC
4. John Wehrheim
5. Joe Pattillo, Joe Pattillo Plumbing
6. Judy Dalton
7. Canen Hookauo

8. Trevor Juttman
9. Alan Hoffman
10. Don Heacock, Kaua'i DLNR, DAR, NBWC
11. Kawai Warren
12. Healani Tremboth
13. Angela Hughes & Carl Berg, Surfrider
14. Steve Carvalho
15. Robert Lober
16. Hope Kallai, Malama Moloaa
17. Michael Seeley
18. Laurie Cicotello, The Garden Island
19. Ruby Pap
20. Steve Glass
21. Sharry Glass
22. E. Ignacio Neumillor
23. Katherine Muzik
24. Mary Lu Kelly
25. Rayne Regush, Sierra Club
26. Keith Blake
27. Ken Taylor
28. Steve Rapozo
29. Tek Nickerson
30. Debra Kekaulua
31. Elaine Dunbar
32. Doug Wilmore
33. Pamilei Utanisei, Kanaka Hui Lands
34. Felicia Cowden

The following will be consulted:

FEDERAL GOVERNMENT

1. Senator Hirono's representative on Kaua'i
2. Congresswoman Gabbard's representative on Kaua'i
3. State Representative, District 14, Derek Kawakami
4. Corps of Engineers
5. National Oceanic and Atmospheric Association
6. National Marine Fisheries Service
7. U.S. Fish and Wildlife Services
8. U.S. Geological Survey, Pacific Islands Water Science Center, Scot Izuka

STATE GOVERNMENT

1. Department of Health
2. Department of Hawaiian Home Lands
3. Office of Hawaiian Affairs
4. Department of Agriculture

5. Department of Accounting and General Services
6. Department of Business Economic Development and Tourism (DBEDT)
7. DBEDT Planning Office
8. DBEDT Energy, Resources & Technology
9. Department of Land and Natural Resources (DLNR)
10. DLNR Historic Preservation Division
11. Department of Transportation

COUNTY GOVERNMENT

1. County of Kaua'i Planning Department
2. County of Kaua'i, Department of Public Works
3. County of Kaua'i, Department of Water

COMMUNITY GROUPS, ORGANIZATIONS, AND INDIVIDUALS

1. Kaua'i Office of Economic Development
2. Kapa'a Business Association
3. Kaua'i Island Utilities Corporation
4. Kaua'i-Niihau Burial Council
5. Kaua'i Chamber of Commerce
6. Kaua'i Hotel and Lodging Association
7. Kaua'i Board of Realtors
8. Kaua'i Contractors Association
9. Līhu'e Business Association
10. Kāhili Adventist School
11. Kaua'i Backcountry Adventures
12. Kaua'i Cattlemen's Association
13. Kaua'i Grown
14. Kaua'i County Farm Bureau
15. Kaua'i Watershed Alliance
16. No Ka Oi Nursery
17. Kaua'i Farmers Coop
18. Hawai'i Farmers Union
19. Gay and Robinson
20. Grove Farm
21. Apollo Kaua'i
22. Filipino Community Association
23. Kaua'i Eclectic
24. Barking Sands
25. Hanalei Watershed Hui
26. Island School
27. Malama Kaua'i
28. The Nature Conservancy
29. Princeville
30. Pacific Missile Range PIO
31. Nishimura & Associates



32. East Kaua'i Water User's Cooperative
33. Nui Na Makaiwa o Wailuanuiaho'ano
34. Wailua-Kapa'a Neighborhood Association
35. A&B Properties
36. Smith's Motor Boat Service
37. Richardson School of Law
38. Waipa Foundation
39. Aqua Engineers
40. Kaua'i Island Utility Cooperative
41. Bank of Hawai'i
42. National Tropical Botanical Garden
43. Koa Trading
44. Kaua'i Planning & Action Alliance
45. Kaua'i North Shore Lions Club
46. West Kaua'i Lions Club
47. Rotary Club of Hanalei
48. Kapa'a Lions Club
49. Rotary Club of West Kaua'i
50. East Kaua'i Lions Club
51. Rotary Club of Kalepa Sunrise
52. Rotary Club of Poipu Beach
53. Koloa Lions Club
54. Rotary Club of Kapa'a
55. Ramon Dela Pena, Taro Farmer
56. Michael Faye, Historic Building Contractor
57. Kehau Kekua, Hawaiian Activist, Kumu Hula
58. Cheryl Lovell, Hawaiian Activist
59. Lester Milnes, Rancher
60. Sharon Pomroy, Community Organizer
61. Elton Ushio, Hunter/Fisher/Prawner
62. Eric A. Knudsen Trust

9. LIST OF PREPARERS

The following is a list of people responsible for the preparation of this Preparation Notice:

1. David Craddick, P.E., Manager and Chief Engineer, KDOW
2. Dustin Moises, P.E., KDOW Project Manager and Point of Contact
3. Jim Williams, P.E., Project Manager, Mears Group, Inc.
4. Kevin Gooding, Project Manager and Hydrogeologist, Oceanit Laboratories, Inc.
5. Joanne Hiramatsu, EIS Preparation Manager, Oceanit Laboratories, Inc.

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