BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

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| In the Matter of the Application of HAWAIIAN ELECTRIC COMPANY, INC. For Approval to Commit Funds in Excess of $500,000 for Item Y48500, East Oahu Transmission Project. | DOCKET NO. 03-0417 |

PROPOSED DECISION AND ORDER NO. 23610

Filed August 24, 2007

At 11 o'clock A .M.

Karen Higashi

Chief Clerk of the Commission



ATTEST: A True Copy
KAREN HIGASHI
Chief Clerk, Public Utilities
Commission, State of Hawaii.

Karen Higashi

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| HAWAIIAN ELECTRIC COMPANY, INC. ) | Docket No. 03-0417 |
| For Approval to Commit Funds in ) Excess of $500,000 for Item Y48500,) East Oahu Transmission Project. ) | Proposed Decision and Order No. 23610 |

PROPOSED DECISION AND ORDER

By this Proposed Decision and Order, the commission approves HAWAIIAN ELECTRIC COMPANY, INC.'s ("HECO") request to commit approximately $55,644,000 for Item Y48500, East Oahu Transmission Project ("EOTP" or "Proposed Project"), pursuant to Paragraph 2.3.g.2 of the commission's General Order No. 7, Standards for Electric Utility Service in the State of Hawaii ("G.O. No. 7"). The commission also approves HECO's request to construct forty-six kilovolt ("kV") subtransmission lines below the surface of the ground, pursuant to HRS § 269-27.6(a). As explained in greater detail herein, the commission finds and concludes that the Proposed Project is necessary to address several specific and identifiable transmission constraints in the East Oahu area that may affect system reliability, and is a cost effective means to address those constraints within the necessary time frame.

## I.

## Background

HECO is a Hawaii corporation that was initially organized under the laws of the Kingdom of Hawaii on or about October 13, 1891. HECO, a public utility as defined by HRS § 269-1, is engaged in the production, purchase, transmission, distribution, and sale of electricity on the island of Oahu in the State of Hawaii.

### A.

### Application

On December 18, 2003, HECO filed an application[1] for commission approval to: 1) commit approximately $55,644,000,[2] in

[1]Application; Exhibits 1-11; Verification and Certificate of Service, filed on December 18, 2003 ("Application"). HECO served copies of its Application on the DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, DIVISION OF CONSUMER ADVOCACY ("Consumer Advocate"), an ex officio party to this docket, pursuant to HRS § 269-51 and Hawaii Administrative Rules § 6-61-62.

On January 6, 2004, Life of the Land ("LOL") filed a motion to intervene. On January 7, 2004, Palolo Community Council ("PCC"), Hoolaulima O Palolo ("HOP"), Malama O Manoa ("Malama"), and Carol Fukunaga, Scott Saiki, and Ann Kobayashi (collectively, "Public Officials"), Kapahulu Neighbors ("KN"), Michelle S. Matson, and Carolyn H. Walthers filed motions to intervene.

On March 23, 2004, the commission issued Order No. 20860, granting LOL and the Public Officials' motions to intervene, and Order No. 20861, denying intervention but granting participant status to PCC, HOP, Malama, and KN. By Order No. 20862, filed on March 23, 2004, the commission denied the motions to intervene filed by Michelle S. Matson and Carolyn H. Walthers. By Order No. 22179, filed on December 12, 2005, the commission approved KN's request to withdraw as a participant in this proceeding.

Accordingly, the current parties to this docket are HECO, the Consumer Advocate, LOL and the Public Officials; and the participants are PCC, HOP, and Malama.

accordance with Paragraph 2.3.g.2 of G.O. No. 7, as amended by Decision and Order No. 21002, issued on May 27, 2004, in Docket No. 03-0257; and 2) construct 46kV subtransmission lines below the surface of the ground for the Proposed Project. In its Application, HECO requested that the commission conduct a public hearing pursuant to HRS § 269-27.5 regarding its proposal to construct 46kV underground subtransmission lines through a residential area, which the commission held on September 1, 2004, at the State Capitol Auditorium. HECO also requested that the commission determine that construction of the 46kV lines below the surface of the ground is consistent with HRS § 269-27.6(a).

1.

Proposed Project

For the Proposed Project, HECO proposes to reconfigure and connect existing 46kV circuits from the Pukele Substation at the end of HECO's Northern 138kV transmission corridor with existing and new 46kV circuits at the Archer and Kamoku Substations in HECO's Southern 138kV transmission corridor. HECO plans to implement the Proposed Project in two independent phases.

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[2]HECO originally estimated the cost of the Proposed Project as $55,424,000, but amended the estimate after revising the schedule to postpone the in service date for Phase 1 until mid-2007 and for Phase 2 until early 2009. See HECO ST-9 at 2-4; HECO ST-6 at 4; HECO ST-901.

a. Phase 1

Phase 1 involves the installation of 0.5 mile of new underground ductline for 46kV subtransmission lines, and related work at seven substations to interconnect three 46kV circuits out of the Pukele Substation, at the end of HECO's Northern 138kV transmission corridor, to four 46kV lines connected to HECO's Southern 138kV transmission corridor.

Specifically, HECO anticipates that Phase 1 will involve: (a) the installation of six underground 46kV lines in the Ala Moana, McCully, Moiliili, and Kapahulu areas; (b) a 138kV/46kV transformer installation at the existing Kamoku Substation with associated protective relaying; (c) a 46kV/12kV transformer installation at the existing Makaloa Substation with associated switchgear; (d) various switching and reconnections on the existing 46kV and 12kV systems near the Makaloa and McCully Substations; (e) the removal of existing 46kV and 12kV cables between the Makaloa and McCully Substations; (f) the removal of an existing 46kV/12kV transformer and associated switchgear from the McCully Substation; and (g) modifications of various existing distribution substations in the Honolulu area.

b. Phase 2

For Phase 2, HECO proposes to install 1.9 miles of underground ductline for 46kV subtransmission lines, and related work at one substation to interconnect four out of the five remaining 46kV circuits out of the Pukele Substation to three

other 46kV lines connected to HECO's Southern 138kV transmission corridor. Phase 2 includes: (a) the installation of three underground 46kV lines in the new ductline in the Kakaako, Makiki, and McCully areas, predominantly along King Street; and (b) a 138kV/46kV transformer installation at the existing Archer Substation with associated protective relaying.

2.

Justification for the Proposed Project

a. System Background

Bulk power from Leeward Oahu power plants is transmitted to the service area in East Oahu over two major transmission corridors. The Northern Transmission Corridor extends from the Kahe Power Plant to the Halawa Substation, the Koolau Substation, and the Pukele Substation, where it currently ends. HECO's Southern Transmission Corridor extends from the Kahe Power Plant to the Waiau Power Plant and the Iwilei, School Street, and Archer Substations. The Southern Transmission Corridor was recently extended to the Kamoku Substation through the installation of two 138kV transmission lines from the Archer Substation to the Kewalo Substation and the installation of a 138kV transmission line from the Kewalo Substation to the Kamoku Substation.

In West Oahu, the two corridors are linked together by transmission lines between power plants and substations connected to the Northern and Southern Corridors. HECO contends that there are no similar connections that exist to provide reliable power

to the East Oahu service area. HECO intends to build upon existing facilities installed to serve the local load growth through the Archer-Kewalo-Kamoku projects and close the existing gap between the Northern Transmission Corridor and the Southern Transmission Corridor on the East side of Oahu, which would provide additional reliability to the Eastern and Windward portions of the island, which represents more than 50% of HECO's total load.

b. Transmission Constraints Addressed by the Proposed Project

HECO's primary goal for operating its generation and transmission systems is to keep power flowing continuously to its customers. From a planning perspective, there are two types of reliability concerns that HECO attempts to guard against: the catastrophic power outage, where disturbances on the system could potentially throw the entire system into instability, and the localized power outage, where the outage affects a limited area of the island.

The Proposed Project is designed to address four transmission constraints concerning Oahu's 138kV transmission system in the eastern half of the island: the "Koolau/Pukele Overload Situation," the "Downtown Overload Situation," the "Pukele Substation Reliability Concern," and the "Downtown Substation Reliability Concern," each of which is subsequently described in greater detail herein.

HECO describes the Koolau/Pukele Overload Situation and the Downtown Overload Situation as problems that increase the risks for catastrophic type power outages; and the

Pukele Substation Reliability Concern and the Downtown Substation Reliability Concern as involving substations that serve critical loads.

i. Koolau/Pukele Overload Situation

There are three 138kV transmission lines providing power to the Koolau Substation. There are two 138kV transmission lines from the Koolau Substation that provide power to the Pukele Substation. HECO estimates that together, these two substations provide power to approximately thirty percent of the load served by HECO on Oahu. HECO projects that if one 138kV transmission line to the Koolau Substation is out of service for maintenance, and if a second 138kV Koolau transmission line becomes unavailable for any reason, the current flowing through the third 138kV Koolau transmission line will exceed its emergency current carrying capacity rating during daytime peak load conditions in the year 2005.[3] Using the 2004 actual system loads and escalating the loads using the May 2005 Peak Forecast, the Koolau/Pukele Overload Situation was expected to occur in 2006.

Such an overload situation violates HECO's Transmission Planning Criteria, which provides that no transmission component shall exceed its emergency rating with one generating unit on overhaul, one transmission line out for maintenance and loss of a second transmission line. Loss of the third 138kV transmission line feeding the Koolau/Pukele area would result in loss of electricity services to about 30% of HECO's customers, including

[3]HECO prepared this projection by using load flow analyses based on load projections in HECO's August 2002 load forecast.

subtransmission substations that feed Kailua, Kaneohe, Kahala, McCully, and Waikiki. In the event of an overload situation, load shedding is a possibility, but according to HECO, should not be relied on as a long-term solution to line overloading conditions.

ii. Downtown Overload Situation

There are two 138kV transmission substations serving the Downtown area, including the Iwilei Substation and the School Street Substation. Power to serve the Downtown area can also come from the Honolulu Power Plant ("HPP") when it is on line. HECO estimates that together, these two substations and the HPP (when on line) provide power to about twenty-five percent of the load served by HECO (at the 2002 Day Peak). These two transmission substations are fed from three 138kV transmission lines providing power from the Halawa and Makalapa Substations. HECO projects that if one of the three 138kV transmission lines to the Iwilei or the School Street Substation is taken out of service for maintenance, and a second Downtown 138kV transmission line becomes unavailable, then the current flowing through the remaining Downtown 138kV transmission line will exceed the emergency current carrying capacity rating during daytime peak load conditions in the year 2024, assuming the HPP is on line, which would violate HECO's Transmission Planning Criteria. Loss of the third 138kV transmission line feeding the Downtown area would result in loss of electricity service to about 25% of HECO's customers.

According to HECO, the availability of the HPP defers this overload problem. If, however, the HPP is not operating, HECO projects that the Downtown Overload Situation is forecasted to be accelerated to 2009.

Using the 2004 actual system loads and escalating the loads using the May 2005 Peak Forecast, HECO estimates that the Downtown Overload Situation may occur in 2007 without the HPP in operation and in 2034 with the HPP in operation.

iii. Pukele Substation Reliability Concern

Two 138kV transmission lines currently feed the Pukele Substation from the Koolau Substation in Kaneohe. The two 138kV lines cross the Koolau Mountain Range to connect the Pukele Substation to the rest of the HECO system. The power transported from these two lines is stepped down to sub-transmission voltage and transported over eight 46kV feeders that branch out from Palolo Valley to distribution substations in Kahala, Kaimuki, Manoa, Makiki, and Waikiki.

HECO states that the Pukele Substation is the most heavily loaded 138kV substation in the HECO system. Based on the 2002 Day Peak load conditions, HECO estimates that the Pukele Substation supplied electricity to approximately seventeen percent of the Oahu load.

HECO asserts that if the two lines providing power to the Pukele Substation are both out of service, approximately ninety-three percent of the customers serviced from the Pukele Substation will experience an outage. HECO cautions that while many parts of the two lines have been renewed and upgraded,

the two Koolau-Pukele 138kV transmission lines are more than forty years old, and are subject to extreme weather conditions due to high winds, heavy rains and salt-laden marine air. In such an outage, HECO contends that the vast majority of customers within the Pukele service area, including most of Waikiki, the University of Hawaii at Manoa and Kapiolani Community College, would be without power until at least one of the two 138kV lines to the Pukele Substation is restored to service.

iv. Downtown Substation Reliability Concern

There are three Downtown area substations with only two 138kV transmission feeds, including the Archer and the Kewalo Substations. The Kamoku Substation has only 138kV transmission feed.

While HECO notes that the Archer and Kewalo Substations are relatively new substations that are fed by two underground 138kV lines, it states that a catastrophic underground duct bank failure could result in the loss of power to the substations. The Kamoku Substation is the newest transmission substation and is fed by one 138kV underground transmission line, which brings power from the Archer Substation via the Kewalo Substation to the Kamoku Substation. The Kamoku Substation has a 25kV back up system, so if the 138kV transmission line feeding the substation should fail, the Kamoku Substation load can be transferred to the Kewalo Substation. If, however, the two 138kV feeds to the Kewalo Substation experience an outage, then both the Kewalo and Kamoku Substations would be unable to serve the load,

which includes portions of Ala Moana Shopping Center and the Hawaii Convention Center.

HECO acknowledges that the concerns regarding the reliability of the three Downtown substations are not as critical as the concerns regarding the Koolau-Pukele Overload Situation and the Pukele Substation Reliability Concern because the underground lines serving the Downtown substations are relatively new, the line segments between the substations are shorter, the Pukele Substation is the most heavily loaded substation on the HECO system, and the two transmission lines serving the Pukele Substation cross the Koolau Mountains.

c. Operational Effectiveness of the Proposed Project

HECO contends that implementation of the Proposed Project will allow electrical loads currently being served exclusively from the Pukele Substation to also be served from the Kamoku and Archer Substations. The Proposed Project, as envisioned by HECO, will allow load to be shifted among the three substations using 46kV lines, and will provide a means for the substations to back up each other if the need arises, which will address the four transmission problems detailed above.

First, some of the Pukele Substation's existing electrical load will be shifted to the Archer Substation and the Kamoku Substation with the implementation of the Proposed Project. HECO argues that this shift will reduce the overall Koolau/Pukele service area load, which in turn will relieve the potential overload situation of the 138kV transmission lines transporting power to the area.

Second, most of the loads transferred from the Pukele Substation to the Archer Substation and the Kamoku Substation (in addition to some existing load currently served by the Archer Substation) could temporarily be shifted back to the Pukele Substation when a transmission line providing power to the Downtown area or generation from the HPP is taken out of service for maintenance. This would reduce the load in the Downtown area while the line is out of service and defer the potential overload situation of the 138kV lines transporting power to the area.

Third, some of the Pukele Substation's existing electrical load would be shifted to the Archer Substation and the Kamoku Substation with the implementation of the Proposed Project. Thus, if the two 138kV transmission lines serving the Pukele Substation were to be lost, the loads that were transferred to the Archer Substation and the Kamoku Substation because of the Proposed Project would not experience an outage. HECO projects that the loads that continue to be served by the Pukele Substation even after the Proposed Project would experience a momentary outage of approximately six seconds as the loads are automatically transferred to the Archer Substation, the Kamoku Substation, and the Koolau Substation.

Fourth, if the two 138kV transmission lines that serve the Archer Substation are lost, some of the loads served by the Archer Substation, the Kewalo Substation, and the Kamoku Substation would experience an outage, but other

Archer Substation loads would experience a momentary outage of approximately six seconds as the loads are automatically transferred to the Pukele Substation.

3.

Project Schedule

HECO estimates that Phase 1 of the Proposed Project will be completed in mid-2007 and will address the Koolau/Pukele Overload Situation and will partially address the Pukele Substation and the Archer Substation Reliability Concerns. Phase 2 is projected to be completed in early 2009 to fully address the Pukele Substation Reliability Concern. The estimated time to complete the construction work for Phase 1 is ten to twelve months and for Phase 2 is thirteen to fifteen months.

4.

Cost of the Proposed Project

The total estimated initial installation cost of the Proposed Project is $55,644,000. According to HECO, this includes planning costs, permit and approval costs, materials costs, labor costs, land costs, and Allowance for Funds Used During Construction ("AFUDC") costs. The net present value (in 2003 dollars and assuming an 8.4 percent discount rate) of the revenue requirements for the Proposed Project is estimated to be $55.5 million. HECO estimates that the potential rate impact associated with the Proposed Project for a "typical" residential

customer will be $0.73 in 2008, after Phase 1 is installed and increases to $0.92 in 2010, after Phase 2 is installed.

5.

Underground Placement of the Proposed Project

HECO proposes to place the 46kV lines for the Proposed Project underground. In Phase 1, HECO intends to utilize existing ductline for the proposed two new 46kV circuits for the Makaloa Substation to the McCully Substation segment. Once installed, the two new 46kV circuits will replace the existing three 46kV circuits, which will be cut and removed from the existing ductline. HECO has not proposed to install the replacement circuits overhead, since, among other reasons, this would result in the conversion of underground circuits to overhead. In addition, there are currently no overhead electrical lines on Makaloa Street from the Makaloa Substation to Kalakaua Avenue, except for a 250 foot section on Makaloa Street. According to HECO, an overhead alignment on Kalakaua Avenue may be subject to a City ordinance, ROH § 14-22.1, that requires public utility companies to place their utility lines and related facilities underground when certain streets are improved under certain circumstances. HECO projects that the cost to install the two new 46kV circuits overhead between the Makaloa and McCully Substations would be $1.9 million. The approximate engineering and construction cost to install the same two circuits underground was estimated to be $3.4 million. HECO states that notwithstanding the higher engineering and

construction cost for an underground alignment, it is not practical to construct the proposed 46kV circuits overhead as public opposition would be increased given the history of the project.

HECO proposes to also install the Pumehana Street to Date Street and the Winam Avenue to Mooheau Avenue segments underground. For the Pumehana Street segment, HECO estimates the engineering and construction cost to install the segment overhead as $159,000, and underground as $478,000. For the Winam/Mooheau Avenue segment, the engineering and construction cost estimate to install this segment overhead was approximately $112,000, and $370,000 to install it underground. HECO proposes to install the Pumehana Street to Date Street and the Winam Avenue to Mooheau Avenue segments underground because the other 46kV lines installed as part of the Proposed Project are being placed underground, there is a relatively small incremental engineering and construction cost of placing these two segments underground in comparison to the total cost of the Proposed Project, and the possible adverse impact if the schedule for Phase 1 is delayed.

HECO proposed an underground alignment for Phase 2 for a number of reasons. State and City and County of Honolulu laws (the Hawaii Community Development Authority Kakaako Community Development District and the City's Thomas Square/Honolulu Academy of Arts Special Design District) require the placement of new lines underground along Cooke Street and King Street between

the Archer Substation and Pensacola Street, approximately one-third of the entire length of the circuits.

HECO asserts that since there are currently no overhead electrical lines running along King Street from Cooke Street to McCully Street, the possibility of obtaining approvals in a timely manner to install three new overhead 46kV lines on King Street appear to be remote. HECO anticipates that public opposition to the visual impact of such an overhead route alignment would result in significant delays to the approval and permitting of the Proposed Project.

Like the section of Phase 1 route alignment on Kalakaua Avenue, an overhead alignment on King Street may be subject to a City and County of Honolulu ordinance requiring public utilities to place utility lines and related facilities underground whenever certain streets, including King Street, are improved under certain circumstances. The approximate engineering and construction cost to install the remainder of the three new 46kV circuits overhead along King Street from Pensacola Street to McCully Street was estimated to be $5.2 million while the cost to install them underground was $8.8 million. As with Phase 1, HECO states that notwithstanding the higher engineering and construction cost for an underground alignment, it is not practical to construct the proposed 46kV circuits overhead given the history of the project, and the possibility of public opposition which would inhibit HECO's ability to timely meet the needs of the electrical system, and would increase costs significantly.

6.

Alternatives to the Proposed Project

A project to address the East Oahu transmission concerns was first initiated as a result of a study conducted in July 1991 titled, "East Oahu 138kV Requirements," which was updated in August 1992 and March 1998. The study outlined the four problems identified above: the Koolau/Pukele Overload Situation, the Downtown Overload Situation, the Pukele Substation Reliability Concern, and the Downtown Substation Reliability Concern.

According to HECO, after evaluating numerous alternatives, the Kamoku-Pukele 138kV Transmission Line was selected as the preferred alternative to address the problems. The Board of Land and Natural Resources, however, denied the Conservation District Use Permit for the overhead section of the project in 2002, which HECO asserts eliminated the only practical overhead 138kV transmission line alternative.

As a result, a HECO Executive Team was formed, which requested updates of various studies and reports, including the East Oahu Transmission Requirements Study. In selecting an alternative to address the East Oahu transmission concerns, HECO considered factors such as effectiveness, timeliness, cost, construction and other impacts, and public sentiment.

a. Three 138kV and 46kV Alternatives

HECO presented three alternatives to the public to address HECO's East Oahu transmission concerns: 1) the Kamoku-Pukele 138kV Underground Alternative, which requires the

installation of a 3.6 mile 138kV underground line running from the Kamoku Substation to the Pukele Substation; 2) the Kamoku 46kV Underground Alternative, which involves the installation of an eighty megavolt ampere ("80MVA") 138/46kV transformer at the Kamoku Substation, a new ductline with two new 46kV circuits installed running from the Makaloa Substation to the McCully Substation, a new circuit in the area of the intersection of Pumehana Street and Date Street near the Lunalilo Elementary School, two new 46kV underground circuits from the Kamoku Substation onto Date Street, one new 46kV underground circuit on Winam Avenue from Hoolulu Street to Mooheau Avenue in Kapahulu and modification of equipment at various distribution substations; and 3) the Kamoku 46kV Underground Alternative - Expanded, which involves the same installation described in the Kamoku 46kV Underground Alternative and an additional 80 MVA 138/46kV transformer at the Archer Substation and a new duct bank with three new 46kV circuits installed running from the Archer Substation to existing 46kV circuits on King Street and McCully Street.

After the public input process was completed, HECO submitted a report on the process and finalized information to its executive team, which was given the responsibility for selecting the alternative. In terms of timeliness, the Kamoku-Pukele 138kV Underground Alternative had the longest schedule with implementation initially estimated for 2010. The Kamoku 46kV Underground Alternative had the shortest schedule with implementation initially estimated in 2006. The Kamoku 46kV

Underground Alternative - Expanded was initially estimated for implementation in 2008, but HECO later determined that it could be implemented in two phases with the first phase initially targeted for completion by the end of 2006. Of the three alternatives, the Kamoku-Pukele 138kV Underground Alternative had the most schedule uncertainty because of the permits and approvals required.

With respect to construction and other impacts, the three alternatives were similar even though they were in different locations. Aesthetic impacts were considered minimal to none for all three alternatives because underground construction was proposed for all three. With respect to cost, the Kamoku-Pukele 138kV Underground Alternative had the highest capital cost of approximately $110 million to $122 million; while the Kamoku 46kV Underground Alternative had the lowest capital cost at approximately $41 million. The Kamoku 46kV Underground Alternative - Expanded had an estimated capital cost of $59 million.

HECO acknowledges that the Kamoku-Pukele 138kV Underground Alternative, from an engineering standpoint, is the best long-term solution for addressing all of the transmission overload and reliability situations. HECO estimated, however, that this alternative could not be implemented until 2010, leaving a period of vulnerability to the Koolau/Pukele Overload Situation (which was estimated to begin in 2005).

According to HECO, the Kamoku 46kV Underground Alternative would be adequate to reduce the Koolau/Pukele

Overload Situation, defer the Downtown Overload Situation for several years, provide partial back-up of the load served by the Pukele Substation, and provide partial back-up of the load served by the Downtown substations. If the HPP was not operational, this alternative would not address the Downtown Overload Situation. While this alternative had the advantage of having an earlier implementation date, its duration of effectiveness was shorter than that of the Kamoku-Pukele 138kV Underground Alternative.

HECO asserts that the Kamoku 46kV Underground Alternative - Expanded will effectively address the Koolau/Pukele Overload Situation, defer the Downtown Overload Situation, and fully address the Pukele Substation and the Archer Substation Reliability Situations. Like the Kamoku 46kV Underground Alternative, if the HPP is not operational, this alternative would not address the Downtown Overload Situation. HECO determined that the Kamoku 46kV Underground Alternative - Expanded was advantageous, as it could be installed sooner than the Kamoku-Pukele 138kV Underground Alternative. While its effectiveness was not as long in duration as that of the Kamoku-Pukele 138kV Underground Alternative, it would provide complete back up to the Pukele Substation, which is one of HECO's primary concerns.

b. Other Options Considered by HECO

HECO states that in addition to the 138kV and 46kV alternatives identified above, it considered options that might address all of the East Oahu transmission problems collectively;

and options that might address only the Koolau/Pukele Overload Situation.

HECO analyzed other options that would not resolve the Pukele Substation Reliability Concern, including increasing the current carrying capacity of existing lines (at least for planning purposes), and reducing the Koolau/Pukele service area load (or peak load) by targeting additional demand-side management, load management, distributed generation and combined heat and power system penetration in the service area.

HECO also considered other options to address all of the East Oahu transmission problems, including live line maintenance,[4] which HECO states has limited applicability for the lines serving the Koolau and Pukele Substations due to the climate, terrain and facility conditions. HECO also considered increased use of renewable resources, but concluded that they were not a viable alternative because of the lack of suitable sites, large land requirements, the non-firm nature of wind and solar resources, and the costs and need for interconnection lines if suitable sites could be found and battery energy storage systems were added to firm up the resources. The use of distributed generation was also considered, but was screened out because of the cost of the option as well as uncertainties with land, fuel supply, interconnection and permitting. Increased demand-side management and load management programs were considered, but could not address the Pukele reliability

[4]Live line maintenance refers to maintenance work on distribution and transmission facilities without de-energizing the distribution and transmission lines.

concern since they could not provide the Pukele Substation with a reliable and cost effective source of electricity equivalent to its peak load or eliminate the customer load in the Pukele service area.

Some of the options HECO considered to only address the Koolau/Pukele Overload Situation were increasing conductor capacity of the transmission lines; and implementing demand-side management or other programs to reduce power demand at customer sites. HECO states that it did not consider distributed generation and combined heat and power as viable options for addressing the transmission overload situation, given the uncertainties it identified relating to land availability, fuel supply, interconnection, and permitting the installation of small generating units in the Koolau/Pukele area.

c. Alternative Routes Studied

For Phase 1, HECO examined alternative routes that used Kapiolani Boulevard, but did not select this option for a number of reasons: (a) HECO's chosen route uses an existing ductline between the Makaloa and McCully Substations, so no trenching would be required for approximately seventy percent of the route; (b) the Kapiolani Boulevard route would result in more traffic impacts; (c) Kapiolani Boulevard is full of existing underground utilities, making it difficult to design and construct a new ductline; and (d) a section of Kapiolani Boulevard is so crowded with other existing lines that HECO would need to install the ductline approximately seven feet deeper than the typical depth for a 46kV underground ductline. In total, HECO estimates that

the design and construction costs would be approximately $1.6 million more for a Kapiolani Boulevard route.

HECO reviewed alternative routes to using King Street for the three new underground circuits from the Archer Substation to McCully Street for Phase 2 of the Proposed Project - the use of Young Street and Beretania Street. Use of Young Street and Beretania Street were not selected as the proposed underground route alignment because construction of a ductline along Young Street would require more traffic control and coordination because there is only one lane of traffic in each direction; and a Beretania Street route would result in a longer distance to interconnect the new 46kV circuits from the Archer Substation with the existing 46kV circuits near and on McCully Street.

B.

Stipulated Issues

As identified in Order No. 20968, filed on May 10, 2004, the issues in this docket are:

1. Whether HECO's proposed expenditures for Phases 1 and 2 of the [EOTP] will provide facilities which are reasonably required to meet HECO's present or future requirements for utility purposes?

2. Whether HECO's selected routing, location, configuration and method of construction for Phases 1 and 2 of the [EOTP] are reasonable?

3. Whether HECO's [EOTP] is preferable to HECO's other 138kV and 46kV transmission system alternatives, comparing factors such as, but not limited to the following:

    a) Cost;
    b) Timeliness and Schedule;
    c) Effectiveness;
    d) Construction impacts;

e) Electromagnetic fields;
f) Other impacts, if any;
g) Public sentiment; and
h) The public welfare in general.

4. Whether HECO's [EOTP] is preferable to other feasible non-transmission options?

5. Pursuant to the requirements of HRS [§] 269-27.6(a), whether all (as proposed by HECO) or part of the 46kV lines that are part of HECO's [EOTP] should be placed, constructed, erected or built below the surface of the ground?

Order No. 20968, filed on May 10, 2004, at 3-4.

C.

Stipulation

On October 28, 2005, HECO and the Consumer Advocate filed a Joint Motion for Approval of Stipulation, which contained their agreement as to the following matters:

> 1. In this proceeding, a determination should be made as to whether HECO should be given approval to expend funds for the [EOTP], provided that no part of the [EOTP] may be recovered from ratepayers unless and until the [c]ommission grants HECO recovery in a general rate increase proceeding.
>
> 2. Any issue as to whether the pre-2003 planning and permitting costs, and related [Allowance for Funds Used During Construction] should be included in the costs of the instant project has been reserved to and may be raised in the next general rate increase proceeding (or other proceeding) in which HECO seeks approval to recover the [EOTP] costs.
>
> 3. Provided the [c]ommission approves the Stipulation in its entirety, HECO and the Consumer Advocate withdraw from the evidentiary record in this docket specified portions of their filed testimonies, exhibits and responses to information requests relating to this issue.

> 4. Nothing in th[e] Stipulation shall be construed to prevent the Consumer Advocate and HECO from discussing or addressing the subject of including the pre-2003 planning and permitting costs in the instant project costs prior to the hearing in the general rate increase proceeding in which HECO seeks recovery of the [EOTP] costs.
>
> 5. Th[e] Stipulation shall apply solely to this proceeding, and is entered solely for the purposes of simplifying and expediting this proceeding.
>
> 6. The agreements in th[e] Stipulation are subject to [c]ommission approval. If the [c]ommission does not issue an order adopting the Stipulation in its entirety, HECO and/or the Consumer Advocate may withdraw from th[e] Stipulation.

On November 4, 2005, the commission issued Order No. 22104, which approved, in part, the Stipulation and agreements contained therein. In particular, the commission accepted HECO and the Consumer Advocate's withdrawal of the pre-2003 permitting and planning costs issue, but denied their agreement to withdraw from the record certain portions of their filed testimonies, exhibits, and responses to information requests related to that issue. Accordingly, as stated in Order No. 22104, the commission will not address the pre-2003 planning and permitting costs incurred by HECO in this Proposed Decision and Order.

D.

Evidentiary Hearing

On November 7 and 8, 2005, the commission held an evidentiary hearing to hear witness testimonies and the parties' arguments.

On February 8, 2006, LOL filed its opening brief.[5] On February 13, 2006, HECO and the Consumer Advocate filed their respective opening briefs.[6] LOL, the Consumer Advocate and HECO filed their reply briefs on March 6, 2006.[7]

1.

Consumer Advocate's Position

The Consumer Advocate in its Opening and Reply Briefs recommends that the costs related to the initial 138kV proposal and the additional 138kV/46kV transformer at the Archer Substation be removed from the costs projected for the Proposed Project.[8] According to the Consumer Advocate, it will seek to address HECO's complete system planning and related cost issues in HECO's Integrated Resource Planning ("IRP") docket pending before the commission, and to analyze expenses in HECO's next general rate case.[9]

The Consumer Advocate contends that HECO's proposal in Phase 2 to install an additional 138kV/46kV transformer to supplement three existing 138kV/46kV, 83 MVA transformers at the

[5][LOL's] Opening Brief and Certificate of Service, filed on February 8, 2006 ("LOL's Opening Brief").

[6]Opening Brief of [HECO]; Exhibits "A" - "E"; and Certificate of Service, filed on February 13, 2006 ("HECO's Opening Brief"); [Consumer Advocate's] Opening Brief and Certificate of Service, filed on February 13, 2006 ("Consumer Advocate's Opening Brief").

[7][LOL's] Reply Brief and Certificate of Service, filed on March 6, 2006 ("LOL's Reply Brief"); [Consumer Advocate's] Reply Brief and Certificate of Service, filed on March 6, 2006; Reply Brief of [HECO] and Certificate of Service, filed on March 6, 2006 ("HECO's Reply Brief").

[8]Consumer Advocate's Opening Brief at 15.

[9]Consumer Advocate's Opening Brief at 17.

Archer Substation is unnecessary. The Consumer Advocate cautions that the improvement will cause the Archer and Kamoku Substations to be underutilized because the current combined emergency rating far exceeds the combined normal load. Accordingly, the Consumer Advocate proposes that the Proposed Project costs be reduced by $1.6 million to remove the costs for the Archer transformer. The Consumer Advocate further suggests that HECO should provide support data in the next rate case proceeding following the in-service date of the Proposed Project to establish the necessity or reasonableness of the transformer.

Generally, however, the Consumer Advocate contends that the Proposed Project will be a more reliable option than the 138kV alternative reviewed by HECO, since a complete backup of the Pukele Substation can be established through the Proposed Project. Moreover, the Consumer Advocate expresses a preference for the Proposed Project over other "non-transmission" options considered by HECO.

Finally, the Consumer Advocate asserts that the all-underground alignment as proposed by HECO is reasonable in light of the availability of existing underground ducts, applicable State and City and County of Honolulu laws and regulations, delays and additional costs to pursue an overhead installation due to construction constraints and community or aesthetic-related concerns, and longer routing of circuits.[10] The Consumer Advocate is persuaded that there are benefits that

[10]Consumer Advocate's Opening Brief at 21.

outweigh the costs of placing the transmission system underground.[11]

2.

LOL's Position

LOL recommends that the commission reject HECO's Proposed Project for a number of reasons. LOL found HECO's witnesses lacking credibility and resorting to "scare tactics" to support their conclusions. LOL urged the commission to require HECO to utilize measures other than the Proposed Project to meet the system need identified by HECO. Included in its recommendations were the use of additional renewable resources, distributed generation, and combined heat and power.

II.

Findings and Conclusions

A.

Commitment of Funds

G.O. No. 7 states, in relevant part:

> Proposed capital expenditures for any single project related to plant replacement, expansion or modernization, in excess of $500,000 or 10 per cent of the total plant in service, whichever is less, shall be submitted to the Commission for review at least 60 days prior to the commencement of construction or commitment for expenditure, whichever is earlier. If the Commission determines, after hearing on the matter, that any portion of the proposed project provides facilities which are unnecessary or are unreasonably in excess of probable future requirements for utility purposes, then the utility shall not include such portion of the

[11] Id.

> project in its rate base. If the utility subsequently convinces the Commission that the property in question has become necessary or useful for public utility purposes, it may then be included in the rate base. Failure of the Commission to act upon the matter and render a decision and order within 90 days of filing by the utility shall allow the utility to include the project in its rate base without the determination by the Commission required by this rule . . . .[12]

G.O. No. 7. In Docket No. 03-0257, the commission increased the monetary threshold governing the filing of capital expenditure applications by HECO, from $500,000 to $2.5 million, exclusive of customer contributions, effective July 1, 2004.[13]

Here, the commission finds that the Proposed Project is reasonable and in the public interest. Specifically, the commission finds that the four system constraints identified by HECO (the Koolau/Pukele Overload Situation, the Downtown Overload Situation, the Pukele Substation Reliability Concern, and the Downtown Substation Reliability Concern) exist and that they place a significant portion of the HECO system's reliability in jeopardy.

First, the commission finds that an overload situation with one of the three 138kV transmission lines that transport power to the Koolau/Pukele service area in the Northern Transmission Corridor may occur when the other two lines

[12]As the Application was filed on December 18, 2003, the 90-day deadline for the commission to take action on HECO's Application was March 17, 2004. HECO, however, requested an extension of time until March 18, 2004, to file a stipulated prehearing order. By Order No. 20845, filed on March 10, 2004, the commission suspended the 90-day review period to allow HECO, the Consumer Advocate, the commission and any intervenors or participants to complete a thorough review of the Application.

[13]See Decision and Order No. 21002, filed on May 27, 2004, in Docket No. 03-0257.

are out of service, i.e., the Koolau/Pukele Overload Situation. Although HECO and the Consumer Advocate dispute when such an overload situation could occur, the commission finds that the situation is sufficiently imminent and that deferral of imminent overload should not be the preferred method of dealing with the situation.

Second, the commission finds that an overload situation could occur if two of the three 138kV transmission lines that transport power to the Downtown area in the Southern Transmission Corridor are out of service, i.e., the Downtown Overload Situation. This constraint is deferred assuming the availability of the HPP, but may occur sooner if for some reason the HPP is not operational.

Third, the commission finds that if the two 138kV lines providing power to the Pukele Substation, the most heavily loaded 138kV substation in the HECO system, are out of service, a large number of customers serviced from the Pukele Substation, which includes Waikiki, State Civil Defense and the University of Hawaii at Manoa, will incur an outage, i.e., the Pukele Substation Reliability Concern. The Proposed Project will address this constraint by improving the 46kV subtransmission system to backup the two 138kV lines feeding the Pukele Substation.

Fourth, the commission finds that the Archer, Kewalo and Kamoku Substations will be without power if the two 138kV transmission lines serving the Archer Substation are out of service, i.e., the Downtown Substation Reliability Concern.

Although HECO does not consider this constraint to be as serious or as immediate as the Consumer Advocate, the commission finds that the concern exists and should be addressed by the Proposed Project.

In sum, the commission finds that the possible overload and reliability situations identified by HECO warrant the reinforcement HECO suggests. In particular, after considering factors such as cost, schedule, effectiveness, construction impacts, electromagnetic field concerns, public sentiment and public welfare in general, the commission is convinced that the Proposed Project, as distinguished from the other alternatives considered by HECO, is a reasonable means to address the constraints HECO identified. Specifically, the Proposed Project appears to be a more reliable option than the 138kV alternative reviewed by HECO, since the Proposed Project will backup the two 138kV lines feeding the Pukele Substation. The commission, moreover, agrees with the Consumer Advocate that the Proposed Project, in contrast to the other two alternatives, "provides a positive benefit to the public welfare" as it "will improve HECO's ability to provide reliable electric service to east Oahu customers in a more economical and aesthetic manner."[14] In addition, the commission finds that HECO's selected routing, location, configuration and method of construction for the Proposed Project are reasonable.

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[14]Consumer Advocate's Opening Brief at 20.

While the Consumer Advocate does not object to approval of the Proposed Project, it asserts that HECO's proposal in Phase 2 to install an additional 138kV/46kV, 80 MVA transformer to supplement three existing 138kV/46kV, 83 MVA transformers at the Archer Substation is unnecessary. According to the Consumer Advocate, the improvement will cause the Archer and Kamoku Substations to be underutilized because the current combined emergency rating far exceeds the combined normal load. In addition, the Consumer Advocate asserts that there are measures that HECO could take to avoid overloading the Archer transformers without installing a fourth Archer transformer should there be an outage of the Pukele Substation; for example, other transformers at the Koolau and Kamoku Substations are available to serve the load in the service area during an outage of the Pukele Substation. Accordingly, the Consumer Advocate proposes that the $1.6 million in costs for the Archer transformer be removed. The Consumer Advocate further suggests that HECO should provide support data in the next rate case proceeding following the in-service date of the Proposed Project to establish the necessity or reasonableness of the transformer.

HECO, however, claims that the Consumer Advocate's calculations regarding total transformer load are only applicable if the transformers at the Archer Substation are installed in a network configuration. HECO states that the transformers are not networked and each transformer serves the load for specific 46kV circuits under normal and N-1 46kV contingencies. In addition, according to HECO, installation of Phase 2 without

the Archer D transformer "would have limited benefit and would create a substation reliability concern."[15]

While the Consumer Advocate has articulated valid concerns over whether the Archer D transformer is necessary, the commission finds in this instance that the addition of the fourth transformer at the Archer Substation, which is HECO's preferred alternative for providing backup to the remaining Pukele Substation load upon loss of both Koolau-Pukele 138kV transmission lines, is reasonable. HECO should, however, be prepared to present data in the next rate proceeding that demonstrates the need and use of the Archer D transformer.

LOL argues that other non-transmission alternatives such as renewable energy, distributed generation, combined heat and power and live line maintenance, are currently feasible as alternatives to the Proposed Project. While the commission is supportive of such non-transmission options, the commission finds that there is insufficient specific evidence from LOL in the record as to the cost of installing, operating and maintaining the non-transmission alternatives, the permitting and approvals necessary for the siting and installation of such alternatives, the length of time needed to implement the alternatives, the availability of space to install the alternatives and the types of facilities needed to interconnect the alternatives to HECO's grid, and the sufficiency and capability of such alternatives to address the transmission constraints to be addressed by the Proposed Project. The commission agrees with the

[15]HECO's Reply Brief at 10.

Consumer Advocate that the non-transmission options are unable to eliminate the Pukele Substation Reliability Concern in a timely manner; that alternatives such as distributed generation and combined heat and power are in the early stages of planning and implementation in Hawaii; and that the technology is new and developing, costs are uncertain and relatively high, and implementation schedules are not defined.[16] Accordingly, the commission finds that LOL has not shown that such non-transmission alternatives are realistic or viable alternatives to the Proposed Project at this time.

Based on the foregoing, the commission concludes that the Proposed Project is necessary to ensure that HECO can provide reliable service in the subject area, and that the proposed commitment of funds for the Proposed Project should be approved. As noted above, HECO should, however, be prepared to present data in the next rate proceeding that demonstrates the need and use of the Archer D transformer. That is, HECO shall prepare to provide more detailed cost estimates of the Archer D transformer alternatives in support of its rate case testimonies.

B.

Underground Alignment

HRS § 269-27.6(a) titled "Construction of high-voltage electric transmission lines; overhead or underground construction" states:

[16]See Consumer Advocate's Opening Brief at 21.

> Notwithstanding any law to the contrary, whenever a public utility applies to the public utilities commission for approval to place, construct, erect, or otherwise build a new forty-six kilovolt or greater high voltage electric transmission system, either above or below the surface of the ground, the public utilities commission shall determine whether the electric transmission system shall be placed, constructed, erected, or built above or below the surface of the ground; provided that in its determination, the public utilities commission shall consider:
>
> (1) Whether a benefit exists that outweighs the costs of placing the electric transmission system underground;
>
> (2) Whether there is a governmental public policy requiring the electric transmission system to be placed, constructed, erected, or built underground, and the governmental agency establishing the policy commits funds for the additional costs of undergrounding;
>
> (3) Whether any governmental agency or other parties are willing to pay for the additional costs of undergrounding;
>
> (4) The recommendation of the division of consumer advocacy of the department of commerce and consumer affairs, which shall be based on an evaluation of the factors set forth under this subsection; and
>
> (5) Any other relevant factors.

HRS § 269-27.6(a).

First, under HRS § 269-27.6(a)(1), the commission finds that benefits exist that outweigh the costs associated with constructing the lines entirely underground. The commission finds reasonable HECO's assertions that use of existing ducts, delays anticipated as a result of additional permitting and public opposition to overhead lines, and State and City and County of Honolulu laws and regulations justify use of an underground alignment. Accordingly, there appear to be benefits

that outweigh the additional costs of placing the 46kV lines of the Proposed Project underground.

Second, under HRS § 269-27.6(a)(2), there appear to be several State and City and County of Honolulu laws and regulations (i.e., the Hawaii Community Development Authority Kakaako Community Development District, the City's Thomas Square/Honolulu Academy of Arts Special Design District, and ROH § 14-22.1) that would require an underground alignment of portions of the Proposed Project.

Third, under HRS § 269-27.6(a)(3), the commission is not aware of any governmental agency or any other party willing to pay for the additional costs of placing the lines entirely underground.

Fourth, under HRS § 269-27.6(a)(4), the commission recognizes that the Consumer Advocate, after reviewing the Proposed Project under HRS § 269-27.6(a), stated that it "is convinced that there are benefits that exist currently to outweigh the costs of placing the transmission system underground"[17] According to the Consumer Advocate, the all-underground alignment as proposed by HECO is reasonable in light of the availability of existing underground ducts, applicable State and City and County of Honolulu laws and regulations, delays and additional costs to pursue an overhead installation due to construction constraints and community or aesthetic-related concerns, and longer routing of circuits.[18]

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[17]Consumer Advocate's Opening Brief at 23.

[18]Consumer Advocate's Opening Brief at 21.

Based on the foregoing, the commission concludes that the underground construction of the 46kV subtransmission lines in association with the Proposed Project, in the manner set forth in the Application, should be approved.

## III.

## Orders

THE COMMISSION ORDERS:

1. HECO's request to expend an estimated $55,644,000 for Item Y48500, East Oahu Transmission Project, is approved; provided that no part of the Proposed Project may be included in HECO's rate base unless and until the Proposed Project is in fact installed, and is used and useful for public utility purposes, and provided that HECO presents data in the next rate proceeding that demonstrates the need and use of the Archer D transformer.

2. HECO's request to construct and install 46kV subtransmission lines below the surface of the ground, as part of the Proposed Project, is approved, pursuant to HRS § 269-27.6(a).

3. Consistent with HRS § 91-11[19] and HAR § 6-61-121,[20] the parties and participants shall notify the commission as to whether it accepts, in toto, the Proposed Decision and Order, or does not accept, in whole or in part, the Proposed Decision and Order within ten days of the date of this Proposed Decision and Order.[21] If a party or participant does not accept, in whole or in part, the Proposed Decision and Order, it shall file any

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[19]HRS § 91-11 provides that

> Whenever in a contested case the officials of the agency who are to render the final decision have not heard and examined all of the evidence, the decision, if adverse to a party to the proceeding other than the agency itself, shall not be made until a proposal for decision containing a statement of reasons and including determination of each issue of fact or law necessary to the proposed decision has been served upon the parties, and an opportunity has been afforded to each party adversely affected to file exceptions and present argument to the officials who are to render the decision, who shall personally consider the whole record or such portions thereof as may be cited by the parties.

HRS § 91-11.

[20]HAR § 6-61-121 states:

> All decisions and orders shall be signed by the commissioners who heard and examined the evidence in the proceeding. A commissioner who did not hear and examine all of the evidence may sign only after the requirements set forth in section 91-11, HRS, have been complied with. If a commissioner does not concur with the majority in a decision, that commissioner may issue a dissenting decision or sign the decision indicating that the commissioner does not concur with the majority.

HAR § 6-61-121

[21]This deadline is consistent with the deadline to file a motion for reconsideration of a commission decision and order. See HAR §§ 6-61-21(e) (two days added to the prescribed period for service by mail), 6-61-22 (computation of time), and 6-61-137 (ten day deadline, motion for reconsideration).

exceptions to the Proposed Decision and Order within ten days of the date of this Proposed Decision and Order. A party's exceptions or non-acceptance shall be based on the evidence and information contained in the docket record. If a party or participant does not accept, in whole or in part, the Proposed Decision and Order, and requests a hearing on its exceptions, it shall file its hearing request within ten days of the date of this Proposed Decision and Order.

4. HECO shall submit a report within sixty days of the Proposed Project's commercial operation, with an explanation of any deviation of ten percent or more in the Proposed Project's cost from that estimated in the Application. Failure to submit this report will constitute cause to limit the cost of the Proposed Project, for ratemaking purposes, to that estimated in the Application.

5. HECO shall conform to the commission's order set forth in paragraph 4, above. Failure to adhere to the commission's order shall constitute cause for the commission to void this Decision and Order, and may result in further regulatory action as authorized by law.

DONE at Honolulu, Hawaii AUG 24 2007.

PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

By _____
Carlito P. Caliboso, Chairman

By (EXCUSED)
John E. Cole, Commissioner

By _____
Leslie H. Kondo, Commissioner

APPROVED AS TO FORM:

Stacey Kawasaki Djou
Commission Counsel

03-0417.eh

CERTIFICATE OF SERVICE

I hereby certify that I have this date served a copy of the foregoing Proposed Decision and Order No. 23610 upon the following parties, by causing a copy hereof to be mailed, postage prepaid, and properly addressed to each such party.

CATHERINE P. AWAKUNI
EXECUTIVE DIRECTOR
DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS
DIVISION OF CONSUMER ADVOCACY
P. O. Box 541
Honolulu, HI 96809

WILLIAM A. BONNET
VICE PRESIDENT - GOVERNMENT AND COMMUNITY AFFAIRS
HAWAIIAN ELECTRIC COMPANY, INC.
P. O. Box 2750
Honolulu, HI 96840-0001

DEAN MATSUURA
DIRECTOR - REGULATORY AFFAIRS
HAWAIIAN ELECTRIC COMPANY, INC.
P. O. Box 2750
Honolulu, HI 96840-0001

THOMAS W. WILLIAMS, JR., ESQ.
PETER Y. KIKUTA, ESQ.
GOODSILL ANDERSON QUINN & STIFEL
Alii Place, Suite 1800
1099 Alakea Street
Honolulu, HI 96813

Counsel for Hawaiian Electric Company, Inc.

HENRY Q CURTIS
VICE PRESIDENT FOR CONSUMER ISSUES
LIFE OF THE LAND
76 North King Street, Suite 203
Honolulu, HI 96817

SCOTT K. SAIKI
c/o Hawaii State Capitol, Room 438
415 South Beretania Street
Honolulu, HI 96813

KAREN H. IWAMOTO, PRESIDENT
PALOLO COMMUITY COUNCIL
3443 Hardesty Street
Honolulu, HI 96816

DARLENE NAKAYAMA
HOOLAULIMA O PALOLO
2396 Palolo Avenue
Honolulu, HI 96816

COREY Y.S. PARK, ESQ.
PAMELA W. BUNN, ESQ.
PAUL JOHNSON PARK & NILES
1001 Bishop Street
Suite 1300, ASB Tower
Honolulu, HI 96813

Counsel for Malama O Manoa

DR. JEREMY LAM, PRESIDENT
MALAMA O MANOA
2230 Kamehameha Avenue
Honolulu, HI 96822

Karen Higashi

Karen Higashi

DATED: AUG 24 2007