ENVIRONMENTAL COMPLIANCE AND PERMITTING PLAN
WAIAU GENERATING STATION RE-POWER PROJECT

PREPARED FOR:

Hawaiian Electric Company, Inc.

PREPARED BY:

PLANNING SOLUTIONS

APRIL 2023

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LIST OF ACRONYMS

BMP	Best Management Practice
CCH	City and County of Honolulu
CIA	Cultural Impact Assessment
CMS	Continuous Monitoring System
CO	Carbon Monoxide
CT	Combustion Turbine
CUP	Conditional Use Permit
CSP	Covered Source Permit
DLNR	Department of Land and Natural Resources
DPP	Department of Planning and Permitting
EA	Environmental Assessment
ECPP	Environmental Compliance and Permitting Plan
EIS	Environmental Impact Statement
GHG	Greenhouse Gas
HAP	Hazardous Air Pollutant
HDOH	State of Hawai‘i, Department of Health
HFD	Honolulu Fire Department
HHCTCP	Honolulu High-Capacity Transit Corridor Project
HPD	Honolulu Police Department
HRS	Hawai‘i Revised Statutes
LCA	Land Commission Records of Awards
LSFO	Low-sulfur Fuel Oil
LUO	Land Use Ordinance

MSL	Mean Sea Level
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
OR&L	Oahu Rail and Land Company
PHHT	Pearl Harbor Historic Trail
PUC	Public Utility Commission
PUCDP	Primary Urban Center Development Plan
PSD	Prevention of Significant Deterioration
ROH	Revised Ordinances of Honolulu
ROW	Right-of-Way
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Places
SMA	Special Management Area
SMP	Special Management Area Permit
TMK	Tax Map Key
USEPA	United States Environmental Protection Agency
USGS	U.S. Geological Survey
VOC	Volatile Organic Compound
WGS	Waiau Generating Station

CHAPTER 1 INTRODUCTION

1.1 OVERVIEW OF THE PROPOSED PROJECT

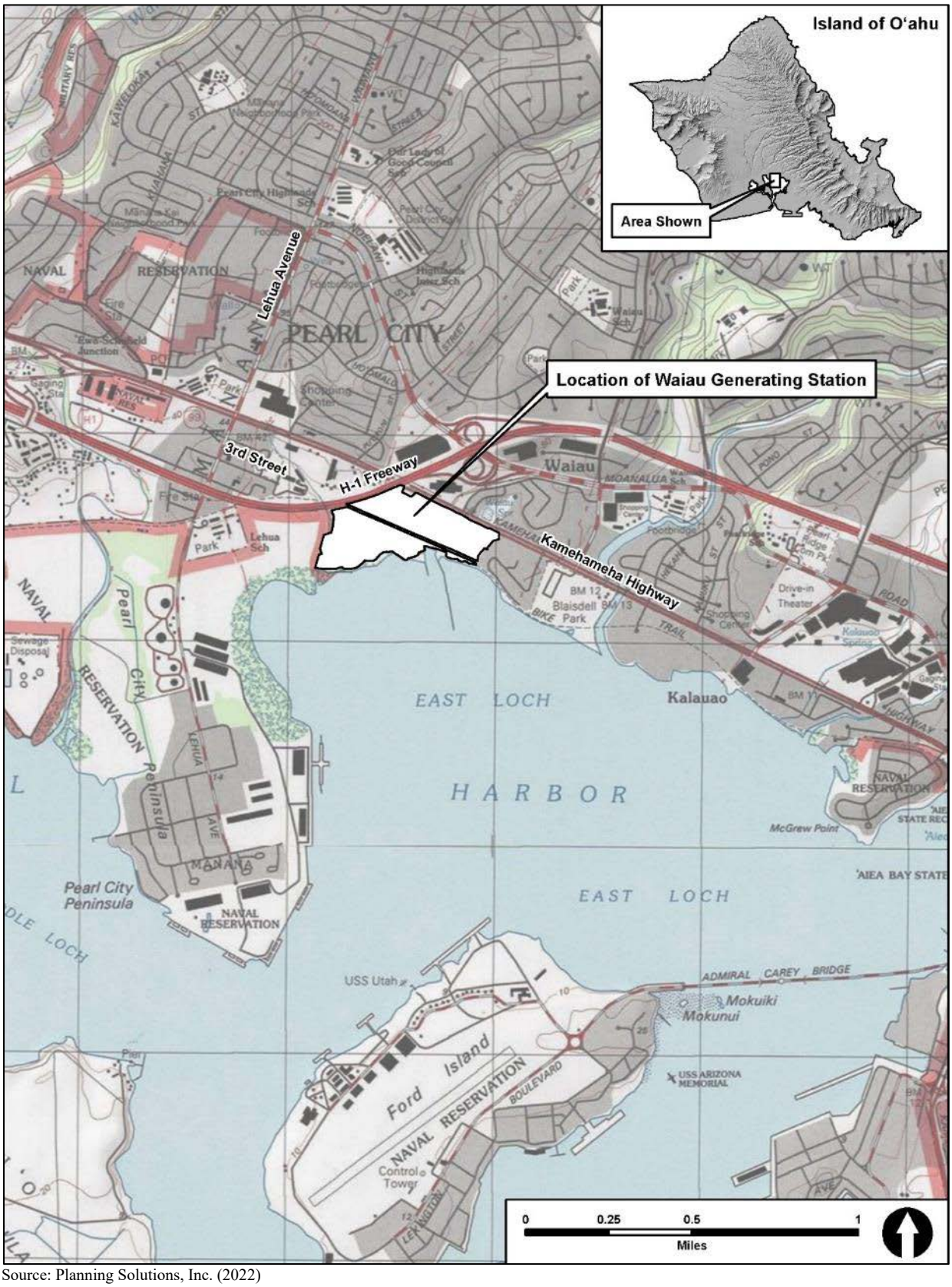
The Proposed Project involves the installation and commissioning of six (6) new, simple-cycle combustion turbine (CT) units, to be designated Waiau Units 11 through 16. The new CT units will be primarily fueled by biodiesel, but also permitted to operate on ultra-low sulfur derived from fossil fuels. A separate, earlier project would decommission, dismantle, and partially remove Waiau Units 3 through 8. These six (6) generating units are low-sulfur fuel oil (LSFO) fired boiler units and steam turbines, which have been used to generate electricity at Waiau Generating Station (WGS) for approximately 70 years. The replacement of Units 3 through 8 with Units 11 through 16 would be phased such that two units are replaced at a time. Thus, four units would be available throughout the replacement period. Hawaiian Electric plans to have the first two proposed new units in operation by 2029 and the entire replacement project completed prior to the end of 2033.

Th new units will be connected to the existing 46kV and 138kV substations at WGS and, to limit capital costs, will take advantage of and reuse much of the old unit infrastructure. The general location of the Proposed Project is shown in Figure 1-1. The proposed facilities' relationship with the adjacent area is depicted in Figure 1-2. The proposed layout for the WGS Re-Power Project is shown in Figure 1-3.

The proposed CT units will replace the existing Rankine Cycle steam turbines and provide reliable, dispatchable generation to support Hawaiian Electric Company, Inc.'s (henceforth "Hawaiian Electric" or "the Company") island-wide electrical grid. Currently, the Company anticipates replacing the existing steam turbine units with General Electric (GE) LM6000 PC spray intercooling (SPRINT) CTs with water injection for nitrogen oxides (NO_X) emissions control. The new aeroderivative CTs will be configured in three (3) blocks of two (2) simple-cycle CTs, each with a nominal output of 43.5 megawatts (MW) gross, for a nominal block output of 86 MW, and a total output at WGS of 261 MW. Most of the electrical equipment for the new units will be new.

The CTs are intended to burn primarily biodiesel with ultra-low sulfur diesel (ULSD) as a secondary fuel or back up fuel. The units will be permitted accordingly. Hawaiian Electric currently stores and burns LSFO and diesel at WGS but will convert to 100 percent biodiesel/ ULSD as part of the Proposed Project. That transition will not require substantial modifications to the fuel storage infrastructure at WGS. Existing LSFO equipment will, to the extent practicable, be converted to support operation of the CTs with the planned fuels. In general, the current equipment, and resources for utilities (e.g., raw water, compressed air, cooling water, drains, demineralized water system, etc.) are adequate to support the new CT units per the capacity factors identified in the O'ahu Stage 3 RFP. The existing demineralized water system is capable of use for daily cyclic operation, but may not be adequately sized to support operations beyond the identified capacity factor in the RFP. The existing demineralized water system can be expanded to support increased operation of the new CT units, if that becomes necessary. Also, there is existing equipment at WGS that is aging and is not optimally scaled for the new equipment. The reuse or replacement of existing equipment will be coordinated by Hawaiian Electric to determine the best value for the project.

Figure 1-1 Location Map

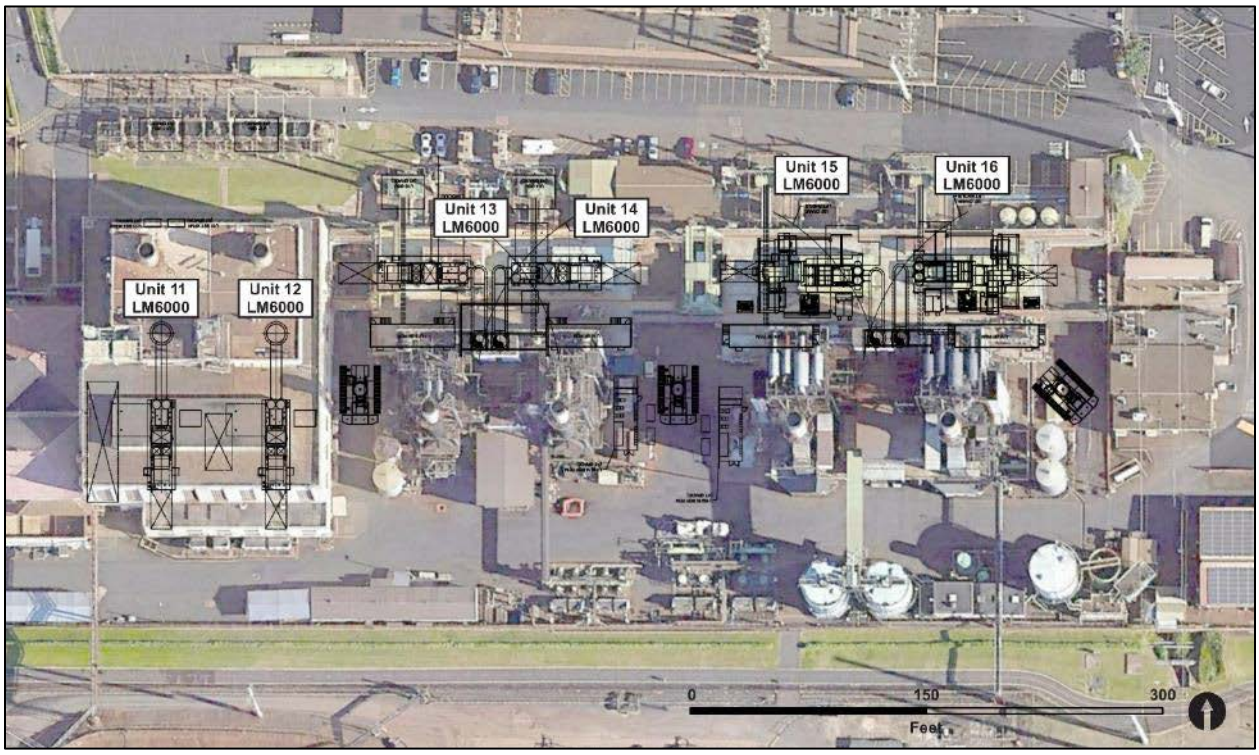


Source: Planning Solutions, Inc. (2022)

Figure 1-2 Vicinity Map

Source: Planning Solutions, Inc. (2022)

Figure 1-3 Proposed Project Site within WGS



Source: Hawaiian Electric Company, Inc. (2022)

1.2 PURPOSE OF THE PLAN

This Environmental Compliance and Permitting Plan (ECPP) is intended to provide all the information Hawaiian Electric will need to respond to portions of Appendix B, Sections 2.5, 2.6, and 2.7 of Hawaiian Electric's Stage 3 Request for Proposals (RFP) dated January 20, 2023, in Docket Number 2017-0352 that relate to the WGS site.

1.3 ORGANIZATION OF THE PLAN

The ECPP addresses the RFP requirements as follows:

- Section 5.2.1 contains land use information that address Section 2.5.6 of the RFP.
- Chapter 2 outlines an overall land use and environmental permits and approvals strategy as called for in Section 2.6.1 of the RFP.
- Chapter 3 summarizes topics related to the existing County Zoning and State Land Use District classifications as called for in Section 2.6.2 of the RFP.
- Chapter 4 provides details regarding the specific environmental permits and approvals that will be needed as called for in Section 2.6.3 of the RFP.
- Chapter 5 contains a Preliminary Environmental Assessment for the site as called for in Section 2.6.4 of the RFP.
- Chapter 6 discusses potential cultural effects as called for in Section 2.7 of the RFP.

CHAPTER 2 OVERALL LAND USE AND ENVIRONMENTAL PERMITS AND APPROVALS STRATEGY (RFP APP. B § 2.6.1)

Hawaiian Electric's overall strategy for obtaining all required permitting approvals in a timely and cost-efficient manner has involved:

- Placing the subject equipment within existing Hawaiian Electric structures, where existing approvals and infrastructure could be leveraged, and requiring a minimal amount of work outside that area.
- Siting the proposed facilities within structures that are on parcels currently owned by Hawaiian Electric that have been extensively studied, characterized, and are already essentially disturbed.
- Siting the proposed facilities within structures that are on parcels that are zoned for intensive industrial use (I-2) and on the site of one of O'ahu's largest generating facilities, the WGS, that has been located there for 70 years.
- Siting the proposed facilities where the necessary auxiliary resources (e.g., water) and infrastructure (e.g., fuel storage and switchyard) are already present.
- Siting the proposed facilities in an area that is outside of the tsunami evacuation zone and sea level rise exposure area (SLR-XA).
- Laying out the new CT units within existing structures in a way that is intended to minimize the amount of ground disturbance that is required and taking advantage of existing infrastructure to the greatest extent practicable to minimize the need for new construction.
- Interfacing with permitting authorities at the earliest possible time to fully understand (and be able to address) any concerns.
- Collecting, reviewing, and extracting information from available reports and studies containing relevant information about the proposed site.
- Conducting reconnaissance-level site visits to confirm that conditions have not changed visibly since earlier studies and/or databases were prepared.
- Siting the proposed facilities in a way that recognizes any site limitations and attempts to avoid unnecessary impacts.
- Providing for site investigations sufficient to minimize the probability of encountering previously unknown adverse conditions late in the design/development process.

The location of the Proposed Project within the WGS parcel is shown in Figure 1-3. This location provides for the needs of the CT systems while minimizing effects on other facilities and activities within WGS.

2.1 AGENCIES AND AUTHORITIES HAVING JURISDICTION

The property on which the Proposed Project would be developed consists of two parcels, Tax Map Key (TMK) Nos. 9-8-003:010 and 9-8-004:003, with a combined area of 26.1 acres. The project site lies within the property of Hawaiian Electric's WGS on the mauka side of the Pearl Harbor Historic Trail (PHHT). The WGS site is within the State's Urban Land Use District. Land use in the State's Urban District is regulated by the County in which it is located. The City and County of Honolulu (CCH) has zoned the site I-2 Intensive Industrial and CCH's Land Use Ordinance, which is contained in Chapter 21 of the Revised Ordinances of Honolulu (ROH), contains relevant land use controls.

The State of Hawai'i Department of Land and Natural Resources (DLNR) State Historic Preservation Division (SHPD) has jurisdiction over historic resources via Hawai'i Revised Statutes (HRS) Chapter 6E. As discussed in Chapter 4, the CCH Department of Planning and Permitting (DPP) and the State of Hawai'i Department of Health (HDOH) are responsible for additional regulatory approvals that are needed.

2.2 EXISTING STUDIES AND ASSESSMENTS

Hawaiian Electric worked with Burns & McDonnell Engineering Co. of Kansas City, Missouri to assess the feasibility of the Proposed Project. This investigation resulted in a report, *Waiau New Generation Project Feasibility Evaluation Report* (2022). The project-specific information in that report has been used to inform this ECPP. Should development of the Proposed Project move forward at WGS, additional planning, design, and engineering studies will be conducted in support of permit applications.

WGS has been owned and operated by Hawaiian Electric since the 1930s and several studies and assessments of the WGS site have been completed in the past. Most of the past studies have focused on the developed portion of the WGS facility, including the area currently under consideration for the Proposed Project. Relevant existing studies and assessments include, but are not limited to:

- (2022) *Waiau New Generation Project Feasibility Evaluation Report*. Prepared by Burns & McDonnell Engineering Co., Kansas City, Missouri.
- (2016) *Final Environmental Assessment and Finding of No Significant Impact for the Waiau Generating Station Non-Character Altering Projects: 2016-2025, Pearl City, O'ahu, Hawai'i*. Prepared by Planning Solutions, Inc., Honolulu, Hawai'i.
- *Historic American Engineering Record for Hawaiian Electric Company, Waiau Power Plant, Units 3 and 4 Buildings*. Prepared by KCA Architects LLC, Honolulu, Hawai'i.
- *Historic American Engineering Record for Hawaiian Electric Company, Waiau Power Plan, Units 1 and 2 Buildings*. Prepared by KCA Architects LLC, Honolulu, Hawai'i.
- (2005) *Final Environmental Assessment and Finding of No significant Impact for Waiau Power Plant, Pearl City, O'ahu, Hawai'i*. Prepared by Planning Solutions, Inc., Honolulu, Hawai'i.

2.3 OVERALL APPROVAL PROCESS

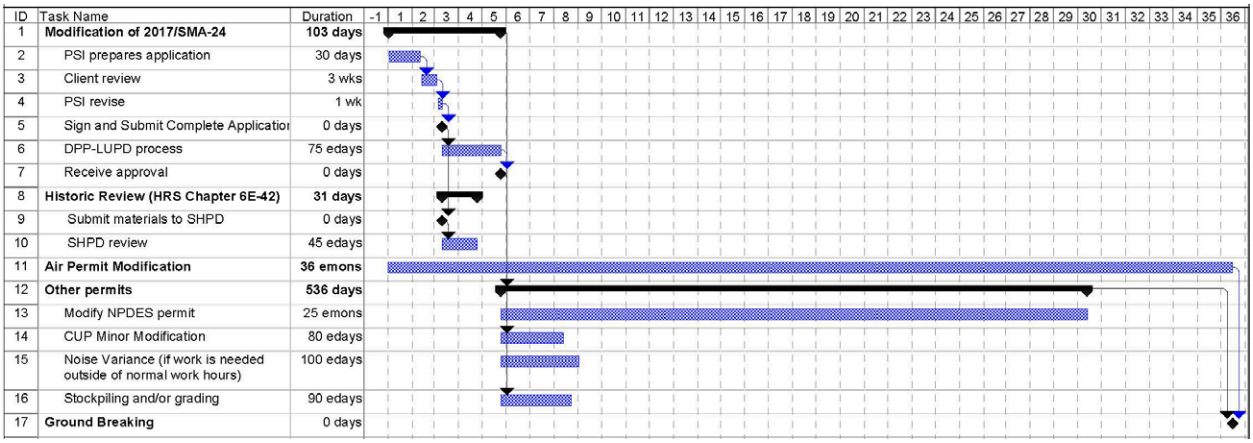
The entire WGS is within a Special Management Area (SMA). If the project is determined to meet the definition of development, which appears to be the case and because the Proposed Project has a value that easily exceeds $500,000; the project must fit under the existing SMA Major Permit or a new SMA Major Permit is required. The SMA Major Permit would be the primary land use permit that is required. The approval process will proceed along one of two possible scenarios. The scenarios, which are detailed in the subsections below, hinge on whether the Proposed Project can be included under an existing SMA Major Permit (2017/SMA-24) or will require its own new SMA Major Permit. Hawaiian Electric will continue to work with DPP to determine which scenario applies and proceed accordingly. The appropriate scenario will be identified prior to the Proposed Project being selected through the Stage 3 RFP process.[1]

2.3.1 SCENARIO 1: MODIFY 2017/SMA-24

This scenario involves Hawaiian Electric seeking an approval from DPP for a modification to the existing Special Management Area Major Permit referred to as 2017/SMA-24 to include the Proposed Project. DPP has previously modified the subject permit for other projects and may agree to modify the permit if it determines that the Proposed Project will not have a significant effect on coastal resources.

The Gantt chart, depicted in Figure 2-1, illustrates the interrelationship and dependencies between the various documents, approvals, and permits required under this scenario.

Figure 2-1: Scenario 1 Overall Approval Process, in Months



Source: Planning Solutions, Inc.

2.3.2 SCENARIO 2: OBTAIN A NEW SMA MAJOR PERMIT

This scenario would result if DPP determines that it cannot modify 2017/SMA-24 to include the project and that Hawaiian Electric must seek a new SMA Major Permit for the Proposed Project. SMA Major Permit process requires that the applicant follow the process outlined in ROH, Chapter 25 and HRS Chapter 343 (HEPA) which could include an Environmental Assessment (EA) or

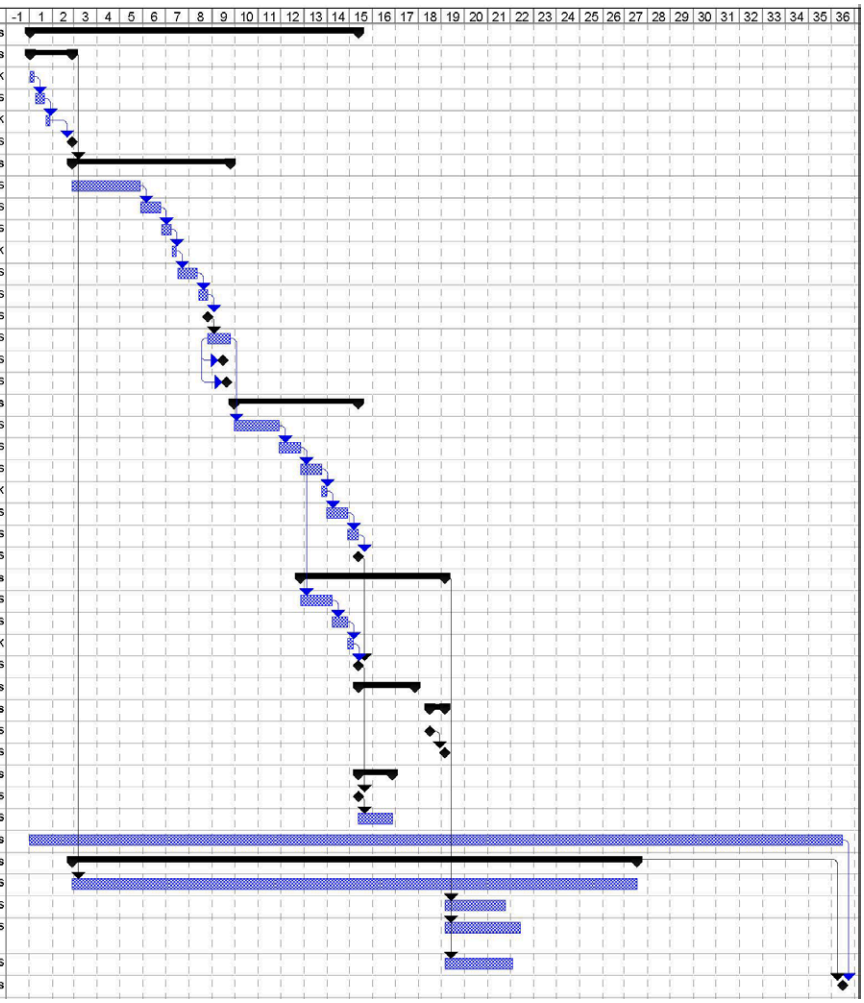
[1] Hawaiian Electric will work with DPP resolve which scenario is appropriate should the Proposed Project be identified as being on the "Priority List."

Environmental Impact Statement (EIS) before its SMA Major Permit application will be considered complete by DPP. The Gantt charts, depicted in Figure 2-2 and Figure 2-3, illustrate the interrelationship and dependencies between the various documents, approvals, and permits required under scenario 2, is an EA or EIS is used, respectively.

The Chapter 343 and SMA Major Permit process will involve consultation with state and county agencies. For example, the SHPD will be contacted regarding the HRS Chapter 6E process. That process will be completed in parallel with the Chapter 343 and SMA permit processes and be available when Hawaiian Electric applies for ministerial building, stockpiling, and/or grading permits.

Figure 2-2 Scenario 2 Overall Approval Process, Using an EA, In Months

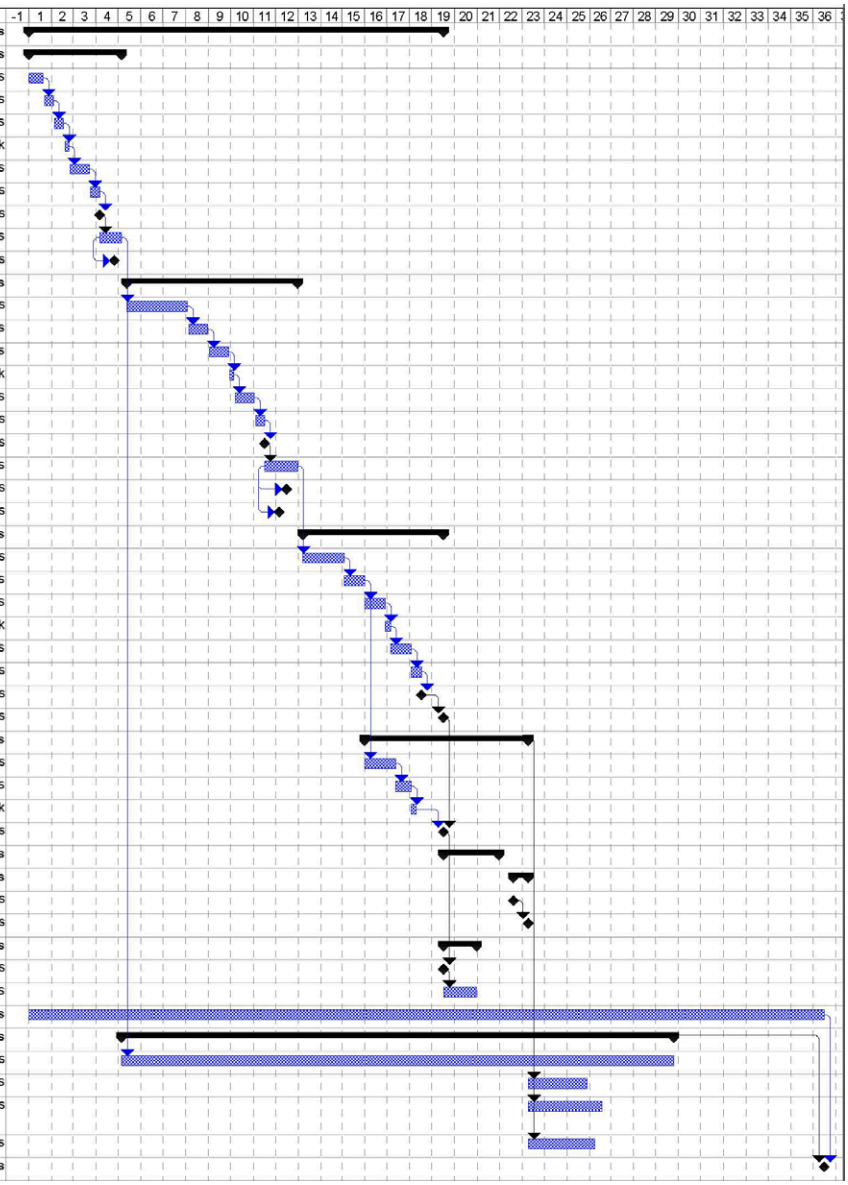
ID	Task Name	Duration
1	**EA**	**312 days**
2	**Scoping**	**40 days**
3	PSI prepares letter	1 wk
4	Client review	2 wks
5	PSI/Client resolve, revise, and send	1 wk
6	Scoping period closes	0 days
7	**DEA/AFONSI**	**150 days**
8	PSI prepares DEA	3 emons
9	Client review	4 wks
10	PSI/Client resolve and revise	2 wks
11	Client review and submit to AA	1 wk
12	AA process and submits to ERP	4 wks
13	ERP process	10 days
14	DEA announced in TEN	0 days
15	Public Comment Period	30 edays
16	Public meeting	0 days
17	PSI presentation to Neighborhood Board	0 days
18	**FEA/FONSI**	**117 days**
19	PSI prepares FEA (respond to comments)	2 emons
20	Client review	4 wks
21	PSI/Client resolve and revise	4 wks
22	Client review and submit to AA	1 wk
23	AA process and submits to ERP	4 wks
24	ERP process	10 days
25	FEA/FONSI announced in TEN	0 days
26	**SMA Major**	**138 days**
27	PSI prepared application	30 days
28	Client review	3 wks
29	PSI revise	1 wk
30	Sign and Submit Complete Application	0 days
31	**DPP-LUPD Process**	**53 days**
40	**City Council Resolution process**	**15 days**
41	Committee action	0 days
42	City Council full council action	0 days
43	**Historic Review (HRS Chapter 6E-42)**	**33 days**
44	Submit materials to SHPD	0 days
45	SHPD review	45 edays
46	**Air Permit Modification**	**36 emons**
47	**Other permits**	**536 days**
48	Modify NPDES permit	25 emons
49	CUP Minor Modification	80 edays
50	Noise Variance (if work outside normal work hours)	100 edays
51	Stockpiling and/or grading	90 edays
52	**Ground Breaking**	**0 days**



Source: Planning Solutions, Inc.

Figure 2-3 Scenario 2 Overall Approval Process, Using an EIS, in Months

ID	Task Name	Duration
1	**EIS**	**403 days**
2	**Scoping/EISPN**	**90 days**
3	PSI prepares EISPN	3 wks
4	Client review	2 wks
5	PSI/Client resolve and revise	2 wks
6	Client review and submit to AA	1 wk
7	AA process and submits to ERP	4 wks
8	ERP process	10 days
9	EISPN announced in TEN	0 days
10	Public Comment period	30 edays
11	Public scoping meeting	0 days
12	**DEIS**	**166 days**
13	PSI prepares DEIS (respond to comments)	3 mons
14	Client review	4 wks
15	PSI/Client resolve and revise	4 wks
16	Client review and submit to AA	1 wk
17	AA process and submits to ERP	4 wks
18	ERP process	10 days
19	DEIS announced in TEN	0 days
20	Public Comment Period	45 edays
21	Public meeting	0 days
22	PSI presentation to Neighborhood Board	0 days
23	**FEIS**	**137 days**
24	PSI prepares FEIS (respond to comments)	2 mons
25	Client review	4 wks
26	PSI/Client resolve and revise	4 wks
27	Client review and submit to AA	1 wk
28	AA process and submits to ERP	4 wks
29	ERP process	10 days
30	FEIS announced in TEN	0 days
31	FEIS accepted by Governor	0 days
32	**SMA Major**	**159 days**
33	PSI prepared application	30 days
34	Client review	3 wks
35	PSI revise	1 wk
36	Sign and Submit Complete Application	0 days
37	**DPP-LUPD Process**	**53 days**
46	**City Council Resolution process**	**15 days**
47	Committee action	0 days
48	City Council full council action	0 days
49	**Historic Review (HRS Chapter 6E-42)**	**32 days**
50	Submit materials to SHPD	0 days
51	SHPD review	45 edays
52	**Air Permit**	**36 emons**
53	**Other permits**	**536 days**
54	Modify NPDES permikt	25 emons
55	CUP Minor Modification	80 edays
56	Noise Variance (if work outside normal work hours)	100 edays
57	Stockpiling and/or grading	90 edays
58	**Ground Breaking**	**0 days**



Source: Planning Solutions, Inc.

CHAPTER 3 COUNTY ZONING AND STATE LAND USE CLASSIFICATION (RFP APP. B § 2.6.2)

This chapter summarizes the existing County Zoning and State Land Use classifications, assesses the extent to which the Proposed Project is allowable under the existing designations, and describes the process and approximate schedule for obtaining the required designation if a change appears to be necessary.

3.1 STATE LAND USE REGULATIONS

Chapter 205, HRS establishes state land use law. It provides for all lands in the state to be placed into one of four Land Use Districts (Urban, Rural, Agricultural, and Conservation). The land on which the Proposed Project would be constructed is in the Urban District. As provided for in HRS §205-2(b), activities and land use in areas within the State Urban District are regulated solely by the county in which they occur. Hence, the Proposed Project is a permissible use insofar as the state land use law is concerned and no changes are necessary.

3.2 CITY AND COUNTY OF HONOLULU LAND USE ORDINANCE

The CCH Land Use Ordinance (LUO), contained in ROH, Chapter 21, establishes the land use controls applicable to the Proposed Project. The land on which the proposed facilities would be constructed has been zoned "I-2." ROH § 21-3.140 describes the purpose and intent of the "I-2" zone as an Intensive Industrial District to set aside areas for the full range of industrial uses necessary to support the city. It is intended for areas with necessary supporting public infrastructure near major transportations systems and with other locational characteristics necessary to support industrial centers. It shall be in areas away from residential communities where certain heavy industrial uses would be allowed. Permitted uses within the I-2 zoning district are enumerated in the master use table of the LUO (Table 21-3).

ROH § 21-10.1 contains the definitions of terms used in the LUO. It defines two types of "utility installations," Type A and Type B. Type A utility installations are relatively minor facilities (e.g., substations, vaults, or wells); Type B utility installations are major facilities such as generating stations and baseyards. The CIP Generating Station and the proposed CT facilities best fit the definition of Type B utility installations. The proposed CT facilities best fit the definition of Type B utility installations.

The "Utilities and Communications" portion of Table 21-3 identifies "Utility Installations, Type B" as a permitted use in the I-2 zoning district subject to the standards in Article 5, provided a Conditional Use Permit (CUP) – Minor (Minor CUP) is attained (see Section 4.3). In the unlikely event that the Proposed Project were to be classified as a Type A utility installation, it would still be an allowable use.

Development standards within the I-2 zoning district are specified in Table 21-3.5 of the LUO and are reproduced below in Table 3-1.

Table 3-1 I-2 Development Standards

Minimum Lot Area	7,500 square feet
Minimum Lot Width and Depth	60 feet
Front Yard	5 feet
Side and Rear Yard	0 feet
Maximum Building Area	80% of zoning lot (can be greater in certain situations)
Maximum Density (Floor Area Ratio)	2.5
Maximum Height	Per zoning map (60 feet)
Height Setbacks	Per abutting R-5 minimum front and side setbacks are 11 ft. Per ROH § 21-3.140-1(c)(3) for lots adjacent to a street, max. height equal to twice the distance from the structure to the vertical projection of the center line of street.
Parking Requirement	Table 22-6.1 provides that the number of parking stalls is to be determined by the Director.

Note: Where the side or rear property line of a zoning lot adjoins the side or rear yard of a zoning lot in a Residential, Apartment, Apartment Mixed Use or Resort District, there shall be a side or rear yard which conforms to the side or rear yard requirements for dwelling use of the adjoining district.
Source: ROH Chapter 21, Table 21-3.5.

In summary, the I-2 zone is the most appropriate to the Proposed Project and no changes to zoning are necessary, the location of the Proposed Project within the WGS parcels (Figure 1-3) appears to meet all the applicable development standards, and a Minor Modification to the existing CUP for the facility 89CUP/1-47 is required (see Section 4.3).

CHAPTER 4 LAND USE, ENVIRONMENTAL AND CONSTRUCTION PERMITS AND APPROVALS (RFP APP. B § 2.6.3)

This chapter addresses permitting requirements specific to the Proposed Project. As used here, the terms "permit" and "approval" differ from the land use authorizations discussed in Chapter 3. For each of these, it lists: (*i*) the name of the permit; (*ii*) the agency and/or authorities having jurisdiction over its issuance; (*iii*) the anticipated timeline for obtaining the required permit, approval, and/or license; and (*iv*) the interrelationships/interdependencies with other required permits, approvals, and/or licenses.

The engineering and environmental permits and approvals that will be needed are listed in Table 4-1. In addition to the name, the table indicates the agency that grants the approval, the status and timeline, and the basis of the timeline. A more detailed discussion of the regulatory requirements of the major land use permit or approval is presented in the following subsections of this Chapter. The Gantt chart in Figure 2-3 indicates the interrelationship and dependencies of the various processes. As explained in Section 2.3, an EA or EIS needs to be completed prior to applying for an SMP-Major and then the SMP-Major would need to be approved by the Honolulu City Council before DPP will consider the necessary ministerial grading, building, and other permits.

Table 4-1 Required Permits and Regulatory Approvals

Name	*Discussion*	*Agency/Authority*	*Status and Timeline*	*Basis of Timeline*
Scenario 1 only: Minor Modification of 2017/SMA-24	The proposed project site is within the Special Management Area and the project cost will exceed $500,000. Therefore, an SMP-Major permit is required. ROH 25 requires that an EA or EIS be prepared prior to submitting the SMP-Major application.	City and County of Honolulu, Department of Planning and Permitting	3 months	Experience modifying this permit for other WGS projects.
Scenario 2 only: ROH 25 Special Management Area Permit-Major		City and County of Honolulu, Department of Planning and Permitting and Honolulu City Council.	EA or EIS: 9 to 18 months. SMP-Major: 5 months beginning immediately following EA or EIS.	Experience with EAs, EISs, and SMP-Majors for previous projects at WGS.
Minor Modification to Conditional Use Permit (CUPmm)	The change in generation at WGS triggers the requirement for a minor modification to the facility's existing CUP 89/CUP1-47 use permit.	City and County of Honolulu, Department of Planning and Permitting.	3 months.	Experience with CUPmm at Hawaiian Electric facilities around O'ahu, including WGS.

Name	*Discussion*	*Agency/Authority*	*Status and Timeline*	*Basis of Timeline*
HRS Chapter 6E Historic Preservation	Assess the effects of the Proposed Project on historic properties (i.e., Generator Buildings 1-2 and 3-4). This is conducted during the EA/SMP process, if necessary.	State of Hawai'i, Department of Land and Natural Resources, State Historic Preservation Division (SHPD).	165 days; to be conducted during EA/SMP process.	Experience with 6E-42 process in similar situations.
Significant Modification to Covered Source Permit (CSP) No. 0239-01-C	Modify Waiau CSP to reflect the retirement of the existing six (6) boilers (W3 thru W8) and installation of six (6) proposed new combustion turbines LM6000.	State of Hawai'i Department of Health Clean Air Branch, United States Environmental Protection Agency (USEPA) Region IX.	36 months	Prior experience and complexities of the air permitting process.
NPDES Permit No. HI0000604 Modification	The existing NPDES will be modified to reflect change in operation and discharge	State of Hawai'i Department of Health, Clean Water Branch	25 months	Experience with agency
Building, stockpiling, and/or grading	These engineering permits may be required for certain planned developments and activities.	City and County of Honolulu, Department of Planning and Permitting.	Building: unknown. Stockpiling and Grading: 3 months.	Prior experience.

Source: Planning Solutions, Inc. (2022)

4.1 SCENARIO 1 ONLY: MINOR MODIFICATION TO 2017/SMA-24

SMA Permit 2017/SMA-24 can be modified by the DPP Director to include newly identified projects at WGS provided the subject project:

1. Would not change the character of the land use at WGS.
2. Satisfies the definition of one of the four defined "categories" of project identified in permit application materials including the respective category's geographic envelope.
3. Would not have a significant effect on coastal resources relative to existing conditions.

DPP requires that a "Minor Modification" application be submitted. DPP will evaluate the application and issue a response, generally within 60 days.

4.2 SCENARIO 2 ONLY: SPECIAL MANAGEMENT AREA PERMIT-MAJOR

ROH Chapter 25 outlines the requirements of the SMA. The entirety of the parcel where the Proposed Project will be placed is within the SMA. The project meets the definition of a development in ROH § 25-1.3; therefore, an SMP is required. Because the Proposed Project will have a value greater than $500,000, either the project must be subject to the existing SMP, or a new SMP-Major is necessary. The SMP-Major requires that Chapter 343 be complied with which could include an EA or EIS be completed prior to submitting the SMP-Major application to DPP (ROH § 25-4.2), that DPP conduct a public hearing in the project area (ROH § 25-5.3), and that the Honolulu City Council pass a resolution (ROH § 25-5.5) approving the SMP-Major.

4.3 MINOR MODIFICATION TO 89/CUP1-47

As discussed in Section 3.2, WGS is classified as a Type B utility installation located in the I-2 Intensive Industrial District and the Proposed Project is an allowable use in that zone, provided certain standards and conditions are met. The method by which the CCH regulates such uses is the CUP. WGS is currently operating under an existing use permit, 89/CUP1-47. Once the requirement for an SMA permit for the Proposed Project has been complied with, Hawaiian Electric will need to obtain a Minor Modification to 89/CUP1-47.

4.4 HRS 6E-42 HISTORIC PRESERVATION REVIEW

Before any agency, including DPP, can approve any permit, license, certificate, land use change, subdivision, or other entitlement for use which has the potential to affect a historic property, the agency must consult with the SHPD, pursuant to Hawai‘i Revised Statutes, Chapter 6E-42. Consultation with SHPD is intended to provide them with an opportunity to review and comment on the effect of the Proposed Action on historic properties, including those listed in the Hawai‘i Register of Historic Places.

4.5 SIGNIFICANT MODIFICATION TO COVERED SOURCE PERMIT (CSP) NO. 0239-01-C

Waiau Generating Station is a major stationary source regulated under CSP No. 0239-01-C. As mentioned above, the project proposes to replace Waiau boilers Unit Nos. 3 through 8 with new, simple-cycle CT units, to be designated Waiau Unit 11 through 16. The new CT units will be permitted to operate on biodiesel and ULSD. The replacement of Units 3 through 8 with Units 11 through 16 would be phased such that two units are replace at a time.

Although the proposed plan triggers the requirement for a significant modification to the CSP, it does not trigger the Prevention of Significant Deterioration (PSD) requirements. The approval for the modification will be required from the HDOH Clean Air Branch and United States Environmental Protection Agency Region IX (USEPA), prior to any construction.

The significant modification application will be a non-PSD application, filed in accordance with HAR § 11-60.1-104. The application will reflect the following project-specific plans:

- The retirement of the existing boilers and the construction of the six new CTs. The emissions rates for criteria pollutants, hazardous pollutants, and GHG, will include the emissions decrease from the retirement of the boilers and emissions increase from the proposed new CTs. The net increase in emissions will be presented to justify the proposed operating parameters/limitations and to demonstrate the non-applicability of the PSD requirements.
- Air pollution control proposed in this project include use of biodiesel to control GHG, consistent with Hawaiian Electric’s carbon neutral goals, use of biodiesel and ULSD with sulfur content less than 15 ppm to control SO_2, use of water injection to control NOx, and use of oxidation catalyst to control CO, VOC, and formaldehyde.
- Citation and description of all applicable requirements, including applicable limits, monitoring and reporting requirements. The proposed new combustion turbines will

be subject to the requirements in 40 CFR 60 Subpart KKKK and 40 CFR 63 subpart YYYY. 40 CFR 60 Subpart KKKK requires new turbine with heat input between 50 MMBtu per hour and 850 MMBtu per hour, firing fuels other than natural gas, to a NO_x emission standard of 74 ppm at 15% O_2. The manufacturer guarantees NOx emissions of 42 ppm at 15% O_2 with water injection, without use of Selective Catalytic Reduction. Therefore, the proposed LM6000 will be able to meet Subpart KKKK's NO_x emission standard with water injection, as proposed. Additionally, the proposed use of 15 ppm sulfur fuel in biodiesel and ULSD will meet the requirements of Subpart KKKK § 60.4330 for the SO_2 limits.

40 CFR 63 subpart YYYY requires the turbine to meet the formaldehyde emission limit of 91 ppbvd at 15% O_2, except during turbine startup. The proposed use of oxidation catalyst will be utilized to comply with this emission limit.

- An assessment of the ambient air quality impact with the inclusion of background air quality data. The ambient air quality impact assessment will include dispersion modeling using USEPA's AERMOD modeling system, in accordance with HDOH and USEPA modeling guidelines. The dispersion modeling will evaluate the LM6000's maximum emissions rates at startup and shutdown, 25% load, 50% load, 75% load, and 100% load, as provided by the manufacturer. The model will utilize meteorological data from Honolulu International Airport. The background air quality data will be taken from existing HDOH monitors. The assessment will demonstrate the project's compliance with the National Ambient Air Quality Standard and state ambient air quality standards.
- If requested by the HDOH, a State Best Available Control Technology analysis, supporting the selection of emissions control technology proposed for this project may be required.
- A compliance assurance monitoring plan demonstrating compliance with the applicable operations and emissions limits. Compliance will be demonstrated using either Continuous Emissions Monitoring System, Continuous Monitoring System (CMS), and/or annual source tests. At a minimum, the CMS will monitor load, water injection rate, and fuel input rate.

The significant modification application process will provide an opportunity for public participation, including the method by which a public hearing can be requested and an opportunity for public to comment on the draft significant modification to the CSP in accordance with Hawai'i Administrative Rules § 11-60.1-99. The public comment period usually lasts for 30 days. In addition to public participation, following HDOH's review, the application will go through USEPA for its review and approval. Depending on the complexities, USEPA review period can last anywhere from 45 days to several months.

CHAPTER 5 PRELIMINARY ENVIRONMENTAL ASSESSMENT OF THE SITE (RFP APP. B § 2.6.4)

The following summary of potential environmental effects is based on the data contained in past reports and publicly available environmental databases. It summarizes identifiable pre-existing environmental conditions and describe the kinds of short- and long-term direct, indirect, and cumulative environmental impacts likely to result from development, operation, and decommissioning of the Proposed Project.

5.1 NATURAL ENVIRONMENT

5.1.1 AIR QUALITY

5.1.1.1 Existing Environment

The HDOH monitors ambient air quality on O'ahu using a system of monitoring stations. The primary purpose of the monitoring network is to measure ambient air concentrations of the six criteria pollutants. These are particulate matter smaller than 2.5 micrometers ($PM_{2.5}$) and smaller than 10 micrometers (PM_{10}), Sulfur dioxide (SO_2), Nitrogen dioxide (NO_2), Carbon monoxide (CO), and ozone (O_3). The 2020 air quality measurements at the full monitoring site closest to the project area (Kapolei) are summarized in the State of Hawai'i Department of Health, *2020 Air Quality Data Book* (https://health.hawaii.gov/cab/files/2022/02/aqbook_2020_.pdf).[2] As that report documents, air quality in the area during 2020 (which is generally representative of past and more recent years) never exceeded the short-term or long-term state or national standards for the five pollutants measured [$PM_{2.5}$ and PM_{10}, NO_2, SO_2, CO] at the Kapolei monitoring station. The air quality is good, and the region is considered an attainment area.

5.1.1.2 Potential Effects

Currently, Hawaiian Electric is in the process of converting its generation portfolio to emphasize the use of non-polluting, locally generated, renewable energy such as wind and solar. However, to continue to meet its customers' need for continuous, reliable power, Hawaiian Electric also needs to incorporate firm generation capacity, which is rapidly dispatchable, so that it can quickly and flexibly supplement renewable sources which tend to be variable. The proposed CT Unit Nos. 11-16 for the WGS Re-Power Project, will ultimately contribute to the reduction of total air emissions that have the potential to adversely impact air quality by: (*i*) replacing larger oil-fired generating units with more flexible units that would utilize a cleaner burning fuel, and (*ii*) enabling an increase in the proportion of electricity in the Hawaiian Electric's island-wide grid that is produced by clean, non-polluting methods. Thus, over the lifetime of the project, the WGS Re-Power Project is anticipated to facilitate reductions in air pollutants emissions island-wide.

Site preparation will not involve any substantial grading, grubbing, trenching, or other earthmoving. However, much of the old LSFO boilers and steam turbines will need to be demolished or dismantled and removed from Waiau Generating Station; this needs to be done

[2] The Pearl City Air Quality Monitoring Station is closer to the project site but is limited to monitoring $PM_{2.5}$ and PM_{10}.

whether the Proposed Project moves forward or not and is being planned as a separate project. Preparation for installation and interconnection of the proposed CTs will require temporary use of heavy, diesel-powered equipment, contributing to air emissions, including GHG, during the construction period. The impact of these brief, construction-period impacts would be very limited so long as appropriate dust control measures are implemented. The emissions during the construction period will be temporary and will allow for long-term emissions reduction through the operation of more efficient CT units using a cleaner burning fuel, as described above.

Once in operation, the CTs are not anticipated to adversely impact air quality in the region or the State. Because the Proposed Project will allow Hawaiian Electric to: (*i*) produce power using a cleaner fuel source (i.e., biodiesel vs. LSFO), (*ii*) operate WGS' generators at less total run time; and (*iii*) incorporate additional clean, renewable energy into its grid, the Company expects that the Proposed Project will reduce the potential-to-emit for criteria pollutants and reduce overall net GHG emissions. Assessments of these reductions will be made as the Proposed Project progresses through the permitting. If selected, Hawaiian Electric will perform the life cycle GHG analyses, as part of the application for project approval from the Public Utility Commission (PUC).

As explained above, the project proposes to replace the existing large LSFO-fired boilers with new more efficient combustion turbines. Below are potential quantitative emissions benefits that can be expected from the proposed replacement.

From the GHG perspective, the majority of emissions will be generated from the combustion of fuel during CT operation. The proposed replacement intends to reduce carbon emissions through the amount of fuel avoided by utilizing the more efficient generating units and replacing LSFO with less carbon intensive fuels. The following approximations summarizes the differences between the existing LSFO units and the proposed LM6000 units:

- Average Heat Rate:
  - Existing W3 – W8 on LSFO = 11,043 Btu/net kWh[3]
  - Proposed LM6000 on ULSD/Biodiesel = 10,800 Btu/net kWh[4]
- Avoided fuel per net kWh:
  - 243 Btu/net kWh when operating proposed LM6000 on ULSD/Biodiesel
- Avoided GHG emissions per net kWh:
  - 30.62 kg CO_2e/kWh when operating proposed LM6000 on ULSD[5]
  - 831.5 kg CO_2e/kWh when operating proposed LM6000 on Biodiesel[6]

[3] Source: Page 402 of 2021 PUC Annual Utility Report. Available at: https://puc.hawaii.gov/wp-content/uploads/2022/07/HECO_2021-AFR.pdf

[4] Source: Heat rate used for the calculation is based on Manufacturer's provided literature, at 50% load. Normal operation is expected at 50-100% load. Operations at higher loads are more efficient, with lower heat rate, resulting in higher avoided GHG emissions per kWh. Startup/shutdown and operation at low load are expected to be intermittent and infrequent.

[5] Calculated based on emissions factors in 40 CFR Subchapter C Part 98 Subpart C Table A-1 and A-2.

[6] Calculated based on emissions factors in 40 CFR Subchapter C Part 98 Subpart C Table A-1 and A-2. Biogenic CO_2 is not included.

From the criteria pollutants perspective, Table 5-1 below provides a comparison of hourly short-term emissions rates, showing potential significant reduction of emissions rates for SO_2, NO_x, and PM on an hourly basis.

Table 5-1: Hourly Short-Term Emissions Rates (lb./hour), Comparison of Existing Waiau Units and Proposed LM6000 Units

Criteria Pollutant	*W3[1] LSFO*	*W4[1] LSFO*	*W5[1] LSFO*	*W6[1] LSFO*	*W7[1] LSFO*	*W8[1] LSFO*	*LM6000[2,3] ULSD*	*LM6000[2,3] Biodiesel*
SO_2	305.62	310.5	335.86	338.20	488.99	489.84	0.9	1
NO_x	638.21	648.4	701.36	688.39	662.17	578.85	76.7	92.4
CO	38.6	39.21	42.42	42.71	61.76	61.86	36.5[4]	41.8[4]
VOC	5.87	5.96	6.45	6.49	6.81	6.82	10.1[4]	11.5[4]
PM/PM-10	59.6	60.55	65.49	65.95	95.35	95.52	13.8	16.6

Notes:
1. Existing boilers emissions rates are taken from the administrative record of Waiau Generating Station, Application for Significant Modification No. 0239-06, P.159-164. Available at: https://health.hawaii.gov/cab/files/2020/07/0239-01-C-Admin-Record.pdf
2. Proposed combustion turbine emissions rates are provided by GE.
3. Worst case emissions among startup/shutdown, 25% load, 50% load, 75% load, and 100% load scenarios.
4. CO and VOC emissions rates presented in this table are without control. The project proposes to install oxidation catalyst to control CO, VOC, and Formaldehyde. Emissions rates for CO, VOC, and Formaldehyde after control will be provided by GE following source performance tests. Most catalyst manufacturers guarantee design efficiency of at least 90% reduction of CO and VOC. This efficiency performance is consistent with destruction efficiency published for typical catalytic oxidation technology in EPA Control Technology Fact Sheet (https://www3.epa.gov/ttncatc1/dir1/fregen.pdf).

5.1.2 BIOLOGY

5.1.2.1 Existing Environment

There is little vegetation to speak of within the working areas of WGS. The ground cover over most of the facility is pavement and gravel. Because unchecked vegetation poses a fire risk, it is kept to a minimum and controlled by cutting and the occasional application of herbicide. Sparse landscaping is employed in a few areas (e.g., along Kamehameha Highway and the main entrance). Natural vegetation in this portion of the facility is limited to the periphery of the facility, along the shore of Pearl Harbor, the undeveloped farmed areas, and nearby marshland. While no project-specific survey has yet taken place for the present undertaking, biological resources in various portions of the facility have been documented in 1979, 2002, 2007, and 2022.

5.1.2.2 Potential Effects

The Proposed Project will not require the removal of any appreciable level of vegetation within WGS, nor will it disturb areas which may occasionally attract the interest of itinerant native waterbirds. No plants listed as endangered or threatened are present in the area where the new CTs and their appurtenances would be installed, which is primarily in and around existing buildings and generation structures. In view of the fact that work will be inside an existing structure and the area outside is already disturbed and the low value of the existing habitat and the absence of any known rare or endangered species, no significant adverse impacts on flora or fauna are anticipated as a result of construction or operation of the Proposed Project.

5.1.2.3 Natural Habitats/Ecosystems, Especially if Threatened or Endangered

The WGS is not designated as critical habitat for any threatened or endangered species. The nearest designated wildlife sanctuary is the Pearl Harbor National Wildlife Refuge, more than one

mile to the west, along the eastern bank of Pearl Harbor's Middle Loch. The nearest U.S. Fish and Wildlife Service (USFWS)-designated critical habitat is in the Koʻolau Mountains above residential developments, primarily above 800 feet in elevation. Undeveloped portion of WGS that consist of wetlands, including farm areas, are known to attract threatened and endangered waterbird species at times. The waterbirds habituate the area despite the nearby WGS operation. Work on the Proposed Project will not occur in those wetland areas and waterbirds are not known to visit the portion of WGS where work would occur.

5.1.3 CLIMATE

5.1.3.1 Temperature

Due to the tempering influence of the Pacific Ocean and their low-latitude location, the Hawaiian Islands experience extremely small diurnal and seasonal variations in ambient temperature. The temperature data from representative stations are summarized in Table 5-2.

5.1.3.2 Rainfall

The island's terrain strongly influences the amount of rainfall. While rainfall near the top of the Koʻolau Range on the windward side of Oʻahu averages nearly 250 inches per year, average annual rainfall at the project site is a little over 20 inches per year, more than an order of magnitude less. As shown in Table 5-2, on average, more than 80 percent of the annual rainfall occurs between October and April; from May through September, it averages less than 1 inch per month. As shown in Figure 5-1, the annual rainfall is also highly variable, and appears to have decreased somewhat over the past 65 years.

While average rainfall is relatively low, intense rainfall events do occur. During the first 15 days of November 1996, for example, record-breaking rainfall occurred along the leeward coast of the island. In Waiʻanae, 21 inches fell in an area where the average annual rainfall is 20 inches. At Kalaeloa Airport, 20.2 inches of rain fell with 7.48 inches falling during a single day on November 5, 1996. The maximum daily (24-hour) rainfall that occurred during this period was 10.51 inches, which fell on March 5, 1958.

5.1.3.3 Wind Patterns

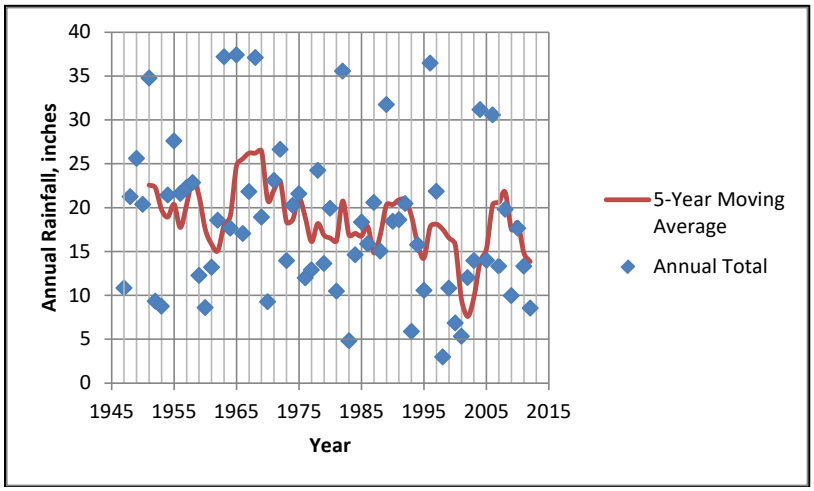
As shown in Figure 5-2, northeasterly trade winds dominate in the project area. Trade winds are produced by the outflow of air from the Pacific Anticyclone, also known as the Pacific High. The center of this system is usually located well north and east of the Hawaiian chain and moves to the north and south seasonally. Average wind speeds (Table 5-3) are moderate, ranging between 7 miles/hour (mph) in October and 8.1 mph in April. Maximum recorded gusts range between 22.6 mph (Jan. and Oct.) and 24.9 mph (July).

Table 5-2 Average Monthly Temperature, Rainfall, and Humidity

Month	*Air Temperatures, F° (January 1949 - June 2013)*			*Monthly Rainfall, inches (April 1945 - June 2013)*			*Average Relative Humidity (%)*
	Min.	*Average*	*Max.*	*Min.*	*Average*	*Max.*	
January	50.0	72.3	89.1	0.09	3.14	14.22	71.7
February	52.0	72.2	89.1	0.00	2.19	10.06	69.1
March	52.0	73.0	91.9	0.03	2.11	17.42	67.9
April	55.9	74.2	91.9	0.01	1.07	12.13	67.5
May	59.0	75.7	91.9	0.00	0.89	8.52	65.5
June	61.0	77.7	96.1	0.00	0.31	2.09	62.6
July	62.1	78.7	98.7	0.00	0.35	2.57	62.0
August	64.9	79.2	96.1	0.00	0.40	2.96	61.8
September	64.0	79.0	93.9	0.02	0.49	2.72	63.8
October	54.0	77.8	93.9	0.00	1.65	13.57	70.6
November	55.9	75.8	96.8	0.01	2.24	22.43	69.4
December	55.0	73.6	91.9	0.00	2.80	12.30	70.8

Note: Temperatures calculated from hourly observations
Sources: National Climate Data Center, http://www.ncdc.noaa.gov/cdo-web/) Met. Stations:
Kalaeloa Airport (USW00022514, 1949-1998; USW00022551, 1999-2013)
Honolulu Observatory 702.2 (USC00518806, 1960-8/1962; USC00511918, 9/1962-2013
Ewa MCAS (USW00022515, 1945-1949)

Figure 5-1 Long-Term Annual Rainfall Trend (1947-2012)



Sources: Planning Solutions, Inc. based on data from National Climate Data Center.

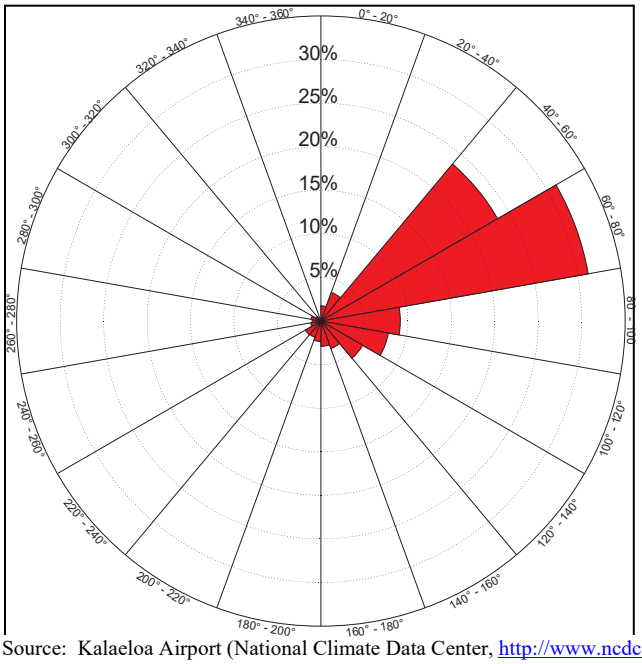
Table 5-3 Project Area Average Wind Speeds by Month

Month	*Wind Speed Monthly Averages (miles per hour)*			
	Average[1]	*Maximum 2-Minute Gust*[2]	*Maximum 5-Second Gust*[2]	*Maximum Recorded Gust*[3]
January	7.6	16.2	20.6	22.6
February	7.4	15.5	19.7	23.3
March	8.0	16.3	21.5	24.1
April	8.1	16.0	21.8	24.5
May	7.8	15.4	20.2	24.0
June	7.9	15.8	21.3	24.7
July	7.9	15.7	21.9	24.9
August	7.6	15.8	22.1	24.3
September	7.2	15.3	20.9	22.8
October	7.0	15.1	20.4	22.6
November	7.2	14.8	19.9	23.5
December	7.4	15.6	20.1	23.3
Overall	7.6	15.6	20.8	23.7

Source: Kalaeloa Airport (National Climate Data Center, http://www.ncdc.noaa.gov/cdo-web/)

The principal exceptions to these mild wind conditions take place when hurricanes pass nearby. The highest wind speed recorded at the Kalaeloa Airport Station was 70.2 mph, which occurred on November 23, 1982, as Hurricane ‘Iwa produced its maximum winds on the island of Kaua‘i. Hurricane ‘Iniki, which passed directly over Kaua‘i causing extensive damage, produced a maximum gust of wind at Kalaeloa Airport measured at 51.7 mph on September 11, 1992.

Figure 5-2 Wind Rose (Kalaeloa Airport, 1999 – 2012)



Source: Kalaeloa Airport (National Climate Data Center, http://www.ncdc.noaa.gov/cdo-web/)

5.1.3.4 Potential Impacts

The Proposed Action is intended to increase Hawaiian Electric's ability to incorporate non-polluting, renewable energy sources (e.g., wind and solar) while still maintaining sufficient dispatchable backup power to ensure that all customers have access to continuous, reliable electrical power for their homes and businesses. The proposed CTs, which will replace the existing LSFO boilers and steam turbines do not have the potential to alter regional airflow substantially and will not significantly increase the thermal signature of the area.

5.1.4 SOILS

5.1.4.1 Existing Conditions

According to the U.S. Department of Agriculture's Soil Conservation Service, three soil types make up the bulk of the developed area of WGS. In the makai area the soil is composed of Kea'au Clay (KmbA). These soils are saline, have 0 to 2 percent slopes, and are poorly drained. This type of soil occurs in depressions adjacent to the ocean or in pockets within the limestone where seepage water evaporates. In the central and western portion of WGS the soil is Honouliuli Clay (HxA); these soils have 0 to 2 percent slopes and are well drained. In the mauka portion, the soil is Moloka'i Silty Clay Loam (MuC). This soil has 7 to 15 percent slopes with a moderate risk of erosion and is well drained. This soil type occurs on knolls and sharp slope breaks. Two other soil types are present in limited areas: (*i*) Pearl Harbor Clay (Ph) is present in a small area in the southwest corner of the facility, this soil has 0 to 2 percent slopes and is poorly drained; and (*ii*) Tropaquepts (TR) in the northeast corner of WGS. This soil has 0 to 2 percent slopes and is poorly drained; Tropaquepts are typically found in areas of very shallow groundwater and are subject to flooding. This soil can be used to grow crops that thrive in water by periodically flooding them.

Development at WGS has largely capped or removed the soils listed above with structures, roadways and parking areas. During this development the natural soils that were not considered supportive of the planned structures and uses were covered or removed and replaced with engineered fill material. Where open areas do remain, primarily in the western portion of the facility, soil maps indicate the Pearl Harbor Clay, Kea'au Clay and Honouliuli Clay noted above. Although some farming takes place in unused portions of the WGS property, the soil classifications indicate only Honouliuli Clay represents prime farmland, if irrigated.

5.1.4.2 Potential Effects

Given the nature and scope of the Proposed Project, the I-2 Intensive Industrial zoning, and existing use of WGS, the soils are not resources critical to either the welfare of the community or to the continued operation of the facility. Most of the WGS facility is built on select fill placed at the site as part of the original development of WGS, and the naturally occurring soils in the area have been almost entirely capped or removed. Given that the proposed CTs will be installed in the same areas as the existing LSFO boilers and steam turbines, there is no evidence that soils are incompatible with the potential loads.

None of the new developments would occur in steeply sloped areas or incur risk of mass wasting or landslides. In addition, Best Management Practices (BMPs) would be employed during construction and post-construction measures will be incorporated into project designs to reduce

the already-low potential for erosion and windborne fugitive dust. These BMPs will help Hawaiian Electric to avoid, or where unavoidable, minimize the potential for project-related impacts to soils.

5.1.5 TOPOGRAPHY AND GEOLOGY

5.1.5.1 Topography

5.1.5.1.1 Overview

The WGS is located at the foot of the Koʻolau Range, one of the two shield volcanoes that originally formed the island of Oʻahu. Pearl Harbor is essentially a series of drowned river valleys and has a complex historic reflecting a balance among the processes of sea-level change, uplift and subsidence of the island itself, and inputs of material from erosion of the island. Its makai portions were also influenced by the development of coral reefs (see MacDonald, Abbott and Peterson 1983). The result is a complicated series of discontinuous layers of sedimentary deposits lapping into hard-rock outcrops of volcanic basalt.

The bulk of WGS is on the gentle sloping portion of the mostly drowned river valley and has ground elevations ranging from approximately 40 feet above mean sea level (MSL) along Kamehameha Highway to just a few feet above MSL along the makai side of the facility. Slopes range from a maximum of less than 5 percent on the upper portion of the site to less than 0.5 percent on the makai side of the station, with a consistent slope toward Pearl Harbor (i.e., makai side of the facility).

The shoreline on the eastern side of WGS has been modified by dredging and filling over the years to create the present engineered shoreline (see Figure 1-2). The western portion of the facility includes a portion of the Waiau Stream delta as it empties into Pearl Harbor. In times past, native Hawaiian fishponds were present in this area but fell into disrepair or were destroyed. It has been reported that sedimentation increased, forming the current delta when areas upland of WGS were used for commercial-scale sugarcane cultivation.

5.1.5.1.2 Potential Effects

The topography within WGS has already undergone alteration during its long history of use as a power plant. Substantial earthwork and grading will not be required to implement the Proposed Project. The area of ground disturbance will be roughly 20,000 square feet (0.46 acre) the volume of material that will be excavated for foundations and other needs will be roughly 3,000 cubic yards. The excavated material is anticipated to consist of the fill brought to the site when the existing units were built and much of it will be reused on-site to backfill excavations after foundations have been poured or conduit installed. The ground level may change slightly in some areas to allow for equipment installation, but those changes will be limited in area and depth. Consequently, no significant impacts to topography or geology are anticipated.

5.1.5.2 Geology/Geologic Hazards

5.1.5.2.1 Overview

The geology of WGS is a product of the Koʻolau Mountain Range of Oʻahu, Hawaiʻi. The Koʻolau range, which means “windward” in ʻŌlelo Hawaiʻi, is the remnant western portion of the original

volcano that formed much of Oʻahu. In prehistoric times, the eastern half of that volcano, including the caldera at its summit, collapsed into the Pacific Ocean (Jackson and Wright, 1970). The remnants of this cataclysmic collapse are still present, strewn over the sea floor for nearly 100 miles northeast of Oʻahu. Today, the steep cliffs of the Koʻolau Range have been designated a National Natural Landmark by the National Park Service. These Koʻolau Mountains form the windward coast of Oʻahu and frame the City of Honolulu on the leeward, southern shore of the island. Most of Honolulu's residential communities are located on the slopes and valleys of the Koʻolau Mountains.

The massive volcano which formed the Koʻolau Mountains is believed to have first erupted from the ocean floor more than 2.5 million years ago. At some point the volcano rose above sea level and continued to grow until approximately 1.7 million years ago, when it entered into dormancy. The volcano remained dormant for hundreds of thousands of years, during which time the processes of erosion and subsidence substantially altered its form. At its highest, the elevation of this volcano was believed to be perhaps as much as 10,000 feet high; the tallest summit of the Koʻolau Mountains today is Puʻu Kōnāhuanui at 3,100 feet in elevation.

Per Jackson and Wright (1970), after hundreds of thousands of years of dormancy, the Koolau Volcanics once again began erupting. A sequence of some thirty eruptions known as the Honolulu Volcanic Series, occurring over the past 0.5 million years created many additional craters and cinder cones or puʻu including many of the landmarks that define Honolulu's modern landscape such as Lēʻahi (Diamond Head), Pūowaina (Punchbowl), Koko Head.

Volcanic Hazards. While geologists have not ruled out the possibility of future eruptions of this type, the threat that volcanic activity will adversely affect the site is very low.

Seismic Risk. According to USGS Earthquake Hazards Program earthquake hazard maps, the project site, like all Oʻahu, has a relatively low level of seismic risk. Table 1604.5 in ROH 16 Classifies buildings according to their importance based on their occupancy category and their "seismic use group". The Proposed Project falls into the category of power-generating stations and other public utility facilities required as emergency backup facilities for Category IV structures. Accordingly, it is in Occupancy Category IV and Seismic Use Group III. The stipulated "seismic factor" is 1.50. The seismic design category based on short-period response acceleration for this is specified in Table 1613.5.6(1). The seismic design category based on 1-second period response for this is specified in Table 1613.5.6(2). Because the design of the Proposed Project will comply with this requirement, there would be no undue risk of failure due to earthquakes.

5.1.5.2.2 Potential Effects

Because the site is not exposed to volcanic hazards and the facility would be designed and constructed to withstand anticipated seismic forces, the Proposed Project does not appear to have a significant exposure to these hazards.

5.2 LAND REGULATION

5.2.1 LAND USE AND LAND USE REGULATIONS

This section addresses land use regulations, present use of the land, and impervious cover in the vicinity of the project site and is intended to address the requirements of Section 2.5.8 of the RFP.

5.2.1.1 Existing Land Use Regulations

As discussed in Section 3.2, all WGS and the surrounding community are within the State Urban Land Use District. In addition, the CCH has designated the land which WGS occupies as being in the I-2 Intensive Industrial zone. Neighboring parcels are zoned R-5 Residential, and a small parcel of land adjacent to the WGS is zoned B-2 Community Business. Other nearby parcels are zoned AG-2 General Agriculture, B-2 Community Business, and F-1 Federal and Military. Figure 5-3 depicts the CCH zoning district boundaries in the project vicinity.

As outlined in the *Primary Urban Center Development Plan* (PUCDP; 2004), the project site is within the urban community boundary. The PUCDP indicates that east-west views of East Loch from what is now Joint Base Pearl Harbor-Hickam is designated as a significant panoramic view. The PUCDP also identified views from Farrington Highway to the ocean as significant mauka-makai view(s) that should be retained. Importantly, the PUCDP identifies WGS as one of two generation facilities operated by Hawaiian Electric within urban Honolulu (i.e., WGS and the now-decommissioned Honolulu Generating Station). Specifically, in Section 4.3.2 of the PUCDP, policies related to electrical power in the Primary Urban Center states that it is the position of the CCH to, "Support retention and upgrade of the Waiau and Honolulu Power Plants as part of a strategic plan to improve the reliability of the Primary Urban Center's electrical power system." Thus, the Proposed Project, which consists of retaining and upgrading WGS' existing generation capacity with modern CT units, is consistent with and supportive of the PUCDP.

The proposed use is considered a utility installation. A Type B utility installation (which the Proposed Project appears to be) is a permitted use in this zoning district if a CUP-Minor is approved.

5.2.1.2 Existing Use and Impervious Ground Cover

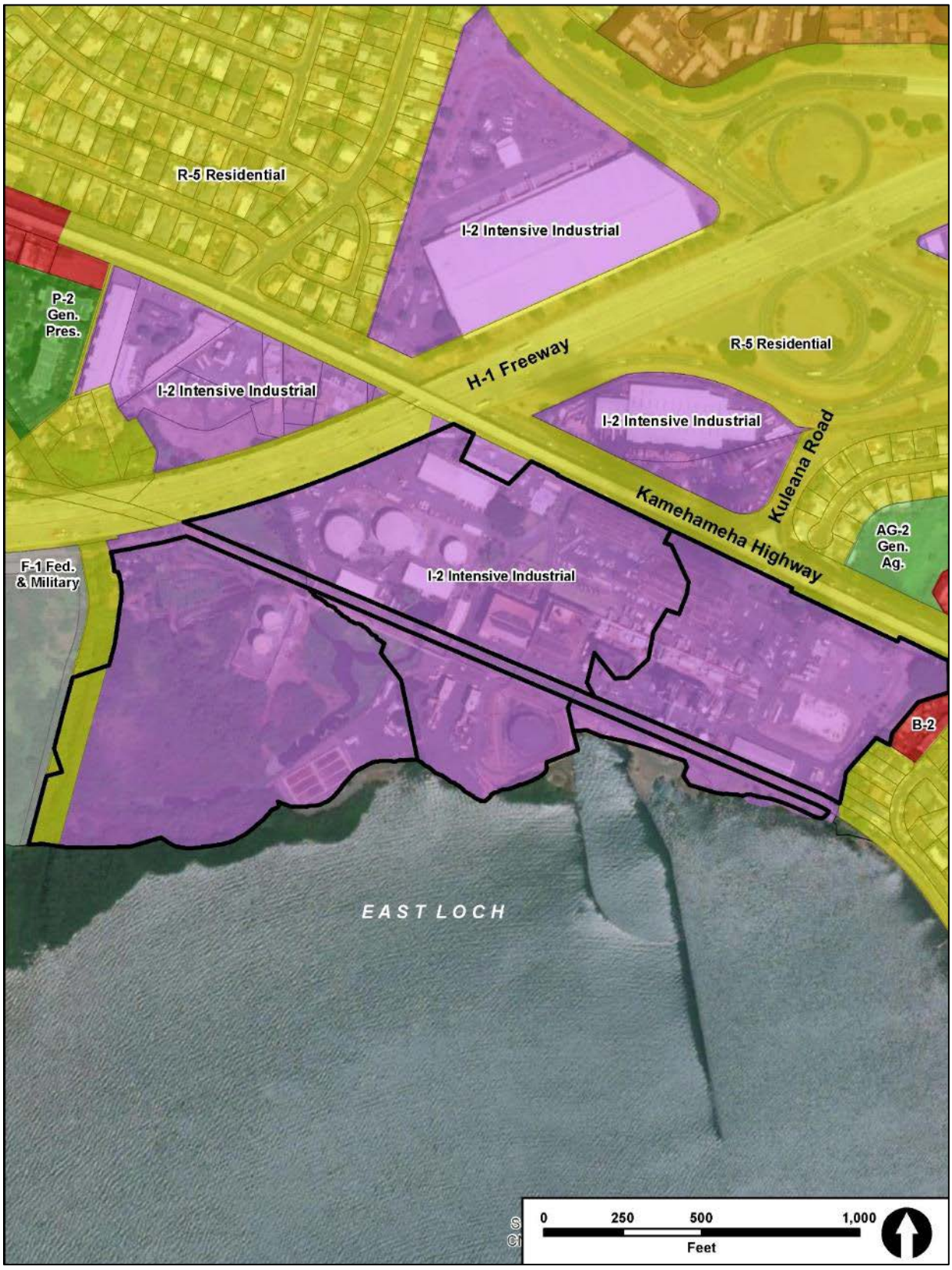
One hundred percent of the project site is in the Urban State Land Use District and the CCH's I-2 Intensive Industrial District. The Proposed Project is confined to two of the five parcels which comprise WGS (see Figure 1-2); TMK Nos. 9-8-003:010 and 9-8-004:003. Both parcels are heavily developed with an industrial character and, as discussed in Section 5.1.2.1, there is minimal vegetation or unmodified groundcover. Table 5-4 summarizes the existing acreage of each affected parcel and provides the approximate proportion of the total acreage which has been developed and may be consequently considered impervious.

Table 5-4 Summary of Impervious Ground Cover at Project Site

TMK No.	*Parcel Size*	*Estimated Area of Impervious Ground Cover*
9-8-003:010	15.4 ac.	13.4 ac.
9-8-004:003	10.7 ac.	7.7 ac.

Source: Compiled by Planning Solutions, Inc. (2022)

Figure 5-3 CCH Zoning District Map



Source: Planning Solutions, Inc. (2022)

5.2.1.3 Proposed Use and Impervious Ground Cover

No change to the State Land Use District or CCH zoning designation is required to, or will result from, implementation of the Proposed Action. The project site will remain in the Urban State Land Use District and the CCH's I-2 Intensive Industrial District. Because all the CTs will be installed inside existing buildings and structures, the Proposed Project will not result in a change in the percent of impervious ground cover at WGS, and, consequently, does not have the potential to contribute additional storm water runoff.

5.2.2 FLOOD AND TSUNAMI HAZARDS

According to the Federal Emergency Management Agency's National Flood Insurance Program, the Flood Insurance Rate Map designates WGS as being in Flood Zone D, signifying an area where flood hazards are undetermined. While this classification indicates that a detailed flood analysis has not been conducted, in settled urban areas, the general practice is to assign Zone D status only to areas where there is no history of flooding. Hence, the Zone D rating implies that the Proposed Project is situated in areas with minimal risk of flooding.

Tsunamis pose a risk to many coastal areas on O'ahu. However, due to its location along the protected estuarine coastline of East Loch, it is not a substantial risk to WGS. The bulk of the facility is not located within the CCH's updated 2014 Tsunami Evacuation Map evacuation zones, due to the low-energy system present in Pearl Harbor. A thin strip of WGS' low coastal land is within the tsunami evacuation zone; however, none of the development related to the Proposed Project would occur in this portion of WGS.

5.2.3 NOISE

5.2.3.1 Existing Sound Levels

Anecdotal observations confirm that there are only two notable sources of noise in the project area. The first is vehicles traveling on H-1 Freeway and Kamehameha Highway; the second is the generation-related equipment at WGS. Because the major noise sources at WGS are set back from the highway in an area with no public access, highway noise is generally the greater noise source for individuals in nearby public areas, which are along Kamehameha Highway. The exception is a portion of the PHHT where the generating station shields those present from the traffic noise, but the WGS equipment can clearly be heard.

5.2.3.2 Potential Effects

Construction activities will involve the use of cranes, lifts, and other heavy equipment. Construction will also entail the use of trucks with backup alarms to transport workers and material. Some of the equipment is inherently noisy. Because of the proximity of the Proposed Project to the property line, noise from the operation of construction equipment is likely to exceed the 70-dBA maximum permissible property line sound limit specified in HAR §11-46-3 for boundaries with industrial (i.e., Class C) uses. Because of this, the contractor is expected to seek a construction noise permit in accordance with the provisions of HAR § 11-46. The implementation of HDOH construction noise permit procedures will require that noisy construction activities do not occur during the nighttime, Sundays, and holidays. These permit

procedures, which are routinely applied to noisy construction activities, are intended to minimize adverse noise impacts at residences and businesses.

Construction worker vehicles traveling to and from the project site will increase peak traffic volumes on Kamehameha Highway. The addition of these to the baseline traffic volumes will increase total traffic noise levels by no more than a few tenths of a decibel, which will be very difficult to measure. This means that project-related construction will not cause a significant change in highway noise.

A noise study to assess the impact of long-term operation of the generating units will be conducted prior to implementation of the project. At the present time the Waiau Generating Station Re-Power Project is not anticipated to have a substantial or significant adverse effect on the sonic environment.

5.2.4 ROADWAYS AND TRAFFIC

5.2.4.1 Existing Conditions and Proposed Roadway Access

There are several well-maintained paved roadways within WGS, all of which are typical of an industrial facility, and which are not accessible to the public. There are three locations where facility roads cross the PHHT, all of which are gated and monitored by Hawaiian Electric security personnel. WGS has two established points of ingress and egress off Kamehameha Highway:

- The primary access point, or "main entrance" off Kamehameha Highway is an unsignalized 3-way "T" intersection with Kamehameha Highway roughly 400 feet east of the H-1 Freeway overpass; only traffic exiting WGS is required to stop at this point.
- The secondary access point, off Kamehameha Highway is an unsignalized four-way intersection consisting of: (*i*) Kamehameha Highway eastbound; (*ii*) Kamehameha Highway westbound; (*iii*) Kuleana Road; and (*iv*) the facility driveway. This intersection is approximately 600 feet east of the primary access and both the facility driveway and Kuleana Road are required to stop.

Kamehameha Highway, designated as State Route 99, is part of the State of Hawai'i's National Highway System and is classified as a principal arterial. It has three lanes in each direction (i.e., eastbound and westbound), a grassed median, a sidewalk on the makai side of the highway, and no bicycle lane.

5.2.4.2 Potential Effects

The proposed CT units and other appurtenances that are at the core of the design would be produced off-island. From there they would be transported to their port of origin, where they would be loaded into shipping containers or other appropriate means for ocean transport to Barbers Point Harbor. Once at the harbor, they would be placed on trucks and hauled to the project site. The last part of the journey may use a combination of state highways, including Kalaeloa Boulevard, the H-1 Freeway, and Kamehameha Highway. Other major equipment, such as exhaust ducting, will take a similar logistical route from their respective points of origin to the project site. Larger vehicles will only be needed on those occasions when significant infrastructure (e.g., an outgoing steam turbine or an incoming CT generator) and/or sub-elements must be swapped out.

Some of these loads may be oversized and require a permit to operate or transport oversize and/or overweight vehicles and loads over state highways from the State of Hawai‘i, Department of Transportation, Highways Division.

The number of containers needed to ship the equipment to O‘ahu would represents a tiny percentage of the containers that arrive at the harbor each year. Hence, their delivery would not adversely affect the performance of the port.

Because of the number of vehicle-trips that are involved and the fact that the equipment deliveries would be scheduled for off-peak hours, they would not have a significant adverse effect on roadway service levels for anything more than brief periods during deliveries/removals of oversized loads. While moving those oversized loads may cause some localized traffic congestion, they will not be frequent and the impacts will be temporary and less than significant.

The new units would be installed in three phases, with each phase involving the replacement of two existing units with two new units. Biofuel delivery would proceed as follows during these phases:

- Phase 1: replace existing units W3 and W4 with new units W11 and W12. Convert one existing LSFO tank to biodiesel. Initial tank filling is estimated to take 2 months with 6,000-gallon fuel trucks delivering fuel 5 times per day. Once units W11 and W12 are in operation, it is estimated that 3 trucks with a capacity of 6,000-gallons per truck will deliver fuel per day to maintain fuel level.
- Phase 2: replace existing units W5 and W6 with new units W13 and W14. Convert another LSFO tank to biodiesel. Another initial fill period would ensue and then roughly 7 trucks with a capacity of 6,000-gallons per truck will deliver fuel per day to maintain fuel levels.
- Phase 3: replace existing units W7 and W8 with new units W15 and W16. Convert existing LSFO pipeline to biodiesel and convert remaining LSFO tank to biodiesel. Truck deliveries to stop following pipeline conversion to biodiesel.

The 6,000-gallon fuel truck deliveries would emanate from Campbell Industrial Park during weekdays. Truck trip timing will be spread throughout the day because it is most likely only one truck will be dedicated to delivering the biofuel. The fuel deliveries by truck will occur over a period of roughly 3 to 4 years. Most of the deliveries would occur during non-peak hours. Because a single truck would be utilized, so the impact is anticipated to be minimal.

Once the Proposed Project has been implemented and the new units are fully operational and pipeline has been converted, the Proposed Project will generate roughly the same number of vehicle-trips per week as the site does currently. Most of those trips will be made by passenger cars and light-duty utility vehicles.

5.2.5 UTILITIES

5.2.5.1 Existing Conditions

5.2.5.1.1 Electric Power

WGS is a major source of electrical power for Hawaiian Electric's island-wide grid, and power generated there is delivered to the transmission and distribution system through its existing substation and switchyard. Electrical service at WGS is supplied by the same local distribution circuit with which Hawaiian Electric powers area businesses and residents.

5.2.5.1.2 Telecommunications

WGS has its own internal telecommunications system, which it uses to control the operation of the various generating, transmission, and distribution facilities that it operates. Certain functions at WGS are also connected to Hawaiian Telcom's voice telecommunications system through a telephone line running along the Kamehameha Highway right-of-way.

5.2.5.1.3 Water Supply

The potable water in use at WGS is obtained from the existing CCH's Board of Water Supply system 24-inch water line running along Kamehameha Highway. A lateral from the main enters the generating station near the main gate, and smaller lines distribute it throughout the property.

5.2.5.1.4 Sanitary Wastewater

WGS is served by the municipal sewer system operated by the CCH's Department of Environmental Services. Pearl City, including WGS, is part of the Honouliuli Sewershed and wastewater from Hawaiian Electric's facility is pumped by the Pearl City Wastewater Pump Station to the Honouliuli Wastewater Treatment Plant, where it is treated and eliminated via that facility's ocean outfall.

5.2.5.1.5 Demineralized Water

Demineralized water is used to supply the spray intercooling (SPRINT) water, NO_x injection water, and water wash to the proposed CTs. The existing demineralized water system at WGS supplies 135 gallons per minute of demineralized water to existing demineralized water storage tanks that serve the existing units. The total storage capacity of the existing demineralized water storage tanks at WGS does not have adequate capacity to support continuous operation of proposed six CT units beyond five (5) hours per day at normal top load.

5.2.5.2 Potential Effects

The Proposed Project would facilitate Hawaiian Electric's delivery of reliable, economical electrical service to the homes and businesses of the island. It would not substantially increase the use of potable water or otherwise affect water supply facilities on the island. The facilities would use Hawaiian Electric's own telecommunications network and would not, therefore, burden the island's existing telecommunication network.

5.3 SOCIO-ECONOMIC CHARACTERISTICS

5.3.1 EXISTING CONDITIONS

WGS is bordered by the Joint Base Pearl Harbor-Hickam on the south and west, by H-1 Freeway (Interstate Route H-1) on the northwest, Kamehameha Highway to the north, and by commercial and residential property to the east. The generating station is located within the Pearl City Neighborhood Board Area (Neighborhood Board No. 21), which is part of the CCH's PUCDP Area. Pearl City is a Census Defined Place, with a population in 2020 of 45,295; this represented approximately 5 percent of the county's total population that year. Population growth in Pearl City has been significant, growing 54 percent between 2000 and 2010 according to U.S. Census counts. However, more recently, Pearl City has lost approximately 5 percent of its population between 2010 and 2020.

5.3.2 POTENTIAL EFFECTS

WGS is currently in use for electrical power generation and will continue to be used for that purpose once the Proposed Project is implemented. The project site is not used for agriculture or other private economic endeavors, although agriculture is present in a portion of Waiau Generating Station property not used by Hawaiian Electric. No existing uses will be displaced by the Proposed Project. Therefore, there will be no direct adverse effects on socio-economic characteristics of the area. The Proposed Project will not conflict with or otherwise interfere with adjacent land uses or economic activity. It is compatible with, and intended to support, existing use of the area. Aside from the temporary and relatively minor construction employment and expenditures, the project would not stimulate or otherwise promote population growth or economic activity. Thus, the Proposed Project is not anticipated to have a significant effect on the socio-economic environment of the area and no mitigation is recommended.

5.4 AESTHETIC/VISUAL RESOURCES

5.4.1 EXISTING CONDITIONS

The CCH's *Visual and Aesthetic Resources Technical Report* for the Honolulu High-Capacity Transit Corridor Project (HHCTCP) (2008) summarize its aesthetic priorities as:

> *"...the preservation of scenic resources such as mature trees, scenic views and vistas, key landmarks, and historic and cultural features; the use of urban design principles that emphasize aesthetic compatibility while meeting functional standards; and reviewing standards to ensure that the character of older communities is maintained while still allowing for new construction and maintaining older facilities."*

The PUCDP (2004; see Section 5.2.1.1) is the regional development plan for Honolulu's urban core, including the WGS region; it focuses on preserving historic and cultural sites and panoramic views, including landmarks and the urban skyline. Planning and design, as well as adaptive reuse, are promoted to allow for new uses while preserving historic value. The PUCDP identifies panoramic views of Pearl Harbor as an important scenic resource and includes a call to create

public open space along the Pearl Harbor waterfront, strengthening physical and visual connections between the urban center and the water. Specifically, it states that:

> *"Residents and visitors also enjoy the broad waterfront of Pearl Harbor's East Loch. The historic OR&L bikeway and promenade links extensive parks, including Aiea Bay State Recreation Area, the new park at McGrew Point, and an expanded Neal S. Blaisdell Park. Restored historic sites on Ford Island, together the U.S.S. Missouri and U.S.S. Arizona Memorial, make Pearl Harbor the nation's most important site for World War II history." The Historic Effects Report for the Honolulu High-Capacity Transit Corridor Project (pg. 79) includes a discussion related to WGS. It states, in part, "the property's [WGS's] location adjacent to Pearl Harbor represents its only historically significant feature of its setting or a significant viewshed. Other properties and features within the property's setting and viewshed do not contribute to its historic significance."*

The primary transportation thoroughfares in the area which offer views of WGS are Kamehameha Highway (State Route 99) and Interstate Route H-1. Generally, views of WGS are curtailed by the elevated nature of the freeway in this area and the typical rate—albeit varied—of travel.

Major viewpoints where the affected portions of WGS are visible from:

- Vehicles and pedestrians along Kamehameha Highway;
- Vehicles traveling on H-1 Freeway;
- Future passengers on the Honolulu Rapid Transit Project; and
- Pedestrians and bicyclists traveling along the PHHT.

WGS has a heavy industrial visual character, consistent with its I-2 Intensive Industrial zoning designation. Principle visual elements on the mauka side of the PHHT include:

- Generating units; from west to east these include:
  - Administration building, former Generating Units 1 and 2, which is 82 feet tall;
  - Generating Units 3 and 4, which have a building facade that is 109 feet tall;
  - Generating Units 5 and 6, which do not have a facade and are 108 feet tall; and
  - Generating Units 7 and 8, which do not have a facade and are 124 feet tall.
- Warehouses, shop buildings, and other small outbuildings, which generally do not exceed a height of 30 feet. These facilities are generally nearer the PHHT than Kamehameha Highway except Warehouse No. 10, which is in the northern portion of the facility near Kamehameha Highway and the Interstate Route H-1 viaduct.
- Electrical transformers and switching stations located between the generating units and Kamehameha Highway. These facilities are not buildings but consist of ground-mounted equipment with poles and bents supporting associated overhead cables. The more solid ground-mounted equipment typically does not exceed 20 feet in height and the cables and support structures typically reach a height of 90 feet.
- Storage tanks, including:

- Three fuel tanks with heights of 40 to 50 feet in the northwest portion of the facility;
- South of Generating Units 7 and 8 near the PHHT there are a number of tanks associated with water treatment and control. The three largest tanks are 40 feet tall; and
- Other smaller tanks near the generating units that are dwarfed by the scale of the generating units.

Principle visual elements on the makai side of the PHHT include:

- Storage tanks with associated secondary containment, from west to east these include:
  - Two fuel tanks on the west side of Waiau Pond that are 48 feet tall with vertical concrete containment walls; and
  - A fuel tank makai of Generating Units 3 and 4 that is 55 feet tall with dikes for secondary containment.
- Generating Units 9 and 10, which are makai of former Generating Units 1 and 2 and approximately 50 feet high.
- Small single-floor outbuildings near Generating Units 9 and 10.

There are also many power lines within and extending from WGS, particularly along Kamehameha Highway. Together, these vertical facilities and the generally hardened nature of the working portion of WGS create a heavily developed industrial viewscape. The relatively undeveloped and agricultural use on the western portion of the facility contrasts with the industrial appearance of the working portion of WGS. The proximity of the H-1 Freeway (Interstate Route H-1), which is elevated on a viaduct in this area, provides another significant vertical element that is most visible in the western portion of WGS. The height of H-1 varies but is similar to the 50-foot-tall fuel tanks adjacent to it.

5.4.2 PROBABLE IMPACTS

Based on the current, preliminary design for the Proposed Project (see Figure 1-3), most of the new equipment and ancillary facilities which would be installed at WGS will be inside existing buildings and enclosures. However, because each CT must be equipped with a stack designed for the specific loading parameters of this technology, six new, approximately 137.5-foot-high stacks, which is the same height as the existing stacks, will be added to the visual environment at WGS. These six stacks will join the existing six stacks that serve the LSFO boilers and steam turbine units and which the current plan calls for abandoning in place. In this scenario, the number of stacks will be effectively doubled, creating an intensification of the appearance of WGS, which is already relatively heavily developed and industrial in visual character. Consideration of measures to avoid, minimize, or mitigate the impact of these six new stacks (e.g., reducing or removing the existing stacks) may be warranted.

5.5 SOLID WASTE

Currently, the project site is occupied by the existing LSFO boilers and steam turbines in use for power generation at WGS. Refuse from WGS is picked up by a private contractor paid for by

Hawaiian Electric and hauled to recycling and disposal sites, as appropriate. The nearest construction waste disposal site is the nearby PVT Landfill in Nānākuli, and it is likely that it would be used by the contractor during construction of the Proposed Project.[7] The Proposed Project, and in particular the disassembly and removal of the existing boilers and steam turbines, will result in large quantities of recyclable metals which will be transported to an appropriate offsite recycler and will not have a significant impact on solid waste collection activities or landfills.

Day to day operation of the facility will not produce large volumes or unusual types of solid waste. All wastes generated will be collected and properly disposed.

5.6 HAZARDOUS MATERIALS

5.6.1 EXISTING CONDITIONS

Within the vicinity of the Proposed Project are areas that contain materials considered hazardous to human health and the environment if managed incorrectly. These include asbestos-containing materials (e.g., insulation, arc chutes, transite), mercury-containing switches, surfaces coated with lead-based paint, and electrical equipment containing polychlorinated biphenyls. There may also be hazardous chemicals used during normal generating unit operations stored in designated hazardous materials storage areas. These items and materials will be removed and properly disposed of or recycled during the decommissioning of the current generating units, which will be done as a separate project.

In the broader geographic context of Pearl Harbor, operations at the U.S. Naval Shipyard are known to have contributed pollutants to the harbor. These include heavy metals from vessel maintenance activities and heat from the operation of the naval power plant (Evans 1974). Other pollutants enter the harbor via the many streams that drain into it, including those waterways adjacent to WGS. The HDOH has previously issued a health notice warning against the consumption of marine life taken from Pearl Harbor due to bioaccumulation of toxins in fish and shellfish tissues.

5.6.2 POTENTIAL EFFECTS

If hazardous materials are needed during construction of the of the Proposed Project, then appropriate BMPs, such as the use of secondary containment and the use of flammable material storage cabinets, will be utilized. Only small amounts of hazardous materials (e.g., solvents) are likely to be required during construction activities. Removal of the existing LSFO boilers and steam turbines will generate construction waste. Although some work may involve minor quantities of hazardous materials, the Proposed Project will not result in the use or storage of a hazardous materials not currently utilized at the generating station. No further mitigation measures are expected to be required.

[7] PVT landfill expects to be forced to close in 2026 without legislative action to allow expansion of its current footprint. It is unknown if a suitable construction and demolition landfill will be available on Oʻahu after this date. Construction and demolition landfills are available on the continental U.S. and possibly at West Hawaiʻi Sanitary Landfill in Kona.

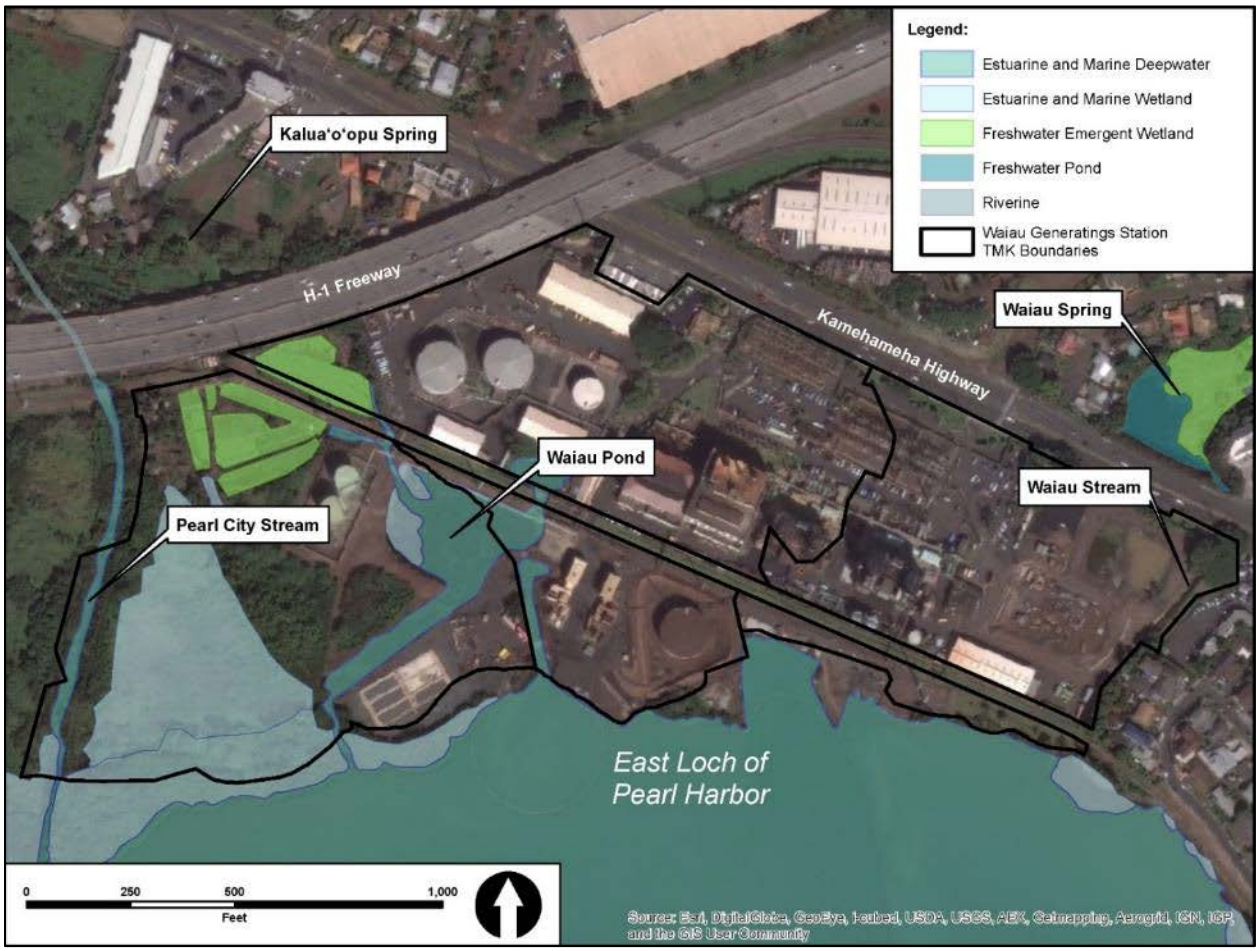
5.7 WATER QUALITY

5.7.1 EXISTING CONDITIONS

5.7.1.1 Surface Water

WGS lies along the shore of the East Loch of Pearl Harbor. The principal surface water features in the project area are: (*i*) Pearl Harbor Estuary; (*ii*) Waiau Pond; (*iii*) Waiau Stream; (*iv*) Kalua'o'opu Spring; and (*v*) Pearl City Stream. These features are depicted in Figure 5-4 below. Neither Waiau Stream nor Pearl City Stream are perennial streams as identified in *The Atlas of Hawaiian Watersheds and Their Aquatic Resources* (Parham et al., 2008).

Figure 5-4 Surface Water Bodies at WGS



Source: USFWS National Wetlands Inventory (2022)

According to the provisions of HAR § 11-54-3, the HDOH classifies waters based on the uses within them that are to be protected. Except for Pearl Harbor, all the water bodies in and around WGS are designated as "Class 2 Inland Water" by HDOH. According to HAR § 11-54-3(2):

> *The objective of class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation. The uses to be protected in this class of waters are all*

> *uses compatible with the protection of fish, shellfish, and wildlife, and with recreation in and one these waters.*

The existing generators utilize water drawn from Pearl Harbor and then discharges the water back to Pearl Harbor. Intake and discharge infrastructure existing along the shoreline at WGS. Hawaiian Electric holds National Pollutant Discharge Elimination System (NPDES) Permit No. HI0000604 for discharges from WGS to Pearl Harbor.

5.7.1.2 Groundwater

WGS is situated over the southwest corner of the Waimalu Aquifer System of the Pearl Harbor Aquifer Sector. The U.S. Environmental Protection Agency has designated the Waimalu Aquifer as part of Southern O'ahu Basal Aquifer sole-source aquifer. The Commission for Water Resource Management has assigned the Waimalu Aquifer a code of 30201. HDOH indicates there are two aquifers beneath the facility. The shallow basal aquifer consists of unconfined groundwater within sedimentary deposits overlaying lava flow deposits. The deeper basal aquifer consists of confined groundwater within the lava flow deposits. The overlaid sedimentary deposits act as a confining layer.

The shallow sedimentary aquifer is not very extensive in this area. Nearby WGS, on the mauka side of Kamehameha Highway, the sedimentary deposits and associated shallow aquifer thins and becomes absent. The groundwater in the lava flow deposits is unconfined from mauka of that transition point. The two springs in the vicinity of WGS, discussed above in Section 5.7.1.1, are situated at the mauka extent of the confining sedimentary deposits and are the result of the unconfined nature of the lava flow aquifer at that point.

Both aquifers are considered ecologically important and are low in salinity with chloride concentrations of between 250 and 1,000 milligrams per liter (mg/L). The Waimalu Aquifer System has a sustainable yield of 45 million gallons per day; there are numerous municipal wells throughout the aquifer, and it provides substantial drinking water for the people and businesses on O'ahu. As with the adjacent Waipahu-Waiawa Aquifer to the west, the direction of flow is toward discharge along the Pearl Harbor shoreline. Gradients in this corner of the aquifer are on the order of one foot per 3,000′. There are no active wells at WGS.

5.7.2 POTENTIAL EFFECTS

5.7.2.1 Surface Water

No work will occur in surface water bodies such as streams, ponds, or wetlands, nor will any such water bodies be adversely impacted by the Proposed Project. Removal of the existing LSFO boilers and installation of the new CTs and ancillary infrastructure is not anticipated to increase the quantity, or decrease the quality, of storm water runoff from the facility. None of the construction activities associated with the Proposed Project will utilize substantial amounts of chemicals or other potential contaminants that could affect water quality, nor will they subject WGS or other adjacent properties to a greater risk of flooding than is currently the case. For all construction work, Hawaiian Electric will require its personnel and contractors to employ BMPs to minimize or eliminate the potential for substantial impacts to water quality because of wind- or

storm-born particulate, chemicals, or other matter entering surface water bodies in the vicinity of WGS.

The Proposed Project would continue to utilize the infrastructure installed to withdraw water from and discharge water to Pearl Harbor. The Proposed Project does not represent a substantial change from the existing use of water from Pearl Harbor. Hawaiian Electric would modify its existing NPDES permit (Permit No. HI0000604) and continue to comply with the conditions imposed by that permit, which minimize the potential for adverse impacts to water quality.

5.7.2.2 Groundwater

Neither demolition and removal of the existing LSFO boilers and steam generators, nor installation of the proposed CTs will impact groundwater use, quality, or recharge. The Proposed Project will not increase water use that might lead to, or require, significant additional groundwater withdrawals for potable consumption or other uses. Their construction and operation would not significantly increase the amount of impermeable surface or entail other changes that could reduce groundwater discharge. Finally, they would not require substantial amounts of chemicals or other potential contaminants that could affect groundwater quality.

5.8 PUBLIC SAFETY SERVICES

5.8.1 FIRE PROTECTION

The Honolulu Fire Department's (HFD) station closest to WGS is the Pearl City Fire Station (HFD Station No. 20), located at 886 1st Street in Pearl City (less than 1 mile away); the Waiau Fire Station (HFD Station No. 38) is also nearby. In addition, Hawaiian Electric has integral fire suppression equipment located within WGS, which draws water from Waiau Pond.

Hawaiian Electric will make the provision of adequate fire protection a fundamental aspect of the design program for the Proposed Project and require that the final design for all facilities comply with the National Fire Protection Association's (NFPA) recommendations, the Uniform Fire Code, local codes, and other applicable fire protection regulations. This includes compliance with the applicable provisions of the NFPA's *Fire Code Handbook*. The CT units and their biodiesel/diesel fuel source are inherently flammable, and some other flammable materials are present in adjacent areas within WGS in varying quantities, but frequent site inspections, site security, vegetation management, and other safety protocols are intended to keep the risk of fire at a minimum.

5.8.2 POLICE PROTECTION

WGS is located within Beat 358 of the Honolulu Police Department's (HPD) District 3. Pearl City Police Station, HPD's main station for District 3, is in Pearl City at 1100 Waimano Home Road. The proposed CTs and associated infrastructure will be in a fully secured area behind fencing and locked gates. Their presence will not impose a measurable burden on the HPD. The site will be monitored by Hawaiian Electric which will dispatch security personnel if needed to investigate suspicious activity.

5.8.3 MEDICAL SERVICES

The Proposed Project does not constitute a significant health risk. Should an accident occur, those injured can receive emergency attention at several facilities located on the island. The nearest medical facilities are Straub Pearlridge Clinic at 98-151 Pali Momi Street, and Queen's Medical Center West O'ahu at 91-2141 Fort Weaver Road. The nearest urgent care facility is Adventist Health Castle Urgent Care Pearl City, less than a ten-minute drive from the project site.

5.9 RECREATION

5.9.1 EXISTING CONDITIONS

As shown in Figure 1-2, the PHHT bisects WGS into two areas, one mauka and the other makai of the PHHT right-of-way, which is owned by the U.S. Navy. Former Mayor Jeremy Harris' preface to the *Pearl Harbor Historic Trail Master Plan* (2001) summarizes the vision for the PHHT this way:

> *"…To become a world-class heritage and recreational facility linking Leeward communities from 'Aiea to Nānākuli that will enhance the quality of life for Hawai'i residents and visitors. Bicyclists, joggers, walkers, birdwatchers, schoolchildren, and senior citizens who come to appreciate the unique historic, cultural, and natural resources will all benefit."*

The master plan's goals and objectives focus on four key characteristics of the vision for the PHHT; they are (2001; page 2-1):

- Outdoor recreation/physical fitness network;
- Historic preservation and education;
- Economic revitalization; and
- Environmental preservation and education.

No other recreational resources are present in the immediate vicinity of WGS. The nearest recreational facility is Neal S. Blaisdell Park, approximately 1,000 feet to the east-southeast, which is separated from WGS by a mixture of commercial and residential uses. The typical recreational use of the PHHT, which also passes through this park, includes individuals and groups bicycling and walking along the trail; in some areas it may also accommodate recreational fishermen accessing various points along the shoreline.

The four lochs of Pearl Harbor are not considered a recreational resource because it is an active Naval Harbor, closed to recreational boaters. As noted previously, people do fish recreationally from the banks of Pearl Harbor, however the HDOH has issued a fish and shellfish consumption advisory for Pearl Harbor and signs have been posted at intervals along the shoreline cautioning against consumption of these resources due to potential contamination. Unauthorized entry into Pearl Harbor is prohibited by law.

5.9.2 PROBABLE IMPACTS

The Proposed Project will have no impact on local or regional recreational resources including the PHHT or Neal S. Blaisdell Park. No aspect of the Proposed Project would conflict with any of the goals or objectives of the *Pearl Harbor Historic Trail Master Plan*. As is currently the case, the PHHT would continue to be present and well-maintained where the Navy's right-of-way (ROW) bisects the WGS. The Proposed Project will not require any new uses on the PHHT or within the Navy's ROW. The PHHT would continue to serve as a public recreational resource as it does currently and none of the characteristics listed above would be adversely affected.

5.10 POTENTIAL CUMULATIVE AND SECONDARY IMPACTS

The Proposed Project is intended to create new, reliable, dispatchable generation capacity at WGS and facilitate the decommissioning and removal of the existing, aged LSFO boilers and steam turbines which are currently operated there. In doing so, it will also provide a secondary benefit of allowing Hawaiian Electric to expand the proportion of renewably generated "soft", or intermittent/variable, power in its total generation portfolio. Because the addition of the CTs at WGS would create a rapidly scalable reserve of firm power, available on demand, which can smooth out fluctuations in the island-wide electrical grid, Hawaiian Electric will be able to expand the proportion of renewably generated power from "soft" or intermittent sources, such as solar and wind. In addition, the proposed transition to CTs at WGS via the Proposed Project may also support Hawaiian Electric achieving its goal of decommissioning certain fossil fuel generating stations on O'ahu. However, the Proposed Project does not commit Hawaiian Electric to other energy projects or other large-scale actions. The impacts associated with future decommissioning and potential alternative use of existing fossil fuel generating stations will be disclosed in separate documents, should they occur.

CHAPTER 6 CULTURAL RESOURCE IMPACTS (RFP APP. B § 2.7)

A Cultural Impact Assessment (CIA) and review of available archaeological information was completed as part of the (2016) *Final Environmental Assessment and Finding of No Significant Impact for the Waiau Generating Station Non-Character Altering Projects: 2016-2025, Pearl City, Oʻahu, Hawaiʻi*. Additional information was obtained from the *Historic American Engineering Record for Hawaiian Electric Company, Waiau Power Plan, Units 1 and 2 Buildings* and *Historic American Engineering Record for Hawaiian Electric Company, Waiau Power Plant, Units 3 and 4 Buildings*, both prepared for the Company by KCA Architects, LLC. These reports form the basis for the information provided in this chapter; no new studies were conducted during preparation of this ECPP.

6.1 OVERVIEW OF SETTING

WGS is located on the East Loch of Pearl Harbor, in the ahupuaʻa of Waiau, which was part of the traditional Hawaiian moku or district or ʻEwa. The ʻEwa District occupies the southwestern quadrant of the island of Oʻahu, encompassing the dry ʻEwa Plain, all of Pearl Harbor (known in pre-contact times as Puʻuloa or Honouliuli), the southern half of the central plateau of the island, and portions of the Waiʻanae and Koʻolau mountain ranges. In ancient times the ʻEwa District was a center of power for the island's ruling chiefs (Cordy 1996). It is important to note that at that time the ʻEwa District extended far beyond the area that is commonly referred to as ʻEwa today; hence, care must be taken when interpreting references to sites and traditions of the ʻEwa region.

The legendary origin of the ʻEwa District comes from the land division created by the gods Kāne and Kanaloa (Sterling and Summers 1979:1, quoting Simeon Nāwaʻa in 1954):

> *When Kane and Kanaloa were surveying the islands, they came to Oʻahu and when they reached Red Hill saw below them the broad plains of what is now ʻEwa. To mark boundaries of land they would throw a stone and where the stone fell would be the boundary line. When they saw the beautiful land lying below them, it was their thought to include as much of the flat level land as possible. They hurled the stone as far as the Waianae range and it landed somewhere in the Waimanalo section. When they went to find it, they could not locate the spot where it fell. So Ewa (strayed) became known by that name. The stone that strayed.*

The ʻEwa District had great importance in the pre-contact history of Oʻahu. According to Cordy (1996), by the 13th century CE, ʻEwa was one of three major competing districts that had developed out of earlier small, independent political units; called ʻEwa-nui, or "Greater ʻEwa" it combined the later districts of ʻEwa, Waiʻanae, and Waialua. In the early-1400s CE, the king Laʻakona, considered the great progenitor of the Ewa chiefs (Fornander 1969:II-48-49), ruled Oʻahu. During this time, ʻEwa was the center of power of the Oʻahu Kingdom, with the ruling center at Līhuʻe on the upland plateau (Cordy 1996). Subsequent generations saw periods of unification and peace alternating with periods of conflict. Although the royal center moved from Līhuʻe to Waikīkī, ʻEwa continued to be an important chiefly domain. By the second half of the 18th century, all the precincts of Oʻahu had been united under a single ruler. At the time of Cook's arrival in 1778, Peleiōhōlani sat on the throne of a kingdom that included Molokaʻi and Kauaʻi.

Shortly after his death, Oʻahu was conquered by the king of Maui, Kahekili. Kahekili's reign was short lived, however as only a few years later all his lands were absorbed into the domain of Kamehameha from Hawaiʻi.

The district of ʻEwa is traditionally known for its abundance of food resources. The deep bays of Pearl Harbor produced a large variety of shellfish, fish, and waterbirds, including an abundance of pipi (pearl oysters). Hawaiians constructed fishponds and fish traps, enabling them to catch deep-sea fish from the influx of tidal waters. At the time of contact, population and land use in ʻEwa centered on Puʻuloa Lagoon (i.e., Pearl Harbor), particularly its inner shore where complex irrigation systems were developed along numerous streams, springs, and floodplains. Fishponds and fish traps lined the deeply indented shoreline (Cordy 1996). Although currently dry, streams in gulches in the southern Waiʻanae Mountains may have had water at some time in the past; in other places springs brought fresh water to the surface.

Numerous temples are recorded as having been located in the ʻEwa District, including many in the heights and ridgelines above Pearl Harbor (McAllister 1933; Sterling and Summers 1978:56). The only traditionally recognized site on the ʻEwa Plain is at Puʻuokapolei, described as, "...the home of the family of Kamapuaʻa and also the location of a temple" (Tuggle and Tomonari- Tuggle 1997). Recorded temples in the coastal areas of the lagoon include one heiau in the Waiau ahupuaʻa, the same ahupuaʻa where WGS is presently located (McAllister 1933:103- 106). In addition, there were many fishing shrines or koʻa, signifying the importance of fishing and the population density of this interior region.

The successive conquests of Oʻahu by Kahekili and then Kamehameha I in the early post-contact period greatly reduced the power of the island's aliʻi. In addition, communities shrank and, in many cases, disappeared entirely due to the precipitous decline in population resulting from disease and migration. ʻEwa was transformed in the early 19th century from a center of power to a rural backwater, far from the political, social, and economic nexus of Honolulu. On the ʻEwa Plain, communities contracted from scattered residential localities on the plain to the well-watered Honouliuli Gulch and places along the inland shore of Pearl Harbor. For a brief period, approximately ten years in the 1820s, Pearl Harbor became an important collection and export center for the short-lived sandalwood trade. A Christian mission was established in the ahupuaʻa of Waiawa, adjacent to Waiau, in 1834.

By mid-century, ownership of lands in the islands was codified in a system of fee-simple ownership during the reign of King Kamehameha III. The Māhele (lit. "dividing up") of 1848 divided lands among the king, the high chiefs, and the government, not including commoner's rights to land they lived on and used. Land Commission records of awards (LCAs) to commoners indicate that the irrigated fields and fishponds were still maintained. Dense clusters of award parcels, usually coincident with taro fields and house lots, occurred along the inland shore of Pearl Harbor, particularly near the banks of the major perennial streams and around springs. Two fishponds, located just west of the current site of WGS, were also given by the Land Commission as awards: Loko Kukona (Site No. 50-80-09-114) and Loko Luakahaole (Site No. 50-80-09-115). Both have been either partially or completely filled in since at least 1930 (McAllister 1933). Neither site is listed on the State or National Register of Historic Places.

The second half of the 19th century saw the transformation of the ʻEwa landscape. Wetland agriculture was still practiced, but it was largely overtaken by Chinese rice farmers who also took

over operations of many of the fishponds. The spring at Waiau (see Figure 5-4) became the locality of a rice mill. Ranching also began to develop in this period; John Dowsett and John Meek made the initial efforts west of WGS on the ʻEwa Plain beginning in 1871. Shortly thereafter, most of the ʻEwa Plain was purchased by James Campbell, who began improving his property by removing the wild cattle on his land, establishing a section for grazing, and converting the remainder to agriculture. Smaller ranches were located inland of West Loch and Waipiʻo Peninsula, a short distance to the west of the present site of WGS (Monsarrat 1913).

In 1889, Benjamin F. Dillingham acquired a 50-year lease on most of Campbell's Honouliuli lands; a year later he subleased a portion of this to the Ewa Plantation Company for sugarcane cultivation. Dillingham's main interest was the Oahu Railway and Land Company (OR&L). The company's system linked Honolulu with rural Oʻahu and brought urban development to the inner shoreline of Pearl Harbor. The OR&L line began rail service in 1889. This was followed a year later by the development of Pearl City, the island's first planned community. Railway stations serviced the line, including stations at Pearl City, Waiawa, Waipiʻo, Waipahu, Hōʻaeʻae, Honouliuli, and Ewa Mill.

By the dawn of the 20th century, the landscape of the ʻEwa District reflected commercial agricultural development, budding urbanization, and scattered remnants of earlier, small-scale farms and communities. Ewa Plantation Company had transformed the ʻEwa Plain into vast fields of sugarcane irrigated by a series of 72 artesian wells. On the southern slopes of the central plateau, the Oahu Sugar Company, formed in 1897, was undertaking a similar transformation of the island landscape. Along the inland shoreline of Pearl Harbor, Chinese-operated rice fields were extensive and Chinese managers continued to harvest fish from converted Hawaiian ponds, although many of the smaller fishponds were filled in or fell into disuse. The OR&L rail line was a conspicuous feature of this shoreline, cutting alongside the ponds and fields.

The modern history of Pearl Harbor is inextricably linked to the emergence of commercial agriculture and the U.S. military. The early 20th century saw commercial agriculture in Southern Oʻahu at its height. During this same period, the military was beginning to shape the Pearl Harbor landscape. Following the overthrow of the Hawaiian monarchy in 1893 and annexation of the islands by the United States in 1898, the development of Pearl Harbor as a naval base began. The first decade of the 20th century saw sand dredging of the central lagoon, condemnation of private lands along the lagoon's edge, and massive channelization of the harbor entrance. The major facilities of the naval base and submarine base were constructed between 1910 and 1918.

As part of a general buildup of facilities on Oʻahu, in the 1930s the military acquired ever more land around Pearl Harbor. A major section of Campbell Estate in Honouliuli was developed for naval magazine facilities, an Army coastal defense battery was built at Puʻuokapolei, Army and Marine training facilities, and a Marine Corps airfield. Just one month prior to the commencement of the Second World War, other Pearl Harbor facilities underwent major expansion, including acquisition of most of the Waipiʻo and Pearl City Peninsulas.

The war brought changes to ʻEwa, not the least of which was the intensification of land use along the perimeter of Pearl Harbor and military control over railroad operations. After the war, the Navy retained much of the lands over which it had assumed control, and the railroad lost its primacy in island transportation. The Ewa Plantation Company ended its use of railroad (Condé and Best 1973) but continued to use rail easements for automotive vehicles. At the end of 1947,

the OR&L ran its last train. Although sugarcane cultivation continued to flourish for several decades after the war, by the 1970s, evolving world economies made commercial sugar agriculture in Hawai‘i less competitive, and both Ewa Plantation and Oahu Sugar Company closed their doors. In recent times, urban development has been the main driver of landscape change in ‘Ewa.

6.2 HISTORIC AND ARCHAEOLOGICAL RESOURCES

6.2.1 HISTORIC AND ARCHAEOLOGICAL SITES IN WAIAU AHUPUA‘A

The first published accounts of the archaeology of Waiau ahupua‘a are from J. Gilbert McAllister’s *Archaeology of Oahu*, published in 1933 by the Bernice Pauahi Museum. An additional published source of modern information is Sroat and McDermott’s *Archaeological Monitoring Plan for Construction Phase 2 of the Honolulu High-Capacity Transit Corridor Project, Waiawa, Manana, Waimano, Waiau, Waimalu, Kalauao, ‘Aiea, and Hālawa Ahupua‘a, ‘Ewa District, Island of O‘ahu, TMK: [1] 9-7.9-8, and 9-9 (Various Plats and Parcels)*, prepared for the Federal Transit Administration and the CCH as part of the Honolulu Area Rapid Transit project and *Archaeological Assessment for 98-113 Kaulike Drive, Waiau Ahupua‘a, ‘Ewa District, O‘ahu, Hawai‘i* by D. Filimoehala and T.M. Rieth.

Within the immediate vicinity of WGS there are two sites that have been given State Inventory of Historic Places (SIHP) numbers[8]: (*i*) Loko Kukona (Site No. 50-80-09-114) fishpond; and (*ii*) Loko Luakahaole (Site No. 50-80-09-115). Neither of these sites is listed on the State or National Register of Historic Places. These sites, and the relative uncertainty regarding their exact location, are described briefly below. Site -114 was first recorded by McAllister in 1933 as Kukona Pond – elsewhere referred to as Loko Kukona – located on the shoreline of East Loch and was a fishpond that at one time encompassed 27 acres. McAllister describes the pond as having a wall only 2′ high and a width between 4′ and 5′. The wall was constructed from coral and basalt, without a mākāhā or sluice gate. Cobb (1905:748) places Loko Kukona in the adjacent ahupua‘a of Waimano, and reports that its area was 2.7 acres; since McAllister cites Cobb for Site -115 (see below), it seems likely that Cobb’s 2.7-acre measurement of area is the correct one.

Site -115, Loko Luakahaole was identified by McAllister (1933) as being within the ahupua‘a of Waiau, as located “just above Loko Kukona (Site -114)” and originally covering one acre. He described it as having already been filled in at the time of his survey. McAllister’s small-scale map plots Site -115 north or northwest of Loko Kukona, up a shared stream above Loko Kukona. The ahupua‘a where it is located is not labeled in McAllister’s map. Alternatively, Cobb (1905:748) places Kukona Pond in the adjacent Waimano ahupua‘a. Sterling and Summers (1979) locate both Site No. -114 and -115 in Waimano ahupua‘a, and furthermore plots Loko Luakahaole next to Loko Kukona on its northeast side, a location that described as “above” Loko Kukona. The two flank a stream that appears straightened, as though channelized. It seems likely that both ponds then were in Waimano ahupua‘a, not in Waiau.

In 2012, Cultural Surveys Hawai‘i, Inc. (Sroat and McDermott 2012) conducted an archaeological inventory survey for construction of Phase 2 of the Honolulu High-Capacity Transit Corridor and

[8] Having been assigned a SIHP number is not the equivalent of being listed on the Hawai‘i Registry of Historic Place. Having a SIHP number indicates that a property has been documented but it does not mean that it has been determined to be eligible for listing on the Registry.

identified one property on the mauka side of Kamehameha Highway from WGS consisting of potentially historic features according to Criterion D and has been given the SIHP No. 50-80-09-7150.6. Two cultural deposits consisting of silty clay strata containing organic material, yellowish-red mottling, oxidized root tubes, and charcoal flecking were recorded there. The inclusions within these deposits, designated Strata IIIa, are consistent with those in abandoned and buried lo‘i soils. The deposits were covered within a historically documented LCA 9385, where pond field agriculture was practiced, and near two taro patches first described in 1945. Two charcoal samples recovered from bulk samples of the two soils yielded a calibrated radiocarbon date range of 1414 to 1480 CE.

Filimoehala and Allen (2014) identified three sites—all of which are mauka of Kamehameha Highway—during archaeological monitoring for the Waiau Sewer Rehabilitation Project: Site Nos. 50-80-09-7569, -7570, and -7571. Site -7569 is a buried pre-contact charcoal deposit interpreted as associated with former traditional Hawaiian irrigated cultivation. *Chenopodium oahuense* charcoal was collected from Site -7569, which was dated (via two separate methods) to between 1518 and 1593 and 1618 to 1664, suggesting a late pre-contact origin, if it is assumed that the charcoal relates to the use of the agricultural soil. Site -7570 is an isolated fire feature of an unknown age, and Site -7571 consists of two charcoal concentrations known as Features 1 and 2. Feature 1 may have been a fire feature or a refuse deposit; it yielded post-contact items. Feature 2 may date to either the late pre- or early post-contact period.

6.2.2 HISTORIC ARCHITECTURAL STRUCTURES

In addition to the archaeological properties identified above (which are “historic properties”), some structures adjacent to and within WGS have been included in, or identified as eligible for inclusion in, the State and National Register(s) of Historic Places (SRHP/NRHP), including Pearl Harbor (Site No. 50-80-13-9992) and the OR&L rail line ROW (Site No. 50-80-12-9714). During development of the HHCTCP, Hawaiian Electric’s Waiau Generator Building, which originally housed Waiau Generating Units 1 and 2, was identified as an architectural property eligible for inclusion in the NRHP under Criterion A, being “associated with events that have made an important contribution to the broad patterns of our history” for its connection with the history of electric power generation on O‘ahu.

The generation of electricity was begun by Hawaiian Electric Company near downtown Honolulu. An early power plant was the 1894 generator on Honolulu’s waterfront; this plant received its first steam turbine in 1907. The WGS was the company’s first “expanded generating facility” (Pratt 1988), and as noted above, was completed in 1938 to deliver power to the people of O‘ahu west of Iwilei, where a substation was located. A building permit for the new 7-story power plant building was issued in May 1945, to house Waiau Units 3 and 4; however, development of unit 4 was delayed until 1950. The architectural description of the Waiau Units 1 and 2 Building prepared by Mason Architects, Inc. (2009) states:

> *This large building has square massing with a stepped-back section at its uppermost story that has two large smokestacks. Along its sides, the lower section of the building has closely spaced pilasters (with no capitals) that extend to just below the inset cornice of the main mass. The pilasters interrupt horizontal bands of short awnings. The uppermost stepped-back section has an encircling awning*

> *band and a cornice with a slight projection. At its west end the building is lower with a double hip roof.*

Today this building has been repurposed to provide office space for Hawaiian Electric personnel, which involved the removal of the bulk of the old generators and construction of an office building within the shell of the old building. The exterior and some interior generator components have been retained. The Mason Architects report goes on to say that although the facility has been modified over the decades, its "modifications are part of the history of development in the area and of O'ahu in general."

The KCA Architects report regarding the Waiau Units 3 and 4 Building states that:

> *Waiau Power Plant, Unit No. 3 & 4 building is significant for its association with the electrical supply system for O'ahu. The buildings started construction in 1945 and its generating units came online in 1947 & 1950. Units No. 3 & 4 were important additions to the Hawaiian Electric Company's generating capacity, providing power initially to military installations and the rest of the Island of O'ahu.*
>
> *The units 3 & 4 building is a ten-story, steel framed, reinforced concrete building, each building measuring 60 feet wide by 194 feet long and exceeding 100 feet in height. The frame structure was made of steel, with corrugated Galbestos siding, fixed and hinged Galbestos windows.*
>
> *Approximately 5,000 cubic yard soft earth and soft rock were removed before stable material was encountered on which the building and equipment foundations were to be constructed. Foundations for the major equipment and the building proper, nearly 4,500 cubic yards of concrete and 450 tons of structural steel to support the seven floors and roof of the building were required to complete each unit. The roof of the main portion is flat supported by steel trusses.*
>
> *The original windows in the building are hinged Galbestos metal framed, the typical window bay has 13 awning windows running from the 3rd to the 6th floor and manually operated by a push up bar mechanism.*

While most of the other structures at WGS have no apparent architectural distinction, and no known association with an important historic context, in some cases, other structures may also be considered significant for their association with the early history of the area, even though many of them have received subsequent additions or modifications. This appears unlikely as all the buildings on TMKs 9-8-003:010 and 9-8-004:003 (the working portion of the station mauka of the PHHT) were evaluated as part of the review performed for the HHCTCP.

6.3 TRADITIONAL AND CUSTOMARY CULTURAL PRACTICES

Access to the working areas of WGS is restricted for security and safety purposes. Currently, no traditional or customary cultural practices are conducted there. However, as discussed previously in this ECPP, the broader Waiau and 'Ewa area does have a rich cultural history and over the years Hawaiian Electric has worked with consultants to regularly conduct outreach to community members to help shape its plans for the property. As part of a previous CIA conducted in 2016 by Planning Solutions, Inc., an effort was made to contact and consult with Hawaiian cultural

organizations, government agencies, and individuals who might have knowledge of, or concerns about, traditional cultural practices related to WGS.

As part of this undertaking, Hawaiian Electric and its consultants also attempted to identify cultural informants who could act as sources of oral history relating to WGS and the Waiau ahupua'a. Because the site has been in continuous use as an electrical generating station since 1938, access has been limited to Hawaiian Electric employees, contractors, and a relatively few other individuals. This presented particular challenges in locating individuals who might possess knowledge regarding cultural resources, practices, or beliefs relating to the project area. To address this challenge, Hawaiian Electric made inquiries with several long-term employees at WGS to determine whether they possessed such knowledge or were aware of individuals who did. None of the Hawaiian Electric employees contacted possessed such knowledge of cultural resources or processes.

The only activity in the project vicinity which could be categorized as a traditional or customary activity was the wetland farming of taro and watercress on the western edge of the property adjacent to Waiau Pond. The two farms active on the property are Kobashigawa Farm and Watabu Farm. Contacts were made with the operator of each farm; one full interview and one partial interview were conducted by telephone. A transcript was prepared for the complete interview. Ultimately, it was concluded that despite having multi-generational ties to the area, neither possessed knowledge of any cultural beliefs, resources, or practices tied to the area. For these reasons, the interviews are not reproduced here. No conflicting information was collected as part of the CIA and no information of relevance to the discussion has been kept confidential.

6.4 POTENTIAL IMPACTS

6.4.1 POTENTIAL IMPACTS TO ARCHAEOLOGICAL RESOURCES

The Proposed Project, which is confined to the working portion of WGS, does not have the potential to adversely affect archaeological historic properties (such as fishponds) which may be present outside of the working area of WGS. In addition, there are no known archaeological properties or sites located within WGS, which is largely built on fill material placed there during the 20th century (see Section 5.1.4). The Proposed Project will result in modifications to at least two architectural historic properties which have been determined to be eligible for inclusion in the SRHP/NRHP: (*i*) Units 1 and 2 Generator Building, and (*ii*) Units 3 and 4 Generator Building. As the Proposed Project continues the use of the site as a generating station and will retain the buildings, significant adverse effects to these resources are not anticipated. Nevertheless, care will need to be taken to design and implement the Proposed Project in a manner that minimizes modifications to the historic structures.

6.4.2 POTENTIAL IMPACTS TO CULTURAL RESOURCES

The results of prior Hawaiian Electric investigation and outreach revealed no current or recent use of the project area by Native Hawaiian—or any other—cultural practitioners exercising traditional and customary access or use rights of the project area. The site has been used almost exclusively by Hawaiian Electric for electrical generation since its initial construction in the 1930s. The results also showed that those long-term residents of the area that were interviewed did not have any direct knowledge of any specific traditional cultural properties located within the project area. In view

of the above findings, Hawaiian Electric has concluded that the Proposed Project considered in this ECPP is not anticipated to have the potential to adversely affect cultural resources, practices, or beliefs associated with or present in the proposed project area.

6.5 MITIGATION MEASURES

Because most of WGS is built on fill placed there during its construction, there is a low potential for unrecorded subsurface deposits, with no surface indicators, to be present in the area's environment. Thus, archaeological construction monitoring is not deemed necessary, but the following mitigation measures will be implemented during the construction of the Proposed Project:

- If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find. SHPD will be notified as soon as possible, and work will not be reinitiated without its prior authorization.
- If human remains are discovered, further disturbances and activities will be halted in any area or nearby area suspected to overlie remains, and the SHPD and Police Department will be contacted in accordance with HAR §13-300. If a discovery occurs on Saturday, Sunday or a holiday, the DLNR Division of Conservation and Resource Enforcement will be notified.

To minimize and mitigate the potential for adverse impacts to the Unit 1 and 2 Building, the Unit 3 and 4 Building, and other potentially historic properties, Hawaiian Electric will consult with SHPD prior to the implementation of the Proposed Project via the HRS, 6E-42 historic preservation review process. However, potential impacts to those buildings, which are not listed on a registry of historic places, has already been addressed to a certain degree by preparing Historic American Engineering Record (HAER) reports for them.

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