BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
HWY-DD 2.9478

AUG - 7 2000

RECEIVED
'00 AUG 10 A10:48
OFC. OF ENVIRONMENTAL QUALITY CONTROL

TO: GENEVIEVE SALMONSON, DIRECTOR
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

FROM: KAZU HAYASHIDA
DIRECTOR OF TRANSPORTATION

SUBJECT: FINDING OF NO SIGNIFICANT IMPACT (FONSI) FOR LEEWARD BIKEWAY OR&L RIGHT-OF-WAY, EWA AND WAIANAE DISTRICTS, OAHU, FEDERAL-AID PROJECT NO. STP-BW-0300(8)

The State Department of Transportation, Highways Division, Design Branch, (DOT-HD) has reviewed the comments received during the 30-day public comment period which began on May 8, 2000. The agency has determined that this project will not have significant environmental effects and has issued a FONSI. Please publish this notice in the August 10, 2000, OEQC Environmental Notice. We have enclosed a completed OEQC Publication Form and four copies of the final EA.

Identification of Proposing Agency
The State Department of Transportation, Highway Design Branch

Identification of Accepting Agency
The State Department of Transportation, Highway Design Branch

Determination
Negative Declaration, Finding of No Significant Impact

Reasons Supporting Determination
This determination is based on the significance criteria listed in 11-200-12 of the Environmental Impact Statement Rules. Specifically these significance criteria are summarized below and addressed in Chapter 5:

92

1. There would be no irrevocable commitment to loss or destruction of any natural or cultural resource;

2. The proposed action would not curtail the range of beneficial uses of the environment;

3. The proposed action does not conflict with the state's long-term environmental policies or goals and guidelines, as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders;

4. The economic and social welfare of the community or State will not be substantially affected by the proposed action;

5. The proposed action would not substantially affect public health;

6. The proposed action does not involve substantial secondary impacts, such as population changes or detrimental effects on public facilities;

7. It is anticipated that no substantial degradation of environmental quality will occur as a result of the proposed action;

8. The proposed action does not involve a commitment to larger actions, nor would it contribute to a considerable cumulative impact upon the environment;

9. Rare, threatened, or endangered species and habitat would not be substantially affected by the proposed action;

10. Air and water quality and ambient noise levels will not be detrimentally affected by the proposed action;

11. The proposed action will not affect or likely suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land area, estuary, fresh water, or coastal waters;

12. Scenic vistas and viewplanes identified in county and state plans and studies will not be substantially affected by the proposed action; and

13. The proposed action does not require substantial energy consumption.

The final Environmental Assessment for the proposed action, prepared pursuant to Chapter 343, HRS, and the State Department of Health Title 11-200 administrative rules, is attached to support the Finding of No Significant Impact (FONSI).

Contact Persons for Further Information

Proposing Agency: Mr. Ken Tatsuguchi
Department of Transportation
Highway Design Branch
Highway Design Section
601 Kamokila Boulevard, Room 609
Kapolei, Hawaii 96707
(808) 692-7578

Consultant: Mr. Karl Bromwell
Earth Tech, Inc.
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813
(808) 523-8874

Enclosures

also addressed above; maintenance by the DOT will be performed and access will be restricted to the bikeway at night and to unauthorized vehicles.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 808-523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111
http://www.honolulupd.org
www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

LEE D. DONOHUE
CHIEF

MICHAEL CARVALHO
ROBERT AU
DEPUTY CHIEFS

OUR REFERENCE CS-TL

June 7, 2000

Mr. Karl B. Bromwell
Project Manager
Earth Tech, Inc.
700 Bishop Street, Suite 900
Honolulu, HI 96813

Dear Mr. Bromwell:

Subject: Draft Environmental Assessment for Leeward Bikeway, Districts of Ewa and Waianae, Oahu, Project Nos. STP-0300(55) and STP-0300(56)

Thank you for the opportunity to review and comment on the subject document.

The proposed Leeward bikeway will run through two police districts. The portion that is east of Kunia Road will be in District 3, which is headquartered in Pearl City, while the portion that is west of Kunia Road will be in District 8, which is headquartered in Kapolei.

We will be anticipating traffic problems during the construction phase of the proposed project. Traffic lanes will need to be closed in areas where the bikeway runs along or crosses major roadways. In addition, there may be construction dust and noise complaints in areas close to institutions and residences.

Institutions and residents along the bikeway are concerned about their own security. The bikeway will provide a means for burglars and vandals to have easier access to their properties. If this occurs, it will have an impact on police services to the various areas in question. In addition, the residents are concerned about the potential noise that could be generated by the people using the bikeway.

We would like to see some kind of restriction in using the bikeway at night because of the possibility of assaults and robberies on the people using the bikeways.

Further, after the construction phase is completed and the bikeway is in use, additional bicycle patrol officers will be needed. Parts of the bikeway are in remote areas which are inaccessible to patrol sedans. It should be noted that the bicycle patrol in District 3 is not a permanent body and that there is no bicycle patrol in District 8.

We may have further comment as further plans and details for the proposed project are developed.

If there are any questions, please call me at 529-3255, Acting Captain Derek Shimatsu of District 3 at 455-7672 or Captain George Yamamoto of District 8 at 674-8802.

Sincerely,

LEE D. DONOHUE
Chief of Police

By
EUGENE UEMURA
Assistant Chief
Support Services Bureau

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.524.8844

Facsimile
808.524.8950

August 10, 2000

Lee D. Donohue
Chief of Police
City and County of Honolulu Police Department
801 South Beretania Street
Honolulu, HI 96813

Attn: Eugene Uemura

Subject: **Draft Environmental Assessment, Leeward Bikeway, OR&L Railway Right of Way,**
Ewa and Waianae Districts, Oahu
Project No.s STP-0300(55) and STP-0300(56)

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. The final EA (FEA) has been amended to reflect your comments where appropriate. We appreciate your efforts in reviewing the document and provide the following response to your comments (presented in **bold**):

We will be anticipating traffic problems during the construction phase of the project. Traffic *lanes will need to be closed in areas where the bikeway runs along or across major roadways.* In addition, there may be construction dust and noise complaints in areas close to institutions and residences. As described in Section 4.9, the State of Hawaii Department of Transportation Highways Division, (DOT) will comply with all applicable laws and regulations and reduce traffic problems with appropriate traffic signs and controls. These will be posted along the roadways near the project area to increase awareness of potential traffic flow delays. Only brief lane closures during non-peak hours will occur at road crossings for installation of pavement markings. As described in Section 4.7, short-term construction related noise impacts will be controlled within acceptable limits by coordinating construction projects and ultimately complying with requirements set forth in Hawaii Administrative Record (HAR) 11-46 – Community Noise Control, HAR 11-42 – Vehicular Noise Control for Oahu, and Hawaii Revised Statutes (HRS) 342F – Noise Pollution. Work will be completed during business hours to reduce impacts to residences. In order to reduce air quality problems (i.e., fugitive dust), construction activities will be conducted in accordance with the State of Hawaii and Environmental Protection Agency (EPA) air pollution control regulations. This includes regular dust control (watering) program and covering soil stockpiles during storage and transportation as described in Section 4.1.

Institutions and residents along the bikeway are concerned about their own security. The bikeway will provide a means for burglars and vandals to have easier access to their properties. If this occurs, it will have an impact on police services to the various areas in question. In addition, the residents are concerned about the potential noise that could be generated by people using the bikeway. As completion of the proposed bikeway nears, DOT will inform the City and County of Honolulu Police Department (HPD), and the City and County of Honolulu (i.e., the Mayor, the Mayors Advisory Committee on Bicycles, and the council members of the areas containing the bikeway) of the need to provide funding for permanent bicycle patrols. Additionally, as discussed in Sections 3.16 and 4.13 (Security and Maintenance) and 4.7 Noise, the bikeway will be maintained and revegetated by the DOT, with a code of conduct established. The code of conduct for the path will restrict hours of use, require continuous movement, restrict the use of radios/music and restrict access of unauthorized motorized vehicles. In it's current state, with the railroad and pipelines/energy corridor present with an unsecured access road, the right-of-way is accessible. With the development of the proposed bikeway, the right-of-way will be improved in terms of control of vehicular access, hours of use, maintenance and allowable conduct.

We would like to see some kind of restriction in using the bikeway at night because of the possibility of assaults and robberies on the people using the bikeways. The hours of the bikeway will be restricted from dawn to dusk. This is discussed in Sections 3.16 and 4.13.

Further, after the construction phase is completed and the bikeway is in use, additional bicycle patrol officers will be needed. Parts of the bikeway are in remote areas which are inaccessible to patrol sedans. It should be noted that the bicycle patrol in District 3 [headquartered in Pearl City] **is not a permanent body, and that there is no bicycle patrol in District 8** [headquartered in Kapolei]. With the completion of the proposed bikeway, the DOT will inform the HPD, and the City and County of Honolulu (i.e., the Mayor, the Mayor's Advisory Committee on Bicycles and the council members of the areas containing the bikeway) of the need to provide funding for permanent bicycle patrols. It should be noted that many of the present "remote areas" will be undergoing development in the near future. Numerous housing developments are planned in the Ewa area, and Renton Road is to be extended further west. With these developments in Ewa, most of that portion of the bikeway will be viewable from a nearby street (Renton Road) and will also be crossed by other intersecting roads of the planned developments. Areas on the Waianae Coast are mostly accessible to patrol from Farrington Highway or one of the numerous beach parks as well.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869

JEREMY HARRIS
MAYOR

ATTILIO K. LEONARDI
FIRE CHIEF

JOHN CLARK
DEPUTY FIRE CHIEF

May 19, 2000

Mr. Karl B. Bromwell
Project Manager
Earth Tech
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

Subject: Draft Environmental Assessment for Leeward Bikeway
Districts of Ewa and Waianae, Oahu
Project Nos. STP-0300(55) and STP-0300(56)

We received your letter dated May 8, 2000, regarding the subject project.

The Honolulu Fire Department requests that you comply with the following:

1. Maintain fire apparatus access throughout the construction site for the duration of the project.

2. Notify the Fire Communication Center (523-4411) of any interruption in the existing fire hydrant system during the project.

Should you have any questions, please call Battalion Chief Kenneth Silva of our Fire Prevention Bureau at 831-7778.

Sincerely,

ATTILIO K. LEONARDI
Fire Chief

AKL/KS:jl

-00 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

August 10, 2000

Attilio K. Leonardi, Fire Chief
City and County of Honolulu
Fire Department
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819-1869

Attn: Battalion Chief Kenneth Silva

Subject: **Draft Environmental Assessment, Leeward Bikeway,**
OR&L Railway Right of Way,
Ewa and Waianae Districts, Oahu
Project No.s STP-0300(55) and STP-0300(56)

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. The final EA (FEA) has been amended to reflect your comments. We appreciate your efforts in reviewing the document and provide the following response to your comments:

- Your comments have been addressed in section 4.10 Utilities and Infrastructure. Fire apparatus access will be maintained throughout the construction site for the duration of the project. The Fire Communication Center will be notified if there is any interruption in the existing fire hydrant system during the project.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P O BOX 3378
HONOLULU, HAWAII 96801-3378

BRUCE S. ANDERSON, Ph.D., M.P.H.
[redacted]
DIRECTOR OF HEALTH

In reply, please refer to
EMD/CWB

05092PSS.00

May 23, 2000

Mr. Karl B. Bromwell
Project Manager
Earth Tech, Inc.
700 Bishop Street, Suite 900
Honolulu, HI 96813

Dear Mr. Bromwell:

Subject: **Draft Environmental Assessment for Leeward Bikeway**
Districts of Ewa and Waianae, Oahu
Project Nos. STP-0300(55) and STP-0300(56)

The Department of Health, Clean Water Branch (DOH-CWB) acknowledges receipt of the Draft Environmental Assessment (DEA) for the subject project. The DOH-CWB recognizes that the project may require a Section 401 Water Quality Certification (WQC) and coverages under the National Pollutant Discharge Elimination System (NPDES) General Permits for the discharge of storm water associated with construction activity and the discharge of construction activity dewatering. The DOH-CWB reserves the right to comment on the project during the processing of the WQC application and the Notices of Intent for coverage under the NPDES General Permits.

Should you have any questions, please contact Mr. Edward Chen (WQC), Ms. Hong Chen (stormwater), or Mr. Shane Sumida (construction dewatering) of the Engineering Section at 586-4309.

Sincerely,

for DENIS R. LAU, P.E., CHIEF
Clean Water Branch

SS:auc

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8060

August 10, 2000

Denis R. Lau, P.E., Chief
State of Hawaii Department of Health
Clean Water Branch
919 Ala Moana, Room 301
Honolulu, HI 96813

Attn: Mr. Edward Chen, Ms. Hong Chen, Mr. Shane Sumida

Subject: **Draft Environmental Assessment, Leeward Bikeway,**
OR&L Railway Right of Way,
Ewa and Waianae Districts, Oahu
Project No.s STP-0300(55) and STP-0300(56)

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. We appreciate your efforts in reviewing the document and provide the following response to your comments:

- As part of this project, permitting through the State of Hawaii Department of Health will be completed for Section 401 Water Quality Certification and coverages under the National Pollutant Discharge Elimination System (NPDES) General Permits. We will be coordinating the permitting with Mr. Edward Chen (for WQC) and Ms. Hong Chen (for stormwater) and Mr. Shane Sumida (for construction dewatering).

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

EARTH TECH
A tyco INTERNATIONAL LTD COMPANY

BENJAMIN J. CAYETANO
GOVERNOR

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

Nicole or Karl 523-8950

May 9, 2000

Kazu Hayashida, Director
Department of Transportation
Highways Division
869 Punchbowl St.
Honolulu, HI 96813

Attn: Ken Tatsuguchi or Jonathan Winn

Dear Mr. Hayashida:

Subject: Draft Environmental Assessment (EA) for Leeward Bikeway OR & L Easement, Waipio to Nanakuli, Oahu

In general we are supportive of this project because it adheres to state policy (HRS Chapters 26, 226, 264, 344) which requires promotion of alternative forms of transportation systems that reduce reliance on the private automobile, conserves energy, decreases pollution and provides safe accommodation for their users. We have, however, the following comments to offer:

1. EA distribution: In addition to your current distribution list, please also send copies as soon as possible to the Waipahu, Ewa Beach and Waianae Libraries; and to the City & County and State Departments of Parks & Recreation.

2. Section 4(f) review: Has this review been completed? If not, what is the anticipated date of filing or review completion?

3. Archeological/historical consultation: Document your contacts and include copies of your correspondence with the State Historic Preservation Division of DLNR in the final EA.

4. Drainage: Section 3.15.1, *Surface Water*, notes that existing culverts will be maintained during bikeway development. Do you expect to install any new

culverts? What mitigation measures are planned to reduce impacts from flooding in low lying areas?

5. Proximity to shoreline: How close to the shoreline will the bikeway be? In the final EA indicate those sections that are closest to the shoreline and give their respective distances. Also indicate the distance of the most mauka portion.

6. Recreational uses: Development of this corridor will likely open up adjoining areas to increased recreational uses. How will adjacent wetlands and other sensitive habitats be protected from degradation from the additional "people traffic?" Include a discussion of this in the final EA.

7. Visual impacts:

   a. Describe the visual impacts from relocation of the utility poles.

   b. Section 2.2, *Proposed Action*, describes two of the proposed retaining walls as ranging from 3.5 feet to 8.0 feet in average heights and having lengths of 380 feet and 1090 feet. In the final EA include a discussion of the material to be used and the final visual appearance to path users, motorists and train passengers. If possible include a photo or drawing in the final EA.

8. Glassphalt: Has this material been considered for the base course aggregate?

If you have any questions call Nancy Heinrich at 586-4185.

Sincerely,

GENEVIEVE SALMONSON
Director

c: Earth Tech

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808 524 8844

Facsimile
808 524 8890

August 10, 2000

Genevieve Salmonson
Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

Attn: Nancy Heinrich

Subject: **Draft Environmental Assessment, Leeward Bikeway,**
OR&L Railway Right of Way,
Ewa and Waianae Districts, Oahu
Project No.s STP-0300(55) and STP-0300(56)

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. The final EA (FEA) has been amended to reflect your comments where appropriate. We appreciate your efforts in reviewing the document and provide the following response to your comments (presented in **bold**):

EA Distribution: In addition to your current distribution list, please also send copies as soon as possible to the Waipahu, Ewa Beach and Waianae Libraries; and to the City and County and *State Departments of* Parks and Recreation. DEAs were sent as requested.

Section 4(f) review: Has this been completed? If not, what is the anticipated date of filing or review completion? Federal Highways Administration (FHWA) has indicated that there is not a need to complete a Section 4(f) review. The State of Hawaii Department of Transportation – Highways Division (DOT-HD) is currently seeking documentation regarding this matter.

Archaeological /historical consultation: Document your contacts and include copies of your correspondence with the State Historic Preservation Division of DLNR in the final EA. The communications with Ms. Sara Collins of the State Historic Preservation Division (SHPD) have been documented in Section 7.0, References. Any correspondence received from the SHPD will be included Appendix D, Correspondence.

Drainage: Section 3.15.1 Surface Water, notes that existing culverts will be maintained during bikeway development. Do you expect to install any new culverts? What mitigation measures are planned to reduce impacts from flooding in low lying areas? At this time, the proposed bikeway is in it's design phase, and more information is forthcoming. However, where existing drainage is blocked by the proposed bikeway, culverts will be used to alleviate it. Currently, no drainage problems are expected to result from the project; streams and gulches will be spanned with new bridges. Improving adjacent drainage conditions is being reviewed on a case by case basis during the design phase of the project. Improvements will be made where they fit the deign of the proposed bikeway and allowed funding.

Proximity to shoreline: How close to the shoreline will the bikeway be? In the final EA indicate those sections that are closest to the shoreline and give their respective distances. Also indicate the most mauka portion. The proximity to the shoreline and mauka most location was added to Section 3.5 and 3.15.

Recreational uses: Development of this corridor will likely open up to adjoining areas to increased recreational uses. How will adjacent wetlands and other sensitive habitats be protected

from degradation from additional "people traffic". Include a discussion of this in the final EA. To reduce movement off of the proposed bikeway, appropriate signage and markings will be used to direct path users. The following relevant comments have been added to the FEA in Sections 3.16 and 4.13 (Security and Maintenance).

> *Place signage at the entrances and along the bikeway to identify the route and establish a Code of Conduct. This will include the following rules placed on signs at entrance points to the bikeway and along the bikeway:*
> *-Stay on the trail in continuous movement.*
> *-Respect rights of all trail users as well as adjacent homeowners and properties.*
> *-Ride single file keeping to the right of the trail.*
> *-Give warning before passing other trail users.*
> *-Only leashed pets are welcomed, you must clean up after your pet.*
> *-Unauthorized vehicles are prohibited.*
> *-Use of radios is prohibited.*
> *-Trail Hours are from dawn to dusk.*
> *-No dumping, littering or loitering. Please use trash receptacles.*
> *-Do not take or harm any plants or animals; areas outside the trail may contain sensitive plants and animals.*
> *-Use bikeway at your own risk.*
> *-Warning: golf course ahead.*

Visual impacts: Describe the visual impacts from relocation of utility poles. Section 2.2 Proposed Action, describes two of the proposed retaining walls...In the final EA include a discussion of the material to be used and the final visual appearance to path users, motorists and train passengers. If possible include a photo or drawing in the final EA. Movement of the utility poles will be to one side of the r-o-w. Currently, utility poles are present on both sides of the r-o-w; movement to one side will be a visual improvement. For neighboring properties, they will essentially maintain the same visual impact or improve the view that they now have. At this time, the proposed bikeway is in it's design phase, and completion of the proposed retaining walls has not yet occurred. It is anticipated that the smaller retaining wall would have a concrete appearance, while the larger wall may be faced with a veneer rock, to give it a natural appearance.

Glassphalt: Has this material been considered for the base course aggregate? The use of glassphalt will be considered for the base course material. The final selection of the materials has yet to be completed.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 808-523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

JW MARRIOTT IHILANI
RESORT AND SPA
at Ko Olina

July 6, 2000

Mr. Ken Tatsuguchi
Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, HI 96813

Subject: Leeward Bikeway Proposal

Good Morning Mr. Tatsuguchi:

As a resident and manager of the JW Marriott Ihilani Resort and Golf Course, I have serious concerns regarding the possible impact of a proposed bikeway through my property.

Before cutting a wide swath through our golf course, homes and private sectors, I would have thought that the concerns of my associates, residents and my 2,000 guests would have been taken into consideration. Everything from security, accesses, privacy and a host of liabilities surrounding my guests and associates is affected.

Hopefully the route of the bikeway is not already a fait accompli and that alternate proposals are forthcoming. As we operate almost one mile on either side of the proposed path, I feel our input would be appreciated.

Please keep me informed of developments and let me be of assistance in obtaining your objectives.

Sincerely,

John A. Homer
General Manager

JAH:lta

92-1001 Olani Street • Kapolei, Hawaii 96707 • Telephone: (808) 679-0079 • Toll Free: 1-800 626 4446 • Facsimile. (808) 679-0050

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.524.8854

Facsimile
808.524.8950

August 10, 2000

John A. Homer
General Manager
JW Marriott Ihilani Resort and Spa
at Ko 'Olina
92-1001 Olani Street
Kapolei, Hawaii 96707

Subject: **Draft Environmental Assessment, Leeward Bikeway, OR&L Railway Right of Way,**
Ewa and Waianae Districts, Oahu
Project No.s STP-0300(55) and STP-0300(56)

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. The final EA (FEA) has been amended to reflect your comments where appropriate. We appreciate your efforts in reviewing the document and provide the following response to your comments (presented in **bold**):

Before cutting a wide swath through our golf course, homes and private sectors, I would have thought that the concerns of my associates, residents and my 2,000 guests would have been taken into consideration. The proposed project has taken into account location, notifying the public/requesting comment, and development concerns of the Ewa Plain:

- A "wide swath" will not be cut through pre-existing golf courses, homes or private sectors. The former OR&L railroad right-of-way has not changed since it was built in the late 1800's, and the proposed bikeway location is within it. The deed transfer of the right-of-way included considerations of a bikeway in the early 1970's, and was finalized to include the development of the bikeway in the deed transfer of 1980. At that time, the area surrounding the former OR&L railroad was mainly sugar cane plantation and Barber's Point Naval Air Station on the Ewa Plain. The development of the Ko 'Olina golf course did not occur until 1991, and resorts were not built until 1991-1994. With funding, the design of the proposed bikeway is now occurring, placing it within the right-of-way which is shared with the operating railway of the Hawaiian Railroad Society. Considerations have been given in the placement of the bikeway with respect to the elements listed in the environmental assessment. The adjacent land uses of residences and golf courses are consistent with planned and anticipated land use along the bikeway and other bikeways, (Ewa Development Plan, CCH 1997).
- The proposed project is approximately 14 miles in length, with numerous property owners adjacent to it. To provide notice of preconsultation and to give each adjacent landowner a copy of the environmental assessment would be extremely difficult and costly. In order to provide notice and inform the public of the proposed project, the neighborhood boards in the vicinity of the proposed project were provided with preconsulting notices and copies of the EA (i.e., Ms. Maeda Timson of the Makakilo/Kapolei/Honokai Hale No. 34 Neighborhood Board was preconsulted on February 4, 2000 and sent a DEA on May 8, 2000). Copies of the EA were also placed at the Pearl City Regional Library, the Ewa, Waianae and Waipahu Libraries. As required by law, the proposed project with a synopsis and deadlines was listed in *The Environmental Notice, Office of Environmental Quality Control*, on May 8, 2000. Additionally, Ko 'Olina Resort was contacted (personal communication between Ken Williams and Nicole Griffin on April 6, 2000 at 1100 hours) with information that the proposed project was in the environmental assessment phase, and that information was

needed on building at Ko 'Olina to determine cumulative effects. Ko 'Olina indicated that lot 16, low density housing on 29 acres would be developed by Brookfield Southland within the next 6 months. This construction effort was not anticipated to occur at the same time as the Leeward Bikeway.

- Community concerns regarding development and implementation of the proposed project were addressed in the EA process. The proposed project was reviewed for consistency with the community goals and objectives that are put forth in the following documents: The General Plan, Policies and Objectives (City and County of Honolulu [CCH], 1992), Central Oahu Sustainable Communities Plan (CCH, 1999), the Ewa Development Plan (CCH, 1997), the Waianae Sustainable Communities Plan (CCH, 1999), the Master Plan and Phased Implementation Plan of the Pearl Harbor Historic Trail (Belt Collins and CCH-DPP, forthcoming). Results of the review indicate that the project is consistent with these plans as well as other applicable regulations and laws (Section 4.14 of the FEA).

With publication of notice of the EA in *The Environmental Notice* (May 8, 2000), the public was invited to review the documents, request copies and provide comment. The community can also provide comment through participation in their monthly neighborhood board meetings. Comments received during the DEA review period have been reviewed and addressed in the FEA where appropriate. In particular, additional sections have been added specifically addressing security and maintenance of the proposed bikeway. The State Department of Transportation-Highways Division (DOT-HD) has also met with various interested parties to coordinate planning efforts and clarify actions along the proposed bikeway during this period. Constructive community participation and input is always encouraged during the EA process.

Everything from security, accesses, privacy and a host of liabilities surrounding my guests and associates is affected.

- To address security concerns for the proposed bikeway and adjacent properties, several controls will be employed as recommended by the Honolulu Police Department and others. These topics have been added to the FEA in Sections 3.16 and 4.13.
  1.) Place signage at the entrances and along the bikeway to identify the route and establish a Code of Conduct. This will include the following rules placed on signs at entrance points to the bikeway and along the bikeway:
  -Stay on the trail in continuous movement.
  -Respect rights of all trail users as well as adjacent homeowners and properties.
  -Ride single file keeping to the right of the trail.
  -Give warning before passing other trail users.
  -Only leashed pets are welcomed, you must clean up after your pet.
  -Unauthorized vehicles are prohibited.
  -Use of radios is prohibited.
  -Trail Hours are from dawn to dusk.
  -No dumping, littering or loitering. Please use trash receptacles.
  -Do not take or harm any plants or animals, areas outside the trail may contain sensitive plants and animals.
  -Use bikeway at your own risk.
  -Warning: golf course ahead.

2.) With the development of the proposed bikeway, increased bicycle police patrols will be recommended and requested of HPD and the City and County of Honolulu. Currently, there is a temporary bicycle patrol in the Waipahu area, and none in the Ewa and Waianae areas. (This reflects the fact that there is a partial bikeway in the Waipahu area and none in the Ewa and Waianae areas.)

It should also be noted that the proposed bikeway does not create access that was not already there. The development of the bikeway will be an improvement in restricting access at night, restricting vehicular access and requiring a code of conduct.

- **Liability from errant golf balls.** Portions of the proposed Leeward Bikeway are located adjacent to existing golf courses (Ted Makalena Golf Course) and the West Loch (Villages) Golf Course. Mr. Dave Mills, Golf Systems Administrator of the City and County of Honolulu, Enterprise Department, Golf Course Division was contacted on 6/16/00 to determine if there have been an injuries or incidents reported with errant golf balls and pedestrians/bicyclists. Mr. Mills stated that there have been no complaints system wide and that he would be surprised if incidents of such a nature did occur along the proposed Leeward Bikeway, even in the Ewa area. The Hawaiian Railway Society was also contacted to determine if any incidents have occurred with train rides. They reported that one errant golf ball incident had occurred, however it was not within the last four years of the current personnel tenure (HRS, 6/20/00). Additionally, conditions along the r-o-w through the Ko 'Olina area were reviewed (6/19/00) and the following was observed:

  - In many cases, a golf cart path with berms parallels the location of the r-o-w;
  - Oleander bushes line many sections of the r-o-w where the golf course has been constructed;
  - At the entrance to the golf course, a parking lot exists next to the r-o-w.
  - Aliinui Drive also borders the r-o-w and golf course for a significant distance.
  - Brookfield Southland is developing 29 acres of low density, single-family residential land bordering a portion of the golf course.

  With the current uses surrounding the r-o-w at the Ko 'Olina golf course, errant golf ball incidents do not appear to be a major problem. Signs will be placed on the State r-o-w warning path users to 'use the path at your own risk" and "warning: golf course ahead".

It should also be noted that a positive effect may also occur with the implementation of the proposed Leeward Bikeway. Ihilani guests will have access to another athletic venue which can also provide historic information.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET • HONOLULU, HAWAII 96813
TELEPHONE (808) 523-4414 • FAX (808) 527-6743 • INTERNET www.co.honolulu.hi.us/planning

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

RS 2000/CLOG-3190

July 3, 2000

Mr. Karl B. Bromwell, M.P.H.
Project Manager
Earth Tech, Inc.
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

Draft Environmental Assessment (DEA): Leeward Bikeway,
OR&L Railway Easement, Ewa and Waianae Districts,
Oahu, Tax Map Keys: Various

Thank you for the opportunity to review and comment on Earth Tech's April 2000 Draft Environmental Assessment which was prepared for the State Department of Transportation - Highways Division's (DOT-HD) Leeward Bikeway Project and received by our Department on May 31, 2000.

We support the State DOT-HD's proposal to construct the Leeward Bikeway along the State-owned former OR&L 40-foot right-of-way ("r-o-w") from Waipio Point Access Road in Waipahu to the east end of the West Loch Bikepath and then from the west end of the West Loch Bikepath to Lualualei Naval Road in Nanakuli, Waianae with the following comments and suggestions:

From the Land Use Permits Division (LUPD):

SECTION 1.3 Required Permits.

We confirm that a major Special Management Area (SMA) Use Permit and Shoreline Setback Variance (SV) will be required for the development of the bikeway along the Pearl Harbor and Nanakuli to Kahe Point segments. As a "public use" pursuant to the Land Use Ordinance (LUO), no other land use approvals will be required.

However, please note that if this EA is to be used as the primary document in applications for the SMA and SV permits, it will need to be significantly expanded as follows:

General Information.

SMA Boundaries - The Final EA should describe precisely which portions of the bikeway project will be located within the SMA and which portions will be located within the 40-foot shoreline setback. Exhibits which illustrate the SMA boundaries and shoreline relative to the proposed bikeway should be included. The bikeway alignment should also be illustrated against existing tax map key boundaries and an additional discussion should be included on properties adjacent to the proposed project.

SECTION 2.2 Proposed Action.

This section should clarify that the existing segment of the bikeway, between Waipio Point Access Road and Waipahu Street, was constructed as a *temporary* bikepath by the City's Department of Public Works (DPW) via Minor Special Management Area Use Permit (File No. 98/SMA-045), issued on June 26, 1998. This 0.8 mile segment of the bikeway, designated by DPW as Bike Path Extension II, consists of a 10-foot wide asphaltic concrete (AC) pavement 1.5 inches thick, and did not include any associated improvements such as lighting, interpretative/historic signage, landscaping or security fencing.

The description of construction activities must be expanded. The Final EA must describe the construction details required within areas located within the SMA and shoreline setback, including estimates of the amounts of grubbing, grading and fill required with those areas. Construction details on the demolition and construction of the Waikele and Kapakahi Stream bridges, as well as the construction of the Pili O Kahe, Keoneoio, and Kahe Point Beach Park gulch crossings must be disclosed. Similarly, details on the construction of the proposed retaining walls at Nanakuli Stream and Limaloa Gulch should be provided. Exhibits which illustrate these improvements should also be included in the Final EA.

Certified Shoreline Survey - Because a shoreline setback variance (SV) will be required for the development of the bikeway in the Pearl Harbor Shore area, a certified shoreline survey will be required when submitting the SV application.

Use characteristics - A section should be added detailing the use characteristics of the complete bikeway. Details such as hours of operation, lighting, security concerns, including ones relative to bikepath users as well as for adjacent property owners, periodic access by service vehicles in certain locations, should be discussed.

SECTION 4 ENVIRONMENTAL CONSEQUENCES.

4.2.2. Avifauna and Mammals - This section should be expanded to describe possible impacts of bike and pedestrian traffic on the avifauna resources, primarily in the Pearl Harbor Shore portions of the bikeway. This section should specifically discuss possible disruption of migratory bird feeding and nesting patterns which may result from night lighting, increased vandalism and general increases in human exposure on areas which currently enjoy limited human exposure.

4.4 Flora and Wetlands - The Final EA should clarify whether additional landscaping along the 40-foot railroad right-of-way is proposed.

4.7 Noise - This section should more thoroughly discuss the potential long-term noise impacts of users of the bikeway may have on migratory birds which utilize the Pearl Harbor Shore Segment of the project area, as well as associated noise impacts to property owners along the bikeway (eg., lower Waipahu area).

4.11 Visual - Elevation drawings/simulations should be provided which illustrate how proposed bikeway improvements will not negatively impact the project area. This section should clarify if additional landscaping is planned, as opposed to the revegetation of areas that are cleared and grubbed during construction.

4.12 Water Resources - The discussion of permanent erosion control and drainage impacts of the project must be expanded. This section should discuss actual drainage improvements or mitigation measures proposed to manage flood runoff, particularly in the low lying Pearl Harbor Shore area (eg., retention swales, basins or sediment traps, etc.).

4.13 Conflict with Federal, State, and Local Land Use Plans, Policies and Controls for the Area Concerned - This section must be expanded to include separate subsections which discuss how the development of the Bikeway conforms with the policies and objectives of the Coastal Zone Management Act (Section 205A-2, HRS), and the Special Management Area guidelines (Section 25.3.2, ROH); as well as meet the criteria for granting a variance pursuant to the Shoreline Setback Ordinance, Chapter 23, ROH. We suggest that the heading for this section be titled as "Compliance with ...," rather than "Conflict with...."

From the Long Range Planning Division (LRPD)

1. **Background of the Pearl Harbor Historic Trail (PHHT Project)**

   Belt Collins was hired by the Department of Planning and Permitting ("DPP") to prepare the master plan and phased implementation plan ("the plan") for the Aiea-Pearl City Vision Teams championed PHHT Project. The PHHT was envisioned to link numerous points of interest and activity centers along the former Oahu Railway and Land (OR&L) r-o-w with a 18.5 mile trail and rail system between the U.S.S. Arizona Memorial at Pearl Harbor and Lualualei Naval Road in Nanakuli (proposed project map attached). The State DOT's proposed 14 mile Leeward Bikeway project is included in the PHHT's proposed alignment.

   The PHHT plan will recommend infrastructure improvements and other actions for redevelopment of the r-o-w with a multi-modal ("shared use") pathway to accommodate *the historic train operation, bicyclists, joggers, walkers* ("pedestrians") and other uses. The final master plan is scheduled for completion in the latter part of 2000.

   Thank you for coordinating your project plans and schedule with Sue Sakai and Lisa Reinke at Belt Collins (at 521-5361).

2. We recommend the State DOT reconsider its preliminary bikeway design and **increase** the proposed "10-foot wide bikeway with two-foot graded shoulders" to 12-feet to conform to the recently revised 1999 American Association of State Highway and Transportation Officials (AASHTO) recommended guidelines for the development of bicycle facilities. Our consultants at Belt Collins informed us that the increased width will be consistent with the guidelines supported by the Mayor's Advisory Committee on Bicycling, the Hawaii Bicycling League and the University of Hawaii Bicycling Advisory Committee and their Environmental Center.

   We suggest the following option to DOT for increasing the width of their proposed shared-use pathway: That they explore and seek a favorable ruling/interpretation by the State Historic Preservation Division on what (either the railroad tracks or OR&L ROW) is listed on the National Register of Historic Places that would allow moving the railroad tracks to accommodate the wider shared use path.

3. The FEA should include a map of the proposed path alignment, which reflects the land acquisition parcels, to supplement the descriptive narrative. Although we recommend a 12 feet width for as much of the path as possible, it would be helpful if the leeward bikeway map identifies where the path would be 12 feet wide and where it will be constrained to 10 feet.

4. The FEA should include a short discussion (in Section 4.13), of how this project relates to the General Plan of the City and County of Honolulu, 1992 Edition, specifically Policy 1.c. Bikeways ("for recreational activities ...") of Objective A of the Transportation and Utilities Chapter (V).

5 We offer the following specific comments/corrections to the draft:

a. Page 4, Section 1.3.7: The Department of Planning and Permitting vice Department of Land Utilization (DLU was merged into DPP).

b. Page 37, Section 3.3, First paragraph: enclosures vice inclosures.

c. Page 49, Table 3-3: mean sea vice seal level.

d. Page 102, Section 6: Department of Planning and Permitting (delete DLU). Since the Department of Public Works was merged into several departments in the City's recent reorganization, please call DOT's former DPW contacts for the name(s) of their new Departments.

e. Pages 95 (Section 4.13) and 103: the January 2000 Waianae *Sustainable* Communities Plan was **approved** as Ordinance 00-14, Bill 70 (1999), CD2 on May 10, 2000 (to be effective July 9, 2000). The former Waianae Development Plan Special Provisions and Maps (Land Use and Public Facilities Maps) are repealed but "shall remain in force and effective until such time as the Public Infrastructure Map for Waianae is adopted..."

f. Appendix page for Photo documentaries: Should be Appendix **D** vice E.

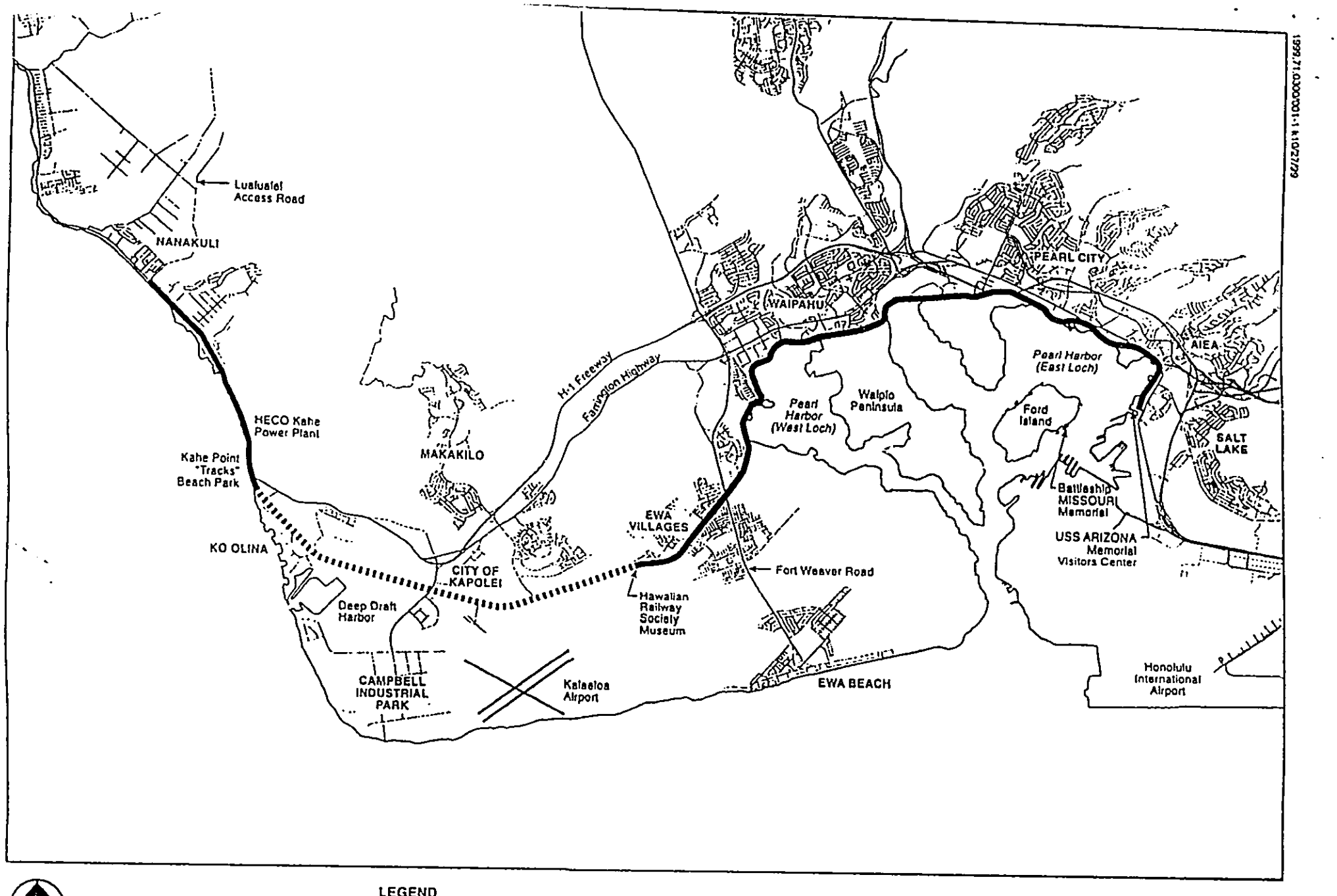
If you have any questions, please call Steve Tagawa of LUPD at 523-4817 or Ray Sakai of LRPD at 523-4047.

Sincerely yours,

RANDALL K. FUJIKI, AIA
Director of Planning and Permitting

RKF:js
Attachment - PHHT Project Map

cc: OEQC
DOT - Highways Division
Sue Sakai, Belt Collins
Steve Tagawa, DPP/LUPD Branch 2



PEARL HARBOR HISTORIC TRAIL

Karl B. Bromwell, M.P.H.
ect Manager
h Tech, Inc.
3, 2000
· 5

The FEA should include a short discussion (in Section 4.13), of how this project relates to the General Plan of the City and County of Honolulu, 1992 Edition, specifically Policy 1.c. Bikeways ("for recreational activities ...") of Objective A of the Transportation and Utilities Chapter (V).

We offer the following specific comments/corrections to the draft:

a. Page 4, Section 1.3.7: The Department of Planning and Permitting vice Department of Land Utilization (DLU was merged into DPP).

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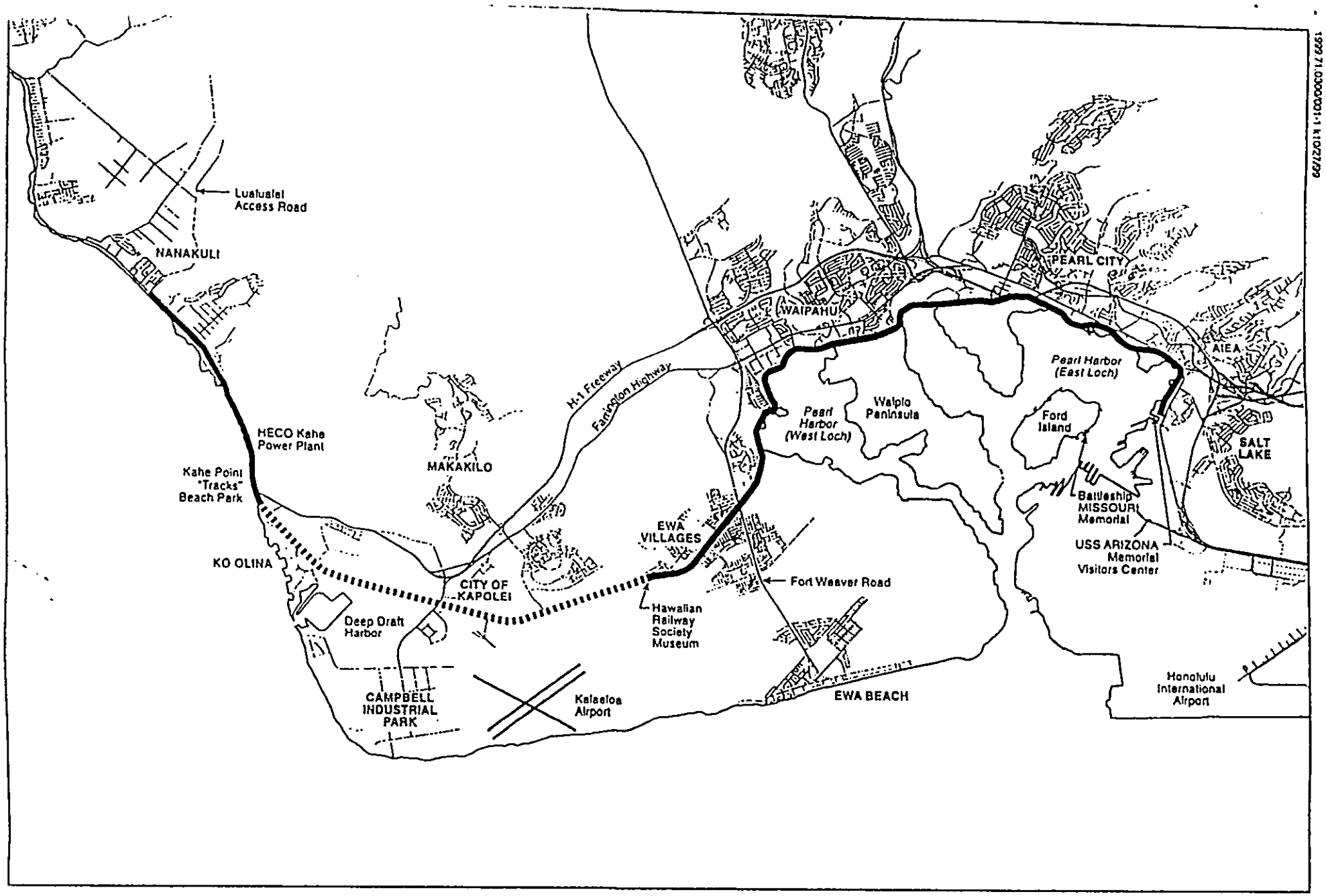
Sincerely yours,

RANDALL K. FUJIKI, AIA
Director of Planning and Permitting

:js
chment - PHHT Project Map

OEQC
DOT - Highways Division
Sue Sakai, Belt Collins
Steve Tagawa, DPP/LUPD Branch 2



NORTH

0 .5 1 2

SCALE IN MILES

LEGEND

Pearl Harbor Historic Trail

Existing Historic Railway Operations

PEARL HARBOR HISTORIC TRAIL

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

August 10, 2000

Randall K. Fujiki, AIA
Director of Planning and Permitting
City and County of Honolulu, Department of Planning and Permitting
650 South King Street
Honolulu, Hawaii 96813

Subject: **Draft Environmental Assessment, Leeward Bikeway,**
OR&L Railway Right of Way,
Ewa and Waianae Districts, Oahu
Project No.s STP-0300(55) and STP-0300(56)

Dear Reviewer (s):

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. The final EA (FEA) has been amended to reflect your comments where appropriate. We appreciate your efforts in reviewing the document and provide the following response to your comments (presented in bold):

Proposed Action.
We confirm that a major Special Management Area (SMA) Use Permit and Shoreline Setback Variance (SV) will be required for the development of the bikeway along Pearl Harbor and Nanakuli To Kahe Point segments. As a "public use" pursuant to the land Use Ordinance (LUO), no other land use approvals will be required. Thank you for your comment.

However, please note that if this EA is to be used as the primary document in applications for the SMA and SV permits, it will need to be significantly expanded as follows:

SMA Boundaries – The Final EA should describe precisely which portions of the bikeway project will be located within the SMA and which portions will be located within the 40-foot setback. Exhibits which illustrate the SMA boundaries and shoreline relative to the proposed bikeway should be included. The bikeway alignment should also be illustrated against existing Tax Map Key boundaries and an additional discussion should be included on properties adjacent to the proposed project. This information will be included with the permit applications; including it in the EA would significantly increase the amount of figures and decrease the "user-friendliness" of the document.

Section 2.2 Proposed Action

This section should clarify that the existing segment of the bikeway, between Waipio Point Access and Waipahu Depo Street, was constructed as a *temporary* bikepath by the City's Department of Public Works (DPW) via a Minor Special Management Area Use Permit (File No. 98/SMA-045), issued on June 26, 1998. This 0.8 mile segment of the bikeway, designated by DPW as Bike Path Extension II, consists of a 10-foot wide asphaltic concrete (AC) pavement 1.5 inches thick, and did not include any associated improvements such as lighting, interpretive/historic signage, landscaping or security fencing. This clarification has been added to Section 2.2.

The description of construction activities must be expanded. The final EA must describe the construction details required within areas located within the SMA and shoreline setback, including estimates of the amounts of grubbing, grading and fill required with those areas. Construction details on the demolition of and construction of the Waikele and Kapakahi Stream bridges, as well as the construction of Pili O Kahe, Keoneoio and Kahe Point Beach Park Gulch crossings must be disclosed. Similarly, details on the construction of the proposed retaining walls at Nankuli Stream and Limaloa Gulch should be provided. Exhibits which illustrate these improvements should also be included in the Final EA. At this time, the proposed bikeway is in the design phase, and more complete information is forthcoming. This information will be included in the permit applications, where appropriate.

Certified Shoreline Survey – Because a shoreline setback variance (SV) will be required for the development of a bikeway in the Pearl Harbor Shore area, a certified shoreline survey will be required when submitting the SV application. This information will be included with the permit application, where appropriate.

Use characteristics – A section should be added detailing the use characteristics of the completed bikeway. Details such as hours of operation, lighting, security concerns, including ones relative to bikepath users as well as for adjacent property owners, periodic access by service vehicles in certain locations, should be discussed. This information has been addressed in the new Sections 3.16 and 4.13 (*Security and Maintenance*) *of the FEA.*

Section 4 Environmental Consequences

4.2.2 Avifaunal and Mammals – This section should be expanded to describe possible impacts of bike and pedestrian traffic on avifauna resources, primarily in the Pearl Harbor Shore Portions of the bikeway. This section should specifically discuss possible disruption of migratory bird feeding and nesting patterns which may result from night lighting, increased vandalism and general increases in human exposure in areas which currently enjoy limited human exposure. The section of the Pearl Harbor Shore where the proposed bikeway will be located is used as a "loafing area" by waterbirds, which is not a primary habitat. As stated in Section 4.2.2, this behavior is primarily resting and socializing and is not feeding or nesting. The placement of the proposed bikeway is not anticipated to affect this behavior. At Pohala Marsh, Ducks Unlimited is completing restoration activities which will include the placement of a fence to restrict unwanted human access into the marsh. Additionally, as added to Section 3.16, signage will be placed at entry points to alert trail users to stay on the path in continuous movement, and not to disturb adjacent areas. It should also be noted that the proposed bikeway does not create an access that was not already there. The development of the bikeway will be an improvement in restricting access at night, restricting vehicular access and requiring a code of conduct.

4.4 Flora and Wetlands – The Final EA should clarify whether additional landscaping along the 40-foot railroad right-of-way is proposed. Revegetation of areas grubbed during construction is planned.

4.7 Noise – This section should more thoroughly discuss the potential long-term noise impacts of users of the bikeway may have on migratory birds which utilize the Pearl Harbor Shore Segment of the project area, as well as associated noise impacts to property owners along the bikeway (e.g., lower Waipahu area). The discussion of long-term effects of bikeway noise on birds in wetlands are discuss in Section 4.2.2, as it is referenced in Section 4.7. Section 4.2.2 points out that the

waterbirds in the loafing areas (of the wetlands) have co-existed with numerous pipelines in the area. The pipelines in the Pearl Harbor area have an unimproved maintenance road, and are routinely visited not only by pipeline companies but other unauthorized parties. The following text was added to Section 4.7 Noise, to address concerns of noise-effects from bikeway use:

Long-term effects related to bicyclist using the bikeway are not anticipated. *since use is anticipated to be non-motorized, continuous movement and intermittent in nature. To reduce possible negative noise-effects of users of the proposed bikeway, a code of conduct for users (as described in Section 3.16) will be implemented requiring continuous movement, restriction of use of unauthorized vehicles, with use limited to daylight hours. Additionally, permanent bicycle police patrols will be requested for the pathways.*

4.11 Visual – Elevation drawings/simulations should be provided, which illustrate how proposed bikeway improvements will not negatively impact the project area. This section should clarify if additional landscaping is planned as opposed to the revegetation of areas that are cleared and grubbed during construction. At this time, the proposed bikeway is in the design phase and more complete information is forthcoming. Section 2.2 Proposed Action has been clarified to state that landscaping will be limited to revegetation of areas grubbed.

4.12 Water Resources – The discussion of permanent erosion control and drainage impacts of the project must be expanded. This section should discuss actual drainage improvements or mitigation measures proposed to manage flood runoff, particularly in the low lying Pearl Harbor Shore area (e.g., retention swales, basins or sediment traps etc.). As discussed in Section 3.15.1, existing drainage along the project will be maintained. Improving adjacent drainage conditions is being reviewed on a case by case basis during the design phase of the project. *Improvements will be made* where they fit the design of the proposed bikeway and allowed funding.

4.13 Conflict with Federal, State and Local Land Use Plans, Policies and Controls for the Area of Concern – This section must be expanded to include separate subsections which discuss how the development of the bikeway conforms with policies and objectives of the Coastal Zone Management Act (Section 205A-2, HRS), and the Special Management Area Guidelines (Section 25.3.2, ROH),; as well as meet the criteria for granting a variance pursuant to the Shoreline Setback Ordinance, Chapter 23, ROH. We suggest that the heading for this section be titled "Compliance with.." rather than "Conflict with..." The appropriate discussions have been added to Section 4.14 Conflict with Federal, State, and Local Land Use Plans, Policies and Controls for the Area Concerned of the FEA.

From The Long Range Planning Division (LRPD)

1.) **Background of the Pearl Harbor Historic Trail (PHHT Project)....**Thank you for your comment.

2.) **We recommend the State DOT reconsider its preliminary bikeway design and increase the proposed "10-foot wide bikeway with two-foot graded shoulders" to 12-feet to conform to the recently revised 1999 AASHTO.....** The State Department of Transportation – Highways Division (DOT-HD) will continue to utilize the selection of the 10-foot wide bikeway with 2-foot graded shoulders in order to best utilize the narrow right-of-way. This selection allows for shared use of the right-of-way with the operating railroad and future railroad expansion. The use of a 10-foot width conforms to the 1999 AASHTO guide for the development of bicycle facilities which

states: "Under most conditions, a recommended paved width for a two-directional shared use path is 3.0 meters (10 feet)."

3.) **The FEAs should include a map of the proposed path alignment, which reflects the land acquisition parcels, to supplement the descriptive narrative. Although we recommend a 12 feet width for as much of the path as possible, it would be helpful if the leeward bikeway map identifies where the path would be 12 feet wide and where it will be constrained to 10 feet.** Currently, the design of the bikeway is still being completed, with the descriptive narrative available at this time. As stated above, the proposed bikeway selection will remain at 10-foot wide with 2-foot graded shoulders to account for shared use of the 40-foot wide right-of-way. Specific questions regarding bikeway alignment can be addressed directly to Mr. Jonathan Winn at 692-7579.

4.) **The FEA should include a short discussion (in Section 4.13) of how this project relates to the General Plan of the City and County of Honolulu, 1992 Edition, specifically Policy 1.c bikeways ("for recreational activities...") of Objective A of the Transportation and Utilities Chapter (V).** The appropriate discussion has been added to Section 4.14 of the FEA.

5.) **We offer the following specific comments/corrections to the draft: (comments a-f)**
Thank you for your comments, corrections have been made.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Mail Code WTR-9

June 2, 2000

Karl Bromwell
EARTHTECH
700 Bishop Street, Suite 900
Honolulu, HI
96813

Re: Leeward Bikeway OR&L Railway Easement Project

Dear Mr. Bromwell:

Thank you for your correspondence of 8 May 2000 providing information about the mentioned project. The project is located within the SOBA Sole Source Aquifer designation. Under provisions of the Safe Drinking Water Act, Section 1424(e), EPA is charged with review of projects that receive federal financial assistance and are located in Sole Source Aquifer areas. This program is designed by Congress to assure that projects receiving federal financial assistance are constructed to prevent contamination of drinking water resources.

I am requesting further information as follows.

Please clarify whether or not retention/detention basins (for runoff control) are part of the project design.

The project involves excavation in a railway r-o-w. Apparently unregulated dumping has taken place in the project area. Does the project design include a contingency for subsurface contamination if encountered during excavation activities?

The project involves the construction of several new bridge spans, including piers, across dry gulches. Are any of these piers expected to penetrate the water table?

When I receive this additional information, I will be better able to determine whether the project will adversely impact the Sole Source Aquifer.

If you have questions, do not hesitate to contact me at (415) 744-1890.

Sincerely,

Hillary Hecht
Hydrogeologist
Ground Water Office

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808 523 8871

Facsimile
808 523 8950

June 19, 2000

Hillary Hecht
Hydrogeologist, Groundwater Office
US Environmental Protection Agency, Region IX
75 Hawthorn Street
San Fransico, CA 94105
Mail Code WTR-9

Subject: **Draft Environmental Assessment, Leeward Bikeway, OR&L Railway Right of Way,**
Ewa and Waianae Districts, Oahu
Project No.s STP-0300(55) and STP-0300(56)

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. The final EA (FEA) has been amended to reflect your comments where appropriate. We appreciate your efforts in reviewing the document and provide the following response to your comments:

Please clarify whether or not retention/detention basins (for runoff control) are part of the project design. Retention or detention basins are not part of the project design. However, runoff control best management practices (BMPs) will be used during construction. A construction Best Management Plan will be developed for the State of Hawaii Department of Health 401 Water Quality Certification (WQC) as well as National Pollutant Discharge Elimination System (NPDES) permits near streams.

The project involves excavation in the railway right-of-way. Apparently unregulated dumping has taken place in the project area. Does the project design include a contingency for subsurface contamination if encountered during excavation activities? Most of the dumping observed in the vicinity of the proposed project site has been solid waste (i.e., loads of concrete, piles of rebar, abandoned cars). These materials are not anticipated to require handling as hazardous or regulated wastes. After consultation with the State of Hawaii Department of Transportation, the following comment has been added to Section 4.5; *In the event that subsurface contamination is encountered, it will be identified and handled appropriately in accordance with State of Hawaii and US EPA regulations.*

The project involves the construction of several new bridge spans, including piers, across dry gulches. Are any of these piers expected to penetrate the water table? The following is listed in Section 2.2 Proposed Action:

Pili O Kahe Gulch. 55-foot long prestressed girder bridge; no piers in the stream.
Keanaoio Gulch. 180-foot long prestressed girder bridge; 3 span bridge with 2 piers in the stream.
Gulch at the south end of Kahe Point Beach Park; 30-foot long prestressed girder bridge with no piers in the stream.
Gulch ½ mile west of Kalaeloa Boulevard; 66-foot long prestressed girder bridge, 2 span bridge with one pier in the stream.
Gulch just east of Kalaeloa Boulevard; 17-foot long prestressed girder bridge with no piers in the stream.

Keanaoio Gulch will have 2 piers in the stream bed. It is likely that the piers will be driven into groundwater since the crossing location is in a backbeach area and is close to the ocean. The groundwater at this location is likely brackish, as is the ponded water present in the Muliwai at this location.

CORRECTION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Mail Code WTR-9

June 2, 2000

Karl Bromwell
EARTHTECH
700 Bishop Street, Suite 900
Honolulu, HI
96813

Re: Leeward Bikeway OR&L Railway Easement Project

Dear Mr. Bromwell:

Thank you for your correspondence of 8 May 2000 providing information about the mentioned project. The project is located within the SOBA Sole Source Aquifer designation. Under provisions of the Safe Drinking Water Act, Section 1424(e), EPA is charged with review of projects that receive federal financial assistance and are located in Sole Source Aquifer areas. This program is designed by Congress to assure that projects receiving federal financial assistance are constructed to prevent contamination of drinking water resources.

I am requesting further information as follows.

Please clarify whether or not retention/detention basins (for runoff control) are part of the project design.

The project involves excavation in a railway r-o-w. Apparently unregulated dumping has taken place in the project area. Does the project design include a contingency for subsurface contamination if encountered during excavation activities?

The project involves the construction of several new bridge spans, including piers, across dry gulches. Are any of these piers expected to penetrate the water table?

When I receive this additional information, I will be better able to determine whether the project will adversely impact the Sole Source Aquifer.

If you have questions, do not hesitate to contact me at (415) 744-1890.

Sincerely,

Hillary Hecht
Hydrogeologist
Ground Water Office

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808 521 8871

Facsimile
808 521 8950

June 19, 2000

Hillary Hecht
Hydrogeologist, Groundwater Office
US Environmental Protection Agency, Region IX
75 Hawthorn Street
San Fransico, CA 94105
Mail Code WTR-9

Subject: **Draft Environmental Assessment, Leeward Bikeway, OR&L Railway Right of Way,**
Ewa and Waianae Districts, Oahu
Project No.s STP-0300(55) and STP-0300(56)

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. The final EA (FEA) has been amended to reflect your comments where appropriate. We appreciate your efforts in reviewing the document and provide the following response to your comments:

Please clarify whether or not retention/detention basins (for runoff control) are part of the project design. Retention or detention basins are not part of the project design. However, runoff control best management practices (BMPs) will be used during construction. A construction Best Management Plan will be developed for the State of Hawaii Department of Health 401 Water Quality Certification (WQC) as well as National Pollutant Discharge Elimination System (NPDES) permits near streams.

The project involves excavation in the railway right-of-way. Apparently unregulated dumping has taken place in the project area. Does the project design include a contingency for subsurface contamination if encountered during excavation activities? Most of the dumping observed in the vicinity of the proposed project site has been solid waste (i.e., loads of concrete, piles of rebar, abandoned cars). These materials are not anticipated to require handling as hazardous or regulated wastes. After consultation with the State of Hawaii Department of Transportation, the following comment has been added to Section 4.5; *In the event that subsurface contamination is encountered, it will be identified and handled appropriately in accordance with State of Hawaii and US EPA regulations.*

The project involves the construction of several new bridge spans, including piers, across dry gulches. Are any of these piers expected to penetrate the water table? The following is listed in Section 2.2 Proposed Action:

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Gulch just east of Kalaeloa Boulevard; 17-foot long prestressed girder bridge with no piers in the stream.

Keanaoio Gulch will have 2 piers in the stream bed. It is likely that the piers will be driven into groundwater since the crossing location is in a backbeach area and is close to the ocean. The groundwater at this location is likely brackish, as is the ponded water present in the Muliwai at this location.

Gulch ½ mile west of Kalaeloa Boulevard may have one pier in the stream bed. However, DOT has reviewed the site, and it may not require a pier at all. In the event that a pier is required, it is not anticipated to encounter groundwater, since it is approximately 65-70 feet above mean sea level, the anticipated groundwater elevation in this portion of the Ewa Plain.

As described in Section 3.15.2 and Table 3-8, the groundwater in the vicinity of Keanaoio Gulch and Kalaeloa Boulevard is classified as Moderate Salinity (1,000 to 5,000 parts per million chloride) and is not in use for potable drinking water.

Please review the responses to your questions and reply by 10 July 2000, the date of submittal of the FEA for review. If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 808-523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell, M.P.H.
Project Manager

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Mail Code WTR-9

June 30, 2000

Karl Bromwell
EARTHTECH
700 Bishop Street, Suite 900
Honolulu, HI
96813

Re: Leeward Bikeway OR&L Railway Easement Project

Dear Mr. Bromwell:

Thank you for your correspondence of 19 June 2000 providing additional information about the mentioned project. The project is located within the SOBA Sole Source Aquifer designation. Under provisions of the Safe Drinking Water Act, Section 1424(e), EPA is charged with review of projects that receive federal financial assistance and are located in Sole Source Aquifer areas. This program is designed by Congress to assure that projects receiving federal financial assistance are constructed to prevent contamination of drinking water resources.

Based on the additional information provided, it appears unlikely that the project will significantly impact the Sole Source Aquifer. Therefore, EPA approves of federal financial assistance for this project under provisions of the Safe Drinking Water Act, Section 1424(e).

If you have questions, do not hesitate to contact me at (415) 744-1890.

Sincerely,

Hillary Hecht
Hydrogeologist
Ground Water Office

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

TIMOTHY E. JOHNS, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

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HISTORIC PRESERVATION
LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

July 7, 2000

Karl Bromwell, Project Manager
Earth Tech
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

LOG NO: 25733 ✓
DOC NO: 0007EJ03

Dear Mr. Bromwell:

SUBJECT: **Chapter 6E-8 Historic Preservation Review – State of Hawaii Department of Transportation Highways Division, Draft Environmental Assessment (DEA) for the Leeward Bikeway in the Districts of Ewa and Wai`anae Waipahu, Ewa to Nanakuli, Waianae**
TMK: 8 & 9

Thank you for the opportunity to comment on the draft Environmental Assessment for the proposed Leeward Bikeway. The project proposes construction of bridges, retaining walls, railroad crossings and culverts along various sections of the proposed bikeway. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the project areas.

The EA includes a very good assessment on the archaeological resources within the project area. This assessment, synthesized in Section 3.3 of the DEA, determined that there are three known historic sites within the proposed bikeway corridor: 1) the OR&L Right-of-way [SIHP 50-80-12-9714], 2) the Pouhala fishpond [SIHP 50-80-09-126] and 3) a former traditional Hawaiian burial site near Kahe beach [50-80-12-4061]. The archaeological assessment also suggests other areas where historic sites might be found, such as in gulches undisturbed by commercial sugar cane cultivation, within jaucus beach sand deposits between the Kahe power plant to Lualualei Naval Road, and within the sediments associated with Loko Pouhala's use as a fishpond.

In order to mitigate any potential adverse effects this project would have on significant historic sites, the DEA recommends that archaeological monitoring take place in areas where ground disturbing activities has the potential to affect unknown buried historic sites. Specifically, monitoring is proposed for the beach sand areas along the stretch immediately north of Kahe Point to Lualualei Naval Road. Data recovery as a form of mitigation is

proposed for Loko Pouhala fishpond because the sediments within this wetland have the potential to contain information on Hawaiian history and prehistory.

We concur that archaeological monitoring and data recovery are appropriate means of mitigating any adverse effect this project will have on historic sites. The next step in the historic preservation review process would be the submittal of archaeological monitoring and data recovery plans for review and acceptance by the SHPD. We look forward to reviewing these plans.

Should you have any questions, please feel free to call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027.

Aloha,

pp TIMOTHY E. JOHNS
State Historic Preservation Officer

EJ:jk

NOTE:

Burial and Recovery Mitigation Plans are currently in the submittal and review process with DOT and SHPD.

2000-08-23-OA-FEA-

Final Environmental Assessment (EA)

(Leeward Bikeway)
OR&L Railway Right-of-Way
Ewa & Waianae Districts, Oahu

This environmental document has been prepared pursuant to Chapter 343, Hawaii Revised Statutes

Proposing Agency:

State of Hawaii
Department of Transportation
Highways Division

Prepared by:

Earth Tech, Inc.
700 Bishop Street
Suite 900
Honolulu, Hawaii 96813

August 2000

EXECUTIVE SUMMARY

INTRODUCTION

The purpose of this final environmental assessment (EA) is to analyze the potential environmental consequences of the proposed State Department of Transportation, Highways Division (DOT-HD) Leeward Bikeway project activities, to determine if there would be significant short-term, long-term and/or cumulative impacts on the human, natural and historic environments. This project is in compliance with the National Environmental Policy Act (NEPA); Department of Defense (DOD) Directive 6050.1, Chapter 343, Hawaii Revised Statutes (HRS 343), and Title 11, Chapter 200 (11-200), Hawaii Administrative Rules (HAR) of the State Department of Health (DOH) implementing rules for the environmental assessment process.

The need to construct the Leeward Bikeway stems from a requirement in the transfer of the deed of the former Oahu Railroad and Land Company (OR&L) railroad from the Federal DOT to the State DOT-HD. As part of the deed transfer, the State DOT-HD must develop the Leeward Bikeway extending from Waipio Point Access Road through the Ewa Plain to the Waianae Coast at Lualualei Naval Road. The alignment of the bikeway will follow the former OR & L 40-foot right-of-way (r-o-w) or railroad tracks from Waipio Point Access Road to the east end of the West Loch Bikepath and then from the west end of the West Loch Bikepath to Lualualei Naval Road. The proposed project includes construction of bridges, retaining walls, railroad crossings and culverts. The proposed bikeway would share the 40-foot right-of-way with the existing and planned track restorations of the Hawaii Railway Society.

This final EA was prepared for the proposed action pursuant to NEPA, the HRS 343, and the DOH HAR 11-200 environmental impact statement rules. The proposed action "triggers" 40 CFR parts 1500-1508 and HRS 343-5(1) because of the use of Federal and State funds in the development of the bikeway.

ALTERNATIVES CONSIDERED

The "no action" alternative would be to accept the transfer of land and not build a bikeway and/or only utilize the proposed project area with the operation of the Hawaiian Railway Society railroad tours. Although this alternative does utilize some portions of the proposed project area, it does not satisfy the highways purposes and access requirements of the deed. Therefore, this alternative would result in the forfeiture of the parcel back to the federal government. As a result, the "no action" alternative was not considered, and bikeway construction was selected.

Construction alternatives involving the design of the proposed Leeward Bikeway that were considered but not carried forward include the following:

- Initially, a 14-foot wide bikeway was considered. However, with the right-of-way limited to 20 feet from the center of the former railway tracks, a 10-foot wide bikeway with two-foot graded shoulders was selected since it occupied less space within the proposed project area.

- Renovation of the old Waikele and Kapakahi railroad bridges was considered. However, it was determined that the present condition of the bridges was insufficient to support the bikeway; new bridges will be constructed in these locations.

- An alternative evaluated at the Pili O Kahe Gulch crossing was utilization of the shoulder of Farrington Highway at that location. This alternative was rejected, due to the heavy traffic and high speed along Farrington Highway, and to maintain the proposed Leeward Bikeway as a bikepath and not a bike lane. As a result, the bikepath will continue to follow the OR&L r-o-w, requiring a new bridge, and retaining walls.

- At the Hawaiian Railway Society Train Station/Museum, the bikepath alignment will go around the makai side of the train station/museum. An alternative to this alignment would be to make several railroad crossings and relocate the train boarding platforms. This alternative was rejected due to the confusion the crossings would make and possible disruption to the Hawaiian Railway Soceity operations.

- The alignment of the bikepath will require the relocation of several utility poles in the Ewa area. An alternative to relocating these poles would be to construct the bikepath closer to the existing railroad tracks. This alternative was rejected due to the need to maintain a clearance distance between the bikepath and the active railroad.

- Barriers will be used along the alignment to separate the bikepath and the railroad in certain areas where the bikepath cannot be built with a sufficient clearance. One alternative to this would be to place a barrier along the whole alignment. This alternative was rejected using the following considerations:

  - a barrier will be costly to maintain for such an extended length (deterioration, and vandalism);

  - the negative visual impact of the barrier;

  - the low speed and ability to stop of the operating railroad;

  - the clearance used over most of the bikeway is over 1-1/2 times the clearance required between bikepaths and roadways according to the American Association of State Highways and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities.

ANTICIPATED IMPACTS

The analysis detailed in Chapter 4 indicates that implementation of the proposed Leeward Bikeway project would not pose any anticipated significant long term or cumulative impacts on the human, natural and historic environments. However, potential impacts along sensitive sections would cause minimal short-term impacts to vegetation, waterbird activity, water quality, visual resources, noise, and air quality.

SUMMARY OF RESULTS

Air Quality - Project activities would generate exhaust products and fugitive dust emissions from construction vehicles and excavation and construction activities, respectively. Air quality effects will be short-term in nature. Construction vehicles will be scheduled to arrive and depart the site during non-peak traffic hours.

Biological Resources – The impacts to aquatic biota, plants (flora and wetlands), birds, and mammals will be short-term and related to construction activities such a stream work, clearing, and noise associated with the proposed action. The natural drainage flow will be maintained for aquatic biota, vegetation will be inspected for nesting birds prior to clearing activities, and the use of the wetland-type area will be held to a minimum. Areas disturbed will be revegetated with appropriate species. Sensitive plant species identified during the biological survey ('ilima and ma'o) will have their locations marked-off during construction so that they are avoided. Construction activities may disrupt loafing activities of native birds; however the areas in use are not primary habitats and loafing behavior is expected to resume after construction. Construction activities would also cease and/or be redirected in the event that nesting birds are encountered.

Cultural Resources – A cultural resources survey completed for this project indicates that the former OR&L railroad is the main historic feature along the proposed project area. Possible Hawaiian burials could exist in the sands along the Waianae Coast portion of proposed project area, and fishpond sediments could occur in the vicinity of the former Pouhala fishpond near Waikele Stream. Should any archaeologically significant artifacts, bones, or other indicators of previous onsite activity be uncovered during the construction, work will be halted and their treatment will be in strict compliance with the requirements of the State Historic Preservation Office and Department of Land and Natural Resources. This includes the development of a burial plan and a sediment recovery plan.

Hazardous Wastes and Materials – There are no anticipated short-term or long-term effects from hazardous wastes and materials or petroleum products. Appropriate construction best management plans (BMPs) and spill contingency plans will be implemented throughout the duration of the project.

Noise – Intermittent elevated noise levels from specific construction activities are unavoidable, but are expected to be short-term and minor. Typical heavy construction equipment noise levels are within the decibel range identified for a day time, noisy urban environment. Long-term effects related to bicyclist use of the proposed project are not anticipated since use will be non-motorized, continuous movement and intermittent in nature. To reduce possible negative-noise effects, a code of conduct for users of the proposed bikeway will require continuous movement, no unauthorized motorized vehicles, with use limited to daylight hours. Permanent bicycle patrols will also be requested.

Socioeconomic – The development of the bikeway should not induce or decrease economic or population growth in the project vicinity or region. Construction activities will take place Monday through Friday during normal working hours. No weekend and holiday construction activities are planned.

Transportation – Traffic patterns throughout the course of the proposed project should not be substantially altered.

Utilities and Infrastructure – The proposed activities may have short-term effects to various utilities located within the project limits. Owners of the overhead utilities will be consulted prior to relocation, and owners of the pipelines will be contacted prior to construction to determine their exact location. The disposal of the proposed projects generated solid waste will have a secondary long-term effect on the island's sanitary landfill. This is not expected to have a significant impact on the landfill capacity.

Security and Maintenance – The implementation of the proposed project will require security and maintenance measures for the protection and enjoyment of the path users and adjacent property owners. With the development of the proposed bikeway, access will be restricted to daylight hours, a code of conduct will be required and additional police patrols will be requested. Vehicular access will restricted to emergency vehicles. Maintenance including mowing and trash removal will be completed by DOT maintenance crews.

Visual Resources – Short-term construction-related visual impacts are anticipated, but will be controlled to within acceptable limits by timing and phasing of construction activities and by revegetation of cleared areas.

Water Resources – Turbidity will be increased and water quality will be reduced downstream of the bridges during those portions of the project, but this is expected to be short-term in nature. Monitoring of the stream water will also be conducted throughout the bridge construction portions of the project.

APPLICABLE ENVIRONMENTAL PERMITS

- U.S. Army Corps of Engineers Section 404 Permit

- Section 401 Water Quality Certification
- State Stream Channel Alteration Permit
- Conservation District Use Application
- Special Management Area
- Coastal Zone Management Consistency
- Shoreline Setback Variance
- State Historic Preservation Clearance
- US EPA Southern Oahu Basal Aquifer (SOBA) sole source aquifer determination pursuant to provisions under the Safe Drinking Water Act, Section 1424(e)

DETERMINATION

The proposed action was reviewed and analyzed pursuant the "Significant Criteria" established in 11-200-12, HAR, environmental impact assessment process. No significant negative environmental impacts were identified and a Finding of No Significant Impact (FONSI) has been given by DOT-HD.

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

- Section 401 Water Quality Certification
- State Stream Channel Alteration Permit
- Conservation District Use Application
- Special Management Area
- Coastal Zone Management Consistency
- Shoreline Setback Variance
- State Historic Preservation Clearance
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TABLE OF CONTENTS

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TABLES

ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
°C	degrees Celsius
ANSI	American National Standards Institute
APE	area of potential effect
AASHTO	American Association of State Highways and Transportation Officials
BMP	best management practice
BPNAS	Barbers Point Naval Air Station
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CDUA	Conservation District Use Application
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO_2	Carbon dioxide
COE	United States Army Corps of Engineers
CWA	Clean Water Act
CWB	Clean Water Branch
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
DA	Department of the Army
dB	decibel
dBA	A-weighted decibels
DBED	Department of Business and Economic Development
DLNR	Department of Land and Natural Resources
DO	Dissolved oxygen
DOH	Department of Health
DOT	Department of Transportation
DOT-HD	Department of Transportation, Highways Division
DPP	City & County of Honolulu, Department of Planning and Permitting
EA	Environmental Assessment
EO	Executive Order
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FONSI	Finding of no significant impact
FRA	Federal Railway Administration
HAR	Hawaii Administrative Rules

HRS	Hawaii Revised Statutes
IARII	International Archeological Institute, Inc.
L_{dn}	annual average day-night sound level
mg/L	milligrams per liter
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O_3	Ozone
OR&L	Oahu Railroad and Land Company
OSHA	Occupational Safety and Health Act
PM_{10}	particulate matter < 10 microns
ppt	parts per thousand
ROH	Revised Ordinances of Honolulu
r-o-w	right-of-way
SCA	Stream Channel Alteration
SHPD	State Historic Preservation Division
SMA	Special Management Area
SMP	Special Management Area Use Permit
SO_2	sulfur dioxide
SOBA	Southern Oahu Basal Aquifer
SSV	Shoreline Setback Variance
TSP	total suspended particulate matter
USC	United States Code
USDA-SCS	United States Department of Agriculture, Soil Conservation Service
USFWS	United States Fish and Wildlife Service
USGS	Unites States Geological Survey
WQC	Water Quality Certification

1. INTRODUCTION

As part of the deed transfer, the State Department of Transportation, Highways Division (DOT-HD) must construct a bikepath extending from Waipio Point Access Road across the Ewa Plain to the Waianae Coast at Lualualei Naval Road. The alignment of the proposed bikeway will follow a portion of the former Oahu Railroad and Land Company (OR&L) right-of-way (r-o-w) (e.g., railroad tracks).

The proposed project will be funded by the Federal and State DOTs. Therefore, this environmental assessment (EA) was prepared for the proposed action pursuant to National Environmental Protection Act (NEPA), the Hawaii Revised Statutes, Chapter 343 (HRS 343), and the Department of Health (DOH) Hawaii Administrative Rules (HAR) Title 11-200 environmental impact statement rules, and the implementing regulations including the Code of Federal Regulations, Title 40, Parts 1500-1508 (40 CFR 1500-1508) and HRS 343-5(1).

1.1 Purpose and Need for Action

The proposed project is to be developed primarily for pedestrian/cyclist highway purposes. Secondary purposes of the proposed project include providing access to the historic former OR&L railroad, a National Historic site, and additional recreational facilities. The need to construct the Leeward Bikeway stems from a requirement in the transfer of the deed of the former OR&L railroad from the Federal DOT to DOT-HD. The deed transfer requires the State of Hawaii to construct a bikeway in the r-o-w of the historic former OR&L railroad (Appendix A).

1.2 Decisions to Be Made

During the process of this EA, data will be analyzed to determine the possible environmental consequences of the proposed DOT-HD Leeward Bikeway project activities, and if there would be significant short-term, long-term and/or cumulative impacts on human, natural and historic environments. Impacts will be reviewed and mitigation measures developed in support of the proposed and alternative actions.

1.3 Required Permits

In addition to the environmental disclosure requirements of HRS 343, the proposed action requires Federal, State, and County permits. These permits may include: the U.S. Army Corps of Engineers (COE) Department of the Army (DA) Permit and Section 404 Permit; U.S. EPA sole source aquifer determination, DOH Section 401 Water Quality Certification (WQC); State Coastal Zone Management Program (CZMP) Consistency Determination; State Stream Channel Alteration (SCA) permit; Special Management Area (SMA) Use Permit; Conservation District Use Application (CDUA); Shoreline Setback Variance (SSV); National Pollutant Discharge Elimination System (NPDES) coverage for storm water

discharge and Construction Dewatering Permit; State Conservation District Use Application; and State Historic Preservation Clearance.

1.3.1 U.S. Army Corps of Engineers Permit for Activities in Waterways

The DA permit program is authorized under Section 10 of the Rivers and Harbors Act of 1989, Section 404 of the Clean Water Act (CWA), and Section 103 of the Marine, Protection, Research and Sanctuaries Act. The proposed action requires a permit pursuant to 33 CFR 320-330 regulating work in the waters of the United States.

The COE has jurisdiction over dredge and fill actions in U.S. waters, including the streams crossed by the proposed bikeway. Certain discharges specified in 33 CFR 330 are permitted under a "Nationwide Permit" system, while others receive regional and individual permits. The proposed Leeward Bikeway project may meet the conditions for the Nationwide Permit under the criteria established in Permit No. 12 (Historic Properties).

1.3.2 U.S. Army Corps of Engineers Section 404 Permit

Section 301 of the 1977 Federal Clean Water Act regulates actions involving the discharge of dredged or fill material (includes rock, sand, dirt, structures cast in place (concrete) and other material) into waters of the United States, including areas designated as wetlands. The proposed project will require the development of seven bridges to span the perennial streams and gulches (intermittent streams) encountered along the proposed bikeway route. One or more of these crossings may involve a discharge of fill material in jurisdictional waters, as defined by 33 CFR 323.2, and therefore, a permit from the COE will be needed.

1.3.3 U.S. EPA Sole Source Aquifer Determination

Section 1424(e) of the Clean Water Act charges the U.S. Environmental Protection Agency (EPA) with review of projects that receive federal financial assistance and are located in sole source aquifer areas. The program assures that projects receiving federal financial assistance are constructed in a manner that prevents contamination to drinking water sources. The proposed project is located in the U.S EPA designated Southern Oahu Basal Aquifer (SOBA) area, and requires project review by the U.S. EPA Region IX Ground Water Office.

1.3.4 State DOH Section 401 Water Quality Certification

This application is required per Title IV (Permits and Licenses, Certification, Section 401(a)(1) of the 1977 CWA (Public Law 95-217) and HRS 342D. The CWA and Section 401 of its implementing regulations (Title 33, Section 1341 of the United States Code [33 USC 1341]) require any applicant for a federal license or permit conducting any activity that may result in any discharge into navigable waters to obtain a water quality certification from the

state where the discharge takes place or originates. The DOH Clean Water Branch (CWB) administers the WQC permitting process in Hawaii through HAR 11-54 so construction discharge activities can be monitored and conducted in a manner that will not violate the basic water quality criteria applicable to the class of receiving waters at the site.

1.3.5 Coastal Zone Management Program Consistency Determination

Authorized by HRS 205A, the Coastal Zone Management Act (CZMA) guides the use, protection, and development of land and ocean resources within Hawaii's coastal areas. The National Coastal Zone Management Act of 1972, Section 307(c)(1), requires Federal agencies to conduct their planning, management, development, and regulatory activities in a manner consistent with the state CZMP. Informational and procedural requirements for Federal agencies are established under 40 CFR 930. The Office of Planning, Department of Business and Economic Development (DBED), the State's lead agency for review for consistency, must agree with the determination that the proposed action is consistent with the CZMP or provide specific conditions on the proposed action to place it in consistency. All proposed developments within the SMA of Hawaii's community development districts are subject to assessment of valuation and potential environmental effects of the proposed work and the significance of each effect. If the proposed project is authorized under Nationwide Permit Program and covered under a blanket certification, the CZMP consistency determination will not be required.

1.3.6 State Stream Channel Alteration Permit

HRS 174C authorizes the regulation and permitting of activities that propose to alter stream channels and flow characteristics in the State of Hawaii. The State Water Commission regulates actions that propose to alter stream channels and flows under the HAR Title 13, Chapter 169-50 of the State Water Commission for SCA permits. The regulations state that channel alterations adversely affecting the quantity and quality of stream water or stream ecology should be minimized or not allowed. Where instream flow standards have been established, no permit shall be granted for any channel alteration that diminishes the quantity or quality of the stream water below the minimum standards.

1.3.7 State Historic Preservation Clearance

The proposed actions for the Leeward Bikeway are also regulated by the National Historic Preservation Act and its implementing regulations (36 CFR 800), as well as the State Historic Preservation Act (HRS 6E). This clearance process is designed to minimize project impacts to significant historical or archaeological sites.

1.3.8 City and County of Honolulu Special Management Area Permit

The State of Hawaii's HRS 205A authorizes counties to create SMAs to protect and preserve the coastal zone in Hawaii. The City and County of Honolulu regulates actions taking place in the SMA under Chapter 25, Revised Ordinances of Honolulu (ROH). Section 25-3.2 states that all development in the SMA shall be subject to reasonable terms and conditions set by the council to ensure that:

1) Adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas and natural reserves is provided to the extent consistent with sound conservation principles;

2) Adequate and properly located public recreation areas and wildlife preserves are reserved;

3) Provisions are made for solid and liquid waste treatment, disposition and management which will minimize adverse effects upon special management area resources; and

4) Alterations to existing land forms and vegetation, except crops, and construction of structures, shall cause minimum adverse effect to water resources, scenic and recreational amenities as well as minimize danger of floods, landslides, erosion, siltation or earthquake failure.

The City and County of Honolulu, Department of Planning and Permitting administers the SMA Use Permit (SMP) process to control development in the SMAs, minimize effects to sensitive ecological areas, and avoid permanent loss of valuable coastal resources. The permit process also is used to preserve scenic views and ensure public access to beaches, coastal recreation areas, and natural reserves. Actions affecting wetland areas, including dredging, also are regulated in this process.

1.3.9 State DOH NPDES Permit Coverage for Storm Water Discharge

Title IV – Permits and Licenses, of the CWA gives EPA the authority and responsibility to issue discharge permits to every point source discharger. Section 402 (33 USC 1342) of the CWA describes the NPDES permit system. The CWA allows states to request EPA authorization to administer the NPDES program within their borders. The DOH CWB administers the General Permitting process in Hawaii through the HAR Chapter 11-55 Notice of Intent (NOI) Appendix B-I. An NPDES permit is required before any effluent discharge can be made to surface streams or coastal waters. It is envisioned that the construction work may require the preparation of a State DOH NPDES CWB-NOI Form C and G, Storm Water Associated with Construction Activities and Construction Dewatering, respectively.

1.3.10 Conservation District Use Application

This application is required for a land use within areas classified as a State Land Use Conservation District. All applications are subject to County SMA requirements. All land uses, pursuant to Section 13-5-2, HAR require that a CDUA be filed with the State of Hawaii Department of Land and Natural Resources (DLNR), Office of Conservation and Environmental Affairs and be approved by the Board of Land and Natural Resources prior to the application's initiation.

1.3.11 Shoreline Setback Variance

Pursuant to the authority conferred by HRS Chapter 205A, this permit covers structures and activities in the shoreline area as defined in ROH, Chapter 23. This permitting process assists the City and County of Honolulu, Department of Planning and Permitting (DPP) in protecting and preserving the natural shoreline, (especially sandy beaches); public pedestrian access laterally along the shoreline and the sea; and open space along the shoreline.

2. PROJECT DESCRIPTION

This section provides general background information on the proposed project area, a description of the proposed action and alternatives of the proposed action.

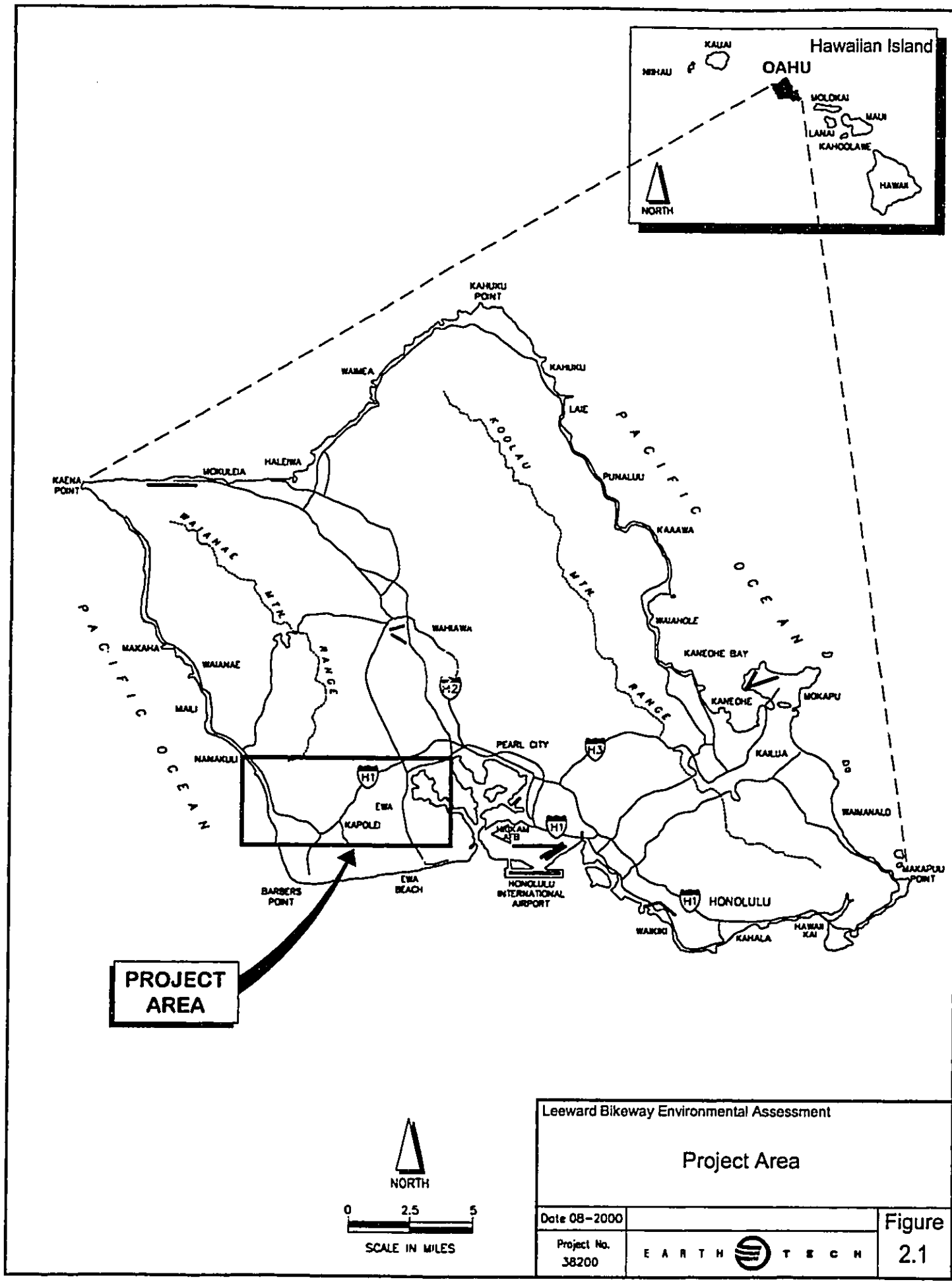
2.1 Project Location and Background

Location. The project area is mainly located in the south portion of the island of Oahu, on the Ewa Plain (Figure 2.1). The proposed Leeward Bikeway construction area follows the OR&L r-o-w or former railroad, from Waipio Point Access Road to the east end of the West Loch Bikepath, and from the west end of the West Loch Bikepath to Nanakuli (at Lualualei Naval Road). The proposed bikeway would share the 40-foot wide r-o-w with the existing and planned track restorations. The tracks are currently used by the Hawaiian Railway Society to run trains throughout the week and weekend. The proposed project area is approximately 14 miles in length (approximately 68 acres) and extends from the Ewa District to the Waianae District on the island of Oahu.

Background. In 1888, King Kalakaua signed a franchise granting OR&L the right to build 15 miles of railroad from Honolulu to Pearl River lagoons (now Pearl Harbor) (Hawaiian Railway Society, 1994). Another charter granted by the Hawaiian government to OR&L on February 4, 1889 allowed for the purchase, ownership, development, sale, and lease of lands along or near the railroad. The OR&L ended mainline operations throughout the island on December 31, 1947, and minor operations in Honolulu ceased in 1971. After the main operations ceased in 1947, the United States Navy exercised a two-year lease on the railroad to continue moving munitions. In 1950, the United States Navy purchased most of the OR&L railway for one dollar (Paoa, 2000). The exact property purchased by the Navy was not determined during this assessment. Subsequent to this deed transfer, the property was transferred within the federal government to the Federal Highway Administration (FHWA). The date of this internal transfer was not determined during this assessment.

Following statehood in 1959, Hawaii filed applications to obtain the former OR&L railroad under the provisions of 23 USC 317 (USA, 1980). The deed stipulates that the use of the transferred land comply with provisions set forth in the following:

- Section 406 of the National Historic Preservation Act of 1966 (16 USC Section 470F)
- Section 1(3) and 2(b) of Executive Order (EO) 11593, May 13, 1971, "Protection and Enhancement of the Cultural Environment"
- Procedures of the Advisory Council on Historic Preservation for the Protection of Historic and Cultural Properties (36 CFR 800) and
- Section 4(f) of the Department of Transportation Act and 23 USC Section 138



Leeward Bikeway Environmental Assessment

Project Area

Date 08-2000		Figure
Project No. 38200	EARTH TECH	2.1

These regulations require preservation of historic sites while best serving the needs of the traveling public.

Additionally, the deed authorizes under 23 USC Section 217, construction of separate or preferential bicycle lanes or paths and pedestrian walkways in conjunction with federally-aid highways (USA, 1980).

2.2 Proposed Action

The DOT-HD and FHWA, in accordance with Deed No. 80-68673 drafted on June 5, 1980 (Appendix A), proposes to construct a bike path along the old OR&L Railroad r-o-w. The proposed bikeway would share the 40-foot wide r-o-w with the existing and planned track restorations. The tracks are currently used by the Hawaiian Railway Society to run trains throughout the week and weekend. The proposed project will include the temporary bikeway constructed by the City and County of Honolulu Department of Public Works also called Bike Path Extension II (Minor SMA Use Permit File No. 98/SMA-045) which is 0.8 miles and extends from Waipio Point Access Road to Waipahu Depot Road. It will also abut the Pearl Harbor Bikepath Extension (from Waipio Point Access Road to Lehua Avenue), and be part of a network of bikeways, bikepaths and bikelanes on the Ewa Plain. The proposed project area is shown on Figure 2.2.1 and Figure 2.2.2. The proposed action includes the following general construction description:

- Construction of a 10-foot-wide asphalt-paved bikeway with two-foot graded shoulders, approximately 14 miles in length, from Waipio Point Access Road in Waipahu to Lualualei Naval Road located in Nanakuli (Figure 2.3).

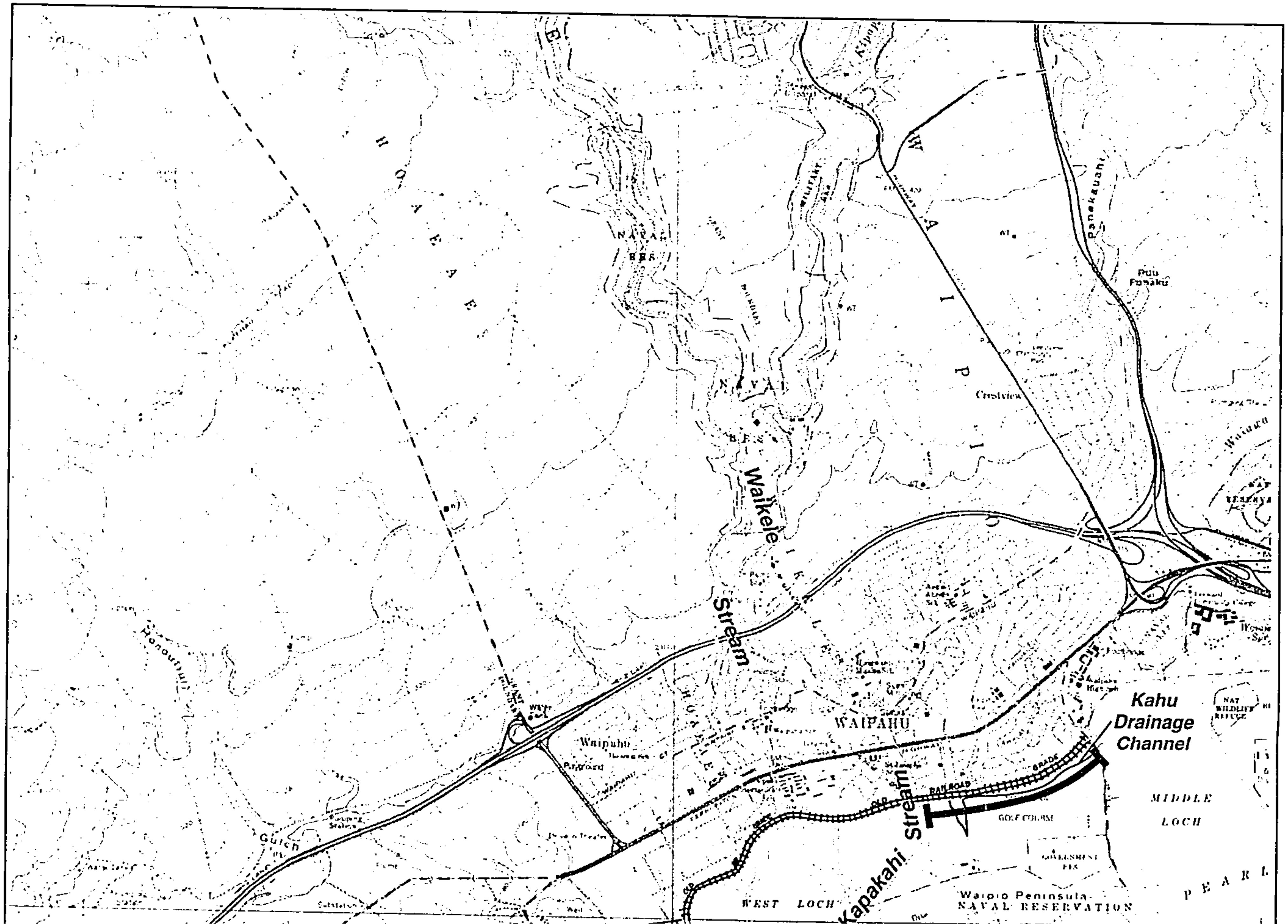
- An area not included in this EA is the existing West Loch Bikepath, located adjacent to West Loch and West Loch Estates (Figure 2.2.1). An area where no additional construction will take place is the existing bikeway constructed by the City and County of Honolulu extending from Waipio Point Access Road to Waipahu Depot Road. This area is included in this EA, and will be part of the proposed Leeward Bikeway project.

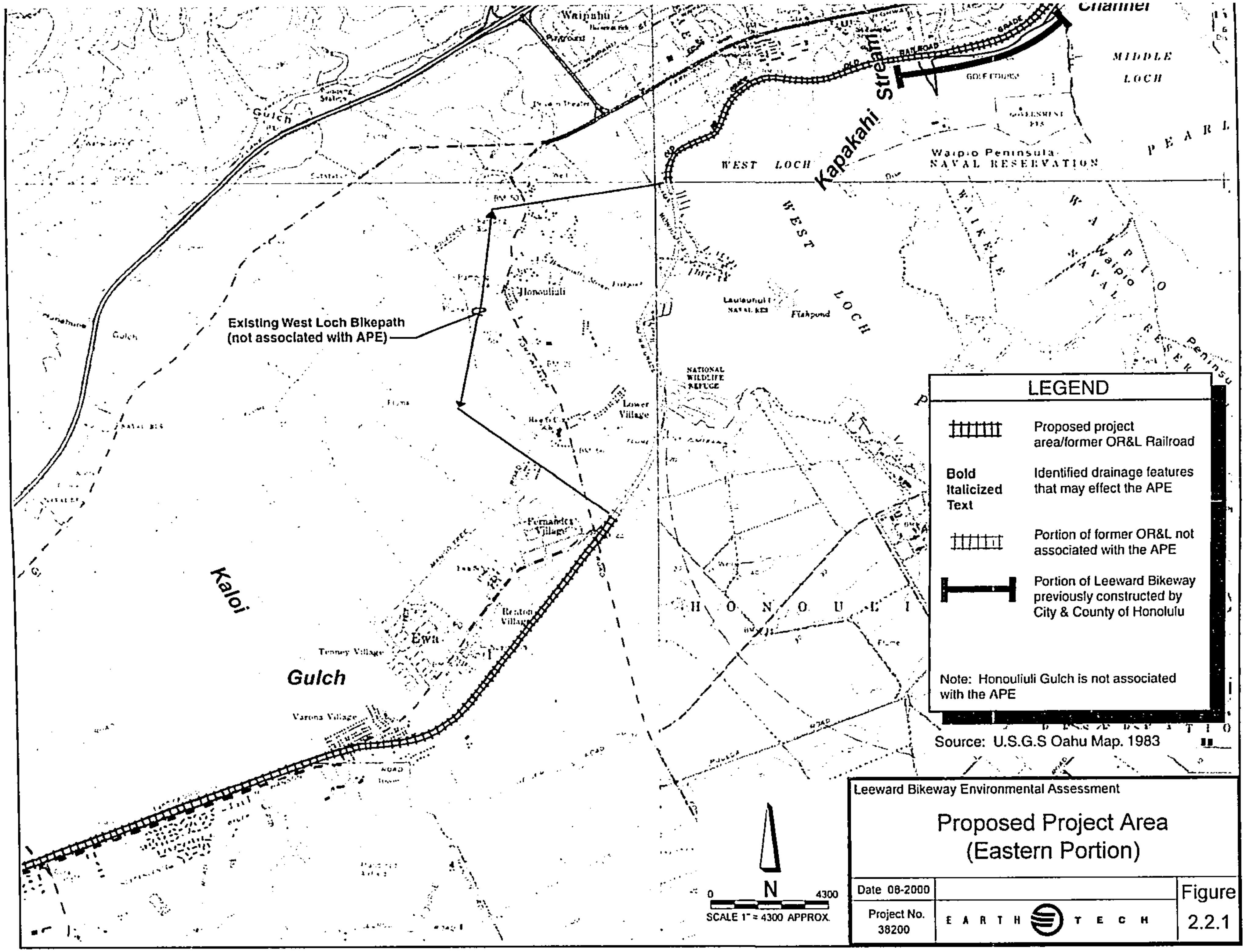
- Stream/gulch crossings across the proposed project site include the following:

  - Pili O Kahe Gulch. 55-foot long prestressed girder bridge; no piers in the bed.

  - Keanaoio Gulch. 180-foot long prestressed girder bridge: 3 span bridge with 2 piers in the bed.

  - Gulch at north end of Kahe Pt. Beach Park. 30-foot long prestress girder bridge; no piers in the bed.


Kahu
Drainage
Channel
Waikele
Stream
Kapakahi
Stream
WAIPAHU
Waipahu
MIDDLE
LOCH
WEST LOCH
PEARL
Waipio Peninsula
NAVAL RESERVATION
GOLF COURSE
Crestview
Puu Pohaku
Honouliuli
Gulch
W A I P I O
H O A E A E


Channel
MIDDLE LOCH
PEARL
Waipahu
Kapakahi Stream
WEST LOCH
Waipio Peninsula NAVAL RESERVATION
WAIKELE
WAIPIO
Waipio NAVAL
Gulch
Honouliuli
Laulaunui NAVAL RES
Fishpond
NATIONAL WILDLIFE REFUGE
Lower Village
Existing West Loch Bikepath
(not associated with APE)
Fernandez Village
Kaloi
Ewa
Renton Village
Tenney Village
Gulch
Varona Village
HONOULIULI
LEGEND
Proposed project area/former OR&L Railroad
Bold Italicized Text
Identified drainage features that may effect the APE
Portion of former OR&L not associated with the APE
Portion of Leeward Bikeway previously constructed by City & County of Honolulu
Note: Honouliuli Gulch is not associated with the APE
Source: U.S.G.S Oahu Map. 1983
N
0
4300
SCALE 1" = 4300 APPROX.

Leeward Bikeway Environmental Assessment

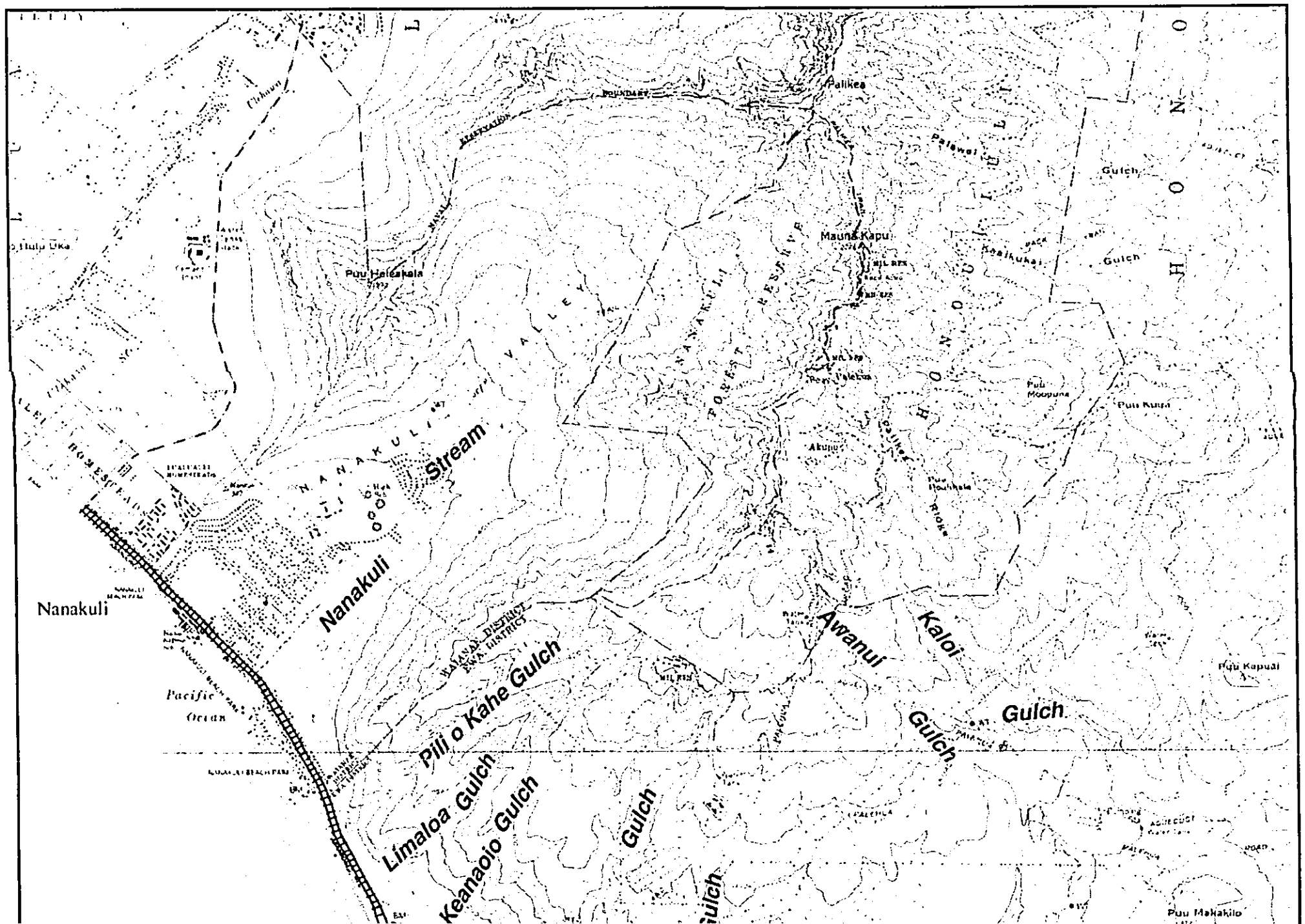
Proposed Project Area (Eastern Portion)

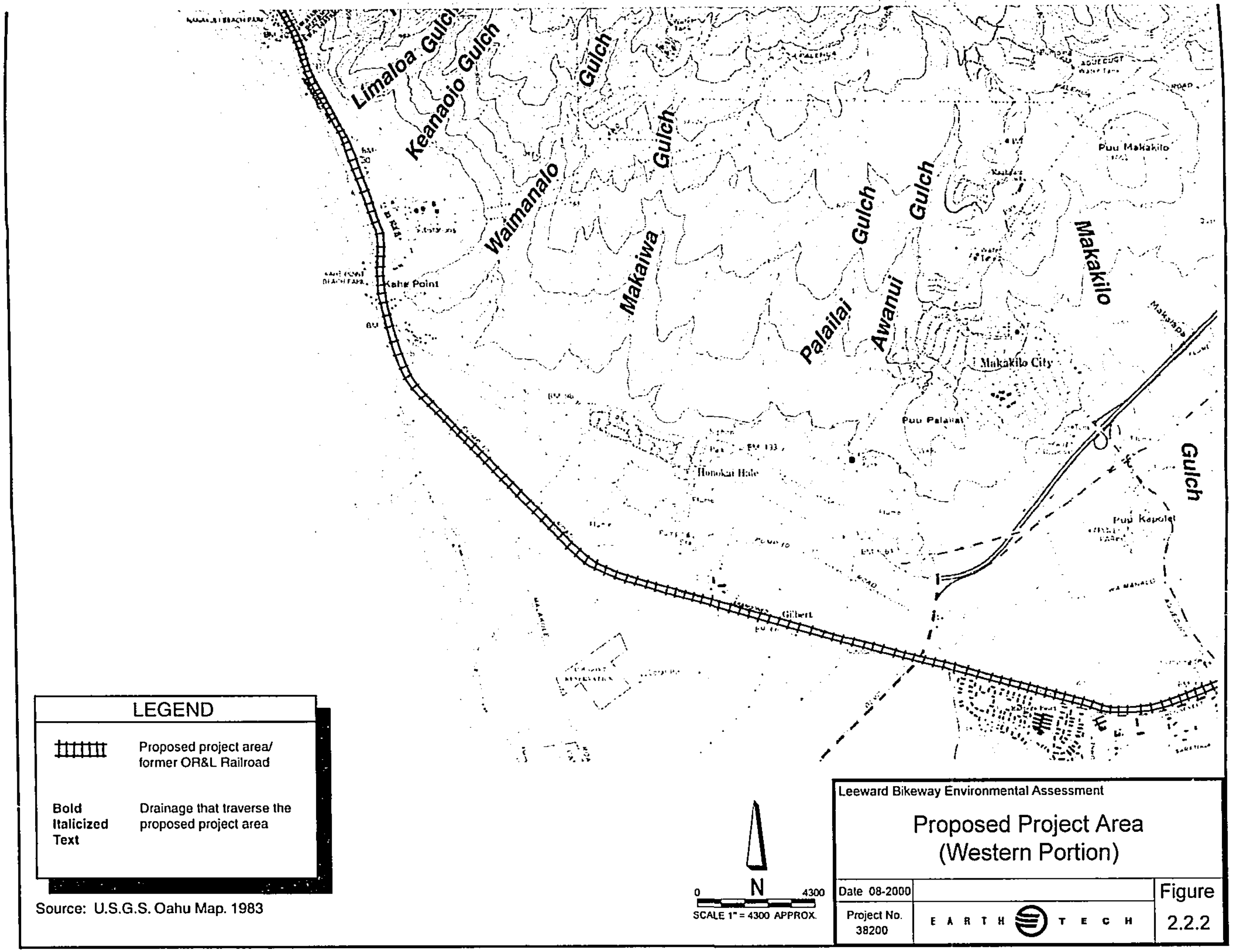
Date 08-2000

Project No. 38200

EARTH TECH

Figure 2.2.1


Palikea
Mauna Kapu
Puu Heleakala
Puu Kapuai
Puu Makakilo
Nanakuli
Stream
Nanakuli
Pili o Kahe Gulch
Limaloa Gulch
Keanaoio Gulch
Awanui
Kaloi
Gulch
Pacific
Ocean



Source: U.S.G.S. Oahu Map. 1983

Leeward Bikeway Environmental Assessment

Proposed Project Area (Western Portion)

Date 08-2000

Project No. 38200

Figure 2.2.2

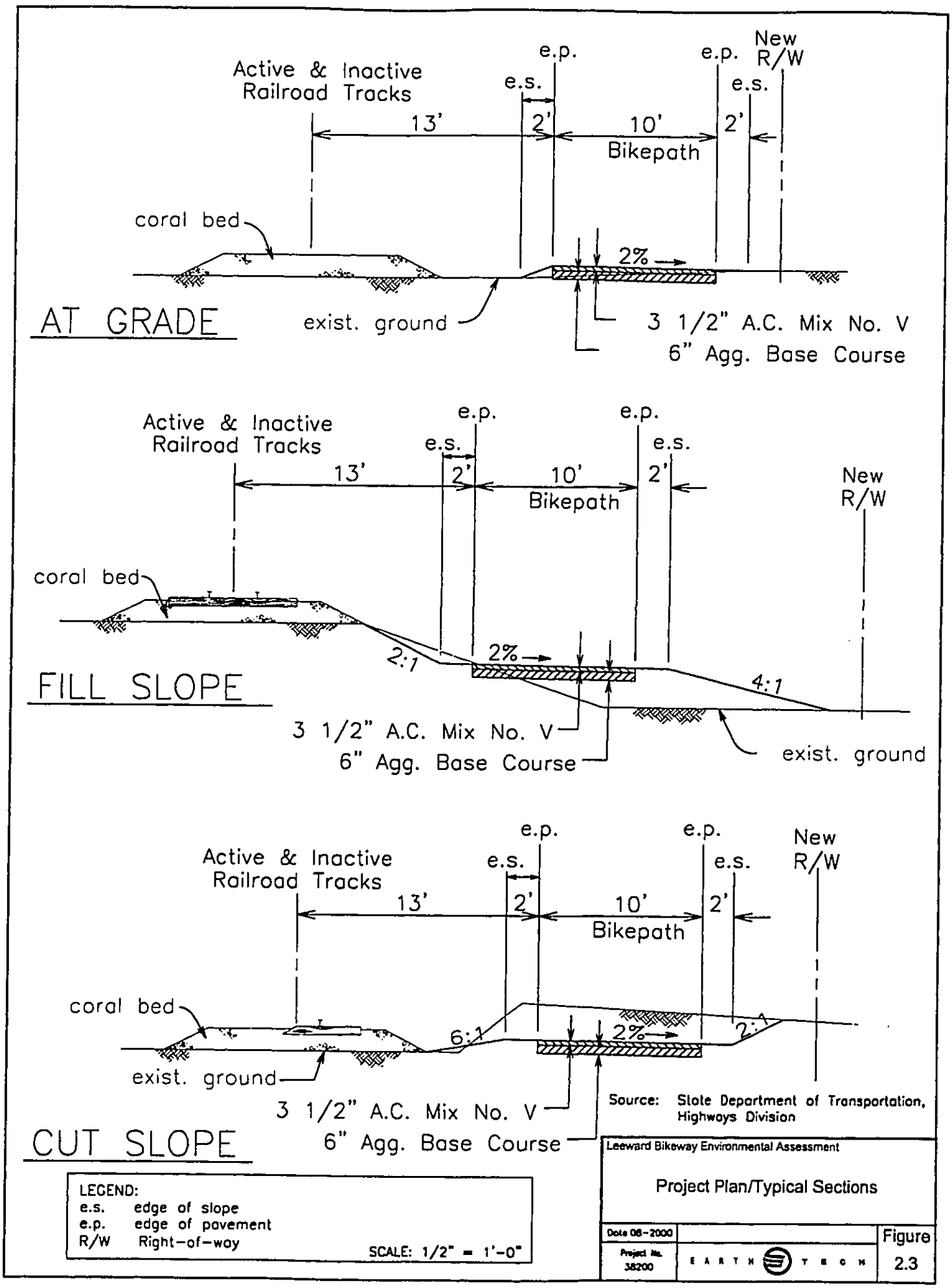

Active & Inactive Railroad Tracks
e.p.
e.s.
e.p.
e.s.
New R/W
13'
2'
10'
Bikepath
2'
coral bed
2%
AT GRADE
exist. ground
3 1/2" A.C. Mix No. V
6" Agg. Base Course
Active & Inactive Railroad Tracks
e.p.
e.s.
e.p.
e.s.
13'
2'
10'
Bikepath
2'
New R/W
coral bed
2:1
2%
4:1
FILL SLOPE
3 1/2" A.C. Mix No. V
6" Agg. Base Course
exist. ground
Active & Inactive Railroad Tracks
e.p.
e.s.
e.p.
e.s.
New R/W
13'
2'
10'
Bikepath
2'
coral bed
6:1
2%
2:1
exist. ground
3 1/2" A.C. Mix No. V
6" Agg. Base Course
CUT SLOPE
LEGEND:
e.s. edge of slope
e.p. edge of pavement
R/W Right-of-way
SCALE: 1/2" = 1'-0"
Source: State Department of Transportation, Highways Division
Leeward Bikeway Environmental Assessment
Project Plan/Typical Sections
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Figure 2.3

- Gulch 1/2 mile west of Kalaeloa Blvd. 66-foot long prestressed girder bridge; 2 span bridge with one pier in the bed.

- Gulch just east of Kalaeloa Blvd. 17-foot long prestressed girder bridge; no piers in the bed.

- Waikele Stream. 65-foot long prestressed girder bridge; no piers in the stream.

- Kapakahi Stream. 62-foot long prestressed girder bridge; 2 span bridge with one pier in the stream.

Design details (typical sections) Kapakahi and Waikele bridges are shown in Figures 2.4.1 and 2.4.2.

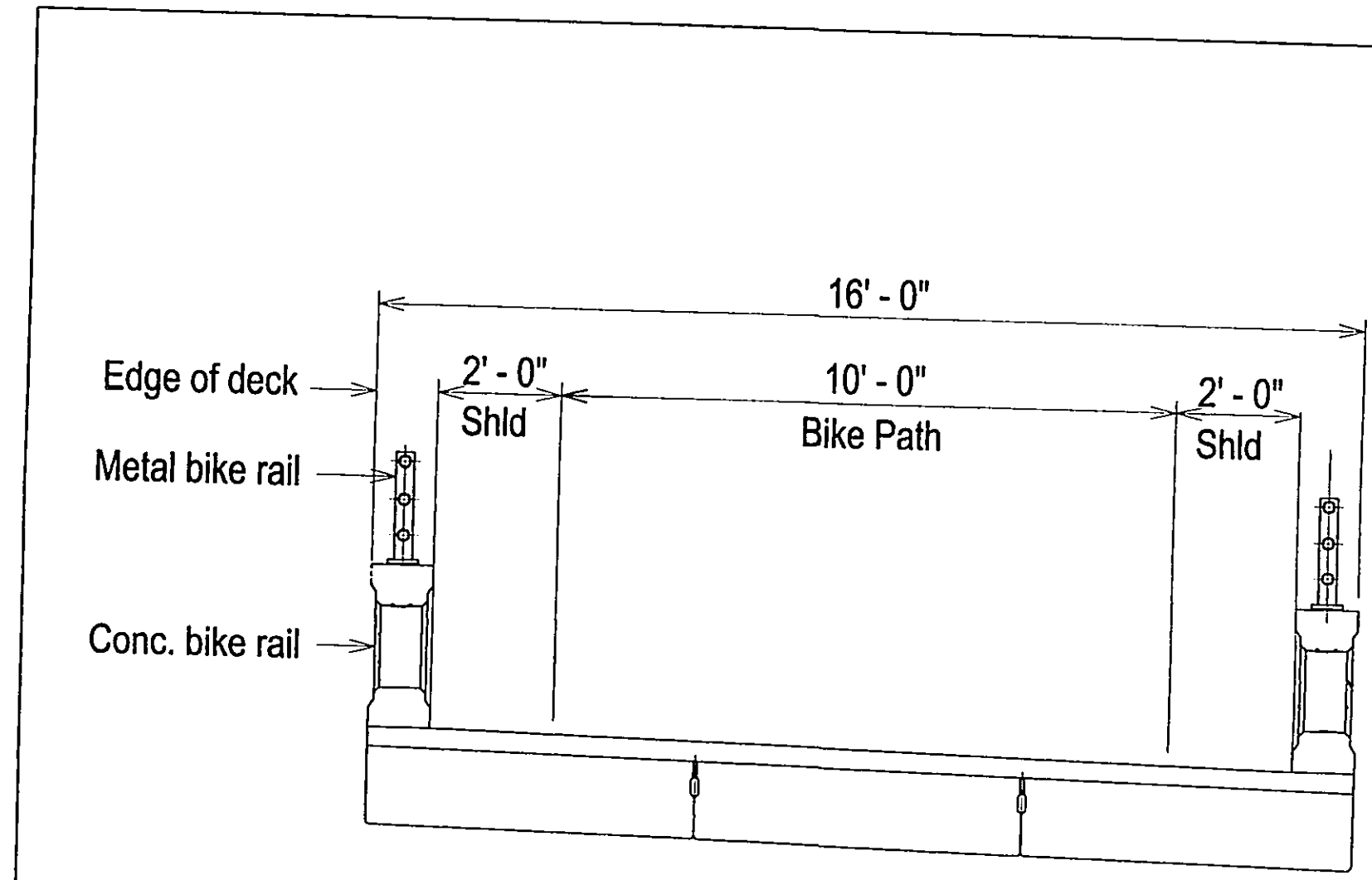
- Construction of the bikeway will take place within the 40-foot r-o-w of the former OR&L Railroad. A new r-o-w will be purchased to allow for maintenance of the bikeway. The bikeway will be located on the makai side of the former railroad tracks from Nanakuli to the vicinity of the Kahe Point Beach Park, where it will cross over to the mauka side of the tracks. The bikeway continues on the mauka side of the tracks to Fort Barrette Road. At this point, the bikeway will then be located on the makai side of the tracks until adjoining with the existing West Loch Bikepath. The bikeway will be routed through the intersection of Fort Weaver and Renton Roads to utilize the established signals and crosswalk on this major thoroughfare.

- In the Ewa area where the r-o-w is limited, barriers may be erected to protect pedestrians and bicyclists from excursion train operations by the Hawaiian Railway Society.

- Two retaining walls will be constructed at narrow portions of the r-o-w between the Nanakuli Stream and Limaloa Gulch crossing. The first retaining wall, located just north of the Pili O Kahe Gulch crossing will be approximately 380 feet (ft.) long with a maximum and average height of 6.5 ft. and 3.8 ft., respectively. The second retaining wall, located just south of the Pili O Kahe bridge, will be approximately 1090 ft. long with a maximum height of 8.0 ft., averaging 3.5 ft. high along the length.

- Existing OR&L railway drainage culverts will be used to the extent possible for the bikeway. The DOT-HD will assess each drainage culvert on a case-by-case basis to determine if additional culverts are needed to aid drainage.

- The DOT-HD will consult with utility and petroleum companies on the current status of utility and pipelines within the proposed area. It is estimated that 80 utility poles will need to be relocated.



Leeward Bikeway Environmental Assessment

Typical Section at Kapakahi Stream

Date 08-2000

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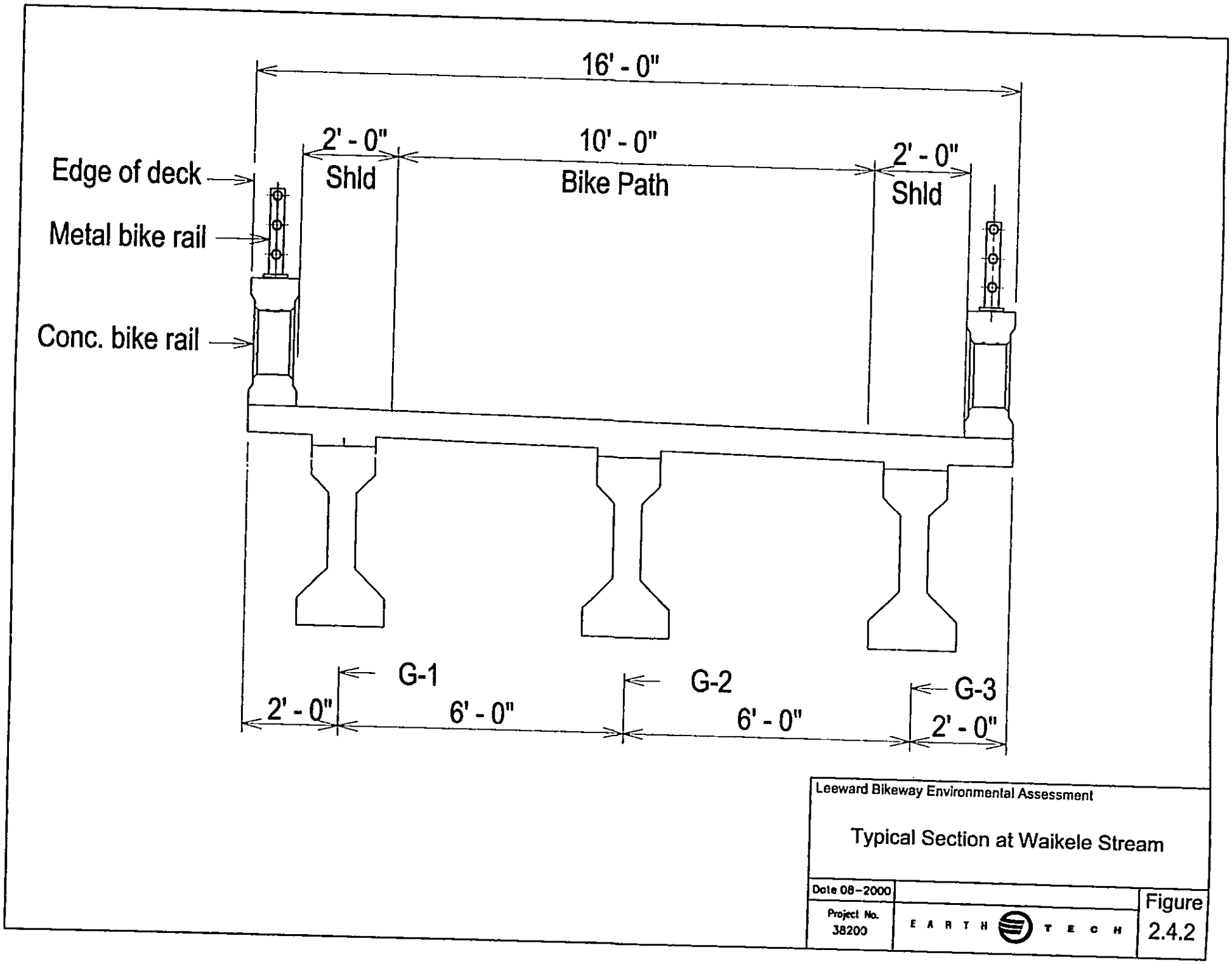
EARTH TECH

Figure 2.4.1



Leeward Bikeway Environmental Assessment

Typical Section at Waikele Stream

Date 08-2000

Project No. 38200

EARTH TECH

Figure 2.4.2

- A new r-o-w will be purchased in some areas to allow for a sufficient clearance between the bikepath and the railroad, and for the construction of bridges and retaining walls.

- Drainage study to be conducted in the vicinity of the Waikele Stream crossing to mitigate ponding. If feasible, earth swales and/or culvert systems will be constructed to discharge runoff into Waikele Stream.

- Landscaping will be limited to revegetation of areas grubbed during construction.

Additional specific construction details requiring definition include the following:

- The types and amounts of materials to be used in construction (i.e., base course, asphalt, shoulder material, retaining wall material, bridge materials, fill material, paints etc.).

- The placement and dimensions of the bikeway and its features (i.e., position in regards to tracks, exact widths and heights, placement of barriers, bridges, and culverts, etc.).

- Demolition of the old steel bridges at Waikele and Kapakahi Streams.

- Location and dimensions of the new r-o-w.

- Relocation positions and methods to relocate utilities.

- Placement and types of signage to control traffic (i.e., pedestrian, cyclists, automobile and train).

- Construction effort details including times of operation, staging areas, access areas, numbers of crews and exact schedule across the proposed project area.

- Construction details regarding grading, paving, fill material, bridge building, retaining wall, barrier and culvert construction and waste management.

2.3 Project Schedule and Costs

The proposed project is scheduled to begin construction in April 2001 with an estimated completion date of October 2003 (Table 2-1). Construction of the proposed bikeway project will be divided into two phases. Phase I construction activities will begin at Waipio Point Access Road in Waipahu and continue west to the existing West Loch Bikeway. Phase I construction activities are anticipated to begin in October of 2001 and continue until October of 2002. Phase II activities will start at the western end of the existing West Loch Bikeway and proceed west through the Ewa Plain to Lualualei Naval Road in Nanakuli.

Phase II construction activities are anticipated to begin in October of 2002 and continue until October of 2003.

The estimated cost for the proposed project is $11 million. A $6 million budget for Phase I and II of construction and $5 million for the acquisition of lands for the new r-o-w. The DOT-HD and the FHWA are jointly funding the project.

Table 2-1 Project Phasing and Timing

Phase of Project	Calendar Period	Duration (months)
Completion of Design		
Phase I	April 2001	
Phase II	April 2002	
Plan to Advertise For Construction Contractor		
Phase I	May 2001	
Phase II	May 2002	
Bid Opening For Construction Contractor		
Phase I	June 2001	
Phase II	June 2002	
Construction of Phase I	Oct. 2001 to Oct. 2002	*12*
Construction of Phase II	Oct. 2002 to Oct. 2003	*12*

2.4 Alternatives to the Proposed Action

2.4.1 No Action Alternative

The "no action" alternative would be to accept the transfer of land and not build a bikeway and/or only utilize the proposed project area with the operation of the Hawaiian Railway Society railroad tours. Although this alternative does utilize some portions of the proposed project area, it does not satisfy the highways purposes and access requirements of the deed. Therefore, this alternative would result in the forfeiture of the parcel back to the federal government. As a result, the "no action" alternative was not considered, and bikeway construction was selected.

2.4.2 Alternatives Considered But Not Carried Forward

Construction alternatives involving the design of the proposed Leeward Bikeway that were considered but not carried forward include the following:

- Initially a 14-foot wide bikeway was considered. However, with the r-o-w limited to 40 feet, which will also include future expansion of the railway tracks and current operation of some sections of the track, a 10-foot wide bikeway with two-foot graded shoulders was selected since it occupied less space within the proposed project area.

- Renovation of the old Waikele and Kapakahi railroad bridges was considered. However, it was determined that the present condition of the bridges was insufficient to support the bikeway; new bridges will be constructed in these locations.

- An alternative evaluated at the Pili O Kahe Gulch crossing was utilization of the shoulder of Farrington Highway at that location. This alternative was rejected, due to the heavy traffic and high speed along Farrington Highway, and to maintain the proposed Leeward Bikeway as a bikepath and not a bike lane. As a result, the bikepath will continue to follow the OR&L r-o-w, requiring a new bridge, and retaining walls.

- At the Hawaiian Railway Society Train Station / Museum, the bikepath alignment will go around the makai side of the train station / museum. An alternative to this alignment would be to make several railroad crossings and relocate the train boarding platforms. This alternative was rejected due to the potential confusion of multiple and disruption to the Hawaiian Railway Society operations.

- The alignment of the bikepath will require the relocation of several utility poles in the Ewa area. An alternative to relocating these poles would be to construct the bikepath closer to the existing railroad tracks. This alternative was rejected due to the need to maintain a 5-foot AASHTO clearance distance between the bikepath and the active railroad.

- Barriers will be used along the alignment to separate the bikepath and the railroad in certain areas where the bikepath cannot be built with a sufficient clearance. One alternative to this would be to place a barrier along the whole alignment. This alternative was rejected using the following considerations:

- a barrier will be costly to maintain for such an extended length (deterioration, and vandalism);

- the negative visual impact of the barrier;

- the low speed and ability to stop quickly by the operating railroad;

- the clearance used over most of the bikeway is over 1-1/2 times the clearance required between bikepaths and roadways according to the AASHTO (American Association of State Highways and Transportation Officials) Guide for the Development of Bicycle Facilities.

3. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The following sections describe the existing natural and man-made environmental conditions for the proposed project area. The objective of this section is to define the area of potential effect (APE) and provide background information for the determination of how the proposed action may affect the area. This includes, but is not limited to, the biological, structural, historical and archeological, cultural, socio-economic, topographic, geologic and climatic conditions of the proposed project area.

3.1 Air Quality

The APE for air quality in the proposed project area includes downwind areas. Downwind areas vary during the year and air quality is affected by the climate. The climate is characterized by two distinct seasons, primarily defined by the annual variation in persistence of the northeast trade winds. The summer months from May to September are typically drier and warmer, while the winters from October to April are usually wet and cooler. The area is subject to prevailing northeast trade winds with average velocities between 14 to 16 miles per hour a majority of the year. Strong gusts up to 20 or 25 miles per hour do occur intermittently. Trade winds prevail 90 percent of the time during the summer and 50 percent in the winter. The area also experiences Kona (southerly or westerly) winds and storms, particularly during the winter months.

Rainfall patterns over Oahu are influenced by the orientation of the Waianae and Koolau mountain ranges perpendicular to the northeast trade winds. Rainfall maxima occur on the intercepting Koolau range, while desiccated trades produce less intense rainfall over the Waianae range. Both the Koolau and Waianae ranges can rain-shadow the Ewa Plain. The mean annual rainfall for the Ewa Plain is approximately 600 millimeters per year. Peak rainfall occurs in January (at approximately 80 millimeters) while the lowest rainfall occurs in June (at approximately 5 millimeters) (Giambelluca, 1986).

Average temperatures on the Ewa Plain vary depending on the two seasons in Hawaii. Temperatures in the drier summer months tend to be higher and range from an average of 24 degrees centigrade (°C) to 32° C and range from an average of 18° C to 25° C in the cooler winter months (University of Hawaii-Hilo, 1998).

Modeling of downwind areas was not completed as part of this assessment. However, typical downwind areas of the APE would normally include places to the south-southwest. During Kona winds, downwind areas would typically be places to the north or east.

Ambient air quality, which refers to the purity of the general outdoor atmosphere, is regulated under the Clean Air Act (CAA) and the U.S. EPA National Ambient Air Quality Standards (NAAQS) (40 CFR 50). The DOH also regulates air quality and established ambient air quality standards (HAR 11-59) that are as strict or, in some cases, stricter than

the NAAQS. The State of Hawaii has also established standards for fugitive dust emissions emanating from construction activities. These standards prohibit any visible release of fugitive dust from construction sources.

The State of Hawaii monitors ambient air quality at twelve stations throughout the state for five regulated pollutants including:

- Particulate Matter < 10 microns (PM_{10})
- Carbon Monoxide (CO)
- Sulfur Dioxide (SO_2)
- Ozone (O_3) and
- Total suspended particulate matter (TSP)

The primary source of air pollution in the vicinity of the project site include vehicular traffic from Farrington Highway, numerous surface roads, and the H-1 Freeway (producing CO and carbon dioxide [CO_2]). Potential sources of air pollution include Pearl Harbor Shipyard, Pearl Harbor Peninsula Landfill, the Waipahu Convenience (Refuse) Center, Honouliuli Waste Water Treatment Plant, refining and industrial activities at Campbell Industrial Park, and the Hawaiian Electric Company power plants located in Pearl City and Kahe Point. As described above, persistent trade winds contribute to favorable climatic conditions in the area for air quality. The State has monitored PM_{10}, O_3, CO, SO_2, and nitrogen dioxide at various locations across the State and island of Oahu (Table 3-1); results from 1994 through 1998 indicate that Oahu meets all ambient air quality standards promulgated by the EPA and is attainment for all criteria pollutants (40 CFR 81.312). Because these standards were not exceeded, it can be concluded that air quality at the proposed project area is currently acceptable.

3.2 Biological Resources

The following sections summarize the aquatic biology and the avifaunal and mammal resources within the proposed project area. The biological resources APE includes the proposed project area, the habitat bordering it, and downstream wetland-type areas. Surveys for biological resources were conducted in January 2000; the complete biological reconnaissance report by AECOS is included as Appendix B. Locations of key elements identified during the surveys are presented in Figure 3.1.

Table 3-1 Hawaii Air Monitoring Data 1994-1998

Constituent	Averaging Time	Monitoring Stations	Federal Standard[a] µg/m³	State Standard[b] µg/m³	Monitoring Result µg/m³
PM_{10}	24-hour Annual (arithmetic)	Honolulu, Liliha, Pearl City, Waimanalo, West Beach, Kapolei, Lihue	50	50	<30
O_3	1-Hour	Sand Island	230	100	< 70
CO	1-Hour	Honolulu, Waikiki, West Beach, Kapolei	40,000	10,000	< 5,000
SO2	Annual Average	Honolulu, West Beach, Kapolei, Makaiwa	80	80	< 10
Nitrogen Dioxide	Annual Average	West Beach, Kapolei	100	70	< 10

Source: State of Hawaii Department of Health – Clean Air Branch, Annual Hawaii Air Quality Data, 1998
Particulate matter equal to or less than 10 microns in diameter
< = less than.
µg/m³ = micrograms per cubic meter.
[a] National standards other than ozone and those based on annual or quarterly averages are not to be exceeded more than once a year. Standards based on annual or quarterly averages are not to be exceeded. The ozone standard is not to be exceeded on more than an average of one day a year over a three year period.
[b] Hawaii standards, other than those based on annual or quarterly averages, are not to be exceeded more than once in any 12-month period. Standards based on annual or quarterly averages are not to be exceeded.

3.2.1 Aquatic Biology

In the APE, surveys of the waters/wetlands were done to determine aquatic fauna. The following waters/wetlands were surveyed: Kahu Channel; Kapakahi and Waikele Streams; Pupuole Mini Park Marsh; Kaloi Gulch; Campbell Industrial Park East Drainage Canal; Keanaoio Gulch Muliwai; and Nanakuli Stream Muliwai. Survey methods involved direct observation and the use of hand nets to collect and identify small aquatic inhabitants (i.e, snails, insects and fish).

No rare, threatened, or endangered species as listed by U.S. Fish and Wildlife Service (USFWS) in 1994 are known from aquatic environments in the project area (AECOS, 2000). Aquatic species observed in the waters/wetlands are noted in Table 3-2. General observations are presented below:

Pupuole Mini Park Marsh: The marsh is home to a large number and variety of aquatic insects including backswimmers, aquatic beetles, damselfly nymphs and dragonfly nymphs. A small amount of top-minnows were also observed.

Kaloi Gulch: A mostly dry waterway with some ponds; however, none were close to the proposed project area.

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

Table 3-1 Hawaii Air Monitoring Data 1994-1998

Constituent	Averaging Time	Monitoring Stations	Federal Standard[a] µg/m^3	State Standard[b] µg/m^3	Monitoring Result µg/m^3
PM_{10}	24-hour Annual (arithmetic)	Honolulu, Liliha, Pearl City, Waimanalo, West Beach, Kapolei, Lihue	50	50	<30
O_3	1-Hour	Sand Island	230	100	< 70
CO	1-Hour	Honolulu, Waikiki, West Beach, Kapolei	40,000	10,000	< 5,000
SO2	Annual Average	Honolulu, West Beach, Kapolei, Makaiwa	80	80	< 10
Nitrogen Dioxide	Annual Average	West Beach, Kapolei	100	70	< 10

Source: State of Hawaii Department of Health – Clean Air Branch, Annual Hawaii Air Quality Data, 1998
Particulate matter equal to or less than 10 microns in diameter
< = less than.
µg/m^3 = micrograms per cubic meter.
[a] National standards other than ozone and those based on annual or quarterly averages are not to be exceeded more than once a year. Standards based on annual or quarterly averages are not to be exceeded. The ozone standard is not to be exceeded on more than an average of one day a year over a three year period.
[b] Hawaii standards, other than those based on annual or quarterly averages, are not to be exceeded more than once in any 12-month period. Standards based on annual or quarterly averages are not to be exceeded.

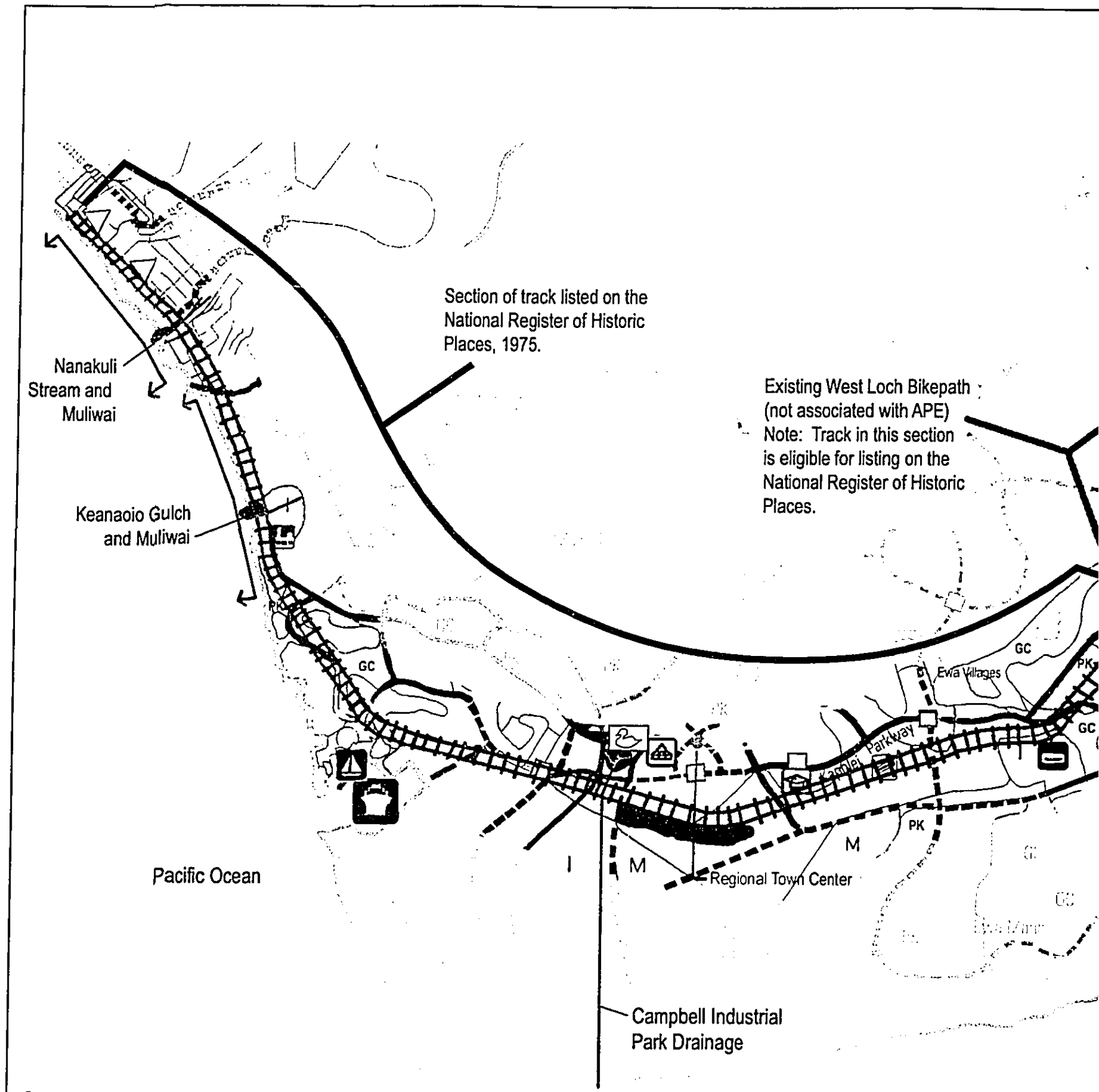
3.2.1 Aquatic Biology

In the APE, surveys of the waters/wetlands were done to determine aquatic fauna. The following waters/wetlands were surveyed: Kahu Channel; Kapakahi and Waikele Streams; Pupuole Mini Park Marsh; Kaloi Gulch; Campbell Industrial Park East Drainage Canal; Keanaoio Gulch Muliwai; and Nanakuli Stream Muliwai. Survey methods involved direct observation and the use of hand nets to collect and identify small aquatic inhabitants (i.e, snails, insects and fish).

No rare, threatened, or endangered species as listed by U.S. Fish and Wildlife Service (USFWS) in 1994 are known from aquatic environments in the project area (AECOS, 2000). Aquatic species observed in the waters/wetlands are noted in Table 3-2. General observations are presented below:

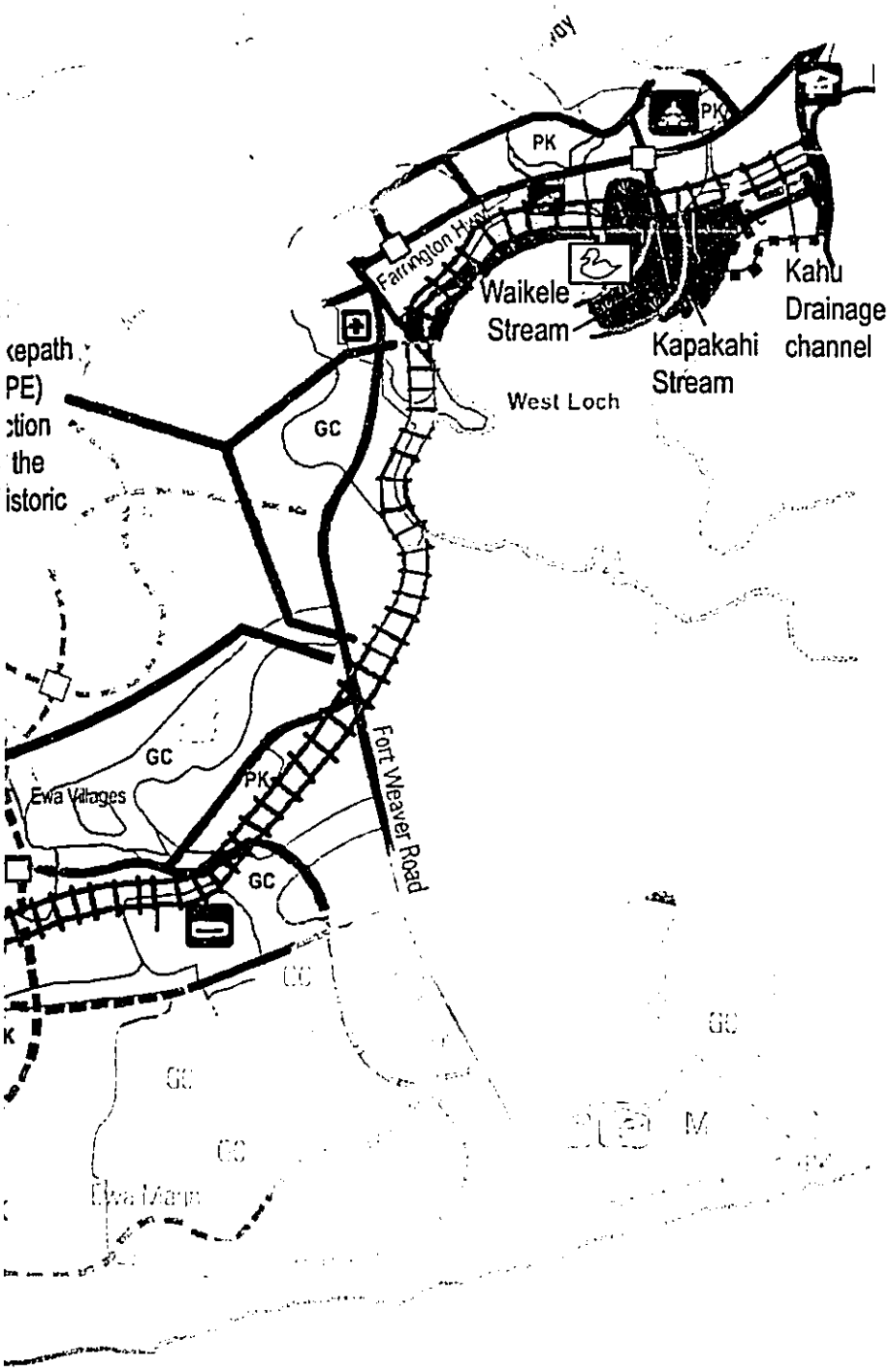
Pupuole Mini Park Marsh: The marsh is home to a large number and variety of aquatic insects including backswimmers, aquatic beetles, damselfly nymphs and dragonfly nymphs. A small amount of top-minnows were also observed.

Kaloi Gulch: A mostly dry waterway with some ponds; however, none were close to the proposed project area.



Sources:

Ewa Development Plan
Waianae Sustainable Community Plan
Central Oahu Sustainable Community Plan
Aecos, 2000.
International Archeological Research Institute, 2000.



Proposed Project Area/former OR&L Railroad

Portion of former OR&L Railroad not associated with the APE

Portion of the Leeward Bikeway previously constructed by City & County of Honolulu

Wetland/former fishpond area/ waterbird habitat

Area where 'Ilima is present.

Area where Ma'o (Hawaiian Cotton) is present.

Panoramic views identified in the Waianae Sustainable Communities Plan.

Important streams, gulches and Muliwai

Area where sensitive bird species were observed.

Note:

Pearl Harbor is a National Historic Landmark.

The view of Waipahu Sugar Mill from Waipahu Depo Road is a panoramic view identified in the Central Oahu Sustainable Communities Plan.

Leeward Bikeway Environmental Assessment

General Resources Map

Date 08-2000		Figure
Project No. 38200	EARTH TECH	3.1

Table 3-2 Aquatic Fauna

Species	Status	Code	Distribution
Invertebrates			
Mollusca, Gastropoda			
Thiarida, *Tarebia granifera* Lam.	Nat	10	E
Mollusca Pulmonata			
Pysidae *Physa virgata* (pond snail)	Nat	20	E
Anthropoda, Insecta			
Coleoptera, Hydrophilidae, *Enochrus sayi Gundersen*	Nat	21	P
Tropisternus salsamentus Fal	Nat	21	P
Hemiptera, Corixidae *Trichocorixa reticulata* (Guerin-Meneville)	Nat	20	K
Hemiptera, Mesoveliidae (water boatman) *Mesovelia mulsanti* White (water treader)	Nat	21	E
Hemiptera, Notonectidae			
Buenoa pallipes (Fabricus) (back-swimmer)	Nat	21	P
Notonecta indica L (back-swimmer)	Nat	21	P
Odonata, Aeschnidae			
Anax junius (Drury) (green darner, adult)	**Ind**	10	M, P, E
Anax junis (Drury) (green darner, nymph)	**Ind**	21	P, E
Odonata, Coenagrionidae			
Enallagma civile (Hagen)	Nat	10	E
Ischnura posita (Hagen) (Damselfly adult)	Nat	10	
Ischnura ramburi (Selys-Longchamps) (Damselfly adult)	Nat	10	M, E
Odonata, Libulellidae			
Crocothemis servilia (Drury) (scarlet skimmer adult)	Nat	10	P, E
Orthemis ferruginea (Fabricius) (adult)	Nat	10	P, E
Orthemis ferruginea (Fabricius) (nymph)	Nat	21	P
Panatala flavescens (Febricius) (globe skimmer, adult)	Nat	10	M, E
Tramea lacerata (Hagen) (raggedy skimmer, adult)	Nat	21	E
Vertebrates			
Verebrata, Pices			
Cichlidae ?Oreochromis sp. (ukw. Tilapia)	Nat	10	M, W, N
Gobiidae Indet. Juv. ('o'opu)	**Ind**	10	M
Mugilidae *Mugil cf. Cephalus L.* (mullet)	**Ind**	10	M
Poeciliidae			
Poecilia mexicana (Steindachner) (Mexican mollie)	Nat	10	M, W, N
Pecilia reticulata (guppy)	Nat	10	E

Species	Status	Code	Distribution
Vertebrata, Amphibia			
Bufonidae			
Bufo marinus (marine toad, tadpole)	Nat	10	P, E, N

KEY TO SYMBOLS USED:
Status:
Nat. - naturalized. An introduced or exotic species.
Ind. - indigenous. A native species also found elsewhere in the Pacific.
End. - endemic - A native species found only in the Hawaiian Islands.
Code:
10 - Observed and identified in the field on October 27-28, 1999.
20 - Collected; identified in the laboratory; specimen(s) not saved.
21 - Collected; identified in the laboratory; voucher specimen(s) saved.
Distribution (where observed in project area):
E – Upper end of East Drainage ditch, Campbell Industrial Park.
K – .West Loch, wetlands near Kapakahi Stream mouth.
M – Kahu Channel and associated drainages near Makalena Golf Course.
N – Muliwai at Nanakuli stream, Nanakuli.
P – Marsh at end of Pupuole Street, Waipahu.
W – Waikele Stream estuary, Waipahu

Campbell Industrial Park East Drainage Canal: This drainage canal is located in the vicinity of the proposed project area and is a concrete culvert extending under the OR&L railroad. The north arm of this structure contains water backed up behind vegetation partly blocking the culvert producing small ponds within the concrete-lined canal. These ponds were observed to contain crustaceans (amphipods) and snails, and attracted a large amount of dragonflies, damselflies including the rare *Tramea lacerata*.

Keanaoio Gulch Muliwai: Ponded water was blocked by sand in the makai direction creating a muliwai. Footings from the old OR&L railroad bridge are evident in the water. The muliwai water is turbid and green from the current algal bloom and pickleweed is growing on the banks. Insects (backswimmers) were dominant and there was evidence of small animals visiting the area, as noted by their tracks.

Nanakuli Stream Muliwai: Water is ponded by sand blocking the mouth of the stream. A large algal bloom is present with pickleweed covering the banks.

3.2.2 Avifauna and Mammals

The environmental assessment process of HRS 343 includes the identification and assessment of terrestrial animal species. In particular, an emphasis is placed on identifying rare, native or threatened and endangered species. For this project, an avifaunal and mammal survey was completed throughout the proposed project area and adjacent lands in January 2000 by AECOS, Inc. A complete report of the avifaunal and mammal survey is presented in Appendix B. Locations of sensitive species are presented in Figure 3.1.

Survey methods for birds involved sighting with binoculars and listening for vocalizations. The walking counts were initially completed during the hours of 0600 to 1100 during peak

bird activity times. Two additional twilight surveys were also completed in the Pearl Harbor area due to the presence of higher quality avian habitat present in the region. Wetland areas were also investigated for waterbird species. Mammal observations were incidental in nature; observations of animals and animal sign were noted. Endangered species listed by the USFWS were given additional consideration during the field survey. A tally was made of all species detected onsite during the survey periods. The following is a summary of the information in the survey that is included as Appendix B.

Mammals encountered across the proposed project area include dogs, small Indian mongoose, cats, and a domestic goat. Rodents were not detected, however it is likely that roof rats, Norway rats and field mice are present. No endemic mammalian species were encountered in or near the proposed project area during this survey.

For the avifaunal survey, the proposed project area was divided into three main study areas: the Pearl Harbor Shore, the Ewa Plain and Waianae Coast. A discussion of the avifauna survey in each of the three main study areas is presented in the paragraphs below.

Pearl Harbor Shore. This portion of the proposed project area extending from Waipio Point Access Road to the West Loch Bikeway is the most important to avifaunal species due to the presence of higher quality habitat present. The Pearl Harbor area contains wetlands, such as the Pouhala Marsh that provides a habitat to four endangered species: the Hawaiian Duck, the Hawaiian Coot, the Common Moorhen, and the Hawaiian Stilt. A total of twenty-seven avian species were recorded in this portion of the proposed project area; all but six of the species were are alien to the Hawaiian islands. Two endemic species, the Hawaiian Stilt and Hawaiian Duck, are endemic species recorded in this portion of the proposed project area; these species are also listed as endangered by both the USFWS and State of Hawaii (AECOS 2000).

Fourteen Hawaiian Stilt were recorded in a playa located west of Kapakahi Stream, adjacent to the pickleweed salt marsh southwest of the proposed project area. This is not a suitable nesting habitat; however, it is used for "loafing" or resting by the birds. Twenty-six Golden Plover, one Wandering Tattler and four Ruddy Turnstone also used this particular playa; these are some of the most common migratory shorebirds found throughout the state between the months of July and April.

Three Hawaiian Duck were flushed from the salt marsh adjacent to Waikele Stream, west of the pickleweed marsh. Several Black-Crowned Night-Heron, a common indigenous waterbird, were also seen in the pickleweed marshes and along the shores of West Loch. The other 21 species observed along the proposed project area were alien species. It should also be noted that although not detected, the Newell's Shearwater may occasionally overfly this area; small numbers of this species have been recovered on the island due to

"downing" incidents. A complete listing of the avian species encountered along this portion of the proposed project area is presented in the AECOS report in Appendix B.

Ewa Plain. The extent of the proposed project area from the West Loch Bikeway to the Waianae Coast has a ruderal habitat and fewer avian species than the Pearl Harbor area. Twenty-four avian species were present; of those only four species were non-alien to the Hawaiian islands. Four Hawaiian Stilts were observed foraging in pools of water beneath the box culvert in the upper arm of the Campbell Industrial Park Drainage Canal. One Ruddy Turnstone, a Pacific Golden Plover and a Wandering Tattler were also present. Several Black-crowned Night-heron were also seen in the eastern portion of the proposed project area as well as the water features present in the Ko'Olina Resort golf course. The other species observed were alien to Hawaii. A complete list of avian species found along this portion of the proposed project area is presented in the AECOS report in Appendix B.

Waianae Coast. The habitat in this section of the proposed project area is dry with standing water present only at the Muliwai at Nanakuli Stream and Keanaoio Gulch. A total of fourteen species were observed; all but three of the species are alien to the Hawaiian islands. The Ruddy Turnstone, Wandering Tattler, and Pacific Golden Plover are common indigenous migrants present in this area. A complete list of avian species present in this section of the proposed project area is presented in the AECOS report in Appendix B.

3.3 Cultural Resources

Cultural resources are prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. For the purposes of this EA, cultural resources are defined to include prehistoric and historic archaeological sites, historic buildings and structures, and traditional (i.e., native Hawaiian) sites.

An archaeological resources background research was completed by International Archaeological Research Institute, Inc. (IARII) in January 2000. This report is included as Appendix C. The APE for cultural resources is the r-o-w for the former OR&L railway. It should be noted that the entire project area has been previously disturbed from the original construction and maintenance of the railway in years past. The following sections present a summary of cultural resource information for the project site.

Prehistoric, Historic, and Traditional Resources. The APE is situated within the ahupua'a of Waikele, Ewa and Waianae, in the Ewa and Waianae Districts, on the south-southwest coast of Oahu. These ahupua'a contained almost all the necessary constituents for a traditional Hawaiian life.

In the Pearl Harbor area, agriculture and fishpond cultivation were the predominate economic activities. Prominent archaeological features present in the Pearl Harbor area

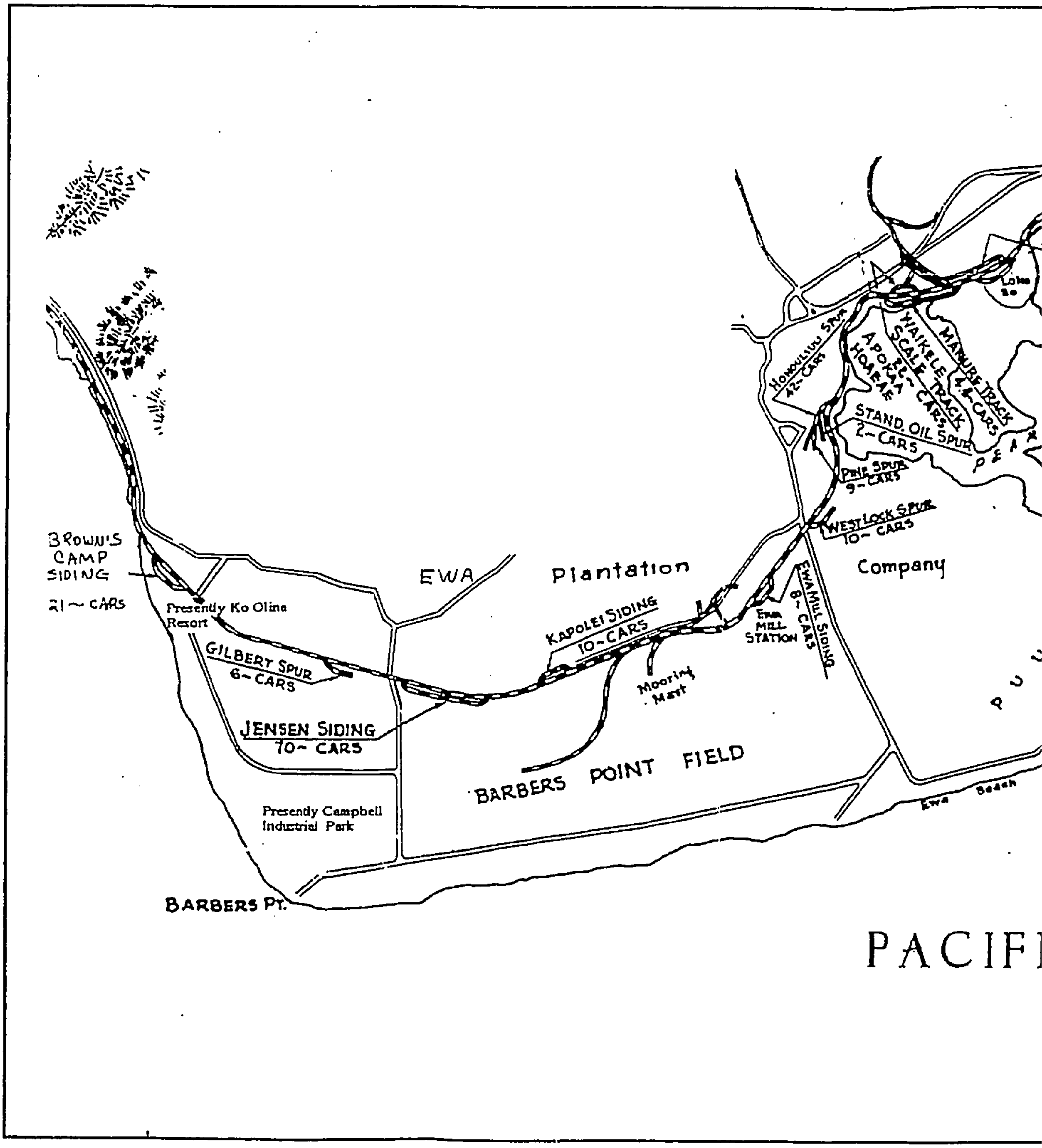
include heiau, and fishponds (McAllister 1933). Many of these features have been disturbed by cattle ranching, development of rice patties, sugarcane plantations, and Pearl Harbor Naval Base as well as modern activities.

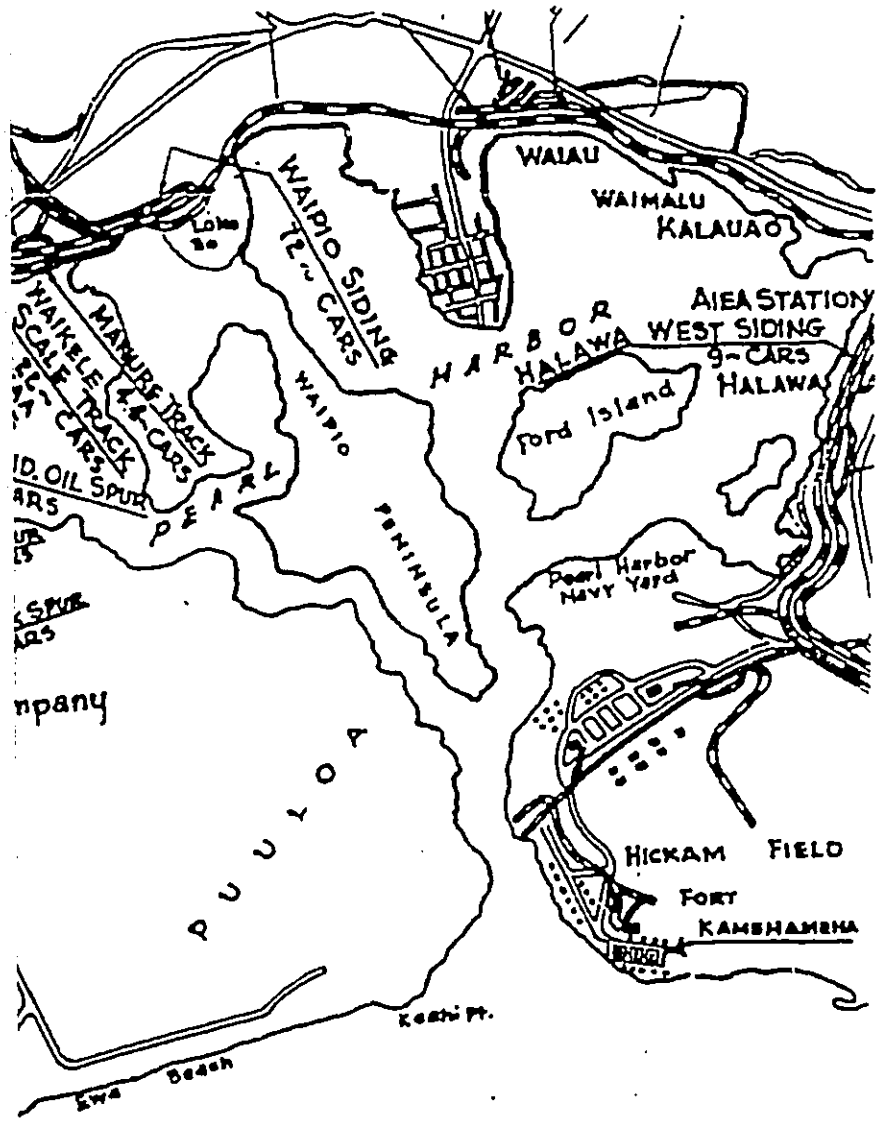
On the Waipio Peninsula, several fishponds were present in the vicinity of the APE. Loko Eo at the north end of the peninsula covered 137 acres and was surrounded on three sides by land with a wall approximately 2,040 feet long, extending to the fourth side (McAllister, 1933). The wall was 6 feet wide and four feet high, composed of coral. It was significantly widened to accommodate a "plantation train" (McAllister 1933). Kaahukuu and Pouhala ponds were 41 and 23 acres, respectively, and were located on the northwestern side of Waipio Peninsula, (McAllister, 1933). Results of the cultural resources survey (Appendix C), indicate that it is unlikely to encounter fishpond sediments associated with Loko Eo or Ulumoku due to past agricultural practices and filling. However, fishpond sediments associated with the former Pouhala pond may exist within the vicinity of the APE.

Hawaiians also apparently populated the broad open areas of the Ewa district in the many gulches that are present there. Hawaiians probably used holes and pits in the coral for shelter, and if soil was present, for cultivation. The most prominent archaeological features present across the Ewa Plain include heiau, enclosures and platforms, many of which have been disturbed by cattle ranching and modern activities (McAllister 1933). Results of the cultural resources survey indicate that due to agricultural activities, encountering cultural resources in this portion of the APE is unlikely.

The portion of the APE extending along the Waianae Coast has expanses of beach sand present. Beach sand was used as burial sites for pre-contact Hawaiians. Results of the cultural resources survey indicate that a pre-contact burial site in the beach sand was found along the Waianae Coast portion of the APE. The remains at this site (State Historic Preservation Division [SHPD] site 50-80-12-4061) were removed for reinterment at another location, and the site is no longer significant. However, the possibility exists that other burials may be present in the area.

Historic Buildings and Structures. The historic structure within the APE is the former OR&L railroad. The construction of the railway from the Pearl Harbor to Waianae (Nanakuli) area began in the late 1800's, and is linked to the development of Leeward Oahu. The railroad tracks along the Oahu shoreline were built on a bed composed of hard coral deposits (Bonnel, 1997). The track itself is narrow gauge, but should not be confused with the portable tracks used in sugar cane fields (Hawaiian Railway Society, 1994). A map of the former OR&L railroad is presented in Figure 3.2 and shows the APE as well as other historical features.


BROWN'S CAMP SIDING
21 ~ CARS
Presently Ko Olina Resort
EWA
Plantation
Company
GILBERT SPUR
6 ~ CARS
JENSEN SIDING
70 ~ CARS
KAPOLEI SIDING
10 ~ CARS
Mooring Mast
Ewa Mill Station
EWA MILL SIDING
8 ~ CARS
WEST LOCK SPUR
10 ~ CARS
9 ~ CARS
STAND. OIL SPUR
2 ~ CARS
HONOULIULI SPUR
42 ~ CARS
WAIKELE SCALE TRACK
MANURE TRACK
BARBERS POINT FIELD
Presently Campbell Industrial Park
BARBERS PT.
Ewa Beach
PACIFI



LEGEND

Former OR&L Railroad, Nanakuli to Pearl Harbor.

Siding

Spur

NOTES

* NOTE: Sidings and spurs were constructed by the parties they served and are not part of the OR&L Railroad and APE.

N

NOT TO SCALE

Leeward Bikeway Environmental Assessment

Former OR&L Railroad Map

Date 04–2000		Figure 3.2
Project No. 38200	EARTH TECH	

The preservation of the OR&L line began in 1971 with the formation of the Hawaiian Railway Society and the donation of locomotive WACO No. 6 by Oahu Railway Inc., (Bonner, 1997). In 1975, with the aid of the Hawaiian Railway Society, the stretch of track from Lualualei Naval Road to approximately 300 feet east of Fort Weaver Road was placed on the National Register of Historic Places (NRHP) (Hawaiian Railway Society, 1994).

A second section of r-o-w approximately 1,000 feet long, along the West Loch Bikepath was deemed eligible for listing on the NRHP as well.

Other historic sites requiring preservation, which are near but not part of the APE, include the following:

- The former Barbers Point Naval Air Station (BPNAS) or Kalaeloa, as it is referred to again, and Pearl Harbor Naval Complex, for their involvement in World War II and other military actions (C & C, 1997);

- The Ewa plantation villages of Varona Village, Renton Village, Tenny Village and the Old Mill Area. These housing areas and old mill are remnants of the plantation era. They are to be preserved to help retain the historic plantation lifestyle that once dominated the Ewa Plain (C & C, 1997).

Other notable historic sites near the APE, but not included in it are the whistle stops of Gilbert and Sisal, as well as the Coral Pit (Figure 3.2).

3.4 Flora and Wetlands

A botanical and wetlands survey was completed at the proposed project area in January 2000, and is included as Appendix B. The APE for flora include the former OR&L r-o-w, and the areas bordering it. Also included in the APE are wetlands bordering the r-o-w, stream estuaries and muliwais within and downstream of the r-o-w. Sensitive areas identified during the survey are presented in Figure 3.1.

The botanical survey was completed to document the species of plants observed along the APE and to provide estimates of their abundance. Endangered species listed by the USFWS as well as native plants, which are increasingly rare in lowland, coastal and urban areas of Hawaii were given particular attention during the survey. The period of the survey (rainy season) was advantageous in locating fast-growing annuals, however there is still a possibility that some species may have remained dormant, and therefore, not observed. A list of the plant species observed in the APE is provided in Appendix B.

For the survey of the flora, the APE was divided into three main study areas (same as biological surveys): the Pearl Harbor Shore, the Ewa Plain, and Waianae Coast. Several different vegetation types were encountered in these areas including:

- Cultivated/fallow lands (former sugar cane fields)
- Occupied lands (residential, industrial, commercial, recreational and roadways)
- Strand vegetation (pockets of coastal ecosystem plants)
- Wetland vegetation (mangrove, pickleweed swamp, cattail and salt marsh) and
- Inland ecosystems (kiawe forest, koa haole scrub, and weedy communities)

The vegetation types in each of the three main flora study areas of the APE is presented in the paragraphs below.

Pearl Harbor Shore. The portion of the APE extending from Waipio Point Access Road to the West Loch Bikeway is substantially different from the other portions of the APE due to its position near the estuarine waters of Pearl Harbor. Typical vegetation types across this portion of the APE include occupied lands and wetland vegetation.

Ewa Plain. Extending from the southwestern end of the West Loch Bikeway to the Waianae Coast, flora on the Ewa Plain portion of the APE is characterized by inland ecosystems, cultivated/fallow lands and occupied land. The indigenous 'ilima plant was present at the south side of the tracks, north of the former BPNAS or Kalaeloa.

Waianae Coast. This portion of the APE contains vegetation typical of strand vegetation, occupied land and inland ecosystems. In open areas between Manners and Pili O Kahe Beach Parks, buffle grass dominates; however, ma'o or Hawaiian cotton is also present.

In general, endangered species were not encountered along the APE. However, two indigenous and endemic species that are rare in lowland areas on Oahu were encountered in the vicinity of the APE (Figure 3.1). This includes the indigenous 'ilima plants (found south of the tracks and north of the former BPNAS fence) and the endemic ma'o plants (found between Manners and Pili O Kahe Beach Parks).

Wetlands. The COE and the EPA define wetlands as: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The COE evaluates three indicators of wetlands when making wetland determinations: (1) vegetation; (2) soil; and (3) hydrology. All three characteristics must be present during some portion of the growing season for an area to be a wetland. If the area occurs in a flood plain or otherwise has low spots in which water stands at or above the soil surface

during the growing season, it meets the criteria for wetland hydrology. Vegetation types associated with wetlands are those that commonly occur in areas having standing water for part of the growing season and are referred to as hydrophytic vegetation. Wetland soils, called hydric soils, are waterlogged for long periods of time and typically become depleted of oxygen.

There are several wetland areas of concern in the APE (Figure 3.1):

- The area bordering West Loch (the border with the Pearl Harbor estuary area dominated by red mangrove),
- The open salt-water marsh near Waipahu Depot Road (former Pouhala fishpond now dominated by pickleweed),
- The fresh water marsh behind Pupuole Mini-Park (dominated by great bulrush), and
- The muliwais (an area of ponded water at the mouth of Nanakuli Stream and Keanaoio Gulch which is blocked by sand).

The species present in these wetland-type areas are hydrophytic vegetation capable of growing in high saline content waters/soils, as described in the botanical report in Appendix B.

3.5 Geology and Soils

The geology and soils of the proposed project area illustrate the geologic environment of southern Oahu. The APE for geology and soils is the former OR&L r-o-w. The island of Oahu consists of two volcanic domes, the younger Koolau in the east, and older Waianae in the west, comprised of tens of thousands of thin, extremely permeable basalt lava flows. Both volcanoes are eroded remnants of large, elongated shield volcanoes.

Pronounced coastal plain development is evident on the south shore of Oahu, on the Ewa Plain. Coastal plain sediments are primarily composed of fossil reef limestone and calcareous beach deposits, as well as alluvial sediments. During fluctuations in sea level during the Pliestocene period (approximately 2 million to 10,000 years before present), an alternating sequence of marine limestone and terrestrial sediments derived from the erosion of the volcanoes were laid down (Stearns, 1985). This combined sedimentary mass is also referred to as caprock. The geology of the Pearl Harbor area was also affected by the fluctuations in sea level. Essentially, the harbor is a drowned river system with several branches.

The soil association in the vicinity of the project area is classified as the Lualualei-Fill land-Ewa association (U.S Department of Agriculture – Soil Conservation Service [USDA-SCS],

1972). It is composed of deep, nearly level to moderately sloping, well drained soils having a fine to moderately fine textured subsoil or underlying material, and areas of fill land on coastal plains. Soil types found in the general vicinity of the APE are presented in Figures 3.3.1 and 3.3.2. The specific soil types underlying the APE are listed in Table 3-3 (USDA-SCS, 1972).

Table 3-3 Soil Types Underlying the APE

Soil Type	Description
MnC	Mamala stony silty clay loam, 0-12% slopes
EmA	Ewa silty-clay loam, moderately shallow, 0-2% slopes
BS	Beaches
CR	Coral outcrop
Mtb	Mokuleia clay
LPE	Lualualei extremely stony clay, 3-35% slopes
KlA	Kawaihapai clay loam, 0-2% slopes
KmA	Keaau clay, 0-2% slopes
WkA	Waialua silty clay, 3-8% slopes
KmaB	Keaau stony clay, 2-6% slopes
Fd	Fill land
FL	Fill land, mixed
HLMG	Helemano silty clay, 30-90% slopes
HxA	Honouliuli clay, 0-2% slopes
LuA	Lualualei clay, 0-2% slopes
LvB	Lualualei stoney clay, 2-6% slopes
MtB	Mokuleia clay
PsA	Pulehu clay loam, 0-3% slopes
Ph	Pearl Harbor clay
RSY	Stoney steep land
WkA	Waialua silty clay, 0-3% slopes
WzA	Waipahu silty clay, 0-2% slopes
Wzc	Waipahu silty clay, 6 to 12 % slopes
TR	Tropaquepts

The proposed project site is located within 100 feet of coastal areas on the Waianae Coast and West Loch areas, while being approximately 1 mile inland of the coast in the Ewa Plain area. Topography at the project site ranges from 10 to 70 feet above mean sea level (msl). The elevations at the proposed project area are presented in Table 3-4.

Table 3-4: Approximate Elevation Ranges across the Proposed Leeward Bikeway

Location	Approximate Elevation Range
Start of the bikeway at Waipio Peninsula	11 feet above msl
West Loch to the old Oahu Sugar Ewa Mill	30-50 feet above msl
Old Oahu Sugar Ewa Mill to the west end of former BPNAS or Kalaeloa	50-60 feet above msl
West end of former BPNAS or Kalaeloa to Malahole Road	20 - 70 feet above msl
Malahole Road to bikeway end at Lualualei Road in Nanakuli	10 - 20 feet above msl

Source: USGS Quadrangles, Ewa, Waianae and Pearl Harbor, 7.5 minute Series,1983.

3.6 Hazardous Materials and Hazardous Waste

The APE for hazardous materials and wastes is the former OR&L r-o-w. EPA defines waste materials in 40 CFR 261.2 as discarded material (i.e., abandoned, recycled, or inherently waste-like) that is not specifically excluded under their definition. Hazardous waste is further defined in 40 CFR 261.3 as any solid waste not specifically excluded, which meets specified concentrations of chemical constituents or has certain toxicity, ignitability, corrosivity or reactivity characteristics.

In 49 CFR 171.8, the DOT defines hazardous materials as a substance or material which is capable of posing an unreasonable risk to health, safety, or property when transported in commerce and has been so designated.

Although there are no transportation or storage facilities specifically designated for hazardous waste or materials in the APE, there are several areas of concern for exposure:

Roadways. Hazardous materials and/or wastes may be transported on roadways that are parallel to or intersect the APE.

Pipelines and Energy Corridor. Several petroleum pipelines and an energy corridor run parallel to the former OR&L railroad approximately from the former BPNAS or Kalaeloa area through Waipio Point Access Road. Although the pipelines and the energy corridor contain petroleum products (which are excluded from the definition of hazardous wastes or materials), chemical constituents of the petroleum products can meet hazardous definitions.

Construction Equipment. Vehicles involved in construction of the proposed project contain an assortment hazardous materials (i.e. gasoline, diesel, oil, hydraulic and brake fluid, etc.).

Unregulated Dumping. During field reconnaissance events, it has been noted that unregulated dumping occurs in some areas along the APE. Discarded appliances, abandoned cars, and piles of solid waste were noted in the areas from Ko 'Olina to Waipio

Point Access Road. Although this debris is not typically hazardous, there is the possibility that hazardous materials may be contained in appliance components (i.e., coolants, gasoline, cleaning solvents, etc.).

3.7 Land Use and Ownership

Lands bordering the r-o-w comprise the land use and ownership APE. In the past 20 years, land use and development has undergone tremendous change in the Ewa, Waianae and Central Oahu districts. Plantation activities decreased and eventually ceased, while urban expansion pressures increased. In 1977, the City and County of Honolulu approved the General Plan that designated Ewa as the site of a new second city, which would be the focus of economic, and housing development to ease pressures on the primary urban center (Honolulu). In 1997, the General Plan was updated, providing detailed information regarding the planning of Ewa (C & C, 1997). Sustainable Communities Plans were also developed for Waianae and Central Oahu (C & C, 1999a, b).

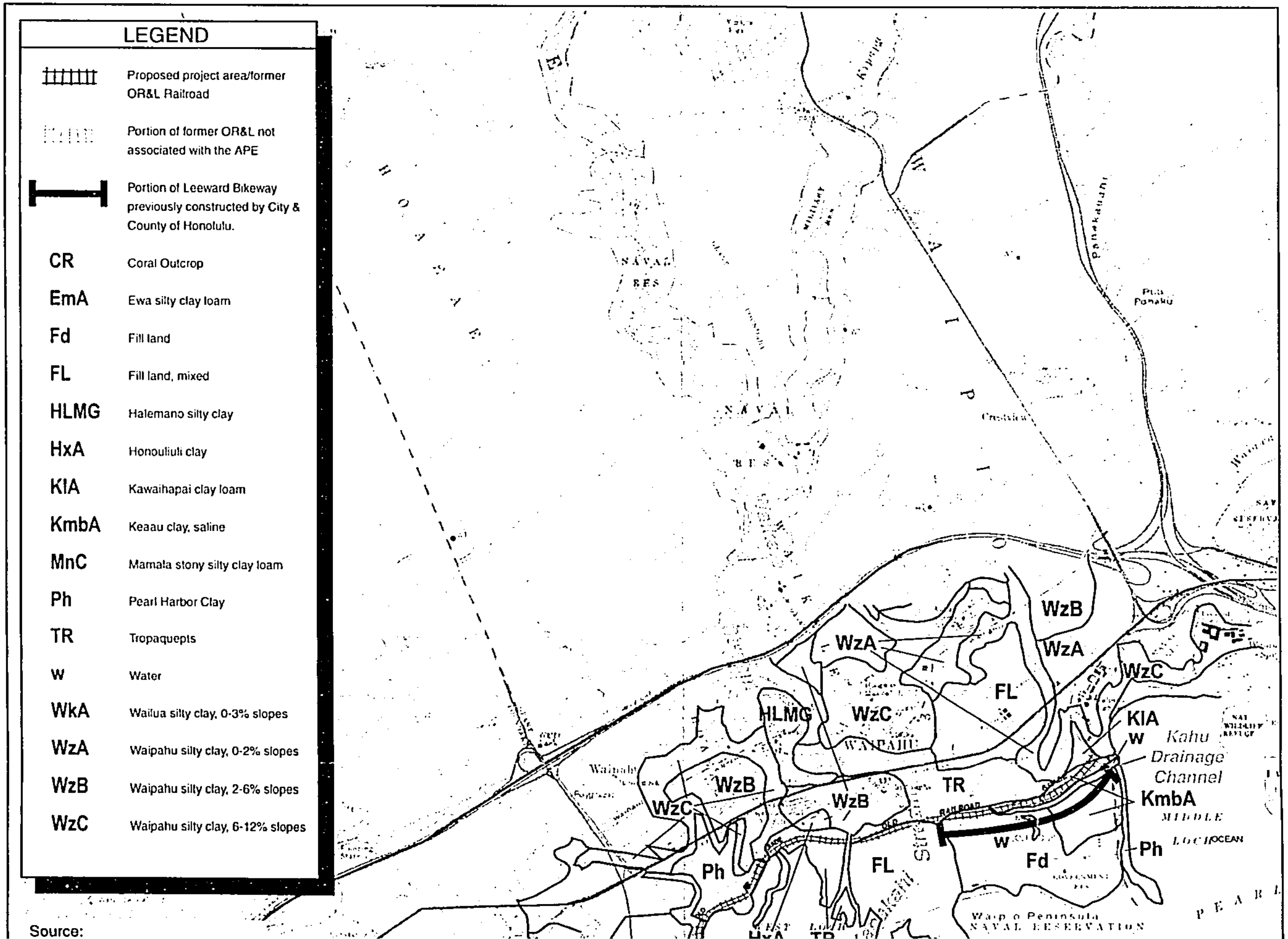
In general, Ewa is planned to have a developed secondary urban center, an open space network, parklands, increased infrastructure, and planned communities that retain the natural, historic and cultural resources that are present (Figure 3.4). According to the Ewa Development Plan, the OR&L is listed as a historic railway and is also listed for the development of a co-existing bikeway (C & C, 1997). Reduced military use at the former BPNAS or Kalaeloa will also occur nearby to the south of the proposed project area (C & C, 1997).

The Waianae plan accounts for the preservation of agricultural lands, beaches, cultural resources and small town character within the development of ahupua'a (C & C 1999a). The Central Oahu plan accounts for the rejuvenation of Wahiawa and Waipahu Towns, growth within urban boundary and preservation of agricultural land and culture, much like the Ewa plan (C & C, 1999b). The Central Oahu plan lists the OR&L as a historic railway/bikeway and greenway corridor.

Current and planned land use adjacent to the APE are shown in Figure 3.4 and include the following:

Ewa

- Low and medium residential
- High density residential
- City of Kapolei (High Density Residential and Commercial)
- Resort and Recreation Area
- Industrial
- High Density Residential and Commercial Transit
- Agricultural and Preservation and
- Parks and Golf Courses

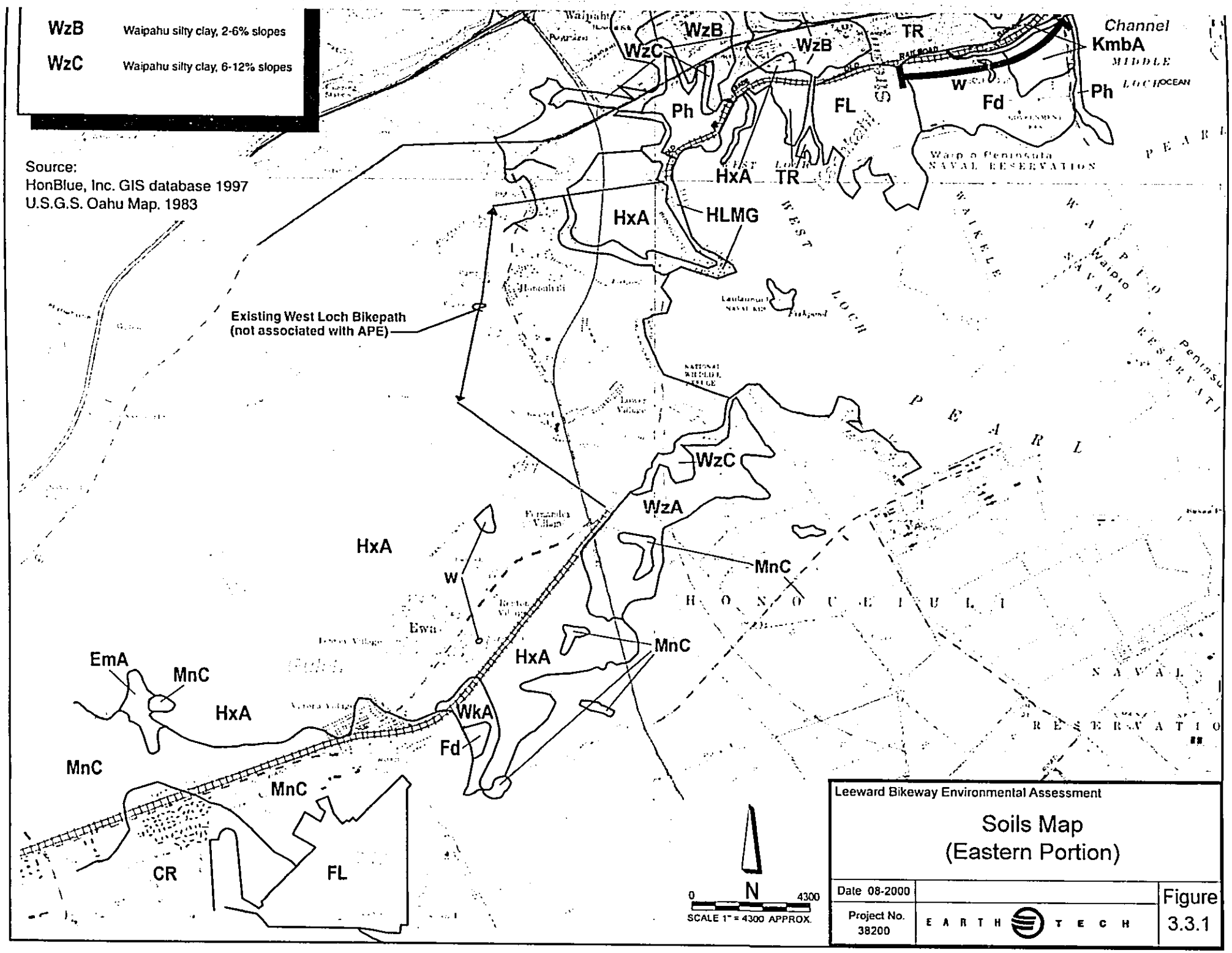


LEGEND
Proposed project area/former OR&L Railroad
Portion of former OR&L not associated with the APE
Portion of Leeward Bikeway previously constructed by City & County of Honolulu.
CR Coral Outcrop
EmA Ewa silty clay loam
Fd Fill land
FL Fill land, mixed
HLMG Halemano silty clay
HxA Honouliuli clay
KlA Kawaihapai clay loam
KmbA Keaau clay, saline
MnC Mamala stony silty clay loam
Ph Pearl Harbor Clay
TR Tropaquepts
w Water
WkA Wailua silty clay, 0-3% slopes
WzA Waipahu silty clay, 0-2% slopes
WzB Waipahu silty clay, 2-6% slopes
WzC Waipahu silty clay, 6-12% slopes
WzB
WzA
WzC
FL
HLMG
KlA
w
Kahu Drainage Channel
TR
KmbA
Ph
Fd

Source:

WzB	Waipahu silty clay, 2-6% slopes
WzC	Waipahu silty clay, 6-12% slopes

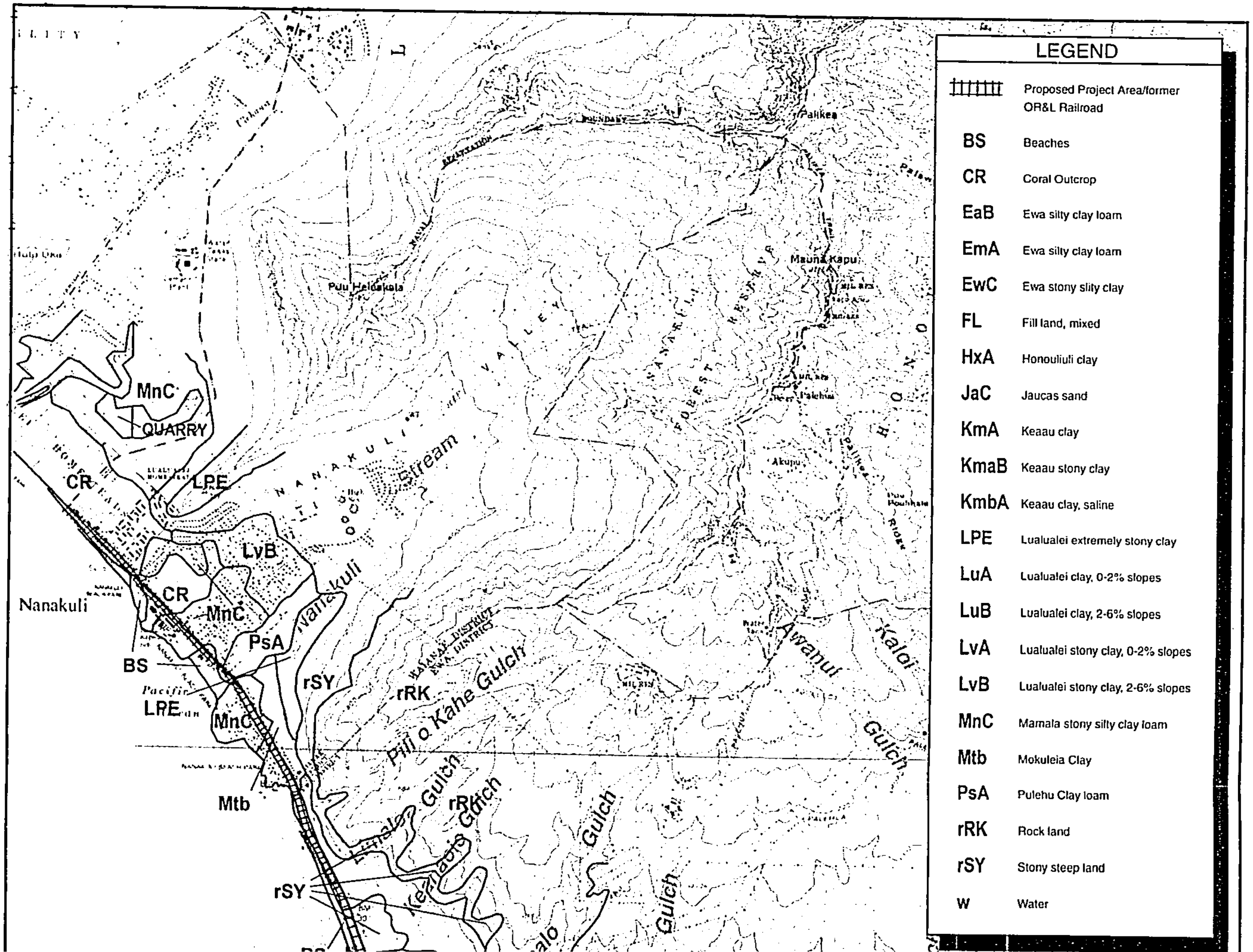
Source:
HonBlue, Inc. GIS database 1997
U.S.G.S. Oahu Map. 1983



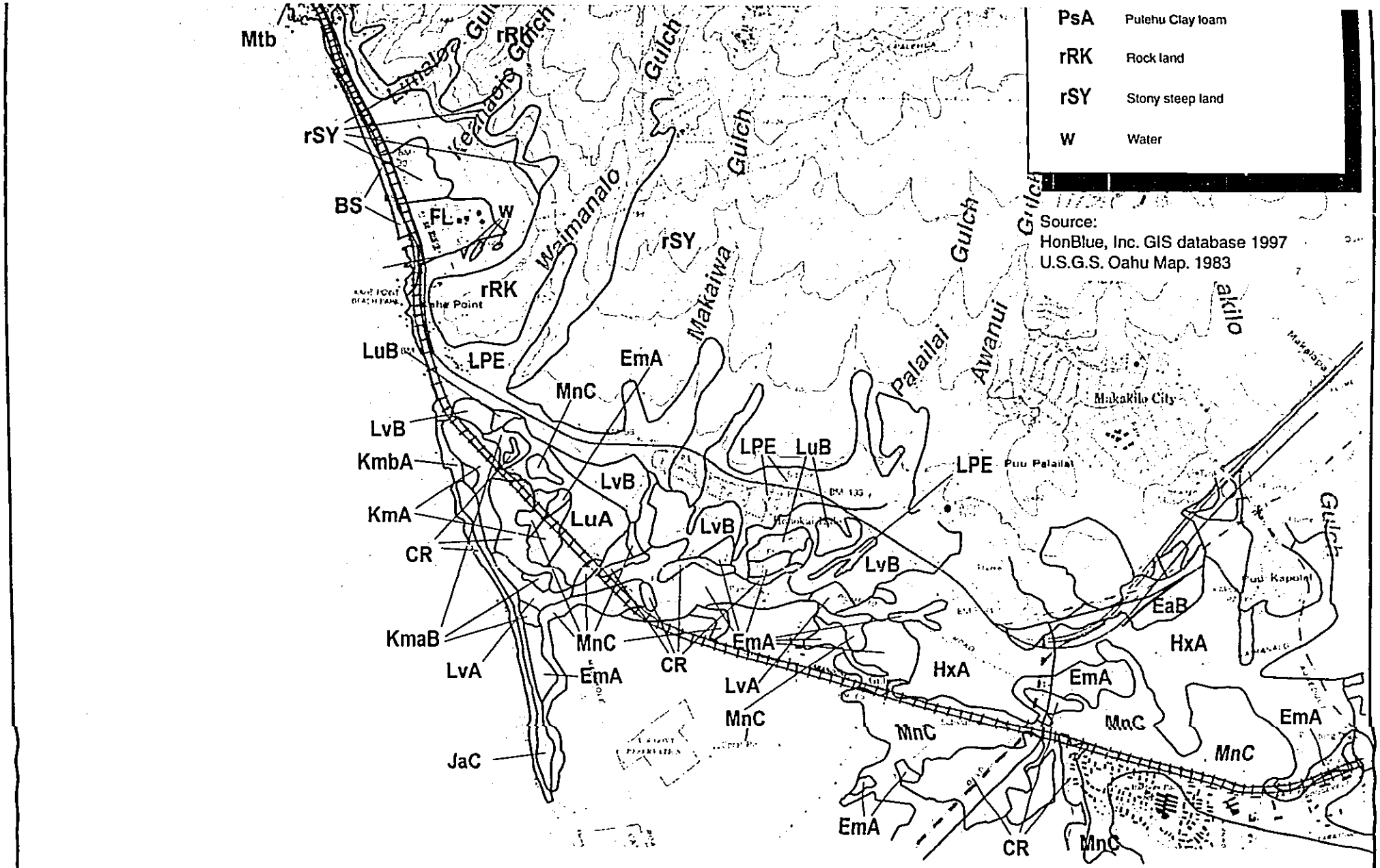
Leeward Bikeway Environmental Assessment

Soils Map (Eastern Portion)

Date 08-2000		Figure 3.3.1
Project No. 38200	EARTH TECH	



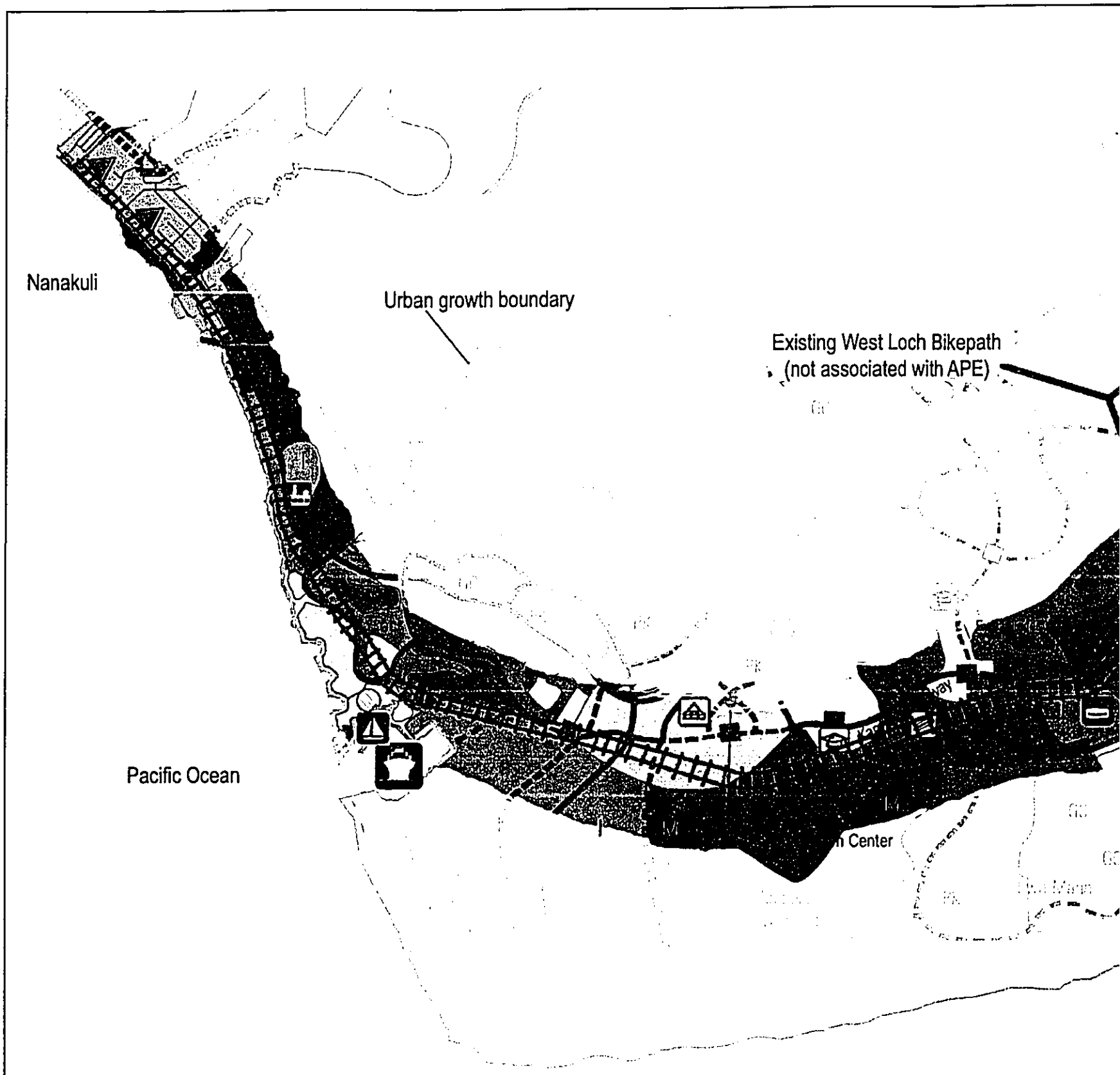
LEGEND
Proposed Project Area/former OR&L Railroad
BS Beaches
CR Coral Outcrop
EaB Ewa silty clay loam
EmA Ewa silty clay loam
EwC Ewa stony slity clay
FL Fill land, mixed
HxA Honouliuli clay
JaC Jaucas sand
KmA Keaau clay
KmaB Keaau stony clay
KmbA Keaau clay, saline
LPE Lualualei extremely stony clay
LuA Lualualei clay, 0-2% slopes
LuB Lualualei clay, 2-6% slopes
LvA Lualualei stony clay, 0-2% slopes
LvB Lualualei stony clay, 2-6% slopes
MnC Mamala stony silty clay loam
Mtb Mokuleia Clay
PsA Pulehu Clay loam
rRK Rock land
rSY Stony steep land
w Water
Nanakuli
MnC
QUARRY
CR
LPE
LvB
MnC
PsA
BS
LRE
Mtb
rSY
rRK
Nanakuli
Stream
Pili o Kahe Gulch
Awanui
Kaloi
Gulch
Puu Heleakala
Mauna Kapu
Palikea



Leeward Bikeway Environmental Assessment

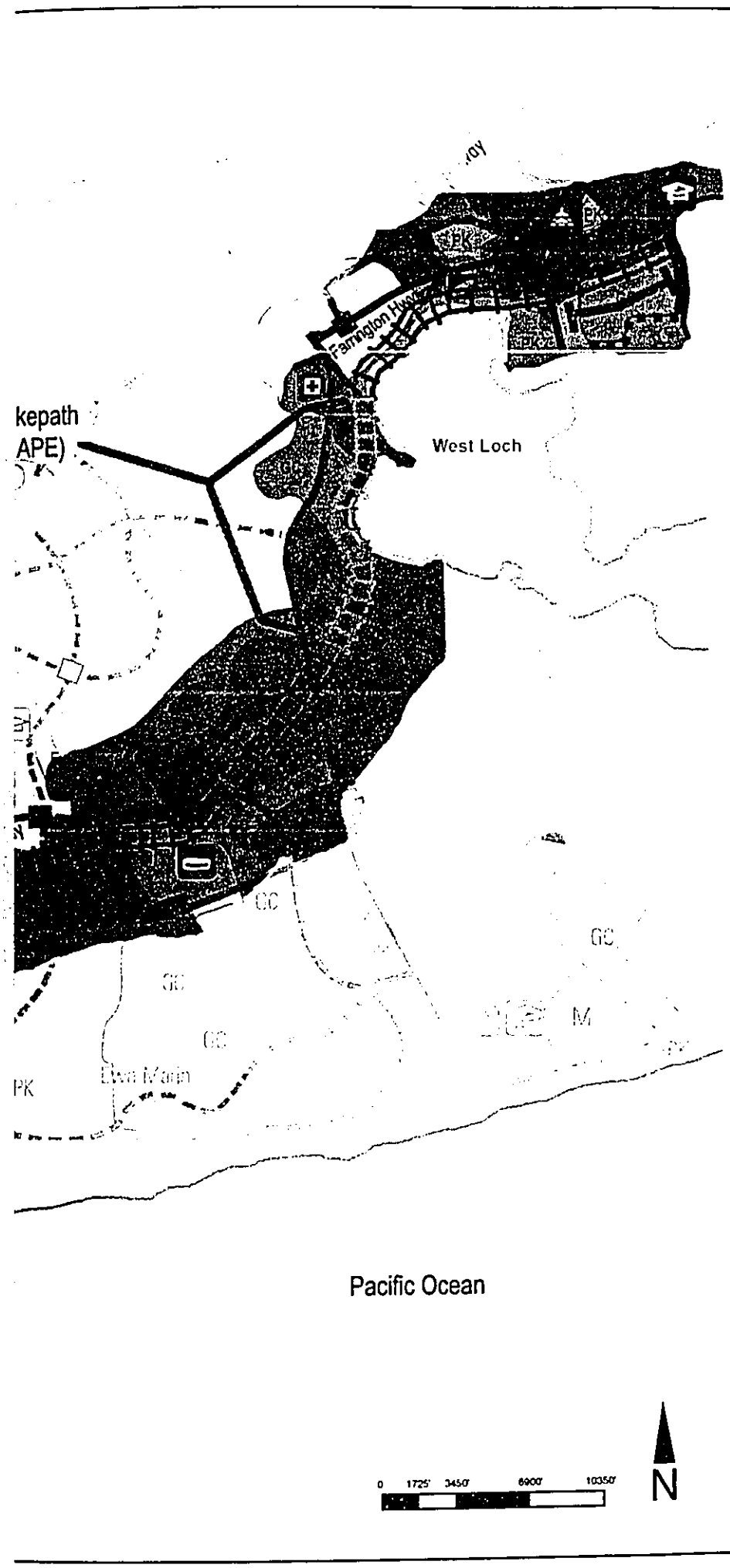
Soils Map (Western Portion)

Date 08-2000		Figure
Project No. 38200	EARTH TECH	3.3.2



Sources:

Ewa Development Plan
Waianae Sustainable Community Plan
Central Oahu Sustainable Communities Plan



Proposed Project Area/former OR&L Railroad

Portion of former OR&L Railroad not associated with the APE

Portion of Leeward Bikeway previously constructed by City & County of Honolulu

- Medium Density Residential / Commercial
- Rural Residential
- Residential and Low Density Apartment
- Low and Medium Density Residential
- High Density Residential
- City of Kapolei (High Density Residential and Commercial)
- Resort / Recreation Area
- Regional Town Center
- Industrial
- Military
- Agricultural and Preservation
- Parks and Golf Courses
- Transit Node (High Density Residential and Commercial)
- Urban Growth Boundary
- Rural Community Commercial Center
- Community Commercial Center
- Historic Railway / Bikeway Corridor
- Special Area Plan Boundary
- Shoreline

EXISTING	FUTURE	
		Civic Center
		Electric Power Plant
		Wastewater T.P.
		Intermediate School
		High School
		Hospital
		Small Boat Marina
		Commercial Harbor
		Highways, Arterial & Major Streets

Leeward Bikeway Environmental Assessment

Land Use Map

Date 08-2000		Figure
Project No. 38200	EARTH TECH	3.4

Waianae

- Preservation
- Rural Residential

Central Oahu

- Urban Area (Commercial and Medium Density/Commercial Residential)
- Landscaped Greenway
- Park
- Golf Course.

The majority of the land along the r-o-w where the proposed project action would take place is owned by the DLNR; the Hawaiian Electric Company; James Campbell Trust Estate; Ko 'Olina Development LLC; and Pan Pacific Hoteliers Inc. The tax map key designations along the APE are presented along with the deed in Appendix A.

3.8 Natural Hazards

Natural hazards that may occur in and affect the proposed project area include floods, tsunamis, hurricanes, earthquakes, and other natural events. The APE for natural hazards *includes the r-o-w and adjacent downgradient areas.*

Floods. The Federal Emergency Management Agency (FEMA) updated the Flood Insurance Rate Map (FIRM) for the Ewa and Waianae areas in 1990. These areas are listed as zones:

- A - Areas of 100 year flood, base flood elevations not determined.
- AE - Areas of 100 year flood, base flood elevation determined.
- XS - Areas of 500 year flood; areas of 100 year flood with average depths of less than one foot or within the drainage area less than one square mile, and areas protected by levees from 100 year flood.
- X - Areas determined to be outside the 100 year flood plain.
- D - Areas in which flood hazard is undetermined.
- VE - Areas of 100 year coastal flood with velocity (wave action), base flood elevations determined (Coastal High Hazard District).

Figures Figure 3.5.1 and 3.5.2 show the flood zones, and base flood elevations determined by FEMA and the COE.

Tsunamis. Tsunamis are a series of destructive ocean waves generated by seismic activity that could potentially affect shorelines of Hawaii. Tsunamis affecting Hawaii are typically generated in the waters off of South America, the west coast of the United States, Alaska

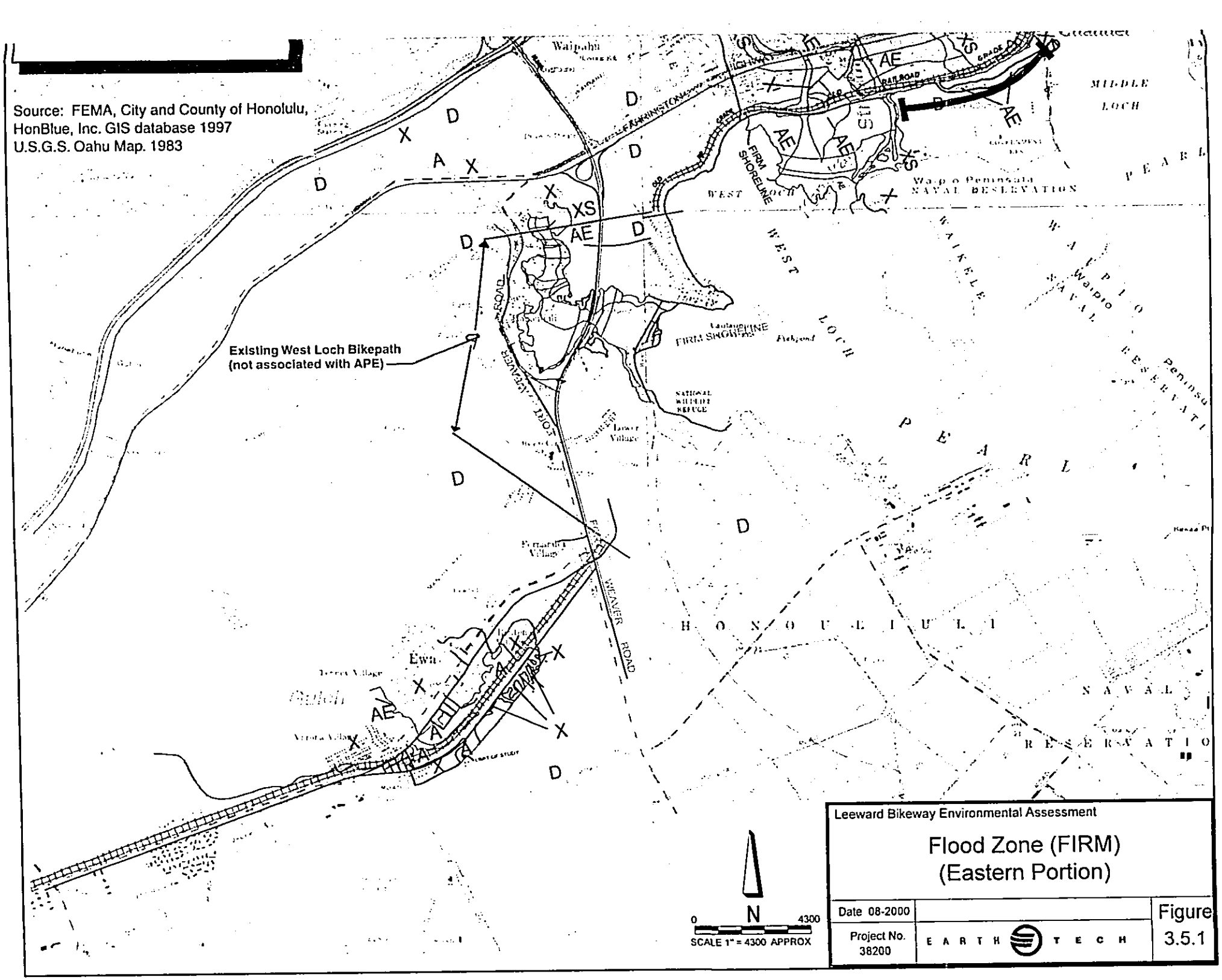
LEGEND

▭▭▭	Proposed project area/former OR&L Railroad
▭▭▭	Portion of Former OR&L not associated with the APE
▬▬	Portion of Leeward Bikeway previously constructed by City & County of Honolulu
A	Areas of 100-yr flood, base flood elevations not determined.
AE	(Flood Fringe District) Areas of 100-yr flood; base flood elevation determined (i.e. AE9').
XS	Areas of 500-yr flood; areas of 100-yr flood with average depths of less than one foot or with drainage area less than one square mile; and areas protected by levees from 100-yr flood.
X	Areas determined to be outside 500-yr flood plain.
D	Areas in which flood hazards are undetermined.
VE	Areas of 100-yr coastal flood with velocity (wave action); base flood elevations determined (i.e. VE15') (Coastal High Hazard

Source: FEMA, City and County of Honolulu, HonBlue, Inc. GIS database 1997
U.S.G.S. Oahu Map. 1983

Source: FEMA, City and County of Honolulu,
HonBlue, Inc. GIS database 1997
U.S.G.S. Oahu Map. 1983

Existing West Loch Bikepath
(not associated with APE)

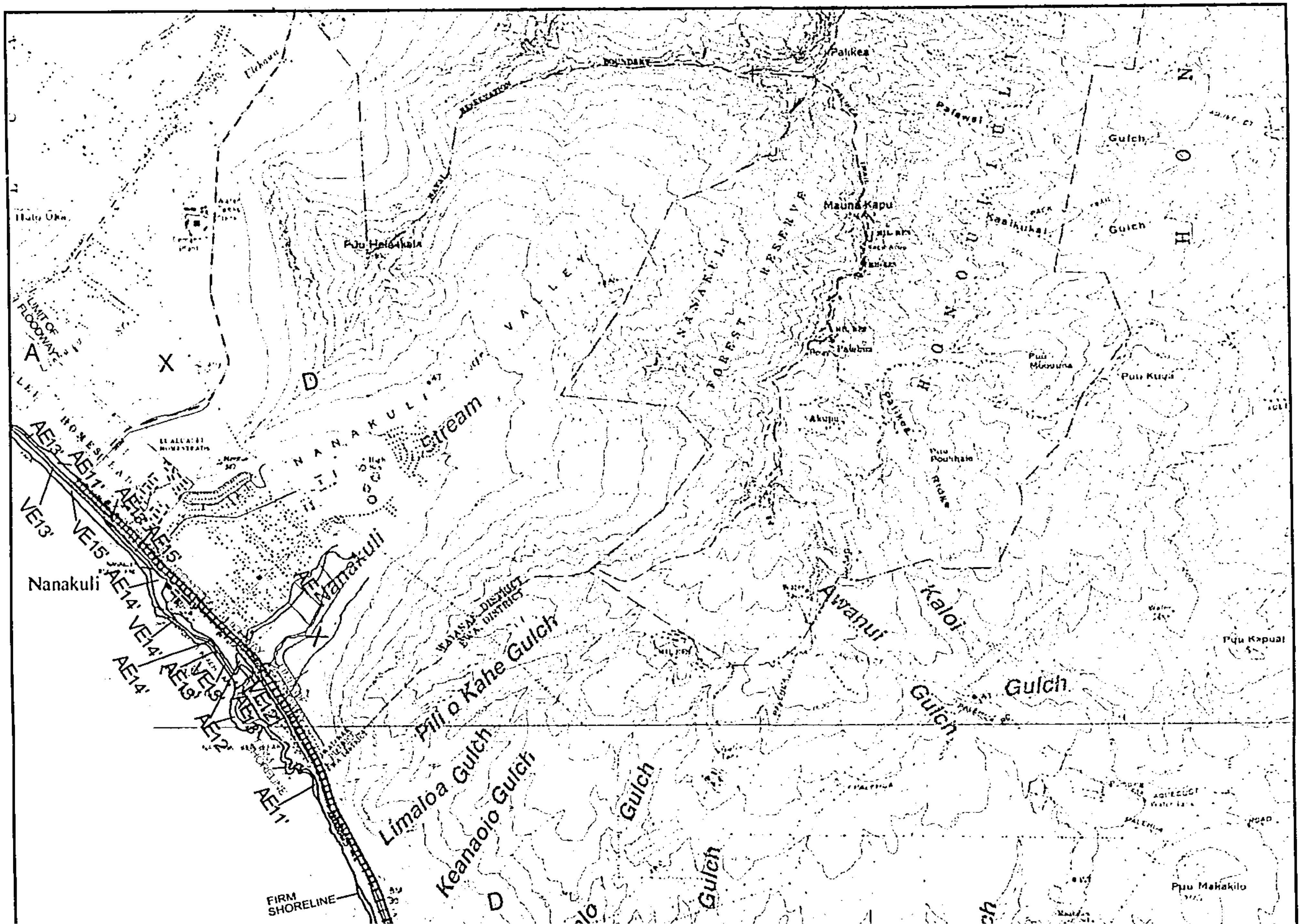


0 N 4300
SCALE 1" = 4300 APPROX

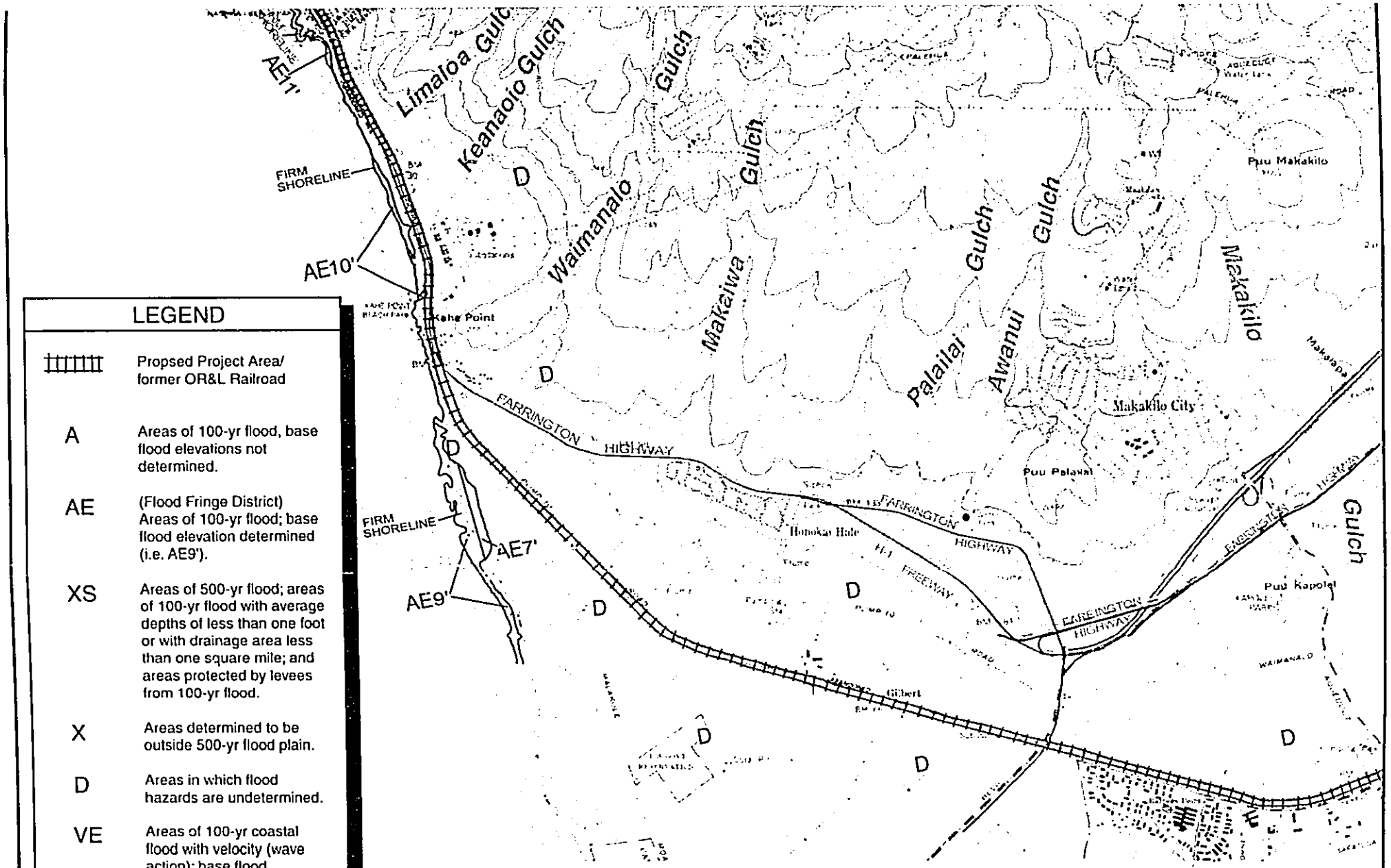
Leeward Bikeway Environmental Assessment

Flood Zone (FIRM)
(Eastern Portion)

Date 08-2000		Figure 3.5.1
Project No. 38200	EARTH TECH	



Kaloi Gulch
Awanui Gulch
Pili o Kahe Gulch
Limaloa Gulch
Keanaolo Gulch
Gulch
Nanakuli Stream
Nanakuli
NANAKULI VALLEY
NANAKULI FOREST RESERVE
Palikea
Mauna Kapu
Puu Heleakala
Puu Kapuai
Puu Makakilo
FIRM SHORELINE
LIMIT OF FLOODWAY
AE11'
AE12'
AE13'
AE14'
AE15
VE13'
VE14'
VE15'
A
X
D



LEGEND

▭▭▭	Propsed Project Area/ former OR&L Railroad
A	Areas of 100-yr flood, base flood elevations not determined.
AE	(Flood Fringe District) Areas of 100-yr flood; base flood elevation determined (i.e. AE9').
XS	Areas of 500-yr flood; areas of 100-yr flood with average depths of less than one foot or with drainage area less than one square mile; and areas protected by levees from 100-yr flood.
X	Areas determined to be outside 500-yr flood plain.
D	Areas in which flood hazards are undetermined.
VE	Areas of 100-yr coastal flood with velocity (wave action); base flood elevations determined (i.e. VE15') (Coastal High Hazard District).

Source:
FEMA, City and County of Honolulu,
HonBlue, Inc. GIS database 1997
U.S.G.S Oahu Map. 1983

Leeward Bikeway Environmental Assessment

Flood Zone (FIRM) (Western Portion)

Date 08-2000		Figure
Project No. 38200	EARTH TECH	3.5.2

and Japan. Local tsunamis have also been generated by seismic activity on the island of Hawaii.

The State of Hawaii Civil Defense establishes tsunami inundation zones and maps for all coastal areas in Hawaii. Portions of the APE from Lualualei Naval Road through Aliinui Drive (Ko 'Olina) are in a tsunami inundation zone (GTE, 1999). The portion of the APE from Aliinui Drive through the Ewa Plain to the West Loch area is not in the tsunami inundation zone (GTE, 1999). Areas in the West Loch and Waipio Peninsula are not in the tsunami inundation zone (GTE, 1999), however, since they are in the Pearl Harbor area, flooding associated with a tsunami is possible (Figure 3.5.1).

The OR&L track has previously been affected by tsunami activity. On April 1, 1946, a tsunami hit the north shore of Oahu in the early morning, and destroyed a "long section" of the track. Two weeks later, it was repaired by the OR&L and nearby plantation workers and put back into service (Hawaiian Railway Society, 1994).

Hurricanes. The Hawaiian islands are seasonally affected by Pacific hurricanes in the season from June to November. These storms generally travel toward the islands from a southerly or southeasterly direction and can deposit large amounts of rain with high winds on the Hawaiian islands. The storms generally contribute to localized flooding and coastal storm surges.

Earthquakes. Because Oahu is an older Hawaiian island with dormant volcanic activity, it is not particularly prone to seismic activity. Seismic activity usually occurs on the island of Hawaii, and has been felt as far away as Oahu. Oahu is listed in Seismic Zone 2A on a scale of 1 to 4 under the Uniform Building Code of 1997 (ICBO, 1997). Zone 2A indicates a place that has low potential for ground motion created by seismic activity.

3.9 Noise

The APE for noise effects is the former OR&L r-o-w and immediately adjacent areas. Noise is defined as sound that is undesirable because it interferes with speech communication and hearing, or is intense enough to damage hearing, or is otherwise annoying. Under certain conditions, noise can interfere with human activities at home or work and affect human health and well-being. The accepted unit of measure for noise levels is the decibel (dB) because it reflects the way humans perceive changes in sound amplitude. Sound levels are easily measured, but human response and perception of the wide variability in sound amplitudes is subjective.

Different sounds have different frequency content. Typical heavy construction equipment noise levels are provided in Table 3-5. When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to account for the response of

the human ear. The term "A-weighted" refers to a filtering of the noise signal to emphasize frequencies in the middle of the audible spectrum and to de-emphasize low and high frequencies in a manner corresponding to the way the human ear perceives sound. This filtering network has been established by the American National Standards Institute (ANSI). The A-weighted noise level has been found to correlate well with a person's judgment of the noisiness of different sounds and has been used for many years as a measure of community noise.

Table 3-5 Heavy Construction Equipment Noise Levels at 50 Feet

Equipment Type	Generated Noise Level (dBA)
Bulldozer	88
Backhoe (rubber tire)	80
Front Loader (rubber tire)	80
Dump Truck	75
Concrete Truck	75
Concrete Finisher	80
Crane	75
Asphalt Spreader	80
Roller	90
Flat-bed Truck (18 Wheel)	75
Scraper	89
Trenching Machine	85

Source: U.S. Army Corps of Engineers, 1978.

Community noise levels change continuously during the day; therefore, to compare levels over different time periods, several descriptors have been developed that take into account this time-varying nature. The most common descriptor is the annual average day-night sound level (L_{dn}). The L_{dn} is the average A-weighted level for a 24-hour period with a 10dB upward adjustment added to the nighttime levels (10:00 PM to 7:00 AM). This adjustment accounts for the increased sensitivity of most people to noise in the quiet nighttime hours. L_{dn} has been adopted by many federal and state agencies as the accepted unit for quantifying human annoyance to general environmental noise and for assessing and correlating the various effects of noise on humans and animals, including land use compatibility, sleep interference, annoyance, hearing loss, speech interference, and startle effects.

Permissible occupational noise exposure levels and duration's defined in 29 CFR 1910.95 are presented in Section 4.7. The DOH monitors noise issues in accordance with HRS, Title

19, Chapter 342F. The DOH issues noise permits only when excessive noise levels are expected. In addition, the Occupational Safety and Health Act of 1970 (OSHA) was established to "assure safe and healthy working conditions for working men and women." OSHA regulations established a maximum noise level of 90 dBA for a continuous 8-hour exposure (typical workday); maximum noise levels for shorter periods of time are higher.

The major contributors of noise in the vicinity of the project area is motor vehicles on nearby roads and from the periodic passing of operation of historic railroad trains operated by the Hawaiian Railway Society between Ko 'Olina and their Renton Road Ewa facility. During the operation of the railroad at unguarded railroad crossing, the Federal Railway Administration (FRA) requires all trains to blow two long blasts, a short blast and a long one. As described in Section 3.11, there are numerous roads that parallel or intersect the APE. In the areas of these roads, traffic is somewhat continuous and ambient daytime noise levels are consistent with an urban area. Estimated noise levels for the roadway areas are between 60-70 and 80-85 dBA, with an estimated 85-95 dBA for railroad (Figure 3.6).

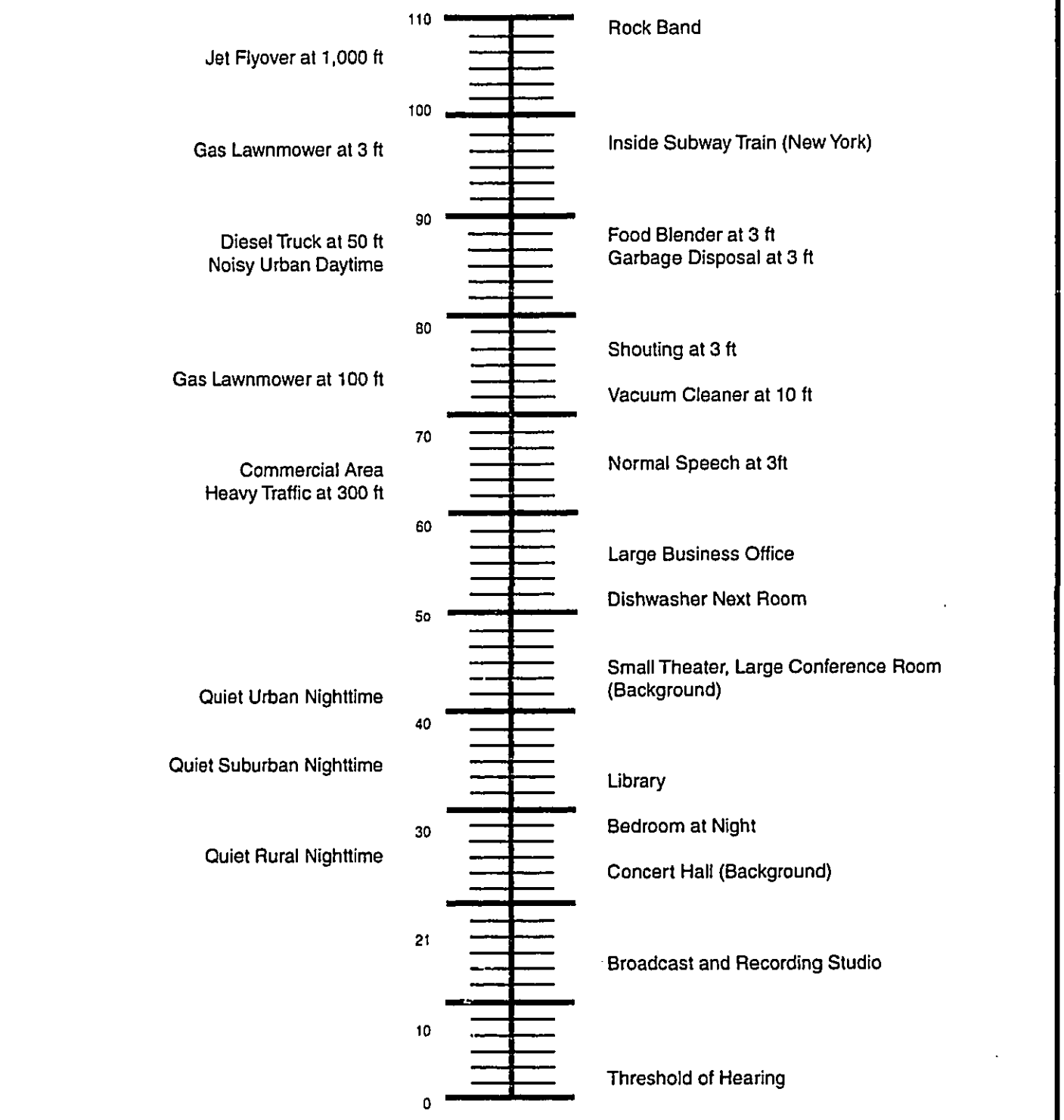
The nearest sensitive noise receptors (human) to the proposed Leeward Bikeway project include residential developments in Ewa, West Loch, Waipio and people present in the beach parks, schools and homes on the Waianae coast. Sensitive wildlife may be present along the APE in the wetlands, stream and estuarine areas, West Loch, and other undeveloped locale.

3.10 Socioeconomics

The socioeconomic characteristics of the proposed project area include demographics, employment, and commercial activities. The following section discusses the existing social and economic characteristics of the Ewa and Waianae districts that comprise the APE. The data are from the last census performed in 1990 (UH-H, 1998). Since that time, BPNAS has ceased operations, and major portions of the base's land area have been transferred over to the State of Hawaii. The data presented in the following sections considers the former BPNAS area to be similar in nature to its neighbors.

The project site is located on the island of Oahu, in the City and County of Honolulu. As of 1990, Honolulu claimed 830,000 residents or approximately three-fourths of Hawaii's population. Approximately 96.4 percent of the population lives in an urban setting with 3.6 percent living in a rural area. The ethnic diversity of Oahu is composed of the following populations: Caucasian (25%), Chinese (6%), Filipino (10.6%), Hawaiian (16.2%), Japanese (21%) and others (21.2%), (UH-H, 1998).

Most of the bikeway straddles the Ewa Plain, which has changed drastically over the last decade. During this period, residential developments have replaced sugar cane plantations,



Source: U.S. Army Space and Strategic Defense Command, 1994a.

Leeward Bikeway Environmental Assessment

Comparative Noise Levels

Date 08-2000		Figure
Project No. 38200	EARTH TECH	3.6

substantial development has occurred in the City of Kapolei (including construction of shopping centers, movie theaters, water parks and government offices). Increased development of Campbell Industrial Park has occurred while BPNAS closed as part of the Base Realignment and Closure (BRAC) program. This has resulted in the Ewa Plain being considered as part of the Honolulu Urbanized Area. Whereas the western portion of the proposed project area, located on the Waianae Coast, is still considered rural.

The average population density along the APE is approximately 501-5,000 people per square mile by census tract according to the 1990 census (UH-H, 1998). The average population ethnicity in the vicinity of the APE ranges from 50 - 74.9% Filipino, 10 - 24.9% Caucasian, 10 - 24.9% Japanese, 5 - 24.9% Hawaiian, and 1 - 4.9% Chinese. According to 1990 census data, median household incomes for this area range from $30,000 to $50,000 (UH-H, 1998).

3.11 Safety and Health

Safety and health includes consideration of activities, occurrences or operations which have the potential to affect the following:

- Safety and Health of Workers. Workers on the project are directly involved with the operation of developing the bikeway and during that operation, (or subsequent maintenance) are physically present onsite.

- Safety and Health of the Public. Members of the public may be physically present on the bikeway or may be in the vicinity of the bikeway (i.e., neighboring residential areas or at bikeway crossings, etc.).

Workers. The affected environment for workers includes the construction areas for the proposed Leeward Bikeway. The APE for workers will be the former OR&L railroad bed, the 20-foot easement on either side of the railroad bed, and any staging/access areas used for construction. Health and safety issues concerning workers include, but are not limited to, heavy equipment operation, traffic, heat exposure, biological exposure (insects, wild dogs), and train operation.

Public. The APE for the public includes the areas immediately adjacent to the r-o-w, e.g., residential developments, parks, business facilities, roads, schools and beach parks on the Waianae coast. Health and safety issues impacting the public include, but are not limited to, exposure to construction activities (i.e., noise pollution, potential fugitive dust exposure, construction traffic, etc.) and bikeway traffic (pedestrian and bikeway traffic in areas near roadways and in conjunction with the operation of a train in some areas). Additionally, for emergencies, police, fire departments and utilities have access to the r-o-w.

3.12 Transportation

The APE for transportation effects includes the former OR&L r-o-w and intersections with roadways. At intersections, crosswalks and warning/directional signage compliant with current standards will be employed. One deviation from constructing the proposed bikeway adjacent to the existing r-o-w will occur at the Fort Weaver Road crossing. The bikeway will be routed to the Renton Road intersection to utilize the crosswalk and signals. This localized rerouting of the bikeway is necessary to protect bicyclists and pedestrians using the bikeway from heavy traffic present at this main thoroughfare. Intersecting roadways in the APE include:

- Farrington Highway (parallel to the APE in Waianae)
- several Waianae beach park entrances (crossings)
- Aliinui Drive, the Ko`Olina entrance (crossing)
- Kalaeloa Boulevard (crossing)
- Fort Barrette Road (crossing),
- Renton Road (parallel to the APE in most of Ewa and a crossing)
- Fort Weaver Road (crossing)
- Waipahu Depot Road (crossing) and
- Waipio Point Access Road (crossing/start point)
- Transportation opportunities that may be provided by the implementation of the proposed bikeway include the following:
- Waianae Coast: Increased access to portions of Nanakuli and Lualualei Valleys will occur as well as schools, businesses and beach parks present along the coast.
- Ewa Plain: Increased access to the Barbers Point Harbor and Marina, Ko 'Olina Resort, Campbell Industrial Park, The City of Kapolei town center, and State of Hawaii offices, parks and residences.
- Waipahu: Increased access to the West Loch coastline, Waipahu town center, parks and residences as well as Waipahu Intermediate, Waipahu High School and bikeway links to Leeward Community College.

3.13 Utilities and Infrastructure

The APE for utilities and infrastructure for the proposed project are those which are located within the former OR&L r-o-w. They include:

- Aboveground and underground utilities including overhead power and telephone lines, subsurface water lines and sewers are present on the northern side of the railroad tracks in the Waianae and Ewa areas.

- Starting from the former BPNAS or Kalaeloa area, and extending to the Waipahu area, several underground petroleum pipelines are present in the r-o-w. These underground pipelines are located to the south of the tracks in the vicinity of the former BPNAS or Kalaeloa area and then north of the tracks near the Hawaiian Railway Society facility through Waipahu.

- In the Waipahu area, an "energy corridor" which houses numerous underground product pipelines is present.

- Portions of the Hawaiian Electric Company Kahe Power Plant (makai cooling basin).

- Active portions of the former OR&L railroad extend from west-northwest of the Ko'Olina resort area to the Hawaiian Railway Society facility near Fleming and Renton Roads.

- The intersections of the roads and the r-o-w listed in Section 3.11.

Large infrastructure facilities located adjacent to the APE include the Honouliuli Waste Water Treatment Plant, and the Waipahu Convenience (Refuse) Center.

3.14 Visual Resources

Visual resources are the aggregate of characteristic features imparting visually aesthetic qualities to a natural, rural, or urban environment. This resource is assessed during the environmental impact analysis process to determine whether or not a project will be compatible with the existing landscape.

The planning documents for the Ewa and Waianae Districts take into account the preservation of visual landmarks and significant vistas. The former OR&L r-o-w is present on the Waipio Peninsula, in the shores of West Loch, the Ewa Plain and the Waianae Coast area. Not only are the views from the proposed project important, but so are the views from other areas that include the proposed bikeway. As a results, the APE for visual resources is the coastal areas along the Waianae Coast and West Loch, and the Ewa Plain area.

The Ewa Development Plan (C & C, 1997) takes into account the preservation of visual landmarks and significant vistas. Those in proximity to the APE include:

- Views of the ocean from Farrington Highway between Kahe Point and the boundary of the Waianae Development Plan Area;
- Views of Na Pu'u at Kapolei, Makakilo, and Palailai;
- Makai views from the Ko'Olina area;
- Mauka and makai views; and,
- Views of central Honolulu and Diamond Head.

The Waianae Sustainable Communities Plan restricts additional development makai of Farrington Highway to protect access to and views of the ocean.

The Central Oahu Sustainable Communities Plan requires retaining the following relevant visual landmarks and significant vistas:

- Distant vistas of the shoreline and Pearl Harbor from the H-2 Freeway and Kunia Road above the Ewa Plain;
- Views of the Waianae and Koolau Mountains from major roadways;
- Views of Pearl Harbor from Farrington Highway in the vicinity of Waipahu High School;
- The view of Waipahu Sugar Mill from Waipahu Depot Road; and
- The view of the Waianae Mountains from the Waipahu Cultural Garden.

The views along the APE are listed in Table 3-6. Photographic documentation of the APE is presented in Appendix D.

Table 3-6 Views Along the APE

Portion of the APE	Views Present
From Lualualei Naval Road to Ko 'Olina Resort	Looking makai: numerous Waianae beach parks and the Pacific Ocean. Looking mauka: Waianae Range, shopping centers, residential areas and the Hawaiian Electric Company Kahe Power Plant.
Ko 'Olina Resort Area	Within Ko 'Olina Resort: golf course, fallow land and resort buildings.
From Ko 'Olina to former BPNAS or Kalaeloa area	Looking mauka: Waianae Range, fallow land and buildings at Kapolei. Looking makai: fallow land and buildings of Campbell Industrial Park (Chevron Refinery)
From former BPNAS or Kalaeloa area to Hawaiian Railway Society	Looking mauka: Waianae Range, fallow land, land under development. Looking makai: former BPNAS or Kalaeloa area.
Hawaiian Railway Society to West Loch Estates	Looking mauka: residential areas. Looking makai: residential areas.
West Loch Estates to Approximately Leowaena Street	Looking mauka: residential areas. Looking makai: West Loch and park.
Leowaena Street to Waikele Stream	Looking mauka: industrial/commercial businesses, Waipahu Intermediate School and a Pupuole Street Mini Park. Looking makai: trees, West Loch.
Waikele Stream to Waipahu Depot Road	Looking mauka: residences. Looking makai: trees and a pond area.
Waipahu Depot Road to Waipio Point Access Road.	Looking mauka: Kahe (Waipahu) Drainage Canal and residences. Looking makai: The Ted Makalena Golf Course.

3.15 Water Resources

Water resources include the aspects of the environment, which relate to the availability and characteristics of water (surface or groundwater). Surface water may include marine water, rivers, streams (including intermittent streams), runoff and drainage. Groundwater includes water present in aquifers (perched, unconfined, confined or artesian). Water resources are also concerned with supply and quality of the water. The APE for water resources includes the surface water bodies, gulches and drainage features traversed and downgradient from the former OR&L r-o-w, and the underlying aquifers. It should be noted that the proposed project site is located within 100 feet of the coastal areas on the Waianae Coast and West Loch areas, while being approximately 1 mile inland of coastal areas in the Ewa Plain area.

3.15.1 Surface Water

Surface water drainage typically begins high in the mountains during rainstorms and proceeds downgradient, collecting in streams and dry gulches. A portion of surface water infiltrates through the streambeds and over sections of the Ewa Plain across the APE, recharging the underlying aquifer.

Potential issues arise when gulches or streams are changed in their course or carrying capacity, causing flooding and scour damage, which in turn affects water quality downstream, ultimately polluting marine water bodies and decreasing the supply and quality of groundwater sources.

Gulches. *Ten* gulches traverse the proposed Leeward Bikeway. These gulches include the Pili O Kahe, Limaloa, Keanaoio, Waimanalo, Makaiwa, Palailai, Kapolei, Awanui, Makakilo, and Kaloi Gulches (Figure 2.2.1 and 2.2.2). Within the APE, low-lying coastal portions of the Ewa Plain and lower Waipahu are subject to flooding from intense rainstorms. Historically, flood control has been provided in urbanized areas by the construction of concrete-lined channels. However, concrete-lined channels present several problems, including decreased infiltration to groundwater, and disruption of coastal water quality.

The federal government as well as State of Hawaii and City & County of Honolulu have mandated and initiated requirements for the development of retention and detention facilities to temporarily store runoff. Natural and man-made vegetated drainage-ways and retention basins are the preferred method to handle runoff and drainage as they promote infiltration and decrease non-point source pollution and other coastal water degradation issues. Additionally, natural gulches should be retained as part of the open space network (C & C 1997).

Planned drainage improvements that may have a direct or indirect relationship to the APE requiring evaluation include the following (C & C, 1997, 1999b):

- The Makaiwa Hills, Kapolei Business Park and industrial areas near the Barber Point Deep Draft Harbor;
- Expansion of the channel at the western edge of the former BPNAS or Kalaeloa area to provide additional capacity for the City of Kapolei;
- A West Loch Drainage Basin System to serve Ewa by Gentry and East Kapolei Development; and,
- Kaloi Drainage Basin System.

Drainage improvements are also planned for the Waianae Coast. In this area, Farrington Highway and the railroad bed are typically at higher elevations than the landscape mauka of these structures causing flooding during heavy rains.

The proposed bikeway and OR&L railroad bed is raised above the existing topography in many areas and therefore, these elevated portions of the APE have the potential to adversely impact drainage. However, existing drainage culverts will be maintained during the development of the proposed bikeway.

Streams and Water Quality. Information on water resources was derived from various sources including the U.S. Geological Survey (USGS), DLNR, and field aquatic biology/water quality surveys.

Federal, state, and county laws regulate actions proposing to affect water resources through permit processes including the COE 404 Permit, the Section 401 WQC, the U.S. EPA sole source aquifer determination, the SCA Permit, the CZMP Consistency Determination, and the City and County of Honolulu SMA Permit.

Two types of streams are present in the project area: estuaries of perennial streams and intermittent streams. The estuaries are located along the West Loch of Pearl Harbor and intermittent streams cross the r-o-w to the west of Pearl Harbor. Nearly all of the proposed bridges in the project (3 in the Nanakuli/Kahe area and 2 in the Ewa Plain) cross normally dry gulches.

Water quality data was collected and assessed by AECOS in January 2000 to characterize the aquatic environments. These measurements do not comprise an adequate baseline for water quality parameters but are an indication of conditions at a specific point in time. Water quality samples were collected from Waikele Stream, Pupuole Street Mini Park Marsh, Kahu (Waipahu) Channel, Campbell Industrial Park Drainage Canal and Nanakuli Stream on January 7, 8 and February 2, 2000. Water quality parameters and methods are listed in

Table 3-7. Analytical results are summarized in Table 3-7 and presented in the AECOS report in Appendix B.

Table 3-7 Water Quality Analyitical Results

	1/7/00		1/8/00			2/3/00	
Analyte	Waikele (0905)	Pupuole (0920)	Kahu (0800)	Campbell (1110)	Nanakuli (1300)	Pupuole (1125)	Campbell (1205)
Temp (°C)	21.5	21.5	22.0	23.6	23.9	21.1	22.5
DO (mg/L)	6.10	1.45	5.42	9.47	5.64	2.71	9.97
DO Saturated (%)	70	17	65	112	70	31	115
Salinity (ppt)	2/47 (Kapakahi)	3	6.5	--	8	--	--
pH	--	--	--	--	--	7.49	8.59
Turbidity	4.10	--	4.30	4.18	22.8	25.6	6.91
TSS (mg/L)	2.7	--	3.0	2.4	22.9	44.0	4.8
Ammonia (µg N/L)	34	--	130	50	9		
Nitrate+Nitrite (µg N/L)	1320	--	868	106	<1	19	59
Total N (µg N/L)	1390	--	1080	737	1260		
Total P (µg P/L)	179	--	114	178	122		

* Complete references are found in the AECOS Report in Appendix B.
DO = dissolved oxygen; N = nitrate; P= phosphorus; µg/L = micrograms per liter; mg/l = milligrams per liter; ppt = parts per thousand.

The three perennial streams include: Waipahu Drainage Canal (Kahu Channel), charged by Wailani Stream mauka of Waipahu town; Waikele and Kapakahi Streams. A brief description of the surface water bodies along the APE and general summations of the water quality data are presented for each sampling location below.

Kahu Channel. The Kahu Channel crosses the APE west of Waipio Point Access Road and just north of Ted Makalena Golf Course. The Canal drains much of the eastern portion of Waipahu town discharging into the Middle Loch of Pearl Harbor. Side channels extend east and west along the mauka and makai side of the existing West Loch bike path in the vicinity of the bridge. The concrete bridge across the channel at the Ted Makalena Golf Course supported petroleum and gas pipelines on the mauka and makai sides of the structure. Petroleum product sheen was present on the water surface along with small amounts of trash and debris. Water quality analytical results indicate that the water is brackish and tidal in nature.

Waikele and Kapakahi Streams. The Waikele Stream originates in the Koolau Mountains and drains the second largest watershed on Oahu. The Kapakahi Stream is a tributary of Waikele Stream, formed just above H-1 freeway. The most extensive water resource and wetland assets related to the proposed bikeway are associated with the mouth of these two streams. The Kapakahi Stream drains through a narrow channel running along the west side of Waipahu Depot Road while Waikele enters West Loch further west. The Waikele and Kapakahi Stream crossings consist of the remnants of dilapidated steel bridges supporting petroleum pipelines. The streams themselves appeared turbid with petroleum product sheens on the surface. The streams contained various types of trash and debris (i.e., waste food, tires, bikes, toys, etc.).

Analytical results indicated that the Waikele Stream water is brackish with high nutrient levels, while Kapakahi Stream water is saltier than seawater probably due to evaporation. However, some cattails are present, probably due to freshwater stream inflow and/or spring inflow.

Campbell Industrial Park East Drainage Canal. No new crossing is required because the massive culvert under the OR&L is sufficient to accommodate the railroad tracks and the bikeway. The small wetlands on either side of the box culverts are interesting biologically and used by Hawaiian stilt, an endangered species. This area is also potentially one of scenic interest for the bikeway; the concrete channel on the north side of the box culvert could be removed and replaced by an enlarged, stepped depression to provide a rest stop or small park with the waterway and riparian trees as its central focus.

Analytical results show moderate eutrophication is occurring with relatively high DO and pH levels, all indicative of a productive aquatic system.

Pupuole Street Mini Park Marsh. The mini park is located in Waipahu, just north of West Loch. The marsh is located along a narrow section of the APE approximately 30 meters east of the mini park.

Water quality results indicate that the water is slightly brackish, somewhat turbid, and low in DO and nitrate. The nitrate concentration is probably low due to bulrush nutrient consumption

Keanaoio Gulch. The Keanaoio Gulch Bridge is the first gulch northwest of the Kahe Power Plant and southeast of the Nanakuli Stream Bridge. The Keanaoio Gulch drains the Waianae Range and has a degraded muliwai present at its mouth near the bridge.

The muliwai water was turbid and green from the current algal bloom; no analytical data are available.

Nanakuli Stream. The Nanakuli Stream is located at the westernmost end of APE, near Lualualei Drive on the Waianae coast. It is an intermittent stream that originates and drains the Waianae Range. A muliwai is present at the streams mouth and is spanned by a concrete pedestrian bridge. The bridge spans the muliwai; current design alignment of the proposed project will utilize this bridge as a stream crossing. Analytical results indicate that the Nanakuli muliwai water is brackish and turbid with an algal bloom. The low dissolved nutrients like nitrate and ammonia are likely results of the algal bloom.

Flow Data. The USGS performs water resource monitoring at two locations within the APE. These locations include Kaloi Gulch and Waikele Stream at Waipahu. The data collected by the USGS at each gauging station relates to flow over a water year, and does not include water quality data. A water year is the time period from October 1 of the starting year to September 29 of the following year. The relevant flow data for the two gauging stations is listed below (USGS, 1999):

Kaloi Gulch

- Station Name and Number: Kaloi Gulch Tributary near Honouliuli 16212450
- Location: Lat 2122'41', Long 158 03'45", at a culvert on a private road, 1.8 miles west of Honouliuli and 2.8 miles northwest of the Ewa Post Office
- Drainage Area: 1.7 square miles
- Period of Record: 1968-1998
- 1998 Water Year Maximum Gauge Height: <2.42 feet
- 1998 Water Year Maximum Discharge: <50 cubic feet per second
- Period of Record Maximum: 1/8/80
- Record Maximum Gauge Height Maximum: 7.45 feet
- Record Maximum Discharge: 724 cubic feet per second

Waikele Stream

- Station Name and Number: Waikele Stream at Waipahu 16213000
- Location: Lat 21 23'11", Long 158 00'49", on left bank, 300 feet upstream from bridge on Highway 90, and 0.3 miles southwest of sugar refinery at Waipahu
- Drainage Area: 45.7 square miles
- Period of Record: 1960-1998
- 1998 Water Year Maximum Gauge Height: (Not Available)
- 1998 Water Year Maximum Discharge: 136 cubic feet per second

- Period of Record Maximum: November 28, 1954
- Record Maximum Gauge Height Maximum: 14.82 feet
- Record Maximum Discharge: 13,600 feet per cubic second

3.15.2 Groundwater

Two general types of groundwater generally occur on Oahu; basal and high level dike water. The predominant source of groundwater on Oahu is fresh water in the basal aquifer that floats on and displaces salt water that saturates the base of the island. The second source of groundwater is fresh water that is contained in vertical dikes that are present in rift zones. Rainwater is the ultimate source of groundwater; it percolates downward through porous and permeable materials, like basalt. Movement of groundwater is downgradient towards the ocean, and it typically discharges in seeps, springs and streams. Coastal sediments can act to confine groundwater movement within underlying basalt, causing artesian conditions during discharge.

Groundwater quality is naturally the end product of geochemical processes, however, it can easily be affected by human activities. This includes industrial, agricultural and commercial activities as well as drainage patterns and groundwater removal. Current aquifer classifications across the APE listing the use, quality and vulnerability to contamination are listed in Table 3-8 (Mink & Lau, 1990).

Table 3-8 Groundwater Resources: Aquifer Identification and Status

Aquifer (Status Code)	Aquifer[1]: Island, Sector, System, Type Status[2]: Development Stage, Utility, Salinity, Uniqueness, Vulnerability to Contamination.
30204116 (23321)	– Oahu, Pearl Harbor, Ewa, Basal, Unconfined, Sedimentary – Currently Used, Neither Use, Moderate Salinity (1,000-5,000), Replaceable, High Vulnerability
30204121 (13213)	– Oahu, Pearl Harbor, Ewa, Confined, Flank – Currently Used, Neither Use, Moderate Salinity (1,000-5,000), Irreplaceable, Low Vulnerability
30301112 (23321)	– Oahu, Waianae, Nanakuli, Basal, Unconfined, Dike – Potential Use, Neither Use, Moderate Salinity (1,000-5,000), Replaceable, High Vulnerability
30203116 (12211)	– Oahu, Pearl Harbor, Waipahu, Basal Unconfined, Sedimentary – Currently Used, Ecologically Important, Low Salinity (250-1,000), Irreplaceable, High Vulnerability

Aquifer (Status Code)	Aquifer[1]: Island, Sector, System, Type Status[2]: Development Stage, Utility, Salinity, Uniqueness, Vulnerability to Contamination.
30203121 (12212)	– Oahu, Pearl Harbor, Waipahu, Basal, Unconfined, Sedimentary. – Currently Used, Ecologically Important, Low Salinity (250-1,000), Irreplaceable, Moderate Vulnerability.
30203111 (11111)	– Oahu, Pearl Harbor, Waipahu, Basal, Unconfined, Flank – Currently Used, Drinking Water Use, Fresh (<250), Irreplaceable, High Vulnerability

[1] The first five digits of the aquifer code refer to the hydrogeologic continuity of an aquifer: the island, sector, system and type that have the have the same general features. The second set of three numbers describes the groundwater as being basal or high level, confined or unconfined, and as flank, dike, perched or sedimentary in its geology.

[2] The status code of the aquifer describes its development stage (currently used, potential use, no use), utility (drinking, ecologically important, neither), the salinity in milligrams per liter as chloride, uniqueness (irreplaceable or replaceable), and vulnerability to contamination (high to none).

3.16 Security and Maintenance

Development of the proposed Leeward Bikeway will require security and maintenance measures for the protection and enjoyment of the path users and adjacent property owners.

Security. Access to neighboring properties has existed since the development of the OR&L railroad. With the development of the proposed bikeway, access will be restricted, a code of conduct will be required and additional police patrols will be requested. At points of entry, unauthorized vehicular entry will be restricted with the placement of pedestrian friendly barricades. The barricades will be placed at the edges of the bikeway and at the center of the bikeway to allow pedestrians and bicycles in, but not vehicles. To allow emergency vehicle access, these barriers may be removable or a gate will be placed next to them. Access will also be restricted from dusk to dawn along the bikeway; lighting will not be provided to discourage night-time use. For bikeway users, a code of conduct will also be required for safe bikeway use and to promote protection of neighboring properties. The code of conduct will be posted on signs at entry points to the proposed bikeway, and will require the following:

- Stay on the trail in continuous movement.
- Respect rights of all trail users as well as adjacent homeowners and properties.
- Ride single file keeping to the right of the trail.
- Give warning before passing other trail users.
- Only leashed pets are welcomed, you must clean up after your pet.

- Unauthorized and motorized vehicles are prohibited.
- Use of radios is prohibited.
- Bikeway hours are from dawn to dusk.
- No dumping, littering or loitering. Please use trash receptacles.
- Do not take or harm any plants or animals; areas outside the trail may contain sensitive plants and animals.
- Use bikeway at your own risk.
- Warning: golf course ahead.

Currently, the City and County of Honolulu Police Department has a temporary bicycle patrol in the Waipahu area and none in the Ewa and Waianae areas. This reflects the fact that bikeways do not exist in the Ewa and Waianae areas. With the development of the proposed bikeway, the City and County of Honolulu Council members, Police Department and Mayor as well as the Mayors Advisor Committee for Bicycles would be notified of the requirement for permanent bicycle patrols in the Waipahu, Ewa and Waianae areas.

Maintenance. The proposed bikeway will consist of a 10-foot wide asphalt path with 2-foot graded shoulders on either the mauka or makai side of the former OR&L railroad tracks. In the limited space left after bikeway construction, bare dirt will be hydroseeded. Maintenance will be performed by the DOT Oahu District Maintenance Section, and will include cutting grass and performing repairs. Trash pickup will be performed by the DOT maintenance crews as well.

4. ENVIRONMENTAL CONSEQUENCES

Project-related effects, both detrimental and beneficial, include, primary, secondary, and cumulative effects. Primary (short-term) effects or direct impacts are caused by the action and occur at the same time and place. Secondary (long-term) effects or indirect impacts are caused by the action and occur later in time or farther removed in distance, but are still reasonably foreseeable. Cumulative effects refer to impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor yet collectively significant actions taking place over a period of time.

Effects of the proposed project are divided into short-term and long-term effects. Short-term effects are related to construction activities. Long-term effects refer to the effects caused from the operation of the proposed action, and are longer in duration.

The following is a summary of the anticipated environmental effects and proposed mitigation measures for the proposed construction of the Leeward Bikeway. In general, due to the previously disturbed condition of the APE, environmental impacts are expected to be short-term from related construction activities.

4.1 Air Quality

During construction, potential sources that may affect air quality at the project site include the following:

- Vehicular traffic (additional sources of CO and CO_2);
- Fugitive dust emissions from excavation and construction;
- Soil and concrete/asphalt removal or placement (particulate); and
- Removal of sediment (possible odor issues if the sediment is from an anaerobic environment).

Construction vehicles traveling to and from the proposed project area will increase vehicular emissions in the area. During the construction phase of the project, on site construction equipment, consisting of primarily diesel engines, also will contribute to local air pollution. These sources are additional to existing emissions from local traffic. Because the project area is in attainment for ambient air quality standards, vehicles to be used during construction activities represent a very minor increase in the number of vehicles traversing the area daily, and because the prevailing trade winds rapidly carry pollutants offshore limiting the effect on receptors, increased vehicular emissions during construction of the proposed bikeway are not expected to be significant.

Construction activity also will generate short-term fugitive dust particulate emissions. Dust control measures will be taken onsite during construction activities. It is anticipated that EPA and DOH standards (HAR 11-59) will not be exceeded.

In general, effects to air quality from construction activities are expected to be short-term; no long-term impacts are anticipated.

Cumulative Impacts. Several concurrent and future possible actions have been identified in the vicinity of the proposed project area and APE:

- In the Ewa Plain area, development of residential and commercial areas near the former OR&L railroad have been planned through 2005 (C & C, 1997). Development may include, but is not limited to Gentry Homes, Schuler Homes, Historic Villages of Ewa, Villages of Kapolei, Ko 'Olina and buildings to support activities of the Hawaii Community Development Authority and the City and County of Honolulu Judiciary Office. The schedule and exact types of construction activities have not yet been completely established; they are dependant upon the economic demand. DOT projects planned that would intersect the APE include North-South Road.

- In the Waipahu area, Pouhala Marsh restoration being undertaken by Ducks Unlimited, The State of Hawaii, USFWS and the City and County of Honolulu. Pouhala Marsh restoration includes vegetation clearing, sculpting basins, levee removal, debris removal, placement of fish screens, damselfly habitat development, fencing and removal of 66,000 cubic yards of fill material (Ducks Unlimited, 1998). The schedule for the marsh restoration is August through November 2000. Other potential future projects in the Pearl Harbor area include the placement of a waterline by the City & County of Honolulu, and the Placement of a Hawaiian Electric Company pipeline in the energy corridor.

- Development makai of Farrington Highway is restricted in the Waianae Coast portion of the project area. As a result, development of most of that portion of the project area is not anticipated. However, in the r-o-w, the Hawaiian Railway Society is planning on refurbishing track and four bridges from Ko 'Olina to Lualualei Naval Road by 2005 (Howard, 2000).

Since numerous construction efforts have the potential to occur at the same time as the proposed project, coordination between DOT-HD and the various developers and agencies will occur in order to reduce and mitigate short-term primary impacts. Long-term cumulative impacts from the proposed project on air quality are not anticipated.

Mitigation Measures. To maintain current air quality, construction activities will employ the proper administrative and engineered controls to reduce air emissions (i.e., dust control,

sediment containment, reduced construction traffic, etc.). Construction vehicles will either remain on site or be scheduled to arrive and depart the project site during non-peak traffic hours.

Construction activities will be conducted in accordance with State of Hawaii and EPA air pollution control regulations. This includes a regular dust control (watering) program and the covering of soil stockpiles during transport and storage. Areas graded and cleared of vegetation also will be revegetated as soon as possible to reduce dust emissions. In the event that anaerobic sediment is removed from streams along the proposed route, it will also be contained to reduce emissions.

4.2 Biological Resources

4.2.1 Aquatic Biology

The impacts to aquatic biota are anticipated to be short-term and related to construction activities. Nearly all the proposed bridges for the project (3 in the Nanakuli/Kahe area and 2 in the Ewa Plain) cross normally dry gulches. The construction activities for the proposed bridges over the Waikele and Kapakahi Streams will result in increased turbidity at the site and will negatively affect the local aquatic population.

Based upon results from the biological survey performed by AECOS (Appendix B), the construction of these new spans will not have significant long-term impacts on either estuary. It is anticipated that the existing stream ecology will re-establish itself following the completion of these activities. It is also anticipated that aquatic species will not suffer long-term negative effects from increased short-term turbidity because of the existing degraded and silted condition of their habitat.

Cumulative Impacts. Several concurrent and future possible actions have been identified in the vicinity of the proposed project area and APE:

- In the Ewa Plain area, development of residential and commercial areas near the former OR&L railroad have been planned through 2005 (C & C, 1997). Development may include, but is not limited to Gentry Homes, Schuler Homes, Historic Villages of Ewa, Villages of Kapolei, Ko 'Olina and buildings to support activities of the Hawaii Community Development Authority and the City and County of Honolulu Judiciary Office. The schedule and exact types of construction activities have not yet been completely established; they are dependant upon the economic demand. DOT projects planned that would intersect the APE include North-South Road.

- In the Waipahu area, Pouhala Marsh restoration being undertaken by Ducks Unlimited, The State of Hawaii, USFWS and the City and County of Honolulu. Pouhala Marsh restoration includes vegetation clearing, sculpting basins, levee removal, debris

removal, placement of fish screens, damselfly habitat development, fencing and removal of 66,000 cubic yards of fill material (Ducks Unlimited, 1998). The schedule for the marsh restoration is August through November 2000. Other potential future projects in the Pearl Harbor area include the placement of a waterline by the City & County of Honolulu, and the Placement of a Hawaiian Electric Company pipeline in the energy corridor.

- Development makai of Farrington Highway is restricted in the Waianae Coast portion of the project area. As a result, development of most of that portion of the project area is not anticipated. However, in the r-o-w, the Hawaiian Railway Society is planning on refurbishing track and four bridges from Ko 'Olina to Lualualei Naval Road by 2005 (Howard, 2000).

Since numerous construction efforts have the potential to occur at the same time as the proposed project, coordination between DOT-HD and the various developers and agencies will occur in order to reduce and mitigate short-term effects. Long-term cumulative impacts from the proposed project on aquatic biology are not anticipated.

Mitigation Measures. Erosion control best management practices (BMPs) will be used to control turbidity and minimize negative impacts to stream and wetland habitats. Natural drainage flows will be maintained for the duration of the project so as not to affect the movement of fish and other aquatic species upstream and downstream of the project site.

4.2.2 Avifauna And Mammals

With the exception of the r-o-w at Pearl Harbor close to the salt marsh, construction of the proposed bikeway will have negligible impacts on native terrestrial vertebrate species (AECOS, 2000). The portion of the r-o-w extending west from Waipio Depot Road to approximately the western boundary of Waipahu Intermediate School passes close to wetlands that currently are utilized by at least two endangered endemic waterbirds. The noise and activity associated with constructing the proposed bikeway along this section may cause Hawaiian stilt and Hawaiian duck populations to vacate the loafing area during the course of construction. However, there is adequate comparable habitat within relatively close proximity to the site to provide alternate loafing areas for any potentially displaced birds. It should be noted that "loafing areas" are not primary habitats for the birds; they are used primarily for resting and socializing. Nesting and feeding occur elsewhere.

According to the avifaunal survey performed in February 2000, if there is no additional mechanical and/or human disturbance of the area during construction, the waterbirds may become acclimated to the construction activity. Additionally, it is logical to assume that following the completion of construction and the restoration of the site there will be no long-term effects to Hawaiian stilts or Hawaiian ducks. This can be attributed to the co-existence

of the waterbirds in the loafing areas with numerous subterranean pipelines traversing this portion of the APE.

Cumulative Impacts. Several concurrent and future possible actions have been identified in the vicinity of the proposed project area and APE:

- In the Waipahu area, Pouhala Marsh restoration being undertaken by Ducks Unlimited, The State of Hawaii, USFWS and the City and County of Honolulu. Pouhala Marsh restoration includes vegetation clearing, sculpting basins, levee removal, debris removal, placement of fish screens, damselfly habitat development, fencing and removal of 66,000 cubic yards of fill material (Ducks Unlimited, 1998). The schedule for the marsh restoration is August through November 2000. Other potential future projects in the Pearl Harbor area include the placement of a waterline by the City & County of Honolulu, and the Placement of a Hawaiian Electric Company pipeline in the energy corridor.

- Since several construction efforts have the potential to occur at the same time as the proposed project, coordination between DOT-HD and the various developers and agencies will occur in order to reduce and mitigate short-term primary impacts. Long-term cumulative impacts from the proposed project on avifaunal and mammalian resources are not anticipated.

Mitigation Measures. During the clearing and construction phase of the project, project activities will cease if any nesting threatened and endangered species are determined to be in the area. The DLNR and the USFWS will be contacted for advice before proceeding.

Following completion of the proposed project, the area will be restored and revegetated to as close to its original condition as possible; denuded areas are expected to recover quickly because of this, and the favorable climate and growing conditions.

4.3 Cultural Resources

According to the archaeological survey and background research (Appendix C), construction of the proposed bikeway will have "no effect" on the qualities that make the OR&L r-o-w significant, and has the potential to make this significant historic site accessible to a larger segment of the public. It is recommended that information about the history of the railroad be made available with signage along the bikeway or by other means.

Results from consultation with the island of Oahu Historic Preservation Specialist (Collins, 2000) at DLNR, SHPD and results from the archaeological survey indicate that three historic sites are known along the proposed bikeway route, including the OR&L railroad, a

former traditional Hawaiian burial site, and the former Pouhala fishpond. Locations of possibly sensitive cultural and historic sites include:

- Former gulches within the abandoned sugarcane fields across the Ewa Plain. Traditional Hawaiian historic sites may have existed across the Ewa Plain. However, steam plow work for sugar cane cultivation, which routinely reached depths of 3 ft. has probably destroyed any historic sites that were not deeply buried. There are no recorded surface sites along the proposed bikeway route from Kahe Point to the terminus east of Fort Weaver Road.
- The section from Kahe Point to the terminus at Lualualei Naval Road, where two retaining walls and three bridges are proposed, appear to be near areas of beach sand with a potential to contain unmarked human burials, similar to the burial discovered at SHPD Site 50-80-12-4061 (Appendix B).
- The section connecting the existing West Loch and Pearl Harbor bikepaths runs along the makai edge of urbanized Waipahu town, but crosses over the former fishponds Loko Pouhala and Loko Eo. Fishpond sediments associated with Loko Pouhala are likely to exist in the wetland in Waikele ahupua'a. It is unlikely that intact sediments associated with Loko Eo would be found because these were most probably disturbed or destroyed when the pond was filled more than a half century ago, thus the site is not eligible for listing on the State and National Registers of Historic Places.

Cumulative Impacts. Several concurrent and future possible actions have been identified in the vicinity of the proposed project area and APE:

- In the Waipahu area, Pouhala Marsh restoration being undertaken by Ducks Unlimited, The State of Hawaii, USFWS and the City and County of Honolulu. Pouhala Marsh restoration includes vegetation clearing, sculpting basins, levee removal, debris removal, placement of fish screens, damselfly habitat development, fencing and removal of 66,000 cubic yards of fill material (Ducks Unlimited, 1998). The schedule for the marsh restoration is August through November 2000. Other potential future projects in the Pearl Harbor area include the placement of a waterline by the City & County of Honolulu, and the Placement of a Hawaiian Electric Company pipeline in the energy corridor.
- Development makai of Farrington Highway is restricted in the Waianae Coast portion of the project area. As a result, development of most of that portion of the project area is not anticipated. However, in the r-o-w, the Hawaiian Railway Society is planning on refurbishing track and four bridges from Ko 'Olina to Lualualei Naval Road by 2005 (Howard, 2000).

Since numerous construction efforts have the potential to occur at the same time as the proposed project, coordination between DOT-HD and the various developers and agencies will occur in order to reduce and mitigate short-term primary impacts. Long-term cumulative impacts from the proposed project on cultural resources are not anticipated.

Mitigation Measures. Due to the possibility of unknown burials occurring in the Kahe Point to Lualualei Naval Road section of the proposed project area, a qualified archaeologist will monitor construction activities for the retaining walls and bridges, as well as areas of cut slope requiring excavation along the previously described areas. In general, if cultural materials, particularly human remains, are unexpectedly discovered during construction, ground-disturbing activities will cease in the immediate area and the SHPD as well as the City and County of Honolulu Police Department will be contacted. If native Hawaiian remains are encountered, the Oahu Burial Council also will be consulted.

Near Waikele Stream, the former Pouhala fishpond, a new stream crossing is being proposed instead of renovating the existing, old debilitated railroad bridge. Intact fishpond sediments might be exposed and disturbed, an action representing an adverse effect on historic sites. In this case, a data recovery plan to collect samples for characterization of the ancient setting is recommended.

Additionally, to mitigate any potential adverse effects of construction that the proposed project may have on cultural or historic sites, the following plans will be prepared for comment by SHPD and the Oahu Island Burial Council prior to construction:

- a burial plan to deal with inadvertently discovered human remains and matters of burial treatment for traditional Hawaiian remains; and,
- a data recovery plan to collect former fish pond sediment samples for characterization of the ancient setting.

4.4 Flora and Wetlands

Construction of the proposed bikeway will have short-term impacts on vegetation along the APE. No threatened or endangered plants (USFWS, 1996; USFWS, 1999) were observed during the botanical survey; the occurrences of native plants were rare due to the weedy plant species that dominate the previously disturbed environment. Two exceptions to this are the presence of native plant areas and wetland-type areas.

Near a segment of the Waianae Coast between Manners Beach Park and Pili O Kahe Beach Park in Nanakuli, approximately a dozen endemic shrubs of ma`o (native cotton, *Gossypium sandvicense*) are present. Another area with species of interest is near the west end of the north fence line of the former BPNAS or Kalaeloa area where there are

numerous large 'ilima (*Sida fallax*) plants growing. The majority of these indigenous plants are outside the 20-foot r-o-w, however, sufficiently close to be of concern from construction damage.

Biological survey results report that the proposed construction activities would most likely disturb the wetland-type areas associated with the APE in the West Loch area and stream and muliwai crossings, but are not expected to cause significant long-term effects. The wetlands lying close to the APE are of generally poor quality, in part because of access afforded to those who dump illegally, and in part because of poor water circulation in what were once Hawaiian fishponds, arising from extensive growth of mangrove, an introduced species.

Cumulative Impacts. Several concurrent and future possible actions have been identified in the vicinity of the proposed project area and APE:

- In the Waipahu area, Pouhala Marsh restoration being undertaken by Ducks Unlimited, The State of Hawaii, USFWS and the City and County of Honolulu. Pouhala Marsh restoration includes vegetation clearing, sculpting basins, levee removal, debris removal, placement of fish screens, damselfly habitat development, fencing and removal of 66,000 cubic yards of fill material (Ducks Unlimited, 1998). The schedule for the marsh restoration is August through November 2000. Other potential future projects in the Pearl Harbor area include the placement of a waterline by the City & County of Honolulu, and the Placement of a Hawaiian Electric Company pipeline in the energy corridor.

- Development makai of Farrington Highway is restricted in the Waianae Coast portion of the project area. As a result, development of most of that portion of the project area is not anticipated. However, in the r-o-w, the Hawaiian Railway Society is planning on refurbishing track and four bridges from Ko 'Olina to Lualualei Naval Road by 2005 (Howard, 2000).

Since numerous construction efforts have the potential to occur at the same time as the proposed project, coordination between DOT-HD and the various developers and agencies will occur in order to reduce and mitigate short-term primary impacts. Long-term cumulative impacts from the proposed project on flora and wetland resources are not anticipated.

Mitigation Measures. Wherever possible, grading and disturbances to vegetation in the area will be minimized or avoided. BMPs will also be employed to reduce impacts to wetlands during construction activities. Landscaping will be limited to revegetation of areas grubbed during construction.

Native Plants Areas. The clusters of plants species identified previously will be marked off with tape and/or flagged for protection during construction of the bike-path in adjacent areas. Once the path is completed, signage is recommended to provide information on the plants and caution hikers and bikers about damaging the plants.

To the extent possible, disturbed areas will be revegetated with indigenous plant species to reduce erosion. Additionally, all project-related materials will be placed or stored in ways to avoid or minimize disturbance to the sensitive vegetation areas.

Wetland-Type Areas. Construction of the proposed Leeward Bikeway will be completed with as little disruption as possible to the several wetland-type areas of concern. These wetland-type areas include the stream estuaries intersected by the proposed project area. The wetlands will provide an excellent scenic aspect to the completed bikeway; where garbage and other debris can be removed within the proposed project area as part of the bikeway construction, this will accomplished.

4.5 Hazardous Materials and Hazardous Wastes

No anticipated short-term or long-term effects from hazardous materials and wastes or petroleum products are expected. Areas of concern for exposure to hazardous materials and wastes in the APE include roadways, pipelines, the energy corridor, and areas of unregulated dumping.

Cumulative Impacts. Several concurrent and future possible actions have been identified in the vicinity of the proposed project area and APE:

- In the Ewa Plain area, development of residential and commercial areas near the former OR&L railroad have been planned through 2005 (C & C, 1997). Development may include, but is not limited to Gentry Homes, Schuler Homes, Historic Villages of Ewa, Villages of Kapolei, Ko 'Olina and buildings to support activities of the Hawaii Community Development Authority and the City and County of Honolulu Judiciary Office. The schedule and exact types of construction activities have not yet been completely established; they are dependant upon the economic demand. DOT projects planned that would intersect the APE include North-South Road.

- In the Waipahu area, Pouhala Marsh restoration being undertaken by Ducks Unlimited, The State of Hawaii, USFWS and the City and County of Honolulu. Pouhala Marsh restoration includes vegetation clearing, sculpting basins, levee removal, debris removal, placement of fish screens, damselfly habitat development, fencing and removal of 66,000 cubic yards of fill material (Ducks Unlimited, 1998). The schedule for the marsh restoration is August through November 2000. Other potential future projects in the Pearl Harbor area include the placement of a waterline by the City & County of

Honolulu, and the Placement of a Hawaiian Electric Company pipeline in the energy corridor.

- Development makai of Farrington Highway is restricted in the Waianae Coast portion of the project area. As a result, development of most of that portion of the project area is not anticipated. However, in the r-o-w, the Hawaiian Railway Society is planning on refurbishing track and *four* bridges from Ko 'Olina to Lualualei Naval Road by 2005 (Howard, 2000).

Since numerous construction efforts have the potential to occur at the same time as the proposed project, coordination between DOT-HD and the various developers and agencies will occur in order to reduce and mitigate short-term primary impacts. Long-term cumulative impacts from the proposed project on hazardous wastes and materials are not anticipated.

Mitigation Measures. Mitigation measures for construction equipment and supplies, including petroleum products, shall consist of confined storage areas away from stream and wetland areas. Storage containers will be equipped with containment devices to contain spills or releases. All refueling and maintenance activities will take place on paved land, away from sensitive areas. To the extent possible, equipment will be kept free of pollutants *during construction* activities. Garbage and waste receptacles will be provided on site for waste containment. All wastes will be removed from the project area after completion of the project.

A contingency plan to control accidental spills of petroleum products shall be developed and implemented at the project site. Absorbent pads and containment booms shall be stored on site to facilitate quick response and clean-up of any spills. The contractor also will not dump any material in the streams or wetlands.

Removal of existing illegally dumped waste material identified in Section 3.6 within the r-o-w will also occur during clearing and grading activities. In the event that subsurface contamination is encountered, it will be identified and handled appropriately in accordance with State of Hawaii and EPA regulations.

A mitigation plan and measures will be in place to address unforeseen pipeline breakage or punctures during bridge construction/pipeline relocation and/or during grading activities.

To mitigate problems in transporting hazardous materials and wastes, transporters are required follow DOT and EPA regulations.

4.6 Land Use and Ownership

The proposed project is consistent with the local transportation plan, land use plans and urban/rural policies for the Waianae, Ewa and Central Oahu districts.

The DOT-HD will need to establish new r-o-ws for the proposed project. According to DOT-HD, only large landowners will be affected by land acquisitions; impacts to small landowners are not anticipated. Land owners to be contacted for right-of-way acquisition include: DLNR; Hawaiian Electric Company; James Campbell Trust Estate; Ko 'Olina Development LLC; and Pan Pacific Hoteliers Inc.

Cumulative Impacts. Several concurrent and future possible actions have been identified in the vicinity of the proposed project area and APE:

- In the Ewa Plain area, development of residential and commercial areas near the former OR&L railroad have been planned through 2005 (C & C, 1997). Development may include, but is not limited to Gentry Homes, Schuler Homes, Historic Villages of Ewa, Villages of Kapolei, Ko 'Olina and buildings to support activities of the Hawaii Community Development Authority and the City and County of Honolulu Judiciary Office. The schedule and exact types of construction activities have not yet been completely established; they are dependant upon the economic demand. DOT projects planned that would intersect the APE include North-South Road.

- In the Waipahu area, Pouhala Marsh restoration being undertaken by Ducks Unlimited, The State of Hawaii, USFWS and the City and County of Honolulu. Pouhala Marsh restoration includes vegetation clearing, sculpting basins, levee removal, debris removal, placement of fish screens, damselfly habitat development, fencing and removal of 66,000 cubic yards of fill material (Ducks Unlimited, 1998). The schedule for the marsh restoration is August through November 2000. Other potential future projects in the Pearl Harbor area include the placement of a waterline by the City & County of Honolulu, and the Placement of a Hawaiian Electric Company pipeline in the energy corridor.

- Development makai of Farrington Highway is restricted in the Waianae Coast portion of the project area. As a result, development of most of that portion of the project area is not anticipated. However, in the r-o-w, the Hawaiian Railway Society is planning on refurbishing track and four bridges from Ko 'Olina to Lualualei Naval Road by 2005 (Howard, 2000).

Since numerous construction efforts have the potential to occur at the same time as the proposed project, coordination between the State of Hawaii DOT-HD and the various developers and agencies will occur in order to reduce and mitigate short-term primary impacts. Long-term cumulative impacts from the proposed project on land use and ownership not anticipated.

4.7 Noise

The noise levels discussed in this section pertain to human receptors; the noise effects associated with waterbirds and other biological resources are discussed in Section 4.2.2.

Intermittent elevated noise levels from certain types of construction activities are expected. Onsite noise levels would not exceed the permissible noise exposure levels and durations shown in Table 4-1 or as defined by the DOH. To reduce nearby residential noise exposure, construction activities would be conducted on weekdays and in daytime hours in accordance with HRS 342-F-1. As a result, no significant noise impacts are expected from construction of the proposed Leeward Bikeway. Long-term effects related to bicyclist using the bikeway are not anticipated, since use is anticipated to be non-motorized, continuous movement and intermittent in nature. To reduce possible negative noise-effects of users of the proposed bikeway, a code of conduct for users (as described in Section 3.16) will be implemented requiring continuous movement, restriction of use of unauthorized vehicles, with use limited to daylight hours. Additionally, permanent bicycle police patrols will be requested for the pathways.

Table 4-1 Permissible Noise Exposure Levels and Durations

Duration (Hours/Day)	Sound Level (dB)
8	90
4	92
4	95
3	97
2	100
1 to 1.5	102
1	105
0.5	110
0.25 or less	115

Source: 29 CFR 1910.95

Cumulative Impacts. Several concurrent and future possible actions have been identified in the vicinity of the proposed project area and APE:

- In the Ewa Plain area, development of residential and commercial areas near the former OR&L railroad have been planned through 2005 (C & C, 1997). Development may include, but is not limited to Gentry Homes, Schuler Homes, Historic Villages of Ewa, Villages of Kapolei, Ko 'Olina and buildings to support activities of the Hawaii Community Development Authority and the City and County of Honolulu Judiciary

Office. The schedule and exact types of construction activities have not yet been completely established; they are dependant upon the economic demand. DOT projects planned that would intersect the APE include North-South Road.

- In the Waipahu area, Pouhala Marsh restoration being undertaken by Ducks Unlimited, The State of Hawaii, USFWS and the City and County of Honolulu. Pouhala Marsh restoration includes vegetation clearing, sculpting basins, levee removal, debris removal, placement of fish screens, damselfly habitat development, fencing and removal of 66,000 cubic yards of fill material (Ducks Unlimited, 1998). The schedule for the marsh restoration is August through November 2000. Other potential future projects in the Pearl Harbor area include the placement of a waterline by the City & County of Honolulu, and the Placement of a Hawaiian Electric Company pipeline in the energy corridor.

- Development makai of Farrington Highway is restricted in the Waianae Coast portion of the project area. As a result, development of most of that portion of the project area is not anticipated. However, in the r-o-w, the Hawaiian Railway Society is planning on refurbishing track and four bridges from Ko 'Olina to Lualualei Naval Road by 2005 (Howard, 2000).

Since numerous construction efforts have the potential to occur at the same time as the proposed project, coordination between DOT-HD and the various developers and agencies will occur in order to reduce and mitigate short-term primary impacts. Long-term cumulative impacts from the proposed project associate with noise are not anticipated.

Mitigation Measures. Short-term construction-related noise impacts will be controlled to within acceptable limits by coordinating construction projects and ultimately complying with all requirements set forth in HAR 11-46 - Community Noise Control, HAR 11-42 - Vehicular Noise Control for Oahu, and HRS 342F - Noise Pollution.

Onsite occupational exposure to noise from construction equipment will be reduced, in accordance with OSHA regulations by requiring construction workers (e.g., heavy equipment operators) to wear appropriate hearing protection (i.e., ear plugs and/or muffs).

Work will be completed during business hours to reduce impacts to nearby residents. In the event that work would occur after normal working hours (i.e., at night or on weekends), or special activities, such as pile-driving, are required, appropriate permitting and monitoring as well as development and implementation of administrative and engineering controls shall be employed.

4.8 Socioeconomic

There are no anticipated negative short-term or long-term socioeconomic impacts from the proposed project. The development of the proposed bikeway should not induce or decrease economic or population growth and public services will not be impacted in the Waianae, Ewa or Central areas or the region in general. The bikeway will be constructed within the state r-o-w and take place during normal working hours on weekdays, therefore, existing lifestyles in the area will not be altered during construction or in the long term.

The development of the bikeway may have positive long-term socioeconomic effects associated with the surrounding social, aesthetic and economic environments and may include the following:

- Increased access to community facilities and services, i.e., recreational and cultural facilities, schools, and regional parks
- Alternate mode of transportation, i.e., availability of a route for bicyclist and pedestrians to commute safely between Waianae, Ewa and Central Oahu districts
- Existence of and proximity to significant historic, archaeological, and cultural sites or property
- Increased access to scenic areas, views and natural landscape
- Economic base of the surrounding areas may increase due to potential small business and tourism influx

Cumulative Impacts. No other concurrent projects affecting socio-economic conditions (federal, state, county, or community) were identified along the Waianae Coast and Pearl Harbor sections of the proposed project area and APE. However, in the Ewa plain section of the proposed project area and APE, significant development is planned as part of the growth of Kapolei (C & C, 1997). The implementation of the proposed project is not anticipated to have a short- or long-term negative socioeconomic impacts in the Ewa Plain area, when coupled with the planned development.

4.9 Transportation

Effects on transportation will be experienced mainly at Farrington Highway and Renton Road, which parallel the proposed project construction; and at road crossings at several Waianae beach park entrances, Aliinui Drive (Ko'Olina entrance), Kalaeloa Boulevard, Fort Barrette Road, Fort Weaver Road and Waipahu Depot Road. Potential lane closures during construction include a bend on Farrington Highway where a guard rail may need to be extended to protect the bikeway and the repainting/widening of the cross walks at roadway

crossings. The lane closures will be short-term in nature and scheduled outside peak traffic periods to minimize the impact on traffic.

Occasional increases in construction traffic will result during the initial and final stages of the project and during the periodic movement of construction equipment and materials within the project area. Traffic patterns throughout the course of the proposed two-year project should not be substantially altered by the proposed action. Minor delays during peak traffic hours can be expected. This can be largely attributed to the arrival and departure of construction crews.

Short-term effects include minor changes to traffic patterns and visual distractions as a result of the close proximity of the construction activities to select roadways. There are no anticipated long-term negative effects from the proposed project.

Cumulative Impacts. Several concurrent and future possible actions have been identified in the vicinity of the proposed project area and APE:

- In the Ewa Plain area, development of residential and commercial areas near the former OR&L railroad have been planned through 2005 (C & C, 1997). Development may include, but is not limited to Gentry Homes, Schuler Homes, Historic Villages of Ewa, Villages of Kapolei, Ko 'Olina and buildings to support activities of the Hawaii Community Development Authority and the City and County of Honolulu Judiciary Office. The schedule and exact types of construction activities have not yet been completely established; they are dependant upon the economic demand. DOT projects planned that would intersect the APE include North-South Road.

- In the Waipahu area, Pouhala Marsh restoration being undertaken by Ducks Unlimited, The State of Hawaii, USFWS and the City and County of Honolulu. Pouhala Marsh restoration includes vegetation clearing, sculpting basins, levee removal, debris removal, placement of fish screens, damselfly habitat development, fencing and removal of 66,000 cubic yards of fill material (Ducks Unlimited, 1998). The schedule for the marsh restoration is August through November 2000. Other potential future projects in the Pearl Harbor area include the placement of a waterline by the City & County of Honolulu, and the Placement of a Hawaiian Electric Company pipeline in the energy corridor.

- Development makai of Farrington Highway is restricted in the Waianae Coast portion of the project area. As a result, development of most of that portion of the project area is not anticipated. However, in the r-o-w, the Hawaiian Railway Society is planning on refurbishing track and four bridges from Ko 'Olina to Lualualei Naval Road by 2005 (Howard, 2000).

Since numerous construction efforts have the potential to occur at the same time as the proposed project, coordination between DOT-HD and the various developers and agencies will occur in order to reduce and mitigate short-term primary impacts. Long-term cumulative impacts from the proposed project on transportation are not anticipated.

Mitigation Measures. Appropriate traffic signs and controls will be posted along the roadways on either side of the project area to increase awareness of potential traffic flow delays and potential hazards from reduced visibility.

4.10 Utilities and Infrastructure

Various utilities are located within the project limits including utility poles, various pipelines, the energy corridor, water and sewer lines. Most utilities will not be impacted, however some will require relocation. No short-term effects are expected with the relocation of 80 utility poles and the pipelines on Waikele and Kapakahi bridges. As requested by the City and County of Honolulu Fire Department, fire apparatus access will be maintained throughout the duration of the project. In general, significant impacts to infrastructure are not anticipated.

Cumulative Impacts. Several concurrent and future possible actions have been identified in the vicinity of the proposed project area and APE:

- In the Ewa Plain area, development of residential and commercial areas near the former OR&L railroad have been planned through 2005 (C & C, 1997). Development may include, but is not limited to Gentry Homes, Schuler Homes, Historic Villages of Ewa, Villages of Kapolei, Ko 'Olina and buildings to support activities of the Hawaii Community Development Authority and the City and County of Honolulu Judiciary Office. The schedule and exact types of construction activities have not yet been completely established; they are dependant upon the economic demand. DOT projects planned that would intersect the APE include North-South Road.

- In the Waipahu area, Pouhala Marsh restoration being undertaken by Ducks Unlimited, The State of Hawaii, USFWS and the City and County of Honolulu. Pouhala Marsh restoration includes vegetation clearing, sculpting basins, levee removal, debris removal, placement of fish screens, damselfly habitat development, fencing and removal of 66,000 cubic yards of fill material (Ducks Unlimited, 1998). The schedule for the marsh restoration is August through November 2000. Other potential future projects in the Pearl Harbor area include the placement of a waterline by the City & County of Honolulu, and the Placement of a Hawaiian Electric Company pipeline in the energy corridor.

- Development makai of Farrington Highway is restricted in the Waianae Coast portion of the project area. As a result, development of most of that portion of the project area is not anticipated. However, in the r-o-w, the Hawaiian Railway Society is planning on refurbishing track and four bridges from Ko 'Olina to Lualualei Naval Road by 2005 (Howard, 2000).

Since numerous construction efforts have the potential to occur at the same time as the proposed project, coordination between DOT-HD and the various developers and agencies will occur in order to reduce and mitigate short-term primary impacts. Long-term cumulative impacts from the proposed project on utilities and infrastructure are not anticipated.

Mitigation Measures. In order to avoid impact to utilities in the APE, the utility owners will be contacted to determine their location and the methods to avoid and or relocate them. In the event that there is any interruption of the existing fire hydrant system during the project, the City and County of Honoulu Fire Department will be notified immediately.

For utilities that will be attached to the bridges, minimum clearance will be allowed so that maintenance and inspection can be performed. Utilities requiring attachment to the bridges will use stainless steel inserts or bolts to prevent corrosion to the bridge structures. Section 4.5 addresses environmental consequences and mitigation measures for pipeline relocation.

Non-hazardous wastes generated from the proposed project will be disposed at an approved landfill. To the extent possible, soil and useable materials will be recycled to minimize land disposal.

4.11 Visual

Disruption of the existing visual quality near Leeward Bikeway will occur in the short term and be limited to construction activities. Long-term negative visual effects are not expected; the Leeward Bikeway will be very compatible with the existing landscape due to its low profile. The proposed project will also help preserve visual landmarks and vistas, and reveal visually aesthetic qualities of the natural, rural and urban environment to bikeway users. As a result, no significant visual impacts are expected from the proposed project.

Cumulative Impacts. Since the Leeward Bikeway project will not include any vertical or obstructing features and will enhance landscape aesthetics, impacts and/or cumulative impacts to visual resources are not anticipated.

Mitigation Measures. Short-term construction-related visual impacts will be controlled by timing and phasing of construction with the revegetation of cleared areas. Additionally, where illegal dumping is evident within the state r-o-w (e.g., abandoned vehicles,

appliances and solid waste), such wastes will be removed as part of the bikeway construction.

4.12 Water Resources

Water resources, which include drainage, stream flow, and water quality, will be temporarily affected where the APE comes in contact with streams and wetlands. Environmental effects related to water resources are anticipated to be primarily short-term and related to construction activities at Waikele and Kapakahi Streams and Keanaoio Gulch muliwai. Water resource surveys of the APE indicate no anticipated long-term negative effects to surface or groundwater quality from the building of new bridge spans on either stream estuary or construction activities near wetland areas.

Cumulative Impacts. Several concurrent and future possible actions have been identified in the vicinity of the proposed project area and APE:

- In the Ewa Plain area, development of residential and commercial areas near the former OR&L railroad have been planned through 2005 (C & C, 1997). Development may include, but is not limited to Gentry Homes, Schuler Homes, Historic Villages of Ewa, Villages of Kapolei, Ko 'Olina and buildings to support activities of the Hawaii Community Development Authority and the City and County of Honolulu Judiciary Office. The schedule and exact types of construction activities have not yet been completely established; they are dependant upon the economic demand. DOT projects planned that would intersect the APE include North-South Road.

- In the Waipahu area, Pouhala Marsh restoration being undertaken by Ducks Unlimited, The State of Hawaii, USFWS and the City and County of Honolulu. Pouhala Marsh restoration includes vegetation clearing, sculpting basins, levee removal, debris removal, placement of fish screens, damselfly habitat development, fencing and removal of 66,000 cubic yards of fill material (Ducks Unlimited, 1998). The schedule for the marsh restoration is August through November 2000. Other potential future projects in the Pearl Harbor area include the placement of a waterline by the City & County of Honolulu, and the Placement of a Hawaiian Electric Company pipeline in the energy corridor.

- Development makai of Farrington Highway is restricted in the Waianae Coast portion of the project area. As a result, development of most of that portion of the project area is not anticipated. However, in the r-o-w, the Hawaiian Railway Society is planning on refurbishing track and four bridges from Ko 'Olina to Lualualei Naval Road by 2005 (Howard, 2000).

Since numerous construction efforts have the potential to occur at the same time as the proposed project, coordination between DOT-HD and the various developers and agencies will occur in order to reduce and mitigate short-term primary impacts. Long-term cumulative impacts from the proposed project on water resources are not anticipated.

Mitigation Measures. A water quality-monitoring program will be implemented during construction, pursuant to the requirements of the Section 401 WQC. Proposed construction in the stream and wetland areas will be minimized to the furthest extent possible. The contractor will comply with the requirements of Section 639, Temporary Project Water Pollution Control (Soil Erosion) of the State of Hawaii Standard Specifications for Road and Bridge Construction.

During the construction of the project phases where the APE is adjacent to potential water resources, the contractor will implement temporary erosion control BMPs. These may include, but is not limited to, the creation of control swales to channel runoff near the bridge constructions and wetland areas, establishment of sediment traps, and construction of control berms.

Areas graded and denuded of vegetation will be covered with mulch during all phases of the project. Silt fences along stream and wetland areas will be used to reduce short-term erosion. Additionally, all project-related materials will be placed or stored in ways to avoid or minimize disturbance to streams and stream banks. Following completion of the construction phases, permanent erosion control measures will be implemented in the APE including revegetation of the stream banks and areas graded during construction.

4.13 Security and Maintenance.

Security and maintenance concerns exist for bikeway users and neighboring properties.

Cumulative Impacts. None identified at this time.

Mitigation Measures. Currently, access to the r-o-w is not restricted. Development of the proposed bikeway will improve the r-o-w by restricting unauthorized vehicular access, restricting hours of access, requiring a code of conduct, requesting permanent police patrols and by providing regular maintenance as discussed in Section 3.16.

4.14 Compliance with Federal, State, and Local Land Use Plans, Policies and Controls for the Area Concerned

Several federal, state and local plans, policies and controls have been identified for the proposed project area. They include the following, with discussion of conflict or compliance with the proposed project:

- The CZM Programs ten objectives as defined by Chapter 205A of the HRS includes:

  Recreational Resources. Provide coastal recreational opportunities accessible to the public. The proposed project provides access to recreational opportunities on portions of the bikeway that are along the coast. The proposed project is in compliance with this objective.

  Historic Resources. Protect, preserve and where desirable restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant to Hawaiian and American history and culture. The proposed project will also provide access to portions of the former OR&L railway which are on the National Register of Historic Places. Cultural resources may be present in the proposed project area, in the form of pre-historic burials and cultural layers. Mitigation measures will be taken in the form of archaeological monitoring, with recovery and burial plans in place. The proposed project will be in compliance with this objective.

  Scenic and Open Space Resources. Protect, preserve and where desirable, restore or improve the quality of coastal scenic and open space resources. Because of its limited profile, the proposed project will be in compliance with this objective.

  Coastal Ecosystems. Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems. The proposed project is not relevant to this objective.

  Economic Uses. Provide public or private facilities and improvements important to the State's economy in suitable locations. The proposed project is not relevant to this objective. However, it may have positive economic benefits in providing alternate modes of transportation and increasing recreational opportunities.

  Coastal Hazards. reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution. The implementation of the proposed project will not be in conflict existing drainage across the proposed project site. It should be noted that the proposed project will not ameliorate flooding, nor can it reduce hazards of natural events such as tsunamis or high waves. This project is in partial compliance with this objective.

  Managing Development. Improve the development review process, communication and public participation in the management of coastal resources and hazards. The proposed project is not relevant to this objective.

  Public Participation. Stimulate public awareness, education, and participation in coastal management. The proposed project has been part of the public review process

in community meetings as well as the EA notification process. The proposed project is in compliance with this objective.

***B*each Protection.** Protect beaches for public use and recreation. The proposed project is not relevant to this objective, since it is not located in an active beach area; it is usually located near Farrington Highway.

Marine Resources. Implement the State's ocean resources management plan. Based on the discussions above, the proposed project is generally in compliance with the States' ocean resources management plan.

- **Shoreline Setback, ROH 23.** It is a primary policy of the city to protect and preserve the natural shoreline, especially sandy beaches; to protect and preserve public pedestrian access laterally along the shoreline and to the sea; and to protect and preserve open space along the shoreline. It is also a secondary policy of the city to reduce hazards to property from coastal floods. Since the proposed project is not directly on the beach or shoreline, it does not directly affect shoreline processes, access or open space. It should be noted that the proposed project will not ameliorate flooding, nor can it reduce hazards of natural events such as tsunamis or high waves. The proposed project is generally in compliance with these objectives.

- **Special Management Area, ROH 25.** It is the City and County of Honolulu's policy to preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawaii. Special controls on development within an area along the shoreline are necessary to avoid permanent loss of valuable resources and foreclosure of management options, and to insure that adequate public access is provided to public owned or used beaches, recreation areas, and natural reserves, by dedication or other means. It is also the policy of the city and county to avoid or minimize damage to natural or historic special management area wetlands wherever prudent or feasible; to require that activities not dependent upon a wetland location be located at upland sites; to allow wetland losses only where all practicable measures have been applied to reduce those losses that are unavoidable and in the public interest. The proposed project allows adequate public access to the beach, and provides for protection of sensitive ecological and historical sites. The proposed project is in compliance with these objectives.

- **The General Plan, City and County of Honolulu, Section V. Transportation and Utilities, Objective A.** To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people including the poor and the physically handicapped, and offer a variety of attractive and convenient modes of travel...to develop and maintain an integrated ground-transportation system consisting of the following elements and their primary

purposes...c.) Bikeways-for recreational activities and trips to work, schools, shopping centers, and community facilities...(City and County of Honolulu 1992). The proposed project is in compliance with these objectives.

Additionally, the proposed Leeward Bikeway project is consistent with the existing Central Oahu Sustainable Communities Plan, the Ewa Development Plan and the Waianae Sustainable Communities Plan. These plans call for the development of the Ewa Plain into the second city of Kapolei, the economic development of the Central Oahu-Waipahu area, and the preservation of the rural qualities of the Waianae area. Greenways, open spaces, panoramic views, preservation of historic features, access to natural features and development of bikeways are required in these plans. The implementation of the proposed Leeward Bikeway project is consistent with these plans.

4.15 Irreversible or Irretrievable Commitment of Resources

Although the proposed activities would result in some irreversible or irretrievable commitment of resources, such as various metallic materials, minerals, fossil fuels, and labor, the amount of materials and energy required for any proposed action-related activities is anticipated to be relatively small. However, the calculated amounts and types of materials has yet to be calculated.

4.16 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Executive Order 12898)

The proposed Leeward Bikeway project should be conducted in a manner that would not substantially affect human health or the environment. The environmental assessment has identified no effects that would result in a disproportionately high or adverse effect on minority or low-income populations in the area. The activities would also be conducted in a manner that would not exclude persons from participation, deny persons the benefits of, or subject persons to discrimination under the Leeward Bikeway project because of their race, color, or national origin.

5. DETERMINATION, FINDINGS AND REASONS FOR SUPPORTING DETERMINATION

To determine whether the proposed action may have a significant impact on the environment, the project, its anticipated primary and secondary consequences, and the cumulative, short and long term effects have been evaluated. Based on the studies performed and research evaluated, a finding of no significant impact (FONSI) is anticipated based on the significance criteria summarized below.

5.1 Significance Criteria

According to the DOH Rules (HAR 11-200-12), an applicant or agency must determine whether an action may have a significant impact on the environment. This includes all phases of the project, its expected consequences, both primary and secondary, its cumulative impact with other projects, and its short and long term effects. In making the determination, "Significance Criteria" are used as a basis for identifying whether significant environmental impacts will occur. According to HAR 11-200-12, an action shall be determined to have a significant impact on the environment if it meets one of the following criteria:

- **Involves an irrevocable commitment to, loss or destruction of any natural or cultural resources.** The proposed project will not adversely impact scenic views of the ocean or any mountains in the area. Long-term negative effects are not expected and the overall visual qualities of the area will not change. Coordination of the project construction will allow for revegetation and landscaping to take place prior to completion of the entire project. Locations of sensitive plant species identified during the biological survey ('ilima and ma'o) will be marked prior to construction so that the identified plants are avoided. Construction activities may disrupt loafing activities of native birds; however, the areas in use are not primary habitats and loafing behavior in the area is expected to resume after construction. Construction activities would also cease and/or be redirected in the event that nesting birds are encountered.

  An archaeological survey for the project determined that the former OR&L railroad is the main historic feature along the proposed project area and that the Leeward Bikeway will have no effect on the qualities that make it significant. Possible Hawaiian burials could exist in the sands along the Waianae Coast portion of the proposed project area, and fishpond sediments could occur in the vicinity of the former Pouhala fishpond near Waikele Stream. Should any archaeologically significant artifacts, bones, or other indicators of previous onsite activity be uncovered during the construction, work will be halted and their treatment will be in strict compliance with the requirements of the SHPD and DLNR. This includes the development of a burial plan and a sediment recovery plan.

Environmental effects related to water resources are anticipated to be primarily short-term and related to construction activities at Waikele and Kapakahi Streams and Keanaoio Gulch muliwai. Water resource surveys of the APE indicate no anticipated long-term negative effects to surface or groundwater quality from the building of new bridge spans on either stream estuary or construction activities near wetland areas.

- **Curtails the range of beneficial uses of the environment.** The proposed Leeward Bikeway will be constructed in the r-o-w of the former OR&L railroad, which was built in the late 1800's. The development of the bikeway will allow greater public access to this historic site. It will also be available as a route for alternative modes of transportation in the Ewa and Waianae Districts. The development of the Leeward Bikeway in the former OR&L railroad easement will not decrease beneficial uses of the environment.

- **Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders.** The proposed development is consistent with the State Environmental Policies established in HRS 344.

- **Substantially affects the economic or social welfare of the community or state.** The proposed project, after completion, will have a positive impact on the Ewa and Waianae Districts populations through increased access to historic features and safe thoroughfare for bicyclists and pedestrians. The existing lifestyles in the area will not be altered during the construction of the project or in the long-term. All construction will take place during normal working hours on weekdays. There are no planned construction activities during weekends and holidays. The proposed improvements are consistent the Central Oahu Sustainable Communities Plan, the Ewa Development Plan and the Waianae Sustainable Community Plan. Surrounding land use patterns will not be negatively altered, nor will unplanned or negative population growth or its distribution be stimulated.

- **Substantially affects public health.** Although public health may be minimally affected by short-term construction-related impacts, (i.e. air, noise, traffic, and water quality), these should be mitigated. The project will have appropriate federal, state and county land use permits, construction BMPs, water quality monitoring plans, and pollution prevention contingency plans to prevent, reduce or mitigate any possible adverse impacts.

- **Involves substantial secondary impacts, such as population changes or effects on public facilities.** The development of the Leeward Bikeway will not have any negative impacts associated with public growth or the need for public facilities. The Leeward Bikeway will benefit the public by providing access to historic features and a

route for alternative modes of transportation. Development of the proposed bikeway will have a positive effect by improving the r-o-w by restricting unauthorized vehicular access, restricting hours of access, requiring a code of conduct, requesting permanent police patrols and by providing regular maintenance. The addition of permanent police patrols and maintenance is consistent with development and sustainable growth in the proposed project areas of Waipahu, Ewa and Waianae.

- **Involves a substantial degradation of environmental quality.** The proposed project will utilize the existing r-o-w of the former OR&L railroad which was previously disturbed. Anticipated short-term impacts to air, noise and water quality are anticipated during construction activities. The implementation of controls for permits and BMPs should reduce and mitigate these impacts. There are no anticipated long-term impacts that would degrade environmental quality.

- **Is individually limited, but cumulatively has considerable effect on the environment, or involves a commitment for larger actions.** The proposed project is individually limited in terms of short- and long-term impacts. However, numerous construction efforts have the potential to occur at the same time as the proposed project. Coordination between the State of Hawaii DOT-HD and the various developers and agencies will occur in order to reduce and mitigate short-term primary impacts. Long-term cumulative impacts from the proposed project on various resources are not anticipated.

  The project is consistent with the existing and planned Central Oahu's Sustainable Communities Plan and is not anticipated to have an accumulative adverse effect on the environment based on the review against past, present and reasonably foreseeable future actions in the area.

- **Substantially affects a rare, threatened, or endangered species or its habitat.** The biological resources survey completed for this project indicates that sensitive plant and bird species are in the proposed project vicinity. Native plant species rare in lowland Oahu ('ilima and ma'o) are present just outside the r-o-w in the Ewa and Waianae Coast areas, respectively. Because of their rarity in lowland Oahu and close proximity to the r-o-w, they will be identified during construction so that damage to them can be avoided. Several waterbirds also utilize wetlands near the proposed project area. The Hawaiian stilt and Hawaiian duck are endangered species that utilize loafing areas in wetlands near the proposed project area. Construction activities may disrupt loafing activities of native birds; however, the areas in use are not primary habitats and loafing behavior is expected to resume after construction. Construction activities would cease and/or be redirected in the event that nesting birds are encountered.

- **Detrimentally affects air or water quality or ambient noise levels.** The project will obtain appropriate federal, state and county land use permits, construction BMPs, water quality monitoring plans, and pollution prevention contingency plans to prevent, reduce or mitigate any possible impact to these resources.

- **Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters.** The flood hazards have been determined by FEMA on updated FIRM in 1990. Portions of the proposed project area along the Waianae Coast are susceptible to tsunami inundation and flooding. Sections of the proposed project site in the Ewa Plain area are not located in a tsunami inundation zone, and are not likely to flood. Areas along West Loch may have flooding associated with a tsunami.

- **Substantially affects scenic vistas and view planes identified in county or state plans or studies.** Disruption of the existing visual quality will be short-term and minor as a result of construction activities. Long-term effects are not expected as the visual qualities of the proposed project area will not change significantly.

- **Requires substantial energy consumption.** Construction of the proposed project will not require substantial energy consumption.

5.2 Determination

Based on the above evaluation of the significance criteria and the discussion of impacts and mitigative measures contained in this document, it is anticipated that the proposed project will not have a significant negative effect on the environment.

6. CONSULTATIONS MADE DURING THE ENVIRONMENTAL ASSESSMENT PROCESS

Table 6-1 identifies the environmental companies that contributed to this draft EA and the agencies, citizen groups, and individuals either consulted in the development of the draft EA or were provided a copy for review. Pursuant to HRS 343 and HAR 11-200-9, the draft EA is subject to a 30-day review and comment period. Correspondence is presented in Appendix E.

Table 6-1: Contributors to the Draft EA

Company	Role
Earth Tech, Inc.	Lead consultant for DEA
Rick Guinther, AECOS	Biological surveys
Thomas Dye, International Archeological Research Institute	Archeological survey
Federal Agencies	
Federal Highway Administration	
U.S. Army Corps of Engineers	
U.S. Department of Agriculture, Natural Resources Conservation Service	
U.S. Department of the Interior, Fish and Wildlife Service	
U.S. Environmental Protection Agency, WTR-9, Region IV	
U.S. Geological Survey, Water Resources Division	
State Agencies	
Department of Agriculture	
Department of Business, Economic Development and Tourism, Land Use Commission	
Department of Health, Environmental Management Division, and Water Resources Division	
Department of Land and Natural Resources, Land Division and Aquatic Division	
State Historic Preservation Office	
Office of Environmental Quality Control	
Office of Hawaiian Affairs	
Office of Planning, DBET	
University of Hawaii, Environmental Center	

City and County of Honolulu Agencies
Department Planning and Permitting
Fire Department
Police Department
Department of Public Works
Community Groups and Individuals
Ducks Unlimited
Hawaiian Railway Society
Historic Hawaiian Foundation
Life of the Land
Sierra Club
#22 Waipahu Neighborhood Board
#23 Ewa Neighborhood Board
#24 Waianae Coast Neighborhood Board
#34 Makakilo/Kapolei/Honokai Hale Neighborhood Board

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Appendix A
Deed

RECORDATION REQUESTED BY:
DEPARTMENT OF TRANSPORTATION
ABSTRACTING SECTION
AFTER RECORDATION, RETURN TO
DEPARTMENT OF TRANSPORTATION
ABSTRACTING SECTION
RETURN BY: MAIL ☐ PICKUP ☐

80- 68673

STATE OF HAWAII
BUREAU OF CONVEYANCES
RECORDED

80 JUN 26 P 2: 33

LIBER 14814, 320
C. P. LAU HOCK, REGISTRAR

DEED

THIS DEED, made this 5th day of June, 1980, by and between the UNITED STATES OF AMERICA, acting by and through the DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, hereinafter referred to as the DEPARTMENT, and the STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION, hereinafter referred to as the GRANTEE:

W I T N E S S E T H:

WHEREAS, the STATE OF HAWAII has filed application under the provisions of the Act of Congress approved August 27, 1958, as amended (Title 23, United States Code, Section 317), for the transfer to the GRANTEE of lands hereinafter described situated in the STATE OF HAWAII, and under the control and jurisdiction of the General Services Administration, and

WHEREAS, this transfer is further authorized under the provisions of the Act of Congress approved October 15, 1966 (80 Stat. 931, 937, Section 6(a)(1)(A)), and the Act of Congress approved August 13, 1973, 87 Stat. 262, Section 124 (Title 23, United States Code, Section 217), authorizes the construction of separate or preferential bicycle lanes or paths and pedestrian walkways in conjunction or connection with Federal-aid highways, and

WHEREAS, the Regional Federal Highway Administrator, pursuant to delegations of authority from the Secretary of Transportation and the Federal Highway Administrator, has determined that the lands covered by the application are reasonably necessary in connection with the construction of Project BW 0300(8), State of Hawaii, and

EXEMPT—HAWAII CONVEYANCE TAX
eij
CERTIFICATE NOT REQUIRED

WHEREAS, the General Services Administration has authorized the DEPARTMENT to transfer the lands to the GRANTEE;

NOW, THEREFORE, the DEPARTMENT as authorized by law, does hereby appropriate, remise, release, quitclaim, and transfer unto the GRANTEE the lands and interests in lands described in Attachment One, Parcels 2, 3, 4, 6, 7, 8, 9, 10, 11, and 12, attached hereto and made a part hereof.

TO HAVE AND TO HOLD, the above-mentioned lands and interests in lands unto the GRANTEE, for so long a time as such are needed for highway purposes, i.e., bicycle lanes or paths and pedestrian walkways upon the express condition that if, at any time, the need for such highway purposes shall no longer exist, notice of the fact shall be given by the GRANTEE to the DEPARTMENT and such lands and interests in lands shall immediately revert to the United States of America and to the control of the General Services Administration as such control existed prior to this instrument, and subject to the following covenants and conditions, which shall be binding on the GRANTEE, its successors and assigns:

1. The GRANTEE, in consideration of the conveyance of said lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns that it will preserve the integrity of the railroad facilities located on said right-of-way including all rails, ties, signals, and appurtenances in their existing condition, natural and unavoidable deterioration excepted, provided, however, that said railroad facilities may be operated by an assignee as a non-profit historic railroad museum and provided that the operation, maintenance or alteration of said facilities shall be in accordance with State and Federal requirements applicable to facilities listed on the National Register of Historic Places including but not limited to:

a. Title 1 of the National Environmental Policy Act of 1969 (NEPA) 42 U.S.C. Section 4321 et seq.;

b. Section 106 of the National Historic Preservation Act of 1966 16 U.S.C. Section 470f;

c. Section 1(3) and 2(b) of Executive Order 11593, May 13, 1971, "Protection and Enhancement of the Cultural Environment";

d. Procedures of the Advisory Council on Historic Preservation for the Protection of Historic and Cultural Properties (36 CFR Part 800); and

e. Section 4(f) of the Department of Transportation Act and 23 U.S.C. Section 138.

Any salvage resulting from tracks, ties or other railroad facilities not needed for the development of the operating railroad museum shall be returned to the General Services Administration.

2. No motorized behicles shall be permitted on the bicycle lanes or paths or pedestrian walkways except for maintenance purposes conducted by the GRANTEE, its successors or assigns.

3. The GRANTEE, in consideration of the conveyance of said lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns that it will comply with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. Sections 2000d-2000d-4) and the regulations set forth in Title 49 - Transportation, Subtitle A, Part 21, Code of Federal Regulations (49 CFR 21.1-21.23) (1970), specifically that: (a) no members of the traveling public and users of the Federally-assisted highway shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be otherwise subject to discrimination in their access to, and use of, said highway or their access to and use of the facilities and services provided for public accommodations (such as eating, sleeping, rest, recreation, and vehicle servicing) constructed on, over, or under the right-of-way of said highway; and (b) the GRANTEE shall use the said lands so conveyed in compliance with all other requirements imposed pursuant to said Title 49, Subtitle A, Code of Federal Regulations, Part 21.

[redacted]

4. The GRANTEE, in consideration of the conveyance of said lands, does hereby covenant and agree that all licenses, permits or easements authorizing the use or occupancy of the 40' railroad right-of-way will be issued only subsequent to the written approval of the Hawaii State Historic Preservation Officer and the written authorization of the Hawaii Division Administrator, Federal Highway Administration.

5. The GRANTEE further covenants and agrees that authority to use said right-of-way as above conditioned shall be by revocable permit or license except in those instances where the applicant satisfactorily demonstrates that its use of said property requires that it be given an easement granting an interest in said property. In all licenses, permits or easements the GRANTEE shall include a provision that in the event of the breach of any covenant or condition, the GRANTEE reserves the right to declare the authority to use the property terminated in whole or in part and to revest title to the State of Hawaii. Further, the GRANTEE shall include in all authorizations to use said property a provision that will revest title to the State of Hawaii in the event of abandonment or non-use by the licensee, permittee or grantee for a period to two years.

6. In the event of breach of the above provided covenants, the DEPARTMENT reserves the right to declare the terms of this grant terminated in whole or in part and to revest title in the United States of America and to the control of the General Services Administration as such control existed prior to this instrument.

[redacted]

IN WITNESS WHEREOF, I, William B. Fuenier, Regional Counsel, pursuant to delegations of authority from the Secretary of Transportation, the Federal Highway Administrator, the Regional Federal Highway Administrator, and the Chief Counsel, Federal Highway Administration, by virtue of authority in me vested by law, have hereunto subscribed my name as of the day and year first above written.

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

WITNESS:

John Balekow

Harry M. Rosin

William B Fuenier
Regional Counsel

STATE OF CALIFORNIA)
COUNTY OF SAN FRANCISCO)

On this 5th day of June, 1980, before me Lynne McClelland, a Notary Public in and for the State of California, personally came William B. Fuenier, Regional Counsel of the Federal Highway Administration, Region IX, San Francisco, California, to me known to be the person described in and who executed the foregoing instrument and he acknowledged to me that he executed the same as Regional Counsel for the Federal Highway Administration.

In witness whereof I have hereunto set my hand and official seal this 5th day of June, 1980.

OFFICIAL SEAL
LYNNE A. MC CLELLAND
NOTARY PUBLIC - CALIFORNIA
SAN FRANCISCO COUNTY
My comm. expires APR 30, 1982

Lynne A. McClelland
Notary Public

[redacted]

14814 325

In compliance with the conditions set forth in the foregoing grant, the STATE OF HAWAII, certifies and, by the acceptance of this grant, accepts the terms thereof and agrees for itself, its successors and assigns, forever to abide by the conditions set forth in said grant.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

By Ryokichi Higashionna
Its Director

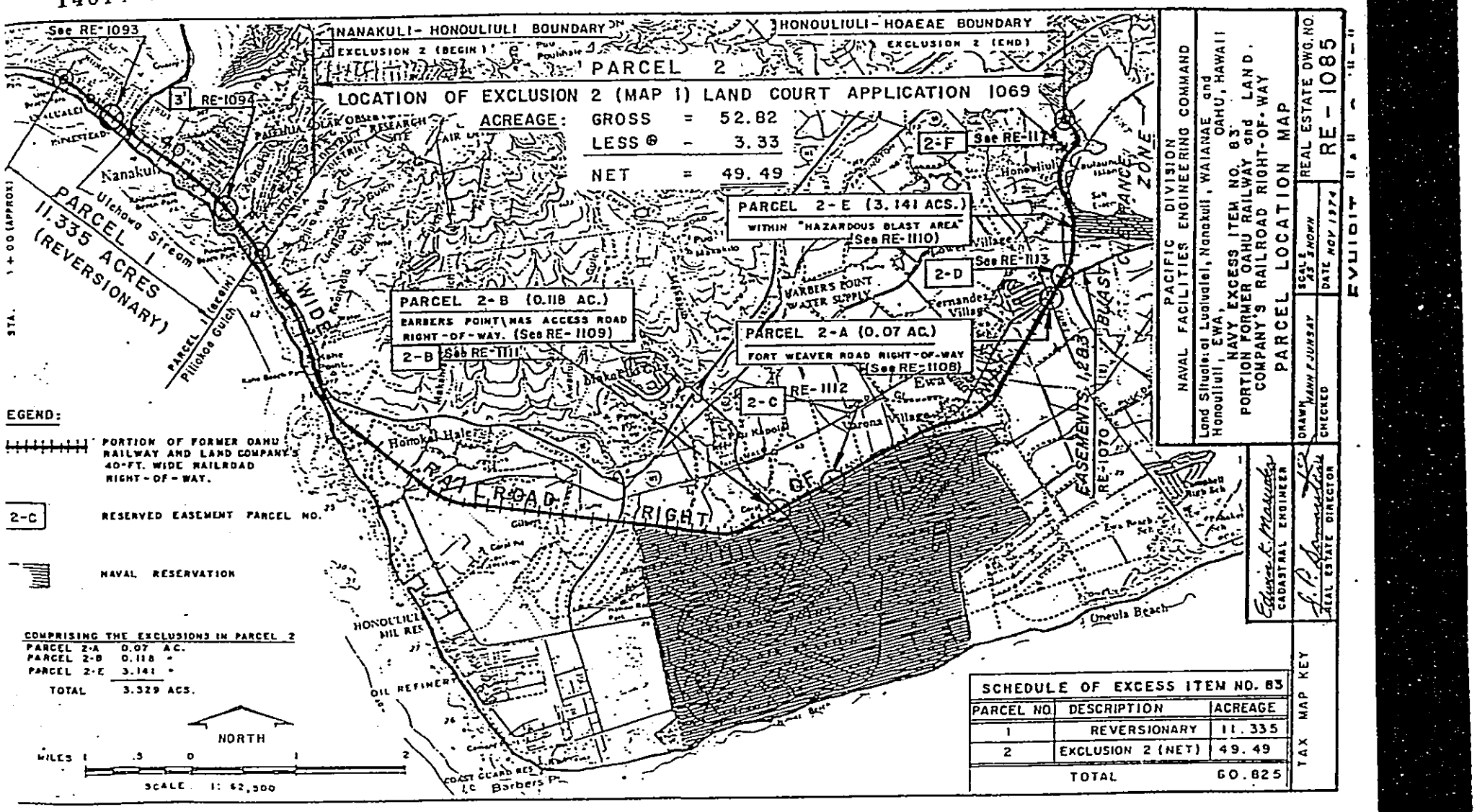
STATE OF HAWAII)
CITY AND COUNTY OF HONOLULU)

On this 24th day of June, 1980, before me appeared Ryokichi Higashionna, to me personally known, who, being by me duly sworn, did say that he is the Director of the Department of Transportation, State of Hawaii, and that the foregoing instrument was signed in behalf of said Department of Transportation, State of Hawaii, and the said Ryokichi Higashionna acknowledged said instrument to be the free act and deed of said Department.

Notary Public, State of Hawaii
My Commission expires: Dec. 17, 1983

[redacted]

14814 504



SCHEDULE OF EXCESS ITEM NO. 83		
PARCEL NO	DESCRIPTION	ACREAGE
1	REVERSIONARY	11.335
2	EXCLUSION 2 (NET)	49.49
TOTAL		60.825

PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND

Land Situate at Lualualei, Nanakuli, WAIANAE and Honouliuli, EWA, OAHU, HAWAII

PORTION FORMER OAHU RAILWAY and LAND COMPANY'S RAILROAD RIGHT-OF-WAY

PARCEL LOCATION MAP

REAL ESTATE DWG. NO. RE-1085

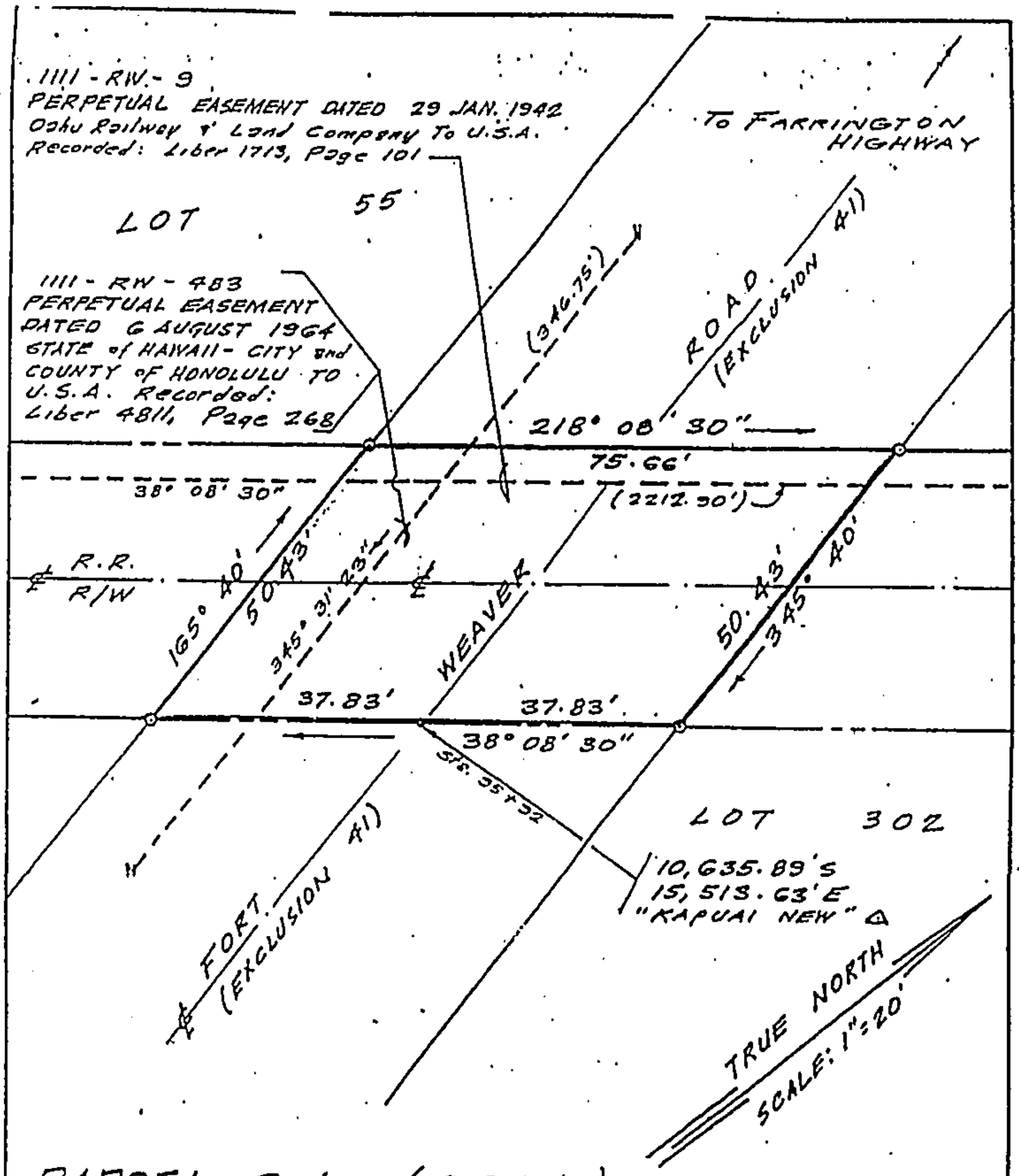
SCALE AS SHOWN
DATE NOV 1974

DRAWN MANNY FUNSAY
CHECKED

Eugene L. Marcuse CADASTRAL ENGINEER
L. P. Yamamoto REAL ESTATE DIRECTOR

TAX MAP KEY

EVIDENCE



PARCEL 2-A (0.07 Ac)

FORT WEAVER ROAD RIGHT-OF-WAY

DESCRIBED AS PARCEL 3 IN DEED DATED NOV. 15, 1935 OAHU RAILWAY and LAND COMPANY TO TERRITORY (NOW STATE) OF HAWAII. RECORDED: Liber 1301, Page 171.

LEGEND:

R.R. R/W — PORTION OF FORMER OAHU RAILWAY and LAND COMPANY'S RAILROAD RIGHT-OF-WAY (EXCLUSION 2 (MAP 1) LAND COURT APPLICATION 1069).

NOTE:

COORDINATES SHOWN REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW"

AZIMUTHS MEASURED CLOCKWISE FROM TRUE SOUTH.

FOR LOCATION, SEE RE-1085.

PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND

Land Situate At Honouliuli, Ewa, Oahu, Hawaii

EXCLUSION IN PARCEL 2
PARCEL 2-A
SHOWING EASEMENTS FOR UTILITY AND ACCESS ROAD RIGHT-OF-WAY

Edwin K. Masuda
CADASTRAL ENGINEER

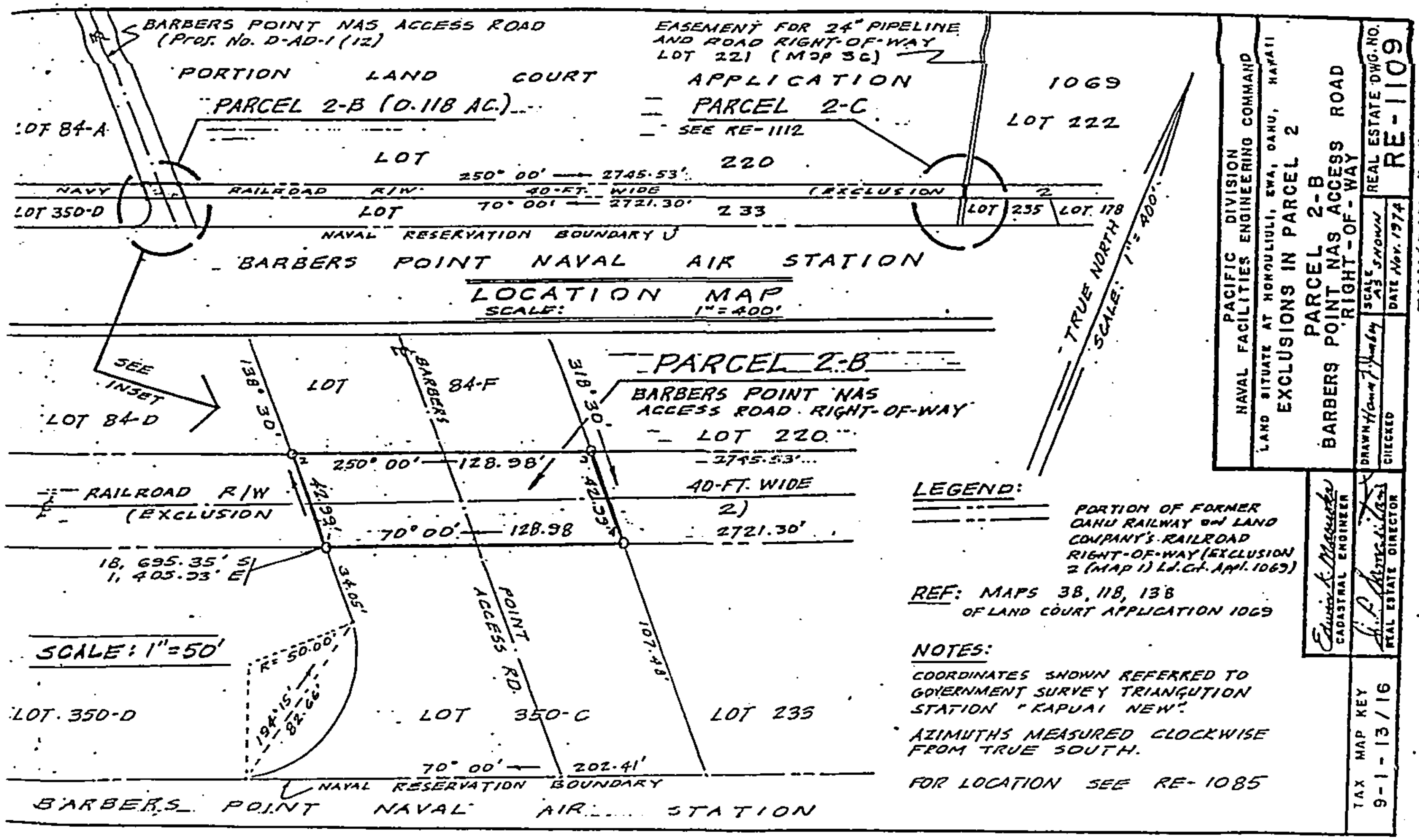
TAX MAP KEY 9-1-17:8

[signature]
REAL ESTATE DIRECTOR

DRAWN	[signature]	SCALE 1"=20"	REAL ESTATE DWG. NO.
CHECKED		DATE Nov. 1975	RE-1108

14874 305

14814 366



BARBERS POINT NAS ACCESS ROAD (Proj. No. D-AD-1 (12)
EASEMENT FOR 24" PIPELINE AND ROAD RIGHT-OF-WAY LOT 221 (Map 36)
PORTION LAND COURT APPLICATION 1069
PARCEL 2-B (0.118 AC.)
PARCEL 2-C SEE RE-1112
LOT 84-A
LOT 220
LOT 222
250° 00' — 2745.53'
NAVY RAILROAD R/W 40-FT. WIDE (EXCLUSION 2
LOT 350-D
LOT 70° 00' — 2721.30' 233
LOT 235
LOT 178
NAVAL RESERVATION BOUNDARY
BARBERS POINT NAVAL AIR STATION
LOCATION MAP
SCALE: 1"=400'
TRUE NORTH
SCALE: 1"=400'
SEE INSET
LOT 84-D
LOT 84-F
BARBERS POINT ACCESS RD.
138° 30'
318° 30'
PARCEL 2-B
BARBERS POINT NAS ACCESS ROAD RIGHT-OF-WAY
LOT 220
2745.53'
40-FT. WIDE
2)
2721.30'
250° 00' — 128.98'
70° 00' — 128.98
42.99'
42.99'
RAILROAD R/W (EXCLUSION
18, 695.35' S
1, 405.93' E
34.05'
107.48'
SCALE: 1"=50'
R= 50.00'
194° 15'
82.66'
LOT 350-D
LOT 350-C
LOT 235
70° 00' — 202.41'
NAVAL RESERVATION BOUNDARY
BARBERS POINT NAVAL AIR STATION
LEGEND:
PORTION OF FORMER OAHU RAILWAY and LAND COMPANY'S RAILROAD RIGHT-OF-WAY (EXCLUSION 2 (MAP 1) Ld.Ct. Appl. 1069)
REF: MAPS 38, 118, 138 OF LAND COURT APPLICATION 1069
NOTES:
COORDINATES SHOWN REFERRED TO GOVERNMENT SURVEY TRIANGUTION STATION "KAPUAI NEW".
AZIMUTHS MEASURED CLOCKWISE FROM TRUE SOUTH.
FOR LOCATION SEE RE-1085
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
LAND SITUATE AT HONOULIULI, EWA, OAHU, HAWAII
EXCLUSIONS IN PARCEL 2
PARCEL 2-B
BARBERS POINT NAS ACCESS ROAD RIGHT-OF-WAY
CADASTRAL ENGINEER
REAL ESTATE DIRECTOR
DRAWN
CHECKED
SCALE AS SHOWN
DATE Nov. 1974
REAL ESTATE DWG. NO.
RE-1109
TAX MAP KEY
9-1-13/16

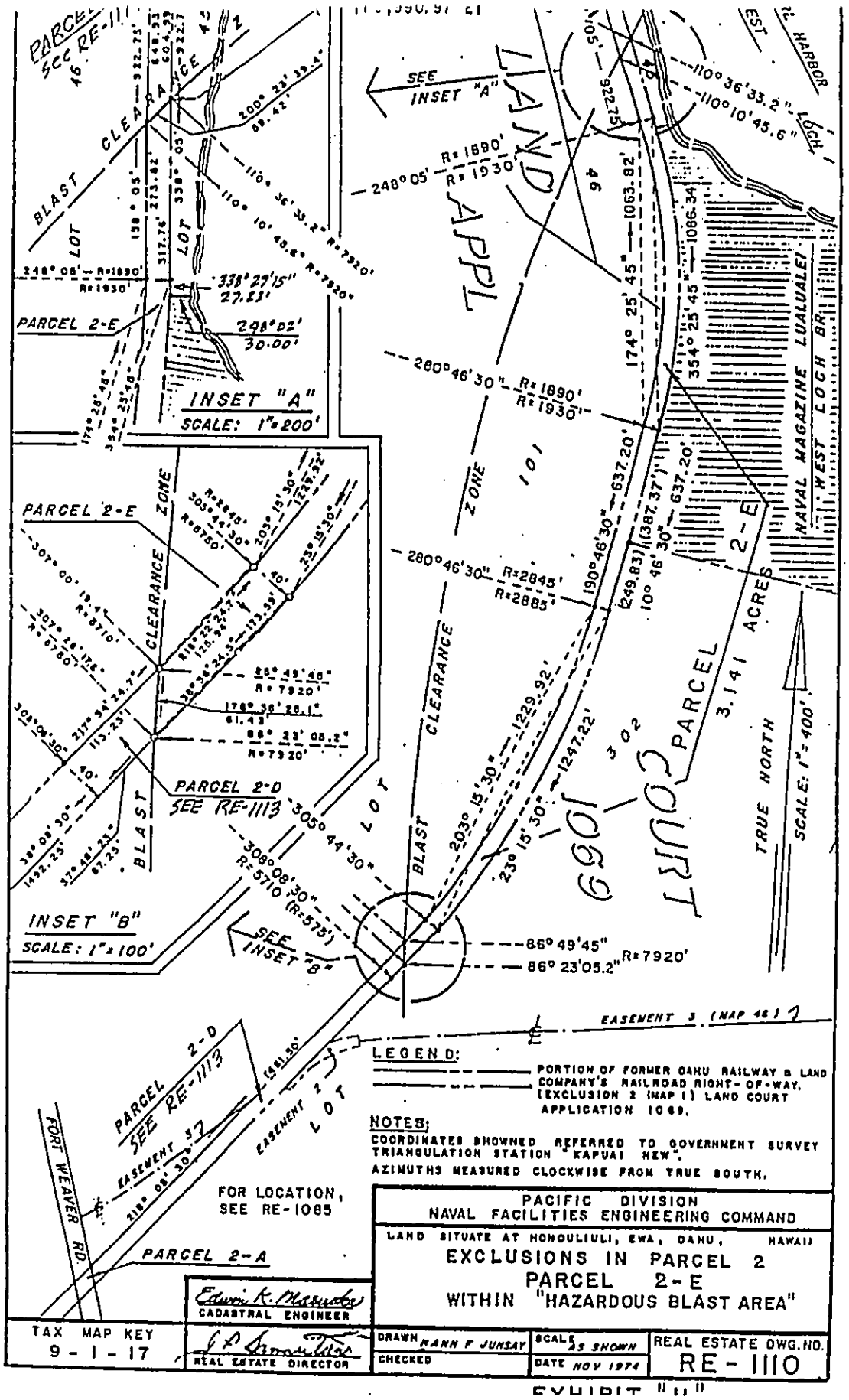

PARCEL 2-E
SEE RE-1113
16' CLEARANCE
BLAST
LOT
INSET "A"
SCALE: 1"=200'
PARCEL 2-E
ZONE
CLEARANCE
INSET "B"
SCALE: 1"=100'
PARCEL 2-D
SEE RE-1113
SEE INSET "A"
SEE INSET "B"
LAND APPL
ZONE 101
LOT 302
PARCEL 3.141 ACRES
2-E
NAVAL MAGAZINE LUALUALEI
WEST LOCH BR
LOCH
HARBOR
TRUE NORTH
SCALE: 1"=400'
EASEMENT 3 (MAP 461)
PARCEL 2-D
SEE RE-1113
EASEMENT 37
EASEMENT 2
LOT
FORT WEAVER RD.
PARCEL 2-A
FOR LOCATION, SEE RE-1085
LEGEND:
PORTION OF FORMER OAHU RAILWAY & LAND COMPANY'S RAILROAD RIGHT-OF-WAY, (EXCLUSION 2 (MAP 1) LAND COURT APPLICATION 1069.
NOTES:
COORDINATES SHOWNED REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW".
AZIMUTHS MEASURED CLOCKWISE FROM TRUE SOUTH.
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
LAND SITUATE AT HONOULIULI, EWA, OAHU, HAWAII
EXCLUSIONS IN PARCEL 2
PARCEL 2-E
WITHIN "HAZARDOUS BLAST AREA"
Edwin K. Masuda
CADASTRAL ENGINEER
REAL ESTATE DIRECTOR
TAX MAP KEY
9 - 1 - 17
DRAWN MANN F JUNSAY
CHECKED
SCALE AS SHOWN
DATE NOV 1974
REAL ESTATE DWG. NO.
RE - 1110

EXHIBIT "1"

BARBERS POINT NAS ACCESS ROAD
(Prof. No. D-AD-1 (12))

EASEMENT FOR 24" PIPELINE AND ROAD RIGHT-OF-WAY
LOT 221 (MAP 3C)

PORTION LAND COURT APPLICATION 1069

84-A

PARCEL 2-B
(0.118 AC.)

PARCEL 2-C
(818 SF = 0.019 AC)

LOT 220

LOT 222

250° 00' — 2745.53'

NAVY RAILROAD R/W 40-FT. WIDE (EXCLUSION 2)

350-D

70° 00' — 2721.30'

LOT 233

LOT 235 | LOT 118

NAVAL RESERVATION BOUNDARY

BARBERS POINT NAVAL AIR STATION

LOCATION MAP
SCALE: 1" = 400'

TRUE NORTH
SCALE: 1" = 400'

SEE INSET

LOT 220 | LOT 221 | LOT 222

250° 00'

2745.53'

4 20.44' 1

17,673.02' S
4,097.81' E

171° 57' 30" — 40.89'

818 Sq. Ft. (0.019 Ac.)

351° 57' 30" — 40.89'

RAILROAD (EXCLUSION 2)

RIGHT-OF-WAY
40-FT. WIDE

2721.30'

3 20.44' 2

70° 00'

LOT 233 | LOT 234 | LOT 235

PARCEL 2-C

EASEMENT FOR WATER PIPELINE AND ROAD RIGHT-OF-WAY

SCALE: 1" = 50'

LEGEND:

PORTION OF FORMER OAHU RAILWAY and LAND COMPANY'S RAILROAD RIGHT-OF-WAY (EXCLUSION 2 (MAP 1) Ld. Ct. Appl. 1069)

REF: MAPS 38, 118, 138 OF LAND COURT APPLICATION 1069

NOTES:

COORDINATES SHOWN REFERRED TO GOVERNMENT SURVEY TRIANGUTION STATION "KAPUAI NEW".

AZIMUTHS MEASURED CLOCKWISE FROM TRUE SOUTH.

FOR LOCATION SEE RE-1085

NAVAL FACILITIES ENGINEERING COMMAND
PACIFIC DIVISION

LAND SITUATE AT HONOULIULI, EWA, OAHU, HAWAII

NAVY EXCESS ITEM NO. 83
RESERVED EASEMENTS OVER
RAILROAD RIGHT-OF-WAY
PARCEL 2-C

DRAWN Howard T. Hanley | SCALE 1" = 100' SHOWN | DATE Nov. 1974 | REAL ESTATE DWG. NO. RE-1112

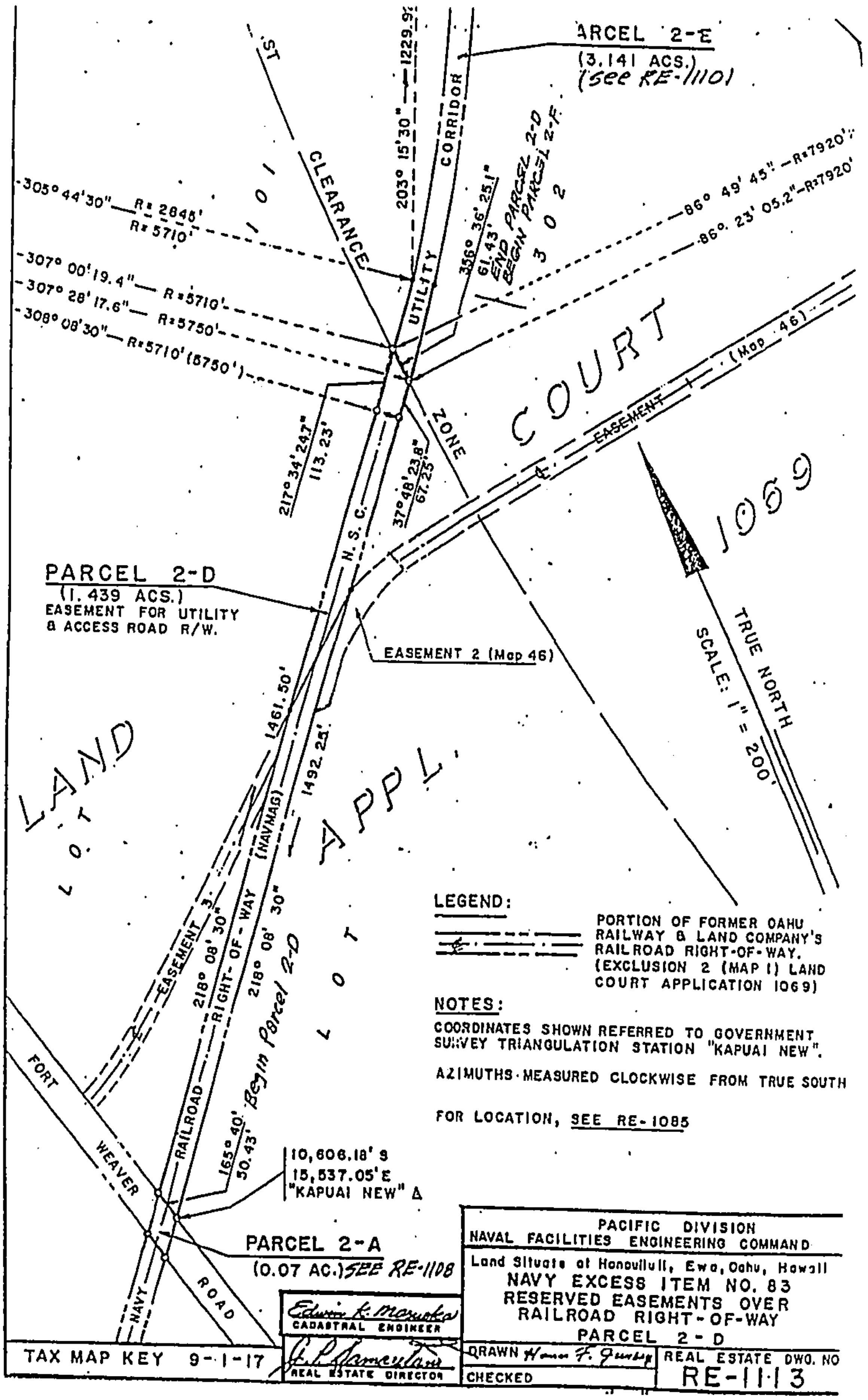
CHECKED

CADASTRAL ENGINEER

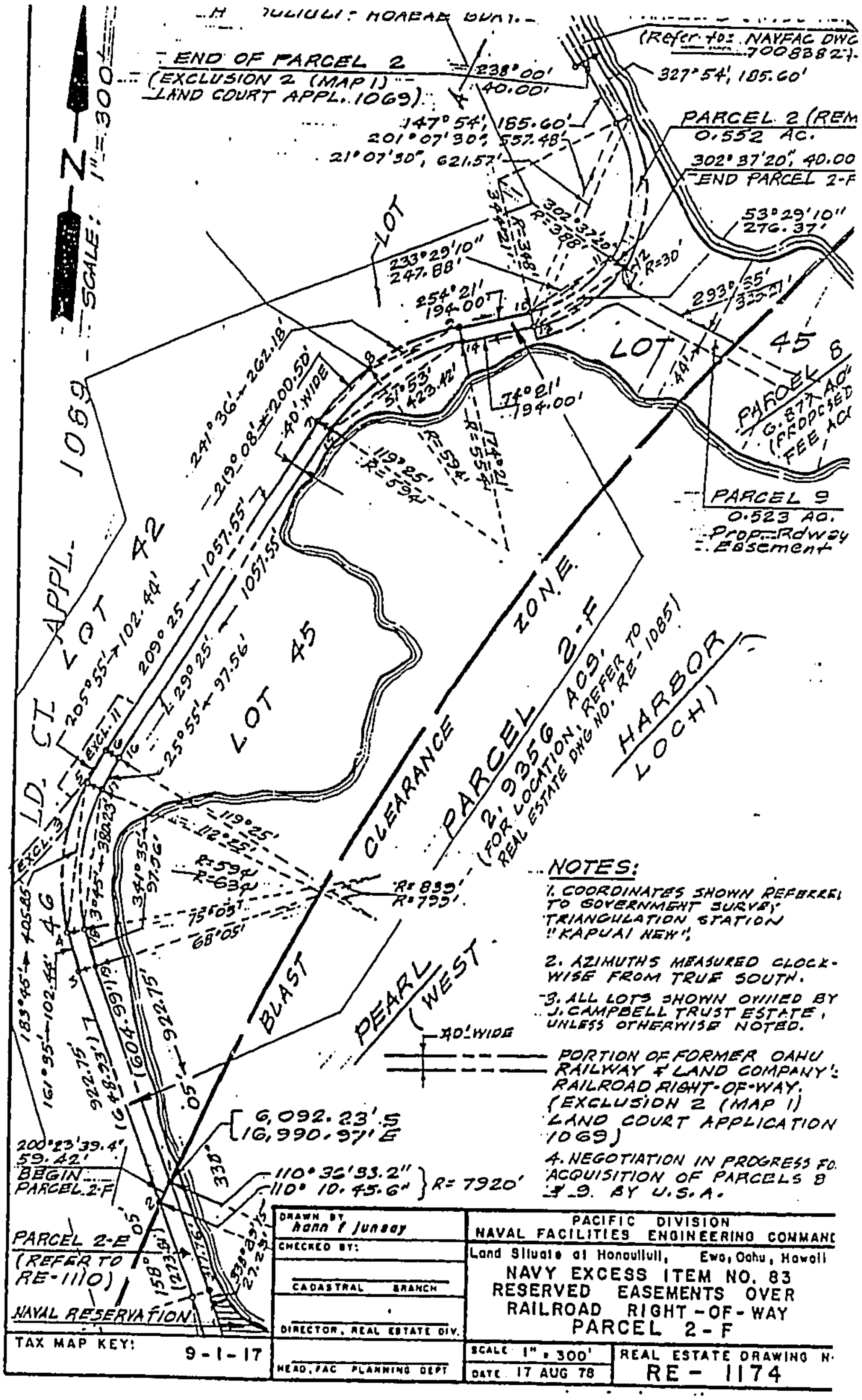
REAL ESTATE DIRECTOR

TAX MAP KEY
9-1-13/16

EXHIBIT "A"

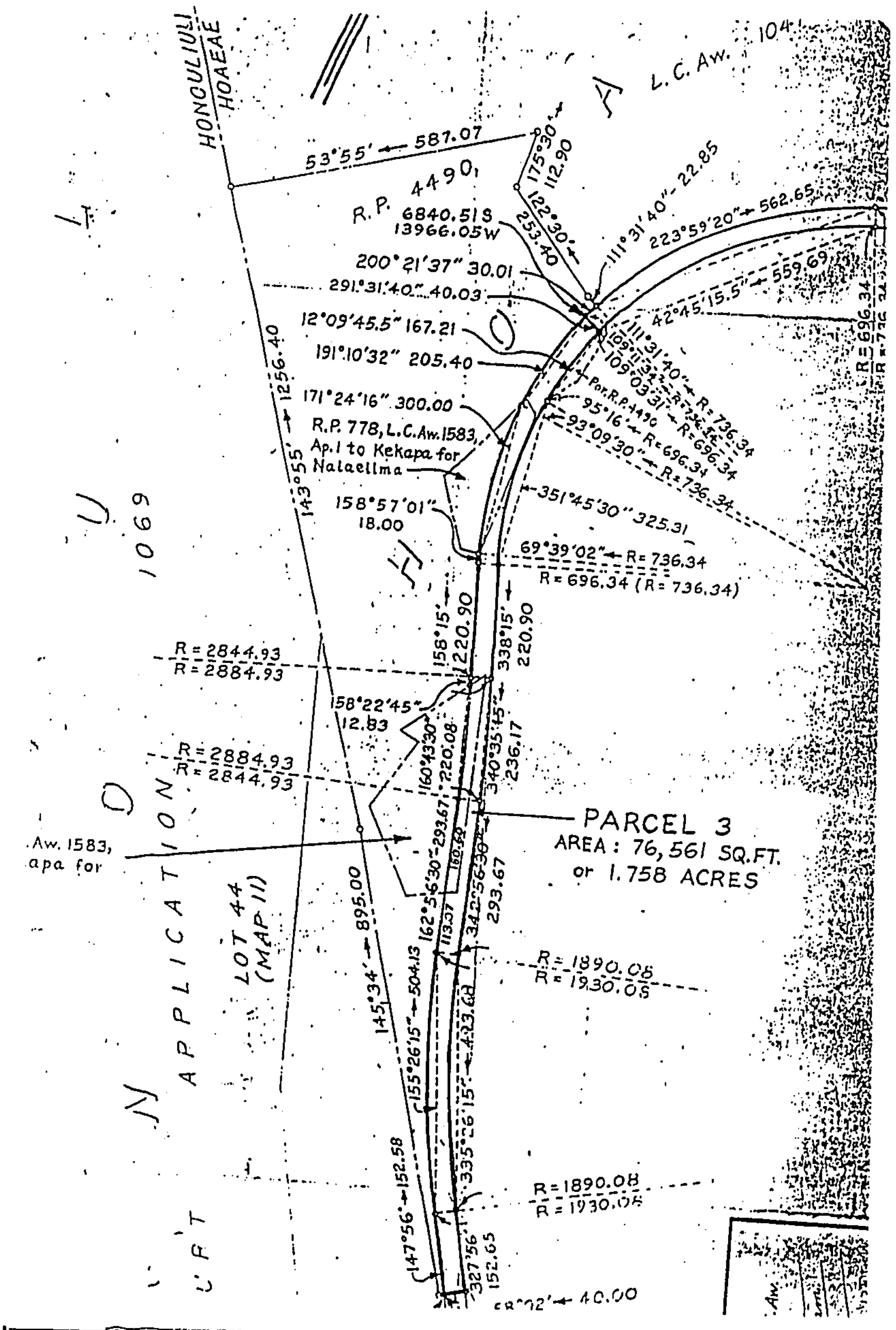

PARCEL 2-E
(3.141 ACS.)
(see RE-1110)
203° 15'30" 1229.9
UTILITY CORRIDOR
CLEARANCE
ST
101
302
356° 36' 25.1"
61.43'
END PARCEL 2-D
BEGIN PARCEL 2-F
-305° 44'30"— R= 2845'
R=5710'
-307° 00' 19.4"— R=5710'
-307° 28' 17.6"— R=5750'
-308° 08'30"— R=5710'(5750')
86° 49' 45" —R=7920'
86° 23' 05.2"—R=7920'
COURT
EASEMENT (Map 46)
ZONE
217° 34' 24.7"
113.23'
37° 48' 23.8"
67.23'
N. S. C.
1069
TRUE NORTH
SCALE: 1" = 200'
PARCEL 2-D
(1.439 ACS.)
EASEMENT FOR UTILITY
& ACCESS ROAD R/W.
EASEMENT 2 (Map 46)
1461.50'
1492.25'
LAND
APPL.
LOT
(NAVMAG)
EASEMENT 3
218° 08' 30"
RIGHT-OF-WAY
218° 08' 30"
Begin Parcel 2-D
LOT
165° 40'
50.43'
RAILROAD
FORT WEAVER ROAD
NAVY
10,606.18' S
15,537.05' E
"KAPUAI NEW" Δ
PARCEL 2-A
(0.07 AC.) SEE RE-1108
LEGEND:
PORTION OF FORMER OAHU RAILWAY & LAND COMPANY'S RAILROAD RIGHT-OF-WAY. (EXCLUSION 2 (MAP 1) LAND COURT APPLICATION 1069)
NOTES:
COORDINATES SHOWN REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW".
AZIMUTHS MEASURED CLOCKWISE FROM TRUE SOUTH
FOR LOCATION, SEE RE-1085
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
Land Situate at Honouliuli, Ewa, Oahu, Hawaii
NAVY EXCESS ITEM NO. 83
RESERVED EASEMENTS OVER RAILROAD RIGHT-OF-WAY
PARCEL 2-D
CADASTRAL ENGINEER
REAL ESTATE DIRECTOR
DRAWN
CHECKED
REAL ESTATE DWG. NO
RE-1113
TAX MAP KEY 9-1-17

[redacted]

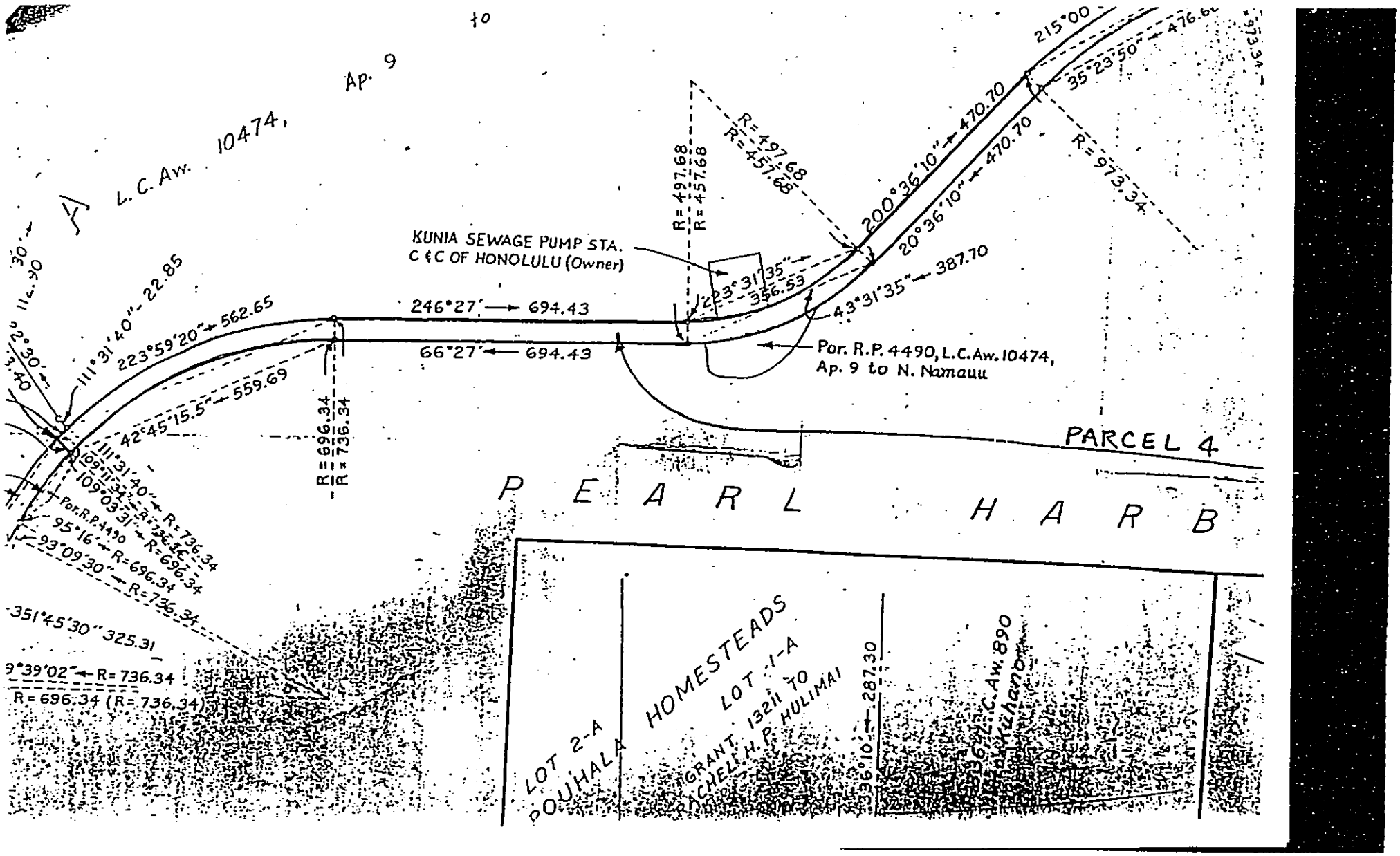


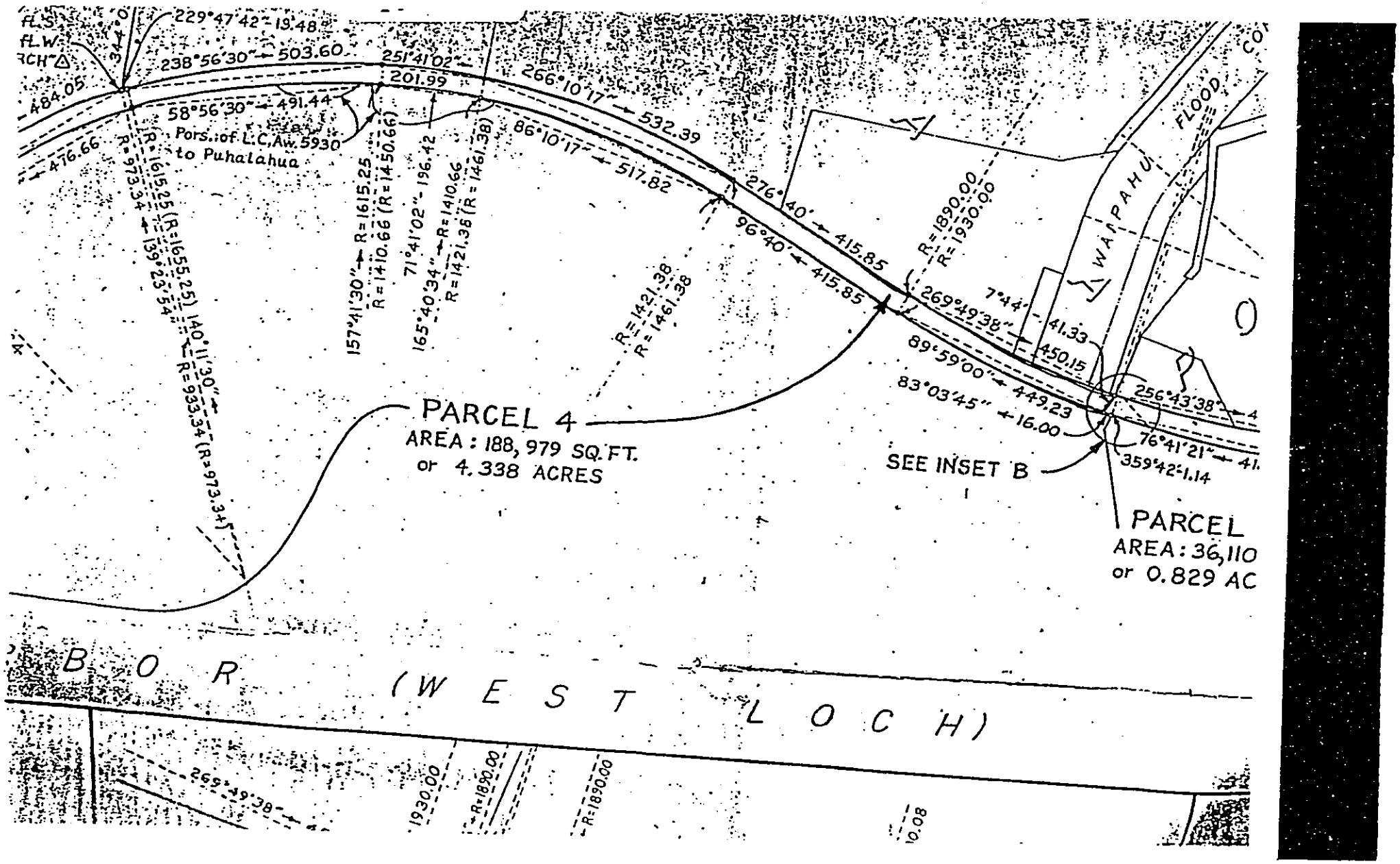
N
SCALE: 1" = 300'
END OF PARCEL 2
(EXCLUSION 2 (MAP 1)
LAND COURT APPL. 1069)
(Refer to: NAVFAC DWG 7008382)
238°00' 40.00'
327°54', 185.60'
147°54', 185.60'
201°07'30", 557.48'
21°07'30", 621.57'
PARCEL 2 (REM
0.552 AC.
302°37'20", 40.00
END PARCEL 2-F
53°29'10" 276.37'
233°29'10" 247.88'
254°21' 194.00'
74°21' 194.00'
293°55'
LOT
LOT 45
PARCEL 8
PARCEL 9
0.523 AC.
Prop. Rdway Easement
40' WIDE
241°36' 262.18'
219°08' 200.50'
209°25' 1057.55'
29°25' 1057.55'
205°55' 102.44'
25°55' 97.56'
LD. CT. APPL. 1069
LOT 42
LOT 45
EXCL. 11
EXCL. 3
LOT 46
BLAST CLEARANCE ZONE
PARCEL 2-F
2.9356 ACS.
(FOR LOCATION, REFER TO REAL ESTATE DWG NO. RE-1085)
PEARL HARBOR
(WEST LOCH)
119°25'
R=594'
R=634'
R=839'
R=799'
75°05'
68°05'
183°45' 405.85'
161°55' 102.44'
922.75'
6,092.23' S
16,990.97' E
200°23'39.4" 59.42'
BEGIN PARCEL 2-F
110°36'33.2"
110°10'45.6"
R= 7920'
PARCEL 2-E
(REFER TO RE-1110)
NAVAL RESERVATION
NOTES:
1. COORDINATES SHOWN REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "KAPUAI NEW".
2. AZIMUTHS MEASURED CLOCKWISE FROM TRUE SOUTH.
3. ALL LOTS SHOWN OWNED BY J. CAMPBELL TRUST ESTATE, UNLESS OTHERWISE NOTED.
40' WIDE
PORTION OF FORMER OAHU RAILWAY & LAND COMPANY'S RAILROAD RIGHT-OF-WAY. (EXCLUSION 2 (MAP 1) LAND COURT APPLICATION 1069)
4. NEGOTIATION IN PROGRESS FOR ACQUISITION OF PARCELS 8 & 9. BY U.S.A.
DRAWN BY
CHECKED BY:
CADASTRAL BRANCH
DIRECTOR, REAL ESTATE DIV.
HEAD, FAC PLANNING DEPT
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
Land Situate at Honouliuli, Ewa, Oahu, Hawaii
NAVY EXCESS ITEM NO. 83
RESERVED EASEMENTS OVER
RAILROAD RIGHT-OF-WAY
PARCEL 2-F
TAX MAP KEY: 9-1-17
SCALE 1" = 300'
DATE 17 AUG 78
REAL ESTATE DRAWING N
RE- 1174

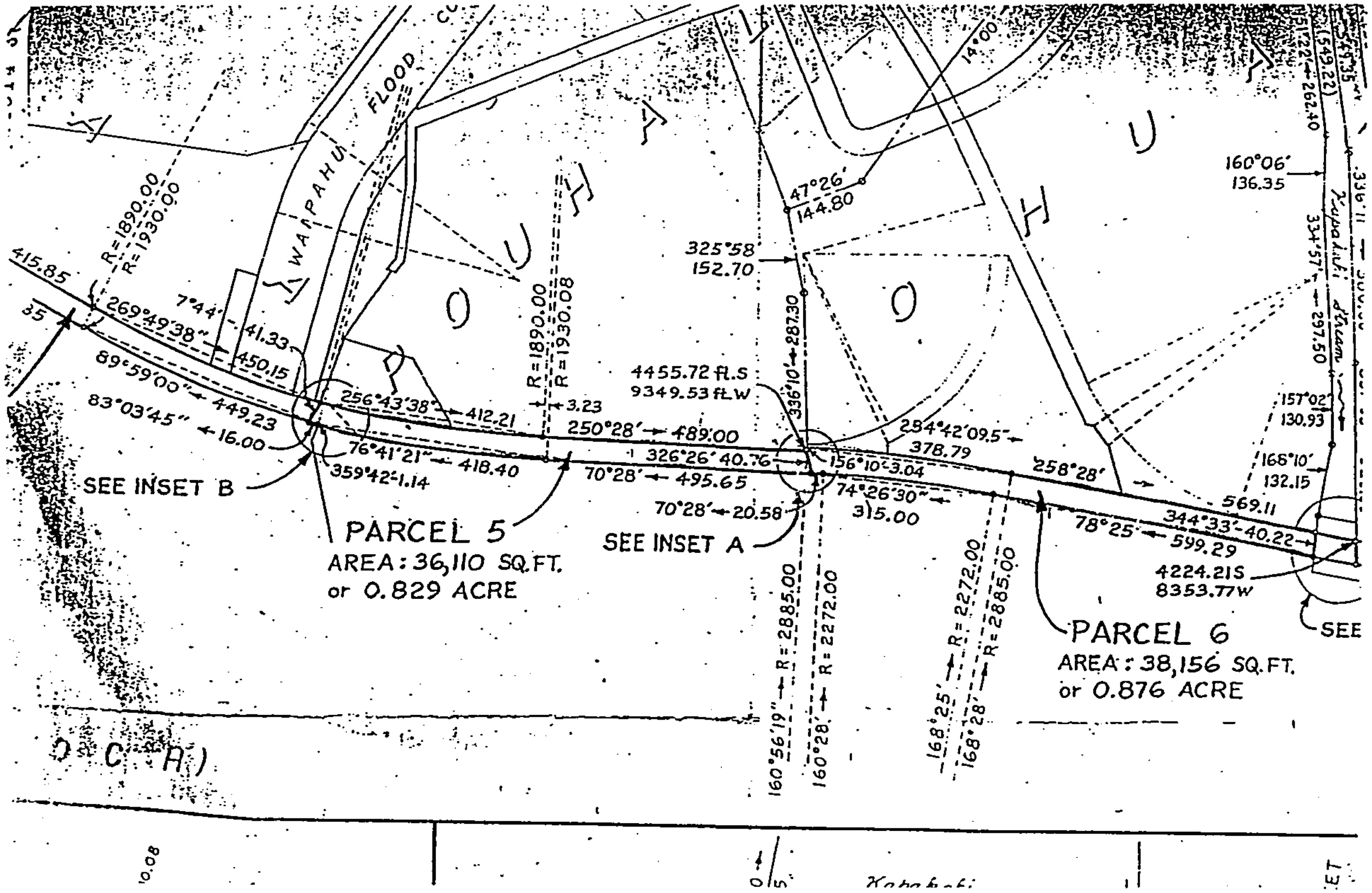
[redacted]



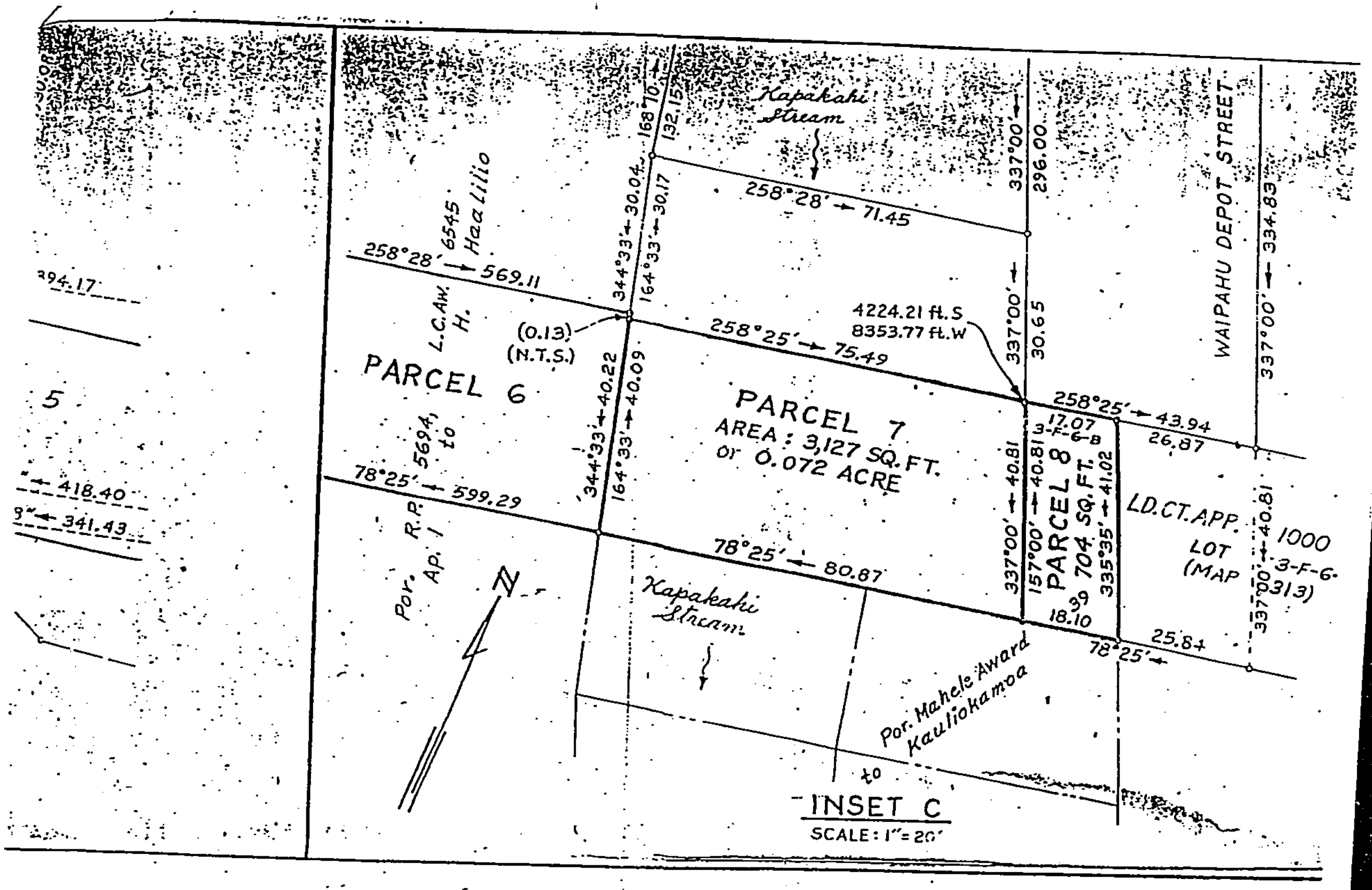
HONOULIULI
HOAEAE
L.C. Aw. 104
53°55' ← 587.07
175°30' 112.90
R.P. 4490
6840.51S
13966.05W
122°30' 253.40
111°31'40" 22.85
223°59'20" 562.65
200°21'37" 30.01
291°31'40" 40.03
42°45'15.5" 559.69
12°09'45.5" 167.21
191°10'32" 205.40
171°24'16" 300.00
R.P. 778, L.C. Aw. 1583, Ap. 1 to Kekapa for Nalaeilma
111°31'40" R=736.34
109°03'31" R=696.34
Por. R.P. 4490
95°16 R=696.34
93°09'30" R=736.34
R=696.34
351°45'30" 325.31
158°57'01" 18.00
69°39'02" R=736.34
R=696.34 (R=736.34)
143°55' 1256.40
1069
R=2844.93
R=2884.93
158°15' 220.90
338°15' 220.90
158°22'45" 12.83
160°43'30" 220.08
340°35'45" 236.17
R=2884.93
R=2844.93
PARCEL 3
AREA: 76,561 SQ.FT.
or 1.758 ACRES
Aw. 1583,
apa for
APPLICATION
LOT 44
(MAP 11)
162°56'30" 293.67
342°56'30" 293.67
145°34' 895.00
R=1890.08
R=1930.08
155°26'15" 504.13
335°26'15" 423.60
R=1890.08
R=1930.08
147°56' 152.58
327°56' 152.65
58°02' 40.00


to
Ap. 9
L. C. Aw. 10474,
KUNIA SEWAGE PUMP STA.
C & C OF HONOLULU (Owner)
R=497.68
R=457.68
246°27' → 694.43
66°27' ← 694.43
223°59'20" → 562.65
111°31'40" - 22.85
42°45'15.5" → 559.69
111°31'40" → R=736.34
109°03'31" → R=696.34
95°16' → R=696.34
93°09'30" → R=736.34
351°45'30" 325.31
9°39'02" → R=736.34
R=696.34 (R=736.34)
Por. R.P. 4490, L.C.Aw. 10474, Ap. 9 to N. Namauu
223°31'35" → 356.53
43°31'35" → 387.70
200°36'10" → 470.70
20°36'10" → 470.70
215°00'
35°23'50" → 476.6
R=973.34
R=973.34
PARCEL 4
P E A R L H A R B
LOT 2-A
POUHALA
HOMESTEADS
LOT 1-A
GRANT 13211 TO
CHEL. H. P. HULIMAI
336°10' → 287.30
R.P. 3642, L.C.Aw. 890
Apokuhano

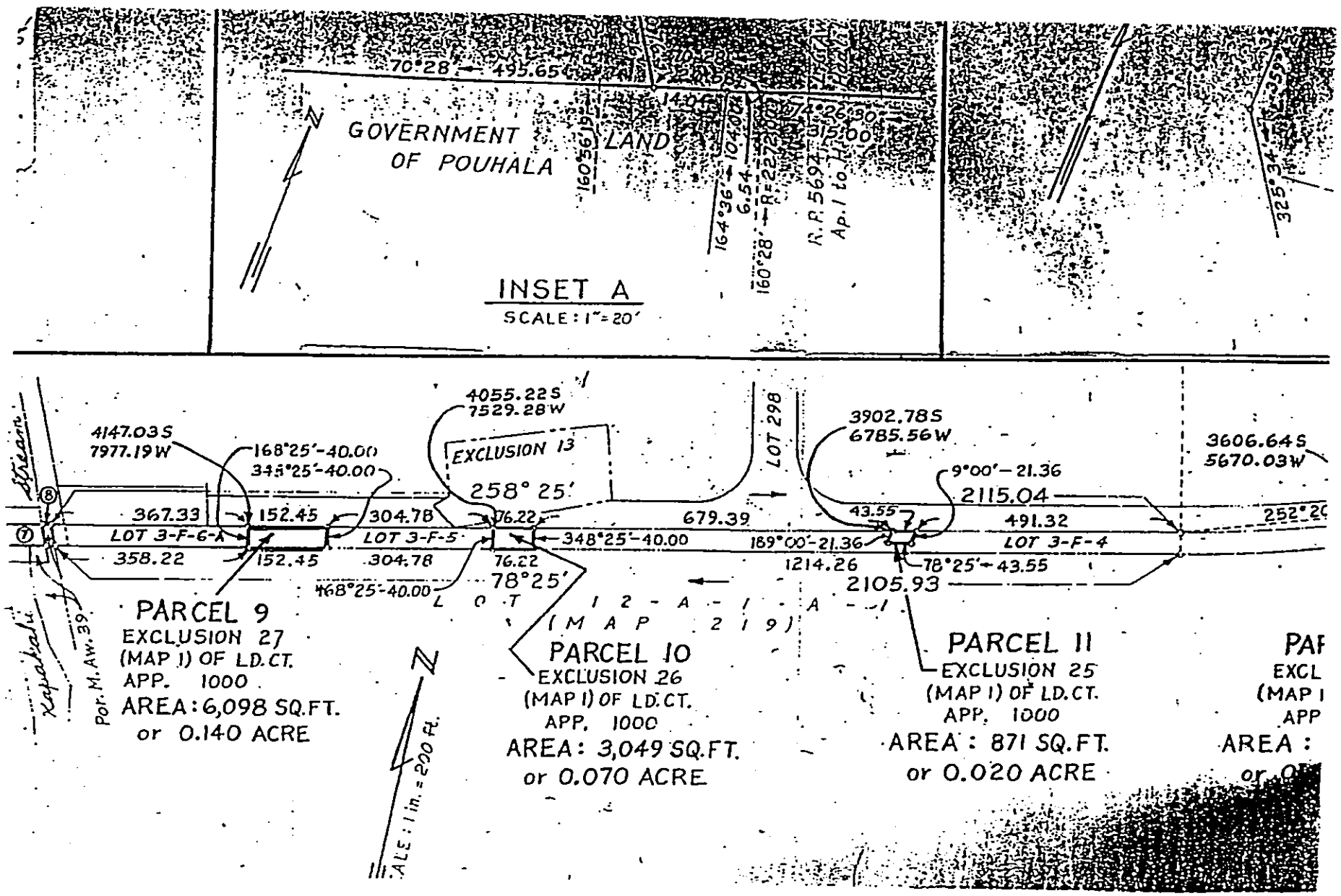

229°47'42" 19.48
238°56'30" 503.60
251°41'02"
201.99
266°10'17" 532.39
58°56'30" 491.44
484.05
476.66
Pors. of L.C.Aw. 5930
to Puhalahua
R=1615.25 (R=1655.25)
R=973.34
139°23'54"
140°11'30"
R=933.34 (R=973.34)
157°41'30"
R=1410.66 (R=1450.66)
71°41'02"
196.42
165°40'34"
R=1421.38 (R=1461.38)
86°10'17" 517.82
276°40' 415.85
96°40' 415.85
R=1421.38
R=1461.38
R=1890.00
R=1930.00
WAIPAHU
FLOOD
269°49'38"
7°44'
41.33
450.15
89°59'00" 449.23
83°03'45" 16.00
256°43'38"
76°41'21" 41.
359°42'1.14
PARCEL 4
AREA: 188,979 SQ.FT.
or 4.338 ACRES
SEE INSET B
PARCEL
AREA: 36,110
or 0.829 AC
B O R (W E S T L O C H)
269°49'38"
1930.00
R=1890.00
R=1850.00
10.08

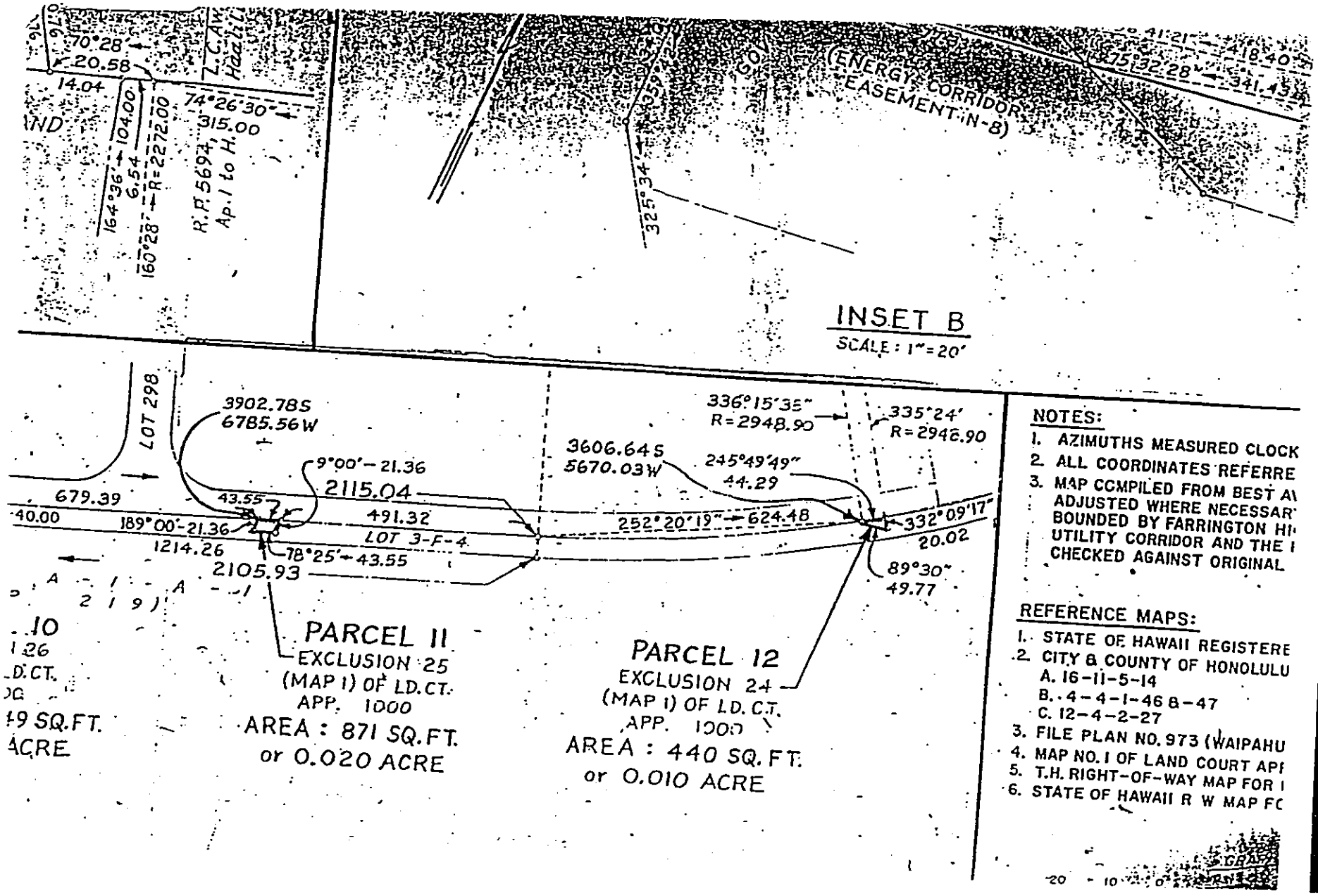


SEE INSET B
PARCEL 5
AREA: 36,110 SQ.FT.
or 0.829 ACRE
SEE INSET A
PARCEL 6
AREA: 38,156 SQ.FT.
or 0.876 ACRE
SEE
WAIPAHU FLOOD
R=1890.00
R=1930.00
R=1890.00
R=1930.08
4455.72 ft.S
9349.53 ft.W
4224.21S
8353.77W
269°49'38"
89°59'00"
83°03'45" ← 16.00
256°43'38" → 412.21
76°41'21" ← 418.40
359°42'-1.14
250°28' → 489.00
326°26' 40.76
70°28' ← 495.65
70°28' ← 20.58
156°10'-3.04
74°26'30"
315.00
284°42'09.5"
378.79
258°28'
78°25' ← 599.29
344°33'-40.22
569.11
160°56'19" → R = 2885.00
160°28' → R = 2272.00
168°25' → R = 2272.00
168°28' → R = 2885.00
325°58'
152.70
336°10' → 287.30
47°26'
144.80
160°06'
136.35
157°02'
130.93
168°10'
132.15
334°57' → 297.50


PARCEL 6
L.C.Aw. 6545 H. Haalilio
Por. R.P. 5694, Ap. 1 to
258°28' → 569.11
78°25' ← 599.29
(0.13) (N.T.S.)
344°33' ← 40.22
164°33' → 40.09
344°33' ← 30.04
164°33' ← 30.17
168°10' ← 132.15
Kapakahi Stream
258°28' → 71.45
337°00' ← 296.00
337°00' ← 30.65
PARCEL 7
AREA: 3,127 SQ.FT. or 0.072 ACRE
258°25' → 75.49
78°25' ← 80.87
4224.21 ft. S
8353.77 ft. W
337°00' ← 40.81
157°00' → 40.81
PARCEL 8
704 SQ.FT.
3-F-6-B
17.07
335°35' ← 41.02
18.10
39
258°25' → 43.94
26.87
78°25' ← 25.84
LD.CT.APP. 1000
LOT
(MAP 313)
3-F-6-
337°00' ← 40.81
WAIPAHU DEPOT STREET
337°00' ← 334.83
Por. Mahele Award Kauliokamoa
to
INSET C
SCALE: 1" = 20'
5
418.40
341.43
394.17

[redacted]


70°28'
495.65
GOVERNMENT LAND
OF POUHALA
160°36'
140.0
164°36'
104.0
6.54
160°28'
R=2272.00
R.P. 5692
Ap. 1 to
325°34'
INSET A
SCALE: 1"=20'
4055.22S
7529.28W
EXCLUSION 13
LOT 298
3902.78S
6785.56W
3606.64S
5670.03W
4147.03S
7977.19W
168°25'-40.00
345°25'-40.00
258° 25'
9°00'-21.36
2115.04
367.33
152.45
304.78
76.22
679.39
43.55
491.32
LOT 3-F-6-A
LOT 3-F-5
348°25'-40.00
189°00'-21.36
LOT 3-F-4
358.22
152.45
304.78
76.22
1214.26
78°25'-43.55
2105.93
168°25'-40.00
78°25'
L O T 1 2 - A - 1 - A - 1
(M A P 2 1 9)
Kapiahali Stream
Por. M. Aw. 39
PARCEL 9
EXCLUSION 27
(MAP 1) OF LD.CT.
APP. 1000
AREA: 6,098 SQ.FT.
or 0.140 ACRE
PARCEL 10
EXCLUSION 26
(MAP 1) OF LD.CT.
APP. 1000
AREA: 3,049 SQ.FT.
or 0.070 ACRE
PARCEL 11
EXCLUSION 25
(MAP 1) OF LD.CT.
APP. 1000
AREA: 871 SQ.FT.
or 0.020 ACRE
SCALE: 1 in. = 200 ft.



NOTES:

1. AZIMUTHS MEASURED CLOCK
2. ALL COORDINATES REFERRE
3. MAP COMPILED FROM BEST AV ADJUSTED WHERE NECESSAR BOUNDED BY FARRINGTON HI UTILITY CORRIDOR AND THE I CHECKED AGAINST ORIGINAL

REFERENCE MAPS:

1. STATE OF HAWAII REGISTERE
2. CITY & COUNTY OF HONOLULU
   A. 16-11-5-14
   B. 4-4-1-46 & 47
   C. 12-4-2-27
3. FILE PLAN NO. 973 (WAIPAHU
4. MAP NO. 1 OF LAND COURT APP
5. T.H. RIGHT-OF-WAY MAP FOR I
6. STATE OF HAWAII R W MAP FO

Appendix B
Biological Resources Survey

Biological resources survey for the Leeward Bikeway environmental assessment[1]

March 17, 2000 | *DRAFT* | *AECOS* No. 942

Eric B. Guinther and Reginald E. David[2]
AECOS, Inc. 970 N. Kalaheo Ave., Suite C311
Kailua, Hawai'i 96734
Phone: (808) 254-5884 Fax: (808) 254-3029 Email: guinther@aecos.com

Introduction

This report describes natural elements of environments found along the proposed route of the Leeward (O`ahu) Bikeway between Waipio Point Access Road in Waipahu and Lualualei Naval Road in Nanakuli. The alignment follows the old Oahu Railroad & Land Company (OR&L) right-of-way (r-o-w) over essentially the entire planned route. (A deviation occurs within West Loch Community Shoreline Park, outside of our defined survey area). The bikeway would be constructed to one or the other side of the OR&L tracks within the r-o-w and will be paved, 10-ft (3 m) wide, with 2-ft (0.6 m) graded shoulders. Bridges, retaining walls, railroad crossings, and culverts will be built where required.

Significant portions of the Leeward Bikeway have already been built: (1) the section through Aiea and Pearl City along the northern edge of East and Middle Lochs of Pearl Harbor; (2) a section between Waipio Point Access Road and Waipahu Depot Road across the base of Waipio Peninsula; and (3) a section through West Loch Community Shoreline Park in Ewa. Our surveys included section (2), which provided an opportunity to visualize the completed project in relation to the natural environment. Section (3) was also walked over in accessing survey segments at either end.

Results of botanical, aquatic, and avifaunal surveys are detailed herein. The area surveyed was delimited according to the scope-of-work as 20 feet (6 m) on either side of the railroad tracks, but in reality included some areas further away if observed to be potentially interesting biological habitat (such as wetlands).

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[1] Report prepared for EarthTech, Inc. for their project: "Leeward Bikeway Environmental Assessment." This report will become part of the public record.
[2] Rana Productions, Inc. P.O. Box 1371, Kailua-Kona, Hawaii 96745

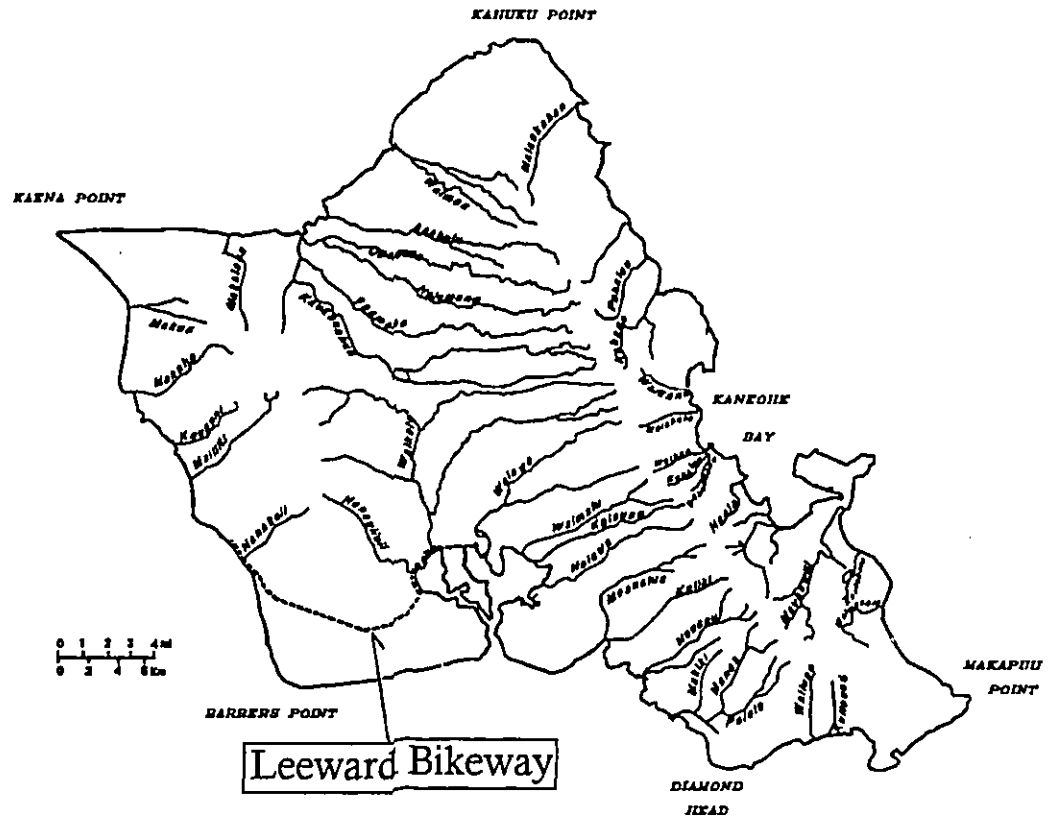

Figure 1. Location of the Leeward Bikeway on a map of O`ahu

Methods

The primary survey method involved walking, or in some cases, driving over all of the nearly 14 miles of proposed bikeway route. An initial reconnaissance survey was conducted on January 6, 2000 to establish access points and view general conditions along the entire route. Two biologists (R. David and E. Guinther) then spent two days (January 7-8, 2000) visiting various segments, most of which were walked or in rare cases driven slowly through while making notes on plants, animals, and wetlands present. The primary purpose of the surveys was to determine if there were any federally listed endangered, threatened, proposed, or candidate species on, or in the immediate vicinity of the proposed bikeway corridor. In addition, we assessed the probability of any usage of the site by listed species given the habitat available.

The botanical survey attempted to list every species of vascular plant seen within the survey area and to provide an estimate of abundance. Particular attention was paid to the presence of native plants, whether listed (by USFWS, 1996) or not, because native plant species are increasingly rare in the urban developed and developing lowlands of leeward O`ahu. Any botanical survey conducted at a specific point in time, is limited to the plants thriving at the time of the survey, and

the possibility that some species present might be dormant. The period of the survey was generally a good one for locating and identifying fast growing annuals because of timing during the middle of the wet season. December 1999 was a relatively normal month with respect to rainfall, giving a general boost to the vegetation.

Field observations for birds were made with the aid of Leitz 10 X 42 binoculars and by listening for vocalizations. Walking counts were concentrated during the early morning hours between 0600 hrs. and 1100 hrs., the peak bird activity time. A tally was made of all species detected during the census time on site. Additionally two crepuscular (twilight) counts were made on two separate mornings and these were concentrated in the Pearl Harbor section of the proposed bikeway due to the higher quality habitat found in this section of the r-o-w. Time not spent counting was used to search the r-o-w and the surrounding area for wetlands and listed avian waterbird species. Observations of mammalian species were essentially of an incidental nature. A record was kept of all mammalian species detected while transiting the site.

Avian phylogenetic order used in this report follows *Birds Of The World: A Checklist 4th Edition* (Clements, 1991), and the *1st and 2nd Supplements to Birds Of The World: A Checklist* 4th *Edition* (Clements and Principe, 1992; Clements, 1997); scientific nomenclature follows *The AOU Checklist of North American Birds 7th Edition* (AOU, 1998), Mammal scientific names follow *Mammals in Hawaii* (Tomich, 1986), and, plant names follow *Manual of the Flowering Plants of Hawai'i* (Wagner, et al., 1990).

Several wetlands were visited separately (E Guinther and R. Douglas) in order to make detailed observations on fauna and collect additional water quality information. Our approach in these instances was to observe and use various hand nets to collect and identify small aquatic inhabitants (for example, snails, aquatic insects, and fishes).

Water quality data were collected primarily for use in characterizing aquatic habitats encountered. It is not expected that these scattered measurements would comprise an adequate baseline water quality survey, nor can it be concluded that such a baseline is necessary for this project. Water quality data collected for this survey are discussed in the report section on Aquatic Environments. Some parameters were measured by field meter and others in samples collected in appropriate containers and taken to the *AECOS* Inc. laboratory on windward O`ahu. Methods and instruments used to analyze the water are listed in Table 1.

Table 1. Analytical methods and instruments used for the January-February, 2000 sampling of wetlands for the Leeward Bikeway, O`ahu.

Analyses List	Method	Reference	Instrument
Ammonia	alkaline phenol	Koroleff in Grasshoff et al. (1986)	Technicon AutoAnalyzer II

Dissolved Oxygen	EPA 360.1	EPA (1979)	YSI Model 58 DO meter
Nitrate + Nitrite	EPA 353.2	EPA (1993)	Technicon AutoAnalyzer II
pH	EPA 150.1	EPA (1979)	Orion SA 250 pH meter / Ross combination electrode
Salinity (field)	refractive index	---	handheld, temperature compensating refractometer
Temperature	thermister calibrated to NBS cert. Thermometer (EPA 170.1)	EPA (1979)	YSI Model 58 DO meter
Total Nitrogen	persulfate digestion /EPA 353.2	D'Elia et al. (1977) / EPA (1993)	Technicon AutoAnalyzer II
Total Phosphorus	persulfate digestion /EPA 365.1	Koroleff in Grasshoff et al. (1986) / EPA (1993)	Technicon AutoAnalyzer II
Total Suspended Solids	Method 2540D (EPA 160.2)	Standard Methods 18th Edition (1992); EPA (1979)	Mettler H31 balance
Turbidity	Method 2130B (EPA 180.1)	Standard Methods 18th Edition (1992); EPA (1993)	Hach 2100P Turbidimeter

D'Elia, C.F., P.A. Stendler, & N. Corwin. 1977. *Limnol. Oceanogr.* 22(4): 760-764.
EPA. 1979. Methods for Chemical Analysis of Water and Wastes. U.S. Environmental Protection Agency, EPA 600/4-79-020.
EPA. 1993. Methods for the Determination of Inorganic Substances in Environmental Samples. EPA 600/R-93/100.
EPA. 1994. Methods for Determination of Metals in Environmental Samples, Supplement 1. EPA/600/R-94/111. May 1994.
Grasshoff, K., M. Ehrhardt, & K. Kremling (eds). 1986. Methods of Seawater Analysis (2nd ed). Verlag Chemie, GmbH, Weinheim.
Standard Methods. 1992. Standard Methods for the Examination of Water and Wastewater. 18th Edition. 1992. (Greenberg, Clesceri, and Eaton, eds.). APHA, AWWA, & WEF. 1100 p.

Environment Description

The Leeward Bikeway follows the right-of-way (r-o-w) of the old Oahu Railroad and Land Company (OR&L) track which, by 1899, had extended all the way from Pearl Harbor (?Honolulu) around Kaena Point to Kahuku on the north shore of O`ahu (HRI, 1999). Although, little evidence remains of this railway over much of the route save for the grade itself, the section between Nanakuli and Pearl Harbor was actively used during World War II and up until the 1970s to connect ammunition storage magazines deep in Lualualei Valley and various parts of the Pearl Harbor Navy Base. In recent decades, efforts by the Hawaiian Railway Society at Ewa Beach have restored rolling stock and functional r-o-w between their museum (off Renton Road in Ewa Beach) and Ko Olina. The Society plans to extend the railway all the way to Nanakuli and is presently rebuilding a trestle on the makai side of Farrington Highway across from HECO's Kahe Generating Station. Thus, the proposed Bikeway Project will share the relatively narrow r-o-w with the railroad. A concrete bridge nearing completion in Ewa near Renton Road appears to be partly for the purpose of restoring functional track east of the museum. The track is in relatively good condition to just across Fort Weaver Road. Thereafter to the east, scant evidence of rails or ties exist along the r-o-w.

The presence of the active railroad is significant in one sense; it is not a little used swath of nature in a developed or developing urban landscape. To the contrary, significant portions of the r-o-w in

the project area support an active railroad and an energy corridor (petroleum pipeline), where road access and vegetation removal are evident.

Given the extensive past and present uses of the r-o-w, it is not surprising that the survey area is essentially a ruderal environment. That is, a disturbed environment. And this fact is reflected in the predominating vegetation, which differs in detail not very substantially over the entire 14 miles surveyed, and is generally distinct from adjacent plots except where these plots are characterized by recent disturbance. Nonetheless, for purposes of our description and assessment, three different environments might be described as the biological regimes through which the right-of-way passes: Pearl Harbor shore, `Ewa Plain, and Kahe/Nanakuli coastline.

Pearl Harbor Shore

Between Pearl City and the West Loch Shoreline Park the r-o-w makes a broad arc across the upper edge of Pearl Harbor. In this section, there is little evidence of the former railroad. Even the old bridges, now mostly rusted away appear to date from the more recent plantation era when trucks hauled cane. The route is used mostly as an energy corridor through which various petroleum products move from refineries at Barbers Point to Pearl and Honolulu Harbors. This part of the route includes the previously completed bikeway between Waipio Depot Road and Aiea. The route is mostly right at the former shore of Pearl Harbor, but now located several tens of meters behind an extensive growth of mangrove that lines the shore of West Loch. This, the elevation is quite low, and wetlands are moderately extensive in this area, in some cases on both the north and south sides of the r-o-w.

`Ewa Plain

The `Ewa Plain is a broad, gently undulating feature on the south side of O`ahu extending from near West Loch of Pearl Harbor to Barbers Point. Representing an ancient reef formation that was part of the ocean during a previous and higher stand of the sea, the plain is now a mostly limestone platform with alluvium eroded from the nearby Waianae mountain covering much of the northern or interior part. Sinkholes of various sizes were once common (Char and Balakrishnan, 1979), but now mostly filled in.

Early Hawaiian occupation of the `Ewa Plains was concentrated near the shore because the area is mostly dry and without permanent streams (M & E Pacific, 1978). In the mid-1800's cattle ranches operated in the area. The Ewa Plantation was started in 1890, by which time the OR&L was running from Honolulu through `Aiea to `Ewa, allowing the plantation to ship product to market in Honolulu or the docks at Honolulu Harbor (Char and Balakrishnan, 1979). In 1893, a sisal (*Agave sisalana*) plantation was started around the town of Sisal located close to Pu`u o Kapolei until the 1920s (Neal, 1965).

By the 1930's all of the `Ewa Plain was covered by sugar cane (Ewa Plantation, Honouliuli), small vegetable farms, poultry farms and piggeries. Lands not so occupied became part of sizable

military bases and facilities (Iroquois Point Navy Housing, West Loch Naval Magazine, Barbers Point NAS), or an industrial park (started in 1959) with a small barge harbor expanded in 1985 to a deep draft ship harbor. Most of the agriculture has since been abandoned, and the land is now being converted to urban environment as the center of a "second city" on O'ahu called Kapolei. To date, this new development adjacent to the OR&L r-o-w has been in the Honouliuli area. However, the r-o-w parallels Barbers Point Naval Air Station (BPNAS) along the latter's north fence line, then passes through the resort development of Ko Olina on the west shore of the `Ewa Plain. Between the old village of Honouliuli and Ko Olina, the route passes mostly through now fallow fields staked out for grading and road building as Kapolei expands southward to BPNAS.

Numerous gulches dissect the broad flank of the Waianae mountain to the north of the `Ewa Plain.

Kahe/Nanakuli Coast

The Waianae coast of O`ahu consists of a series of broad valleys which have eroded to the point of coalescing. Northwest from the `Ewa Plain is first Kahe, followed by Nanakuli, then Lualualei. Each of these valleys is formed from numerous gulches. Thus, Keone`o`io Gulch, Limaloa Gulch, and PilioKahe Gulch all drain different parts of the broad valley known as Kahe. The highway and the OR&L r-o-w are located close to the shore all along here. At Kahe a narrow strip occupied by Kahe Beach Park separates the r-o-w from the water. Around the point separating Kahe and Nanakuli, expansion of the highway has lead to encroachment of the graded road bank on the r-o-w, and the tracks disappear for a short distance, presumably buried under the road. Fronting Nanakuli Valley, the coastal parcels between the road and the water are more extensive, but the OR&L r-o-w lies next to the highway all the way to Lualualei Road where the railroad tracks turn inland.

Terrestrial Flora

The results of our survey of the plants found along the old OR&L r-o-w from Waipio Point Access Road in Waipahu to Lualualei Naval Road in Nanakuli are summarized in Table 2,

Table 2. Checklist of plants found along the proposed route of the Ewa Bikeway Project.

	Species	Common name	Status	ABUNDANCE PH	EP	K/N
		FERNS				
	NEPHROLEPIDACEAE					
	Nephrolepis exaltata	swordfern	nat.	R	-	-
		FLOWERING PLANTS DICOTYLEDONE				
	ACANTHACEAE					
	Asystasia gangetica (L.) T. Anderson	Chinese violet	nat.	O	C	O
	AMARANTHACEAE					
	Achyranthes aspera L.		nat.	O	U	-
	Alternanthera pungens Kunth	khaki weed	nat.	-	R	R
	Amaranthus spinosus L.	spiny amaranth	nat.	A	A	-
	Amaranthus viridis L.	slender amaranth	nat.	R	-	R
	Amaranthus sp.	prostrate form	nat.	R	R	-
	ANACARDIACEAE					
	Mangifera indica L.	mango	nat.	Pc	-	-
	APOCYNACEAE					
	Nerium oleander L.	oleander	orn.	Oc	-	-
	ARALIACEAE					
	Schefflera actinophylla (Endl.) Harms.	octopus tree	nat.	Pc	-	-
	ASTERACEAE (COMPOSITAE)					
	Bidens alba (L.) DC	Spanish needle	nat.	U	R	-
	Bidens pilosa L.	*ki*	nat.	C	C	C
	Calyptocarpus vialis Less.		nat.	-	-	O
?	*Conyza bonariensis*	hairy horseweed	nat.	-	R	-
?	*Cortula australis*		nat.	-	-	R
	Emilia fosbergii Nicolson	Flora's paintbrush	nat.	R	U	R
	Flaveria trinervia (Spreng.) C. Mohr		nat.	-	R	-
	Pluchea indica (L.) Less	Indian fleabane	nat.	Caw	C	C
	Pluchea symphytifolia (Mill.) Gillis	sourbush	nat.	Ca	C	C
	Sonchus oleraceus L.	*pualele*, sow thistle	nat.	C	C	C
	Tanacetum vulgare L.	common tanzy	?nat.	-	-	R
	Tridax procumbens L.	coat buttons	nat.	O	O	O
	Verbesina encelioides (Cav.) Benth. & Hook.	golden crown-beard	nat.	Ca	A	A
	Wedelia trilobata (L.) Hitchc.	wedelia	nat.	U	Uc	-
	Youngia japonica	oriental hawksbeard	nat.	R	-	R

Table 2 (continued).

Species	Common name	Status	ABUNDANCE PH	EP	K/N
BATACEAE					
Batis maritima L.	pickleweed	nat.	Caw	U	Oaw
BIGNONIACEAE					
? *Jacaranda mimosifolia* D. Don	green ebony	nat.	-	-	Pc
Spathodea campanulata P. Beauv.	African tulip tree	nat.	-	-	R
BORAGINACEAE					
Cordia subcordata Lam.	kou	**pol.**	-	-	R
Heliotropium procumbens Mill.		nat.	O	O	O
Tournefortia argentea L. fil.	tree heliotrope	nat.	-	-	U
CAPPARACEAE					
Cleome gynandra L.	wild spider flower	nat.	R	-	-
CARICACEAE					
Carica papaya L.	papaya	nat.	Uc	-	-
CHENOPODIACEA					
Atriplex semibaccata R. Br.	Australian saltbush	nat.	C	Ca	Ca
? *Atriplex* sp.		nat.			
Chenopodium murale L.	*'aheahea*	nat.	U	U	O
CLUSIACEAE					
Calophyllum inophyllum L.	kamani		Pc	-	R
Clusia rosea L.	autograph tree, copey	nat.	U	-	O
COMBRETACEAE					
Conocarpus erectus L.	sea mulberry	nat.	-	-	P
CONVOLVULACEAE					
Convolvulus arvense L.	field bindweed	nat.	U	U	R
Ipomoea cairica (L.) Sweet	*koali 'ai*	nat.?	R	-	R
Ipomoea indica (J. Burm.) Merr.		**ind.**	-	-	U
Ipomoea obscura		nat.	R	R	U
Ipomoea pes-caprae (L.) R. Br.	*puhuehue*	**ind.**	-	-	P
Ipomoea triloba L.	little bell	nat.	U	R	R
Jacquemontia ovalifolia (Choisy) H. Hallier	*pa'u-o-Hi'iaka*	**ind.**	R	-	R
Merremia aegyptia (L.) Urb.	hairy merremia	nat.?		C	C
CUCURBITACEAE					
Coccinia grandis (L.) Voigt	scarlet-fruited gourd	nat.	A	A	A
Momordica charantia L.	balsam apple	nat.	R	R	-
EUPHORBIACEAE					
Chamaesyce hirta (L.) Millsp.	garden spurge	nat.	Ca	Ca	Ca
Chamaesyce hypericifolia (L.) Millsp.	graceful spurge	nat.	R	O	-
Chamaesyce prostrata (Aiton) Small	prostrate spurge	nat.	U	O	U

Table 2 (continued).

	Species	Common name	Status	ABUNDANCE PH	EP	K/N
	EUPHORBIACEAE					
	Macaranga tanarius (L.) Müll Arg.		nat.	Pc	-	-
	Manihot esculenta Crantz	cassava, manioc	orn.	Rc	Rc	-
	Ricinus communis L.	castor bean, *pa'aila*	nat.	O	C	O
	FABACEAE					
	Acacia farnesiana (L.) Wild.	*klu*	nat.	-	U	U
?	*Albizia lebbeck* (L.) Benth.	siris tree	nat.	R	-	R
	Alysicarpus vaginalis	alysicarpus	nat.	-	-	O
	Cassia cf. *javanica* L.	shower tree	nat.	-	-	Pc
	Clitoria ternatea L.	butterfly pea	orn.	Rc	-	-
	Crotalaria incana L.	fuzzy rattlepod	nat.	R	-	-
	Crotalaria pallida Aiton	smooth rattlepod	nat.	-	U	-
	Desmanthus virgatus (L.) Willd.	virgate mimosa	nat.	C	C	-
	Erythrina spp.		orn.	Pc	-	Pc
	Indigofera suffruticosa Mill.	indigo	nat.	-	-	-
	Indigofera spicata Forssk.	creeping indigo	nat.	-	R	-
	Leucaena leucocephala (Lam.) deWit	*koa haole*	nat.	A	AA	AA
	Macroptilium lathyroides (L.) Urb.	cow pea	nat.	O	R	R
	Pithecellobium dulce (Roxb.) Benth.	*'opiuma*	nat.	U	O	-
	Prosopis pallida (Humb. & Bonpl.) Kunth	*kiawe*	nat.	A	A	A
	Samanea saman (Jacq.) Merr.	monkeypod	nat.	P	P	-
	GOODENIACEAE					
	Scaevola sericea Vahl (seedling)	*naupaka*	**ind.**	-	-	O
	LAMIACEAE					
	Leonotis nepetifolia (L.) R. Br.	lion's ear	nat.	C	C	O
	LAURACEAE					
	Persea americana Mill.	alligator pear, avacado	nat.	Pc	-	-
	MALVACEAE					
	Abutilon incanum (Link) Sweet	hairy abutilon	**?ind**	R	-	R
	Abutilon grandifolium (Willd.) Sweet	hairy abutilon, *ma'o*	nat.	O	O	O
	Gossypium cf. *hirsutum* L.	cotton	nat.	R	-	-
	Gossypium tomentosum Nutt. ex Seem.	*ma'o*, Hawaiian cotton	**end.**	-	-	U
	Hibiscus rosa-sinensis L.	hibiscus	orn.	Uc	Uc	R
	Malva parviflora L.	cheeseweed	nat.	C	Ca	Ca
	Malvastrum coromandelianum (L.) Garck	false mallow	nat.	C	C	C
	Sida ciliaris L		nat.	C	C	Ca
	Sida fallax Walp.	*ilima*		U	Oc	O
	Sida rhombifolia L.	Cuba jute	nat.	O	O	O

Table 2 (continued).

Species	Common name	Status	ABUNDANCE PH	EP	K/N
MALVACEAE					
Sida spinosa L.	prickly sida	nat.	U	U	U
Thespesia populnea (L.) Sol. ex Correa	milo	**pol.**	U		U
MORACEAE					
Artocarpus communis Forst.	*'ulu*, breaddfruit	**pol.**	Pc	-	-
Ficus microcarpa L. fil.	Chinese banyan	nat.	Pc	-	Pc
MORINGACEAE					
Moringa oleifera Lam.	horseradish tree	orn.	O	O	-
MYRTACEAE					
Psidium guajava L.	guava	nat.	Pc	-	-
NYCTAGINACEAE					
Boerhavia coccinea Mill.		nat.	U	U	U
Bougainvillea sp.	bougainvillea	orn.	Uc	Uc	-
ONAGRACEAE					
Ludwigia octovalvis (Jacq.) Raven	primrose willow	nat.	Uw	-	-
PASSIFLORACEAE					
Passiflora suberosa L.	wild passionfruit	nat.	R	-	-
PLANTAGINACEAE					
Plantago major L.	broad-leaved plantain	nat.	-	-	R
POLYGONACEAE					
Antigonon leptopus Hook. & Arnott.	Mexican creeper	nat.	-	R	U
PORTULACACEAE					
Portulaca oleracea L.	pigweed	nat.	-		U
indet.		nat.	C	C	C
RHIZOPHORACEAE					
Rhizophora mangle L.	American mangrove	nat.	AA	-	-
RUBIACEAE					
Spermacoce assurgens Ruiz & Pav.	buttonweed	nat.	-	R	-
SOLANACEAE					
Lycopersicon esculentum Mill.	cherry tomato	nat.	R	U	-
Nicotiana glauca Graham	tree tobacco	nat.	-	R	-
Solanum americanum Mill.	*popolo*	**?ind.**	U	-	-
STERCULIACEAE					
Waltheria indica L.	*'uhaloa*	nat.	C	C	C
MONOCOTYLEDONES					
AGAVACEAE					
Agave sisalana Perrine	sisal	nat.	-	O	-
Aloe vera	aloe	orn.	-	R	R

Table 2 (continued).

Species	Common name	Status	ABUNDANCE PH	EP	K/N
AGAVACEAE					
Cordyline fruticosa (L.) A. Chev.	*ki, ti*	**pol.**	R	-	R
ARACEAE					
Colocasia esculenta (L.) Schott	*kalo*	**pol.**	Uc	-	-
ARECACEAE					
Cocos nucifera	*niu*, coconut palm	pol.	Pc	R	O
Pritchardia sp.	*luolu*	?	-	Pc	-
COMMELINACEAE					
Commelina benghalensis L.	hairy *honohono*	nat.	-	R	-
CYPERACEAE					
? *Cyperus compressus*		nat.	-	R	-
Cyperus rotundus L.	nut grass	nat.	-	-	O
Cyperus sp.			-	Uw	-
Eleocharis geniculata.(L.) Roem.& Schult.	spike rush	nat.	Uw	-	-
Schoenoplectus lacustris (L.) Palla	great bulrush	**ind.**	Ow	-	-
LEMNACEAE					
Lemna perpusilla Torr.	duckweed	?nat.	Uw	-	-
MUSACEAE					
Musa x *paradisiaca L.*	banana	pol..	Oc	-	-
POACEAE (GRAMINEAE)					
Bothriochloa pertusa (L.) A. Camus	pitted beardgrass	nat.	-	-	U
Brachiaria mutica	California grass	nat.	Ca	-	-
Cenchrus ciliaris L.	buffelgrass	nat.	A	AA	AA
Cenchrus echinatus	sandbur	nat.	R	R	R
Chloris barbata (L.) Sw.	swollen fingergrass	nat.	A	A	A
Chloris radiata	radiate fingergrass	nat.	U	-	-
Cynodon dactylon (L.) Pers.	Bermuda grass	nat.	U	U	A
Digitaria insularis	sourgrass	nat.	R	-	R
Eleusine indica (L.) Gartn.	wiregrass	nat.	-	U	U
Eragrostis cf. *tenella* (L.) R & S	lovegrass	nat.	U	-	O
Panicum maximum Jacq.	Guinea grass	nat.	A	C	Ca
Pennisetum polystachion	elephant grass	nat.	Ua	-	-
Rhynchelytrum repens (Willd.) Hubb.	Natal redtop	nat.	R	-	-
Setaria verticillata	bristly foxtail	nat.	R	-	R
Sporobolus virginicus (L.) Kunth	beach dropseed	**ind.**	-	-	Oa
Stenotaphrum secundatum (Walt.) Ktze.	Buffalo grass	nat.	-	Uc	-

Table 2 (continued).

Species	Common name	Status	ABUNDANCE PH	EP	K/N
PANDANACEAE					
Pandanus sp.	*hala*	**ind.**	Uc	-	-
TYPHACEAE					
Typha latifolia L.	cattail	nat.	Uw	-	-

Legend to Table 2

Status = distributional status
- **end.** = endemic; native to Hawaii and found naturally nowhere else.
- **ind.** = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
- nat. = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.
- orn. = exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).
- pol. = Polynesian introduction before 1778.

Abundance = occurrence ratings for plants by section (as defined in text)
- R – Rare - only one or two plants seen.
- U - Uncommon - several to a dozen plants observed.
- O - Occasional - found regularly, but not abundant anywhere (unless Oa).
- C - Common - considered an important part of the vegetation and observed numerous times.
- A - Abundant - found in large numbers; may be locally dominant.
- AA - Abundant - abundant and dominant; defining vegetation type.
- P – Present - noted just outside of study area; abundance not recorded.

The following subcategories (lowercase letters) are applied:
- a – locally abundant
- c – cultivated in gardens
- w – limited to wetland

a checklist which includes abundance estimates by section. The three sections of the route are: Pearl Harbor (**PH**) from Waipio Point Access Road to the north end of West Loch Community Shoreline Park, `Ewa Plain (**EP**) from the south end of West Loch Community Shoreline Park to Ko Olina (Waimanalo Gulch), and Kahe/Nanakuli (**K/N**) from Kahe Point (Waimanalo Gulch) to Lualualei Naval Road in Nanakuli. Our discussion, which follows, considers each of these sections separately, beginning first with the 'Ewa Plain because information about it is basic to an understanding of both the 'Ewa Plain and Pearl Harbor sections. The Kahe/Nanakuli section is discussed last. Although most of the plant species found in the Kahe/Nanakuli section are the same as those found in the `Ewa Plain section, the former is a coastal environment, justifying separate treatment.

`Ewa Plain

For our purposes, the `Ewa Plain section begins at the end of pavement (completed bikeway) at the south end of West Loch Community Park and extends first southwest then west across the `Ewa Plain to the coastal place once called Brown's Camp and now part of Ko Olina. The distance measured on a topographic map is approximately 13.3 km (8.3 mi). The crossing of Waimanalo Gulch could also serve as a boundary.

The vegetation of the `Ewa Plain was extensively surveyed and mapped in 1979 from Waipahu to Kahe Point (Char and Balakrishnan, 1979). Although the area has undergone extensive changes and development since that effort, the *`Ewa Plains Botanical Survey* provides a valuable reference base for discussing the present botanical survey. The classification system presented in the 1979 survey is used here to match with vegetation types (plant communities) encountered along the OR&L r-o-w. The 1979 report identified 25 different vegetation types (10 man-modified ecosystems and 15 natural ecosystems). Of these, the following were recognized adjacent to or in the vicinity of the OR&L r-o-w in our January 2000 survey (outline modified from Char and Balakrishnan, 1979):

I. Vegetation of man-modified ecosystems
   - A. Cultivated lands
     1. Sugar cane fields (all now abandoned)
   - B. Occupied lands
     1. Residential Areas
     2. Industrial and commercial areas
     3. Recreational areas
     4. Roadways

II. Vegetation of natural ecosystems
   - A. Coastal ecosystems
     1. Strand Vegetation
     2. Wetland Vegetation

a. Mangrove swamp
b. *Batis* swamp
c. *Typha* marsh
d. *Scirpus* (=*Schoenoplectus*) salt marsh

B. Inland ecosystems
1. *Prosopis* forest
2. *Leucaena* scrub
3. Ruderal (weedy) plant communities

The `Ewa Plain, by virtue of the calcareous soil and generally dry conditions, once harbored a unique flora. Only remnants of this flora were evident in 1979: Char and Balaskrishnan noted that "[r]oughly 88 percent of the `Ewa Plains area is under either agricultural or residential use." A total of 396 vascular plant species were recorded in 1979. Of these, 347 (88%) were introduced species and only 49 (12%) were native species. Since 1979, the area of land under development has increased steadily. Substantial areas of agricultural use, especially sugar cane fields in 1979, are now fallow and covered with scrub growth representing one or another stage in succession from cultivated land to a more stable natural community type, perhaps one dominated by kiawe (*Prosopis pallida)* and grasses. However, these lands are slatted for development in the not too distant future. Even less of the native flora exists today (see *AECOS*, 1998).

Most of the lands bordering the OR&L r-o-w in 1979 were cultivated in sugarcane (*Saccharum officinarum*), in military use (BPNAS), or urban (Ewa Plantation and associated villages). The r-o-w itself was mostly classified by Char and Balakrishnan as *Leucaena* scrubland (dominated by koa-haole or *Leucaena leucocephala*) or part of cultivated land from the vicinity of West Loch all the way to Kalaeloa Boulevard. To the west of Kalaeloa Blvd., cultivated land and some closed *Prosopis* forest bordered the tracks, while the r-o-w itself was mostly classified as roadside-wasteland (ruderal) with sparse herbaceous cover.

A majority of the route is now bordered by fallow fields or urban/residential development, an exception being the narrow strip of land between the OR&L tracks and the north perimeter fence at BPNAS, and some remaining *Prosopis* forest on the south side to the east of Ko Olina and Barbers Point Deep Draft Harbor expansion. The r-o-w itself is mostly ruderal, disturbed by maintenance of the tracks and roadways. On the south side of the tracks between Fort Barrette (BPNAS Access) Road and Kalaeloa Blvd. the r-o-w to the BPNAS fence is occupied by a *Prosopis* savannah, dominated by buffelgrass (*Cenchrus ciliaris*), but with other herbs and shrubs, including much `ilima (*Sida fallax*). Areas that are not ruderal or recently cleared by a pipeline construction project, tend to be occupied by *Leucaena* scrub further east.

Pearl Harbor Shore

The eastern portion of the route, about 3.4 km (2.1 mi) long, is substantially different from all of the other parts surveyed by virtue of the close proximity to the estuarine waters of Pearl Harbor.

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

a checklist which includes abundance estimates by section. The three sections of the route are: Pearl Harbor (PH) from Waipio Point Access Road to the north end of West Loch Community Shoreline Park, `Ewa Plain (EP) from the south end of West Loch Community Shoreline Park to Ko Olina (Waimanalo Gulch), and Kahe/Nanakuli (K/N) from Kahe Point (Waimanalo Gulch) to Lualualei Naval Road in Nanakuli. Our discussion, which follows, considers each of these sections separately, beginning first with the 'Ewa Plain because information about it is basic to an understanding of both the 'Ewa Plain and Pearl Harbor sections. The Kahe/Nanakuli section is discussed last. Although most of the plant species found in the Kahe/Nanakuli section are the same as those found in the `Ewa Plain section, the former is a coastal environment, justifying separate treatment.

`Ewa Plain

For our purposes, the `Ewa Plain section begins at the end of pavement (completed bikeway) at the south end of West Loch Community Park and extends first southwest then west across the `Ewa Plain to the coastal place once called Brown's Camp and now part of Ko Olina. The distance measured on a topographic map is approximately 13.3 km (8.3 mi). The crossing of Waimanalo Gulch could also serve as a boundary.

The vegetation of the `Ewa Plain was extensively surveyed and mapped in 1979 from Waipahu to Kahe Point (Char and Balakrishnan, 1979). Although the area has undergone extensive changes and development since that effort, the *`Ewa Plains Botanical Survey* provides a valuable reference base for discussing the present botanical survey. The classification system presented in the 1979 survey is used here to match with vegetation types (plant communities) encountered along the OR&L r-o-w. The 1979 report identified 25 different vegetation types (10 man-modified ecosystems and 15 natural ecosystems). Of these, the following were recognized adjacent to or in the vicinity of the OR&L r-o-w in our January 2000 survey (outline modified from Char and Balakrishnan, 1979):

I. Vegetation of man-modified ecosystems
   - A. Cultivated lands
     1. Sugar cane fields (all now abandoned)
   - B. Occupied lands
     1. Residential Areas
     2. Industrial and commercial areas
     3. Recreational areas
     4. Roadways

II. Vegetation of natural ecosystems
   - A. Coastal ecosystems
     1. Strand Vegetation
     2. Wetland Vegetation

a. Mangrove swamp
b. *Batis* swamp
c. *Typha* marsh
d. *Scirpus* (=*Schoenoplectus*) salt marsh

B. Inland ecosystems
1. *Prosopis* forest
2. *Leucaena* scrub
3. Ruderal (weedy) plant communities

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Pearl Harbor Shore

The eastern portion of the route, about 3.4 km (2.1 mi) long, is substantially different from all of the other parts surveyed by virtue of the close proximity to the estuarine waters of Pearl Harbor.

This section includes an already constructed bikeway between Waipio Point Access Road and Waipahu Depot Road that parallels a large drainage feature and is an extension of the bikeway starting in Aiea. Beyond (west of) Waipahu Depot Road, the route follows the petroleum products energy corridor (OR&L r-o-w without tracks) along the inland or mauka border of the mangrove belt of upper West Loch and a light industrial area of lower Waipahu, ending at West Loch Community Shoreline Park, through which the bikeway is already built. The Pearl Harbor Section crosses three "streams" and is bordered by two wetlands (see below). The route is mostly a recently grubbed, unpaved or "dirt" road, and vegetation within the survey corridor is entirely ruderal in character.

The dominant vegetation bordering the Pearl Harbor Section is red mangrove (*Rhizophora mangle*), except in the open salt marsh near Waipahu Depot Road, where pickleweed (*Batis maritima*) is characteristic around the margins[3] (see wetlands section below). Both of these species tend to form monotypic stands (no other plants present), except along their margins where a variety of weedy species, or particularly Indian fleabane (*Pluchia indica*), can occur, depending upon how recently the land was disturbed. A freshwater marsh behind Pupuole Street Mini Park is dominated by great bulrush (*Schoenoplectus lacustris*).

The segment between Waipio Point Access Road and Waipahu Depot Road borders a drainage canal lined mostly with mangrove, some kiawe, Indian fleabane, and pickleweed on one side, and a tended forest of kiawe trees along the north side bordering Ted Makalena Golf Course. Again, nearly all of the plants within the bikeway corridor (the bikeway is already built here) are weedy species able to recover from periodic disturbance (including herbicide treatments) mostly in that portion of the corridor occupied by the buried petroleum products pipelines. These species are much the same group of plants seen everywhere during the survey in disturbed areas, and represent introduced species that do well in the climate of the Waipahu and `Ewa areas. Relative abundances may change from season to season or year to year depending upon climatic factors as well as biological ones. These species are listed in Table 2 as marked in the column labeled "PH."

Kahe / Nanakuli Coast

The coastline beginning in the old "Brown's Camp" area or Waimanalo Gulch at the boundary between Ko Olina and Kahe Point Beach Park is potentially the most interesting botanically, at least in the Kahe area to Pili-o-Kahe Beach Park. Beyond (northwest from) Pili-o-Kahe to Lualualei Naval Road, the r-o-w is directly adjacent to Farrington Highway, squeezed between the highway and access roadways, parking areas, and other man-made or maintained landscapes. In the northernmost segment, a large dune occupies the space between the r-o-w and the shore of

[3] Char and Balakrishnan (1979) point out that because *Batis* is a woody shrub (although only 0.5 m or less tall), Fosberg (1972) would define this vegetation type as a dwarf-scrub land and technically, then, forming a swamp and not a marsh.

Nanakuli Beach (Ulehawa Section). Total distance along the r-o-w for the Kahe/Nanakuli section is 5.3 km (3.3 mi).

From Kahe Point and the associated beach park to the power company's thermal discharge basin at Hawaiian Electric Beach Park, the track area is maintained by the Railway Society or is essentially part of the park area, and only ruderal weeds typical of this coastal area occur. A muliwai (coastal wetland) is present where the r-o-w crosses Keone`o`io Gulch. After Manners Beach, the lands between Farrington Highway and the rocky, cliffed shore are covered by a *Prosopis-Leucaena-Cenchrus* assemblage, only lightly disturbed by man's recent activities. An unimproved road, narrowing to a trail lies between the tracks and the sea. Evidence of an old coral paved road around the point can be seen from this trail. This area has a greater potential for harboring native strand and/or dryland scrub species than any other location surveyed because of a lack of recent disturbance. The area has been subjected to fires as evidenced by the fact that most of the railroad ties are badly burned. Wildfires in the Waianae lowlands have been sufficiently frequent to remove much of the native vegetation from the slopes behind the developed areas in the valley floors and encourage dominance by buffelgrass (*Cenchrus ciliaris*).

Most of the upper slope (along the r-o-w and close to the highway) is covered by a rather dense koa-haole (*Leucaena* scrub) community from just before Pili-o-Kahe Gulch to the Pili-o-Kahe Beach Park. Closer to the water, kiawe is more common and the scrub less dense. Several kou (*Cordia subcordata*) trees occur here. *Leucaena* scrub occupies much of the ground between Pili-o-Kahe Gulch and Manners Beach at Kahe Beach Park, but open areas of buffelgrass are also present. In one of these open areas is found a grouping of a dozen ma`o (*Gossypium sandvicense*) or Hawaiian cotton plants. The plants are mostly distributed above a railroad bed cut within our designated survey boundary (makai side of tracks). One plant occurs along the tracks as far east as the restrooms/life-guard tower at Manners Beach Park.

Northwest from Pili-o-Kahe, the r-o-w occupied by the OR&L tracks lies between Farrington Highway and Pohakunui Avenue, Nanakuli Beach Park, Nanaikapono Elementary School, and Kalanianaole Beach Park. The land in this area is completely disturbed and all the vegetation of a ruderal type. Several *Abutilon incanum*, a species possibly indigenous, were noted in an empty lot near Nanaikapono Elementary School. A muliwai surrounded by pickleweed (*Batis* swamp) occurs at the mouth of Nanakuli Stream (see Aquatic Environments Section, p. 21). The backside of the dunes where the r-o-w is located, are subject to vehicle and foot traffic, and harbor only ruderal plant species. Indigenous beach morning-glory (*Ipomoea pes-caprae*) occurs on the seaward side, outside the r-o-w.

Terrestrial Fauna

Pearl Harbor Shore

Hawai'i's sole endemic terrestrial mammalian species, the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) or 'Ope'ape'a, was not detected within this, or either of the other two sections surveyed. All other terrestrial mammalian species currently known from Hawaii are alien (introduced by man), and are generally considered to be deleterious to the survival of native species.

Four mammalian species; domestic dog (*Canis f. familiaris*), small Indian mongoose (*Herpestes a. auropunctatus*), cat (*Felis catus*) and goat (*Capra h. hircus*) were detected along this section. The first three species were also encountered along the other two section surveyed. A remarkable amount of dog sign was encountered along this section; this is partially due to the Honolulu Police Department K9 (HPD-K9) training facility, which is located on Waipio Depot Road. HPD-K9 currently use the lands to the west of Kapakahi Stream as a field training area for dogs and handlers. Additionally two feral dogs appeared to be living within the survey corridor in a den located in the denser vegetation close to Kapakahi Stream. Mongoose is all but ubiquitous in the lowland areas on O'ahu and predictably was seen along this and all other sections surveyed. We saw several cats as well as abundant sign, and 6 dead animals along this section. There was one goat tethered on the north side of the existing bikeway close to Waipio Point Access Road. No rodents were detected during the course of this survey; however, it is likely that roof rats (*Rattus rattus*), Norway rats (*Rattus norvegicus*), and house mice (*Mus musculus*), utilize the habitat along the entire length of the r-o-w. Without conducting a trapping program, it is difficult to assess the presence or population densities of these often hard-to-see mammals.

This section of the proposed bikeway is, at least from an ornithological perspective the most interesting part of the ±14 miles of r-o-w surveyed. This is due to the close proximity of West Loch and associated shoreline wetland areas. The closest wetland is Pouhala Marsh located just west of Kapakahi Stream on the Waipi'o Peninsula. A triumvirate of the DLNR, United States Fish and Wildlife Service (USFWS), and Ducks Unlimited are currently working on an enhancement plan for this wetland. There is a unit of the Pearl Harbor National Wildlife Refuge (PHNWR) located on the `Ewa side of West Loch immediately adjacent to the West Loch Golf Course. Additionally there are two units of the PHNWR located on the southwest shore of Pearl City Peninsula. These wetlands provide habitat utilized by the four extant endangered Hawaiian waterbird species found in the main islands: Hawaiian Duck (*Anas wyvilliana*) and Hawaiian Coot (*Fulica alai*) which are endemic at the species level, and the Common Moorhen (*Gallinula chloropus sandvicensis*) and Hawaiian Stilt (*Himantopus mexicanus knudseni*), which are endemic at the sub-species level (Federal Register, 1998; DLNR, 1986).

There have been monumental changes in the avian species makeup of the areas around West Lock following the closure of Castle & Cooke's Ewa Plantation in the early 1970's, then Oahu Sugar Co. (OSc) operations in 1994. Between the turn of the century and the mid 1990's man-made wetlands associated with sugar cane production supported large numbers of waterbirds. The area also was a major migratory shorebird and waterbird stopping off point between September and April of each year. Many of the more than 80 species of migratory and extralimital avian species that have been recorded from Hawai'I have been recorded from this area (Engilis, 1988; Pyle et al., 1988; David,

1991; Pyle, 1992; Pyle, 1997). Between 1995 and the present, the settling ponds have dried up and become overgrown with a mix of alien weedy species or been leveled for development. The shoreline along West Loch is heavily vegetated with red mangrove which all but obscures the beach mudflats. This dense vegetation precludes utilization of the intertidal zone by shorebirds.

A total of 27 avian species representing 16 families was detected within the vicinity of this section of the r-o-w (Table 3) All but 6 of the species recorded are alien to the Hawaiian islands. Two endemic species (native to, and found nowhere else): Hawaiian Stilt and Hawaiian Duck were recorded in this section. Both of these endemic species are listed as endangered by the U.S. Fish and Wildlife Service under the Endangered Species Act of 1973, as amended (ESA), and by the State of Hawai'I under it's endangered species program (Federal Register 1998, DLNR 1986). Fourteen Hawaiian Stilt were seen within the playa, located to the west of Kapakahi Stream adjacent to the pickleweed swamp just to the southwest of the r-o-w. Three Hawaiian Duck were flushed from the wetland adjacent to Waikele Stream west of the pickleweed swamp. None of the 14 individual Hawaiian Stilts observed were banded and all were adult plumaged birds. There is no habitat within the proposed corridor or within the playa suitable for stilt nesting. Stilts generally nest on, or adjacent to low relief islands within bodies of water. Stilts generally forage and nest in separate wetland sites, moving between them on a daily basis (USFWS, 1999). The current usage of the playa by the stilts is best described as a loafing area. Loafing is a term used by shorebird scientists to describe the resting and social activity that shorebirds perform when not feeding, nesting or migrating. Loafing areas are usually open, with good sight lines so that resting shorebirds can easily see approaching predators. Shorebirds usually gather in loafing areas in mixed flocks. In the case of this playa there was a mixed flock of 14 stilts and 26 Pacific Golden Plover (*Pluvialis fulva*), one Wandering Tattler (*Heteroscelus incanus*), and four Ruddy Turnstone (*Arenaria interpres*), the three most common migratory shorebird species found annually throughout the state between the months of July and April.

Table 3. Avian species detected along the Leeward Bikeway right-of-way.

Common Name	***Scientific Name***	***ST***	***PH***	***EP***	***K/N***
GEESE, SWANS & DUCKS – Anatidae					
Black Swan	*Cygnus olor*	AX		X	
Greylag Goose	*Anser anser*	AX	X		
Muscovy Duck	*Cairina moschata*	AX	X		
Hawaiian Duck	*Anas wyvilliana*	EE	X		
HERONS – Ardeidae					
Cattle Egret	*Bubulcus ibis*	A	X	X	
Black-crowned Night Heron	*Nycticorax nyticorax hoactli*	I	X	X	
PHEASANTS & ALLIES – Phasianidae					
Red Jungle Fowl	*Gallus gallus*	A	X	X	X
SANDPIPERS & ALLLIES – Scolopacidae					
Wandering Tattler	*Heteroscelus incanus*	IM	X	X	X
Ruddy Turnstone	*Arenaria interpres*	IM	X	X	X
STILTS & AVOCETS – Recurvirosstidae					
Hawaiian Stilt	*Himantopus mexicanus knudseni*	EE	X	X	

PLOVERS & LAPWINGS – Charadriidae					
Pacific Golden Plover	*Pluvialis fulva*	IM	X	X	X
PIGEONS & DOVES – Columbidae					
Rock Dove	*Columba livia*	A	X		
Spotted Dove	*Streptopelia chinensis*	A	X	X	X
Zebra Dove	*Geopelia striata*	A	X	X	X
MIMIC THRUSHES & ALLIES – Mimidae					
Northern Mockingbird	*Mimus polyglottos*	A		X	
STARLINGS – Sturnidae					
Common Myna	*Acridotheres tristis*	A	X	X	X
OLD WORLD FLYCATCHERS & ALLIES – Muscicapinae					
White-rumped Shama	*Copsychus malabaricus*	A	X	X	
BULBULS – Pycnootidae					
Red-vented Bulbul	*Pycnonotus cafer*	A	X	X	X
SILVEREYES – Zosteropidae					
Japanese White-Eye	*Zosterops japonica*	A	X	X	X
LARKS – Alaudidae					
Sky Lark	*Alauda arvensis*	A	X	X	
OLD WORLD SPARROWS – Passeridae					
House Sparrow	*Passer domesticus*	A	X	X	X
WAXBILLS & ALLIES – Estrilididae					
Common Waxbill	Estrilda astrild astrild	A	X	X	X
Red Avadavat	*Amandava amandava.*	A	X		
Nutmeg Mannikin	*Lonchura punctulata topela*	A		X	
Chestnut Mannikin	*Lonchura Malacca*	A	X	X	
Java Sparrow	*Padda oryzivora*	A	X	X	
FRINGILLIDS – Fringillidae					
House Finch	*Carpodacus m. mexicanus*	A	X	X	X

Table 3 (continued).

EMBERIZIDS – Emberizadae					
Red-crested Cardinal	*Paroaria coronata*	A	X	X	X
Saffron Finch	*Sicalis flaveola*	A	X		
Northern Cardinal	*Cardinalis cardinalis*	A	X	X	X

KEY TO TABLE 3

EE	Endangered Endemic Species	A	Alien Species – established
I	Indigenous Species	AX	Alien Species – not established
IM	Indigenous Migrant Species		

It is currently estimated that the Hawaiian Stilt has a State-wide population of between 1200 and 1600 birds (USFWS, 1999). O'ahu supports a population of between 500 and 750 birds (Engilis and Pratt, 1993). Hawaiian Ducks, once extirpated from the Island of O'ahu, were successfully re-introduced to the Island by the State Department of Land and Natural Resources (DLNR) during the 1970's. The O'ahu population is currently estimated at approximately 300 birds (USFWS, 1999; Engilis and Pratt, 1993).

Several Black-crowned Night-Heron (*Nycticorax nycticorax hoactli*), a common indigenous (native to Hawai`i, but also found elsewhere) waterbird, were seen within the pickleweed and along the shores of West Loch. The other 21 species detected along this section are alien species. This is not surprising given the ongoing trend of almost complete domination of the lowland areas of the Island by alien avian and mammalian species. The findings of this survey are in concordance with other recent faunal surveys of areas close to the bikeway r-o-w (David, 1999a, 1999b).

Although not detected during this survey, the threatened Newell's Shearwater (*Puffinus newelli*) may occasionally overfly this as well as the other two sections of the bikeway r-o-w. No nesting colonies have to date been detected on the Island; however, small numbers of this species have been recovered on the Island following "downing" incidents. The majority of these birds were found on the Honolulu side of the Ko`olau Range (Banko, 1980; R. L. Pyle, pers. comm.; B. Flint, pers. comm.; D. Smith, pers. comm.).

`Ewa Plain

The habitat within this section is almost totally ruderal and not surprisingly we encountered fewer avian species than along the Pearl Harbor section. A total of 24 avian species, representing 17 families was detected within this section of the r-o-w (Table 3) All but four of the species recorded are alien to the Hawaiian islands. Of note were four Hawaiian Stilt seen within the upper end of the Campbell Industrial Park East Drainage Canal (on February 3 seen in the north arm). They were foraging in the small pools of water below the box culvert. They were seen with one Ruddy Turnstone, a Pacific Golden Plover and a Wandering Tattler. Several Black-crowned Night Heron were seen along the eastern part of this section as well as around the water features located on the Ko Olina Gold Course. All other avian species detected along this section are alien to Hawaii.

Kahe/Nanakuli Coast

The habitat within this section is extremely dry, with no standing water, except small wetlands (na muliwai) at the mouths of Keone`o`io Gulch and Nanakuli Stream. A total of 14 avian species, representing 11 families was detected within this section of the r-o-w (Table 3) All but three of the species recorded are alien to the Hawaiian islands. These three species: Ruddy Turnstone, Wandering Tattler, and Pacific Golden Plover are common indigenous migrants.

Aquatic Environments

A check-list of plants and animals noted or collected from each of the wetlands visited during the Leeward Bikeway survey is provided as Table 4. Each water body of any consequence is discussed below, arranged as would be encountered from east to west along the project route. Water quality characteristics of aquatic environments selected for sampling are summarized in Table 5.

Kahu Drainage Channel

This canal is part of a system that drains much of eastern Waipahu town from a drainage canal (Kahu Channel) that extends mauka as Wailani Stream at least to the agricultural fields above H-1 freeway and west of Kamehameha Highway in the Crestview area. The upper estuarine reach was previously surveyed for a channel reconstruction project (*AECOS*, 1988). The Kahu Channel crosses the bikeway between Waipio Point Access Road and Waipahu Depot Road and extends onto the Ted Makalena Golf Course, there turning eastward to empty into Middle Loch of Pearl Harbor. Side channels extend east and west from just above the bikeway bridge along the mauka edge of the bikeway. In this area, the bikeway is already built.

The water in this part of Kahu Channel is brackish and tidal; water samples were collected from near the bikeway bridge on January 8 at 0800 hrs (see Table 5). The shore here is lined with mangrove plants. A temperature recording device was installed briefly in the canal under the eastern-most golf cart bridge at the Ted Makalena Golf Course. The temperature record obtained is summarized in Table 6. The pattern includes the expected diurnal rise and fall of daytime vs. nighttime temperature, but the tidal nature of the location is also evident: a second temperature maximum occurs close to 4 AM on January 7 corresponding to high tide (i.e., slightly warmer salt water coming in), and a seemingly spurious temperature minimum around 9:30 PM on the 7th corresponds to the lowest tide that day. The recorded trace was somewhat eratic, presumably caused by temperature stratification in the estuary.

Table 4. Checklist of aquatic biota observed or reported from wetlands and streams along the Leeward Bikeway route.

Species	Common name	Status	QC Code	LOCATION
ALGAE				
CYANOPHYTA	(bluegreen algae)			
indet.			10	P,E
CHLOROPHYTA	(green algae)			
CLADOPHORACEAE				
indet. *Cladophora*			20	E
AQUATIC PLANTS				
SPERMATOPSIDA, DICOTYLEDONS				
BATIDACEA				
Batis □aritime L.	*'akulikuli-kai*, pickelweed	nat.	10	M,K,N
LEMNACEAE				
Lemna perpusilla Torr..	*duckweed*	nat.	10	P
ONAGRACEAE				
Ludwigia octovalvis (Jacq.) Raven	primrose willow	nat.	10	P
RHIZOPHORACEAE				
Rhizophora mangle L.	red mangrove	nat.	10	M,W
SPERMATOPSIDA, MONOCOTYLEDONS				
ARACEA				

Colocasia esculenta (L.) Schott	*kalo*, taro	pol.	10	misc.
CYPERACEAE				
Eleocharis geniculata (L.) Roem.& Schult.	spike rush	nat.	10	P
Schoenoplectus lacustris (L.) Palla	great bulrush	ind.	10	P
TYPHACEAE				
Typha latifolia L.	common cattail	nat.	10	K
INVERTEBRATES				
MOLLUSCA, GASTROPODA	(mollusks)			
THIARIDAE				
Tarebia granifera Lam.	melanid snail	nat	10	E
MOLLUSCA, PULMONATA				
PHYSIDAE				
Physa virgata	pond snail	nat.	20	E
ARTHROPODA, INSECTA				
COLEOPTERA, HYDROPHILIDAE				
Enochrus sayi Gundersen		nat.	21	P
Tropisternus salsamentus Fal		nat	21	P

Table 4 (continued).

HEMIPTERA, CORIXIDAE				
Trichocorixa reticulata (Guerin-Meneville)	water boatman	nat.	20	K,O
HEMIPTERA, MESOVELIIDAE				
Mesovelia mulsanti White	water treader	nat.	21	E
HEMIPTERA, NOTONECTIDAE				
Buenoa pallipes (Fabricius)	back-swimmer	nat.	21	P
Notonecta indica L	back-swimmer	nat.	21	P
ODONATA, AESCHNIDAE				
Anax junius (Drury)	green darner, adult	ind.	10	M,P,E
Anax junius (Drury)	green darner, nymph		21	P,E
ODONATA, COENAGRIONIDAE				
Enallagma civile (Hagen)		nat.	10	E
Ischnura posita (Hagen)	damselfly, adult	nat.	10	
Ischnura ramburi (Selys-Longchamps)	damselfly, adult	nat.	21	M,E
ODONATA, LIBULELLIDAE				
Crocothemis servilia Drury	scarlet skimmer, adult	nat.	10	P, E
Orthemis ferruginea (Fabricius)	adult	nat.	10	P, E
Orthemis ferruginea (Fabricius)	nymph		21	P
Pantala flavescens (Fabricius)	globe skimmer, adult	nat.	10	M,E
Tramea lacerata (Hagen)	raggedy skimmer, adult	nat.	21	E
VERTEBRATES				
VERTEBRATA, PICES	fishes			
CHANIDAE				
Chanos chanos (Forskal)	*awa*, milkfish (dead)	ind.	10	O
CICHLIDAE				
?Oreochromis sp.	ukw. tilapia	nat	10	M,W,N
GOBIIDAE				
indet. juv.	`o`opu	**ind.**	10	M
MUGILIDAE				
Mugil cf. cephalus L.	mullet	**ind.**	10	M
POECILIIDAE				
Poecilia mexicana (Steindachner)	Mexican mollie	nat	10	M,W,N
Pecilia reticulata	guppy	nat.	10	E
VERTEBRATA, AMPHIBIA	(frogs & toads)			
BUFONIDAE				
Bufo marinus	marine toad, tadpole	nat.	10	P,E,N
VERTEBRATA, AVIA	(birds)			
ANATIDAE				
Anser anser	greylag goose	nat.	11	M
Cairina moschata	muscovy duck	nat	11	M
Anas wyvilliana	Hawaiian duck	**end.**	11	K
ARDEIDAE				
Nyctocorax nytocorax hoactli	black-crowned night heron	**ind.**	11	M,K,P,W

Table 4 (continued).

CHARADRIIDAE				
Pluvialis fulva	Pacific golden plover	**ind.**	11	M,K,P, E,N
RECURVIROSTIDAE				
Himantopus mexicanus knudseni	Hawaiian stilt	**end.**	11	K,E
SCOLOPACIDAE				
Arenaria interpres	ruddy turnstone	**ind.**		K,E
Heteroscelus incanus	wandering tattler	**ind.**	11	K,E,N

KEY TO SYMBOLS USED:

Status:

nat. - naturalized. An introduced or exotic species.

ind. - indigenous. A native species also found elsewhere in the Pacific.

end. - endemic - A native species found only in the Hawaiian Islands.

QC Code:

10 - Observed in the field by aquatic biologist on January 6-8, 2000.

11 – Observed by avian biologist on January 6-8, 2000.

20 - Collected; identified in the laboratory; specimen(s) not saved.

21 - Collected; identified in the laboratory; voucher specimen(s) saved.

Distribution (where observed in project area):

E – Upper end of East Drainage ditch, Campbell Industrial Park.

K – .West Loch, wetlands near Kapakahi Stream mouth.

M – Kahu Channel and associated drainages near Makalena Golf Course.

N – Muliwai at Nanakuli stream, Nanakuli

O – Muliwai at Keone`o`io Gulch, Kahe (HECO) Beach Park

P – Marsh at end of Pupuole Street, Waipahu.

W – Waikele Stream estuary, Waipahu.

Kapakahi and Waikele Streams

The most extensive aquatic environments and wetlands located close to the Leeward Bikeway within our survey area are those associated with the north end of West Loch around the mouth of Waikele and Kapakahi streams. Waikele Stream drains the second largest watershed on O`ahu (12,540 ha or 30,980 acres) (GDSI, 1994). The floodway incorporates two outlets — the eastern is called Kapakahi Stream. The latter stream drains out through a narrow canal on the west side of Waipahu Depot Road. The main channel of Waikele Stream enters West Loch further west. Both streams are presently crossed by rusting, iron bridges that carry petroleum products pipelines and limited foot traffic only. The canals are estuarine at the bikeway project locations.

Table 5. Water quality characteristics of various aquatic environments near the Leeward Bikeway Project sampled January-February, 2000.

	Time sampled	Temp. (°C)	DO (mg/l)	DO Sat. (%)	Sal. (ppt)	pH (pH units)
01-07-00						
Waikele Str.	0905	21.5	6.10	70	2	—
Pupuole wetland	0920	21.5	1.45	17	3	—
01-08-00						
Kahu Channel	0800	22.0	5.42	65	6.5	—
Campbell Drain	1110	23.6	9.47	112	—	—
Nanakuli Str.	~1300	23.9	5.64	70	8	—
02/03/00						
Pupuole wetland	1125	21.1	2.71	31	—	7.46
Campbell drain	1205	22.5	9.97	115	—	8.59

		Turbidity (ntu)	TSS (mg/l)	Ammonia (µg N/l)	Nitrate + nitrite (µg N/l)	Total N (µg N/l)	Total P (µg P/l)
01-07-00							
Waikele Str.	0905	4.10	2.7	34	1320	1390	179
Pupuole wetland	0920	—	—	—	—	—	—
01-08-00							
Kahu Channel	0800	4.30	3.0	130	868	1080	114
Campbell Drain	1110	4.18	2.4	50	106	737	178
Nanakuli Str.		22.8	22.9	9	< 1	1260	122
02-03-00							
Pupuole wetland	1125	25.6	44.0	19	< 1	1280	503
Campbell drain	1205	6.91	4.8	59	61	600	226

Water sampling was conducted under the iron bridge across Waikele Stream on January 7 (see Table 5). The sampling revealed brackish water rather polluted with nutrients. Morning DO level (70% of saturation) was unsatisfactory, although, not as depressed as the high nutrient levels might suggest, perhaps because water was flowing out and not stagnant (sampled on a falling tide).

Surrounding the mouths of both Waikele and Kapakahi channels makai of the bikeway route are extensive mangrove swamps and pickleweed salt flats. A salinity measurement taken on January 7 in the large, shallow pond near Kapakahi Channel beside the proposed bikeway gave a reading of 47 ppt — saltier than seawater. Pearl Harbor water presumably is trapped in the shallow pond and evaporates, raising the salt content. This area is characterized by fill and much garbage and debris on the playa or salt pan. Cleaning up this part of what is a large wetland complex of ponds, salt flats, and mangrove extending out into West Loch, will benefit use of the area by water birds. The only aquatic animal observed (other than water birds, see Terrestrial Fauna Section, p. 17-18) was a water boatman (juveniles, presumed to be *Trichocorixa*). Visible from the route is a *Typha* marsh (cattail or *Typha* sp.), thought to be an area of fresh water ponding from springs or stream inflow.

Table 6. Summary of temperature data (in °C) collected by recording probe EWA 1 (S/N 309029) set in lower Kahu Channel, Waipahu, January 6-8, 2000.

RECORDING PROBE	MEAN ± STD. DEV.	MIN	MAX	N ~ (DAYS)
EWA 1	24.15 ± 0.58	23.0	25.4	269 ~ (3)

Further along to the west, the route skirts the extensive mangrove swamp and is bounded on the north (mauka) side by a marsh adjacent to Pupuole Neighborhood Park (directly below Waipahu Elementary School). This marsh harbors mostly great bulrush (*Schoenoplectus lacustris*), but parts are overgrown with California grass (*Brachiaria mutica*). The water was only slightly brackish (3 ppt) when water quality measurements were made on January 7. This wetland was revisited on February 3, and additional water testing conducted. The water was found to be somewhat turbid and low in DO: 17 % saturation at 9 AM on January 7 and 31% of saturation at 1125 AM on February 3. Nitrate concentration was low; not surprising since the vegetation (both bulrush and algae) use up nitrate to promote growth. However, inorganic nitrogen is present here as ammonia. And a high total nitrogen content (1280 mg N/l) reflects that nutrient input is probably high, but that most of the inorganic nitrogen has been converted to organic nitrogen. Total P is also very high (503 mg P/l), suggestive again of water quality problems.

Despite the low oxygen, the marsh harbored a large number and variety of aquatic insects, including backswimmers, aquatic beetles, damselfly nymphs, and dragonfly nymphs. Although small numbers of top-minnows (Poeciliidae) were observed, these were not captured for identification. The low DO may suppress fish populations in this marsh, allowing insect numbers to remain high.

West Loch and Honouliuli Stream

Honouliuli Stream empties into the West Loch of Pearl Harbor in the vicinity of several fish ponds and mangrove growth at the south end of West Loch Community Park. This area was outside of our survey area as a completed Bikeway extends through the park to the vicinity of West Loch Fairway housing project. The proposed bikeway passes within m (ft) of the USFWS Pearl Harbor Refuge, Honouliuli Unit. This point of closest approach is near the beginning of the `Ewa Plains section.

Kalo`i Gulch

Kalo`i gulch is an intermittent stream at lower elevation which used to flow across the `Ewa Plain in the vicinity of the Ewa Plantation and plantation villages. The stream was rerouted through irrigation ditches during the period when sugar cane was grown in this area. In more recent years, this drainage has been dug out to provide flood relief throughout the Ewa Villages housing

projects. The basins created to receive floodwaters are occupied by a golf course. The proposed Leeward Bikeway crosses this feature down from Renton Road where new bridges are being built to accommodate Kapolei Parkway and (apparently) the OR&L track bed, since the latter bridge, under construction and nearly completion at the time of our survey does not appear to align with any future roads in the area. The mostly dry waterway in this area includes some ponds, but none was close to the bikeway route. Lower Kalo`i Gulch was surveyed previously (*AECOS*, 1992).

Campbell Industrial Park East Drainage Canal

Along the east boundary of Campbell Industrial Park abutting the perimeter fence of Barbers Point NAS (BPNAS) is a large man-made drainage channel that arises in the vicinity of the OR&L r-o-w. Actually, this channel starts as two smaller arms, one extending west along the north edge of Kapolei Business Park (south side of the OR&L r-o-w) and the other from the vicinity of Kapolei Parkway and Kalaeloa Boulevard. The latter is a concrete culvert that crosses under the OR&L r-o-w in a large box culvert.

The west arm is normally dry, but the north arm contains water backed up behind vegetation partly blocking the box culvert and had flowing water that fed into a large pool and many smaller pools at the head of the East Drainage Canal. The lower part of this drainage feature was surveyed as part of a study of natural ecosystems surrounding the BHP refinery (now Tesoro) by *AECOS* (1997).

Water quality samples were collected and a biological reconnaissance of this area was conducted on several dates. The ponds were observed to harbor a rich assemblage of crustaceans (particularly amphipods), snails, and attracted large numbers of dragonflies and damselflies, including the rather rare (but not native) raggedy skimmer (*Tramea lacerata*).

Water quality measurements were made on January 8 and February 3. Samples were collected and analyzed from both dates. Results are summarized in Table 5. The water quality shows moderate eutrophication, with particularly high DO values (>100 saturation) and high pH (8.6 on February 3) indicating a highly productive aquatic system. Total P levels (178 and 226 mg P/l) especially appear to be high.

Kahe Valley Bridges

Three separate bridges are shown in plans for the bikeway between Kahe Point and Pili-o-Kahe: Keone`o`io Gulch, Limaloa Gulch, and Pili-o-Kahe Gulch). In two cases, these bridges would cross dry gulches that empty at the shoreline over a cliff. Only one semi-permanent aquatic environment appears to be located in the Kahe Valley area: a small muliwai[4] at the mouth of Keone`o`io Gulch. The site consists of a *Batis*-swamp and pond wedged between Manners Beach and Farrington

[4] At the mouth of some intermittent and slow flowing perennial streams, the outlet is blocked by wave deposited sand, and forms a brackish water pool. The Hawaiian term *muliwai* that could also mean estuary, is especially suited to refer to these stream features common all around the Hawaiian Islands.

Highway. When surveyed on March 16, the water was turbid, green-brown, and harbored a dense population of water boatmen (*Trichocorixa reticulata*). This small insect develops populations in (usually) temporary pools near the coast, and becomes abundant where fishes are absent or present in low numbers. The absence of both fishes and mollusks suggests the Keone`o`io muliwai may completely disappear in the dry summer months. Three moribund milkfish (*Chanos chanos*) having fork lengths of 30 cm (12 in) were seen in the pool. However, these were likely tossed there (dead or alive), since the roughly 150 m² (1500 ft²) pond would not long support fishes of this size (milkfish do enter coastal ponds).

Waimanalo Gulch, on the boundary between the `Ewa Plain and Kahe/Nanakuli sections, is a relatively small feature that is normally dry and drops from the r-o-w steeply onto a rocky shore at Kahe Point. Presently, the former OR&L tracks cross this gulch on rocky fill, through which have been placed several plastic and concrete pipes of various diameters. The Leeward Bikeway will require a bridge or culvert of some sort at this location. When visited on March 16, a small amount of water was flowing in the gulch beneath the tracks. The source of this water was not investigated, but is presumed to be from a man-made input upslope. Conditions have been very dry on O`ahu for two months, and it is unlikely that any natural flow would be present. Further, there was no sign of aquatic algae or other organisms to suggest water had been flowing here regularly. No water was observed on a previous visit (January 7, 2000).

Nanakuli Stream Muliwai

Farrington Highway and the OR&L r-o-w cross over the muliwai of Nanakuli Stream, an intermittent stream course draining Nanakuli Valley. There is also a pedestrian bridge of fairly recent construction on the makai side of the OR&L trestle; presumably this walkway structure would be incorporated into the bikeway.

The muliwai was sampled on January 8 and the results of water quality testing presented in Table 2. The water was found to be brackish (8 ppt) with moderately low DO content (70 % saturation). The water was quite turbid, caused by an algal bloom present at the time of sample collection. Dissolved nutrients (such as nitrate and ammonia) were low, while total N and total P were both elevated. This circumstance occurs when an algal bloom utilizes most of the available nutrients in the water (the algal cells themselves are included in the total N and total P analyses).

Assessment / Conclusions

Impacts on Vegetation

The proposed bikeway is adjacent to several recognizable vegetation types common to the Pearl Harbor, `Ewa, and Waianae areas, including *Leucaena* scrub, *Prosopis* savannah, and mangrove swamp. For the most part, however, the r-o-w is a disturbed or ruderal environment, typically vegetated with introduced, weedy species of plants. This circumstance arises from the several

ongoing uses of the r-o-w, as an energy corridor and/or a railroad r-o-w. The present users maintain unimproved roadways and apply vegetation suppression techniques (such as herbicides) all along the route, in part to reduce fire hazards.

A total of 138 species of plants were identified during our survey, of which 16 (12%) may be considered native species (indigenous, endemic, or Polynesian introduction). No threatened or endangered plants (USFWS, 1996; USFWS. 1999) were observed in the survey area along the OR&L r-o-w. Occurrences of native plants were rare, but several are worth discussing further.

The main exception to the generalization that the r-o-w is a ruderal environment is on that segment located between Kahe Beach Park (Manners Beach) and Pili-o-Kahe Beach Park in Nanakuli. This section is mostly overgrown with *Leucaena* scrub, although parts are open and dominated by buffelgrass. A dirt road narrows to a trail westward. This area harbors the only significant vegetation resource documented by our survey: some dozen shrubs off ma`o (native cotton). *Gossypium tomentosum*, erroneously described as an endangered species in Char and Balakrishnan (1979), is not listed (USFWS, 1996; 1999). Ma`o is an endemic species (found only in Hawai`i) that was, for a time, a candidate species for listing. It is rare on O`ahu and should be protected wherever it is found.

Another area with species of interest are numerous large `ilima (*Sida fallax*) plants growing outside the BPNAS fence, particularly towards the west end of the BPNAS north fence line. This is an area of *Prosopis* savannah. Most of the `ilima plants are beyond 20 ft from the tracks, but sufficiently close to be of concern from construction damage. *Sida falax* is an indigenous plant (native but not limited to Hawai`i in its distribution) not listed (USFWS, 1996; 1999) but not particularly abundant on O`ahu and should be protected wherever it is found in the wild.

Both of the above clusters of plants should be marked off with tape and/or flagged when construction of the bike-path is anticipated in the area. These are not large areas and avoiding them will probably not impact adversely on construction costs (although more detail is required regarding construction plans in each area). Once the path is completed, signage should be erected to provide information on the plants and caution hikers and bikers about damaging the plants.

Impacts on Terrestrial Vertebrates

With the exception of the r-o-w within the Pearl Harbor section close to the salt marsh the construction of the proposed bikeway will have negligible impacts on native terrestrial vertebrate species. The portion of the r-o-w extending west from Waipio Depot Road to approximately the western boundary of Waipahu Intermediate School passes close to wetlands that currently are utilized by at least two endangered endemic waterbirds. The noise and activity associated with constructing the proposed bikeway along this section may cause stilts to vacate the playa loafing area during the course of construction. There is adequate like habitat within relatively close proximity to the site to provide alternate loafing areas for any potentially displaced birds. If there is

no further mechanical and or human disturbance of the playa area during the course of construction the stilts may become acclimated to the construction activity.

It is logical to assume that following the completion of construction and the restoration of the site that there will be no lingering impacts to Hawaiian Stilts or Hawaiian Ducks. Currently there are 14 known subterranean pipelines of one kind or another traversing this portion of the r-o-w (David 1999b).

Impacts on Wetlands

The wetlands lying close to the r-o-w are of generally poor quality, in part because of access afforded to those who dump illegally, and in part because of poor water circulation in what were once Hawaiian fishponds, arising from extensive growth of mangrove (an introduced species). The wetlands will provide an excellent scenic aspect to the bikeway project, and should be viewed in light of this. That is, where garbage and other debris can be removed as part of the bikeway construction, this should accomplished. Where circulation can be improved, this should be considered.

Impacts on Streams

Two types of streams are present in the project area: perennial streams (actually the estuaries of perennial streams) and intermittent streams. The former occur along the West Loch, Pearl Harbor segment; the later, everywhere else to the west. Nearly all of the proposed bridges for the project (three in the Nanakuli/Kahe area and two in the `Ewa Plain) cross normally dry gulches. The muliwai on Nanakuli Stream is spanned by a concrete pedestrian bridge within the r-ow. The muliwai on Keone`o`io Gulch would require a new structure to be constructed as a crossing. This structure will have some impact since the pond is small (it may, at times extend under Farrington Highway) and presumably will also be crossed someday by a railway trestle. However, there is substantial shading presently from large kiawe trees on both banks, and the water is stagnant from low input. It is suspected the pond dries up at some point during the summer season, and is therefore an ephemeral wetland.

Proposed bridges ("6") over Waikele Stream and ("7") over Kapakahi Stream would each be over 60 feet long. The existing steel structures over Waikele and Kapakahi estuaries might be renovated, but are in poor condition. Neither renovation nor building of new spans will have long-term impacts on either estuary.

No new crossing of the upper Campbell Industrial Park East Drainage Canal is required because the massive culvert under the OR&L r-o-w is sufficient to accommodate the railroad tracks and the bikeway. The small wetlands on either side of the box culverts are interesting biologically and used by Hawaiian stilt, an endangered species. This area is also potentially one of scenic interest for the bikeway. It is 5.7 km (3.5 mi) east to Kalo`i Gulch and 8.5 km (5.3 mi) west to Nanakuli Stream, the nearest wetlands along the bikeway route (the shore of the Pacific Ocean is reached within 4.8

km or 3 mi west at Kahe Point). Most or all of the route to the east will be bordered by houses in the not too distant future. The concrete channel on the north side of the box culvert could be removed (in part) and replaced by an enlarged, stepped depression to provide a rest stop or mini-park with the waterway and riparian trees as a central focus.

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AECOS
970 N. Kalaheo Avenue, Suite C311 • Kailua, Hawaii 96734
Telephone: (808) 254-5884

CLIENT: EarthTech, Inc.
AMFAC Center Tower, 700 Bishop St. Ste 900
Honolulu HI 96813

ATTENTION:

FILE No.: 942
REPORT DATE: 03/01/00
PAGE: 1 of 1

AECOS REPORT OF ANALYTICAL RESULTS

SAMPLE TYPE: Streamwater
DATE SAMPLED: 01/07-08/00

AECOS LOG No.: 12647
DATE RECEIVED: 01/08/00

SAMPLE ID ⇨ / ANALYTE ⇩	Waikele Stream	Campbell Drain	No Name Canal	Nanakuli Muli	Analysis Date / Analyst ID
Turbidity (NTU)	4.10	4.18	4.30	22.8	01/11/00 kl, rd
Conductivity (µmhos/cm)	3,320	1,100	11,900	11,900	01/12/00 rd
Total Suspended Solids (mg/L)	2.7	2.4	3.0	22.9	01/12/00 rd
Ammonia (µg N/L)	34	50	130	9	01/11/00 dh
Nitrate+Nitrite (µg N/L)	1320	106	868	<1	01/25/00 dh
Total Nitrogen (µg N/L)	1390	737	1080	1260	01/31/00 dh
Total Phosphorus (µg P/L)	179	178	114	122	01/12/00 dh

J. Mello, Laboratory Director

AECOS
970 N. Kalaheo Avenue, Suite C311 • Kailua, Hawaii 96734
Telephone: (808) 254-5884

CLIENT: EarthTech, Inc.
AMFAC Center Tower, 700 Bishop St. Ste 900
Honolulu HI 96813

ATTENTION:

FILE No.: 942
REPORT DATE: 03/01/00
PAGE: 1 of 1

AECOS REPORT OF ANALYTICAL RESULTS

SAMPLE TYPE: Streamwater
DATE SAMPLED: 02/03/00

AECOS LOG No.: 12718
DATE RECEIVED: 02/03/00

SAMPLE ID ⇨ / ANALYTE ⇩	Wetland A	Wetland B			Analysis Date Analyst ID
Temperature (° C)	21.1	22.5			02/03/00 rd
Dissolved Oxygen (mg/L)	2.71	9.97			02/03/00 rd
pH	7.46	8.59			02/03/00 rd
Turbidity (NTU)	25.6	6.91			02/04/00 rd
Total Suspended Solids (mg/L)	44.0	4.8			02/07/00 rd
Ammonia (µg N/L)	19	59			02/10/00 dh
Nitrate+Nitrite (µg N/L)	<1	61			02/23/00 dh
Total Nitrogen (µg N/L)	1280	600			02/24/00 dh
Total Phosphorus (µg P/L)	503	226			02/27/00 dh

J. Mello, Laboratory Director

Appendix C
Cultural Resources Survey

International Archaeological Research Institute, Inc.

PREHISTORIC & HISTORIC INVESTIGATIONS • CULTURAL RESOURCES ASSESSMENTS & PLANNING • PALEOENVIRONMENTAL STUDIES

February 2, 2000

Karl B. Bromwell
Earth Tech, Inc.
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

Re: Archaeological Resources Survey, Leeward Bikeway Environmental Assessment, Hawaii Department of Transportation, Highway Division

At the request of Earth Tech, Inc., International Archaeological Research Institute, Inc. has completed background research on historic sites for the Leeward Bikeway Environmental Assessment. The proposed leeward bikeway follows an approximately 14 mile route along the Oahu Railway and Land Company (OR&L) railroad line from Waipi`o Point Access road in Waipi`o *ahupua`a* through the *ahupua`a* of Waikele, Hō`ae`ae, Honouliuli, and Nanakuli to its terminus at Lualualei Naval road in Wai`anae *ahupua`a* (Fig. 1). The goals of the background research were to determine: 1) the presence or absence of known historic sites along the proposed route; 2) the likelihood of discovering significant historic sites during bikeway construction; and 3) the types of historic sites that might be discovered. The goals of the research were achieved through a review of materials at the State Historic Preservation Division in Kapolei, including archaeological reports, site location maps, site files, Geographic Information System data, and a field check of potentially important locations along the proposed bikeway route.

Locations of Known Sites and Their Significance

Three historic sites are known along the proposed bikeway route, including the OR&L Right of Way, a former traditional Hawaiian burial site, and abandoned Pouhala fishpond (Fig. 1).

The proposed bikeway follows the OR&L Right of Way, portions of which are listed or have been determined eligible for listing on the National Register of Historic Places (NRHP). A 13 mile, 40 ft. wide right of way listed on the NRHP (National Register of Historic Places 1975) begins at the intersection of Farrington Highway and Lualualei Road in Wai`anae *ahupua`a*, passes through Nanakuli *ahupua`a*, and ends about 300 ft. east of Fort Weaver Road in Honouliuli *ahupua`a* (Fig. 1). The railway along this section consists of narrow-gauge steel rails (36") on a raised roadbed of mixed materials. The right of way is significant because it is the longest remaining continuous stretch of narrow-gauge OR&L railroad track, is the longest stretch of continuous railroad track in Hawaii, and is also one of the longest stretches of narrow-gauge railroad track in place in the United States. A second section of right of way, approximately 1,000 ft. long, that passes over federal land at the National Wildlife Refuge at West Loch, was determined eligible for listing in 1989 (Paty 1989). This portion of the OR&L line is part of the existing West Loch bike path, which is outside the scope of this survey.

HAWAII: 2081 Young Street, Honolulu, Hawaii 96826-2231 Tel: (808) 946-2548 Fax: (808) 943-0716 e-mail: iarli@aloha.net
GUAM: P.O. Box 22621, GMF, Guam 96921 Tel/Fax: (671) 734-2755 e-mail: iaril@kuentos.guam.net
PALAU: P.O. Box 1714-i103, Koror, Palau 96940 Tel/Fax: (680) 587-3631 e-mail: iarii@palaunet.com

Site 50-80-12-4061 marks the spot in Honouliuli *ahupua`a* (Fig. 1) where a mandible, right scapula fragment, and portions of a right femur and humerus, probably from the same individual, were recovered eroding out of the sand on December 28, 1987 (Pietrusewsky 1988). The individual was identified as a young adult of undetermined sex, probably of Polynesian ethnicity, with dental caries and periodontal disease. The remains were determined to be ancient. According to State Historic Preservation Division records the remains were scheduled for reinterment at a separate location, and are no longer present at Site 4061. Thus, the site is not significant today, although the discovery of human remains indicates that other burials might be located in similar circumstances along this coast.

Site 50-80-09-126, Pouhala and Ulumoku (or Kaaukuu) fishponds, are located in Waikele *ahupua`a* (Fig. 2). In 1900, the two ponds were divided into a number of smaller ponds, some of which were used for rice cultivation (McAllister 1933:106). Today, the area around Pouhala pond is a low-lying wetland with poorly drained soils, portions of which are still used for small-scale agriculture. Ulumoku fishpond, south of the proposed bikeway route, has been deeply filled with urban waste. Fishpond sediments, if present today in the wetland, would be significant for the information on Hawaiian history and prehistory that they are likely to yield.

Site 50-80-09-123, Loko Eo, is a fishpond located in Waipi`o *ahupua`a* (Fig. 2). This fishpond was probably filled in the 1940s by a sugar company, which used it as a settling pond for capturing topsoil from irrigation water. Most of the former pond is used today as Ted Makalena Golf Course. Paleoenvironmental coring at the pond indicates that intact sediments are found at a depth greater than 7 m below surface, a depth corresponding to a time more than 2,500 years ago, well before the islands were first settled (Athens 1999). It is unlikely that intact fishpond sediments from Loko Eo remain. The site is thus not eligible for listing on the State and National Registers of Historic Places.

Locations Where Historic Sites Are Likely To Be Found

Most of the proposed bikeway route crosses abandoned sugarcane fields in Honouliuli *ahupua`a*. Much of the agricultural soil here was deposited in the late 19th century through the efforts of sugar planters. Steam plows in the sugarcane fields routinely reached depths of 3 ft.; their repeated application over the years of sugarcane cultivation in the region would have destroyed any historic sites that were not deeply buried. The only traditional Hawaiian historic sites in the old sugarcane fields were found in (former) gulches where they escaped the work of the plow. There are no surface sites along the proposed bikeway route from Kahe Point to the terminus east of Fort Weaver Road.

The section from Kahe Point to the terminus at Lualualei Naval Road crosses several expanses of beach sand, including a long stretch immediately north of Kahe Point, another surrounding the outlet of Nanakuli Stream, and a final stretch over the last approximately 3,000 ft. to the terminus at Lualualei Naval Road. In these areas construction of two planned retaining walls, three bridges, and any other actions requiring excavation have the potential to discover traditional Hawaiian burials, similar to the burial discovered at Site 50-80-12-4061.

The section connecting the existing West Loch and Pearl Harbor bikepaths runs along the *makai* edge of urbanized Waipahu town, but crosses over the abandoned fishponds Loko

Pouhala and Loko Eo. Fishpond sediments associated with Loko Pouhala are likely to exist in the wetland in Waikele *ahupua`a*. These deposits would be significant for the information on Hawaiian history and prehistory that they contain. It is unlikely that intact sediments associated with Loko Eo will be found because these were most probably disturbed or destroyed when the pond was filled more than a half century ago.

Recommendations for Completing the Historic Preservation Review Process

Construction of the proposed bikeway will have "no effect" on the qualities that make the OR&L Right of Way significant, i.e. its status as the longest continuous stretch of narrow-gauge railway in the U.S., the longest continuous stretch of railway in Hawaii, and the longest remaining stretch of the OR&L line. The bikeway has the potential to make this significant historic site accessible to a larger segment of the public, and it is recommended that information about the history of the railroad be made available with signage along the bikeway or by other means.

Two retaining walls and three bridges are proposed in the section of bikeway from Kahe Point to Lualualei Naval Road. These appear to be in or near areas of beach sand with a potential to contain unmarked human burials. Because it is not possible to predict the locations of unmarked human burials in sandy areas such as this, and because it would not be practical to conduct subsurface inventory survey over the entire areas potentially affected by the proposed retaining walls and bridges, it is recommended that construction activities for the retaining walls and bridges, along with areas of cut slope requiring excavation be monitored by a qualified archaeologist. Matters of burial treatment for traditional Hawaiian remains rests with the O`ahu Island Burial Council, and it is recommended that the council and other interested parties be consulted prior to construction so that a plan to deal with inadvertently discovered human remains can be developed.

At Pouhala pond, a 62' long existing bridge structure might be renovated. Depending upon the scope of this renovation, intact fishpond sediments might be exposed and disturbed, an action constituting an adverse effect on historic sites. In this case, a data recovery plan to collect samples for characterization of the paleoenvironment, including pollen and material for radiocarbon dating, should be developed and implemented. Such a plan would mitigate the adverse effects of construction on significant fishpond deposits at Pouhala pond.

Thank you for the opportunity to carry out this archaeological resources survey. If you have any questions please feel free to contact me at our Honolulu office, 946-2548 x116.

Sincerely,

Thomas S. Dye

Thomas S. Dye
Senior Archaeologist

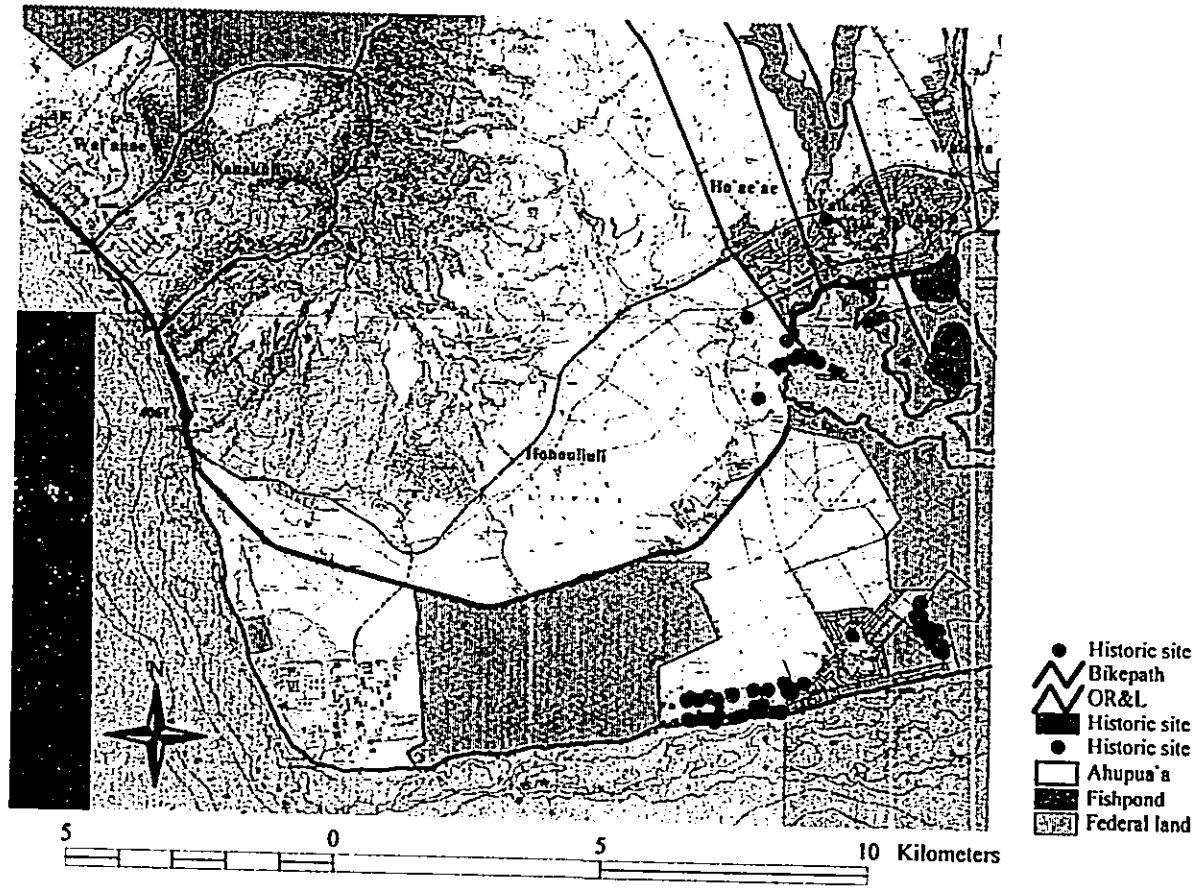

Figure 1. Proposed bikeway in relation to known historic sites.

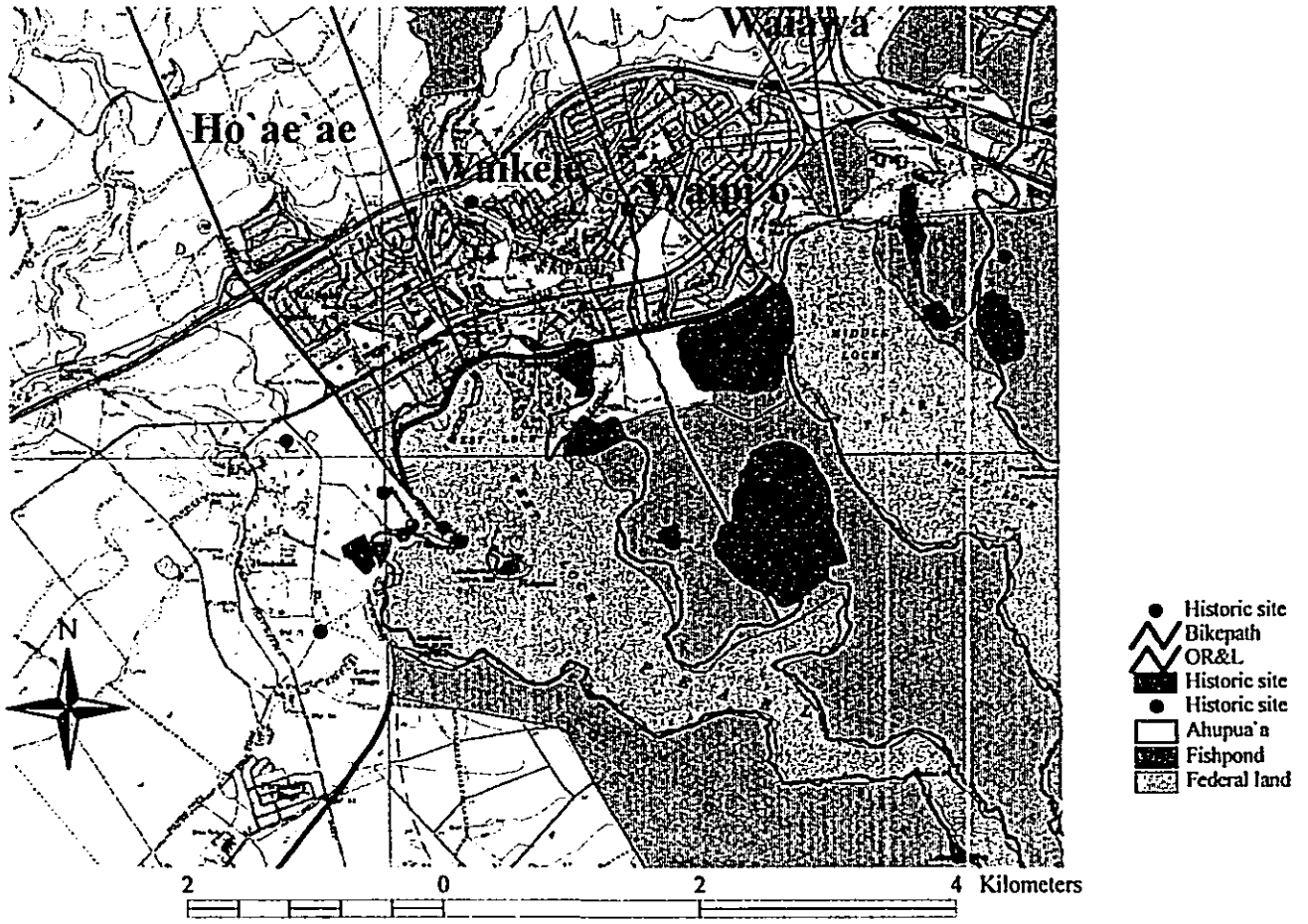

Figure 2. Proposed bikeway location in Hō`ae`ae, Waikele, and Waipi`o *ahupua`a*.

References Cited

Athens, J. Stephen

1999 *Ancient Hawaiian Fishponds of Pearl Harbor: Archaeological and Historical Studies on U.S. Navy Lands, Hawai'i.* Prepared for State Historic Preservation Division, Department of Land and Natural Resources. International Archaeological Research Institute, Inc., Honolulu.

McAllister, J. Gilbert

1933 *Archaeology of Oahu.* Bernice P. Bishop Museum Bulletin 104. Bernice P. Bishop Museum, Honolulu.

National Register of Historic Places

1975 Inventory Nomination Form—Historic Oahu Railway and Land Company Right of Way. On file, State Historic Preservation Division, Kapolei.

Paty, William W.

1989 September 12 letter to J. M. Kilian, Naval Facilities Engineering Command. On file, State Historic Preservation Division, Kapolei.

Pietrusewsky, Michael

1988 Forensic Identification Report dated 12/7/88. Site file 4061, State Historic Preservation Division, Kapolei.

Appendix D
Photodocumentation

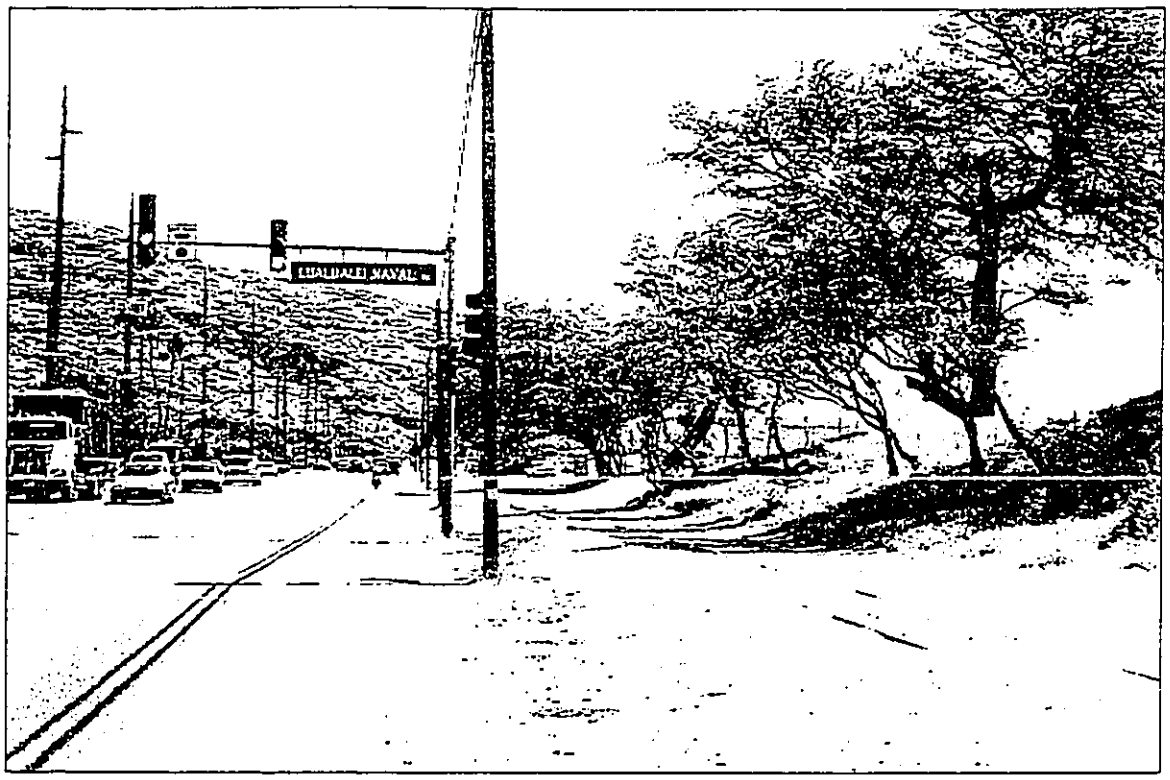

Photo 1: View of the end of the proposed project area at Lualualei Naval Road, looking southeast. Note the presence of the tracks and sand to the right of the photo.

Photo 2: View of Nanakuli Stream, looking southeast. Note the footbridge and tracks crossing the stream.

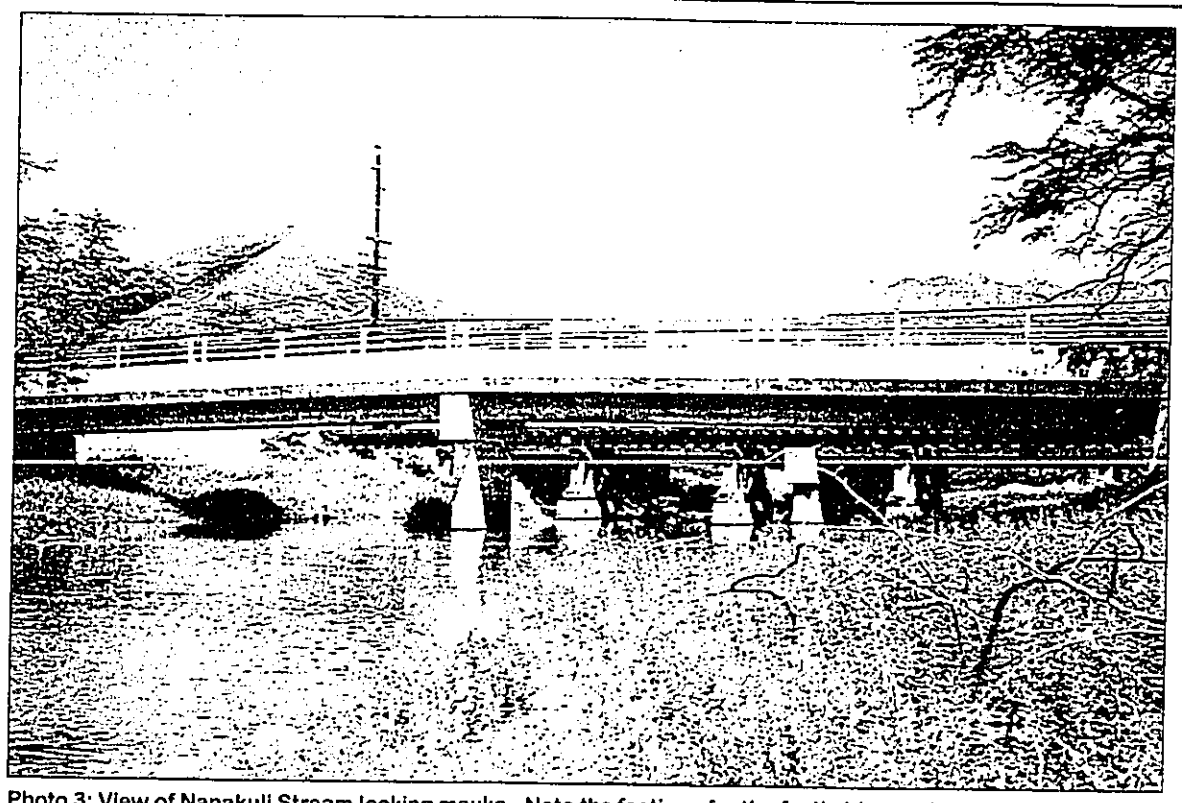

Photo 3: View of Nanakuli Stream looking mauka. Note the footings for the footbridge and road as well as the pickleweed and water of the muliwai.

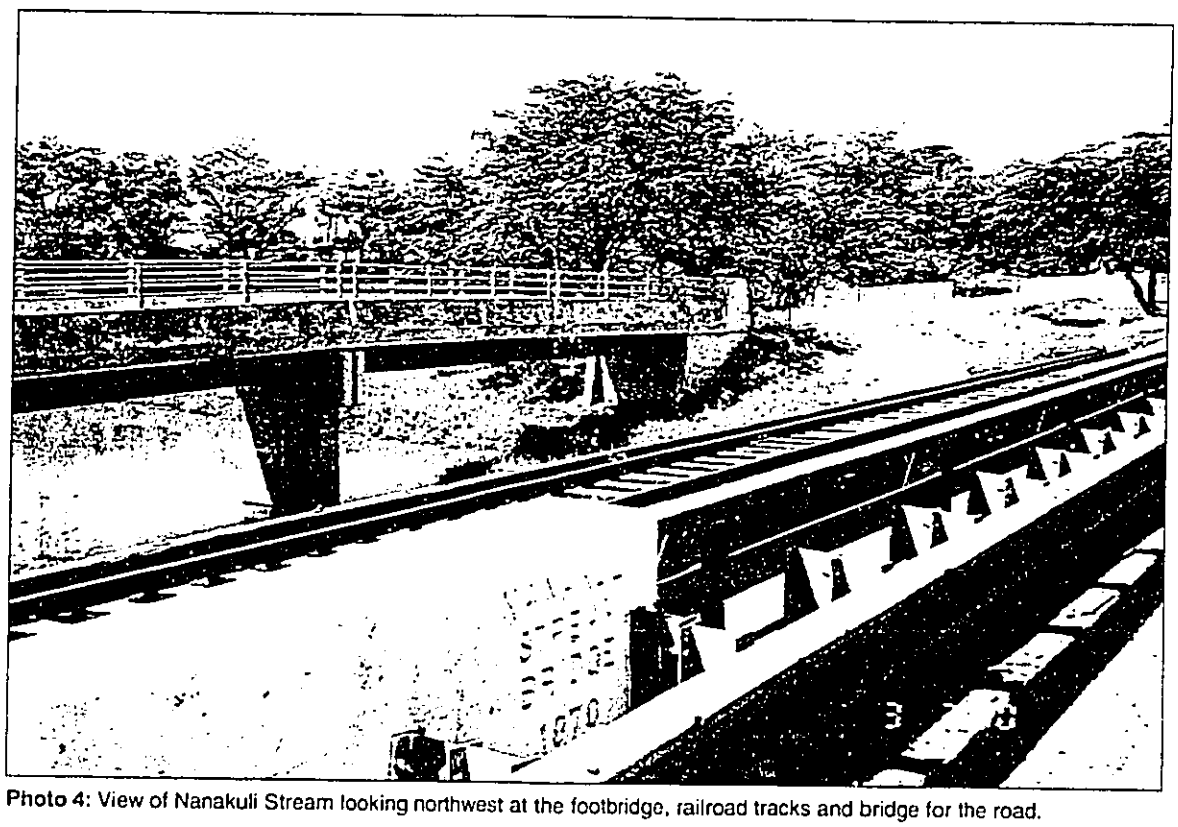

Photo 4: View of Nanakuli Stream looking northwest at the footbridge, railroad tracks and bridge for the road.

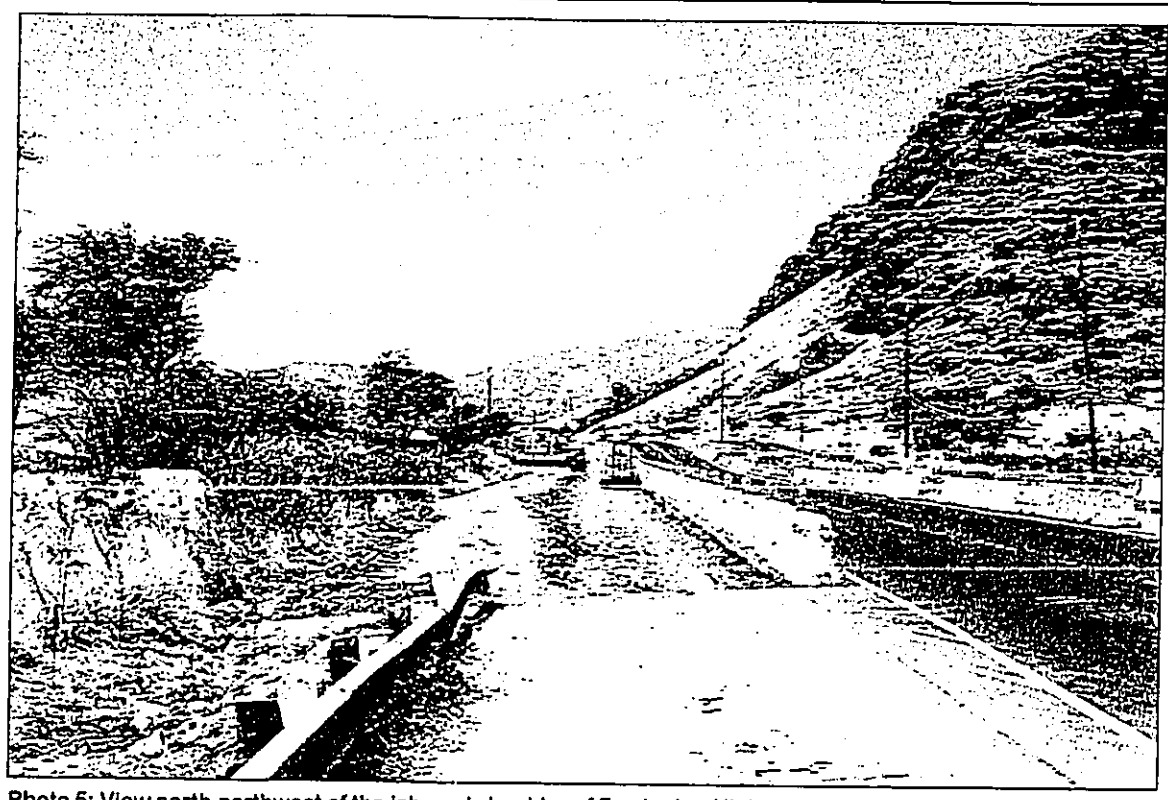

Photo 5: View north-northwest of the inbound shoulder of Farrington Highway. Note the railroad track is present to the left in the photo, along the stand of trees.

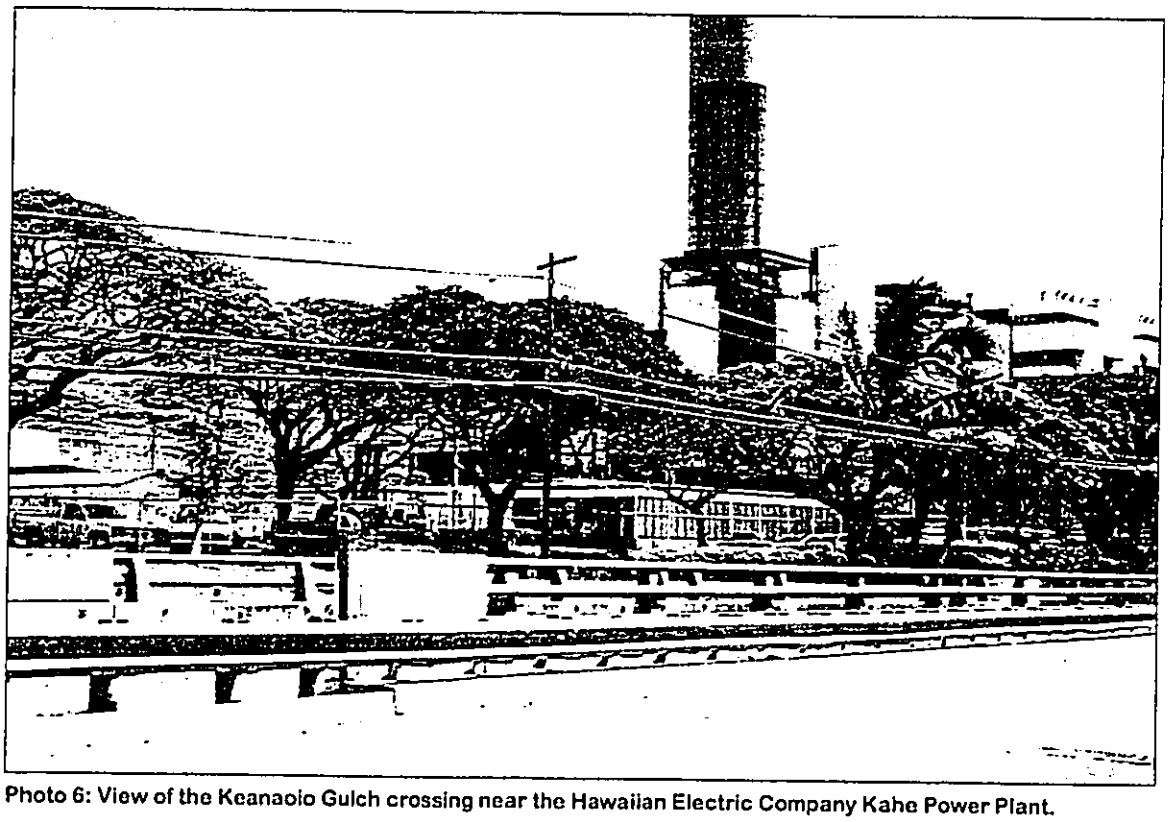

Photo 6: View of the Keanaolo Gulch crossing near the Hawaiian Electric Company Kahe Power Plant.

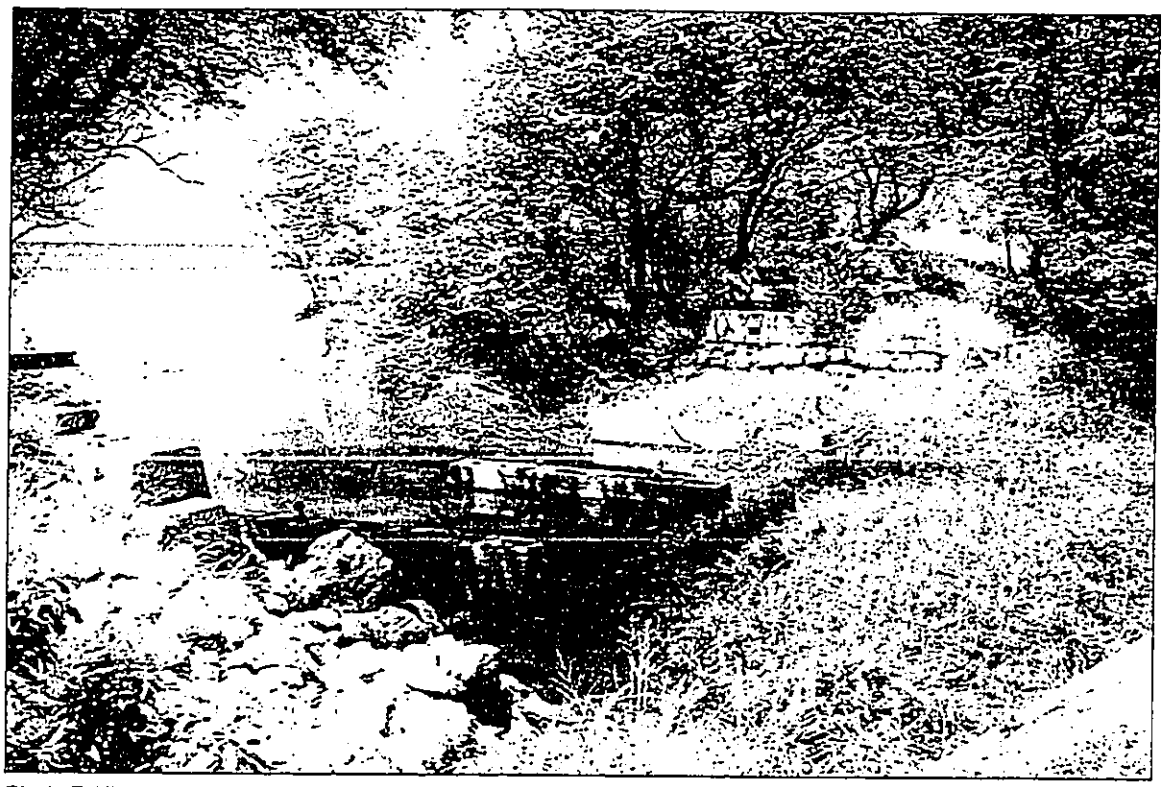

Photo 7: View makai of the Keanaoio Gulch crossing muliwai. Note the footings for the former railroad bridge, the pickleweed and eutrophicated water of the muliwai.

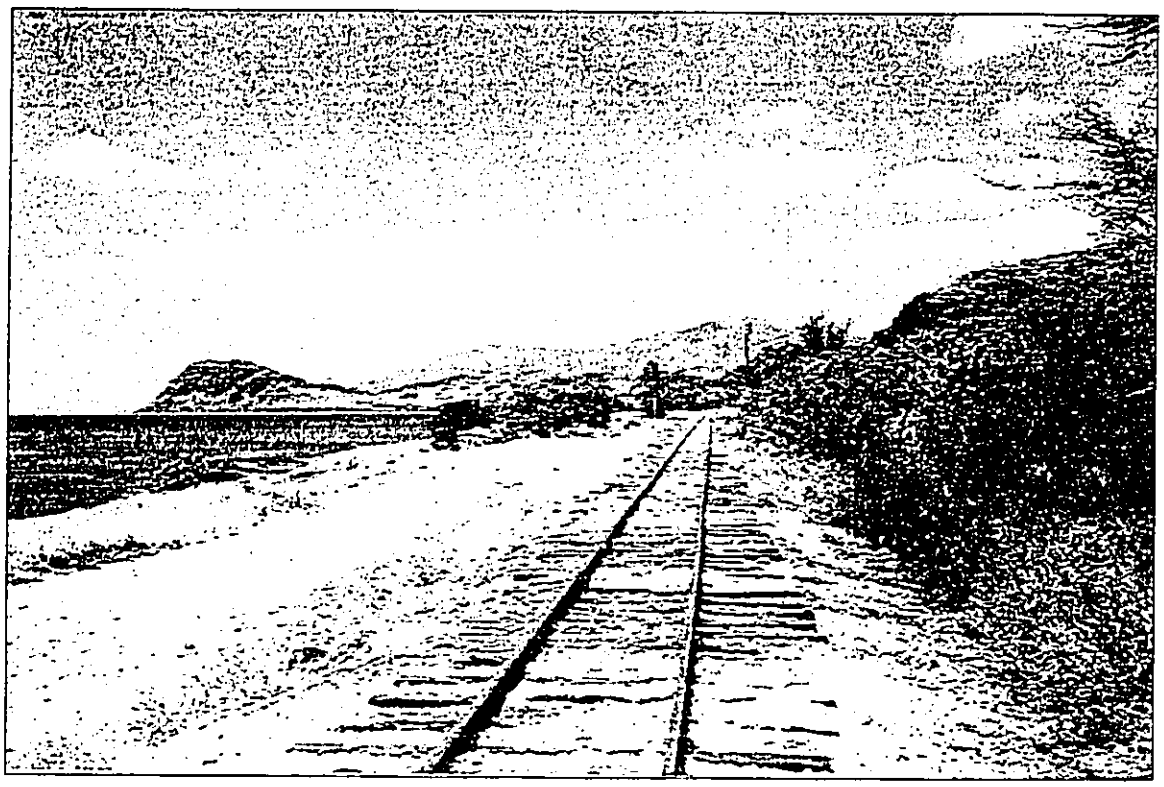

Photo 8: View of the Waianae Coast just north-northwest of Ko'Olina Resort. Note the presence of the tracks and the views of the ocean.

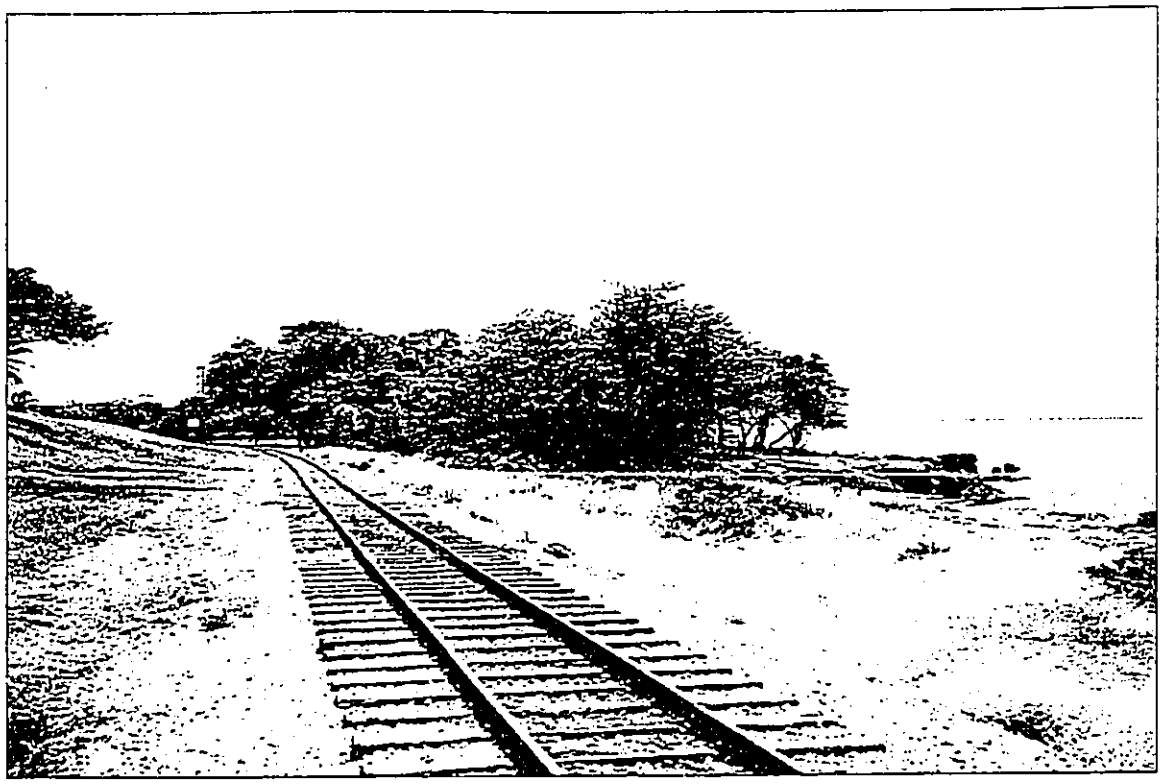

Photo 9: View of the proposed project area south-southeast towards Ko'Olina Resort. Note the ocean views and developed landscaping at the resort.

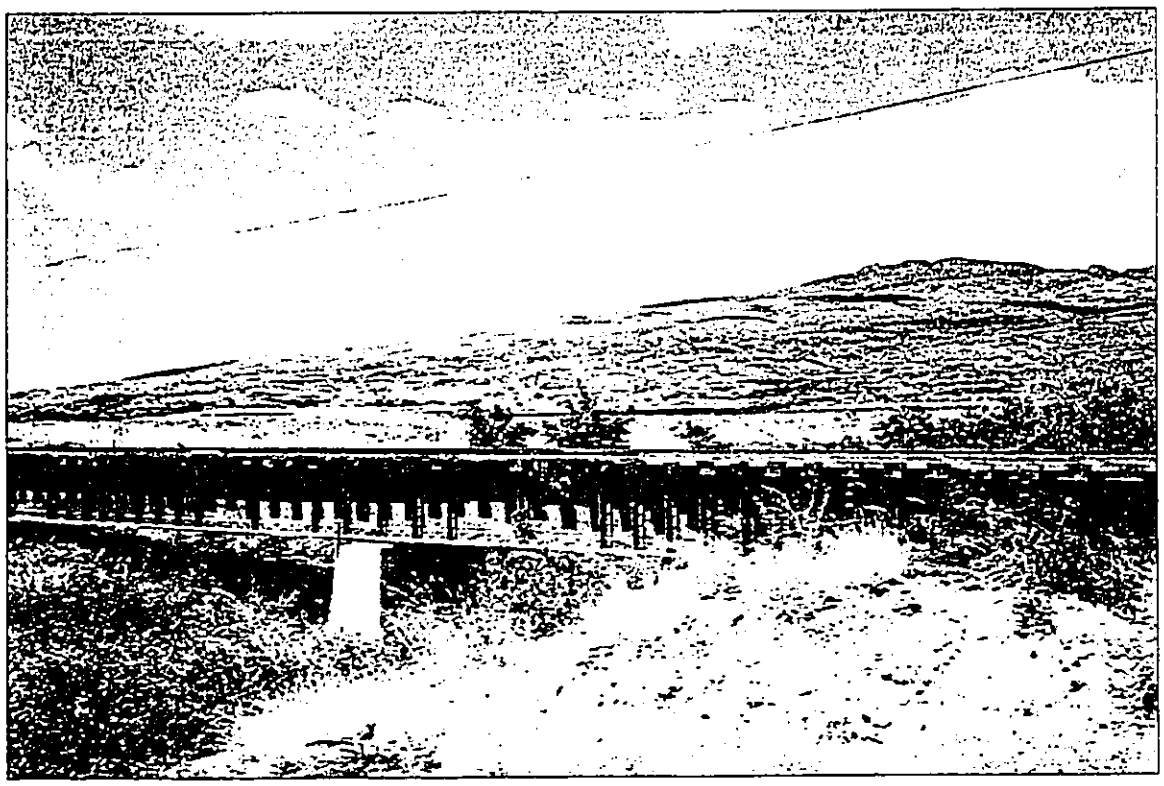

Photo 10: Mauka view of the proposed project area at an unnamed gulch crossing west of Kalaeloa Boulevard. Note the views of the Waianae Range and Makakilo.

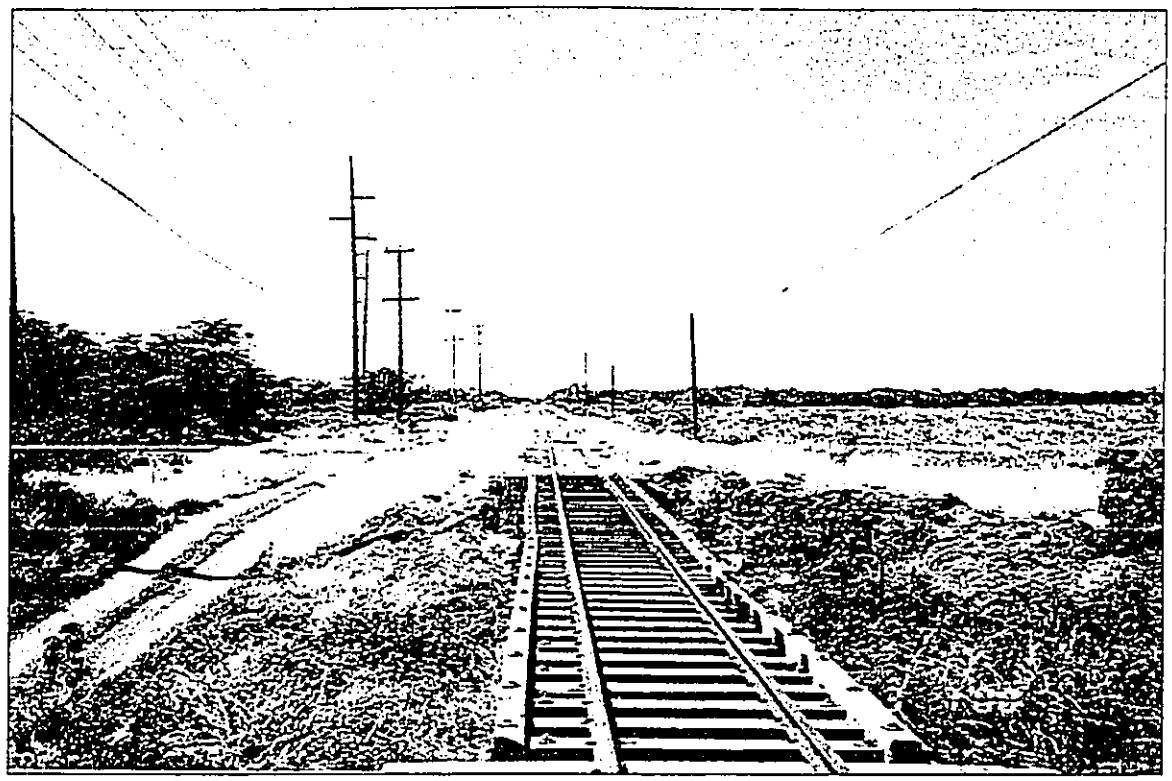

Photo 11: View west-northwest of the proposed project area at the unnamed gulch crossing west of Kalaeloa Boulevard. Note the access road to the south, as well as utility lines on both sides of the tracks.

Photo 12: View south at Fort Barrett Road. Note the tracks are present in front of the lights.

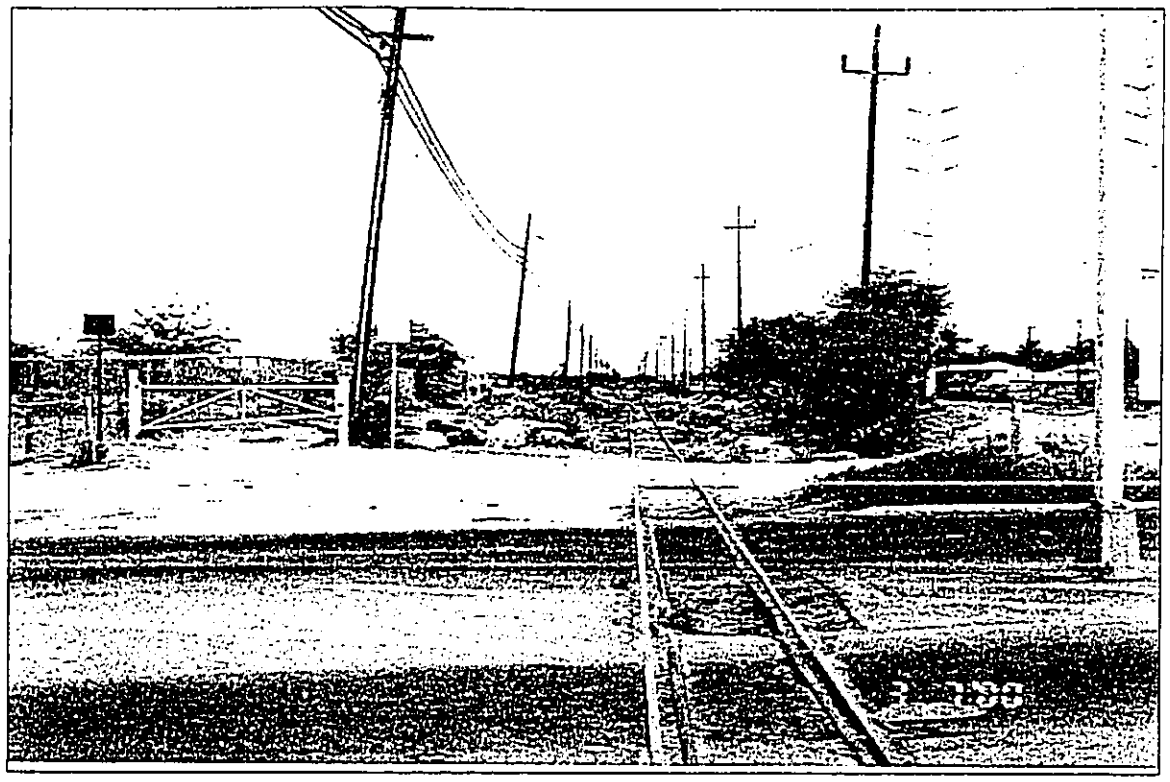

Photo 13 View east of the proposed project area at the Fort Barrett Road crossing. Note the warning signs for the petroleum pipelines (energy corridor) to the right (south) of the tracks, and the fenced construction area north of the tracks.

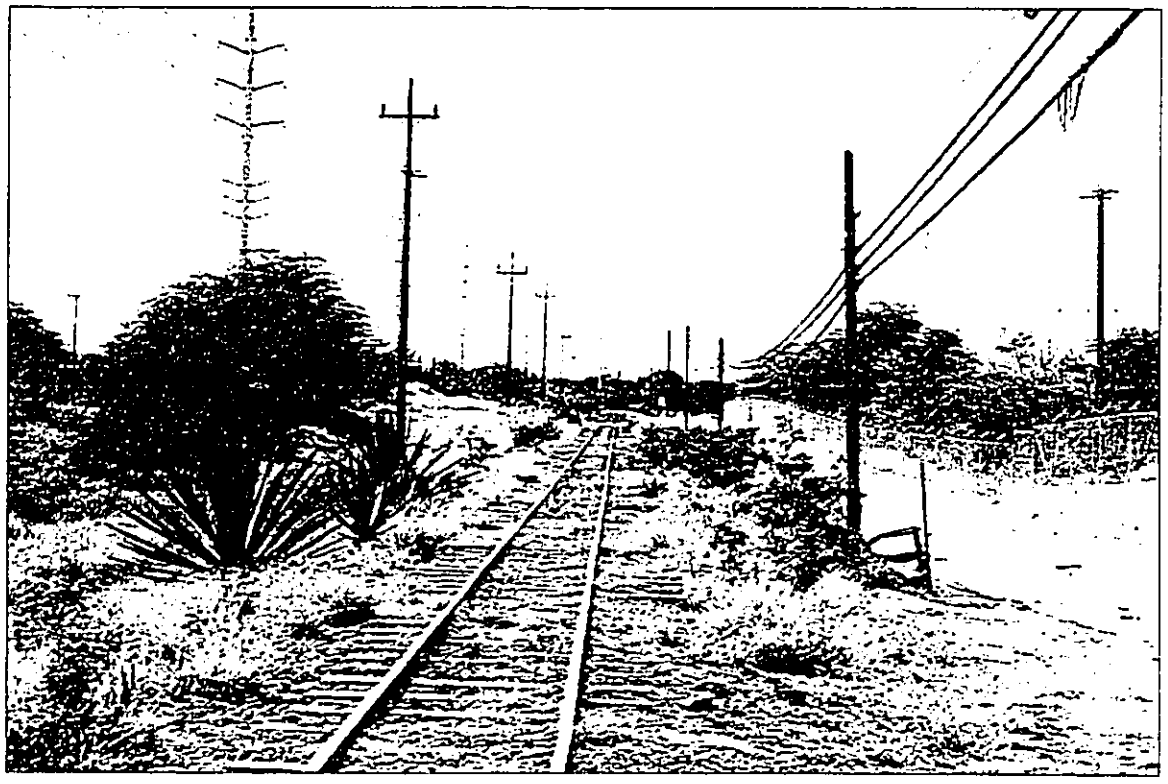

Photo 14 View east of the proposed project area along the northern boundary of the former BPNAS. Note the ruderal environment with agave and Kiawe plants prominent.

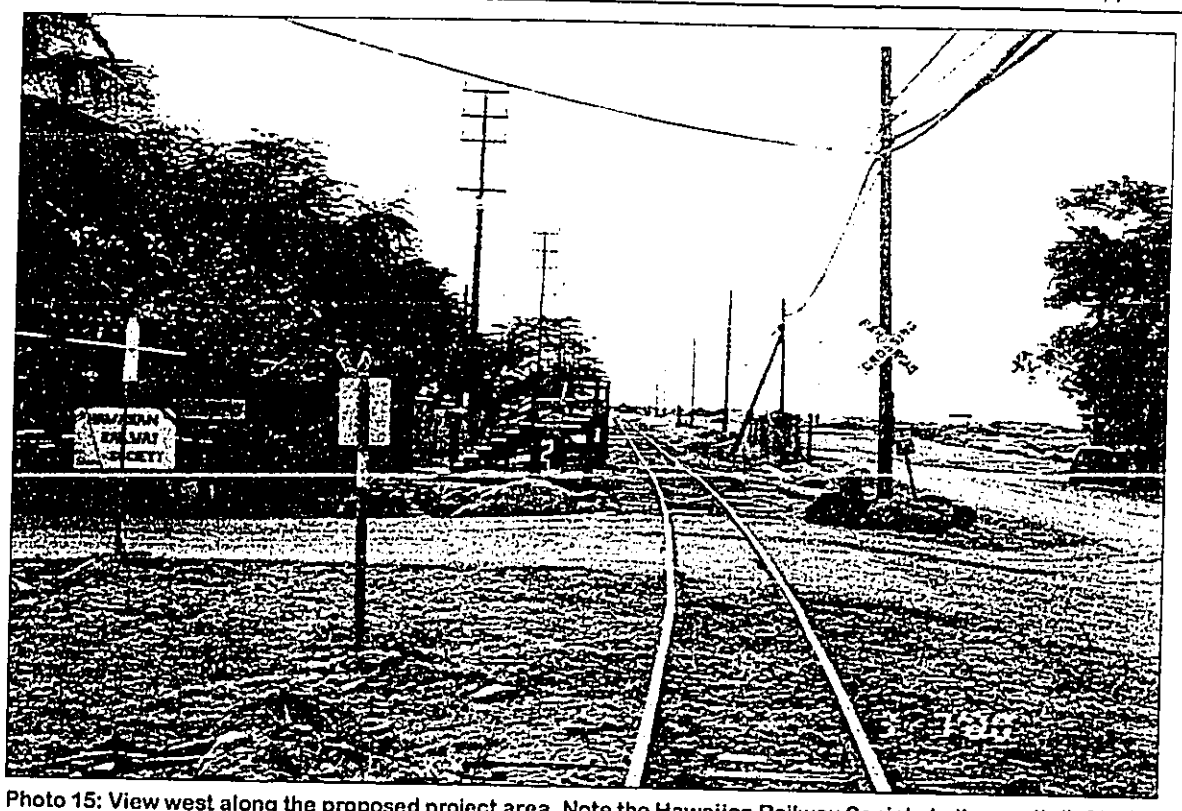

Photo 15: View west along the proposed project area. Note the Hawaiian Railway Society to the south (left) of the tracks, the petroleum pipeline (energy corridor) warning signs to the north (right) of the tracks and Renton Road and construction activities to the north (right) of the tracks.

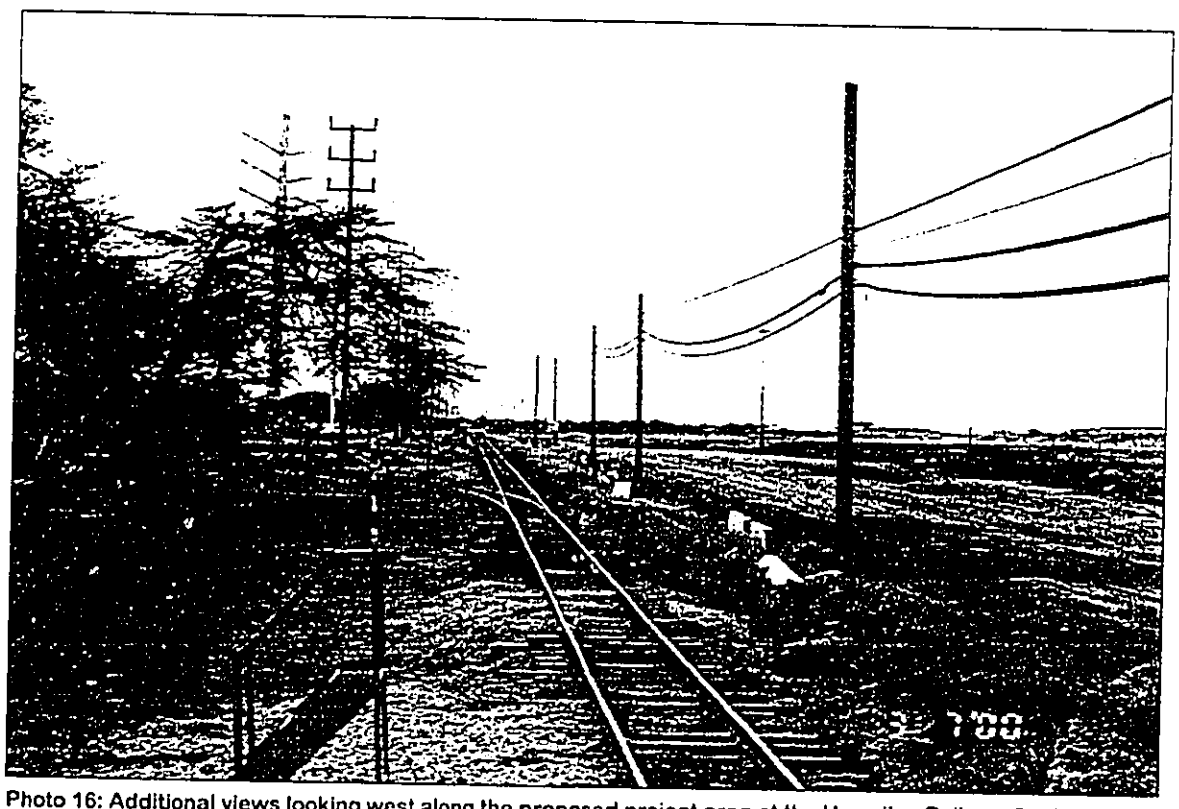

Photo 16: Additional views looking west along the proposed project area at the Hawaiian Railway Society.

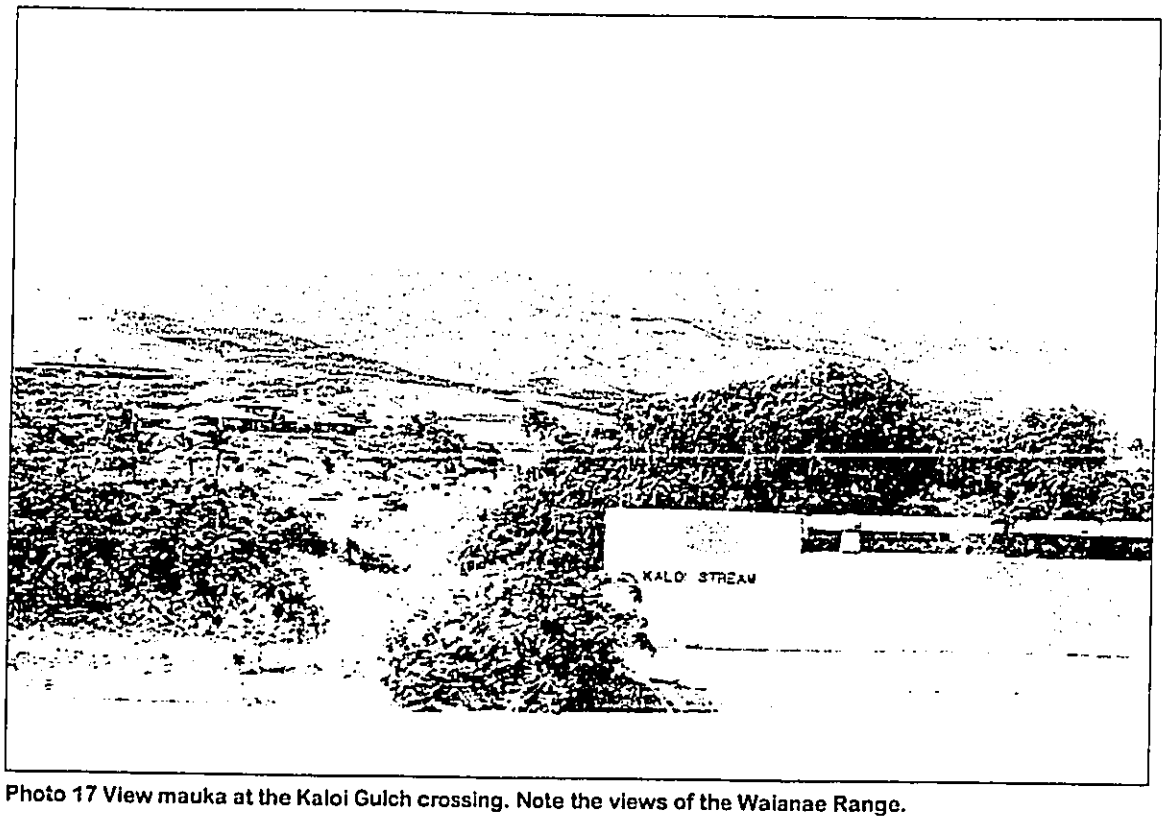

Photo 17 View mauka at the Kaloi Gulch crossing. Note the views of the Waianae Range.

Photo 18: Mauka view of the drainage basin and drainage features at the Kaloi Gulch crossing.

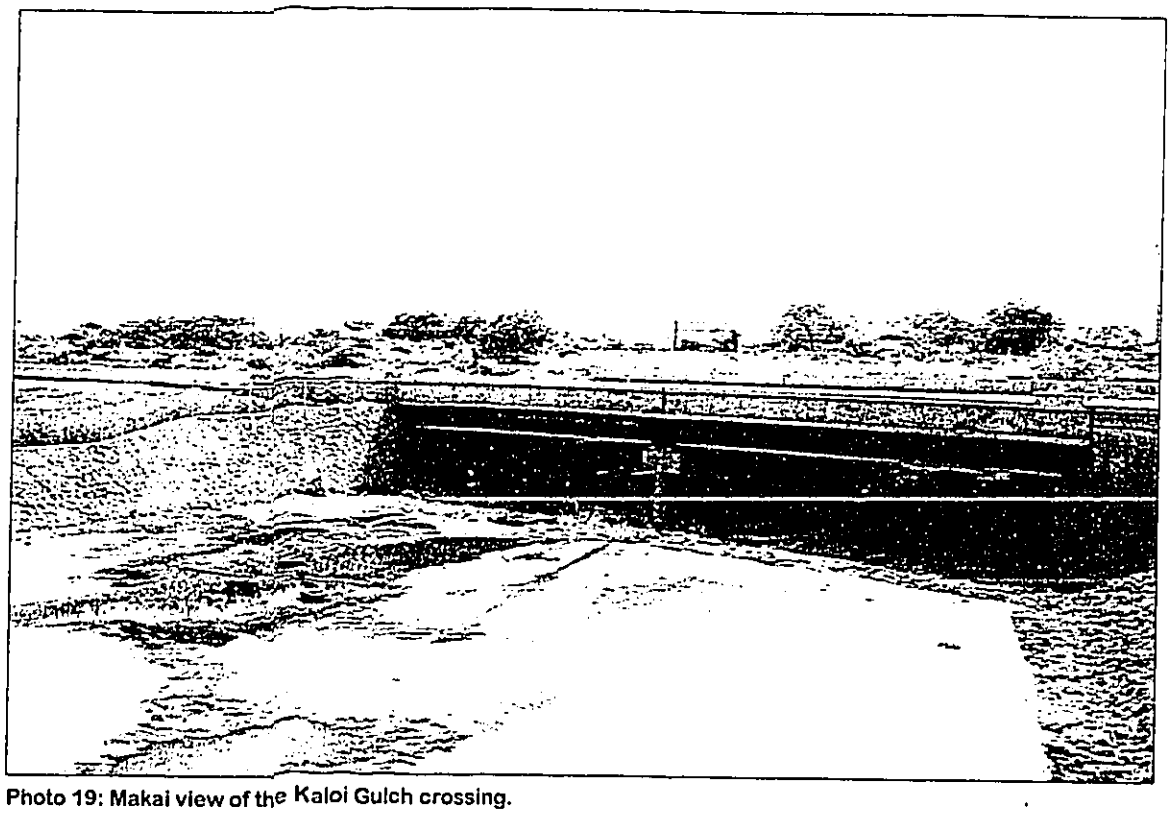

Photo 19: Makai view of the Kaloi Gulch crossing.

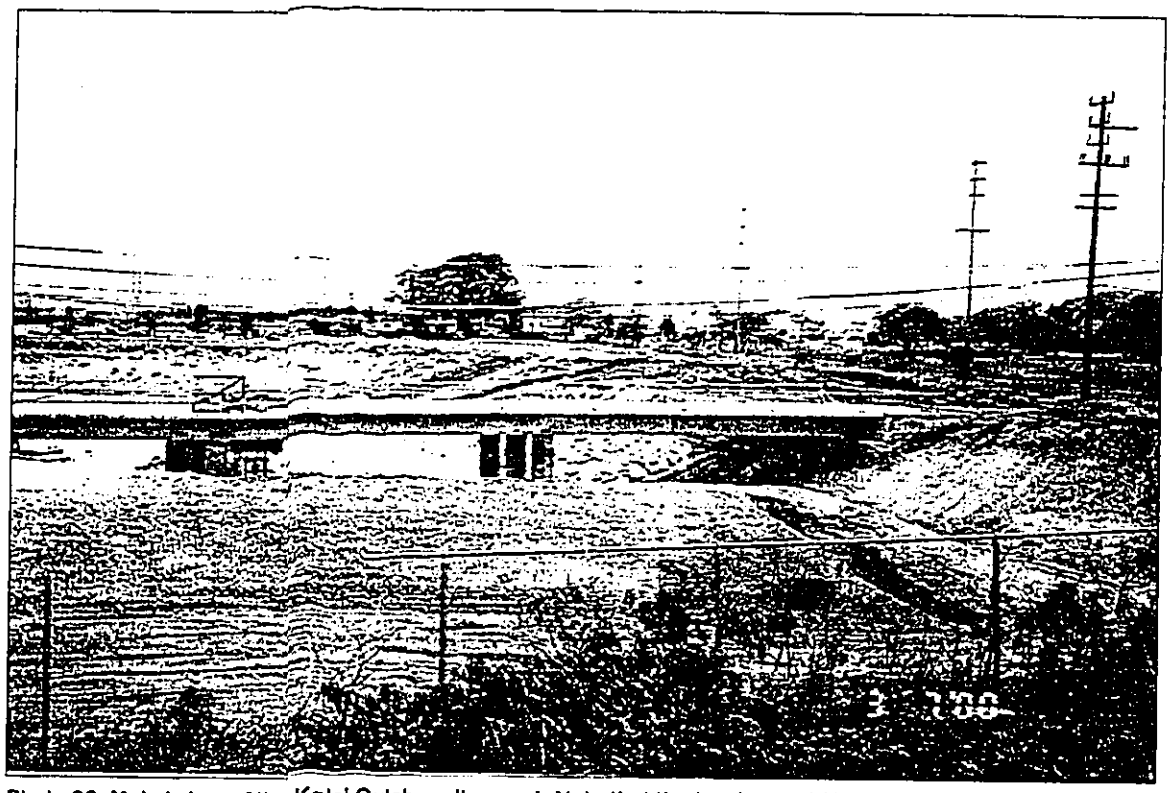

Photo 20: Makai view of the Kaloi Gulch realignment. Note that the tracks would be present in the vicinity of the trees to the right of the photo.

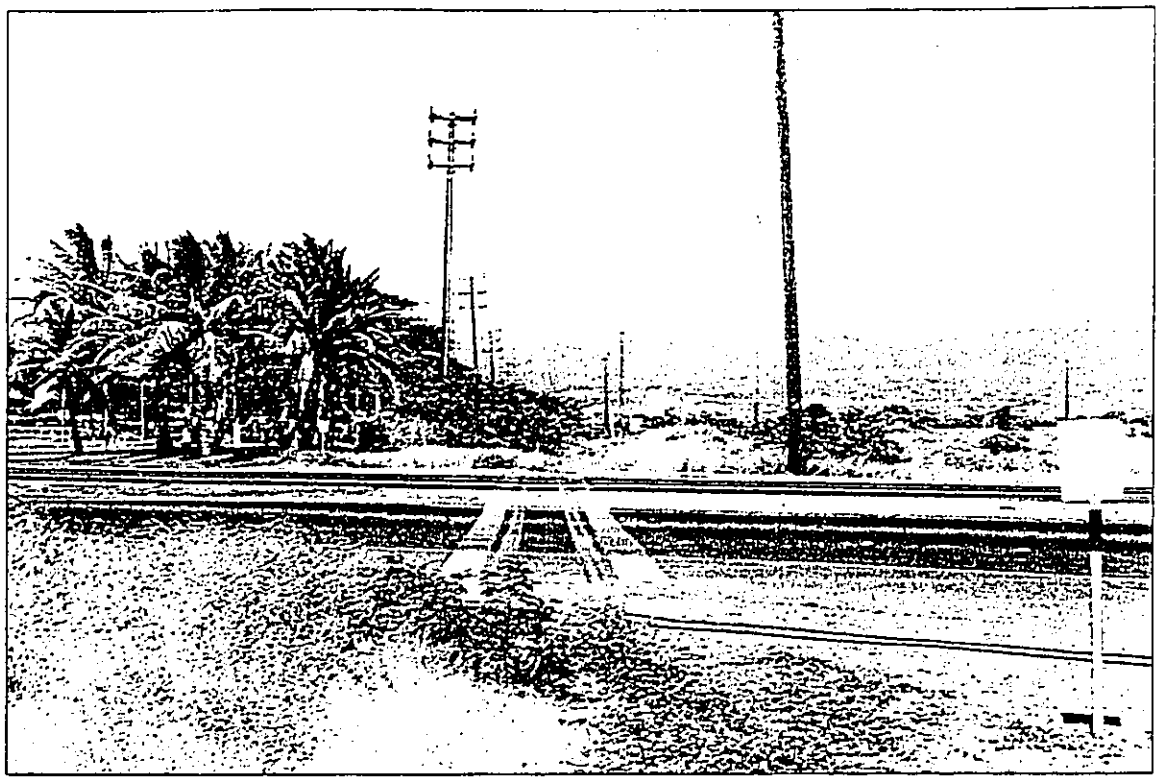

Photo 21: View east northeast along the proposed project area at the Fort Weaver Road crossing. Note the view of the Koolau Range, and the ruderal environment along the tracks.

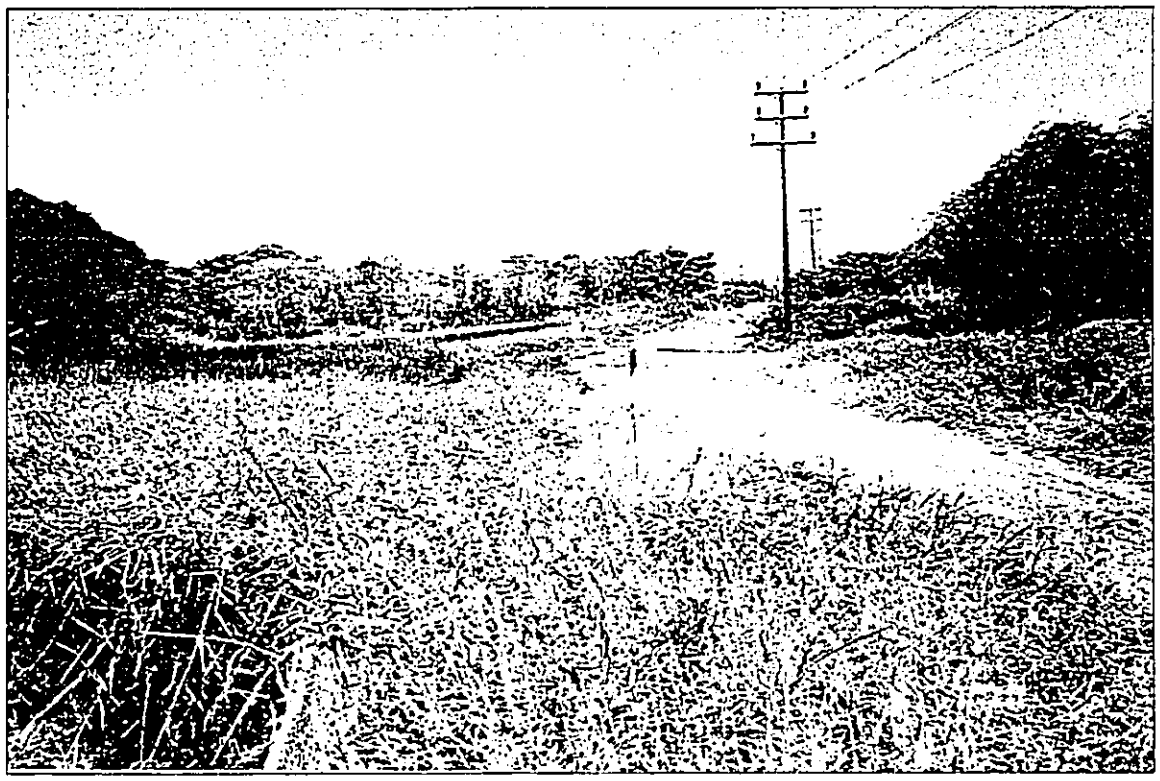

Photo 22: View of the proposed project area looking east near the Pupuole Street Mini Park. Note the view of the Koolaus, the marsh to the north (left) of the photo and the markers for petroleum pipelines (energy corridor) running along the access road.

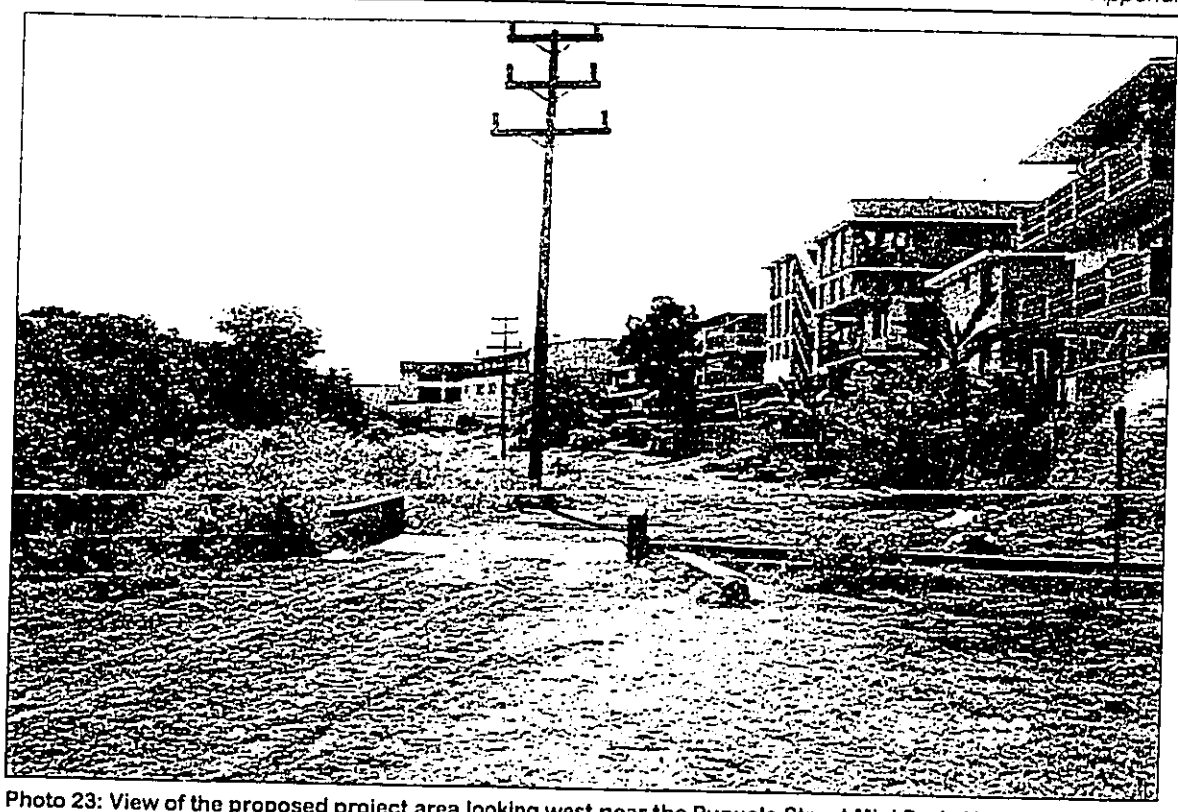

Photo 23: View of the proposed project area looking west near the Pupuole Street Mini Park. Note the drainage/bridge in the center of the photo, the mangrove south (left) and residences to the north (right). Also note the trash that is scattered along the access road and near the residences.

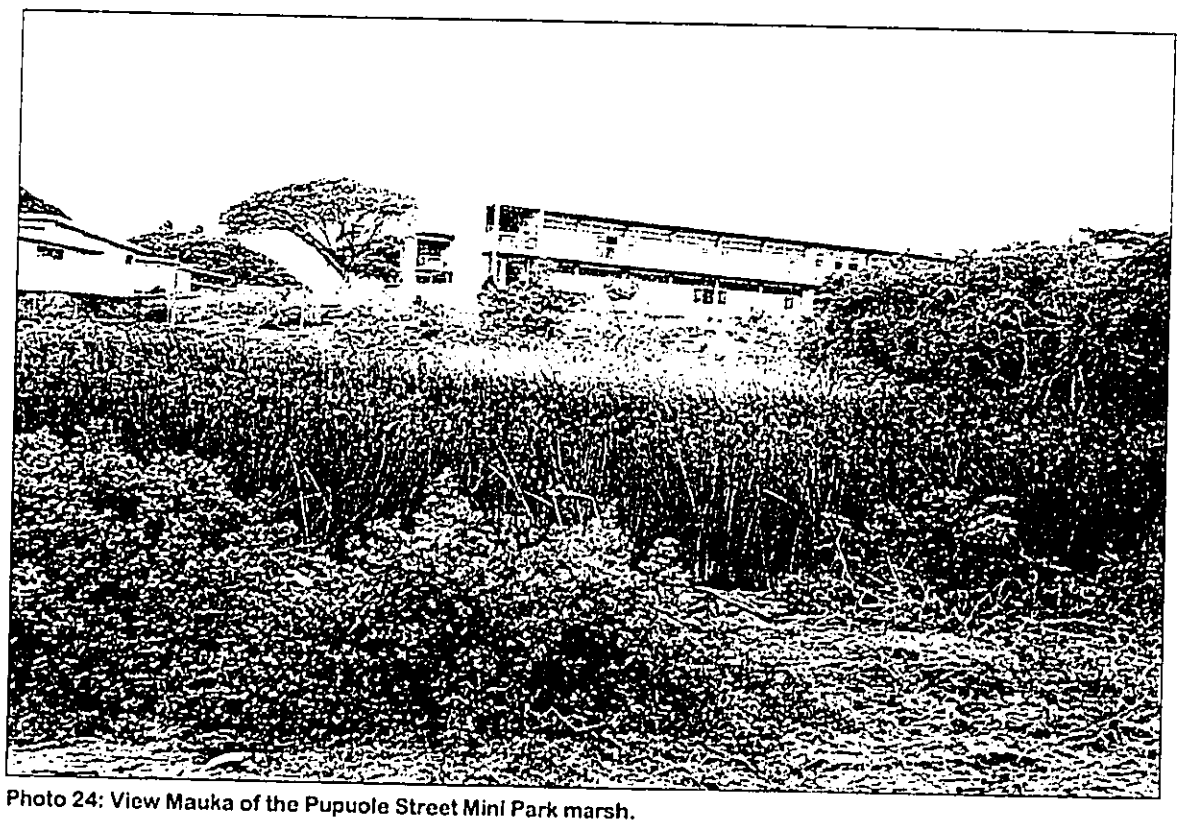

Photo 24: View Mauka of the Pupuole Street Mini Park marsh.

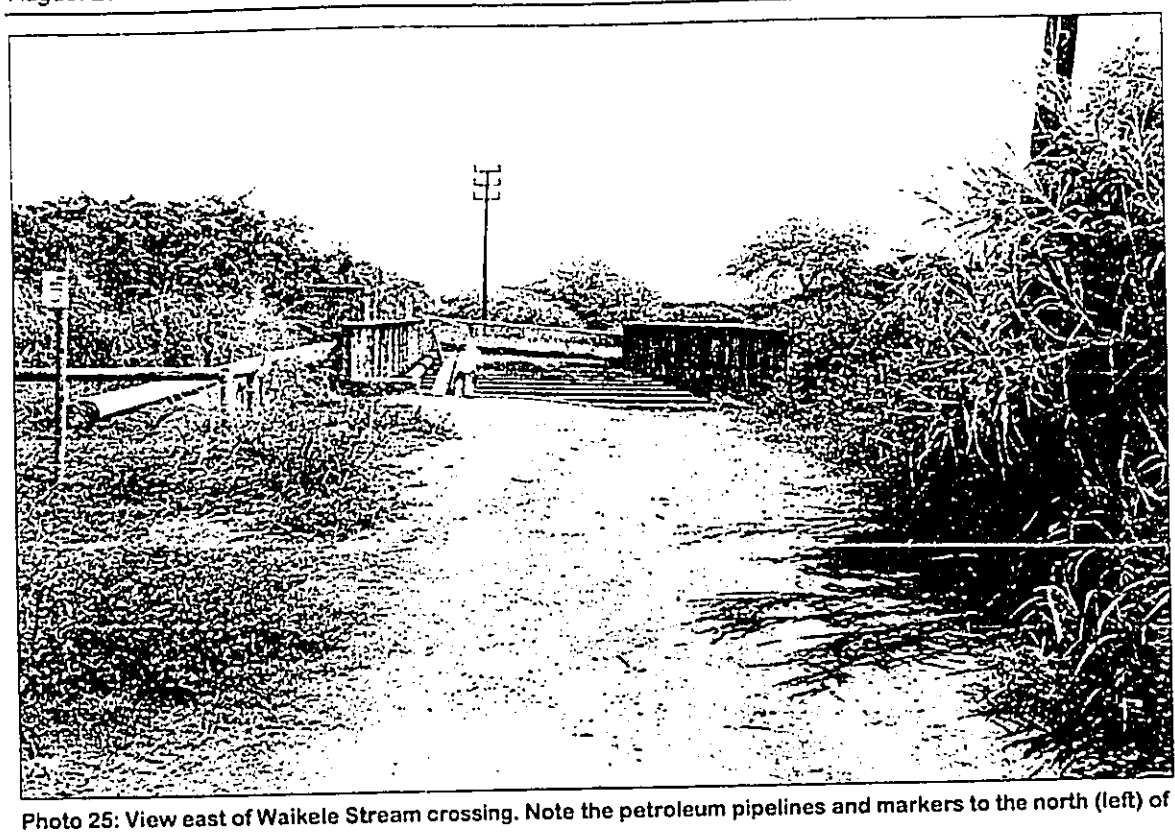

Photo 25: View east of Waikele Stream crossing. Note the petroleum pipelines and markers to the north (left) of the bridge.

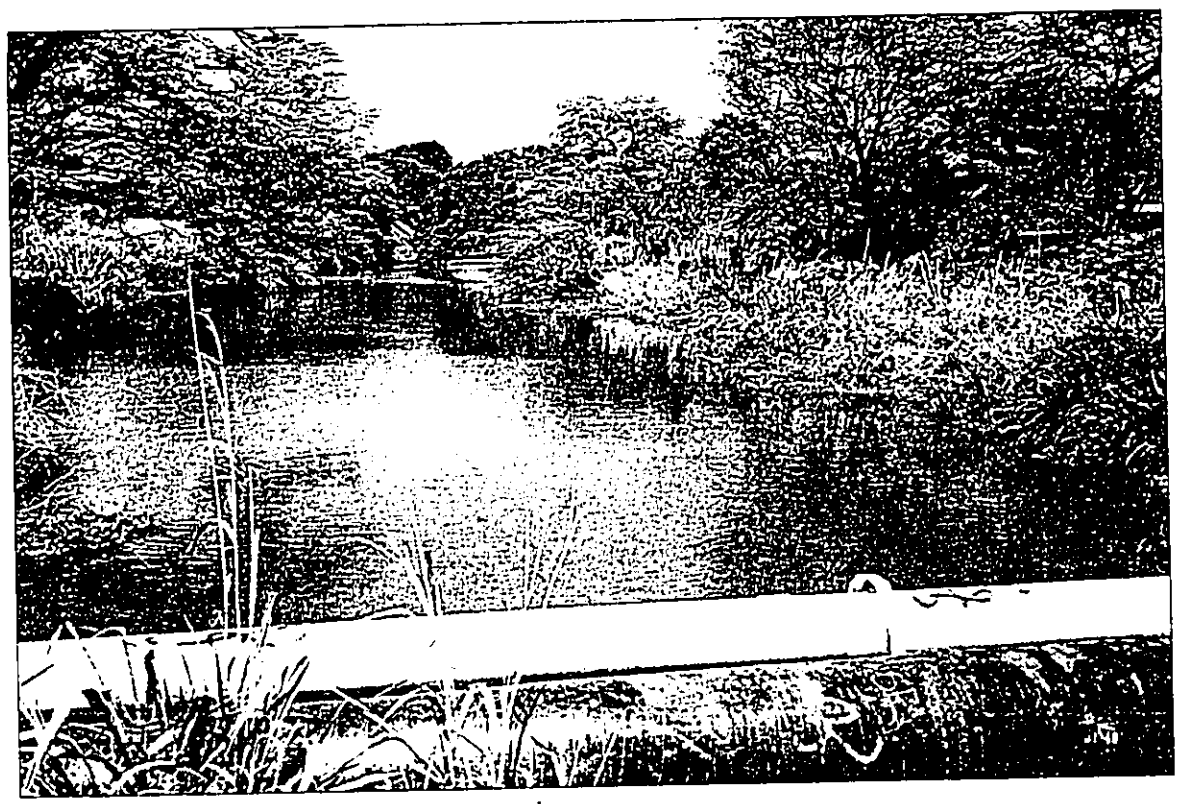

Photo 26: View upstream at Waikele Stream crossing.

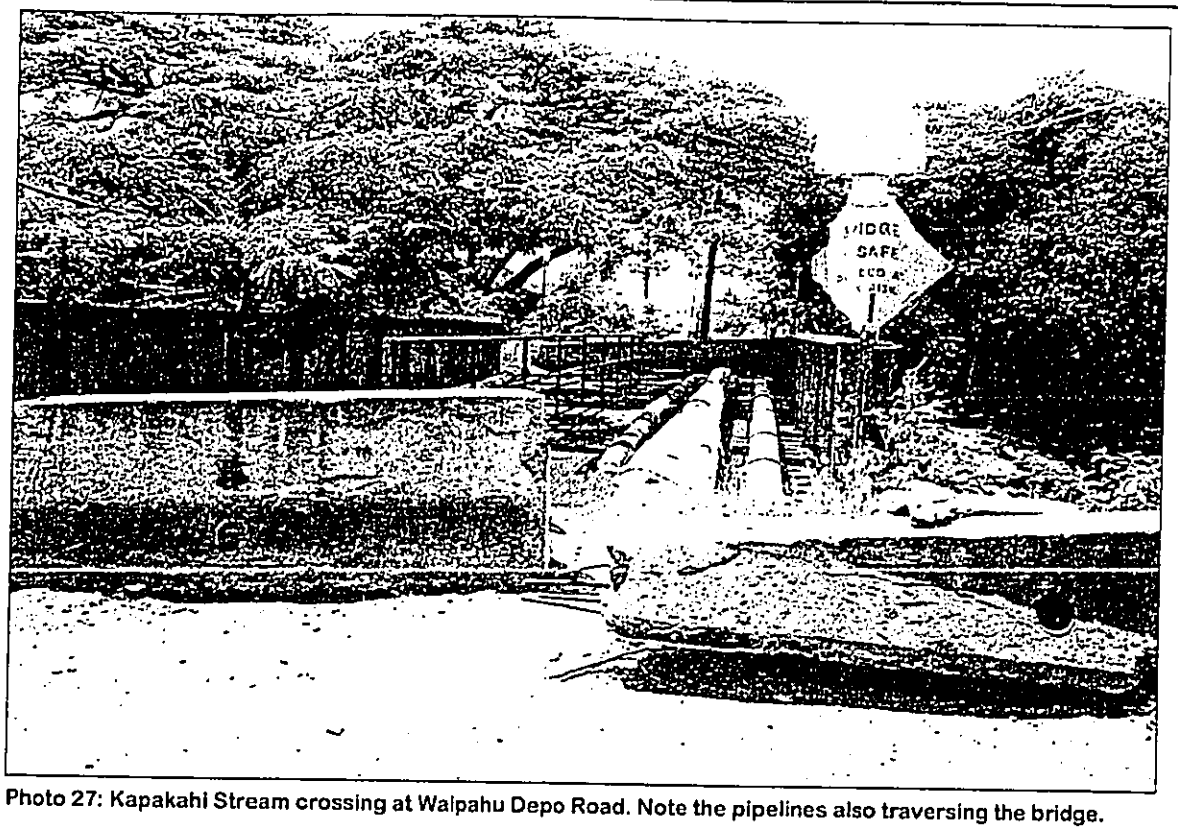

Photo 27: Kapakahi Stream crossing at Waipahu Depo Road. Note the pipelines also traversing the bridge.

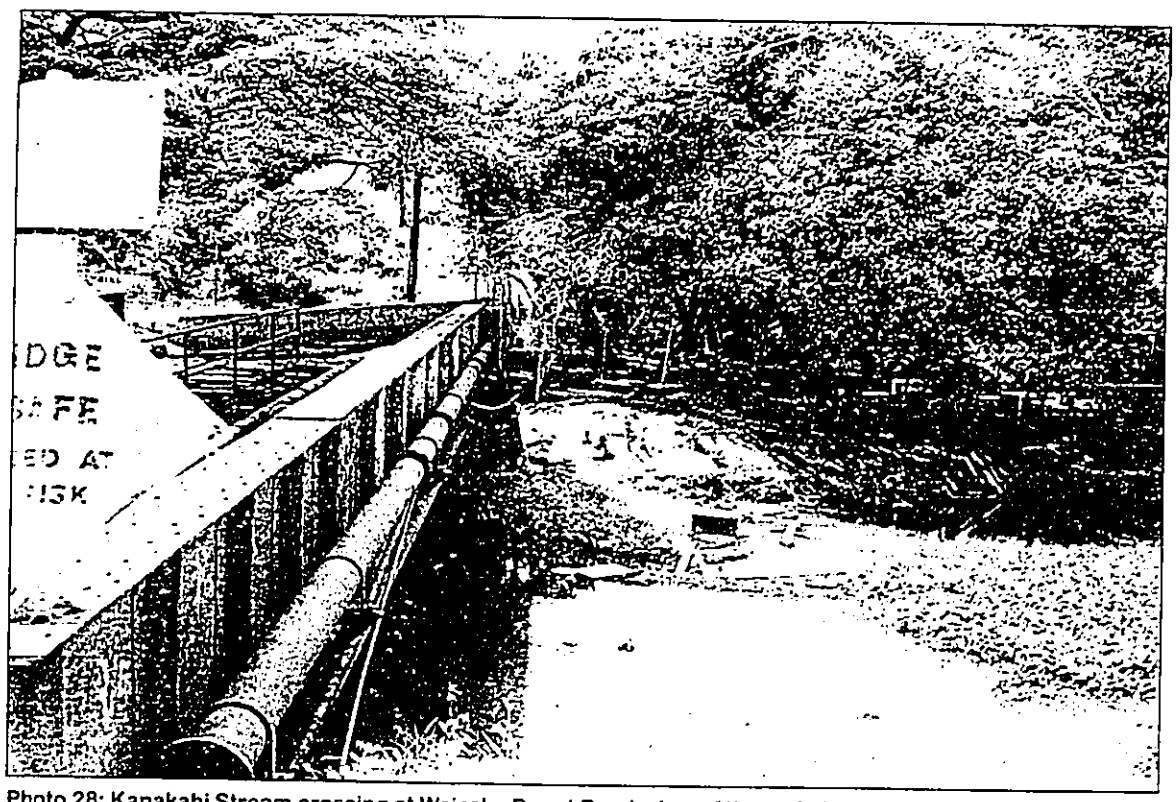

Photo 28: Kapakahi Stream crossing at Waipahu Depot Road, view of the makai side. Note the trash and debris in the water.

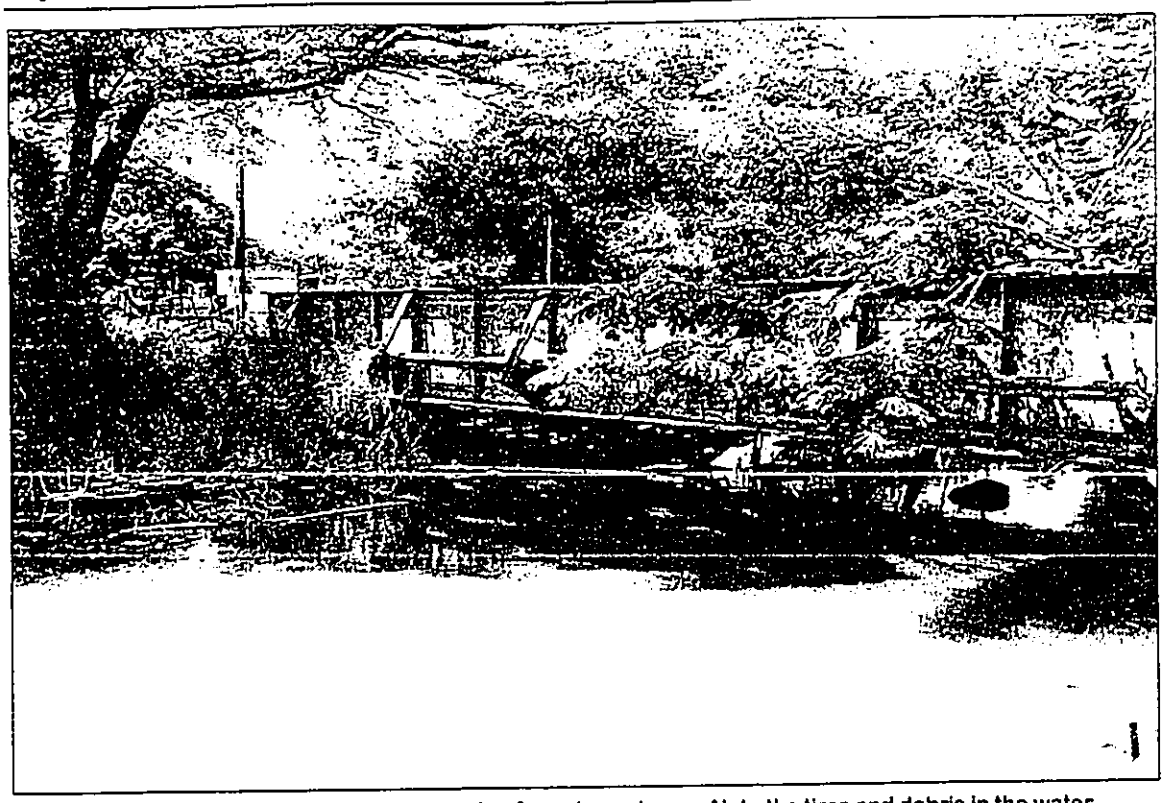

Photo 29: View of the Kapakahi Stream crossing from downstream. Note the tires and debris in the water.

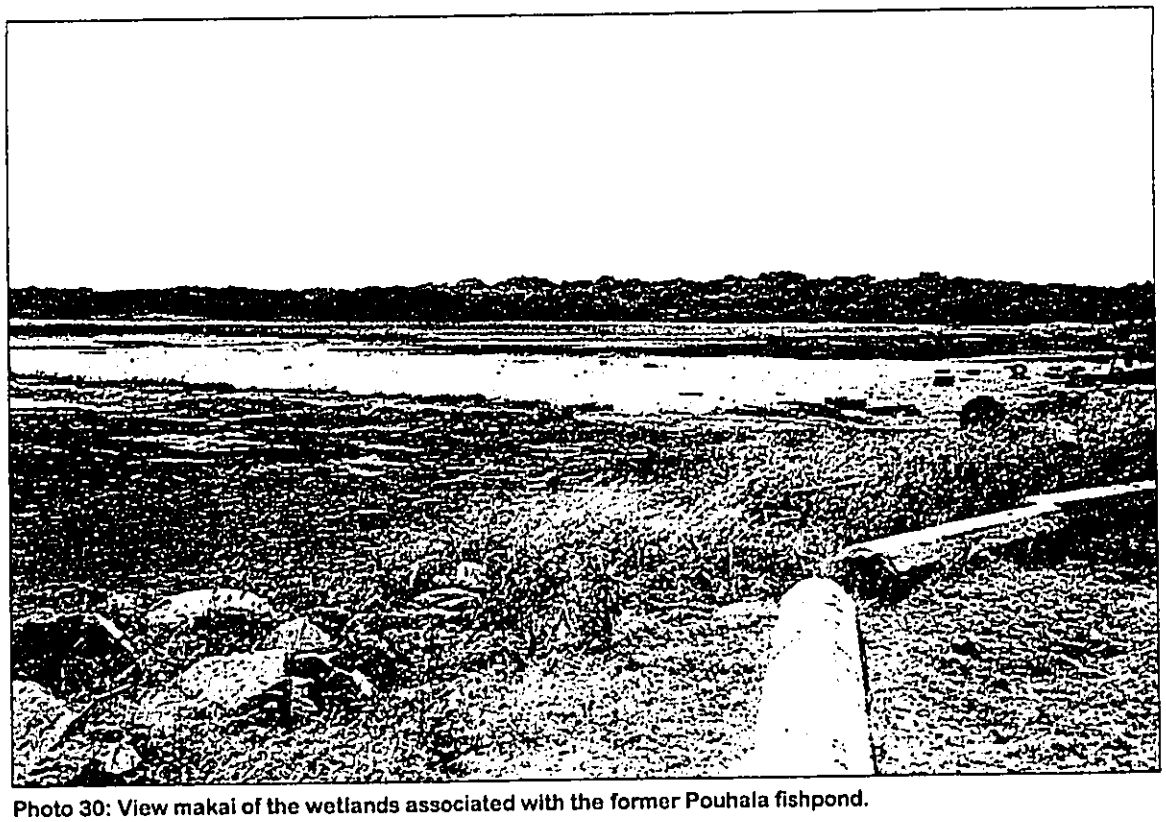

Photo 30: View makai of the wetlands associated with the former Pouhala fishpond.

Photo 31: View makai of the wetlands associated with the former Pouhala fishpond

Photo 32: View West along the proposed project area of the wetlands associated with the former Pouhala fishond.

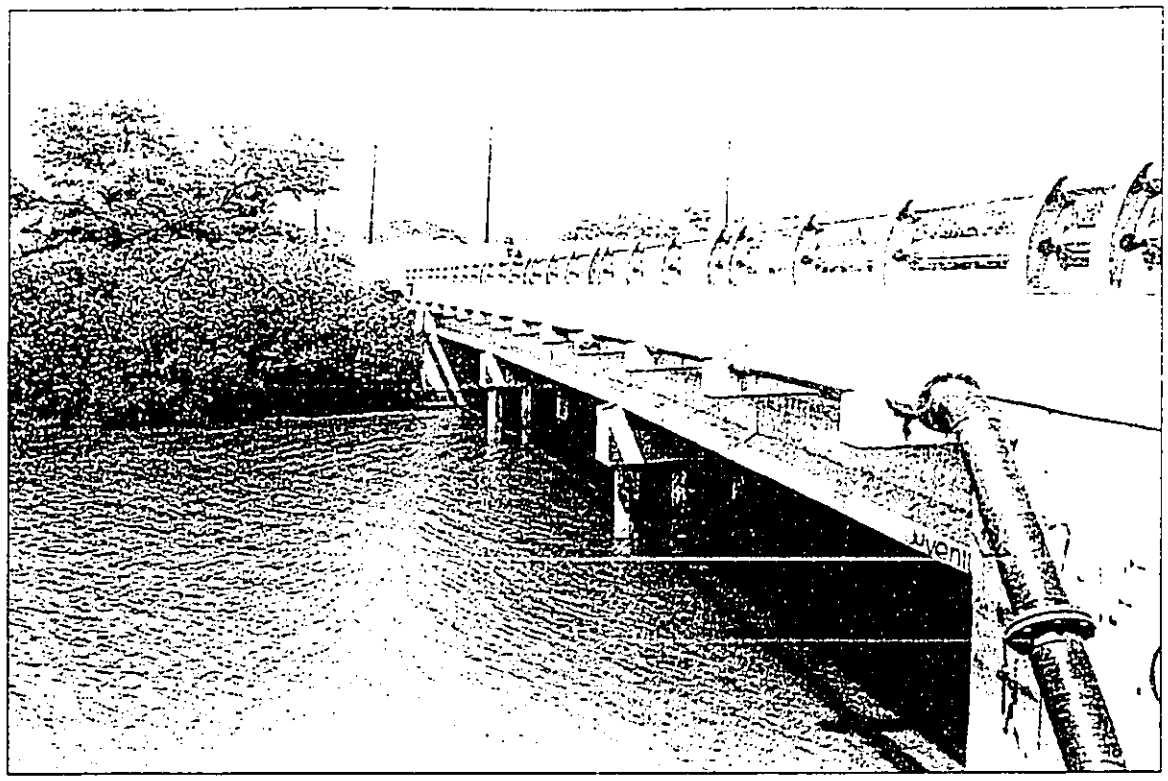

Photo 33: Start of the proposed project area at Waipio Point Access Road.

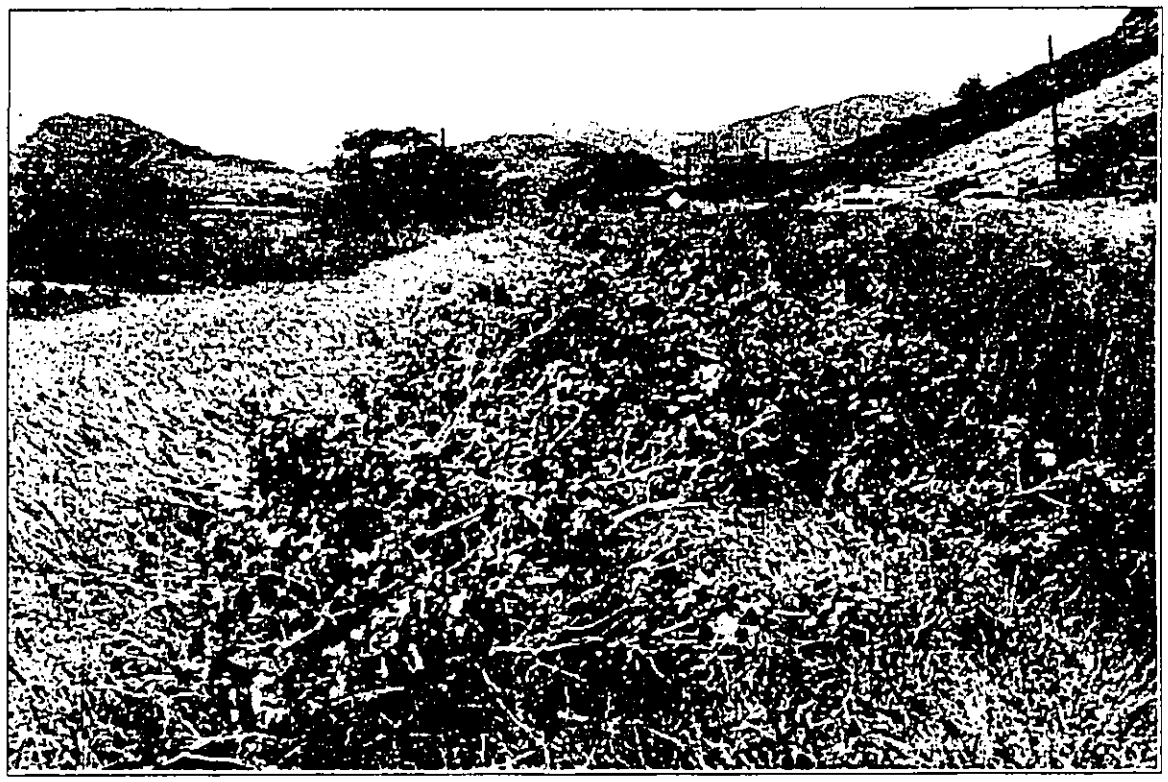

Photo 34 & 35: Above left, Hawaiian Cotton Plant or ma'o observed between Manners and Pili O Kahe beaches. Above right, 'ilima observed on the south-side of the tracks near the former BPNAS fence, between Fort Barrette Road and Kalaeloa Blvd.

Appendix E
Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Boulevard, Room 3-122
Box 50088
Honolulu, Hawaii 96850

In Reply Refer To: JJS

APR 14 1999

Pericles Manthos
Hawaii Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Re: Pre-Environmental Assessment (EA) Scoping Comments for Bike Path Construction Along Oahu Railway and Land Company Right of Way (OR&L ROW), Oahu.

Dear Mr. Manthos:

The U.S. Fish and Wildlife Service (Service) has received your letter dated March 5, 1999, requesting general comments to assist in the preparation of an EA for the construction of a bike path along the OR&L ROW. The Service understands that the bike path will be eight to ten feet wide and will be constructed of concrete asphalt with two-foot graded shoulders. The edge of the bike path will be situated approximately thirteen feet from the centerline of the railroad tracks.

Comments

The Service suggests that a botanical survey be conducted in areas where brush will be cleared for bike path construction. Although the Ewa Plain is heavily impact by alien vegetation, there have been recent finds of rare, native species in the vicinity of the project site such as the discovery of a population of the endangered plant, *Abutilon menziesii*, in an abandoned sugar cane field.

The provided map does not include sufficient detail to enable the Service to provided site-specific comments on potential impacts to wetlands. However, the EA must clearly indicate if the proposed bike path construction will encroach upon habitats such streams, depressional wetlands, and/or anchialine pools. The EA should also clearly indicate how potential impacts to these habitats will be minimized or mitigated.

The Service appreciates your interest in protecting threatened and endangered species and in minimizing project-related impacts to fish and wildlife resources. If you have questions or comments, please contact Fish and Wildlife Biologist John Schmerfeld by telephone at (808) 541-3441 or by facsimile transmission at (808) 541-3470.

Sincerely,

Barbara A. Maxfield, acting

for Robert P. Smith
Pacific Islands Manager

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

February 4, 2000

Ms. Mary Miyashiro, Chair
Ewa No.23 Neighborhood Board
c/o Neighborhood Commission
City Hall, Room 400
Honolulu, HI 96813

Dear Ms. Miyashiro:

The public is invited to review and comment on an Environmental Assessment (EA) prepared by the State Department of Transportation (DOT) and Earth Tech Inc. (Earth Tech) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR & L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access to the public along the historic former OR & L railroad as required by the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20 feet from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed.

Permits that may be required for this project include a US Army Corps of Engineers (USACE) Section 404 Permit; a Department of Health (DOH) Section 401 Water Quality Certification; State Coastal Zone Management Program (CZMP) Consistency Determination; State Stream Channel Alteration Permit; National Pollutant Discharge Elimination System (NPDES) Construction Dewatering Permit; and State Historic Preservation Clearance. The impacts and proposed mitigation measures are described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

An informational meeting can be arranged if there is sufficient public interest. At the meeting, the public can have an opportunity to ask questions or address concerns to the DOT/Earth Tech. The time period for such a meeting would be while the Final EA is being drafted, prior to submittal to the Office of Environmental Quality Control (OEQC). The notice of submittal of the Draft EA will be placed in the semi-monthly OEQC bulletin, and placed for review at the Pearl City Regional Library and the Hawaii Documents Center, Hawaii State Library.

If you have interest in an informational meeting or any immediate questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl B. Bromwell

Karl Bromwell
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

February 4, 2000

Ms. Cynthia Rezentes, Chair
Waianae Coast No.24 Neighborhood Board
c/o Neighborhood Commission
City Hall, Room 400
Honolulu, HI 96813

Dear Ms. Rezentes:

The public is invited to review and comment on an Environmental Assessment (EA) prepared by the State Department of Transportation (DOT) and Earth Tech Inc. (Earth Tech) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR & L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access to the public along the historic former OR & L railroad as required by the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20 feet from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed.

Permits that may be required for this project include a US Army Corps of Engineers (USACE) Section 404 Permit; a Department of Health (DOH) Section 401 Water Quality Certification; State Coastal Zone Management Program (CZMP) Consistency Determination; State Stream Channel Alteration Permit; National Pollutant Discharge Elimination System (NPDES) Construction Dewatering Permit; and State Historic Preservation Clearance. The impacts and proposed mitigation measures are described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

An informational meeting can be arranged if there is sufficient public interest. At the meeting, the public can have an opportunity to ask questions or address concerns to the DOT/Earth Tech. The time period for such a meeting would be while the Final EA is being drafted, prior to submittal to the Office of Environmental Quality Control (OEQC). The notice of submittal of the Draft EA will be placed in the semi-monthly OEQC bulletin, and placed for review at the Pearl City Regional Library and the Hawaii Documents Center, Hawaii State Library.

If you have interest in an informational meeting or any immediate questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl B. Bromwell

Karl Bromwell
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8871

Facsimile
808.523.8950

February 4, 2000

Ms. Annette Yamaguchi, Chair
Waipahu No.22 Neighborhood Board
c/o Neighborhood Commission
City Hall, Room 400
Honolulu, HI 96813

Dear Ms. Yamaguchi:

The public is invited to review and comment on an Environmental Assessment (EA) prepared by the State Department of Transportation (DOT) and Earth Tech Inc. (Earth Tech) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR & L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access to the public along the historic former OR & L railroad as required by the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20 feet from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed.

Permits that may be required for this project include a US Army Corps of Engineers (USACE) Section 404 Permit; a Department of Health (DOH) Section 401 Water Quality Certification; State Coastal Zone Management Program (CZMP) Consistency Determination; State Stream Channel Alteration Permit; National Pollutant Discharge Elimination System (NPDES) Construction Dewatering Permit; and State Historic Preservation Clearance. The impacts and proposed mitigation measures are described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

An informational meeting can be arranged if there is sufficient public interest. At the meeting, the public can have an opportunity to ask questions or address concerns to the DOT/Earth Tech. The time period for such a meeting would be while the Final EA is being drafted, prior to submittal to the Office of Environmental Quality Control (OEQC). The notice of submittal of the Draft EA will be placed in the semi-monthly OEQC bulletin, and placed for review at the Pearl City Regional Library and the Hawaii Documents Center, Hawaii State Library.

If you have interest in an informational meeting or any immediate questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl Bromwell
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

February 4, 2000

Ms. Maeda Timson, Chair
Makakilo/Kapolei/Honokai Hale No.34
Neighborhood Board
c/o Neighborhood Commission
City Hall, Room 400
Honolulu, HI 96813

Dear Ms. Timson:

The public is invited to review and comment on an Environmental Assessment (EA) prepared by the State Department of Transportation (DOT) and Earth Tech Inc. (Earth Tech) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR & L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access to the public along the historic former OR & L railroad as required by the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20 feet from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed.

Permits that may be required for this project include a US Army Corps of Engineers (USACE) Section 404 Permit; a Department of Health (DOH) Section 401 Water Quality Certification; State Coastal Zone Management Program (CZMP) Consistency Determination; State Stream Channel Alteration Permit; National Pollutant Discharge Elimination System (NPDES) Construction Dewatering Permit; and State Historic Preservation Clearance. The impacts and proposed mitigation measures are described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

An informational meeting can be arranged if there is sufficient public interest. At the meeting, the public can have an opportunity to ask questions or address concerns to the DOT/Earth Tech. The time period for such a meeting would be while the Final EA is being drafted, prior to submittal to the Office of Environmental Quality Control (OEQC). The notice of submittal of the Draft EA will be placed in the semi-monthly OEQC bulletin, and placed for review at the Pearl City Regional Library and the Hawaii Documents Center, Hawaii State Library.

If you have interest in an informational meeting or any immediate questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl B Bromwell

Karl Bromwell
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

February 4, 2000

Ms. Lolly Silva
US Army Corps of Engineers
Honolulu District
Building 230
Fort Shafter, HI 96858-5440

Dear Ms. Silva:

Early coordination is requested from the US Army Corps of Engineers (USACE) regarding an Environmental Assessment (EA) prepared by the State Department of Transportation (DOT) and Earth Tech Inc. (Earth Tech) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR & L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access to the public along the historic former OR & L railroad as required in the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20 feet from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed. An appropriate Best Management Plan will be incorporated for construction practices in accordance with the Department of Health (DOH) 401 Water Quality Certification.

Permits that may be required for this project include a US Army Corps of Engineers (USACE) Section 404 Permit; a DOH Section 401 Water Quality Certification; State Coastal Zone Management Program (CZMP) Consistency Determination; State Stream Channel Alteration Permit (SCAP); National Pollutant Discharge Elimination System (NPDES) Construction Dewatering Permit; Conservation District Use Application (CDUA) and State Historic Preservation Clearance. The project area is being surveyed and potential impacts and mitigation measures are currently being address by Mr. Eric Gunther of AECOS Inc. The impacts and proposed mitigation measures will be described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

If you have any comments or questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl B. Bromwell

Karl Bromwell
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

February 4, 2000

Ms. Elaine Jourdane
State Office of Historic Preservation
601 Kamokila Bl, Room 555
Kapolei, HI 96707

Dear Ms. Jourdane:

Early coordination is requested from the State Office of Historic Preservation (SHPO) regarding an Environmental Assessment (EA) prepared by the State Department of Transportation (DOT) and Earth Tech Inc. (Earth Tech) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR & L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access for the public along the historic former OR & L railroad as required in the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20 feet from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed. An appropriate Best Management Plan will be incorporated for construction practices in accordance with the Department of Health (DOH) 401 Water Quality Certification.

Actions relevant to SHPO, among others, for this project include historic preservation clearance. The project area is being surveyed, and potential impacts and mitigation measures are currently being addressed by Mr. Thomas Dye, of International Archeological Research Institute, Inc. The sites, impacts and proposed mitigation measures will be described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

If you have any comments or questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl Bromwell
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

February 4, 2000

Mr. Ed Chen and Mr. Shane Sumida
State of Hawaii, Department of Health
Clean Water Branch
919 Ala Moana, Room 301
Honolulu, HI 96813

Dear Sirs:

Early coordination is requested from the State of Hawaii (DOH) regarding an Environmental Assessment (EA) prepared by the State Department of Transportation (DOT) and Earth Tech Inc. (Earth Tech) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR & L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access to the public along the historic former OR & L railroad as required in the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20 feet from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed. An appropriate Best Management Plan will be incorporated for construction practices in accordance with the DOH 401 Water Quality Certification.

Permits relevant to the DOH, among others, include a DOH Section 401 Water Quality Certification, National Pollution Discharge Elimination System (NPDES) Permit, State Coastal Zone Management Program (CZMP) Consistency Determination, State Stream Channel Alteration Permit. The project area is being surveyed and potential impacts and mitigation measures are currently being address by Mr. Eric Gunther of AECOS Inc. The impacts and proposed mitigation measures are described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

If you have any comments or questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl Bromwell
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

February 4, 2000

Mr. Jeff Mikulina
Sierra Club
PO Box 2577
Honolulu, HI 96803

Dear Mr. Mikulina:

The Department of Transportation (DOT) has contracted Earth Tech Inc. (Earth Tech) to conduct an Environmental Assessment (EA) for the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway and Land (OR & L) railroad from Lualualei Naval Road to the west end of the Westlock Bikeway, and then from the eastern end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access to the public along the Historic OR & L railroad as required in the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20 feet from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage structures will also be constructed.

Permits that may be required for this project include a US Army Corps of Engineers (USACE) Section 404 Permit; a Department of Health (DOH) Section 401 Water Quality Certification; State Coastal Zone Management Program (CZMP) Consistency Determination; State Stream Channel Alteration Permit; National Pollution Discharge Elimination System (NPDES) Construction Dewatering Permit; and State Historic Preservation Clearance. The impacts and proposed mitigation measures are described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

An informational meeting can be arranged if there is sufficient public interest. At the meeting, the public can have an opportunity to ask questions or address concerns to the DOT/Earth Tech. The time period for such a meeting would be while the Final EA is being drafted, prior to submittal to the Office of Environmental Quality Control (OEQC). The notice of submittal of the Draft EA will be placed in the semi-monthly OEQC bulletin, and placed for review at the Pearl City Regional Library and the Hawaii Documents Center, Hawaii State Library.

If you have interest in an informational meeting or any immediate questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl B Bromwell

Karl Bromwell
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

February 4, 2000

Ms. Kat Brady
Life of the Land
76 N. King St. Ste. 203
Honolulu, HI 96817

Dear Ms. Brady:

The State Department of Transportation (DOT) has contracted Earth Tech Inc. (Earth Tech) to conduct an Environmental Assessment (EA) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR & L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access to the public along the historic former OR & L railroad as required by the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20-foot from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed.

Permits that may be required for this project include a US Army Corps of Engineers (USACE) Section 404 Permit; a Department of Health (DOH) Section 401 Water Quality Certification; State Coastal Zone Management Program (CZMP) Consistency Determination; State Stream Channel Alteration Permit (SCAP); National Pollutant Discharge Elimination System (NPDES) Construction Dewatering Permit; Conservation District Use Application (CDUA) and State Historic Preservation Clearance. The impacts and proposed mitigation measures are described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

An informational meeting can be arranged if there is sufficient public interest. At the meeting, the public can have an opportunity to ask questions or address concerns to the DOT/Earth Tech. The time period for such a meeting would be while the Final EA is being drafted, prior to submittal to the Office of Environmental Quality Control (OEQC). The notice of submittal of the Draft EA will be placed in the semi-monthly OEQC bulletin, and placed for review at the Pearl City Regional Library and the Hawaii Documents Center, Hawaii State Library.

If you have interest in an informational meeting or any immediate questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl B. Bromwell

Karl Bromwell
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

February 4, 2000

Mr. Hillary Hecht
WTR-9
US Environmental Protection Agency-Region 9
75 Hawthorn Street
San Francisco, CA 94105

Dear Mr. Hecht:

Early coordination is requested from the US Environmental Protection Agency (USEPA) regarding an Environmental Assessment (EA) prepared by the State Department of Transportation (DOT) and Earth Tech Inc. (Earth Tech) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR & L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access to the public along the historic former OR & L railroad as required in the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20 feet from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka (mountain) side in some areas, and the makai (ocean) side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed. An appropriate Best Management Plan will be incorporated for construction practices in accordance with the State of Hawaii Department of Health (DOH) 401 Water Quality Certification.

Issues relevant to the USEPA, among others, include a Sole Source Aquifer Review pursuant to Section 1424 (e) of the Safe Drinking Water Act. The aquifer (s) and status codes for the project area are currently being assessed. Any possible impacts and proposed mitigation measures will be described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

If you have any comments or questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl Bromwell
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8871

Facsimile
808.523.8950

February 4, 2000

Mr. Robert Smith
US Fish and Wildlife Service
300 Ala Moana Blvd., Room 3-122
Honolulu, HI 96850

Dear Mr. Smith:

Early coordination is requested from the US Fish and Wildlife Service (USFWS) regarding an Environmental Assessment (EA) prepared by the State Department of Transportation (DOT) and Earth Tech Inc. (Earth Tech) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR & L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access for the public along the historic former OR & L railroad as required in the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20 feet from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed. An appropriate Best Management Plan will be incorporated for construction practices in accordance with the Department of Health (DOH) 401 Water Quality Certification.

Actions relevant to the USFWS, among others, include a review of threatened and endangered species. The project area is being surveyed and potential impacts and mitigation measures are currently being address by Mr. Eric Gunther of AECOS Inc. The impacts and proposed mitigation measures will be described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

If you have any comments or questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl B. Bromwell

Karl Bromwell
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

February 22, 2000

Office of Hawaiian Affairs
711 Kapiolani Blvd. Suite 500
Honolulu, HI. 96813

Early coordination is requested from the Office of Hawaiian Affairs (OHA) regarding an Environmental Assessment (EA) prepared by the State Department of Transportation (DOT) and Earth Tech Inc. (Earth Tech) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR & L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

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Actions relevant to OHA, among others, for this project include historic preservation clearance. The project area is being surveyed, and potential impacts and mitigation measures are currently being addressed by Mr. Thomas Dye, of International Archeological Research Institute, Inc. The sites, impacts and proposed mitigation measures will be described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

If you have any comments or questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl Bromwell

Karl Bromwell, M.P.H.
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

February 22, 2000

David Scott
Historic Hawaii Foundation
PO Box 1658
Honolulu, HI. 96806

Early coordination is requested from the Historic Hawaii Foundation (HHF) regarding an Environmental Assessment (EA) prepared by the State Department of Transportation (DOT) and Earth Tech Inc. (Earth Tech) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR & L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access for the public along the historic former OR & L railroad as required in the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20 feet from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed. An appropriate Best Management Plan will be incorporated for construction practices in accordance with the Department of Health (DOH) 401 Water Quality Certification.

Actions relevant to HHF, among others, for this project include historic preservation clearance. The project area is being surveyed, and potential impacts and mitigation measures are currently being addressed by Mr. Thomas Dye, of International Archeological Research Institute, Inc. The sites, impacts and proposed mitigation measures will be described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

If you have any comments or questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl Bromwell

Karl Bromwell, M.P.H.
Project Manager
Attachments: Figure 1

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8020

April 6, 2000

Hawaiian Railway Society
PO Box 60369, Ewa Station
Ewa, HI 96706

Dear Reviewer:

The State Department of Transportation (DOT) has contracted Earth Tech Inc. (Earth Tech) to conduct an Environmental Assessment (EA) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR&L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access to the public along the historic former OR & L railroad as required by the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20-foot from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed.

Permits that may be required for this project include a US Army Corps of Engineers (USACE) Section 404 Permit; a Department of Health (DOH) Section 401 Water Quality Certification; State Coastal Zone Management Program (CZMP) Consistency Determination; State Stream Channel Alteration Permit (SCAP); National Pollutant Discharge Elimination System (NPDES) Construction Dewatering Permit; Conservation District Use Application (CDUA) and State Historic Preservation Clearance. The impacts and proposed mitigation measures are described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

An informational meeting can be arranged if there is sufficient public interest. At the meeting, the public can have an opportunity to ask questions or address concerns to the DOT/Earth Tech. The time period for such a meeting would be while the Final EA is being drafted, prior to submittal to the Office of Environmental Quality Control (OEQC). The notice of submittal of the Draft EA will be placed in the semi-monthly OEQC bulletin, and placed for review at the Pearl City Regional Library and the Hawaii Documents Center, Hawaii State Library.

If you have interest in an informational meeting or any immediate questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl B. Bromwell

Karl Bromwell, M.P.H.
Project Manager
Attachments: Figure 1

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.521.9520

April 6, 2000

Ms. Kim Uehara
Ducks Unlimited
73-1270 Awa Kea Street
Kona, HI 96740

Dear Ms. Uehara:

The State Department of Transportation (DOT) has contracted Earth Tech Inc. (Earth Tech) to conduct an Environmental Assessment (EA) for the construction of the Leeward Bikeway Project. The proposed project is to be constructed in the easement of the former Oahu Railway & Land (OR&L) railroad from Lualualei Naval Road to the west end of the West Lock Bikeway, and then from the east end of the West Lock Bikeway to Waipio Point Access Road (Figure 1). Portions of the former OR & L railroad have been placed on the National Historic Register.

The purpose of this project is to provide access to the public along the historic former OR & L railroad as required by the deed transfer from the Federal DOT to the State DOT. The easement of the former railroad is 20-foot from the center (on either side) of the former tracks. The bikeway will be constructed in this easement on the mauka side in some areas, and the makai side in others. Construction of the new bikeway will include a 10-foot wide asphalt concrete pavement bikepath with 2-foot graded shoulders. Bridges, retaining walls, railroad crossings, culverts and other drainage features will also be constructed.

Permits that may be required for this project include a US Army Corps of Engineers (USACE) Section 404 Permit; a Department of Health (DOH) Section 401 Water Quality Certification; State Coastal Zone Management Program (CZMP) Consistency Determination; State Stream Channel Alteration Permit (SCAP); National Pollutant Discharge Elimination System (NPDES) Construction Dewatering Permit; Conservation District Use Application (CDUA) and State Historic Preservation Clearance. The impacts and proposed mitigation measures are described in the Draft EA. A finding of no significant impact (FONSI) is anticipated for this project.

An informational meeting can be arranged if there is sufficient public interest. At the meeting, the public can have an opportunity to ask questions or address concerns to the DOT/Earth Tech. The time period for such a meeting would be while the Final EA is being drafted, prior to submittal to the Office of Environmental Quality Control (OEQC). The notice of submittal of the Draft EA will be placed in the semi-monthly OEQC bulletin, and placed for review at the Pearl City Regional Library and the Hawaii Documents Center, Hawaii State Library.

If you have interest in an informational meeting or any immediate questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl B. Bromwell

Karl Bromwell, *N.P.H.*
Project Manager
Attachments: Figure 1

EARTH TECH

A tyco INTERNATIONAL LTD COMPANY

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF

May 11, 2000

Regulatory Branch

Mr. Karl B. Bromwell
Earth Tech, Inc.
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

This is in response to your letter requesting comments on the Draft Environmental Assessment (DEA) for the Leeward Bikeway project. Based on a cursory review of the DEA, a Department of the Army permit will be required as waters of the U.S. including wetlands will be impacted. Please contact Ms. Lolly Silva of my staff at 438-7023 to arrange a meeting to discuss the various permits available under which this project can be authorized. In addition, you should be prepared to discuss wetland impacts and possible mitigation requirements.

File Number 200000098 is assigned to this project. Please refer to this number in any future correspondence with our office.

Sincerely,

George P. Young, P.E.
Chief, Regulatory Branch

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.524.8874

Facsimile
808.524.8050

August 10, 2000

Mr. George P. Young, P.E.,
Chief, Regulatory Branch
US Army Corps of Engineers
Honolulu District
Building 230
Fort Shafter, HI 96858-5440

Attn: Ms. Lolly Silva

Subject: **Draft Environmental Assessment, Leeward Bikeway,**
OR&L Railway Right of Way,
Ewa and Waianae Districts, Oahu
Project No.s STP-0300(55) and STP-0300(56)
Corps Of Engineers File Number: 200000098

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. We appreciate your efforts in reviewing the document and provide the following response to your comments:

- As part of this project, permitting through the US Army Corps of Engineers will be completed and coordinated with Ms. Lolly Silva.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
2550 Campus Road • Crawford 317 • Honolulu, Hawai'i 96822
Telephone: (000) 956-7361 • Facsimile: (808) 956-3980

June 7, 2000
EA: 00198

Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, Hawaii 96813
Attn: Ken Tatsuguchi and Jonathan Winn

Dear Mr. Tatsuguchi and Mr. Winn:

Leeward Bikeway OR&L Railway Easement
Draft Environmental Assessment
Ewa and Waianae, Oahu

The State Department of Transportation, Highways Division (DOT-HD) proposes to construct a bikepath from Waipio Point Access Road to Luahualei Naval Road, along a portion of the former Oahu Railroad and Land Company (OR&L) right of way. The purpose of this project is to provide a venue for pedestrian/cycling activities, to provide access to the historic OR&L railroad and recreational sites, and to fulfill the requirements of a deed transfer of the OR&L railroad from the Federal DOT to the DOT-HD.

This review was conducted with the assistance of Michael Graves, Anthropology; Khalil Spencer, Geology and Geophysics; James Parrish, Cooperative Fisheries Unit; and Sherri Hiraoka, Environmental Center.

General Comments

The Draft EA was well done and covered most of the topics well. Our reviewers, for example, found the discussion on historic resources and flora and fauna to be appropriate for this project. However, the EA seemed to concentrate on potentially negative impacts of the project and their possible mitigation measures, but we note that there are several potentially positive impacts as a result of this bikeway which can be included in the discussion. One benefit is the addition of a car-free cycling, running, walking, and skating environment. The only other major east-west roadway to Leeward Oahu that is "bikeable" is Farrington Highway. This road is very dangerous due to speeding and the lack of adequate shoulders. The car-free bikepath proposed will offer a safer opportunity for recreational activities, and may in fact encourage additional exercise in the community. Another positive outcome of the project is the potential health benefit that an additional exercise/recreation opportunity provides.

The proposed bikeway will be a welcome addition to the recreational opportunities available in the Ewa and Waianae areas. To ensure that this path is constructed in the best possible manner, we offer some suggestions that the DOT may want to consider when planning this project. Specifically, we wish to point out guidelines which may be helpful in assuring the safety of those who will utilize this facility. Other minor points which were may be further addressed are also brought up in the discussion below.

Proposed Action

The EA should include more complete information on the design of the path itself. Factors to consider when designing the path include safety, aesthetics, and compliance with the American Association of State Highway and Transportation Officials (AASHTO) codes.

A 14-foot wide bikeway was initially considered, but was narrowed to a 10-foot wide path due to space constraints (page ES-1). This narrow a path may create safety issues. The City's Bike Plan advises a 12-foot width for a shared-use path (page B-6), which is what this particular path can expect to be. The path may become congested, dangerous, and unpleasant if joggers, rollerbladers, bicyclists, walkers, and people in wheelchairs are all competing for space on the path. Suggestions for bicycle path design may be located either in the AASHTO Guide, or in the 1998 Federal Highways Administration report "Implementing Bicycle Improvements at the Local Level", specifically Chapter 5 on Trail Networks, which may be found at the website http://www.bikefed.org/local.htm. The AASHTO Guide recommends a 12-foot to 14-foot width for shared use paths. Considering this, our reviewers suggest that the path be at least 12 feet wide wherever possible.

Most of the proposed path seems relatively flat, as indicated by the Approximate Elevation Ranges Across the Proposed Leeward Bikeway (Table 3-4, page 49). The EA, however, does not include estimates of maximum percent slope. Our reviewers suggest that all grades be kept reasonable to encourage new, inexperienced, or out-of-shape cyclists to use the path.

Land Use and Ownership

Some additional right of way (ROW) will be required to provide for maintenance, clearance between the bikeway and the railroad, and for the construction of retaining walls and bridges (page 17). What is the reaction of the current landowners to these acquisitions? What is the expected cost of these ROW purchases? Also, the need for additional ROW was not clear when the existing ROW is 40 feet (page 17), especially considering the fact that the path width was reduced from 14 feet to 10 feet.

Socioeconomics

Social impacts that should be addressed in the EA include increased burglaries to homes adjacent to the path, such as those which occurred near the City's/Navy's Westloch bike path. These problems were eventually resolved. Perhaps the DOT can refer back to this past situation to address this potential impact.

Safety and Health

What is the accessibility of the bicycle path to emergency communications, crews, and vehicles? Will lighting be included as a part of the project?

Transportation

The proposed bikeway will provide an environmentally-friendly transportation alternative to those in the Waianae and Ewa districts. An analysis of the transportation opportunities that may be provided by this bikeway should be included in the EA. A Global Information System study, similar to the that conducted by Helber, Hastert, and Fee in the Honolulu Bike Plan may be useful in demonstrating how the path would connect to schools, businesses, and communities along the route. Potential commuter destinations include schools, Leeward Community College, and the state offices in Kapolei, and should be discussed in further detail. This project also presents the potential for continuing a bikeway further up the Leeward Coast, which would benefit that community as well.

Consultations Made During the Environmental Assessment Process

It may be useful to contact a bicycle club such as the Hawaii Bicycling League (HBL) to include the interests of a large group of potential users of this project. HBL members have been known to be active in the planning processes of bicycle-related projects, and may be a source of information as to the design of the actual path in terms of safety and pure recreational value.

Conclusion

The project itself is one that benefits the community as a recreational resource, as well an alternative travel opportunity. To ensure that this is constructed in the best possible manner, certain areas should be examined in further detail. These areas include securing a bicycle path design that is able to accommodate the volume and types of traffic that will be using it, planning for the prevention of increased criminal activity as a result of easier access to particular areas, and ensuring the safety of those that use the facility. We would also point out the safeguard to endemic plants outlined in the Biological Resource Survey, Appendix B, proeared by Aecos, Inc. should be incorporated into the final plans for the bikeway. We hope that our comments will be helpful in preparing the Final Environmental Assessment. Thank you for the opportunity to comment.

Sincerely,

Peter Rappa
Assistant Environmental Coordinator

cc: Karl Bromwell, Earth Tech, Inc.
OEQC
James Moncur, WRRC
Michael Graves, Anthropology
Khalil Spencer, Geology and Geophysics
James Parrish, Cooperative Fisheries Unit
Sherri Hiraoka, Environmental Center

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.524.8874

Facsimile
808.524.8950

August 10, 2000

Peter Rappa
University of Hawaii
Environmental Center
2550 Campus Road, Crawford 317
Honolulu, Hawaii 96822

Subject: **Draft Environmental Assessment, Leeward Bikeway, OR&L Railway Right of Way, Ewa and Waianae Districts, Oahu Project No.s STP-0300(55) and STP-0300(56) University of Hawaii EA:00198**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. The final EA (FEA) has been amended to reflect your comments where appropriate. We appreciate your efforts in reviewing the document and provide the following response to your comments (presented in **bold**):

Proposed Action.
Comment requests that more complete information on the design of the bikepath itself be included. At this time, the proposed bikeway is in the design phase, and more complete information is forthcoming.

Comment requests that a 12- to 14- foot bikepath be utilized for less congestion, safety and compliance with American Association of State Highway and Transportation Officials (AASHTO) codes. The proposed Leeward Bikeway project shares the right-of-way with the Hawaiian Railway Society (HRS). Plans exist for restoring the operating railroad from Nanakuli to the Waipahu Cultural Gardens not only with HRS, but also with the City and County of Honolulu (C&C, 1997). This comment was added to Section 2.1 and 2.2 for clarification: *The proposed bikeway would share the 40-foot wide* [right-of-way] *r-o-w with the existing and planned track restorations. The track is currently used by the Hawaiian Railway Society to run trains throughout the week and weekend.* Since the r-o-w is shared, the limited space must be utilized by both the railroad and the bikeway. This requires a 10-foot bikepath with 2-foot shoulders to be utilized. The use of 10 feet for the width of the path conforms to the 1999 AASHTO guide for the development of bicycle facilities which states "Under most conditions, a recommended paved width for a two-directional shared use path is 3.0 meters (10 feet). To reduce congestion and safety hazards, appropriate signage and markings will be used to direct path users. The following relevant comments have been added to the FEA in Sections 3.16 and 4.13 (Security and Maintenance).

> *Place signage at the entrances and along the bikeway to identify the route and establish a Code of Conduct. This may include the following rules placed on signs at entrance points to the bikeway and along the bikeway:*
> *-Stay on the trail in continuous movement.*
> *-Respect rights of all trail users as well as adjacent homeowners and properties.*
> *-Ride single file keeping to the right of the trail.*

Comment requests that grades be kept reasonable to encourage new, inexperienced, or out-of-shape cyclists to use the path. During the preparation of the DEA, the surveying portion of the project was being completed, and data was not available. As indicated in the Approximate Elevation Ranges Across the Proposed Leeward Bikeway (Table 3-4), the general topography of the bikeway is flat. Additionally, the staff preparing the DEA completed a field visit to the proposed project site, covering the entire proposed bikeway area on bike. Although the bikeway is not yet in place, extreme nor accentuated grades were not encountered.

Land Use and Ownership.
What is the reaction of current landowners to these (additional right-of-way) acquisitions? Several interested parties requested additional information on the location and amount of additional right-of-way. Since the proposed bikeway is in the design-phase, exact locations and amounts of additional right-of-way have not yet been determined. However, additional right-of-way is not anticipated to exceed 10 feet from the current boundary in some areas. Interested landowners can discuss specifics with Mr. Jonathan Winn of the State of Hawaii Department of Transportation-Highways Division (DOT-HD) at 692-7579.

What is the expected cost of these right-of-way purchases? *The DOT-HD anticipates $5 million for* additional right-of-way acquisition. This information is presented in Section 2.3 Project Schedule and Costs.

The need for additional right-of-way is not clear when the existing right-of-way is 40 feet (page 17), especially considering the fact that the path width was reduced from 14 to 10 feet. The right-of-way is shared with the operating HRS railroad. The operating railroad will be extended up to Nanakuli and out to Waipahu Cultural Gardens. Although the proposed bikeway has been reduced to a 10-foot width to accommodate space within the r-o-w, additional space will be required for maintenance and repair access. This comment was added to Section 2.1 and 2.2 for clarification: *The proposed bikeway would share the 40-foot wide r-o-w with the existing and planned track restorations. The tracks are currently used by the Hawaiian Railway Society to run trains throughout the week and weekend.*

Socioeconomics.
Social impacts that should be addressed in the EA include increased burgleries to homes adjacent to the path, such as those which occurred near the City's/Navy's Westloch bike path. These problems were eventually resolved. Perhaps DOT can refer back to this past situation to address this potential impact. To address security concerns for the proposed bikeway and adjacent properties, several controls will be employed as recommended by the Honolulu Police Department and others. These topics have been added to the FEA in Sections 3.16 and 4.13 (Security and Maintenance).

1.) *Place signage at the entrances and along the bikeway to identify the route and establish a Code of Conduct. This will include the following rules placed on signs at entrance points to the bikeway and along the bikeway:*
-Stay on the trail in continuous movement.
-Respect rights of all trail users as well as adjacent homeowners and properties.
-Ride single file keeping to the right of the trail.
-Give warning before passing other trail users.
-Only leashed pets are welcomed, you must clean up after your pet.

-Unauthorized vehicles are prohibited.
-Use of radios is prohibited.
-Trail Hours are from dawn to dusk.
-No dumping, littering or loitering. Please use trash receptacles.
-Do not take or harm any plants or animals, areas outside the trail may contain sensitive plants and animals.
-Use bikeway at your own risk.
-Warning: golf course ahead.

2.) *With the development of the proposed bikeway, increased bicycle police patrols will be recommended and requested of HPD and the City and County of Honolulu. Currently, there is a temporary bicycle patrol in the Waipahu area, and none in the Ewa and Waianae areas. (This reflects the fact that there is a partial bikeway in the Waipahu area and none in the Ewa and Waianae areas.)*

It should also be noted that the proposed bikeway does not create access that was not already there. The development of the bikeway will be an improvement in restricting access at night, restricting vehicular access and requiring a code of conduct.

Safety and Health.
What is the accessibility of the bicycle path to emergency communications, crews and vehicles? Utility companies within or adjacent to the right-of-way as well as police and fire departments will have access to the bikeway. This statement was added to Section 3.11 Safety and Health of the FEA: *Additionally, for emergencies, police, fire departments and utilities have access to the r-o-w.*
Will lighting be included as part of the project? In order to discourage night-time use of the proposed bikeway, lighting will not be included as part of the project.

Transportation.
An analysis of the transportation opportunities that may be provided by this bikeway should be included in this EA, (i.e., connecting schools, businesses, and communities, as well as commuter destinations such as colleges, and the State offices in Kapolei). The following was added to Section 3.12 Transportation:

Transportation opportunities that may be provided by the implementation of the proposed bikeway include the following:

Waianae Coast: Increased access to portions of Nanakuli and Lualualei Valleys will occur as well as schools, businesses and beach parks present along the coast.

Ewa Plain: Increased access to the Barbers Point Harbor and Marina, Ko Olina Resort, Campbell Industrial Park, The City of Kapolei town center, and State of Hawaii offices, parks and residences.

Waipahu: Increased access to the West Loch coastline, Waipahu town center, parks and residences as well as Waipahu Intermediate, Waipahu High School and bikeway links to Leeward Community College.

Consultations Made During the Environmental Assessment Process.

It may be useful to contact a bicycle club such as Hawaii Bicycle League (HBL) to include the interests of a large group of potential users of this project. As requested by the Office of Environmental Quality Control, the HBL was provided a copy of the DEA.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell, M.P.H.
Project Manager

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

May 12, 2000

Mr. Karl B. Bromwell
Earth Tech, Inc.
700 Bishop Street, Suite 900
Honolulu, HI 96813

EIS# 392

Subject: Draft Environmental Assessment for Leeward Bikeway, Districts of Ewa and Waianae, Oahu
Project No.s STP-0300(55) and STP-0300(56)

Dear Mr. Bromwell,

Thank you for the opportunity to review and comment on the above-referenced draft. The proposed project includes construction of bridges, retaining walls, railroad crossings and culverts. The need to construct the Leeward Bikeway stems from a requirement in the transfer of the deed of the former Oahu Railroad and Land Company railroad from the Federal DOT to the State DOT-HD.

At this time, the Office of Hawaiian Affairs has no immediate concerns on this project. The mitigation plans presented are standard and acceptable. If you have questions, please contact Ken R. Salva Cruz, Policy Analyst, at 594-1847.

Sincerely,

Colin C. Kippen, Jr.
Deputy Administrator

cc: Board of Trustees
State DOT-HD
OEQC

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

August 10, 2000

Colin C. Kippen, Jr
Deputy Administrator.
State of Hawaii
Office of Hawaiian Affairs
711 Kapi'olani Boulevard, Suite 500
Honolulu, HI 96813

Attn: Ken R. Salva Cruz

Subject: **Draft Environmental Assessment, Leeward Bikeway, OR&L Railway Right of Way, Ewa and Waianae Districts, Oahu Project No.s STP-0300(55) and STP-0300(56)**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. We appreciate your efforts in reviewing the document. If any questions or concerns arise during the completion of the final EA or during the execution of the project, Mr. Ken R. Salva Cruz will be contacted as requested.

If you have any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Telephone 808.524.8874
Facsimile 808.524.8950

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

KO OLINA COMMUNITY ASSOCIATION
92-619 Farrington Highway
Ko Olina, Hawaii 96707
Phone: (808) 671-2512, Facsimile: (808) 671-3640

June 7, 2000

Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Ken Tatsuguchi:

Subject: Draft Environmental Assessment for the Leeward Bikeway OR&L Easement

The Ko Olina Community Association has reviewed the Environmental Assessment (EA) for the Leeward Bikeway.

Although the Ko Olina Resort Community appreciates the benefits of increased access afforded by this proposed bikeway, we strongly feel as a neighborhood community that the project has the potential to substantially affect community and social welfare (Section 5.1, 4th significance criteria). The bikeway will provide increased access from Waianae, Kapolei, Ewa and Waipahu to private residential areas, increasing security risks and concerns. Potential impacts not addressed include:

1. Security concerns from vandalism.
2. Evening use of bike path: Ko Olina Resort currently provides for shoreline access at each of the four swimming lagoons from sunrise to sunset. The same daytime use policy should be used for the bikeway.
3. Off-path access through private property.
4. Invasion of homeowner privacy.
5. Use of motorized vehicles on the bikeway and resultant noise/disturbance.
6. Liability related to the above items.
7. Liability from errant golf balls: The bikeway runs through and along the Ko Olina Golf course for over 3500 feet and in most cases parallel with fairways. The potential for injury to a bikeway user from an errant golf ball is significant.

Other comments related to the Leeward Bikeway Draft EA are as follows:

1) Consultation. KOCA was not consulted in preparation of the draft EA and was not provided a copy of the Draft EA for review. Notice of

availability and review was obtained through the Star Bulletin article of June 5, 2000.

2) Bikepath location and alignment not depicted well. The location map (Figure 2.2.2) does not identify the Ko Olina Resort area, show major existing thoroughfares, the golf course, and current geographical configurations of the Ko Olina lagoons, marina, and the Barbers Point Harbor.

3) Alignment within the right-of-way. It should be more clearly shown where the bikeway is aligned within the OR&L right-of-way along its route. Does the alignment consider and minimize impacts to adjacent uses, such as residential and golf course use?

4) Adjacent and surrounding uses not fully disclosed. Generalized land uses are identified, but more specific developments and proximity to the proposed bikepath should be indicated on maps. In particular, existing developments such as the Ko Olina Fairways townhomes, and Ko Olina Resort Golf Course should be identified and located relative to the bikepath.

5) Bikepath use. Are there any ridership projections to help assess impacts?

6) New Right-of-Way. It is unclear where and how much new right-of-way will be acquired, although a $5 million cost estimate for acquisition is cited. This should be disclosed especially if private lands are affected.

Thank you for allowing us to comment on the Leeward Bikeway EA. Please call me if you have any questions.

Very truly yours,

Kenneth M. Williams
General Manager

c: Office of Environmental Quality Control
235 South Beretania Street
Honolulu, Hawaii 96813

Earth Tech, Inc.
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Attn: Karl Bromwell

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8030

August 10, 2000

Kenneth M. Williams
General Manager
Ko 'Olina Community Association
92-619 Farrington Highway
Ko Olina, Hawaii 96707

Subject: **Draft Environmental Assessment, Leeward Bikeway, OR&L Railway Right of Way,**
Ewa and Waianae Districts, Oahu
Project No.s STP-0300(55) and STP-0300(56)

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. The final EA (FEA) has been amended to reflect your comments where appropriate. We appreciate your efforts in reviewing the document and provide the following response to your comments (presented in bold):

Security concerns from vandalism.

Evening use of the bikepath: Ko Olina Resort currently provides for shoreline access at each of the four swimming lagoons from sunrise to sunset. The same daytime use policy should be used for the bikeway.

Off-path access through private property.

Invasion of homeowner privacy.

Use of motorized vehicles on the bikeway and resultant noise/disturbance.

Liability related to the above items.

To address security concerns for the proposed bikeway and adjacent properties, several controls will be employed as recommended by the Honolulu Police Department and others. These topics have been added to the FEA in Sections 3.16 and 4.13 (Security and Maintenance).

1.) Place signage at the entrances and along the bikeway to identify the route and establish a Code of Conduct. This will include the following rules placed on signs at entrance points to the bikeway and along the bikeway:
-Stay on the trail in continuous movement.
-Respect rights of all trail users as well as adjacent homeowners and properties.
-Ride single file keeping to the right of the trail.
-Give warning before passing other trail users.
-Only leashed pets are welcomed, you must clean up after your pet.
-Unauthorized motorized vehicles are prohibited.
-Trail Hours are from dawn to dusk.
-No dumping, littering or loitering. Please use trash receptacles.
-Do not take or harm any plants or animals, areas outside the trail may contain sensitive plants and animals.
-Use bikeway at your own risk.
-Warning: golf course ahead.

2.) With the development of the proposed bikeway, increased bicycle police patrols will be recommended and requested of HPD and the City and County of Honolulu. Currently, there is a temporary bicycle patrol in the Waipahu area, and none in the Ewa and Waianae areas. (This reflects the fact that there is a partial bikeway in the Waipahu area and none in the Ewa and Waianae areas.)

It should also be noted that the proposed bikeway does not create access that was not already there. The development of the bikeway will be an improvement in restricting access at night, restricting vehicular access and requiring a code of conduct.

Liability from errant golf balls: The bikeway through and along the Ko 'Olina Golf Course for over 3500 feet and in most cases parallel with the fairways. The potential for injury to a bikeway user from an errant golf ball is significant. Portions of the proposed Leeward Bikeway are located adjacent to existing golf courses (Ted Makalena Golf Course) and the West Loch (Villages) Golf Course. Mr. Dave Mills, Golf Systems Administrator of the City and County of Honolulu, Enterprise Department, Golf Course Division was contacted on 6/16/00 to determine if there have been an injuries or incidents reported with errant golf balls and pedestrians/bicyclists. Mr. Mills stated that there have been no complaints system wide and that he would be surprised if incidents of such a nature did occur along the proposed Leeward Bikeway, even in the Ewa area. The Hawaiian Railway Society was also contacted to determine if any incidents have occurred with train rides. They reported that one errant golf ball incident had occurred, however it was not within the last four years of the current personnel tenure (HRS, 6/20/00). Additionally, conditions along the r-o-w through the Ko 'Olina area were reviewed (6/19/00) and the following was observed:

- In many cases, a golf cart path with berms parallels the location of the r-o-w;
- Oleander bushes line many sections of the r-o-w where the golf course has been constructed;
- At the entrance to the golf course, a parking lot exists next to the r-o-w.
- Aliinui Drive also borders the r-o-w and golf course for a significant distance.
- Brookfield Southland is developing 29 acres of low density, single-family residential land bordering a portion of the golf course.

Apparently, with the current uses surrounding the r-o-w at the Ko 'Olina golf course, errant golf ball incidents do not appear to be a major problem. Signs will be placed on the State r-o-w warning path users to 'use the path own risk" and "warning: golf course ahead". If Ko 'Olina is further concerned regarding uses of their property impacting users of the State r-o-w, they are welcomed to provide additional barriers (i.e., landscaping or screens) as they see fit.

Consultation: KOCA was not consulted in preparation of the draft EA and was not provided a copy of the Draft EA for review. Notice of availability was obtained through the Star Bulletin article of June 5, 2000. The proposed project is approximately 14 miles in length, with numerous property owners adjacent to it. To provide notice of preconsultation and to give each adjacent landowner a copy of the environmental assessment would be extremely difficult and costly. In order to provide notice and inform the public of the proposed project, the neighborhood boards in the vicinity of the proposed project were provided with preconsulting notices and copies of the EA (i.e., Ms. Maeda Timson of the Makakilo/Kapolei/Honokai Hale No. 34 Neighborhood Board was preconsulted on February 4, 2000 and sent a DEA on May 8, 2000). In addition, copies of the EA were placed at the Pearl City Regional Library, the Ewa, Waianae and Waipahu Libraries. As required by law, the proposed project with a synopsis and deadlines was listed in *The Environmental Notice, Office of Environmental Quality Control*, on May 8, 2000. Additionally, Ko 'Olina Resort was contacted (personal communication between Ken Williams and Nicole Griffin on April 6, 2000 at 1100 hours) with information that the proposed project was in the environmental assessment phase, and that information was needed on building at Ko 'Olina to determine cumulative effects. Ko 'Olina indicated that lot 16, low density housing on 29 acres would be developed by Brookfield Southland within the next 6 months. This construction effort was not anticipated to occur at the same time as the Leeward Bikeway.

Bikepath location and alignment not depicted well. The location map (Figure 2.2.2) does not identify the Ko 'Olina Resort area, show major existing thoroughfares, the golf course and current geographical configurations of the Ko 'Olina lagoons, marina and the Barbers Point Harbor. Figure 2.1, the Project Area map orients the reader to the location of the proposed project on the island of Oahu. Figures 2.2.1 and 2.2.2 depict the proposed project area from Waipio Point Access Road to Lualualei Naval Road with respect to major geographical features and accurate scale. The base maps utilized for Figures 2.2.1 and 2.2.2 are the US Geological Survey (USGS) maps which were last revised from aerial photographs in 1978, with a limited field check in 1982 and editing in 1983. These standard maps are used because they are accurate with respect to the mean sea level datum (i.e., the National Geodetic Vertical Datum of 1929) and show other geographical features (i.e., topography, mountains, gulches, streams, shoreline). Unfortunately, since the last updates to the USGS maps, Ko 'Olina Resort was acquired and developed; it is not depicted on the USGS maps. Unless already depicted on the USGS maps, private property features were not included on the maps, because of the numbers of individual properties, difficulty in depicting the legal boundaries, and the scale of the map. The exact location of the proposed bikeway itself is also difficult to plot on a map that scale, being that it is 10 feet wide on a map of a scale where 1-inch equals approximately 4,300 feet. To show the 10-foot wide proposed bikeway in a 40-foot right-of-way on maps of appropriate scale would result in producing numerous maps for one figure. This would make the document cumbersome and reader-unfriendly. The position of the bikeway is described in Section 2.2, Proposed Action, forth bullet.

Alignment within the right-of-way. *It should be more clearly* shown where the bikeway is aligned within the OR&L right-of-way along its route. Does the alignment consider and minimize impacts to adjacent uses such as residential and golf course use? The first part of this statement is addressed in the above response. The second part of the statement is addressed as follows. The former OR&L railroad right-of-way has not changed since it was built in the late 1800's, and the proposed bikeway location is within it. In the Ko 'Olina area, the proposed bikeway location is on the mauka side of the tracks. The deed transfer of the right-of-way included considerations of a bikeway in the early 1970's, and was finalized to include the development of the bikeway in the deed transfer of 1980. At that time, the area surrounding the former OR&L railroad was mainly sugar cane plantation and Barber's Point Naval Air Station on the Ewa Plain. The development of the Ko 'Olina golf course did not occur until 1991, and resorts were not built until 1991-1994. The design of the proposed bikeway is now occurring, placing it within the right-of-way which is shared with the operating railway of the Hawaiian Railroad Society. Considerations have been given in the placement of the bikeway with respect to the elements listed in the environmental assessment. The adjacent land uses of residences and golf courses are consistent with planned and anticipated land use along the bikeway and other bikeways (Ewa Development plan, CCH, 1997).

Adjacent and surrounding uses not fully disclosed. Generalized land uses are identified, but more specific developments and proximity to the proposed bikepath should be indicated on maps. In particular, existing developments such as the Ko 'Olina Fairways townhomes, and Ko 'Olina Resort Golf Course should be identified and located relative to the bikepath. Because of the numbers of individual properties, difficulty in depicting the legal boundaries, and the scale of the map private property features were not included on the figures. The purpose of Figure 3.4, is to indicate to the reader what land uses in the vicinity of the proposed project are.

Bikepath Use. Are the any ridership projections to help assess impact? Bikepath use is expected to mirror development in the Ewa District; as development increases, so will use.

New Right-of-Way. It is unclear where and how much new right-of-way will be acquired, although a $5 million cost estimate for acquisition is cited. This should be disclosed especially if private lands are affected. Because the proposed bikeway is currently in it's design phase, exact

locations and dimensions of new r-o-w have not yet been determined. It is not anticipated that the new right-of-way would extend more that 10 feet from the current boundary in some areas. Specific information can be discussed directly with Mr. Jonathan Winn at the DOT-HD at 692-7579.

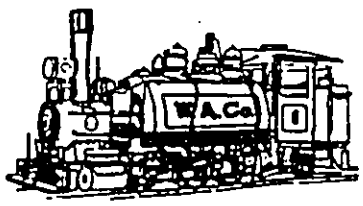
If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager



Hawaiian Railway

5-26-2000

Earth Tech
700 Bishop Street
Suite 900
Honolulu, HI 96813
Attn: Karl Bromwell

Dear Sir:

Enclosed please find our comments on the Leeward Bikeway Environmental Assessment. We are pleased to see this project progressing and look forward to the OR&L Right of Way given more attention. We have enclosed our map of bridges and crossings for your use.

Questions on these comments may be answered by Ben Schlapak at 838 8821.

Sincerely yours

Robert Yatchmenoff
President

HAWAIIAN RAILWAY SOCIETY

A Chapter of the National Railway Historical Society

P. O. Box 60369 • Ewa Station, Ewa Beach, Hawaii 96706 • Ph: (808) 681-5461 • Fax: (808) 681-4860

Comments on Leeward Bikeway EA

General: We concur with the treatment of the impacts discussed and the conclusion of a finding of no significant enviromental impact.

Page 9 - stream crossing number three should be at the north end of Kahe Point Beach Park.

Page 24 - Table 2-1, duration appears to be 12 months, not 24.

Page ES-2 - What is the AASHTO clearance between a bikepath and a roadway ? Apparently it is about four feet.

Page 17 - The location of barriers is very vague. Why is it necessary to relocate so many utility poles ? Why can't the bikeway just jog around them ?

Figure 3.1 - Define APE. Page 27 defines it later. Existing bikepath at West Loch Park is in the center of the old OR&L right of way. If the railroad is restored as part of the Pearl Harbor Historic Trails Project, the bikeway should be offset. There is a cut where this will involve earthwork. Muliwai needs definition. Is this a local Hawaiian term ?

Page 28 - Kahe Point Power Plant is at Manner's Beach, not Nanakuli. Recommend you change assumed to concluded in the second paragraph.

Page 43 - The Keanaoio muliwai is a situation where beach sand should be moved to allow for drainage and flood control. HRS intends to rebuild Bridge 36 but often the pier foundations are underwater. The muliwai is also a stagnant breeder of mosquitoes. The City and County of Honolulu should clear the mouth of the stream annually and also put a few dollars into the maintenance of Kahe Point Beach Park.

Figure 3.3.1 - Show the previous C&C bikepath in West Loch Park which conflicts with the old railway right of way.

Page 50 - Unregulated dumping is a very serious problem along all of the railroad right of way. The violations of County regulations should be enforced and the area should be cleaned up. HRS has taken many loads of tires, batteries and junk to the County refuse transfer point at Honouliuli but assistance is needed from some government agency.

Figure 3.5.2 - Does not show the actual location of the Barbers Point/Kalaeloa Harbor which will come close to the edge of the railroad right of way when the enlargement is done.

Page 63 - Please Add: For safety reasons the Federal Railway Administration (FRA) requires all trains to blow two long blasts, a short and a long through all unguarded railroad crossings.

Page 74 - Kaloi Gulch is designed to take 2500 cfs with the new railway/bikeway/pipeline bridge. Eventually 7000 cfs is planned for the 100 year storm event. In 1917 there were two small timber

trestle bridges in the vicinity but by the 1940s only a irrigation flume remained. The new bridge reopens the natural drainage way that was Kaloi Gulch. This was a C&C project which is a great improvement.

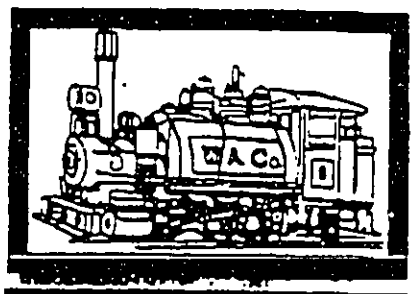
Page 78, 82, 86, 87, 89, 91, 92, 94 - HRS is planning on replacing track and four (not three) bridges between Kahe Point and Nanakuli by 2005.

Attached find our Bridge/Crossing Map from 1996-1997 which shows location and condition on the 1968 USGS Quadrangle.

HRS follows criteria of the American Railway Engineering Association for restoring tracks and bridges and crossings but also takes guidance on historic restoration from the State Historic Preservation Office.

FAX COVER SHEET -- HAWAIIAN RAILWAY

P.O. Box 60369, Ewa Station
Ewa Beach, Hawaii 96706



Oahu's trainride, featuring an educational and entertaining narration about the history of railroading in Hawaii. Come on our [illegible] and take a ride [illegible] train!

DATE: 6-7-00

TO: NICOLE GRIFFIN

AT FAX: 523-8952

Number of pages including cover: 3

FROM: BOB YATCHMENOFF

At Fax: (808) 681-4860 and Phone (808) 681-5461

REMARKS:

JUN 07 '00 10:33 8086814860 PAGE 01

Hawaiian Railway

Date June 06, 2000
To: DOT-HD
Earth Tech
OEQC
State Historic Preservation Division

Re Leeward Bikeway Environmental Assessment

Dear Sir or Madam,

The Hawaiian Railway Society has reviewed the environmental assessment for the Leeward Bikeway and has not indicated concern for environmental issues. However, there are three issues that may have long-term and possibly cumulative adverse impacts to restoration activities along the historic and non-historic railroad right of way.

1. It is understood that in the West Loch area, the DOT is planning to allow another pipeline to be put in the makai most area of the energy corridor, this location would [illegible] proposed pipeline under the railroad right of way. [illegible] room will be available for restoring the railroad in that area. The railroad [illegible] grading and ballast as well as rails to support the load of the train. This could not go over a pipeline, as it would not allow easy access to the *pipeline for maintenance or repair.*

   Solution: Place the pipeline under the bikeway location to allow space for the railroad restoration.

2. The Hawaiian Railway Society has previously (1996) asked the DOT to work with it in restoring the railroad while completing the bikeway under ISTEA funding. The DOT however, already has other funding in place and as a result is completing their bikeway. The Hawaiian Railway Society will complete the restoration of the railroad with their own funding sources. This means that for every water and gulch crossing, there will be two seperate bridges of two different construction methods. This may or may not impact the enviroment, but it will have an adverse visual impact, deterring from the sight of the historic railroad. Historically, from Nanakuli to Ewa, (which is on the Historic Register), the railroad was not double tracked. Construction will also be difficult since the right of way is narrow.

   Solution: Efforts should still be made to work cooperatively and concurrently with Hawaiian Railway Society to produce one bridge crossings, as seen at Kaloi Gulch. The DOT could:

   a.) Work currently with Hawaiian Railway Society to produce one-bridge crossings or:

   b.) If the DOT can not work their project concurrently with the Hawaiian Railway Society, efforts should be made to make the bridges compatible with Hawaiian Railway Society restoration efforts so that essentially, one-bridge crossings will still be the end product.

HAWAIIAN RAILWAY SOCIETY
A Chapter of the National Railway Historical Society
P. O. Box 60369 • Ewa Station, Ewa Beach, Hawaii 96706 • Ph: (808) 681-5461 • Fax: (808) 681-4860

Hawaiian Railway

3. We would also like to restate concern on one of our earlier comments. After the bikeway is built, who will maintain it? Who will address the constant illegal dumping and litter?

We hope there matters can be addressed prior to the initiation of the project.

Sincerely,

for Robert Yatchmenoff

Robert Yatchmenoff
President

HAWAIIAN RAILWAY SOCIETY
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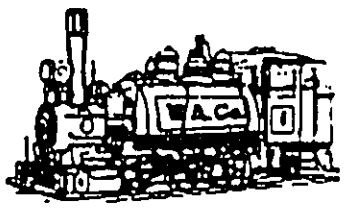

Hawaiian Railway

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Sincerely.

Robert Yaehmenoff
President

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P. O. Box 60369 • Ewa Station, Ewa Beach, Hawaii 96706 • Ph: (808) 681-5461 • Fax: (808) 681-4860

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8854

Facsimile
808.523.8950

August 10, 2000

Robert Yatchmenoff
President
Hawaiian Railway Society
PO Box 60369
Ewa Station, Ewa Beach, HI 96706

Subject: **Draft Environmental Assessment, Leeward Bikeway,
OR&L Railway Right of Way,
Ewa and Waianae Districts, Oahu
Project No.s STP-0300(55) and STP-0300(56)**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed Leeward Bikeway project. The final EA (FEA) has been amended to reflect your comments where appropriate. We appreciate your efforts in reviewing the document and provide the following response to your comments (presented in bold):

Page 9 – stream crossing number three should be at the north end of Kahe Point Beach Park. Comment added.

Page 24 – Table 2-1, duration appears to be 12 months, not 24. Comment added-duration changed to 12 months.

Page ES-2 – What is the AASHTO clearance between a bikepath and a roadway? Apparently it is about 4 feet. The clearance is five feet.

Page 17 – The location of the barriers is very vague. Why is it necessary to relocate so many utility poles? Why can't the bikeway just jog around them? The utilities will be located on one side of the new right-of-way to provide a clearance distance between the active railroad and the bikepath. Where a barrier is used, it will be placed 6-8 feet from the center of the railroad alignment, between the bikepath and the railroad. Barrier use is anticipated in areas adjacent to small property owners.

Figure 3.1 – Define APE. Page 27 defines it later. Existing bikepath at West Loch Park is in the center of the old OR&L right-of-way. If the railroad is restored as part of the Pearl Harbor Historic Trails Project, the bikeway should be offset. There is a cut where this will involve earthwork. Muliwai needs definition. Is this a local Hawaiian term? APE is defined first on page 27, and Figure 3.1 follows that on page 31. The portion of the former railroad in the West Loch Park area, is owned by the City and County of Honolulu. The matter of the existing bikepath placement over the former tracks needs to be addressed by the City and County of Honolulu. Muliwai is a Hawaiian term generally describing a natural wetland-type feature produced at stream mouths where beach sand blocks water draining from the stream and creates a small pond. It is further discussed in the Biological Resources Survey in Appendix B, page 27.

Page 28 - Kahe Power Plant is at Manner's Beach, not Nanakuli. Recommend you change assumed to concluded in the second paragraph. Changes made as requested.

Page 43 – The Keanaoio muliwai is a situation where beach sand should be moved to allow for drainage and flood control. HRS intends to rebuild bridge 36 but often the pier foundations are underwater. The muliwai is also a stagnant breeder of mosquitoes. The City and County of Honolulu should clear the mouth of the stream annually and put a few dollars into the maintenance of Kahe Point Beach Park. The muliwai is a natural wetland-type feature that would need to be evaluated under several regulations and permits before any type of construction could be performed. Some of the regulations and permits may include, but not be limited to the following: US Army Corps of Engineers (COE) Department of the Army (DA) permit, and Section 404 Permit, the Department of Health (DOH) Section 401 Water Quality Certification (WQC), the State Coastal Zone Management Program (CZMP) Consistency Determination, State Stream Channel Alteration (SCA) permit, Special Management Area (SMA) Use Permit, Conservation district Use Application (CDUA), Shoreline Setback Variance (SSV), and State Historic Preservation Clearance. Thank you for your comment regarding maintenance at Kahe Point Beach Park.

Figure 3.3.1 – Show the previous C&C bikepath in West Loch Park which conflicts with the old railroad right-of-way. This bikeway is not part of the proposed project area. Concerns regarding improper placement of the existing bikeway need to be addressed with the City and County of Honolulu.

Page 50 – Unregulated dumping is a very serious problem along all of the railroad right-of-way. The violations of County regulations should be enforced and the area should be cleaned up. HRS has taken many loads of tires, batteries and junk to the County *refuse point at Honouliuli but* assistance is needed from some government agency. With the development of the proposed Leeward Bikeway, the DOT maintenance Department will routinely maintain the route by cutting grass and removing trash within the 40-foot r-o-w. Additionally, in it's current state, access is obtained along the pipeline maintenance road, by those who dump illegally. With the proposed bikeway improvements, access will be restricted to vehicles (outside of emergency and maintenance crews), maintenance will be performed, hours of access will be restricted and additional bicycle police patrols will be requested.

Figure 3.5.2 – Does not show the actual location of the Barbers Point/Kalaeloa Harbor which will come close to the edge of the railroad right-of-way when the enlargement is done. The maps utilized to create this figure were the US Geological Survey (USGS) 7.5 minute series quadrangles for Ewa, Waipahu and Waianae. They were utilized because of their accuracy with respect to the location of the right-of-way, topography and location of major geographical features (i.e., mountains, streams, gulches). These maps were last revised from aerial photographs in 1978, with limited field checks in 1982 and a final editing in 1983. As a result, they do not show recent or future development in the Ewa area. Private property features were not depicted on the figures due to difficulty in accurately representing the legal boundaries, the scale of the map and number of private properties. Additionally, the purpose of this map is to show the readers the flood zone determinations generated by the Federal Emergency Management Agency (FEMA) in the vicinity of the proposed project. Any changes (like harbor creation or enlargement) will require re-evaluation by FEMA after the action is completed.

Page 63 – Please Add: For safety reasons, the Federal Railway Administration (FRA) requires all trains to blow two long blasts, a short and a long through all unguarded railroad crossings. Comment has been added as requested.

Page 74 – Kaloi Gulch is designed to take 2500 cfs with the new railway/bikeway/pipeline bridge. Eventually 7000 cfs is planned for the 100 year storm event. In 1971 there were two small timber trestle bridges in the vicinity but by the late 1940s only an irrigation flume remained. The new

bridge reopens the natural drainway that was Kaloi Gulch. This was a C&C project which is a great improvement. Thank you for your comment.

Page 78, 82, 86, 87, 91, 92, 94 – HRS is planning on replacing track and four (not three) bridges between Kahe Point and Nanakuli by the year 2005. Comments have been added as requested.

It is understood in the West Loch area, the DOT is planning to allow another pipeline to be put in the makai most area of the energy corridor, this location would place the proposed pipeline under the railroad right-of-way. If the DOT bikeway is put in and another bikeway is put in and another pipeline is put in, no room will be available for restoring the railroad in that area. The railroad requires grading, ballast and rails to support the load of the train. This could not go over the pipeline, as it would not allow ease access to the pipeline for maintenance and repair.

Solution:
Place the pipeline under the bikeway location to allow space for the railroad restoration.

The Department of Transportation (DOT) Highways Division (HD) proposed Leeward Bikeway project is placed to allow for room of future railroad expansion. The proposed alignment is already over gas lines in the energy corridor area. The energy corridor project involving the placement of a HECO pipeline is a DOT-Harbors (DOT-HAR) project. This division would need to be contacted regarding this concern.

The Hawaiian Railway Society has previously (1966) asked the DOT to work with it in restoring the railroad while completing the bikeway under ISTEA funding. The DOT however, already has other funding in place and as a result is completing their bikeway. The Hawaiian Railway Society will complete the restoration of the railroad with their own funding sources. This means that for every water and gulch crossing there will be two separate bridges of two different construction methods. This may or may not impact the environment, but it will have an adverse visual impact, deterring from the sight of the historic railroad. Historically, from Nanakuli to Ewa, (which is on the Historic Register), the railroad was not double-tracked. Construction will also be difficult since the right-of-way is narrow.

Solution:

1.) Efforts should still be made to work cooperatively and concurrently with the Hawaiian Railway Society to produce one-bridge crossings or:

2.) If the DOT can not work their project concurrently with the Hawaiian Railway Society, efforts should be made to make the bridges compatible with Hawaiian Railway Society restoration efforts so that essentially, one-bridge crossings will still be the end product.

It should be noted that DOT-HD must complete the project as it was funded and as described in the scope of work by the legislature. The project scope of work only outlines a bikeway. Therefore, the project does not include funding for expanding the railroad, and cannot be used for that purpose. Bridge crossings will be designed to allow room for expansion of the railroad along its current alignment.

We would also like to restate concern on one of our earlier comments. After the bikeway is built, who will maintain it? Who will address the constant illegal dumping and litter? This comment, is