

Special Management Area Use Permit  
And  
Shoreline Setback Variance

**Kalo'i Gulch Drainage Improvements at  
One'ula Beach Park**



District of Ewa, O'ahu, Hawai'i

Prepared by:

**WILSON OKAMOTO**  
CORPORATION

---

ENGINEERS | PLANNERS | CONSULTANTS

December 2006

Special Management Area Use Permit

And

Shoreline Setback Variance

**Kalo'i Gulch Drainage Improvements**

**at**

**One'ula Beach Park**

District of Ewa, Oahu, Hawaii

Prepared by:

Wilson Okamoto Corporation

December 2006

**TABLE OF CONTENTS**

Page No.

**PREFACE** ..... iv

**I. GENERAL INFORMATION** ..... 1

**II. DESCRIPTION OF THE PROPOSED ACTION** ..... 3

**A. General Description**..... 3

        1. Proposed Project ..... 3

        2. Project Location ..... 5

        3. Relation to the SMA ..... 5

        4. Relation to the SSV ..... 9

        5. Land Use Approvals Required ..... 12

**B. Technical Characteristics** ..... 14

        1. Purpose of the Proposed Improvements ..... 14

        2. Description of Proposed Improvements ..... 17

        3. Maintenance of Proposed Improvements ..... 22

        4. Project Schedule and Construction Cost..... 22

**C. Economic and Social Characteristics**..... 23

        1. Upland Landowners Detention Needs ..... 23

        2. One'ula Beach Park Master Plan..... 24

**D. Environmental Characteristics** ..... 25

        1. Soils..... 25

        2. Topography..... 25

        3. Flood Hazards..... 26

        4. Coastal Water Quality ..... 28

**III. AFFECTED ENVIRONMENT** ..... 30

**A. Existing and Proposed Land Uses**..... 30

**B. Natural and Recreational Resources** ..... 33

**C. Historic, Cultural, and Archaeological Resources**..... 34

**D. Coastal Views** ..... 35

**E. Quality of Receiving Water and Groundwater**..... 35

        1. Marine Waters ..... 35

        2. Groundwater ..... 38

<b>IV.</b>	<b>PROJECT IMPACTS AND MITIGATION MEASURES.....</b>	<b>39</b>
<b>A.</b>	<b>COASTAL ZONE MANAGEMENT .....</b>	<b>39</b>
1.	Recreational Resources.....	39
2.	Historic Resources.....	40
3.	Scenic and Open Space Resources .....	41
4.	Coastal Ecosystems .....	42
5.	Economic Uses.....	45
6.	Coastal Hazards .....	46
7.	Managing Development .....	47
8.	Public Participation.....	48
9.	Beach Protection.....	49
10.	Marine Resources .....	49
<b>B.</b>	<b>SPECIAL MANAGEMENT AREA GUIDELINES .....</b>	<b>50</b>
<b>V.</b>	<b>REFERENCES .....</b>	<b>57</b>

**LIST OF FIGURES**

	<u>Page No.</u>
Figure 1	Kalo'i Gulch Regional Watershed .....4
Figure 2	Location Map .....6
Figure 3	Tax Map Key .....7
Figure 4	Tax Map Key .....8
Figure 5	Special Management Area Boundary .....10
Figure 6	Upland Landowners .....15
Figure 7	Grading Plan .....18
Figure 8	Site Plan .....20
Figure 9	Flood Zone Map .....27
Figure 10	Zoning Map .....31
Figure 11	Proposed Zoning Changes .....32

Exhibit A - Certified Shoreline Survey (11" x 17")

## **PREFACE**

This application requests consideration of a Special Management Area (SMA) Use Permit (Chapter 205A, Hawaii Revised Statutes and Chapter 25, Revised Ordinances of Honolulu, as amended), and a Shoreline Setback Variance (SSV), administered by the City and County of Honolulu Department of Planning and Permitting (DPP) for the Kalo'i Gulch Drainage Improvements project. The project will modify and enlarge an existing, temporary emergency drainage channel to increase storm water runoff capacity to the ocean. The Kalo'i Gulch Drainage Improvements project is located within the One'ula Beach Park, a public park owned by the City and County of Honolulu.

**I. GENERAL INFORMATION**

- A. Applicant:** HASEKO (Ewa), Inc.  
91-1001 Kaimalie Street, Suite 205  
Ewa Beach, Hawaii 96706  
Nelson W.G. Lee, Executive Vice President  
Telephone: 689-7772
- B. Recorded Fee Owner:** TMK: 9-1-012: 025  
Department of Parks and Recreation  
City and County of Honolulu  
1000 Uluohia Street, Suite 309  
Kapolei, Hawaii 96707  
Lester K.C. Chang, Director  
Telephone: 692-5585
- TMK: 9-1-011: 007  
HASEKO (Ewa), Inc. (Applicant)
- C. Agent:** Wilson Okamoto Corporation  
1907 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826  
Earl Matsukawa, AICP, Planning Director  
Telephone: 946-2277
- D. Tax Map Key:** 9-1-012: Portion of 025  
9-1-011: Portion of 007
- E. Lot Area:** 6.9 Acres
- F. Agencies Consulted** Federal  
(Preparation of EIS) U.S. Army Corps of Engineers  
Department of Housing and Urban Development  
National Marine Fisheries Service  
U.S. Fish and Wildlife Service
- State Agencies  
Department of Land and Natural Resources (DLNR)  
Land Division  
Historic Preservation Division  
Office of Conservation and Coastal Lands  
Dept. of Business, Economic Development & Tourism  
Office of Planning

**Agencies Consulted** State Agencies (continued)

Department of Health  
Clean Water Branch  
Environmental Planning Office  
Department of Transportation  
Highways Division

City and County of Honolulu Agencies

Department of Planning and Permitting  
Department of Parks and Recreation  
Department of Design and Construction  
Department of Environmental Services  
Department of Transportation Services

Community Organizations

Ewa Neighborhood Board No. 23  
Ewa Beach Community Association  
Outdoor Circle  
Historic Hawaii Foundation  
Ewa Puuloa Hawaiian Civic Club

Elected Officials

State Senator Willie Espero  
State Senator Brian Kanno  
State Representative Romeo Mindo  
State Representative Tulsi Gabbard Tamayo  
Councilmember Mike Gabbard, District 1  
Councilmember Todd Apo (consulted for SMA only)

Interested Parties

Ms. Arline Wainaha Pu`ulei Brede-Eaton  
Mr. Henry Chang Wo  
Mr. Eric Whiteman

Upland Landowners Consulted for SMA

James Campbell Trust Estate  
Gentry  
Department of Hawaiian Homelands  
Hunt Construction Company  
Schuler/Horton  
Laulani Village  
Haseko  
Department of Transportation  
Department of Land and Natural Resources



## **II. DESCRIPTION OF THE PROPOSED ACTION**

### **A. General Description**

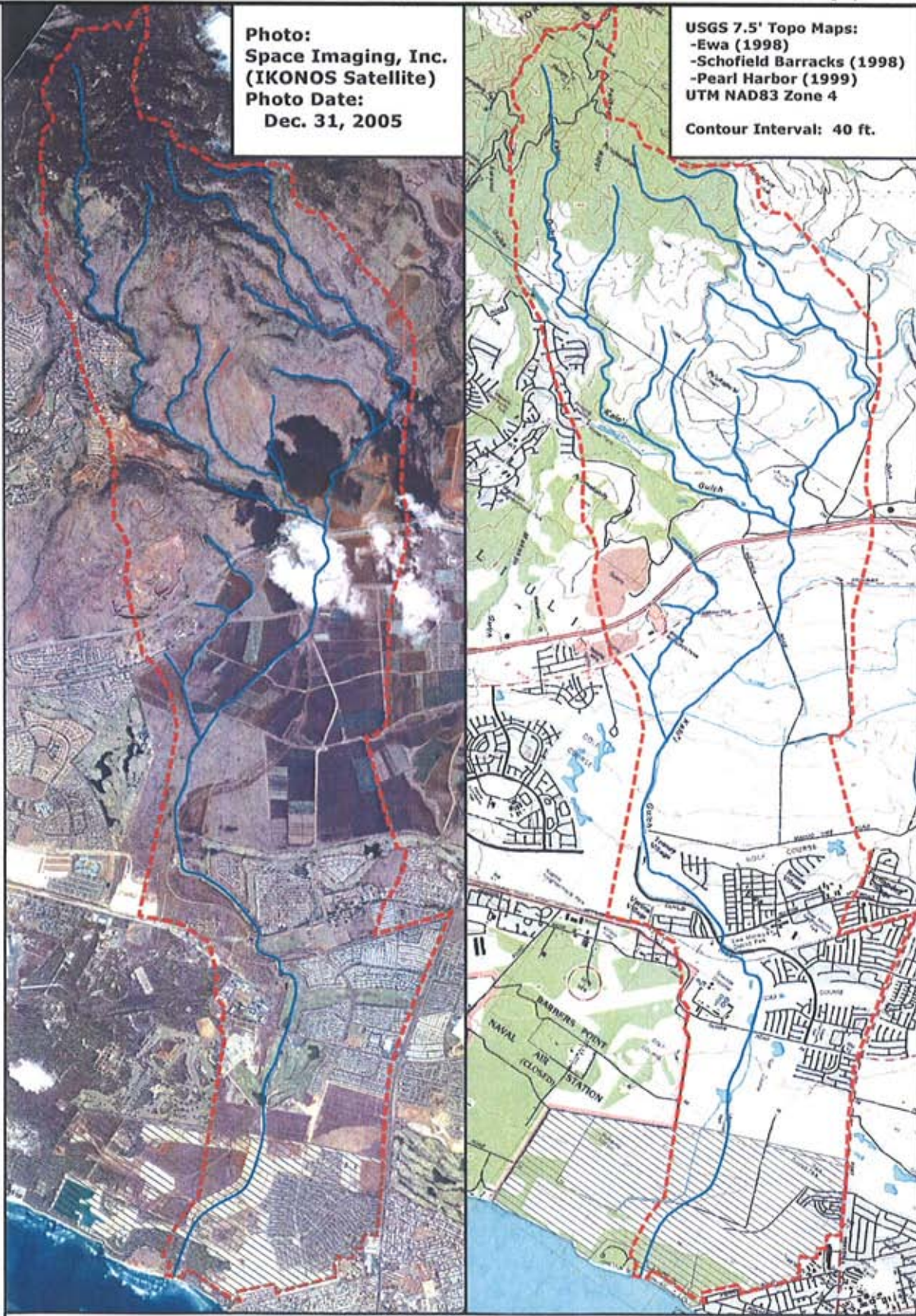
#### **1. Proposed Project**

The proposed Kalo'i Gulch Drainage Improvements at One'ula Beach Park project will modify and enlarge an existing, temporary emergency drainage channel in order to increase storm water discharge capacity to the ocean through the Kalo'i Gulch drainage channel. The drainage improvements are intended to provide flood control and address regional drainage needs for all landowners within the approximately 7,000-acre Kalo'i Gulch Watershed. (see Figure 1). The improvements will benefit all upland landowners whose future development plans are currently constrained by the need to retain surface flows. Haseko is undertaking this effort to coordinate regional infrastructure development in order to integrate upland development plans with their own onsite infrastructure. Improvements to the existing drainage channel will be designed to meet the City and County of Honolulu (City) 100-year storm flow requirements in accordance with its current Storm Drainage Standards.

The proposed drainage improvements will consist primarily of lowering a natural berm along the shoreline to allow storm-water flows to reach the ocean, and raising the channel banks to contain the flow. In addition, a portion of relocated park access road will be constructed as a concrete ford structure to allow the passage of storm flows. The new access road location will be sited in accordance with the planned improvements contained in the One'ula Beach Park Master Plan (2001) and approved by Special Management Area Use Permit (Resolution No. 01-228). Existing water and electrical lines associated with the current access road will be relocated.

**Photo:**  
**Space Imaging, Inc.**  
**(IKONOS Satellite)**  
**Photo Date:**  
**Dec. 31, 2005**

**USGS 7.5' Topo Maps:**  
**-Ewa (1998)**  
**-Schofield Barracks (1998)**  
**-Pearl Harbor (1999)**  
**UTM NAD83 Zone 4**  
**Contour Interval: 40 ft.**



**WILSON OKAMOTO**  
CORPORATION  
ENGINEERS • PLANNERS

Kalo'i Gulch Drainageway Improvements at One Ila Beach Park SMA and SSV Application

# KALO'I GULCH REGIONAL WATERSHED

FIGURE

1

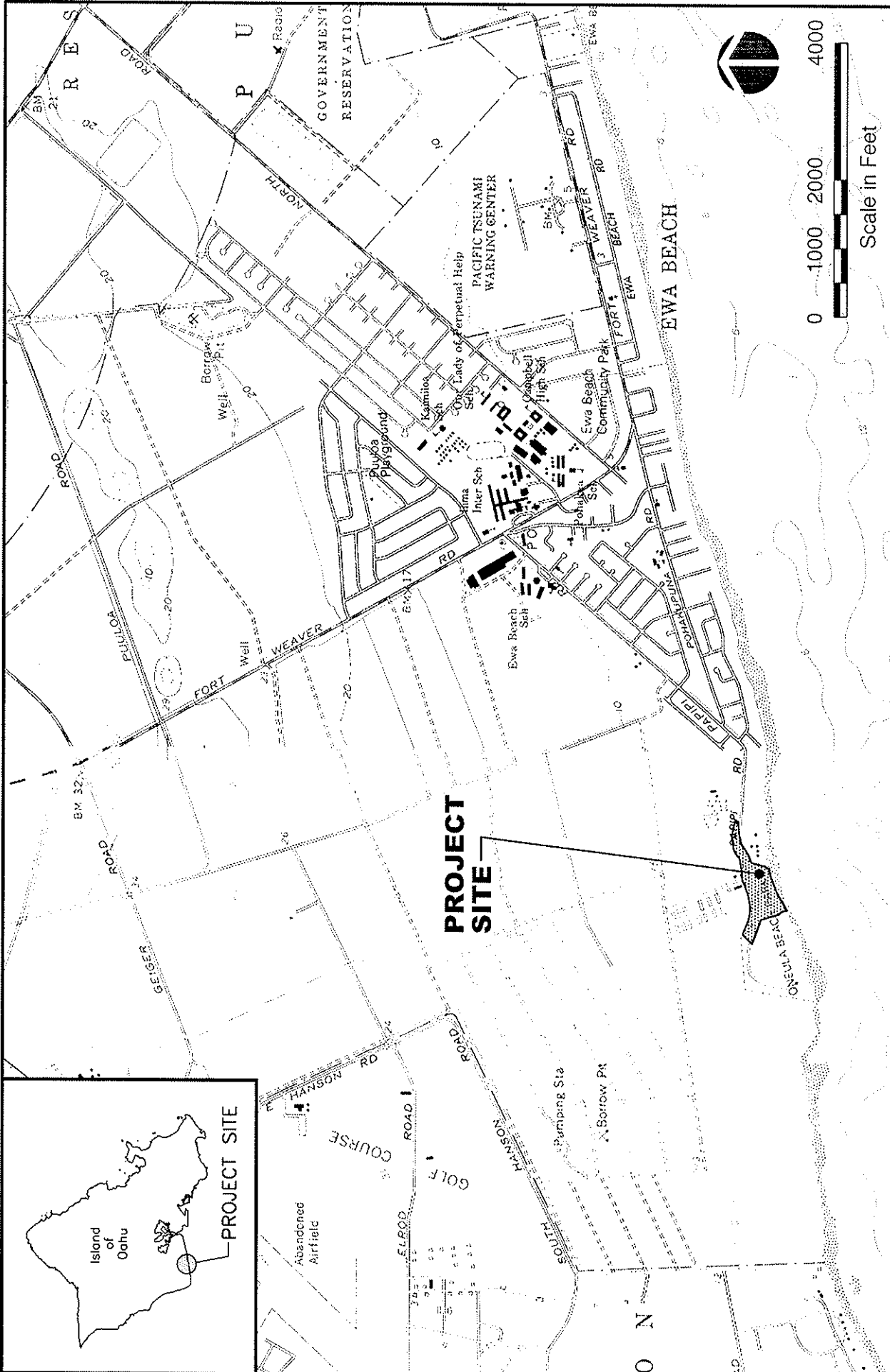
Other minor improvements will include the construction of an emergency park access road, filling of areas that currently collect standing water after heavy rains, and landscaping of the entire site. The road will provide emergency access in the event the main road is blocked due to flooding, or during periods of repair and maintenance. Under normal conditions, the road will be blocked or gated to maintain a single access to the park.

## **2. Project Location**

The proposed project is located at the eastern end of One'ula Beach Park, a 28-acre passive recreation park owned and operated by the City Department of Parks and Recreation. (see Figure 2). The proposed drainage improvements will involve an area of 6.9 acres, occupying Tax Map Keys (1) 9-1-12: portion of 25, owned by the City, and (1) 9-1-11: portion of 7, presently owned by Haseko. (see Figures 3 and 4). About 4.3 acres of the project site is within the existing park, and 1.9 acres comprise part of the park access roadway (no TMK). The remaining 0.7 adjoining acres is located to the east on land that is owned by Haseko. This portion will eventually be conveyed to the City as part of the future park expansion detailed in the One'ula Beach Park Master Plan.

## **3. Relation to the SMA**

The Hawaii Coastal Zone Management Law (Chapter 205A, HRS) requires that the Counties designate and administer Special Management Areas (SMA) along the State's coastline. Within the City and County of Honolulu, any development within the SMA boundary requires an SMA Use Permit (SMP), which is administered by the City and County of Honolulu, Department of Planning and Permitting (DPP) and acted upon by the City Council. All of the proposed project makai of the access road is located within the Special Management Area, an

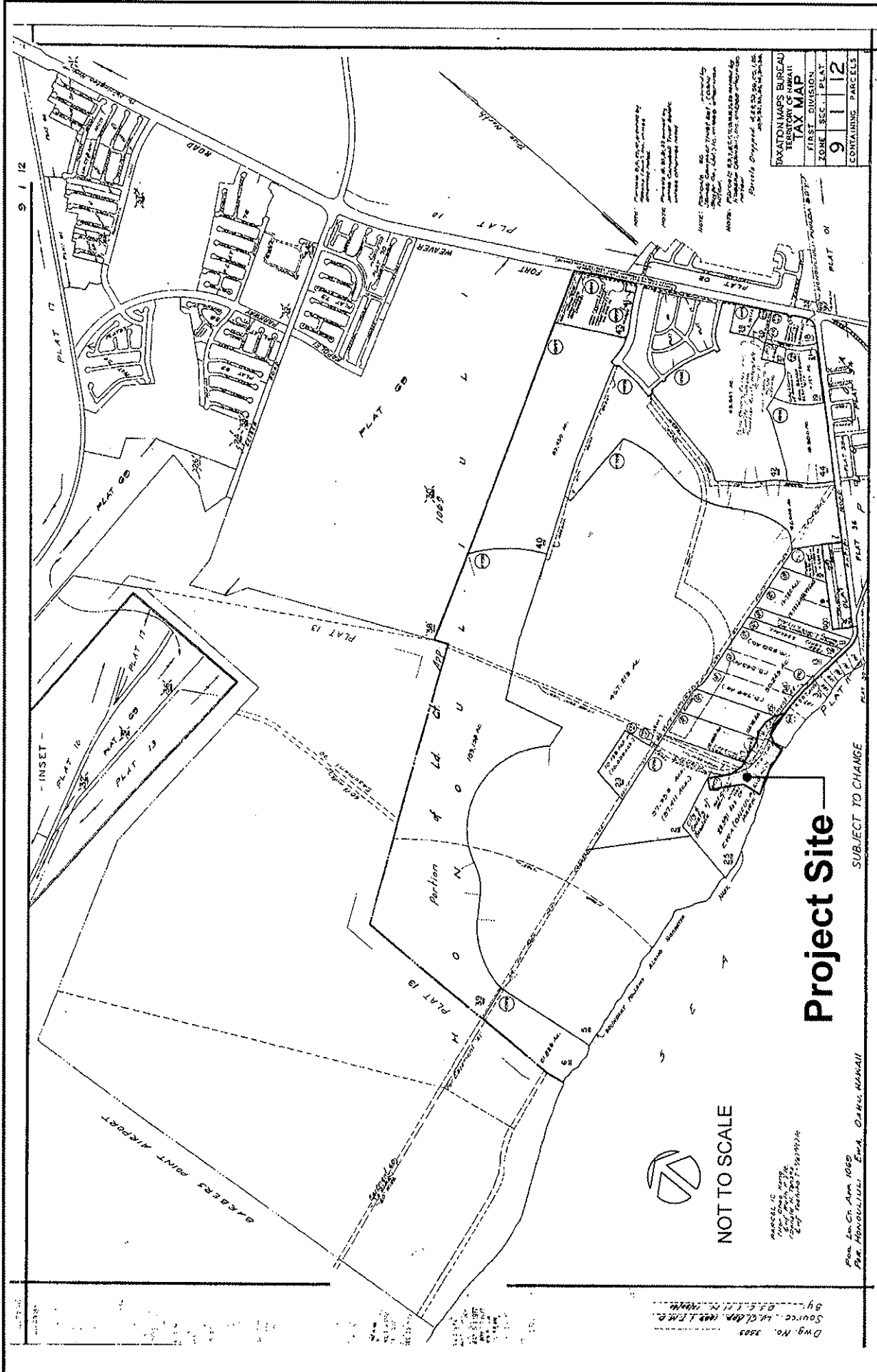



**WILSON OKAMOTO CORPORATION**  
ENGINEERS • PLANNERS

Kalo'i Gulch Drainage Improvements at One 'ula Beach Park SMA & SSV Application

# LOCATION MAP

FIGURE  
2





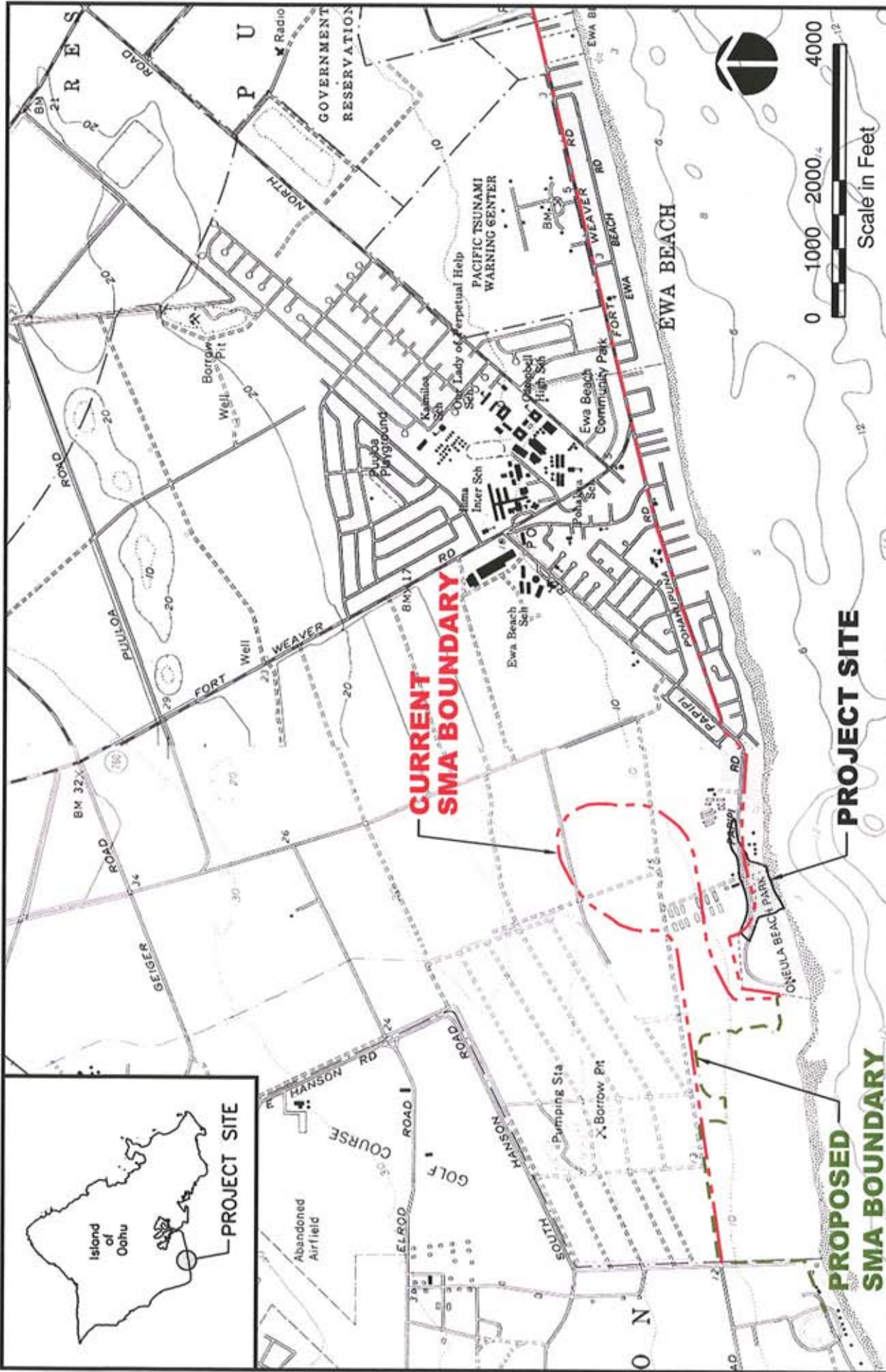
area of about 5 acres. (see Figure 5). A public hearing on this application will be held in accordance with the Revised Ordinances of Honolulu (ROH) Section 25.5-3 Public hearings. Figure 5 also depicts the forthcoming SMA boundary amendment to reflect the limits of the new marina currently under construction.

The beach park was issued its own SMA Use Permit (Resolution No. 01-228) by the City Council for the One'ula Beach Park Master Plan. Since construction of the proposed drainage improvements would occur on park space designated for recreation, the DPR has reviewed and evaluated the project for its impact on the Master Plan. The position of DPR is that the proposed drainage improvements do not constitute a significant change to the Master Plan that would warrant a formal modification, amendment, or update. Except for the relocation of one picnic area and some parallel parking stalls, the proposed drainage improvements will not alter any significant features of the master plan. The drainage channel will be available as open space and playing field for park users.

Should the subject SMP be approved, the existing SMP for the One'ula Beach Park Master Plan will be amended, as necessary, to reflect the approved regional drainage modifications.

#### **4. Relation to the SSV**

The shoreline setback line is established at 40 feet inland from the certified shoreline. In order to lower the natural berm to 4 feet above mean sea level (msl) within the proposed drainage channel, grading within the shoreline setback line will be necessary. (see Certified Shoreline Survey, Exhibit A, end of document). Elevation is between 6 and 8 feet (msl) in this location. A SSV is sought from the Revised Ordinances of Honolulu (ROH) Section 23-1.5(a), which specifies that the mining or taking of any earth material from the shoreline is prohibited.




**WILSON OKAMOTO CORPORATION**  
ENGINEERS • PLANNERS

Kalo'i Gulch Drainage Improvements at One'ula Beach Park SMA & SSV Application

# SPECIAL MANAGEMENT AREA BOUNDARY

FIGURE 5



The proposed project meets two standards for the granting of a SSV: (1) the shoreline-dependent facility standard, and (2) a public interest standard. Section 23-1.8(b)(1) of the ROH specifies that a shoreline setback variance may be granted,

*“ . . . for an activity or structure that is necessary for or ancillary to a shoreline-dependent facility or improvement, including drainage facilities . . . provided that the proposal is the practicable alternative which best conforms to the purpose of the shoreline setback rules.”*

The proposed grading activity is necessary to increase the capacity of the existing drainage channel, which is a shoreline-dependent facility. Under the public interest standard, Section 23-1,8(b)(2) states that a variance may be granted,

*“ . . . for an activity or structure which is undertaken . . . by a private entity and is clearly in the public interest: provided that the proposal is the practicable alternative which best conforms to the purpose of . . . the shoreline setback rules*

The grading will be undertaken by a private entity to benefit the upland landowners within the Kalo'i watershed. The project will serve the public interest by reducing flood hazards in the region.

Both of these criteria for granting a variance specify that proposed activities or structures should conform to the extent possible with the purpose of the shoreline setback rules. As stated in Section 23-1.2(a), the purpose of the shoreline setback rules is to:

*“ . . . protect and preserve the natural shoreline, especially sandy beaches; to protect and preserve public pedestrian access laterally along the shoreline 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.”*

By necessity, the enlargement of the existing drainage channel will require lowering the natural shoreline along the channel's approximately 500-foot width. However, although grading activity will require the relocation of some sand and soil to form berms on either side of the channel, the areal extent of the shoreline will be preserved. Since no structures will be built, open space and public access laterally along the shoreline will also be protected and preserved. The drainage improvements will be integrated into the landscape of the existing One'ula Beach Park.

No structures will be built within the drainage channel, but the project will involve relocation to the south (makai) of the current park access road by between 60 and 75 feet. Development standards mandate that this road will be reconstructed as a concrete ford crossing to prevent washout during the passage of storm flows, in accordance with Section 9.10 of the Land Use Ordinance. Existing overhead electrical power and communication lines will be relocated to an underground concrete-encased conduit system within the new access road. This will minimize flood damage caused by either a tsunami or flood event.

## **5. Land Use Approvals Required**

### City and County of Honolulu

Five (5.0) acres of the 6.9-acre area of work is located within the Special Management Area. In addition, some grading activity to lower the natural berm

will occur within the 40-foot Shoreline Setback. This combined SMP and SSV application will address the issues raised by these land use controls.

A Grading Permit from DPP will also be required prior to construction. Authorization from the City and County of Honolulu will be necessary to use a portion of One'ula Beach Park for the regional drainage channel to serve the Kalo'i Gulch Watershed.

#### State of Hawaii

A portion of the grading will be done seaward of the certified shoreline. All lands seaward of the certified shoreline are in the Conservation District and work in this area will require a Conservation District Use Permit (CDUP). Likewise, excavation of material located makai of the certified shoreline will require a Land Disposition to dredge submerged lands. Both the CDUP and Land Disposition will be obtained from DLNR prior to construction.

The proposed action involves construction activity in an area that is greater than 1 acre, which will require an NPDES, Notice of Intent (NOI) Form C, Discharges of Stormwater Associated with Construction Activity. An NPDES, Municipal Separate Storm Sewer System (MS4) Permit will also be necessary. Both permits will be obtained from the State of Hawaii Department of Health prior to construction.

#### Federal

A U.S. Army Corps of Engineers, Department of the Army Permit (Section 404) is not required for the project. The drainage improvements will be limited to one dry section of the Kalo'i Gulch drainageway and will not result in the discharge of dredged or fill material into the ocean.

## **B. Technical Characteristics**

### **1. Purpose of the Proposed Improvements**

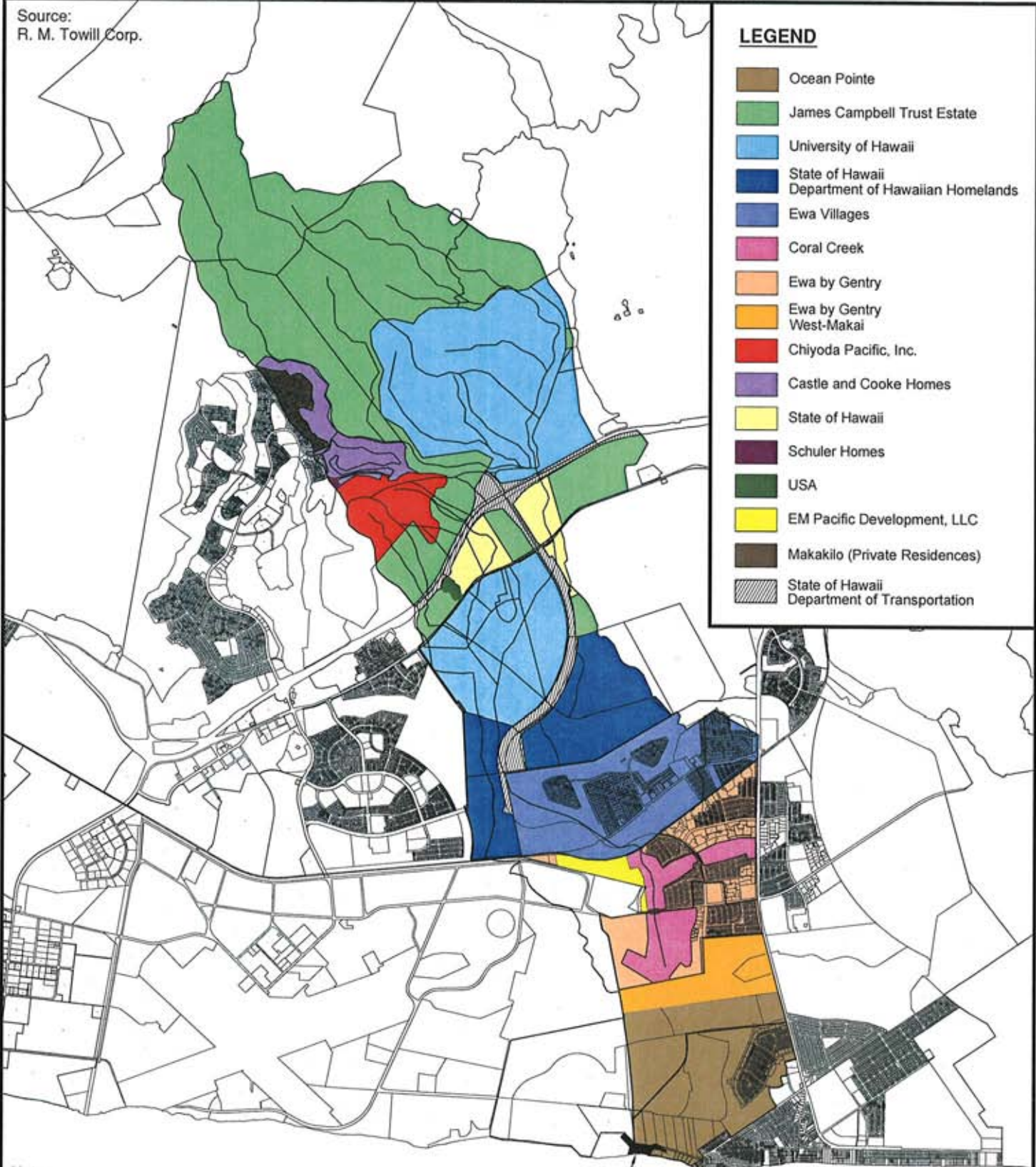
Need for the proposed project originates with the increasing urbanization of the Ewa plain. When the region was predominantly in agriculture, surface flows were generally absorbed through infiltration and did not reach the ocean. As agriculture has declined, numerous urban developments have been built within the watershed which include Ewa Villages, Ewa by Gentry, Coral Creek Golf Course and Ocean Pointe. Proposed new developments within the watershed include East Kapolei, the West Oahu Campus of the University of Hawaii, and supporting residential development and residential development planned by the Department of Hawaiian Home Lands. (see Figure 6). When the region is fully built out, it is estimated that approximately 10,800 cfs of stormwater could flow into the ocean from the Kalo'i Gulch Drainage Basin.

When the Ocean Pointe development (formerly Ewa Marina) was granted approval by the City and State in the 1980's, it was envisioned that the marina at the seaward edge of the Kalo'i Gulch watershed would provide a discharge point for stormwater runoff. In the original marina proposal its configuration extended eastward over the 84-inch sewer outfall that was built in the 1970s and runs north-to-south from the Honouliuli Wastewater Treatment Plant to the ocean. Implementation of the original marina configuration would have required constructing an inverted siphon to lower the outfall and allow the marina to expand eastward. In 2000, an engineering study was conducted to determine if there was a feasible alternative to constructing an inverted siphon. This study concluded that there was no feasible alternative, and that the inverted siphon option could create maintenance issues, potential odor problems, and potential spills of treated effluent. Therefore, the marina configuration was revised to exclude the portion extending east of the outfall.

Source:  
R. M. Towill Corp.

**LEGEND**

-  Ocean Pointe
-  James Campbell Trust Estate
-  University of Hawaii
-  State of Hawaii  
Department of Hawaiian Homelands
-  Ewa Villages
-  Coral Creek
-  Ewa by Gentry
-  Ewa by Gentry  
West-Makai
-  Chiyoda Pacific, Inc.
-  Castle and Cooke Homes
-  State of Hawaii
-  Schuler Homes
-  USA
-  EM Pacific Development, LLC
-  Makakilo (Private Residences)
-  State of Hawaii  
Department of Transportation



Note:  
Boundaries are accurate to the extent  
practicable, as of August 2006.

**PROJECT SITE**

Not to Scale



Kalo Gulch Drainageway Improvements at Oneula Beach Park SMA and SSV Application

**KALOI WATERSHED  
LANDOWNERSHIP MAP**

**FIGURE  
6**

The presence of the sewer outfall also limits the possibility of using the marina in its revised configuration to receive stormwater runoff from Kalo'i Gulch. The depth of the pipe is approximately 5 to 10 feet below existing grade and follows the existing surface flow profile for storm flows in the region, rendering the outfall a major obstacle for storm water flows to reach the marina. Concerns over adequate protective ground cover and potential damage to the outfall from repeated scouring over a significant length (about 800 feet) of the outfall have led to abandoning efforts to use the marina to receive stormwater runoff. A proposal to lower the outfall was also investigated, but the idea was subsequently abandoned due to concerns similar to those involving an inverted siphon.

At the present time, by agreement with the City and County of Honolulu, developments downstream of the Ewa Villages subdivision must provide for channelized flow of up to 2,500 cfs as an emergency relief measure to prevent flooding of the subdivision. Furthermore, pursuant to coordination by the City and County of Honolulu and as agreed upon by the other current developments including Ocean Pointe, Ewa by Gentry and Coral Creek Golf Course, flood control measures are being used such that at any given time, no more than 2,500 cfs channelized along the Kalo'i drainageway will be discharged at each respective makai boundary. These physical requirements will remain in place until the flow capacity is increased by construction of a permanent ocean outlet.

As planning initiatives proceed over time in the drainage basin, there is also the possibility that the need for the drainage improvements may diminish. Proposed new developments within the watershed could be scaled back and/or permanent strategies for retention, detention, or redirection of surface runoff could be implemented which would reduce or eliminate potential drainage concerns. If this were to occur, the drainage improvements could be abandoned in place without affecting park users or the surrounding community.

## **2. Description of Proposed Improvements**

The current capacity (4,200 cfs) of the temporary emergency channel through One'ula Beach Park is not adequate to accommodate the 100-year storm flow of 10,800 cfs. This limitation is mostly due to the presence of a natural berm along the shoreline, which would impede high volume storm runoff into the ocean. The proposed project will increase the capacity of the outlet by reducing the height of the berm and raising the channel banks. The width of the channel, more than its depth, will be increased to handle larger storm flows without diminishing the recreational opportunities of the beach park.

The project site is bordered by the ocean to the south, by the existing Honouliuli sewer outfall easement to the west, and by an existing berm to the east which was constructed recently to form the temporary emergency channel. (see Figure 7). This eastern border actually extends a bit further east of this berm so that the new channel bank may be graded to merge more evenly with the park. To the north, the boundary encompasses about 1,400 feet in length and 150 feet in width of the existing park access road and new access road easement. Inclusion of the access road gives the project site its "T" shape.

Grading of the site will involve the excavation of approximately 7,110 cubic yards (cy) of soil and sandy material. The shoreline berm will be lowered by approximately 2 to 4 feet down to an elevation of 4 feet above msl across the 500-foot width of the channel. A portion of this excavation will occur seaward of the certified shoreline, and within the shoreline setback. The excavated material will be used to raise the channel banks approximately 4 to 6 feet higher than the channel bottom, to an elevation of 10 feet msl. Approximately 763 cy of additional fill will be brought to the site to complete the channel banks.



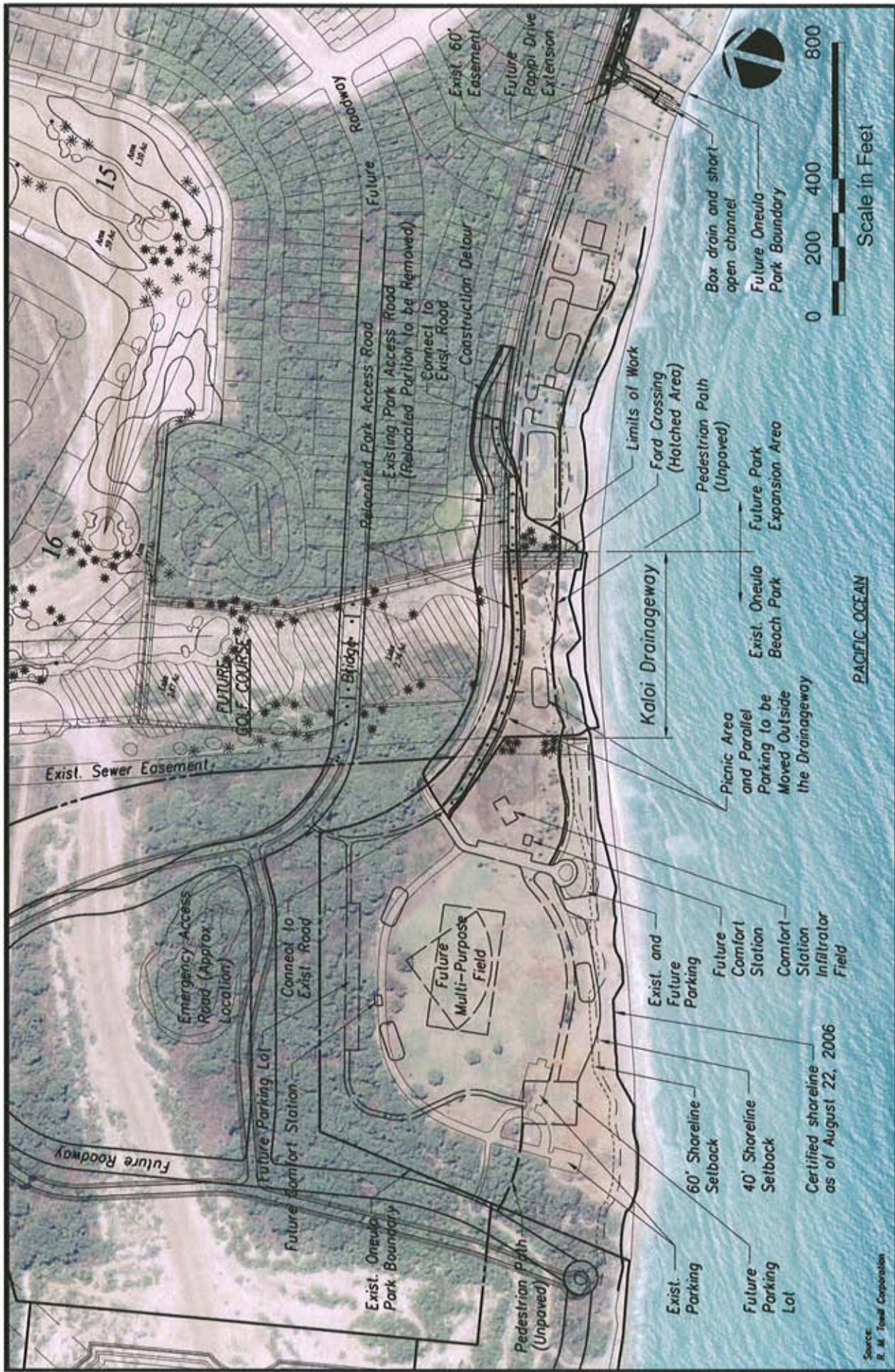


Bank slopes inside the channel will be 10 percent or less, and outside slopes of the east and west banks will be approximately 5 percent and 20 percent, respectively. The west bank slope will be steeper in order to minimize the amount of fill that will have to be placed over the Honouliuli sewer outfall. For ADA accessibility, slopes will be 5 percent or less along the park access road. During implementation of the One'ula Beach Park Master Plan, the pedestrian path that is planned along the shoreline will need to be realigned at both channel banks to maintain the 5 percent slope. This future pedestrian path is not part of the current drainage improvements project.

In addition to lowering the berm and raising the drainage channel banks, the project will also clear brush and debris within the project area. Parts of the site that currently collect standing water after heavy rains will be filled to promote proper drainage.

The new park access road will be set along the bottom of the drainage channel and will function as a ford structure to allow storm flows to pass over it to the ocean. The road will be two-lanes, 24 feet wide and constructed of concrete to prevent washout. Realigned portions of the road outside of the drainage channel will be constructed with asphaltic concrete (AC). Grassed shoulders will be used along both sides of the roadway. One water line and one overhead electrical line located within the existing access road easement will be relocated beneath the new access road.

The emergency access road will initially be unpaved during the construction phase. The road will connect to a future roadway and bridge crossing which will span the Kalo'i Gulch drainageway mauka of the project site, where the future golf course is under construction (see Figure 8). Following completion of the drainage improvements, the road will be 20 feet wide and will use AC pavement



**Kalo'i Gulch Drainage Improvements at One'ula Beach Park**

**SITE PLAN**

**FIGURE 8**

with grassed shoulders. The location of the road shown on Figure 8 is considered preliminary, for planning purposes only. The final location of the road will be developed by HASEKO in coordination with DPR and other City agencies, as appropriate.

The Final EIS for the drainage improvements project stated that the hours that the emergency access road would be open will need to be determined by DPR. In a subsequent meeting with the agency, the DPR emphasized the importance of maintaining a single access to the park. Therefore, the road will be closed during normal operating hours and will only be opened in the event the main road is blocked due to flooding, or during periods of repair and maintenance to the main park access road.

The Final EIS also proposed an early warning system to alert One'ula Beach Park users during large flood events that water may begin to flow in the drainageway and across the access road ford. However, based on consultation with State and Oahu Civil Defense, an early warning system is not warranted. The drainage improvements are designed to accommodate overflow storm runoff from upstream flood control facilities. By the time that any overflow should reach One'ula Beach Park, it would not be in the form of a flash flood but as a gradual filling of the area behind the seaward berm until that berm is overtopped. There is no possibility of unexpected flooding occurring in this location.

There will be a civil defense siren within the park, but it is intended for tsunami and hurricane warnings. Flooding is local, and Civil Defense has never used sirens for flood events. Instead, the notification system will consist of appropriate signage and intervention by park officials to open gates and ensure evacuation. The signs will be posted on either side of the proposed ford crossing to warn the public that they are crossing an area that is subject to flooding.

### **3. Maintenance of Proposed Improvements**

The proposed drainage improvements will be integrated into One'ula Beach Park in a manner that is consistent with the park's existing open space. After completion of the drainage improvements, no additional maintenance responsibilities will be incurred by the City DPR aside from what is currently being done to maintain the park. Mowing of the grass and trash pick up at the site will continue to be accomplished by City and County park personnel.

Although the DPR has agreed to continue with day-to-day maintenance of the channel through the park, maintenance of the berm and storm damage repair is outside their expertise and capability. Based on other drainage infrastructure on Oahu, the most appropriate agency to be responsible for maintenance of the regional drainageway is the Department of Facilities Maintenance (DFM). In preliminary discussion with the agency, DFM has indicated a willingness to accept responsibility for maintenance of the berm and major clean up of the channel within One'ula Beach Park, subject to further review by the Department. Details, including but not limited to funding, will be resolved with DFM prior to the issuance of the building permit.

### **4. Project Schedule and Construction Cost**

It is estimated that construction of the proposed Kalo'i Gulch drainage improvements will begin in 2008. The proposed drainage improvements will cost an estimated \$1.5 million. The cost will be borne by HASEKO.

## **C. Economic and Social Characteristics**

### **1. Upland Landowners Detention Needs**

Until relatively recently, the Kalo'i Gulch Drainage Basin was comprised mostly of sugar cane fields, and surface water was generally absorbed through infiltration and did not reach the ocean. As recently as 1992, only 550 cfs was anticipated to reach the Ocean Pointe site during peak flows.

As the region is developed, most of the storm water runoff may be channelized and transmitted downstream without significant opportunity for infiltration. If no additional retention basins are provided within the various future developments in the Kalo'i Gulch Drainage Basin, storm water flows reaching the ocean would be approximately 10,800 cfs at full build out of the drainage basin.

Developments makai of the O.R. & L. railroad tracks have proceeded while relying on three golf courses (Ewa Village Golf Course, Coral Creek Golf Course and the Ocean Pointe Golf Course) to provide storm water retention basins that meet the City and County storm water standards, and that prevent increased storm water flows generated by these developments from reaching the ocean. These golf courses also fulfill the Ewa Development Plans mandate to provide retention/detention basins to mitigate downstream silt transport and maintain offshore water quality.

Future developments mauka of the O.R. & L. railroad tracks likewise will need to assess the need for retention/detention basins to meet City and County Storm Water Standards and mitigate the potential cumulative impact on offshore water quality. Consistent with existing developments, any future developments will be required to provide retention/detention basins to maintain the current regional storm water flow patterns until a permanent outlet to the ocean is constructed.

## **2. One'ula Beach Park Master Plan**

Increasing urbanization of the Ewa plain will also increase public demand on all recreational resources and facilities in the region. For this reason, a Master Plan for One'ula Beach Park was prepared in 2001 to guide future park development, address anticipated recreational demand, and plan for future park expansion. One of the items the plan addressed was how to use the 9.365-acre park expansion area, which will extend the park shoreline about 1,400 feet eastward. This expansion area encompasses a small part of the proposed drainage improvements project site.

Typical improvements contained in the One'ula Beach Park Master Plan include a realigned park access road, construction of new comfort stations, a new multipurpose community/recreation center, new and expanded parking, picnic areas, camping sites, and ADA beach access. Planned improvements located within the proposed drainage channel include one group picnic area, part of an unpaved pedestrian path, and parallel parking stalls along a portion of the relocated park access road. Since the park has sufficient open space, the planned picnic area and parallel parking stalls can be moved outside the drainage channel without affecting the overall park development. The unpaved pedestrian shoreline path will be realigned where it crosses the drainage channel banks in order to maintain a 5 percent maximum slope. Public access to the park will be maintained throughout the construction period.

If and when the subject SMP for the proposed drainage modifications is approved, the Special Management Area Use Permit (Resolution No. 01-228) that authorizes the implementation of the One'ula Beach Park Master Plan will be amended, as necessary, to reflect the approved regional drainage modifications.

## **D. Environmental Characteristics**

### **1. Soils**

Soil on the project site is classified as coral outcrop (CR) by the U.S. Department of Agriculture, Soil Conservation Service. This soil type consists of coral or cemented calcareous sand unsuited for agriculture or as a mineral resource. Soils within the drainage channel consist primarily of sand accumulation overlying limestone formations. These deposits are considerably deeper than those found closer to the Ocean Pointe marina channel, where coral bedrock is exposed at inland locations.

### **2. Topography**

The proposed site of the Kalo'i Gulch Drainageway Improvements lies at the southern (seaward) edge of the approximately 7,000-acre Kalo'i Gulch Watershed. The watershed encompasses about 2,900 acres of steep slope and semi-steep agricultural land mauka of the H-1 Freeway. Makai of the freeway, the terrain continues to slope rapidly to Farrington Highway, then more gently through the future development of East Kapolei and the existing Ewa Villages community. Slopes continue to decrease toward Renton Road, where they become less than one-half percent, and remain relatively flat through the rest of the watershed to the ocean.

Within the project site itself, elevations range from 8 feet msl along the shoreline berm down to 2 feet msl in the middle of the site, where runoff tends to pond. The highest elevation is a point along the existing park access road, at 10 feet msl.

### **3. Flood Hazards**

The proposed drainage improvements project site is within Flood Zones A and AE on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (15003C0320F), revised September 30, 2004. (see Figure 9). These zones are associated with rising seas during tsunami rather than with storm-water runoff. Base flood elevations in Zone AE are 8 feet at the shoreline and 6 feet at a distance 150 feet inland from the shoreline. Flood Zone A ends at a point about 450 feet inland from shore. There are no structures at the site that would be threatened in the event of a tsunami.

Historically, flooding within the Kalo'i Gulch drainage basin has only occurred most recently at Ewa Villages, which experienced flooding in 1996 after a prolonged heavy rainfall. Under current drainage conditions, stormwater flows cross open fields mauka of Ewa Villages and collect in an interceptor ditch on the mauka side of Mango Tree Road. This ditch directs water through culverts and into detention/retention basins within the Ewa Villages Golf Course on the makai side of the road. In order to minimize the risk of a recurring flood, a bridge was installed at the old O.R.& L. railroad bed, which previously restricted stormwater flows. An emergency drainage channel was constructed within the Ocean Pointe development to accommodate the increased flows, and a temporary emergency channel was constructed at the subject project site to direct flows to the ocean.

At the present time, by agreement with the City and County of Honolulu, downstream flows are constrained to 2,500 cfs as an emergency relief measure to prevent flooding of Ewa Villages. Downstream developments including Ocean Pointe, Ewa by Gentry and Coral Creek Golf Course are using flood control measures so that no more than 2,500 cfs will be discharged at each respective makai boundary. This physical constraint will remain in place until there is a permanent outlet constructed to the ocean.





#### **4. Coastal Water Quality**

Marine waters offshore of the project site are classified by the State as Class "A" Open Coastal Waters. To ensure adherence to water quality standards of the State DOH, HASEKO has monitored water quality off the planned Ocean Pointe marina to the west of the project site for more than a decade. In response to the proposed project, a new sampling transect was added in December 2003, directly offshore of the proposed Kalo'i Gulch drainage channel.

Under the current testing regime, water quality is measured at 7 stations on each of six transects from the shoreline to approximately 500 meters offshore. Based on the over 10-year long monitoring period, some generalizations can be made about the coastal water quality near the proposed project. First, the principal influence on water chemistry appears to be the variability in the input and mixing characteristics of groundwater. For instance, distinct horizontal gradients are evident for silica (Si) and nitrate and nitrite nitrogen ( $\text{NO}_3^-$ ), which is the most common form of nitrogen in agricultural fertilizer mixes. These constituents are found to decrease along the transect from the shoreline to the offshore stations. The quantity of these constituents is dependent on the quantity of groundwater mixing with the marine environment. At the same time, salinity shows the opposite trend, increasing with further distance from shore.

Other water chemistry constituents that are not found in high concentrations in groundwater relative to ocean water (ammonium nitrogen ( $\text{NH}_4$ ), total organic nitrogen (TON) and total organic phosphorus (TOP)) show essentially no horizontal gradients between the shoreline and open coastal ocean. Orthophosphate phosphorus ( $\text{PO}_4^{3-}$ ), another component of fertilizer that is generally found in groundwater, occurs at very low concentrations throughout the sampling regime and exhibits very weak horizontal gradation. It has a higher

absorptive affinity for soils and does not leach into groundwater to the extent of  $\text{NO}_3^-$ .

In contrast to groundwater, surface water discharges enter the ocean from Ewa Beach or the mouth of Pearl Harbor only periodically, during periods of heavy rain. Their influence on coastal water quality has not been established, but the relative stability of the long-term data indicates that the influence of surface water discharge is likely of short duration. Continued water quality monitoring may help to determine if surface water input has a measurable impact on long-term coastal water quality.

### **III. AFFECTED ENVIRONMENT**

#### **A. Existing and Proposed Land Uses**

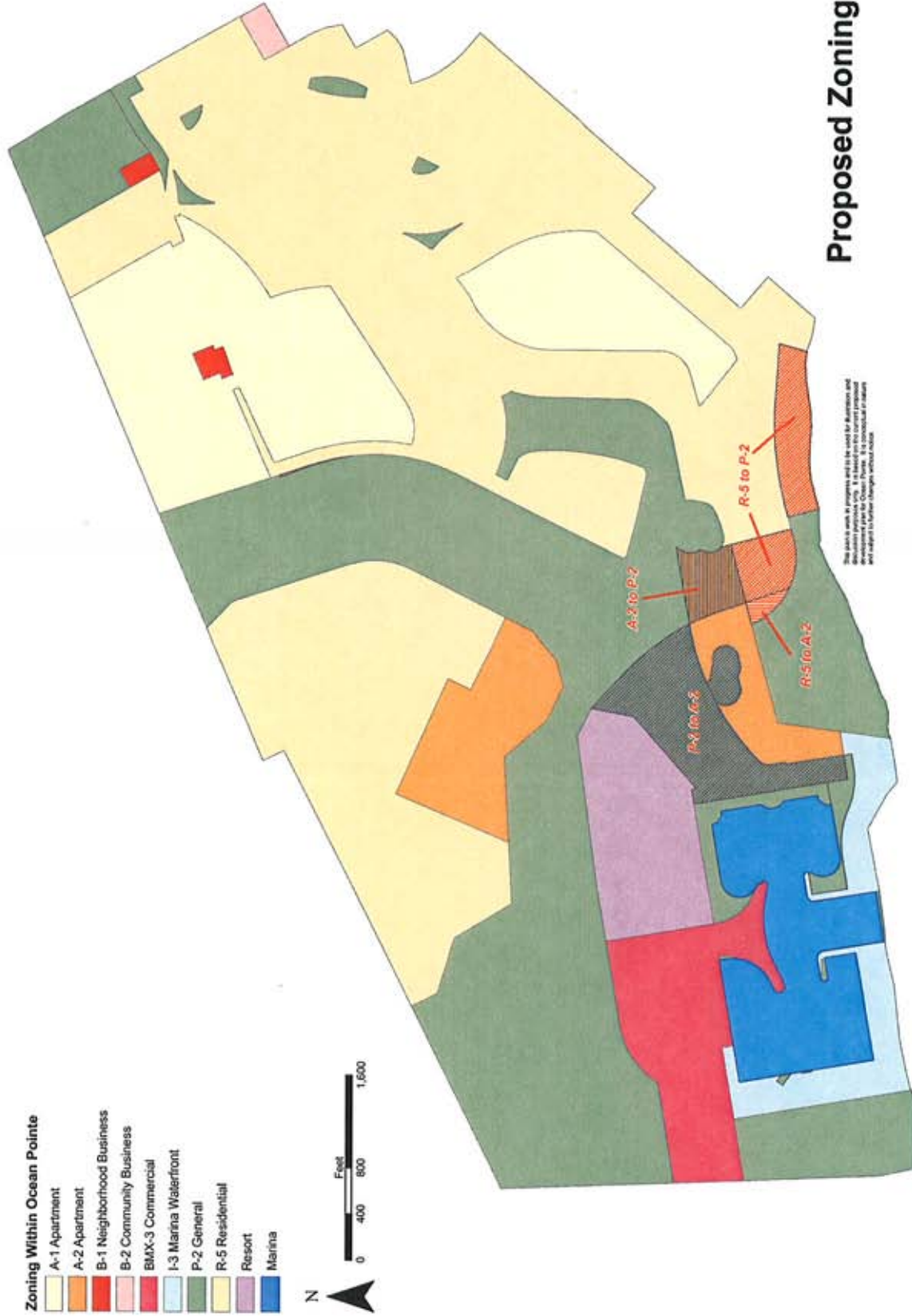
Land immediately surrounding the project site and the rest of the beach park is currently undeveloped, mostly covered over with low-lying vegetation. The nearest residences are in Ewa Beach, about 1,600 feet to the east. There are no other neighboring land uses.

Most of the project site is within the P-2 General Preservation Zoning District. Preservation districts are designated to preserve and manage major open space, recreational lands, and lands of scenic and other resource value. A small part of the site extends east into Residential R-5. (see Figure 10). Although zoned Residential, this area of shoreline makai of Papipi Road is designated for park expansion under the improvements contained in the One'ula Beach Park Master Plan. The park expansion area is in the process of being rezoned from R-5 Residential to P-2 General Preservation (see Figure 11).

Undeveloped land directly mauka of the proposed drainage improvements will soon become the Ocean Pointe Golf Course. A water feature at the southern end of this golf course will function as a settling basin and will direct excess stormwater flow through Kalo'i Gulch and across the project site to the ocean. These portions of the golf course are in the process of being rezoned from A-2 Apartment and R-5 Residential, to P-2 General Preservation (see Figure 11).

Groundbreaking for the golf course occurred in February 2006, with a scheduled completion date in late 2007. The remaining land surrounding the site is designated residential as part of the Ocean Pointe development. (see Figure 8, for reference).





- Zoning Within Ocean Pointe**
- A-1 Apartment
  - A-2 Apartment
  - B-1 Neighborhood Business
  - B-2 Community Business
  - BMX-3 Commercial
  - I-3 Marina Waterfront
  - P-2 General
  - R-5 Residential
  - Resort
  - Marina



## **B. Natural and Recreational Resources**

The proposed project site is located within One'ula Beach Park, one of four City and County beach parks that occupy the coastline from Pearl Harbor to Barbers Point. (The other three include Ewa, Nimitz, and Barbers Point Beach Park). Some of the recreational activities that occur at One'ula Beach Park include swimming, surfing, fishing, diving, unauthorized camping, picnicking, and limu gathering. The open play field is used as a practice field by local youth sports clubs/teams.

Park amenities include a comfort station at the park's west end, two paved parking areas, and one unpaved parking area with a nearby outdoor shower. The unpaved parking area gets the most use because of its proximity to the shoreline, surf breaks, and the outdoor shower.

Several species of limu are present along the shoreline near the proposed drainage outlet. These are harvested periodically by Native Hawaiians and others.

Marine studies of the shoreline biology have been conducted for the Ewa Marina, about one-half mile west of the project site, which share similar if not identical characteristics with the project site shoreline. Nearshore waters are characterized by a smooth limestone bottom that has relatively low coral cover. Algal species predominate close to shore and decrease in abundance where depth increases. Algae is a potential food source for green sea turtles, and turtle counts conducted between 1990 and 2003 indicate that they are regularly present in coastal waters near the project site.

Other organisms found in the area include various species of encrusting sponges, sea cucumber, and sea urchin. Because the area has limited coral

cover, fish species are generally limited to those that inhabit barren areas, isolated coral colonies, or small reef crevices. Triggerfish, hawkfish, surgeon fish, wrasses, goatfish, and butterfly fish are present in small numbers. Desirable fish species sought by fishermen are generally scarce. Neither the Hawaiian Monk Seal nor the Humpback Whale is known to frequent the coastal waters near the project site.

### **C. Historic, Cultural, and Archaeological Resources**

The proposed project site lies within the One'ula Archaeological District (Site No. 80-13-2873), which has been the subject of intensive archaeological surveys and test excavations. Based on the survey findings, the site has been determined to be eligible for listing on the National Register of Historic Places. The State Historic Preservation Division (SHPD) has reviewed and accepted the final plan for data recovery, site preservation, and mitigation at this site. SHPD also determined that implementation of the One'ula Beach Park Master Plan would have "no effect" on significant historic sites.

A supplemental survey of the project site was also conducted by PHRI in 2004 to determine the potential to find human skeletal and cultural remains buried in the sand deposits. Twenty-seven backhoe trenches were placed in the Kalo'i Gulch Drainage Channel, but no human skeletal remains or prehistoric cultural materials were identified. By all indications, the subsurface of the site has been greatly disturbed, as evidenced by large amounts of modern trash present in the excavations.

Based on past surveys, prehistoric use of the Ewa plain is believed to have centered on the sea and reef, although limited agriculture associated with pits and mounds is also possible. Nothing specific is known about the project site. Limu gathering is one of the few ongoing traditional activities that still occur near



the proposed project. Today, it is gathered for food or medicine by Native Hawaiians and others.

#### **D. Coastal Views**

The project site and surrounding land is characteristically flat, without any peaks or ridgelines from which to overlook the site. Elevations above 50 feet do not begin until 3 miles inland. From this distance it is difficult to even identify the proposed project location in relation to its surroundings.

The highest elevation within the project site is 10 feet above mean sea level (msl), along the park access road. Shoreline elevation is between 6 and 8 feet msl. Coastal views are limited to what can be seen of the horizon when standing within the proposed drainage channel. From the shoreline, the mouth of Pearl Harbor and Diamond Head Crater can be seen looking east, and the shoreline to Barber's Point can be seen when looking west.

#### **E. Quality of Receiving Water and Groundwater**

##### **1. Marine Waters**

Marine waters off the project site are classified by the State as Class "A" Open Coastal Waters. In order to designate and protect Class A waters, The State Department of Health assigns specific values to measurable water quality criteria. These criteria include: total nitrogen (TN), nitrate + nitrite nitrogen ( $\text{NO}_3$ ), ammonium nitrogen ( $\text{NH}_4^+$ ), total phosphorus (TP), chlorophyll a (Chl a), turbidity, pH, salinity and temperature. Each of these criteria are assigned a geometric mean value which should not be exceeded whenever possible. Two peak values are also specified, one lower and one higher, which should not be exceeded beyond 10 percent or 2 percent of the time, respectively.

In addition to the water quality parameters specified by the DOH, orthophosphate phosphorus ( $\text{PO}_4^{3-}$ ) and silica (Si) were also reported because they are sensitive indicators of biological activity and the degree of groundwater mixing.

Water quality monitoring in front of the marina has been going on for more than a decade at four transects oriented perpendicular to the shoreline. Three of these transects are spaced evenly along the marina shoreline, while a fourth transect serves as a Control site, located at the west end of the Ewa Marina property. To evaluate the effects of the proposed action, a fifth transect was added in December 2003 directly offshore of the proposed drainage improvements. This new transect will be a permanent component of the monitoring program. A sixth transect was also added in September 2004 to evaluate the effects of a proposed storm drainage system within the One'ula Beach Park expansion area, east of the proposed drainage channel.

Water samples are collected at seven stations on each transect, near the surface and within one meter of the sea floor. During the most recent sampling in November 2005, plots of the concentrations of Si as functions of salinity revealed mixing of groundwater and ocean water in the nearshore zone. This mixing was most evident at the western end of the sampling range and in front of the One'ula Beach Park expansion area. No gradient was evident in front of the Kalo'i Gulch site.

This mixing of groundwater and ocean water has been typical throughout the monitoring program. However, scaling concentrations of dissolved Si and  $\text{NO}_3^-$  to salinity indicates that groundwater entering the ocean at the survey sites varies in composition from site to site, and survey to survey. Between 1997 and 2003, there was a gradually increasing concentration of Si with respect to salinity. Recent surveys that coincide with dredging of the marina basin reveal

concentrations of Si that are more typical of 1999 data. This suggests that the excavation could be resulting in alteration of the groundwater that enters the ocean. At the same time, values of  $\text{NO}_3^-$  and  $\text{NH}_4^+$  have not shown a similar trend, suggesting that concentrations of these constituents are not primarily the result of input from groundwater. It is conjectured that other factors could be influencing the data, such as biological processes occurring in the ocean, or water flowing along the shoreline from Pearl Harbor.

With regard to State DOH standards, geometric means of  $\text{NO}_3^-$ ,  $\text{NH}_4^+$ , TN, turbidity and Chl collected over the past years have all exceeded the State DOH criteria over the past years, including at the Control site. The similarity in the number of samples that exceeded DOH geometric mean standards at the Control site and the other three sites off the Ewa Marina indicate that natural factors influence water quality in the Ewa region, and are not the result of construction activities.

With regard to the proposed drainage improvements, there are two situations when the potential for water quality impacts exist. The first is during construction at the makai end of the drainage channel. Under the current Ewa Marina monitoring program, the potential effects of dust generated by construction activity has been evaluated by measuring total suspended solids (TSS). The lack of consistent significant differences between TSS at each distance from shore indicate little effect from land activities. Overall, results of the monitoring indicate that there is no discernible impact to the nearshore ocean from ongoing construction activity.

The second situation is during the very infrequent periods when storm runoff flows through the channel and discharges to the ocean. Under this condition, the fresh water and suspended sediment plume would persist for a period of time

before conditions return to pre-discharge levels. The rate at which this happens depends on complex wave induced currents and mixing, and tide and wind-driven currents. Numerical modeling of the discharge plume and measurement of existing nearshore currents was performed to evaluate these processes and calculate the possible impact to the environment. The report is attached as Appendix B-1 in the Final EIS. A summary discussion of potential impacts is included in the next section under D. Coastal Ecosystems. The study assumes that development in the Kalo'i Gulch drainage basin will not be required to retain on site storm water flows and that regional flows will be channelized into the proposed drainage channel.

## **2. Groundwater**

Groundwater in the 'Ewa Plain area occurs in two types of aquifers: the Ko'olau Volcanic series, at a depth of approximately 1,000 feet, and an overlying caprock aquifer. While the deeper volcanic aquifer contains fresh water further inland, directly beneath the project site, it probably contains brackish or salty water. The project site overlies the nonpotable aquifer known as the 'Ewa Caprock, which is a designated groundwater management area, and thus subject to regulation by the State Commission of Water Resource Management (CWRM). The CWRM has allocated water from the 'Ewa Caprock aquifer to several users for golf course and landscape irrigation on the east 'Ewa Plain.

The project site is seaward of the Underground Injection Control (UIC) Line. Landscaping on the project site may be irrigated with nonpotable water without risk to potable aquifers.

#### **IV. PROJECT IMPACTS AND MITIGATION MEASURES**

Included below are the project impacts and mitigation measures relative to the applicable objectives, policies and guidelines of the Coastal Zone Management Program (Section 205A, Hawaii Revised Statutes) and the Special Management Area Ordinance (Chapter 25, Revised Ordinances of Honolulu).

##### **A. COASTAL ZONE MANAGEMENT**

###### **1. Recreational Resources**

**Objective:** *Provide coastal recreational opportunities accessible to the public.*

**Policy B:** *Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:*

- (iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value.*

As part of the proposed project, the current park access road will be constructed as a ford crossing to allow stormwater to cross the road, enter the drainage channel and flow to the ocean. This access road will be situated in a new alignment further south, or makai, in accordance with the One'ula Beach Park Master Plan. During construction, public access to the beach park will be maintained via a temporary detour that will redirect traffic around the connection point of Papipi Road with the new road.

An emergency park access road will also be installed to access the northern portion of One'ula Beach Park. This road will provide an alternate means for

park users to enter or leave the park in the event the main road becomes unusable due to flooding or for maintenance reasons. The road will connect to a future bridge crossing which will span the Kalo'i Gulch drainageway mauka of the project site, where the future golf course is under construction.

The park Master Plan also includes an unpaved pedestrian path across the entire shoreline. This path may be installed any time after the drainage channel is completed.

With the restoration of the existing park access road and installation of the emergency access road, public access to the project site will be retained and enhanced. This is consistent with Policy B(i).

## **2. Historic Resources**

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

**Policy C:** *Support state goals for protection, restoration, interpretation, and display of historic resources.*

The proposed project site lies within the One'ula Archaeological District (Site No. 80-13-2873, which has been the subject of thorough archaeological inventory and data recovery work. The State Historic Preservation Division (SHPD) has reviewed and accepted the final plan for data recovery, site preservation, and mitigation at this site. SHPD also determined that implementation of the One'ula Beach Park Master Plan would have "no effect" on significant historic sites.

A supplemental survey of the project site was also conducted in 2004 to determine the potential to find human skeletal and cultural remains buried in the sand deposits. Twenty-seven backhoe trenches were placed in the Kalo'i Gulch Drainage Channel, but no human skeletal remains or prehistoric cultural materials were identified. By all indication, the subsurface of the site has been greatly disturbed, as evidenced by large amounts of modern trash present in the excavations. Nevertheless, it is possible that subsurface remains or artifacts may be encountered during construction. Work crews will be instructed to stop work in the event of a find and to notify SHPD immediately.

### **3. Scenic and Open Space Resources**

**Objective:** *Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.*

**Policy C:** *Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources.*

Use of the project site for a flood control channel will maintain the site in open space. Grading for creation of the channel will have slight impacts on coastal views, but overall impact will be small. The site is primarily grass and weedy plants with a few low, scattered thickets of kiawe, sourbush, and Indian pluchea. Any vegetation that could trap debris during a flood event will be removed, and grass and groundcover will be re-established in graded areas. If trees are planted they will be planted in groups on the top of channel banks for shade and to shield park visitors from the wind.

#### **4. Coastal Ecosystems**

**Objective:** *Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.*

**Policy A:** *Exercise an overall conservation ethic, and practice stewardship in the protection, use and development of marine and coastal resources.*

**Policy B:** *Improve the technical basis for natural resource management.*

**Policy C:** *Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance.*

**Policy D:** *Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs.*

**Policy E:** *Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and non-point source water pollution control measures.*

The marine waters offshore of the project site are classified as Class "A" by the State DOH. The marine environment in the vicinity of the proposed drainage channel is characterized by a smooth limestone bottom, relatively low coral cover, and relatively high algal biomass. Organisms common to the area include various species of encrusting sponges, sea cucumber, and sea urchin. Fish species are generally limited to those that inhabit barren areas, isolated coral colonies, or small reef crevices, while larger species are scarce. Green sea



turtles may often be seen in the area, though they are more common in an area offshore of the former Barbers Point Naval Air Station.

There is the potential for storm water discharge to impact this marine environment both during and after construction. For the construction period, Best Management Practice (BMP) measures will be prepared and followed in accordance with the NPDES Construction Stormwater Permit application. BMP measures will include such practices as phased grading, soil stabilization using sheets or fabric, vegetative controls, and proper vehicle maintenance.

When the drainage improvements are complete, potential impact to corals and other macroinvertebrates, algae, and reef fish is possible during large storm events if the storm water runoff reduces salinity levels or contributes large concentrations of sediment that cannot be quickly dispersed. In order to calculate the behavior of storm water discharge during a range of possible runoff events, a study was conducted using three-dimensional hydrodynamic modeling. The model was used to predict conditions that included storm discharge and suspended sediment load from 20-year and 10-year rain events; strong, moderate, and weak tides; no waves, Kona waves and south swell; and calm winds and Kona winds.

The study simulated 1996 hydrological (flood) conditions and applied them to year 2025 watershed buildout conditions. Future watershed conditions were calculated by using drainage master plans for all existing and planned developments below the freeway. Land above the freeway was assumed to be developed, but without any retention basins. Under developed conditions, total watershed storage was estimated at 300 acre-feet for retention, and 800 acre-feet for detention. The Ocean Pointe golf course included 75 acre-feet of retention to serve as the final settling basin.

Since the Ocean Pointe storm discharge retention capacity is quite large at full buildout, it was calculated that runoff from any rainfall event less than the 8-inch (10-year) rainfall would be retained on land. Discharge of runoff from a 10-year event would last three hours and would generate a plume of suspended sediment that would hug the shoreline, moving either east or west depending on tidal flows (currents flowing to the west and southwest are stronger and last longer). Under calm conditions and moderate tides, the plume would meet the State DOH salinity standard of 31.5 parts per thousand (ppt) within 6 hours after the discharge ends. The extent of the plume is estimated at 2,300 meters along the coast, and 500 meters offshore.

Under this scenario, the deposition of suspended sediment concentrations (TSS) would be relatively low. At the point closest to the drainage channel outlet, the model calculated that the 10-year event would deposit 0.12 mm (0.005) inches of sediment, with levels diminishing rapidly with distance from the channel. TSS concentrations would approach ambient levels of about 10 mg/liter about 1 day after the storm discharge ends.

Worst-case conditions at the site would involve a 20-year discharge event occurring when there are no waves or wind to promote mixing and dispersion. (Note: Perfectly calm conditions are rare at the project site.) Model results show that the time required to meet the State DOH salinity standard is a maximum 12 hours after the peak discharge flow. Under these conditions, the plume would stay near shore and extend up to 2,400 meters to the east during ebb tide. Suspended sediment deposition would be 1.9 mm (0.07 inches) immediately offshore of the discharge point, with levels diminishing rapidly with distance from the channel.

Since there is no way to mitigate the effects of potential discharge once it has occurred, the careful design of all upland drainage infrastructure is important. For the proposed project, the wide, permeable drainage channel will facilitate infiltration and sediment settling. Also, the Ocean Pointe Golf Course will have 75-acre feet of retention to serve as large settling basins.

Three separate studies which pertain to the coastal resource were conducted for the EIS and this SMA/SMP document: The *Kalo'i Gulch Watershed Hydrologic and Sediment Study*, prepared by R.M. Towill Corporation, The *Numerical Modeling of Storm Drain Discharge Plume Transport*, prepared by Sea Engineering, Inc., and *Ocean Pointe Marine Environmental Monitoring Program Water Chemistry*, prepared by Marine Research Consultants. These three studies will improve the technical basis for management of the coastal resource.

## **5. Economic Uses**

**Objective:** *Provide public or private facilities and improvements important to the State's economy in suitable locations.*

**Policy C:** *Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:*

(iii) *The development is important to the State's economy.*

The proposed action is located at the discharge terminus of the 7,000-acre Kalo'i Gulch Drainage Basin, where an existing emergency drainage channel already exists. The project is not itself an economic asset but is an essential public facility designed to protect public and private property from inundation. The

proposed project will become increasingly necessary as more land within the basin is urbanized. It is therefore indirectly important and even vital to the State's economy. In this respect, the proposed drainage improvement project is consistent with Policy C.

## **6. Coastal Hazards**

**Objective:** *Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.*

**Policy A:** *Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and non-point source pollution.*

**Policy C:** *Ensure that developments comply with requirements of the Federal Flood Insurance Program.*

**Policy D:** *Prevent coastal flooding from inland projects.*

The Final EIS for the project proposed an early warning system to alert park users to the threat of flooding. However, based on more recent consultation with Oahu and State Civil Defense, an early warning system is not warranted. Any overflow that reaches the beach park will not be in the form of a flash flood but rather as a gradual filling of the area behind the seaward berm until the berm is overtopped. There will be a civil defense siren in the park, but it is intended for tsunami and hurricane warnings. Oahu and State Civil Defense do not monitor or issue warnings associated with local flood events. Instead of a siren, the notification system will consist of appropriate signage and intervention by park officials to open gates and ensure evacuation. This has been corroborated by the DPR. Detailed plans for signs and gates will be developed in the

engineering design phase, which will ensure that the project is consistent with Policy A.

The project area is within Flood Zones A and AE on FEMA's Flood Insurance Rate Map (15003C0320F), revised September 30, 2004. These zones are associated with rising seas during tsunami rather than storm-water runoff. Base flood elevations in Zone AE are 8 feet at the shoreline and 6 feet at a distance 150 feet inland from the shoreline. Flood Zone A ends at a point about 450 feet inland from shore. During a tsunami it is possible for the sea level to inundate the entire coast, regardless of whether the proposed drainage improvements are constructed. If they are constructed, the drainage channel should facilitate the drainage of seawater back to the ocean.

There are no structures at the site that would be threatened in the event of a tsunami. Apart from grading, the only structure planned on the site will be the relocated access road. This road will be a 24-foot wide ford structure that will accommodate two lanes of traffic and will be designed to allow stormwater to pass over and through to the ocean. Construction of the road will comply with requirements of the Federal Flood Insurance Program, in accordance with Policy C.

In order to prevent flooding of residences in Ewa Beach east of the proposed drainage channel, channel banks will be raised to 10 feet above msl to direct storm runoff to the ocean. This will prevent coastal flooding in the project vicinity, in accordance with Policy D.

## **7. Managing Development**

***Objective:*** *Improve the development review process, communication, and public participation in the management of coastal resources and hazards.*

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

In December, 2005, the Kalo'i Gulch Drainage Improvements at One'ula Beach Park Final EIS was circulated to agencies and the public for review and comment, as required by Chapter 343, Hawaii Revised Statutes, as amended, and Hawaii Administrative Rules Title 11, State of Hawaii Department of Health, Chapter 200, Environmental Impact Statement Rules.

## **8. Public Participation**

**Objective:** *Stimulate public awareness, education, and participation in coastal management.*

**Policy B:** *Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities.*

The Final EIS for the proposed project has been circulated to the Ewa Neighborhood Board, Ewa Beach Community Association, and Ewa Puuloa Hawaiian Civic Club, among others. Individuals consulted included all appropriate government representatives and individuals. The public participation objective will also be addressed during the processing of the SMP, which will include public notification as well as a public hearing.

## 9. Beach Protection

**Objective:** *Protect beaches for public use and recreation.*

**Policy A:** *Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion.*

The park access road will be relocated to a position 80 feet inland of the shoreline setback at its closest point. It is the only structure involved in the proposed action and will not interfere with shoreline processes or result in beach erosion.

## 10. Marine Resources

**Objective:** *Promote the protection, use, and development of marine and coastal resources to assure their sustainability.*

**Policy A:** *Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial.*

**Policy D:** *Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources.*

Use of the Kalo'i Gulch Drainageway for an ocean outlet will benefit upland landowners economically and is a prudent use of the coastal resource. Over time, the drainage channel will become part of a larger system of retention and

settling basins as golf course is developed on mauka lands. Dedication and maintenance of the channel will also help to retain the public park in open space as a valuable recreation resource.

The water quality, sediment, and plume transport modeling studies that were conducted as part of the EIS and SMP process will help to further an understanding of this shoreline. They represent a valuable information base with which to evaluate future coastal development activities.

## **B. SPECIAL MANAGEMENT AREA GUIDELINES**

The proposed project area has been reviewed under the SMP process before, as part of the One'ula Beach Park Master Plan (2001). Under the current application, the project area is being evaluated as an expanded flood control feature necessary to alleviate flooding on urbanized lands mauka of the shoreline. At the same time, it is recognized that the project area must still retain its value as outdoor recreation and open space. For this reason, the proposed drainage improvements have been designed to minimize any impacts on the planned improvements contained within the One'ula Beach Park Master Plan.

With regard to the individual Special Management Area guidelines, adherence is discussed below.

### *(1) Access to Public Beaches, Recreational Areas and Natural Reserves*

Construction of the proposed drainage improvements project will not restrict access to One'ula Beach Park. The current park access road will be reconstructed as a ford crossing to allow stormwater to cross the road, enter the drainage channel and flow to the ocean. This access road will be situated in a new alignment further south, or makai, in accordance with the One'ula Beach



Park Master Plan. During construction, public access to the beach park will be maintained via a temporary detour that will redirect traffic around the connection point of Papipi Road with the new road.

An emergency access will also be installed near the northern portion of One'ula Beach Park. The emergency access will connect to a future bridge crossing that will span the Kalo'i Gulch drainageway mauka of the project site, where the future golf course is under construction. This road will provide an alternate means for park users to enter or leave the park in the event the main road becomes unusable due to flooding or for maintenance reasons. A locked gate or chain will restrict use of the road under normal conditions.

During grading operations, access to some portions of open space will be restricted. This will affect a small portion of the existing 28-acre recreation area, and is not expected to be a significant hindrance to park users. Work on the drainage channel will not extend down to the ocean, therefore beach access will not be restricted unless construction safety concerns arise. Temporary pedestrian routes will be designated across the drainage channel throughout the construction period.

Under the One'ula Beach Park Master Plan, one new picnic area, about 20 parallel parking stalls, and an unpaved pedestrian path are planned within the drainage channel improvements. The picnic site will need to be relocated outside the project area since trees and picnic tables could trap debris during a flood event. The parallel parking stalls can be moved east or west of the channel, alongside other parts of the park access road. The unpaved pedestrian path will need to be realigned where it crosses over the channel banks in order to maintain a 5 percent maximum slope. When the SMP for the proposed drainage modifications is approved, the existing SMP for the One'ula Beach Park Master

Plan will be amended, as necessary, to reflect the approved regional drainage modifications. All other improvements contained in the master plan lie outside of the proposed drainage system improvements.

*(2) Location of Public Recreational Areas and Preserves*

The proposed project is for flood control purposes and will not create any additional recreation amenities. At the same time, construction of the project will retain the area in open space for the foreseeable future and ensure that it remains available for outdoor recreation activities. The mauka end of the proposed drainage channel will tie into the water features that are planned as part of the Ocean Pointe Golf Course. Thus, there will be no impact on the location of public recreational areas.

Haseko has set aside 22 acres of coastal marsh habitat located to the west of the drainage improvement project as a wetland preservation area. The wetland is located west of the sewer outfall and proposed marina and will not be affected by this project.

*(3) Provisions for Liquid and Solid Waste Disposal*

The proposed action is a flood control project free of structures and infrastructure/utility requirements. Except for construction-related material and activities, no liquid or solid waste will be generated. All excavated material will be re-used to elevate the channel banks.

*(4) Alterations to Existing Land Forms, Vegetation, Effects on Water Resources, Scenic and Recreational Amenities, Flood Danger, Landslides and Erosion*

Grading of the project site constitutes the greatest impact of the proposed action. The natural berm along the shoreline will be lowered by approximately 2 to 4 feet down to an elevation of 4 feet above msl along a 500-foot section. Banks along both edges of the drainage channel will be raised to approximately 4 to 6 feet higher than the channel bottom (about 8 to 10 feet above msl). The relocated park access road will be set along the bottom of the drainage channel. Areas that currently collect standing water after heavy rains will be filled so that the site will have a more uniform and even gradient.

Construction grading will change the scenic and recreational character of the project area in subtle ways. By lowering the top of the berm fronting the beach between 2 to 4 feet, ocean views may be slightly enhanced from north to south when standing within the project area. By raising the banks along both edges of the channel, east-west views of the Ewa shoreline from within the site may be slightly more obscured. In terms of the overall scenic quality of the park, however, these changes will be negligible.

Aside from the potential impact to marine water from a storm water discharge, discussed in previous sections, the project will have no effect on water resources. The project will decrease the potential for flood danger, and it will not create any added threats to landslides. Short-term risks of erosion during construction will be managed through the City-required Erosion Control Plan and NPDES Stormwater Discharge permit which will be filed for this project.

#### *(5) Adverse Environmental or Ecological Effects and Elimination of Planning Options*

There is potential for discharge of runoff into the ocean to have adverse environmental effect for short periods. These potential impacts have been

examined and assessed in the report, *Numerical Modeling of Storm Drain Discharge Plume Transport*, attached as Appendix B-1 in the Final EIS.

These discharges are likely to be extremely rare events. Any impacts must be assessed against the potential for flooding in upland areas.

Construction of the Kalo'i Gulch drainage improvements is a low impact development and does not eliminate future planning options for the site. If strategies for retention, detention, or redirection of surface runoff are implemented in upland areas in the future, the drainage improvements can be abandoned in place without affecting park users or the surrounding community.

#### *(6) Consistency with the General Plan and Zoning*

Most of the proposed project is within zoning designation P-2, General Preservation. The remainder is in R-5, Residential. The portion in R-5 will be conveyed to the City by HASEKO as part of the planned One'ula Beach Park expansion.

The purpose of the preservation district is to preserve and manage major open space and recreation lands and lands of scenic and other natural resource value. Permitted uses in the Preservation district include outdoor recreation facilities and public uses. The proposed drainage improvements project constitutes a public use and is consistent with City and County of Honolulu zoning.

#### *(7) Dredging, Filling, and Other Alterations*

All of the proposed drainage improvements will occur on dry land, and no dredging will be required. Approximately 7,110 cubic yards (cy) of soil and sandy

material will be moved to lower the elevation of the shoreline berm to 4 feet above msl. Excavated material will be used to raise the channel banks about 4 to 6 feet higher than the channel bottom. Some additional fill (approximately 763 cubic yards) will be brought to the site to complete the channel banks. These alterations will be graded and landscaped to merge with the rest of the park.

*(8) Reduction of Beaches or Other Recreational Areas*

A portion of the grading necessary to lower the natural berm will occur within the 40-foot shoreline setback. This will lower the elevation of the beach within the channel section, but it will not reduce the square footage of sand.

Relocation of the park access road toward the shoreline will reduce the park open space, but this is in accordance the planned improvements contained in the One'ula Beach Park Master Plan. Overall acreage of the park will increase when this plan is implemented.

*(9) Access to Tidal and Submerged Lands*

Access to the tidal zone and nearshore waters at One'ula Beach Park will not be affected by the proposed project, either during or after construction. The wash of the waves may be higher after construction, most evidently during periods of high tide and/or high surf.

*(10) Line of Sight Towards the Sea from the Coastal Highway*

The project does not include any structures that could obstruct coastal views. The lowering of the natural berm fronting the beach may slightly enhance ocean

views from the park access road and elsewhere within the middle of the drainage channel.

*(11) Effects on Water Quality, Fishing Grounds, Wildlife Habitat, and Agricultural Lands*

There is some potential for effects on marine water quality during stormwater discharge. These effects are discussed in Section D., Coastal Ecosystems.

The State DLNR is proceeding with efforts to construct an artificial reef on the seafloor offshore of the new marina. Projects like these, if successful, will enhance fishing opportunities along the Ewa shoreline. This artificial reef project is well outside of the exposure area modeled under the plume transport study conducted for the Kalo'i Gulch Drainage Improvements EIS. Therefore, the proposed action will not adversely affect the State's effort, even under the worst-case discharge scenario.

## **V. REFERENCES**

City and County of Honolulu. *Revised Ordinances of Honolulu, Volume II*. 1990.

Marine Research Consultants. *Ocean Pointe Marine Environmental Monitoring Program Water Chemistry*. March 2006.

R.M. Towill Corporation. *Final Environmental Impact Statement, Kalo'i Gulch Drainageway Improvements at One'ula Beach Park*. December 2005.

R.M. Towill Corporation. *Summary Report Kalo'i Gulch Watershed Hydrologic and Sediment Study*. August 2004.

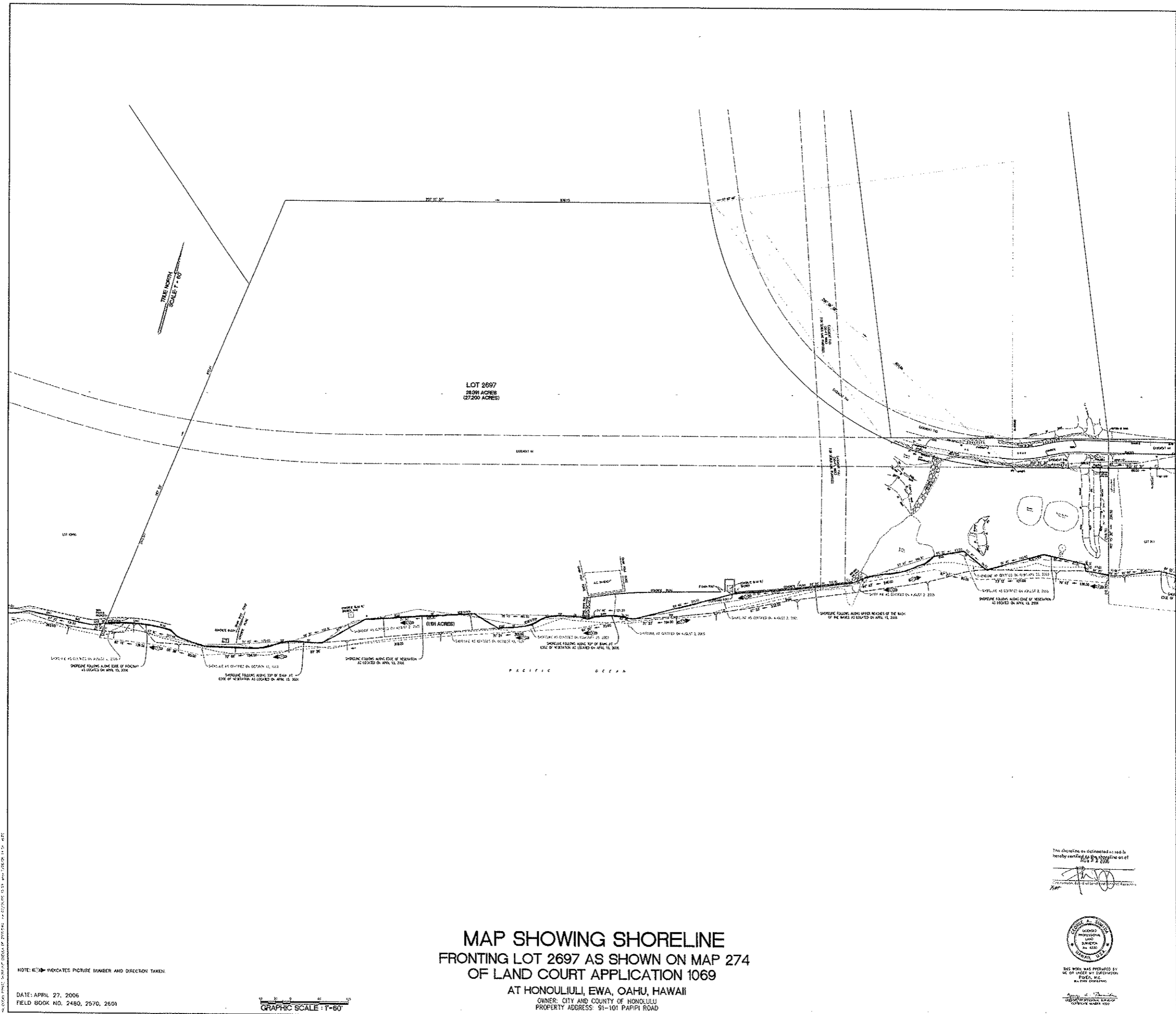
Sea Engineering, Inc. *Numerical Modeling of Storm Drain Discharge Plume Transport, Ocean Pointe Marina, Oahu*. August 2004.

Wilson Okamoto & Associates, Inc. *One'ula Beach Park Final Master Plan*. Prepared for City and County of Honolulu Department of Design and Construction. August 2000.

**EXHIBIT A**

**Certified Shoreline Survey**





**MAP SHOWING SHORELINE**  
**FRONTING LOT 2697 AS SHOWN ON MAP 274**  
**OF LAND COURT APPLICATION 1069**  
**AT HONOLULU, EWA, OAHU, HAWAII**  
 OWNER: CITY AND COUNTY OF HONOLULU  
 PROPERTY ADDRESS: 91-101 PAPIPI ROAD

This document is disseminated as is and is  
 hereby certified as being a true and correct  
 copy of the original.



THIS WORK WAS PREPARED BY  
 ME OR UNDER MY SUPERVISION  
 ALAN S. HARRIS  
 LICENSED PROFESSIONAL LAND SURVEYOR  
 HAWAII

NOTE: (E) INDICATES PICTURE NUMBER AND DIRECTION TAKEN.  
 DATE: APRIL 27, 2006  
 FIELD BOOK NO. 2480, 2570, 2601

GRAPHIC SCALE: 1"=60'