

BOARD OF WATER SUPPLY

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November 5, 1998

*Moanalua Nonpotable
Well*

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Manager and Chief Engineer

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Finding of No Significant Impact for the Board of Water Supply's Proposed Moanalua Nonpotable Well Project, Honolulu, Oahu, TMK: 1-1-12: 13

The Board of Water Supply has reviewed the comments received during the public comment period which began on January 23, 1998. We have determined that the environmental impacts of this project have been adequately addressed as discussed in the final environmental assessment (EA) and are therefore, issuing a finding of no significant impact. We request that our proposed exploratory well project be published as finding of no significant impact in the next Office of Environmental Quality Control (OEQC) Bulletin.

Attached are the completed OEQC bulletin publication form and four (4) copies of the final EA for your review.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

BROOKS H. M. YUEN
Acting Manager and Chief Engineer

Attachments

cc: Brian Takeda, R.M. Towill Corporation

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Nonpotable Well

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Prepared in accordance with Chapter 343, Hawaii Revised Statutes

Final Environmental Assessment
MOANALUA NONPOTABLE WELL
Moanalua, Honolulu, Oahu, Hawaii

November 1998

City and County of Honolulu
BOARD OF WATER SUPPLY
630 Beretania Street
Honolulu, Hawaii 96843

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Final Environmental Assessment
MOANALUA NONPOTABLE WELL
Moanalua, Honolulu, Oahu, Hawaii
TMK: 1-1-12:13

November 1998

PROPOSING AGENCY:
City and County of Honolulu
BOARD OF WATER SUPPLY
630 South Beretania Street
Honolulu, Hawaii 96843

PREPARED BY:
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Chapter 1
EXECUTIVE SUMMARY

1.1 PROPOSING AGENCY AND ACTION

The Board of Water Supply (BWS), City and County of Honolulu, proposes to drill a well at TMK: 1-1-12:13 (Figure 1-1 and Figure 1-2). The proposed site is located at Moanalua Golf Course at the entrance to Moanalua Valley. The project site is located at the northeast end of the golf course, adjacent to an existing residential neighborhood off Ala Aolani Street, which is the primary access into and out of Moanalua Valley. The well is intended for future use as a non-potable production well to irrigate the greens and landscaping of Moanalua Golf Course, Moanalua Freeway landscaping, Moanalua Gardens, and Salt Lake Regional Park. Drinking water quality standards will not be required for development of the well, however, water quality must be suitable for irrigation purposes. Estimated yield of the well is ± 200 million gallons per day (mgd).

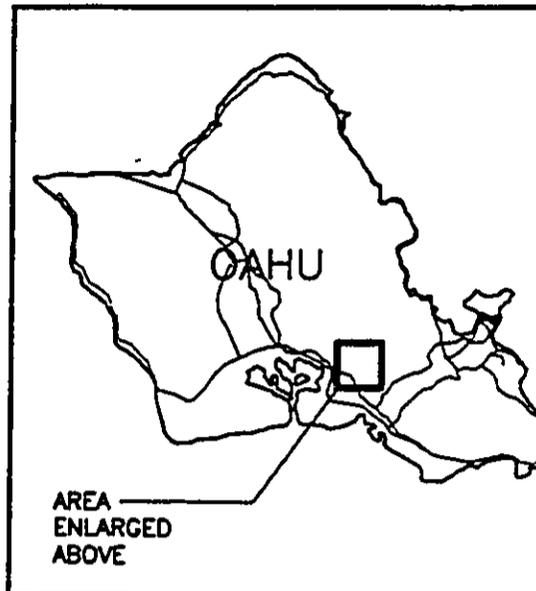
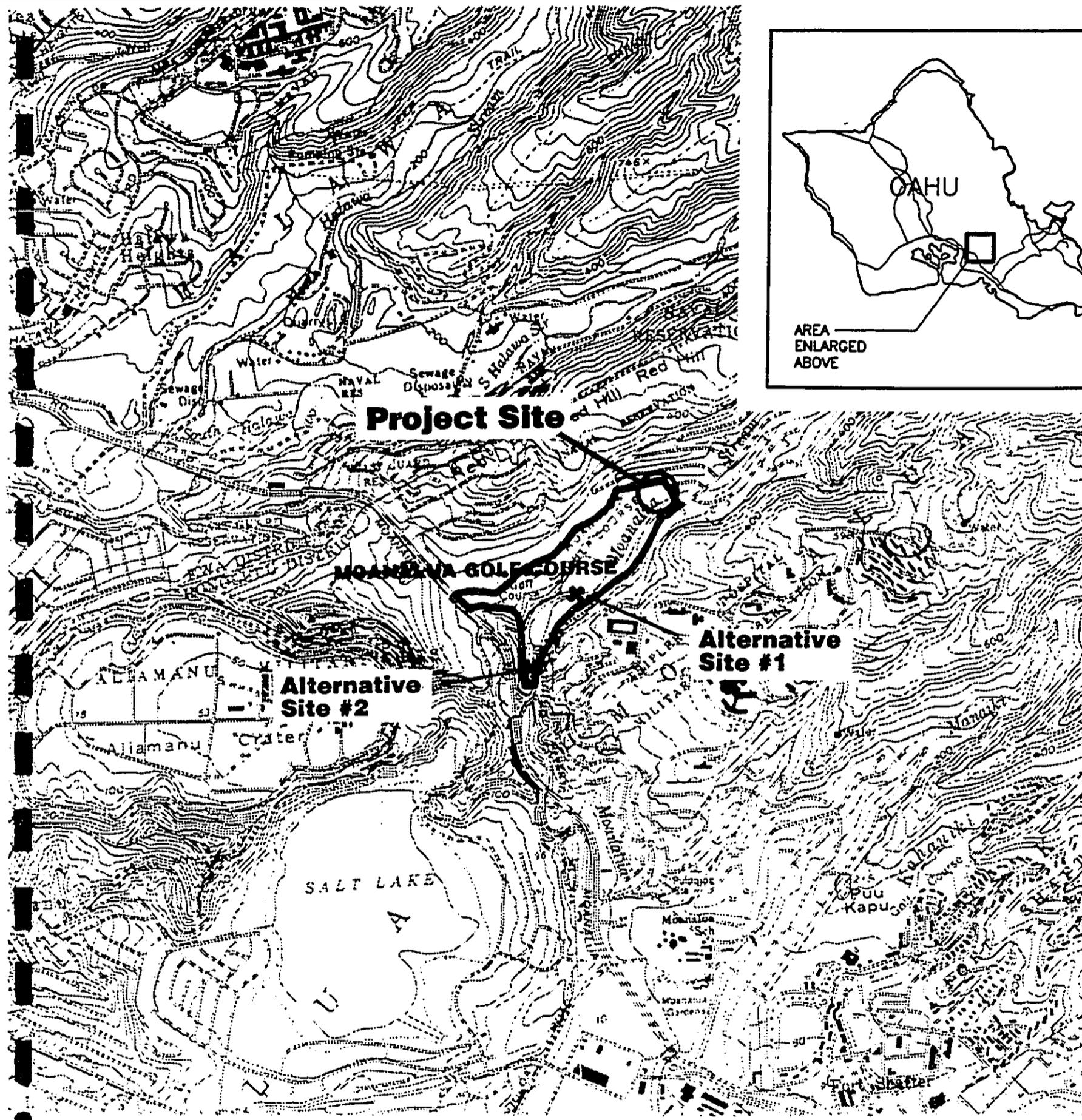
BWS will drill and case the well to obtain hydrogeological data on potential new groundwater resources. After the well has been drilled and cased, test pumping will be performed to determine the quantity and quality of water available. If the required water quality parameters are met, the well will be utilized for irrigation purposes.

This Environmental Assessment (EA) focuses on the drilling, casing, and test pumping of the well, including permanent installation of pumps, piping, and appurtenances for irrigation purposes.

1.2 PURPOSE OF ENVIRONMENTAL ASSESSMENT

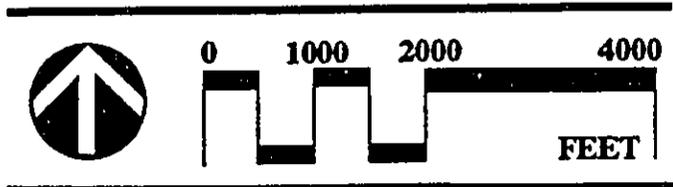
City and County of Honolulu funds will be used for the proposed development. This project, therefore, is subject to preparation of environmental documentation per requirements of Chapter 200, Title 11, Hawaii Administrative Rules (HAR), and Chapter

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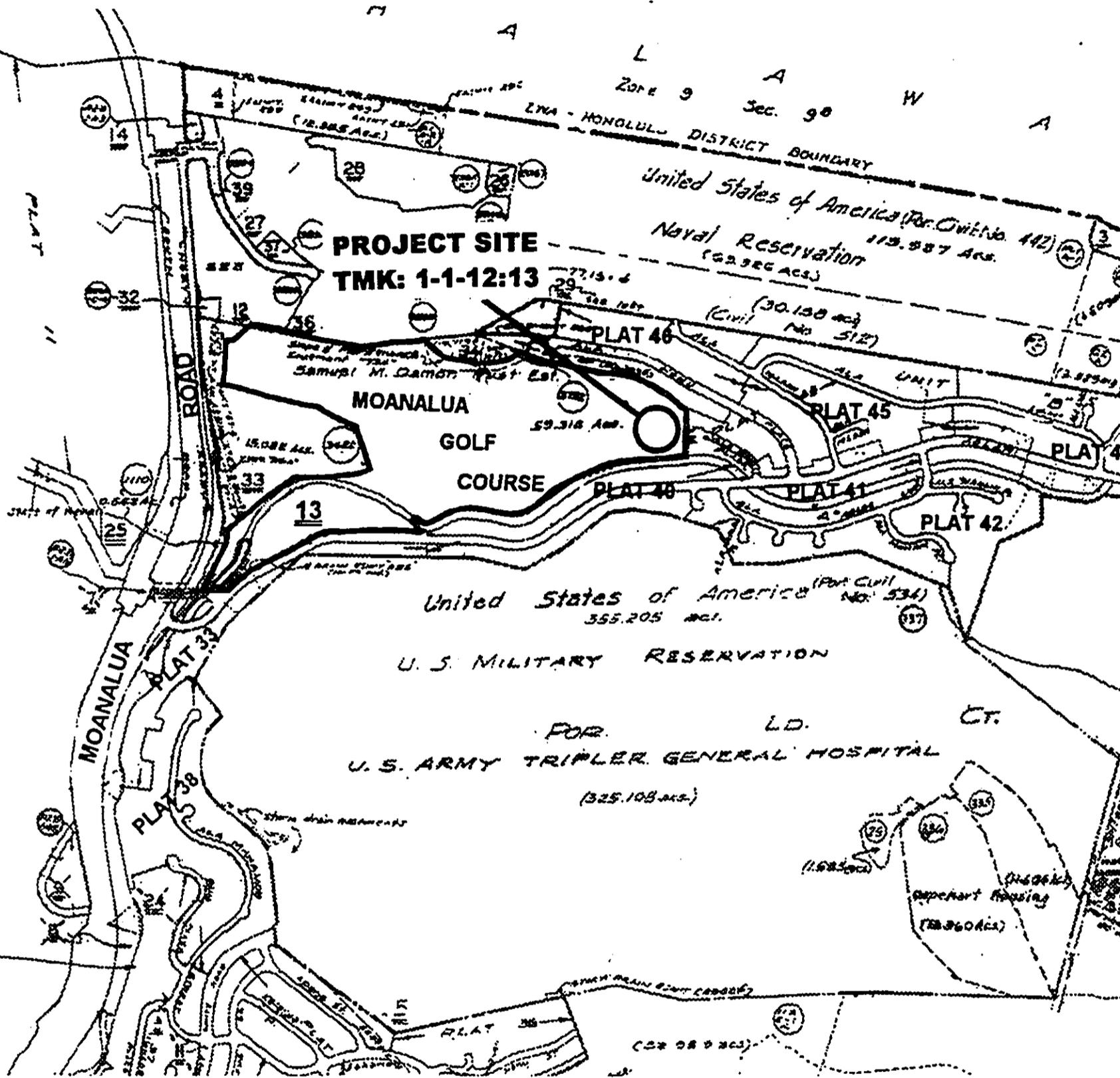
Figure 1-1
PROJECT LOCATION



Board of Water Supply
MOANALUA WELL
City and County of Honolulu

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August 1997

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DEPARTMENT OF TAXATION
PROPERTY TECHNICAL OFFICE
TAX MAPS BRANCH
STATE OF HAWAII
TAX MAP

FIRST TAXATION DISTRICT

ZONE	SEC.	PLAT
1	1	12

Figure 1-2
TAX MAP KEY LOCATION



Not to Scale

Board of Water Supply
MOANALUA WELL
City and County of Honolulu

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August 1997

343, Hawaii Revised Statutes. This EA will address the limited environmental impacts anticipated from the installation and use of the well for non-potable uses.

This Final Environmental Assessment and accompanying Finding of No Significant Impact (FONSI) will be filed by BWS as part of the requirement for processing an EA.

1.3 PERMITS REQUIRED

BWS will obtain a right-of-entry from the Moanalua Golf Club, the owner of the project site, prior to performing test drilling. If the well tests prove successful and BWS determines that a production well is feasible, a utility easement will be sought for installation of the well and irrigation appurtenances.

Successful completion of well tests will lead to conversion to a production well which will require that an application be filed for a Development Plan Public Facilities Map amendment from the Department of Planning and Permitting, City and County of Honolulu. Review and approval for this amendment is from the Honolulu City Council. It is expected that this DP amendment permit will be filed upon successful completion of well tests.

The Commission on Water Resource Management (CWRM) will require a Well Construction permit for the exploratory well. Once exploratory work is completed, the production well will require a permanent Pump Installation Permit and Water Use Permit.

Pursuant to section 14-12.22 Revised Ordinances of Honolulu 1990, as amended, BWS must secure the necessary permit from the City and County of Honolulu, Department of Public Works for disposing of non-potable well water discharge into the city and county storm sewer system.

BWS will also be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Department of Health before discharging non-potable well effluent into State waters through the county storm sewer system.

A noise permit covering construction and drilling activities will be required from the Noise and Radiation Branch of the State of Hawaii Department of Health (DOH).

1.4 PROJECT BENEFITS

Moanalua Golf Course, Moanalua Freeway landscaping, Moanalua Gardens Park, and Salt Lake Regional Park currently use BWS potable water for irrigation. The proposed use of non-potable water is expected to reduce the use of potable water, which in turn can be used for other municipal needs.

The proposed well will also furnish data that will be added to Oahu's island wide hydrogeological information base. This valuable information will be used to estimate the quantity and quality of groundwater resources available in the alluvium of Moanalua Valley at this site, and, in combination with data from other wells, for the Island of Oahu. If the hydrogeological data shows that groundwater sources can be successfully developed for irrigation, the Moanalua Nonpotable Well will facilitate the integration of water savings into the overall municipal water system.

1.5 ALTERNATIVES CONSIDERED

This environmental assessment discusses the no action alternative, the delayed action alternative, site alternatives, and source alternatives.

The no action alternative was not considered a viable option because it would continue to require approximately 0.200 mgd of potable water for irrigation which could otherwise be used for municipal potable needs. The no action alternative, therefore, would prevent BWS from fulfilling its mandate to develop water resources for the growing City and County of Honolulu. Additionally, although the proposed contribution of 0.200 mgd is relatively small, the no action alternative in combination with growing difficulty in discovering new

potable resources, could contribute to restrictions to new development and create regional water shortages.

The delayed action alternative was considered but not pursued because it does not address the existing need to develop or discover new potable sources. Delayed action would also result in substantially similar environmental outcomes with higher development costs due to inflation.

Source alternatives to development of irrigation water are relatively limited. Moanalua Stream which flows through the golf course has been recorded with an average flow of 3.26 mgd during the period 1926 to 1968 (CWRM, 1990). Recent site visits to the stream, however, indicate relatively low flows of approximately $\pm 200,000$ gallons per day along various portions of the stream as it passes through the golf course¹. These flows did not appear to be sufficient for sustained stream flow and irrigation requirements. Any potential withdrawals from the stream, therefore, would most probably affect stream flows at the point of withdrawal as well as downstream. Current interim instream flow standards would also require a permit to divert surface water.

A second source alternative involves use of the Kalauao Spring nonpotable system. The Kalauao Spring system could be extended from Halawa Valley to the golf course and other users in the vicinity. Capacity is available and an existing Halawa pipeline transmission tunnel under Red Hill could be utilized. The Kalauao Spring system was constructed in the early 1990s and provides nonpotable irrigation water to Honolulu International Airport, Aloha Stadium, and the Halawa Quarry. Although this alternative is not now practical, it may be reexamined should the Moanalua Nonpotable well prove infeasible for development.

No other source alternatives were considered for development.

¹Based on site visits in July 1997. Observed stream flow based on 4" depth by 12" width, and lineal stream flow of approximately 1 foot per second across concrete channelized sections.

Two alternative sites, both located within the grounds of the Moanalua Golf Course, were also evaluated. The primary site and both secondary sites are regarded in this EA strictly as candidate locations for exploratory well drilling. Well sites are selected and assessed based on their proximity to existing transmission systems, on their geologic and hydrologic likelihood of locating water, and on their suitability for accommodating exploratory well drilling operations with minimal negative impacts to surrounding areas. Based on this criteria, both of the alternative sites are considered to be compatible with project objectives and requirements, however, the primary site is regarded as the most suitable location for exploratory drilling operations.

Source alternatives to groundwater development have been analyzed in the *Draft Oahu Water Plan* (BWS, 1995). These include desalination, development of surface water and brackish groundwater sources, and recycling of treated wastewater. Although BWS is exploring development of alternative potable water sources, it does not consider currently available technologies to be feasible or practical due to high development and operational costs, and technical difficulties. (BWS, 1997).

1.6 POTENTIAL IMPACTS AND MITIGATION MEASURES

Construction activities will involve use of a truck mounted, or stationary drill rig, electrical or internal combustion powered water pump(s), and construction related equipment including use of pickup trucks. Nearby residential areas may be impacted by vehicular pollution, however, the potential for impacts will be temporary and will cease when construction is completed.

Potential for noise will result from clearing, grading, and use of the drill rig and pump(s). Nearby residential areas may be affected by noise levels exceeding the allowable daytime standards set by DOH through HAR, Chapter 11-46, Community Noise Control. Heavy vehicles traveling to and from the project site will comply with requirements of Chapter 11-42, Vehicular Noise Control for Oahu. Potential noise impacts however, will be temporary and will cease after construction and well testing activities are completed.

Dust control measures are not expected to be required since grading will not be necessary and access to the site will be through a paved driveway. To minimize exhaust emissions, project contractors will properly maintain their internal combustion engines and will comply with DOH, HAR, Title 11, Chapter 59 and 60 regarding Air Pollution Control.

A noise permit will be required from the DOH, Noise and Radiation Branch, due to potential for excessive noise levels generated by project activities. The noise permit will require that contractors muffle all construction vehicles and machinery and maintain all noise attenuation equipment in good operating condition. If necessary, faulty equipment will be repaired or replaced. Further, drilling operations will be restricted to the hours of 7:30 am to 3:30 pm on weekdays and will be suspended on weekends and State holidays. If a surface pump is used mutes will be installed to reduce noise to acceptable levels. Alternatively, a subsurface pump or low noise generator and electric pump may be used.

The drill rig and work crew will be situated toward the rear of the golf course. The location and proximity of equipment and personnel may be a source of disturbance to golfers approaching the hole nearest to the project site. However, once the golfers leave the immediate vicinity of the work area to continue their round, no further impacts are anticipated.

The project will result in a temporary increase in heavy truck traffic. The greatest impact will be during initial mobilization of equipment to the site and following construction and testing activities when equipment is removed. Once construction equipment has been set-up, no significant impacts are expected to the adjoining streets, Ala Aolani Street, Ala Napunani Street, and Moanalua Road. Removal of equipment will be scheduled during non-peak traffic periods to minimize disturbance to residents.

To minimize traffic impacts the contractor will schedule heavy truck activity between the hours of 8:30 am and 2:30 pm on weekdays and will suspend activity on weekends and State holidays. The contractor will also schedule heavy truck traffic to avoid use of Ala

Aolani Street and the adjoining intersection with Moanalua Road and Ala Napunani Street as much as possible during the morning or afternoon peak periods.

No adverse impacts to geological formations underlying the drilling site or to the soils at the surface of the site are expected. Similarly, surface flows, downstream or at the site are not expected to be impacted. Moanalua Stream, the closest surface water, is perched atop low permeability alluvium at an elevation of ± 150 feet above msl. The Moanalua Nonpotable Well is proposed to be drilled and cased 250 feet deep, with its intake extending to ± 90 feet below msl. Water withdrawn from the alluvium deposits at this depth would not affect surface stream flow due to the depth of the well intake combined with the intervening layers of low permeability alluvium.

Wetland areas also do not occur within the Moanalua Aquifer area. The nearest wetlands, the East Loch Wetlands at Waiau, are nearly 6 miles away in the Waipahu-Waiawa Aquifer, Pearl Harbor Sector. Due to distance and intervening geology, no negative impacts to these wetlands are expected to result from pumping activities at Moanalua.

Discharges are planned to be disposed of by use of the City and County of Honolulu storm drainage system. BWS currently has a blanket National Pollution Discharge Elimination System (NPDES) permit to discharge effluent to the municipal storm drainage system which is valid until March 5, 1999. This permit will cover discharges due to the operation of pumps, equipment replacement, and repair. A separate NPDES permit for discharges of well testing effluent will be obtained as required from the State Department of Health.

If test results indicate the quality or quantity of water from the well is unsatisfactory for irrigation use, the well will be capped and/or sealed.

Project activities may alter the local distribution and abundance of birds presently using the site, but will not impact the overall abundance of these species on Oahu. No other faunal or botanical resources are anticipated to be affected and no further mitigation measures are required.

1.7 FINDINGS AND REASONS SUPPORTING DETERMINATION

In accordance with Chapter 343, HRS, BWS has determined that an EIS is not required for the construction, test pumping, and permanent pump installation inclusive of piping and appurtenances for the Moanalua Nonpotable Well. This determination has been made based on short project duration and because any adverse impacts that would result can be minimized to insignificant levels by applying the recommended mitigation measures (see Chapter 10 for details).

1.8 AGENCIES AND OTHERS CONSULTED

The following agencies and personnel were contacted during preparation of the Draft EA:

State of Hawaii

- Department of Health
- Department of Land and Natural Resources

City and County of Honolulu

- Board of Water Supply
- Land Utilization Department
- Department of Planning

Private

- Moanalua Golf Club

The following organizations, agencies, and individuals were also notified during the 30-day Draft Environmental Assessment comment period:

Federal Agencies

- U.S. Geological Survey
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers

State Agencies

- Department of Business, Economic Development & Tourism
- Office of Planning
- Department of Education
- Department of Health
 - Environmental Management Division
 - Office of Environmental Quality Control
- Department of Hawaiian Home Lands
- Department of Land and Natural Resources
 - Aquatic Resources Division
 - Historic Preservation Division
 - Commission on Water Resource Management
- University of Hawaii
 - Environmental Center
- Office of Hawaiian Affairs

City and County Of Honolulu

- Planning Department
- Land Utilization Department
- Department of Transportation Services
- Building Department
- Board of Water Supply

Private and Community Organizations, and Elected Officials

- Moanalua Golf Club
- Honolulu City Council
- Aiea Neighborhood Board No. 20
- State Senator Norman Mizuguchi
- State House Representative Nathan Suzuki

Chapter 2

PURPOSE AND NEED FOR PROPOSED ACTION

2.1 PROJECT PURPOSE AND NEED

The 1996 average municipal water demand on the Island of Oahu was approximately 148 million gallons per day (mgd). According to the *Oahu Water Plan*, this demand for water is expected to increase to 175 mgd by the year 2000, and to more than 193 mgd by the year 2010 (BWS, 1995). BWS has been mandated to meet this demand by investigating, planning and developing additional water supplies within the limits of available resources. BWS proposes to develop new sources of potable and non-potable groundwater on Oahu within the Honolulu Water Management Area (WMA) to fulfill this mandate.

The proposed Moanalua Nonpotable Well will tap into the Moanalua Alluvial Aquifer, which is one of several aquifers within the Honolulu WMA. The well will use a single bore to extract non-potable water from the underlying alluvial aquifer. If tests for quantity and quality of groundwater from the well meet irrigation use standards, BWS intends to convert the well to a production well and integrate it into the Moanalua Golf Course and other irrigation systems. The proposed use of non-potable water for irrigation needs will help to free up an estimated 0.200 mgd of potable water which can be used instead for municipal needs.

2.2 STATE WATER CODE AND COMMISSION ON WATER RESOURCE MANAGEMENT

The State Water Code and CWRM was established in 1987 by the Hawaii State Legislature in Section 174-C of the HRS. The task of CWRM is to administer the new State Water Code.

The State Water Code established a Hawaii Water Plan consisting of four parts:

- A water resource protection plan prepared by CWRM;
- water use and development plans prepared by each county;
- a state water project plan prepared by state agencies; and,
- a water quality plan prepared by the Department of Health.

The State Water Code requires that CWRM establish management boundaries for each WMA. CWRM designated WMAs are located in areas where research suggests that ground and/or surface water resources are threatened by current or future proposed withdrawals or diversions of water (BWS, 1995).

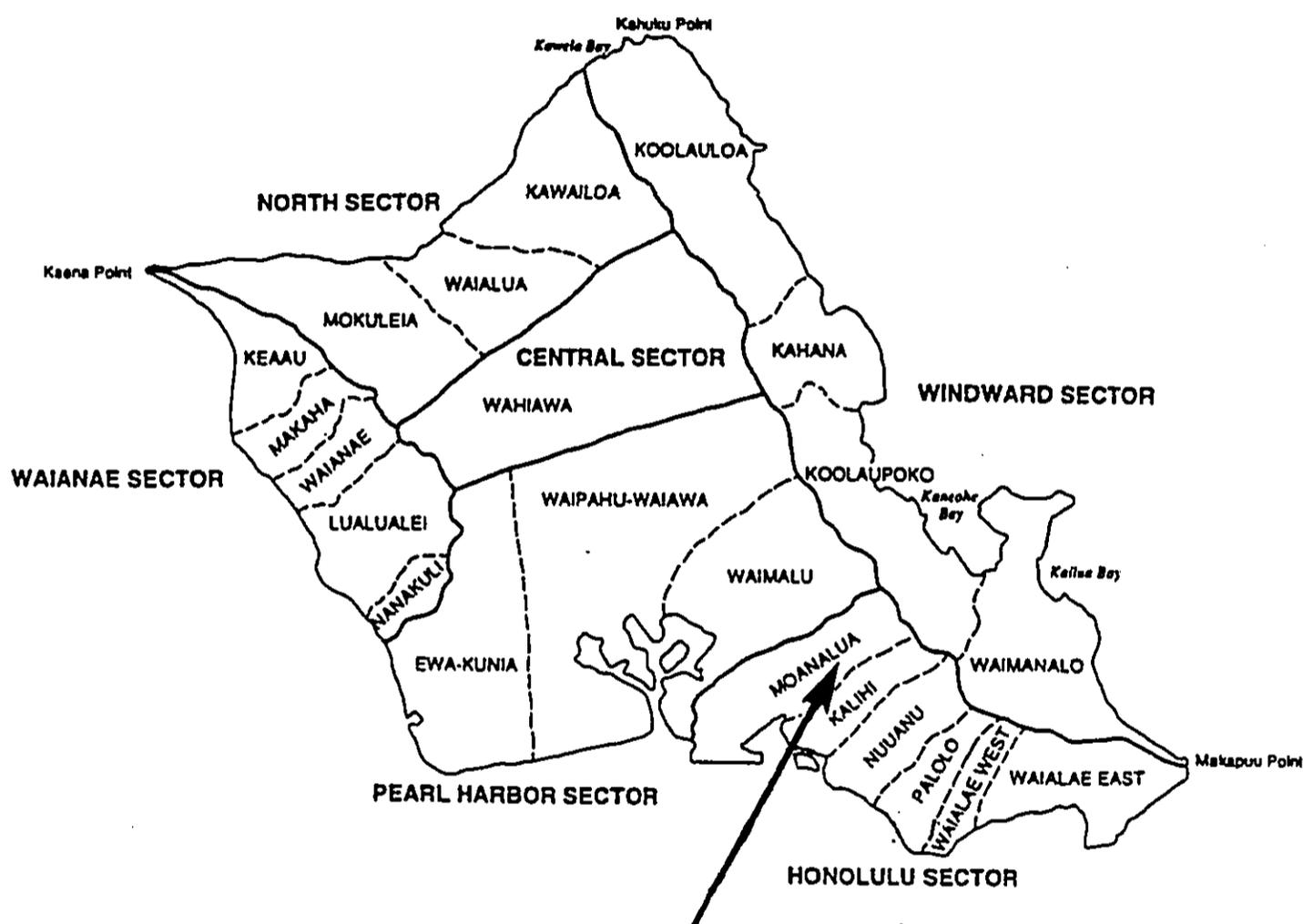
2.3 GROUND WATER SECTORS AND AQUIFERS

CWRM has established six groundwater sectors that encompass the island of Oahu to assist in planning and administration of water resources and WMAs. These six groundwater sectors include: Honolulu, Pearl Harbor, Waianae, Central, North, and Windward. These six groundwater sectors are further divided according to the boundaries of the underlying aquifers. In all sectors except Waianae, the aquifer divisions have been designated WMAs. In some cases, several individual aquifers are combined into a single WMA.

The Honolulu Groundwater Sector follows the same boundary as the Honolulu WMA and is comprised of six aquifer areas. These aquifers include: Moanalua, Kalihi, Nuuanu, Palolo, Waialae West, and Waialae East (Figure 2-1). The proposed Nonpotable Well is sited in the Moanalua aquifer.

2.4 SUSTAINABLE YIELD AND THE HONOLULU WATER MANAGEMENT AREA

The sustainable yield of the underlying aquifer system must be assessed to evaluate the impact of developing permanent potable and non-potable groundwater. Sustainable yield is the amount of groundwater that can be routinely extracted from an aquifer without



PROPOSED MOANALUA EXPLORATORY WELL

**Figure 2-1
OAHU GROUNDWATER SECTORS**



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City and County of Honolulu

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August 1997

adverse impacts to the quality or quantity of the water source. The Hawaii State Water Plan provides for CWRM to determine sustainable yield of surface and groundwater sources statewide. Based on the geologic and hydrologic characteristics of various regions, CWRM produces estimates of sustainable yield for each aquifer, WMA, and groundwater sector. These estimates are used to guide the development of new potable as well as non-potable resources (CWRM, 1997).

The sustainable yield of aquifers for each of the Hawaiian islands is always less than the average annual rate of recharge to the groundwater aquifer because of the amount of fresh groundwater that is lost by mixing with the underlying salt water. Estimating sustainable yield for the island of Oahu and for its individual aquifers is complex because the amount of groundwater that is mixed with fresh water is dependent upon the degree of aquifer confinement, lens thickness, the degree of agricultural and urban development, and numerous other factors. (BWS, 1995).

The Honolulu WMA has an estimated sustainable yield of 53 mgd and is the third largest system. The second largest WMA is Windward which provides 99 mgd, while the largest WMA is Pearl Harbor with a sustainable yield of 184 mgd. The 53 mgd yield from the Honolulu WMA represents 11.4% of the 465 mgd total sustainable yield on Oahu.

The Moanalua basal aquifer has a sustainable yield of 18 mgd. According to CWRM a total of 11 water use permits have been issued for seven wells with a combined permitted use of 18.57 mgd (Table 2-1 and Figure 2-2). Existing withdrawals from the Moanalua basal aquifer, thus, currently exceed the estimated sustainable yield by approximately 0.57 mgd. The proposed exploratory well will develop water in the alluvial aquifer which is perched above and essentially separate from the Moanalua basal aquifer.

Water withdrawal and use from the proposed Moanalua Nonpotable Well will be subject to permit review and reallocation by CWRM according to requirements established under HRS Section 174-C.

Table 2-1
MOANALUA AQUIFER SYSTEM

Water Use Permit No.	Date Approved	Applicant	Well No.	Well Name	Permitted Water Use
24	9/11/81	BWS	2052-08	Kalihi Shaft	8.110
27	9/11/81	U.S. Army	2053-11	Fort Shafter	1.035
358	3/1/95	DPW, USAGH-HI	2053-13	Fort Shafter	
28	9/11/81	Damon Estate	2153-02	Damon Estate	0.021
29	9/11/81	U.S. Army	2153-07	Tripler	0.609
29	9/11/81	U.S. Army	2153-07	Tripler	
30	9/11/81	BWS	2153-10	Moanalua Station	3.790
30	9/11/81	BWS	2153-11	Moanalua Station	
30	9/11/81	BWS	2153-12	Moanalua Station	
31	9/11/81	Hon. Intl. CC	2154-01	Hon. Intl. CC	0.346
85	5/17/89	U.S. Navy	2254-01	Halawa Red Hill	4.659
TOTAL					18.570

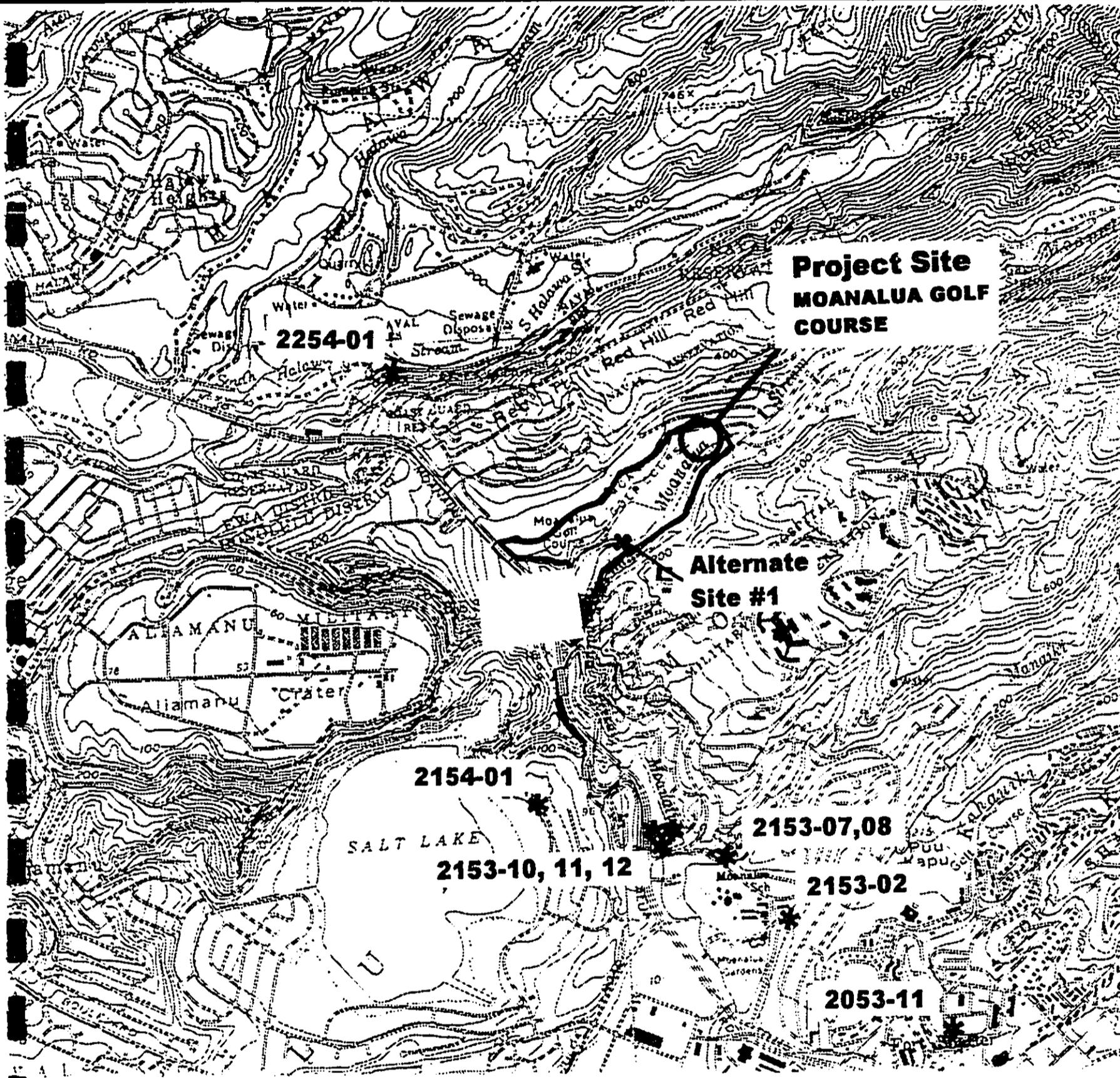
2.5 POTENTIAL AREAS FOR WATER SOURCE DEVELOPMENT

The purpose of the Moanalua Nonpotable Well is to determine if development of irrigation water sources from the alluvium is feasible. Further development of this site or other sites as a water source will follow testing of water quality and quantity and will require permits by CWRM.

2.6 EXISTING WATER SOURCES

According to Table 2-1 - Moanalua Aquifer System, there are seven wells in the Moanalua System. Two wells are privately operated by the Damon Estate and Honolulu International Country Club, two wells are operated by BWS, and three wells are operated by the military. Total permitted yield of basal wells is 18.570 mgd. None of these wells are in the alluvium, which is currently unexploited. Water in the alluvium is hydraulically distinct from water in the basal aquifer.

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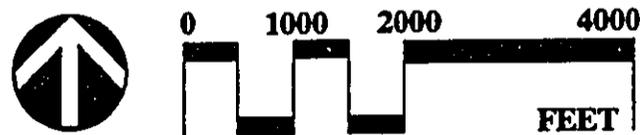


Legend

* Existing Well Site (with identification number)

Note: Well #2053-13 not shown.

**Figure 2-2
EXISTING WELLS
MOANALUA AQUIFER SYSTEM**



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2.7 POTENTIAL FOR REALLOCATION OF CWRM PERMITTED USES

Conversion of the Moanalua Nonpotable Well to a production well will require CWRM to evaluate alluvium apart from the basal system. Currently, permitted uses for the Moanalua Basal Aquifer exceed the CWRM estimate of sustainable yield by approximately 0.570 mgd, but this should not impact water in the alluvium.

2.8 RECOMMENDED WATER SYSTEM IMPROVEMENTS

It is recommended that testing for a new non-potable source at Moanalua be permitted. Development of the well should also be permitted if drawdown tests are successful. Development of this non-potable source for irrigation use will free up potable water supplies for municipal use and help meet the needs of future population growth for the area.

Chapter 3 PROJECT DESCRIPTION

3.1 PROJECT LOCATION AND SITE CHARACTERISTICS

The proposed project site is located at the northeast end of Moanalua Golf Course which occupies a parcel of land at the entrance to Moanalua Valley identified by TMK: 1-1-12:13. The primary project site is bounded on the north-east by a chain link fence that separates the golf course from adjacent residences. The closest homes are situated approximately 75 feet north-east of the proposed site on Ala Hekili Place, a cul-de-sac off of Ala Aolani Street. Ala Aolani Street provides the primary access into and out of Moanalua Valley. (Figure 3-1 and Figure 3-2).

The site is situated on the floor of Moanalua Valley at an elevation of approximately ± 160 feet above mean sea level (msl). The project site and surrounding area consists primarily of manicured lawn that serves as buffer area for the golf course fairway. Immediately to the west of the proposed site is an asphalt area of approximately 1,200 square-feet for parking and maneuvering golf carts.

Access to the site will be via a chain link fence fronting Ala Aolani Street. A locked gateway in the chain link fence immediately adjacent to the site provides access via Ala Hekili Place off of Ala Aolani Street. The chain link fence is approximately ± 30 feet from the proposed well site.

3.2 TECHNICAL CHARACTERISTICS

The Moanalua Well is intended for future use as a non-potable well to irrigate the greens and landscaping of Moanalua Golf Course, Moanalua Freeway landscaping, Moanalua Gardens, and Salt Lake Regional Park. Drinking water quality standards will not be

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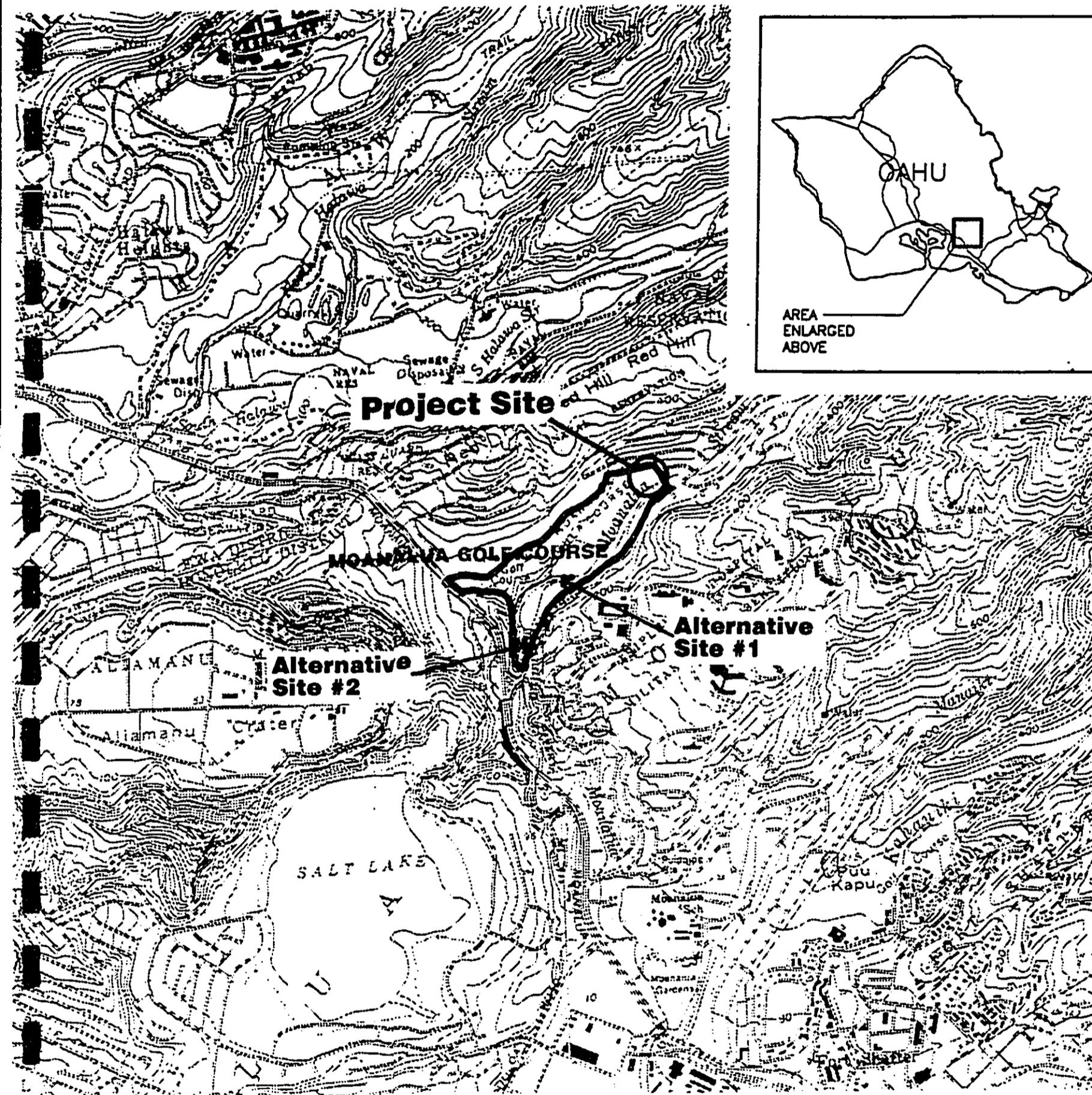
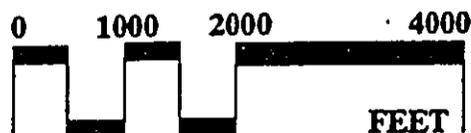


Figure 3-1
PROJECT LOCATION

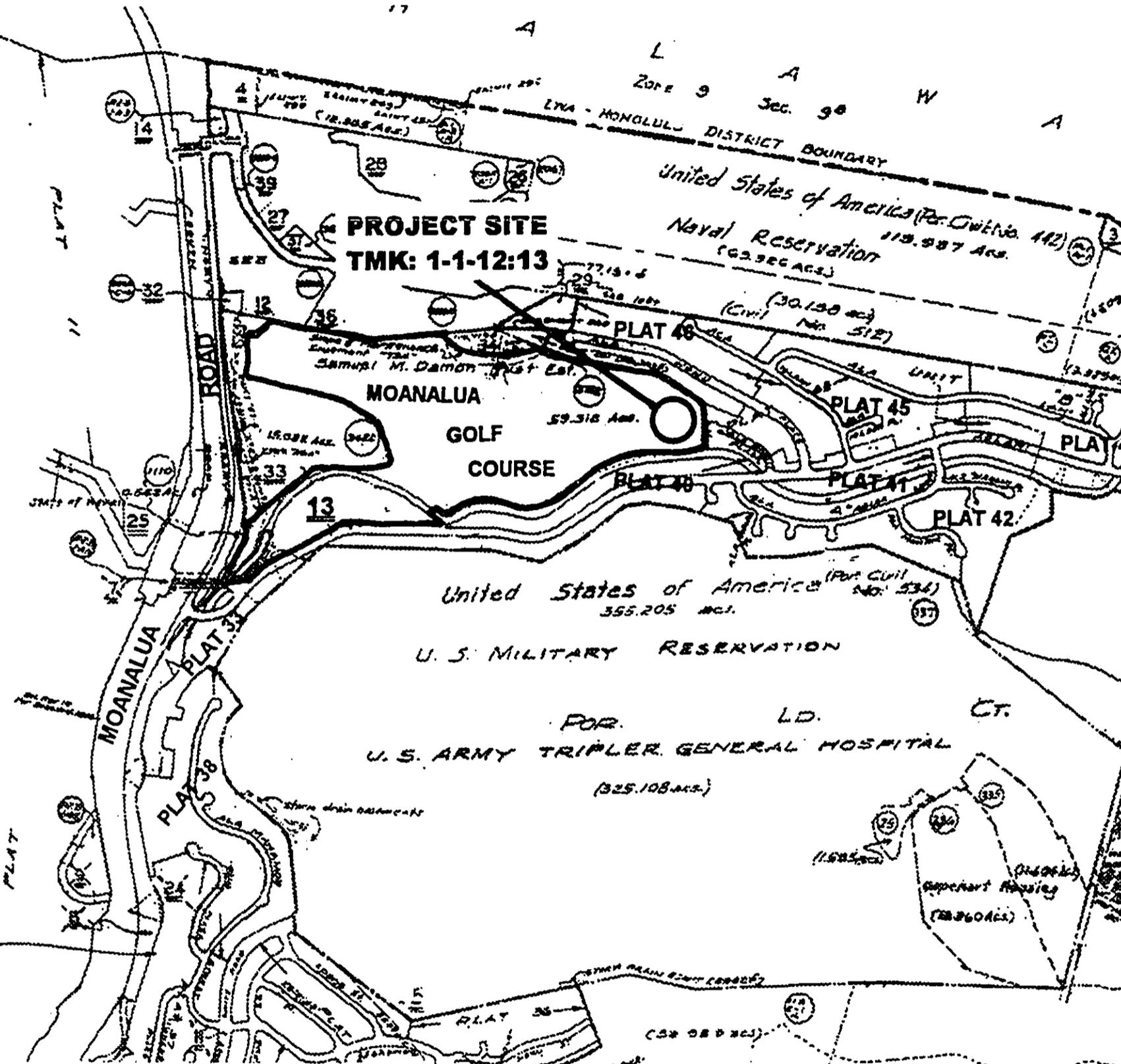


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DEPARTMENT OF TAXATION PROPERTY TECHNICAL OFFICE TAX MAPS BRANCH STATE OF HAWAII TAX MAP		
FIRST TAXATION DISTRICT		
ZONE	SEC.	PLAT
1	1	12

Figure 3-2
TAX MAP KEY LOCATION



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required, however, water quality must be suitable for irrigation purposes. Estimated yield of the well is expected at ± 0.200 million gallons per day (mgd).

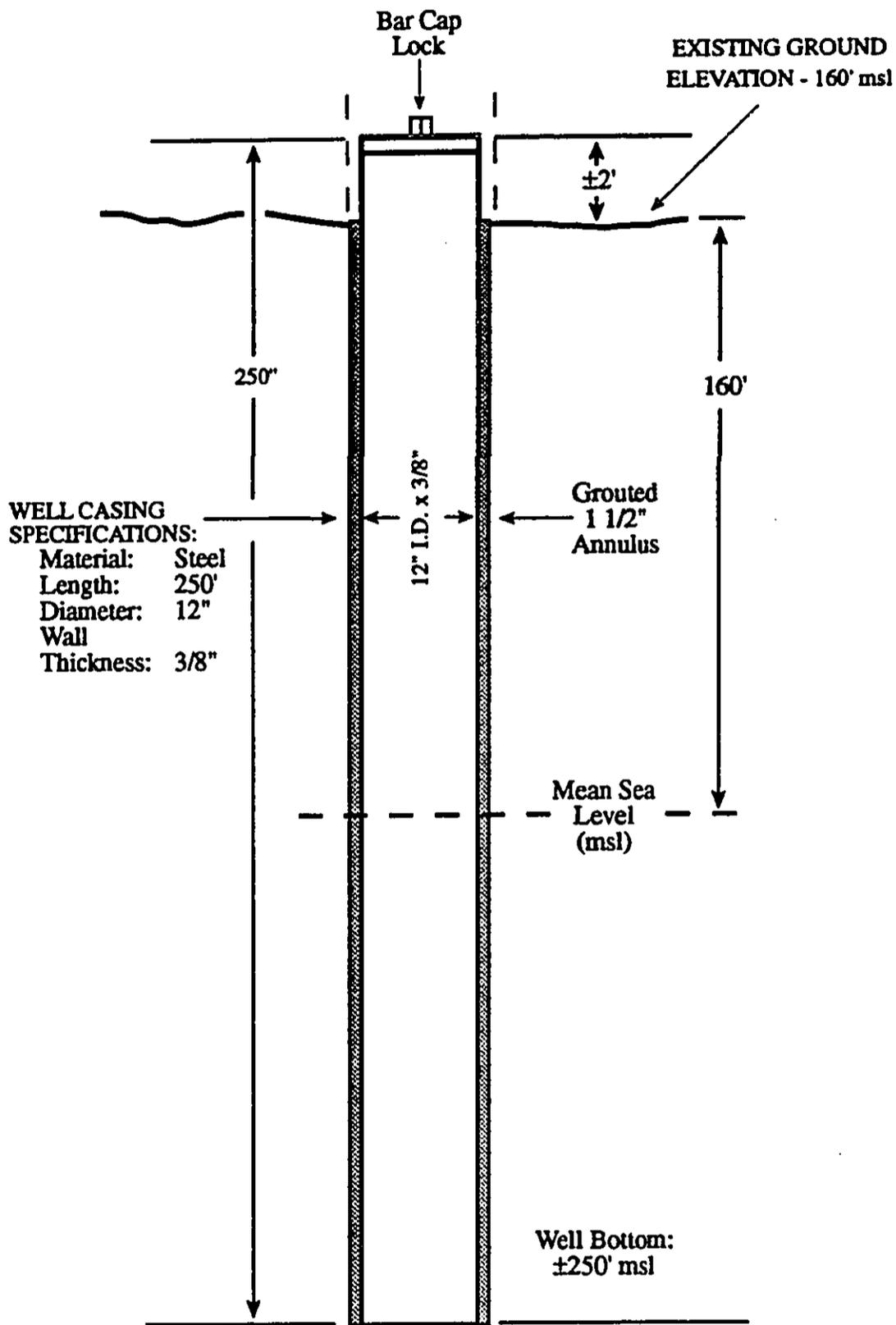
The proposed well will be a single 10-inch cased-bore drilled to approximately 250 feet deep (Figure 3-3). Depth to drawdown is anticipated to be ± 90 feet below msl. A test pump will be used to test the well for yield and drawdown. For a production well, pump controls will be mounted on a 10-foot by 10-foot concrete pad constructed adjacent to the well. The well will be connected via a common 8-inch header to a 2,000-gallon hydropneumatic tank, also located adjacent to the well.

The closest existing BWS wells are approximately one-half mile away to the north-west and south-west of the proposed project site. These include the Navy's Halawa Red Hill Well (No. 2254-01), the Honolulu International Country Club Well (No. 2154-01), and BWS's Moanalua Station Well Field (Nos. 2153-10,11, & 12). Impacts to these wells are not anticipated. These existing wells are basal, while the proposed Moanalua Well is alluvial based.

3.3 CONSTRUCTION AND EXPLORATORY WELL TESTING

The proposed site work will involve set up and installation of the drilling test rig, pump, valves and fittings, and discharge pipes necessary for water testing. Following drilling, the bore will be cased in 10-inch diameter steel piping.

A yield-draw down test will be conducted after the well is drilled, and a temporary electric pump and pipelines will be connected. Power for the pump will be through existing on-site electrical feeds. The yield-draw down test will be performed at a rate of 150 to 300 gallons per minute. Following the yield-draw down test, a long-term constant rate pumping test will be conducted for a period of three to five days at the rate determined from the yield-draw down test. Water table draw down will be measured and the quality of the water will be tested for irrigation standards.



**Figure 3-3
TYPICAL WELL CROSS-SECTION**

Not to Scale

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Discharges of well test water will be conveyed to the existing City and County of Honolulu, Storm Drainage System. A temporary 8-inch discharge pipe will be directed to the county storm drainage system located along Ala Aolani Street. Alternately, the contractor may utilize the storm drain system located on Ala Hekili Street. The storm drain system routes through various municipal feeds that ultimately terminate at Keehi Lagoon. BWS will obtain a permit from the City and County of Honolulu, Department of Public Works, to dispose of non-potable discharges from well pumps into the City and County of Honolulu storm drainage system. The permit is issued pursuant to Section 14-12.22, Revised Ordinances of Honolulu, 1990, as amended. BWS will also obtain an NPDES permit from the State Department of Health for discharging effluent into waters of the state through the municipal storm sewer system.

If the quantity and quality of the water proves to be satisfactory for irrigation purposes, the well will be temporarily capped to protect and preserve the water supply. Authorization from CWRM for permitted use will be obtained for the well. An amendment to the Development Plan Public Facilities Map will be completed showing the facility to be a "site determined, water well programmed for construction within 6 years." The well will then be converted to a production well. Water from the well will be fed to irrigate the Moanalua Golf Course, Moanalua Freeway landscaping, and other users.

If the test pumping proves to be unsatisfactory, the well will be permanently sealed and capped. Regardless of test results, when the yield-draw down and long-term constant rate pumping tests are completed, the temporary pumps, pipelines, and well test appurtenances will be removed from the site and all surplus excavation material and construction debris will be disposed of off-site in compliance with applicable State, and City and County regulations.

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3.4 PROJECT SCHEDULE, COST, AND WORK FORCE

The construction and testing phase is expected to begin in January 1999. Set-up, drilling, testing, and demobilization is expected to take a maximum of 6 months to complete. The cost for the exploratory drilling and testing is estimated at \pm \$100,000.

Drilling will be completed in about four months. Installation of the casings will require approximately one week and another two to three weeks will be needed to install the pumps and conduct the testing. An additional two weeks should be reserved for demobilization.

Chapter 4

ENVIRONMENTAL SETTING, POTENTIAL IMPACTS, AND MITIGATION

4.1 LAND USE AND OWNERSHIP

4.1.1 Existing Environment

The proposed project site occupies approximately 10,000 square feet at the east end of the Moanalua Golf Course. The property, identified by TMK: 1-1-12:13, is owned by the Moanalua Golf Club. The land is currently zoned P-2, Preservation.

The proposed well site is bordered on the north-east by a chain-link fence that separates the golf course from adjacent residences along Ala Hekili Place. The nearest homes are within 75 feet of the proposed well site, directly opposite the chain-fence. Two residential streets, Ala Hoku Place and Ala Aolani Street, line the north-western and south-eastern boundaries of the golf course in proximity to the proposed project site. A chain link fence runs along Ala Aolani Street. Access to the site is possible through a locked gate in this fence. Additionally, a locked gate at the terminus of Ala Hekili cul-de-sac provides direct access to the project site.

The area immediately surrounding the project site consists predominantly of groomed lawns that serve as boundaries for the golf course fairway. An asphalt hard-stand used for golf-cart drive-through and parking, covers approximately 1,200 square feet adjacent to the project site on the west.

Land uses in the areas surrounding the golf-course property include Residential (R-5 and R-7.5), Military (F-1), and Low-density Apartment (A-1).

4.1.2 Project Impacts

Installation of the Moanalua Nonpotable Well will not adversely affect surrounding land uses or ownership patterns. Prior to site work, BWS will request a right of entry from the Moanalua Golf Club to perform the test drilling. If the well tests prove successful and BWS determines that a production well is feasible, a utility easement will be sought for installation of the permanent well and appurtenances.

4.1.3 Mitigation Measures

No mitigation measures are proposed or required.

4.2 TOPOGRAPHY, CLIMATE, AND RAINFALL

4.2.1 Existing Environment

The well site is located at the entrance to Moanalua Valley at an elevation of approximately ± 160 feet above msl. The project site is located on a flat expanse of turf. Topography surrounding the site is characterized by slopes of 7-15 percent. The entire project site and vicinity has been extensively modified by construction of the golf course and by residential development of single family homes.

The climate throughout Honolulu is characterized as warm and dry. Temperatures range from 74° F in March to 80° F in September with highs in the mid 90s. Tradewinds are prevalent throughout most of the year with higher frequency during the summer months. Annual rainfall at the project site ranges between 40 and 50 inches at approximately 200 feet above msl. Rainfall above the project site in the upper reaches of the Koolau Mountain Range can range up to 100+ inches annually. (Atlas of Hawaii, 1983).

4.3 GEOLOGY AND HYDROLOGY

4.3.1 Geology

The island of Oahu is the result of the coalescence growth of two elongated shield volcanoes that form the current Waianae and Koolau mountain ranges. The Koolau Range

was formed after the Waianae Range and continued volcanic activity long after the dormancy of the Waianae system. The Koolau volcano continued to build and fill in the region between the two volcanoes, creating one island as lava flows continued westward to form the Schofield plateau and the leeward areas of what is now Honolulu.

Within the geological time known as the "great erosional period," the Koolau volcano was for a long period of time inactive, during which time erosion and the deposition of sediment continued to shape the deep valleys on the island, including Moanalua Valley in which the project site is located. After the long period of volcanic inactivity, the Koolau range again broke out in eruptions along the length of the ridge and at the heads of the deeply eroded valleys. Lava from these eruptions flowed down the valleys and spread out to form relatively flat valley floors.

During this active period, eruptions along the southeastern end of the Koolau mountain range built a series of cones. Salt Lake Crater developed just south of the mouth of Moanalua Valley, venting ash and other detritus that formed fine-grained deposits of tuff. Weathering and erosion of these tuff deposits and the continual erosion of the valley walls produced layers of alluvium that built up the valley floor.

These alluvial deposits are generally comprised of two layers, an older, more compact and cemented layer that is fairly impervious, and a younger, thinner, permeable layer comprised of relatively looser gravel, volcanic soil, and detritus (Wentworth, 1951). The proposed well site is located atop alluvial deposits at the mouth of Moanalua Valley.

The soil at the primary project site is classified by the U.S. Soil Conservation Service as Papaa Clay with 6 to 20 % slopes (PYD). This soil type generally consists of well-drained soils on smooth upland areas (Figure 4-1). Runoff is slow to medium and the erosion hazard is slight to moderate. Workability is difficult.

Both of the alternate sites lie atop alluvial soil categorized as Kawaihapai Clay Loam, 6 to 15 % slopes (KIC). This soil is also well-drained and generally occurs on alluvial fans and

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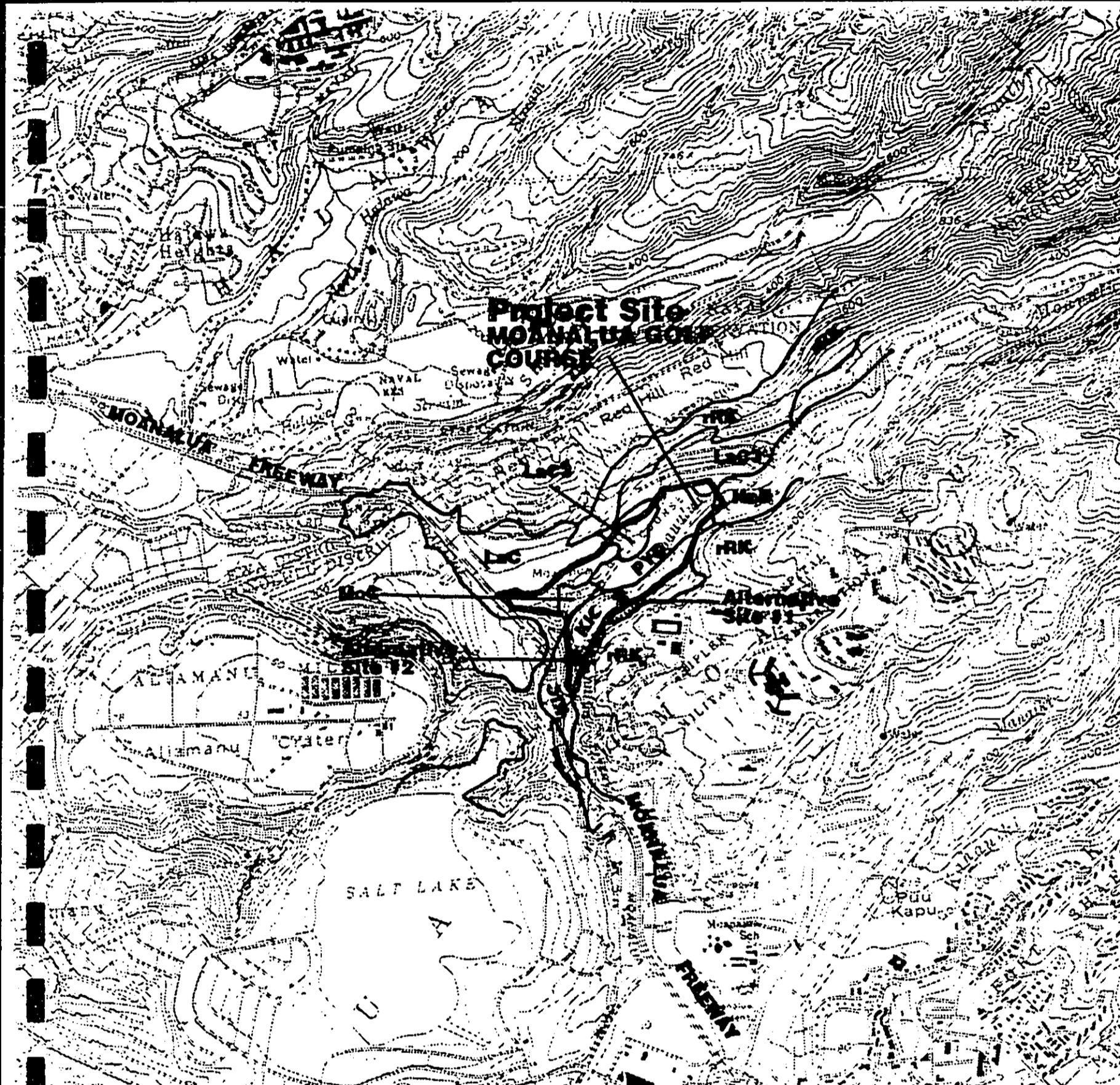
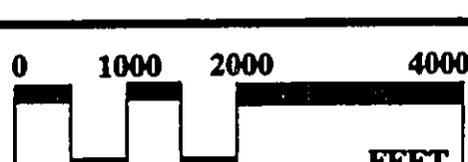


Figure 4-1
SOILS MAP



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drainage ways. Runoff on this soil is slow to medium and the erosion hazard is slight to moderate. Workability is difficult due to the slope. (U.S. Department of Agriculture, 1972).

4.3.2 Groundwater Hydrology

Oahu is divided by BWS into seven water use districts for administrative and planning purposes: Honolulu, Windward, Waialua-Kahuku, Waʻiawa, Pearl Harbor, Ewa, and Waianae. The Honolulu water use district includes the coastal plain of southeastern Oahu, upon which the City of Honolulu is located, and stretches from Makapuu Point at its eastern extremity to the western boundary of the Moanalua drainage divide. Bounded on the north by the crest of the Koolau Range, the area comprises a total of 88 square miles. This area is coextensive with census tracts 1 through 72, the Honolulu Judicial District, and the Honolulu WMA (BWS, 1995).

The proposed Moanalua Nonpotable Well site is located within the Moanalua Aquifer system, but is perched above and is hydraulically separate from the basal aquifer. The alluvial deposits are composed of Koolau soils and lava flows, and are deposited in Moanalua Valley (BWS, 1997).

4.3.3 Surface Water Hydrology

The Moanalua Valley drainage basin flows into Moanalua Stream, a perennial water flow fed by rainfall in the upper elevations of the Koolau Range. Moanalua Stream flows out of Moanalua Valley along Ala Aolani Street at the boundary of the golf course near the proposed project site (Figure 4-2). The stream then arches westward into the golf course before continuing on its course towards the southeast. Within the developed portion of the valley, the stream flows through concrete channels and revetments. Immediately south of the golf course, the stream course gives name to the developed route of the County's storm sewer system, comprised of concrete flumes, culverts, and spillways.

A 1990 appraisal of cultural resources by the State of Hawaii (CWRM & National Park Service), recognized Moanalua Valley as possessing outstanding cultural resources based on numerous remnants of traditional Hawaiian culture and historic ruins found in the

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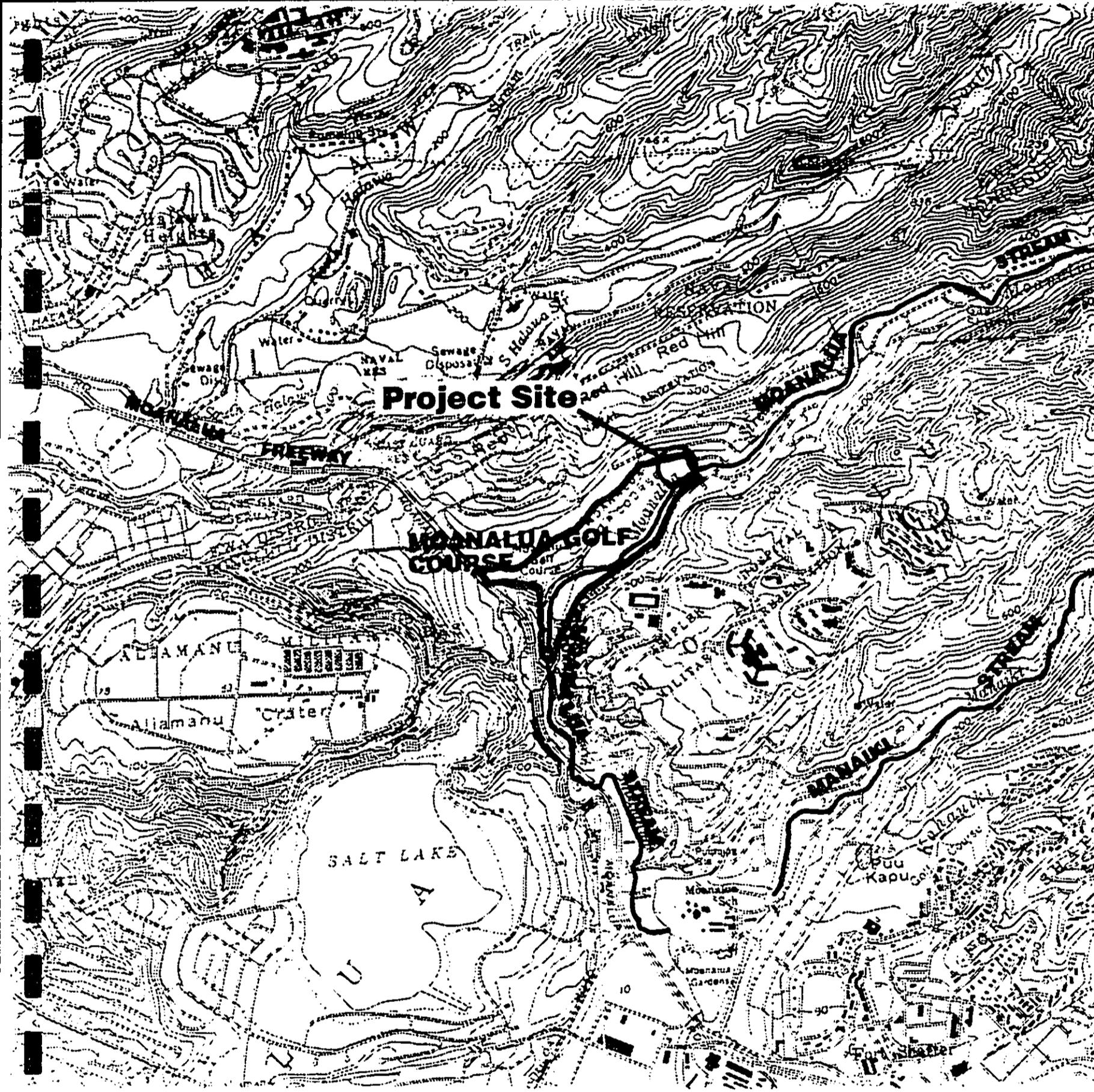
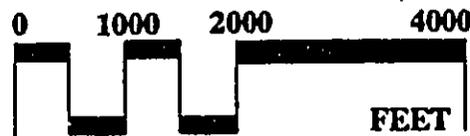


Figure 4-2
SURFACE HYDROLOGY



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middle and upper reaches of the valley. These artifacts include petroglyphs and pre-contact terraces, shrines, and house foundations, as well as bridge-work, and house ruins from the monarchy and early territorial periods.

The assessment also declared Moanalua Stream to have substantial value for recreational uses, including hiking, fishing, swimming, hunting, and nature study and viewing. The Stream was not, however, noted in the report for its riparian resources and is not considered to be a significant habitat for native aquatic biota. In the past, farmers relied on the water from Moanalua Stream for wetland crops such as rice and taro, however, such dependency no longer exists. (CWRM & National Park Service, 1990; Hallett & Chiogioji, 1994).

With respect to Moanalua Golf Course, the stream represents an important resource. It enhances the course environment aesthetically and functionally by providing an attractive fairway hazard. It also serves as a natural drainage way for runoff from heavy rains.

No wetland areas occur within the Moanalua Aquifer. Three wetland areas identified within the Honolulu Sector: Ka'au Crater, Diamond Head (intermittent), and Paiko Lagoon Wildlife Sanctuary are located in other aquifer systems and are not measurably related to the surface or groundwater hydrology of Moanalua.

4.3.4 Watershed and Aquifer Recharge

Recharge depends entirely on rainfall in the Koolau Mountains which seeps through pores, natural channels, and fissures in alluvial and lava formations, and over the alluvium to underlying water tables. Groundwater flows through the formations towards the ocean. The basal aquifer recurs as a lens shaped body of fresh water floating on salt water. Groundwater in the alluvium is perched upon clayey strata of low permeability. Although the alluvium is often very compact and relatively impervious, BWS has found through experience that yield may range up to 0.50 mgd. (BWS, 1997).

4.3.5 Project Impacts

No adverse impacts to geological formations underlying the drilling site or to the soils at the surface of the site are anticipated. Impacts to groundwater flows are expected to be insignificant.

Because the proposed well will tap alluvial based water, existing basal resources would not be affected. For this reason, it is expected that CWRM would address the two hydrologic units separately.

Surface flows are not expected to be adversely affected by the proposed project. Moanalua Stream is perched atop low permeability alluvium at an elevation of approximately 150 feet above msl (Wentworth, 1951). The Moanalua Well is proposed to be drilled and cased 250 feet deep, with its intake extending to approximately 90 feet below msl. Water withdrawn from the alluvium deposits at this depth is not expected to affect surface stream flow due to the depth of the well intake and the intervening layers of low permeability alluvium.

No wetland areas occur within the Moanalua Aquifer. The nearest wetlands, the East Loch Wetlands at Waiau, are nearly 6 miles away in the Waipahu-Waiawa Aquifer, Pearl Harbor Sector. Due to distance and intervening geology, no negative impacts to these wetlands will result from pumping activities at Moanalua.

4.3.6 Mitigation Measures

Pursuant to section 14-12.22 Revised Ordinances of Honolulu 1990, as amended, BWS will secure a permit from the City and County of Honolulu, Department of Public Works for disposing of non-potable well water discharge into the city and county storm sewer system. BWS will also obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Department of Health before discharging non-potable well effluent into State waters through the city and county storm sewer system.

Safe practices will also be employed in the disposal of all effluent. BWS will test water quality and provide a description of filtration or other treatment measures that will be used

prior to discharge if the water does not meet desired standards. In addition to quality testing, flow rates will be regulated, and the flow path, including all necessary piping, will be routed and monitored to prevent contamination of the discharge. Additionally, the use of a flexible hose to transmit discharged water will eliminate impacts caused by flushing debris.

If the test pumping results indicate that the quality or quantity of the water from the exploratory well is unsatisfactory, the well will be capped and sealed to prevent contamination of the underlying groundwater aquifers. No monitoring of the nearby concrete channelized drainage ways is required because the well operation will not affect surface flows.

4.4 NATURAL HAZARDS

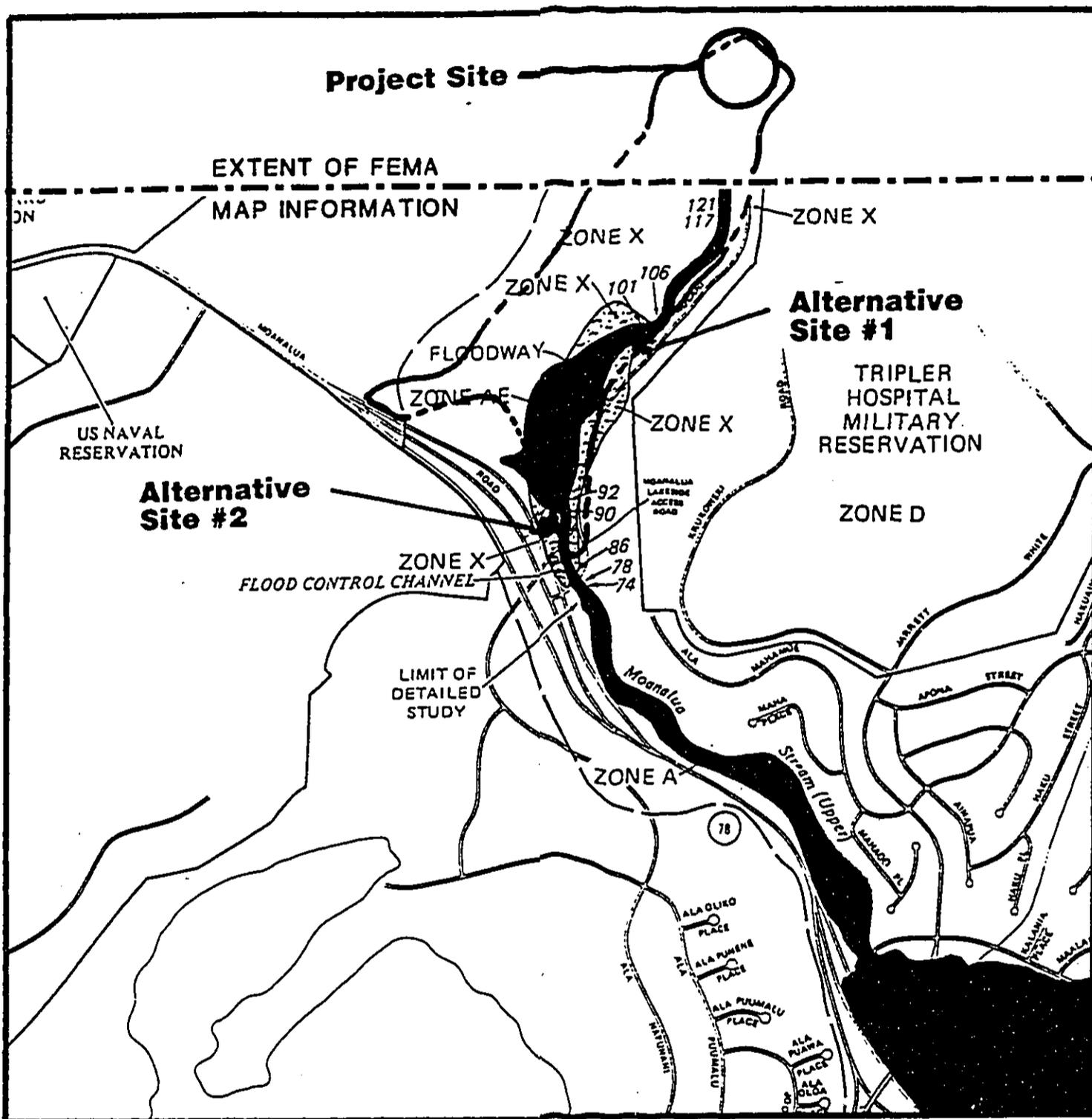
4.4.1 Flood Zones

The Federal Emergency Management Agency Flood Insurance Rate Map (FIRM) of September 28, 1990, identifies the primary project site as lying within "Zone X", an area determined to be outside of the 500-year flood plain (Figure 4-3). This designation indicates the site is not subject to floods which would impact the design or location of the project. (National Flood Insurance Program, 1987).

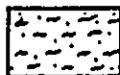
4.4.2 Seismic Activity

The Uniform Building Code (UBC) provides minimum design criteria to address potential for damages due to seismic disturbances. The UBC scale is rated from Seismic Zone 1 through Zone 4, with 1 the lowest level for potential seismic induced ground movement. Oahu has been designated within Seismic Zone 1. BWS, in the interest of public health and safety has adopted UBC Seismic Zone 3 standards for all its structures. All structures proposed for this project, therefore, will be built according to standards for UBC Seismic Zone 3.

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LEGEND

-  Areas outside of 500-year flood
-  Areas of 500-year flood
-  Areas of 100-year flood

Source: FIRM Flood Insurance Rate Map, City and County of Honolulu, Hawaii, September 1990.

**Figure 4-3
FEMA FIRM MAP**



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4.4.3 Project Impacts

Flooding will not affect the proposed project. Additionally, because seismic risk at the project site is minimal the proposed project is not likely be affected by seismic activity.

4.4.4 Mitigation Measures

All construction for this project will be in accordance with standards for Seismic Zone 3 to meet health and public safety requirements. No other mitigation measures are required or recommended.

4.5 DEMOGRAPHICS

4.5.1 Population and Housing

The Moanalua Nonpotable Well site is located within the Neighborhood Statistics Program Area Number 17 and is part of the Census Bureau's Honolulu Division Statistic (Figure 4-4). According to the 1995 State of Hawaii Databook, the Honolulu Division population decreased 0.5% between 1990 and 1994, from 377,059 to 375,300 residents. However, according to State Projections based on the 1990 U.S. Census of Population and Housing, the Honolulu Division population is expected to increase 7.2% to approximately 402,500 persons by the year 2010 (PKF Hawaii & PBR Hawaii, 1996). According to the 1990 Census, the Moanalua Neighborhood Statistics Program Area contains 3,576 households with an average household size of 3.30.

Employment in this area includes teaching, service and administrative jobs in area schools, and medical, service, and administration jobs at Kaiser Hospital and Tripler Army Medical Center. Commercial and industrial service work occurs in the Mapunapuna area, along Nimitz Highway, and at Honolulu International Airport. Additionally, there is a large military population in the area stationed at Ft. Shafter Military Reservation, Aliamanu Military Reservation, and Tripler Army Medical Center. Median household income was \$43,706 in 1990.

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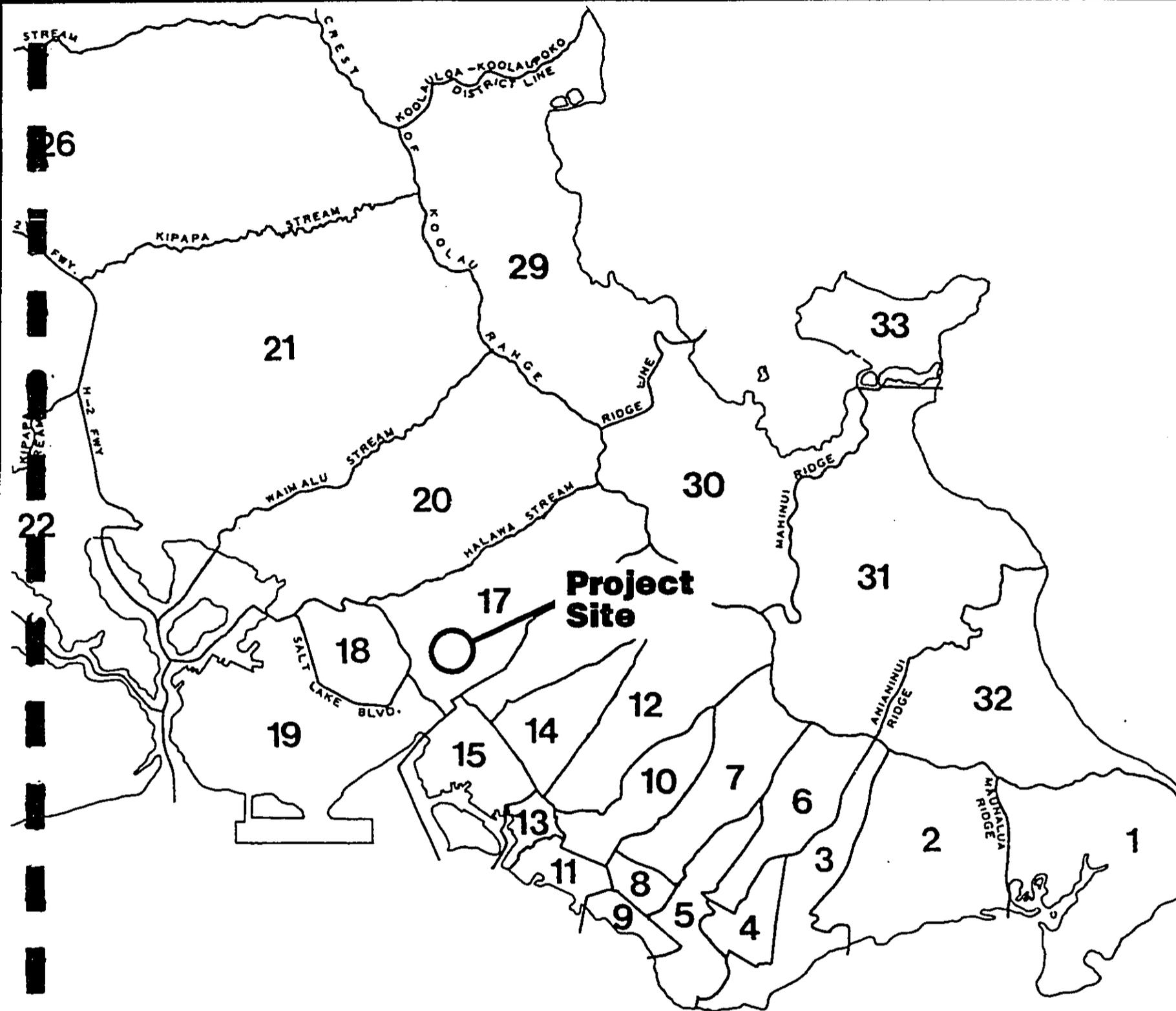


Figure 4-4
NEIGHBORHOOD STATISTICS
AREA NO. 17- MOANALUA



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According to BWS projections for future population and water demand, the increase in islandwide population will result in a commensurate increase in demand for water. According to Table 4-1, the 1990 islandwide service population of 829,738 is projected to increase by the year 2010 to 1,019,838. The Honolulu Water District, which includes the areas served by the aquifer systems of Moanalua, Kalihi, Nuuanu, Palolo, Waialae West, and Waialae East, will also experience an increase in the 1990 service population of 439,705 to a 2010 service population of 494,843. The increase in Honolulu water use will be from the 1990 demand of 86.75 mgd, to a 2010 demand of 97.63 mgd.

Table 4-1
FUTURE POPULATION AND WATER DEMAND
HONOLULU WATER DISTRICT AND OAHU: 1990 - 2010

Year	BWS Service Population		Water Use (mgd)	
	Honolulu	Oahu	Honolulu	Oahu
1990	439,705	829,738	86.75	155.57
2010	494,843	1,019,838	97.63	193.43

Source: Oahu Water Plan, BWS, 1995, and BWS, 1997.

4.5.2 Project Impacts

The proposed project is not anticipated to affect the existing population, housing, or employment of the area. However, additional water resources developed from this site would be utilized as a non-potable irrigation water in order that existing resources can more efficiently meet the demands of anticipated future population of the area.

4.5.3 Mitigation Measures

No mitigation measures are required or recommended.

4.6 ROADWAYS AND TRAFFIC

4.6.1 Site Access

Major roadways in the vicinity include Ala Aolani Street, Ala Napunani Street, and Moanalua Road. Additionally, Moanalua Freeway lies approximately 0.3 miles to the south

of the project site. Two residential streets, Ala Hekili Place and Ala Hoku Place, also flank the golf course.

Primary access to the project area is from Ala Aolani Street, which is the main thoroughfare serving the residences within Moanalua Valley. The well site itself will be reached via a chain link fence fronting Ala Aolani Street. The chain link fence is approximately ± 150 feet from the proposed well site. Alternatively, a locked gateway at the terminus of Ala Hekili Street provides immediate access to the project site.

4.6.2 Project Impacts

The project will create a slight and temporary rise in heavy truck traffic. No significant or long-term impacts to Ala Aolani Street, Ala Hekili Place, or golf course service paths are expected from this project.

4.6.3 Mitigation Measures

To minimize traffic impacts to the nearby residents, the contractor will schedule heavy truck activity between the hours of 8:30 am and 2:30 pm on weekdays and will suspend activity on weekends and State holidays. The contractor will also schedule heavy truck traffic to avoid using Ala Aolani Street and the adjoining intersection with Moanalua Road and Ala Napunani Street as much as possible during the morning or afternoon peak periods.

4.7 VISUAL AND RECREATIONAL RESOURCES

4.7.1 Scenic Resources

The proposed project, when completed, will be comprised of a pump housing and appurtenances installed at the north-eastern boundary of the Moanalua Golf Course. This location is expected to result in little to no visual impacts:

- Facing south from the project site, the area opens up into golf course fairway bordered with trees including palm, Norfolk pine, and monkeypod. The

north-east edge of the project site abuts a chain-link fence and barrier of vegetation separating the golf course from adjacent residences on Ala Hekili Place. Aside from the open expanse of the fairway, the project location offers limited views of the ridge line bordering Moanalua Valley.

- Views toward the project site from Ala Aolani Street and Ala Hekili Place are blocked by the existing border of vegetation. The project site will be visible from elevated residences along Ala Hoku Place on the north-west side of the golf course, however the site does not intrude upon the main view plain from these locations.

4.7.2 Recreational Resources

The proposed project is located on the grounds of the semi-private Moanalua Golf Course. The course occupies approximately 59 acres and offers nine holes of play to golf club members and the public. The course is not used for any other recreational purposes.

4.7.3 Project Impacts

No significant negative impacts to existing views or recreational activities are expected:

- The project site is separated from Ala Aolani Street and Ala Hekili Place by bordering vegetation and no negative visual impacts are expected from those locations;
- The project site is easily observed from the golf course fairway and from some of the residences along Ala Hoku Place. Any work activities, including minor excavation, installation of a drilling rig and pump, and performance of draw down tests, will be noticeable from those locations, but will not intrude on primary view plains;

- The proposed site claims a portion of the golf course border landscape in a location that does not obstruct or visually interfere with the course of play on the fairway or greens;
- The temporary appearance of construction equipment and work crews should not interrupt golf activities;
- Work crews and vehicles required to transit the area and access the project site would be accommodated at the drilling location only to the extent required for scheduled project operations;
- Noise and air quality impacts on golf course users and nearby residences will be addressed by ensuring use of appropriate construction practices and mitigation measures discussed elsewhere in this Chapter.

4.7.4 Mitigation Measures

No further mitigation measures are required or recommended for the well project. The exterior design of the well site may be guided by the City to ensure appropriate theme, materials, color, and landscaping.

4.8 CULTURAL RESOURCES

4.8.1 Archaeological Resources

In 1994, Cultural Surveys Hawaii prepared a cultural and archaeological assessment of the *Ahupua'a* of Moanalua, including the area currently occupied by the Moanalua Golf Course (Hallett & Chiogioji, 1994). The assessment involved a review of traditional accounts, historical documentation, archaeological studies, and other research related to Moanalua *Ahupua'a*. The assessment revealed a rich tradition and history associated with Moanalua Valley, including significant pre- and post-contact habitation and use.

Numerous archaeological sites are recorded in the upper reaches of the valley, including terraces, house platforms, and petroglyph rocks. Other previously recorded sites within the *ahupua'a*, including four *heiau* noted by Gilbert McAllister in 1933, have been lost and presumably destroyed. At present, no evidence or artifact of traditional Hawaiian use is known from the near vicinity of the project site.

The proposed project site itself is located on land that has been heavily modified by various developments and uses over the decades, including commercial cultivation, use as a polo field, a one-time airstrip, and the present use as a golf course (Mark Gomes, Moanalua Golf Course Superintendent, personal communication 7/97). The surrounding area has likewise been extensively altered by residential development. If any cultural artifacts or remains existed at the site, it is most probable that such remains would have been recovered or destroyed during development activities.

4.8.2 Project Impacts

No impacts to archaeological or cultural resources are anticipated from project activities because of the extensively modified landscape at the proposed well site.

4.8.3 Mitigation Measures

There is always the possibility that previously unknown or unexpected subsurface cultural features, deposits, or burials may be encountered. To ensure that no subsurface cultural features will be destroyed during project construction, all work within the project area will be monitored. In the unlikely event that archaeologically significant remains are encountered, work will cease in the immediate area and the DLNR, State Historic Preservation Division should be notified at (808) 587-0047 to determine significance and treatment of any findings.

4.9 BIOLOGICAL RESOURCES

4.9.1 Flora

Native vegetation at the primary project site has long since been replaced by introduced grasses and plants used in golf course landscaping. The majority of the site is covered in

Bermuda grass (*Cynodon dactylon*) that comprises the fairway and golf course border areas. Additionally, various common tree species, such as Norfolk pine, eucalyptus, and several types of palm, have been planted around the primary site to give the course greater definition. Plants originating from adjacent residences include banana, palm, ti, and other fruits and ornamentals common to Hawaii.

A notably different environment exists at the second alternate site, which is located in an area on the golf course property that is untended and overgrown with introduced weeds. Plants noted at this site include such species such as koa haole, Guinea grass, castor bean (*Ricinus communis* L.), Philippine violet (*Barleria cristata*), and spiny amaranth (*Amaranthus spinosus*), as well as coconut palm (*Cocos nucifera*) and avocado.

None of the plants found during the field study are listed, proposed, or threatened and endangered species (U.S. Fish and Wildlife Service, 1996); nor is any plant considered rare and vulnerable (Wagner *et al.* 1990).

4.9.2 Fauna

Urban development around the project site has almost entirely replaced the native fauna and their associated habitats. No threatened or endangered fauna are known to inhabit the site. Common introduced bird species such as House Sparrow (*Passer domesticus*), Spotted Dove (*Streptopelia chinensis*), Zebra or Barred Dove (*Geopelia striata*), Java Sparrow (*Padda oryzivora*) and the Red-vented Bulbul (*Pycnonotus cafer*) have been observed in the area around the project site. Two native bird species are known from the area as well, the Pacific Golden-Plover (*Pluvialis fulva*) and the Ruddy Turnstone (*Arenaria interpres*). These two migratory shore birds occupy open lawn habitat. Neither are listed as endangered or threatened. Mammals such as the Small Indian Mongoose (*Herpestes auropunctatus*), stray cats (*Felis catus*), and rodents including the Roof Rat (*Rattus rattus*) and Norway Rat (*Rattus norvegicus*) may also inhabit the surrounding area.

None of the fauna known from the project site and vicinity are listed, proposed, or threatened and endangered species (U.S. Fish and Wildlife Service, 1996). All species noted

above are common and occur widely throughout central Oahu. Endangered native species that do, on rare occasions, occur in lowland areas of Oahu, including the Hawaiian Hoary Bat (*Lasiurus cinereus semotus*), Short-eared Owl or Pu'eo (*Asio flammeus sandwichensis*), and the White Tern (*Gygis alba rothschildi*), are highly unlikely to visit the proposed project site or its vicinity. (Bruner, July 1994).

4.9.3 Project Impacts

Given the above findings, the proposed project will not have a significant negative impact on botanical or faunal resources. Project activities may alter the local distribution and abundance of birds using the land, but will not impact the overall abundance of these species on Oahu. There are no reasons to impose restrictions, conditions, or impediments to the proposed project based on conditions of natural biological resources at the site.

4.9.4 Mitigation Measures

No mitigation measures are required for botanical or faunal resources.

4.10 AIR QUALITY

4.10.1 Air Quality

Air quality on Oahu is generally good due to regular presence of tradewinds. The proposed project location is exposed to northeast trades funneling down Moanalua Valley. The project site, located adjacent to Ala Aolani Street and approximately 0.3 miles from the Moanalua Freeway, may be exposed to vehicular exhausts during the peak morning and afternoon traffic periods. However, the regular influence of tradewinds should minimize any potential for concentrated vehicular exhaust levels.

4.10.2 Project Impacts

Air quality is not expected to be adversely affected by the proposed project. Clearing and grading will involve use of heavy construction equipment which may generate fugitive dust. Exhaust emissions will also be produced from project machinery and vehicles. However, these effects will be temporary and of short duration.

4.10.3 Mitigation Measures

During development of the well the construction contractor will be required to comply with State Department of Health regulations governing air quality (HAR, Title 11, Chapter 59 and 60, Air Pollution Control). This will include proper maintenance of internal combustion equipment and related use and storage of all petroleum, oils, and lubricants.

Clearing and grading will involve use of heavy construction equipment which may also generate fugitive dust. The contractor will control dust by use of screens, regular watering for dust control, or by other means as required. It is anticipated that given the small scope of the proposed project that impacts due to dust and vehicular exhausts will be minor and of short duration.

4.11 NOISE

4.11.1 Noise

Regulation of noise in residential areas of Oahu are governed by the State Department of Health, HAR, Title 11, Chapter 53, Noise. Allowable day and nighttime noise standards for sensitive receptors have been established for residential, preservation, hotel, apartment, and business districts. Existing noise levels at the site are relatively low due to the existing residential zoning near the site. The maximum allowable day and night noise levels in the R-5 zoning district are as follows:

<u>Time</u>	<u>Allowable Levels</u>
7:00 am to 10:00 pm	55 dBA
10:00 pm to 7:00 am	45 dBA

4.11.2 Project Impacts

Noise will be generated by construction during clearing, grading, bulldozing, and installation of well equipment. Additional noise levels may be generated by vehicular travel along Ala Aolani Street and the Moanalua Freeway during the early morning and afternoon rush hours. These impacts, however, are expected to be relatively minor and only of short duration.

4.11.3 Mitigation Measures

Mitigation measures to address noise impacts include use of construction equipment appropriate to the residential surroundings of the area, e.g., no heavy field equipment larger than necessary; use of mufflers on construction vehicles; maintaining all equipment in good working order; and, limiting construction to weekdays during daylight hours between 7:30 am and 3:30 pm as required by BWS. No work shall be scheduled on weekends or on federal or state holidays.

Pump and drill equipment will be regulated for noise by DOH. Drills and surface pumps will be fitted with sound attenuation devices including, but not limited to, mutes or structural enclosures. Subsurface pumps will be similarly treated to reduce noise levels to below the regulatory limit.

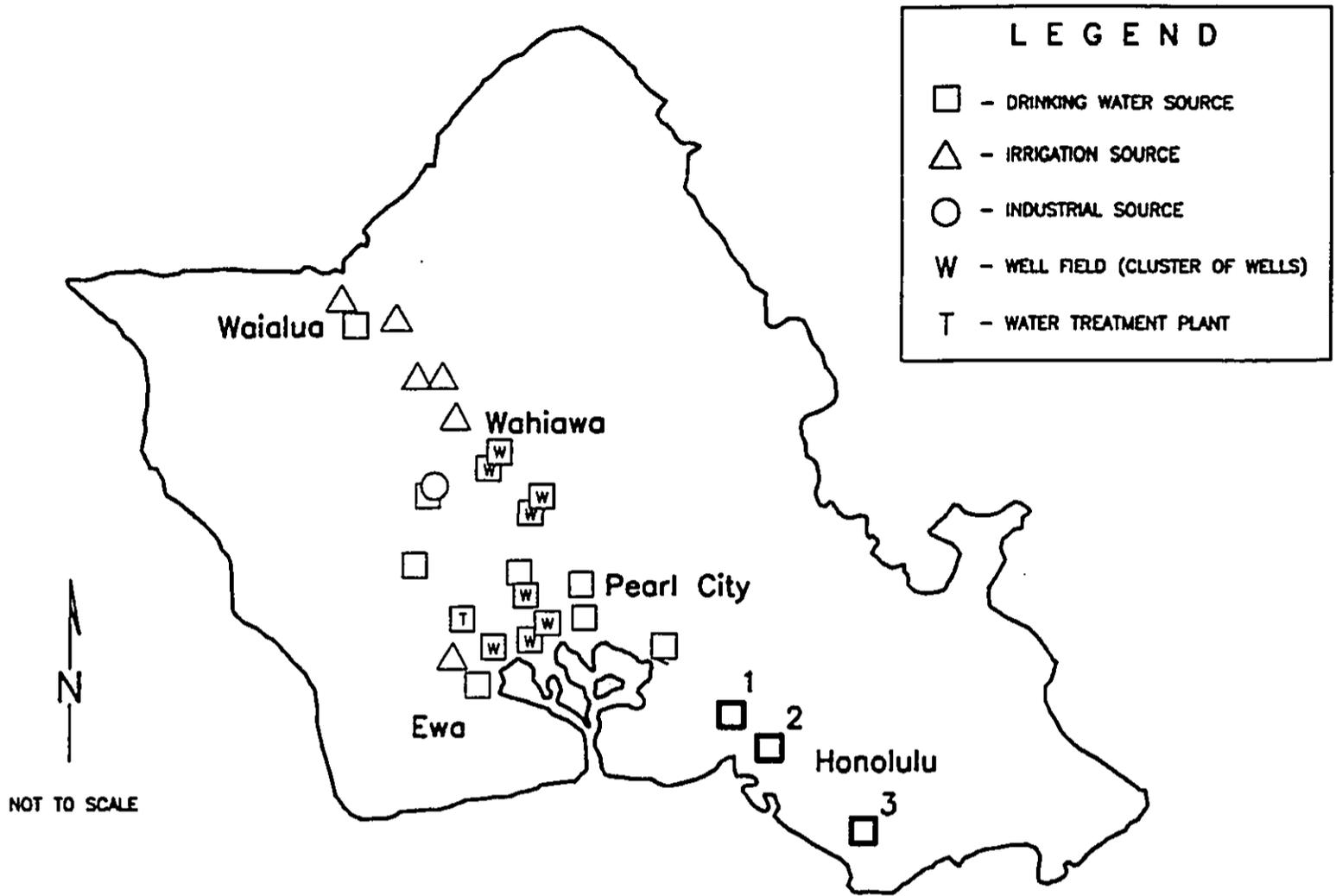
4.12 CONTAMINATION SOURCES

4.12.1 Known Contamination

According to CWRM's *Water Quality Plan* (1990), traces of Dieldrin, a substance found in pesticides, were detected in groundwater sources in the Moanalua and Kalihi Aquifers of the Honolulu WMA. In both cases, the amount detected, 0.009 and 0.008 parts per million (ppm) respectively, exceeded the applicable DOH safe drinking water guideline for this substance of 0.002 ppm (this guideline has since been revised upward by DOH to 0.005 ppb).

Trichloroethylene (PCE), a substance used in solvents and dry cleaning agents, was also detected in drinking water sources in the Honolulu WMA (Figure 4-5). However, the amount detected, 0.030 parts per billion (ppb), is considerably lower than safe drinking water standards for this substance, 5.00 ppb, and is not considered significant.

No other substances were reported in the Honolulu WMA.



THIS MAP CONTAINS THE LAST CONFIRMED RESULTS FROM CONTAMINATED GROUNDWATER WELLS

NO.	CONTAMINANT	DETECTED LEVEL (in ppb.)	APPLICABLE DRINKING WATER GUIDELINE* (in ppb.)
1	DIELDRIN:	0.009	0.002 10(-6)
2	DIELDRIN:	0.008	0.002 10(-6)
3	PCE:	0.030	5.000 pMCL

NOTES: Due to the number of wells in close proximity to each other, some sites are represented by wellfields and may contain several wells.

Possible natural contaminants such as nitrates have not been included.

*This guideline has been revised upward by DOH to 0.005 ppb (DOH, 1997).

**Figure 4-5
GROUND WATER CONTAMINATION**

SOURCE: Water Quality Plan, Hawaii Water Plan. Commission on Water Resource Management, State of Hawaii, June 1990

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August 1997

A search of the Department of Health, Underground Storage Tank Leak Log found no events near the project that would negatively impact groundwater quality. The Moanalua Aquifer has had no known contamination problems caused by saltwater intrusion.

4.12.2 Potential Sources of Contamination

The proposed project site is located on the Moanalua Golf Course. Although no sources of contamination are known to be present, the project area is occasionally treated with lawn fertilizers as part of routine groundskeeping. Further, a residential community lies adjacent to the project site. It is therefore possible that small amounts of contaminants from fuel, oil, solvents, cleaning agents, or other substances may have washed into the golf course and be present in the soil in localized areas. BWS testing for potential groundwater contaminants will be a normal part of the proposed well testing.

4.12.3 Project Impacts

The proposed project is not expected to result in contamination of the BWS municipal water system. Likewise, project operations, including drilling, heavy equipment use and vehicle use, is not expected to contaminate the site grounds.

4.12.4 Mitigation Measures

All water pumped from the Moanalua Well will be tested to non-potable, irrigation standards. If the water does not meet standards for irrigation quality according to HAR, Section 11-20-29, the well shaft will be sealed and capped. If the well is converted to permanent production, standards for irrigation water quality will be maintained through regular monitoring.

Chapter 5

RELATIONSHIP TO LAND USE DESIGNATIONS AND CONTROLS

5.1 HAWAII STATE PLAN

The Hawaii State Plan, Chapter 226, Hawaii Revised Statutes (HRS), serves as a written guide for the future long range development of the State. The Plan identifies goal, objectives, policies, and priorities for the State.

The proposed project would be in conformance to the State Plan objectives and policies for facility systems - in general,

“(a) Planning for the State’s facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.”

“(b) To achieve the general facility systems objective, it shall be the policy of this State to: (1) Accommodate the needs of Hawaii’s people through coordination of facility systems and capital improvement priorities in consonance with state and county plans,” and “(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user” (HRS, Section 226-14).

The project would also conform to HRS, Section 226-16, water,

“(a) Planning for the State’s facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities” (HRS, Section 226-16).

5.2 STATE LAND USE LAW

The property is designated within the State Urban District. Uses proposed under the development would be consistent with objectives and policies of the State Land Use Law, Chapter 205, Hawaii Revised Statutes.

The State Urban District permits the development of infrastructure necessary to the maintenance of health and basic human welfare.

5.3 CITY AND COUNTY OF HONOLULU LAND USE DESIGNATIONS AND CONTROLS

According to the City and County of Honolulu, Development Plan Public Facilities Map, the subject parcel is designated P-2, General Preservation District on the City's Zoning Map (Figure 5-1). Surrounding land use is R-5 and R-7.5, Residential, and A-2, Apartment. The public facility use of the site is consistent with the City Land Use Ordinance (LUO) which identifies the project as a Utility Installation, Type A, which is a permitted use in the P-2 zoning district. According to the LUO:

"Type A utility installations are those with minor impact on adjacent land uses and typically include: 46 kilovolt transmission substations, vaults, water wells and tanks and distribution equipment, sewage pump stations, and other similar uses" (Land Use Ordinance, City and County of Honolulu, April 1995).

A Development Plan Public Facilities Map Amendment, will need to be filed by BWS. This amendment will require an application to the City and County of Honolulu, Department of Planning and Permitting, with approval by the Honolulu City Council.

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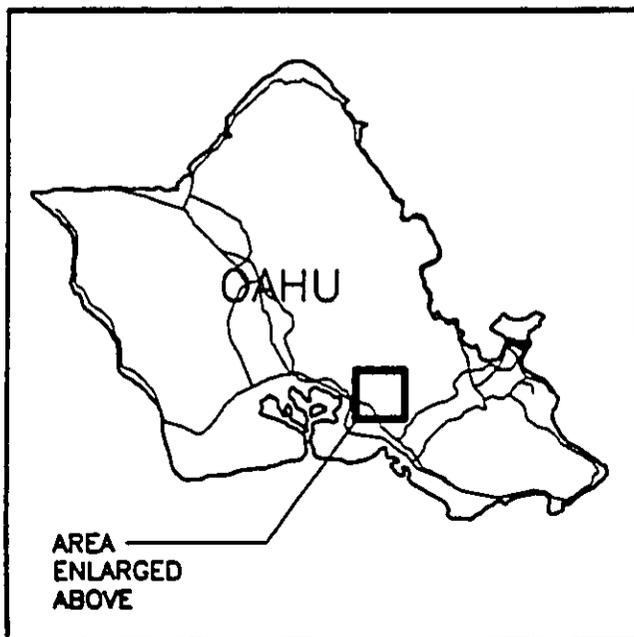
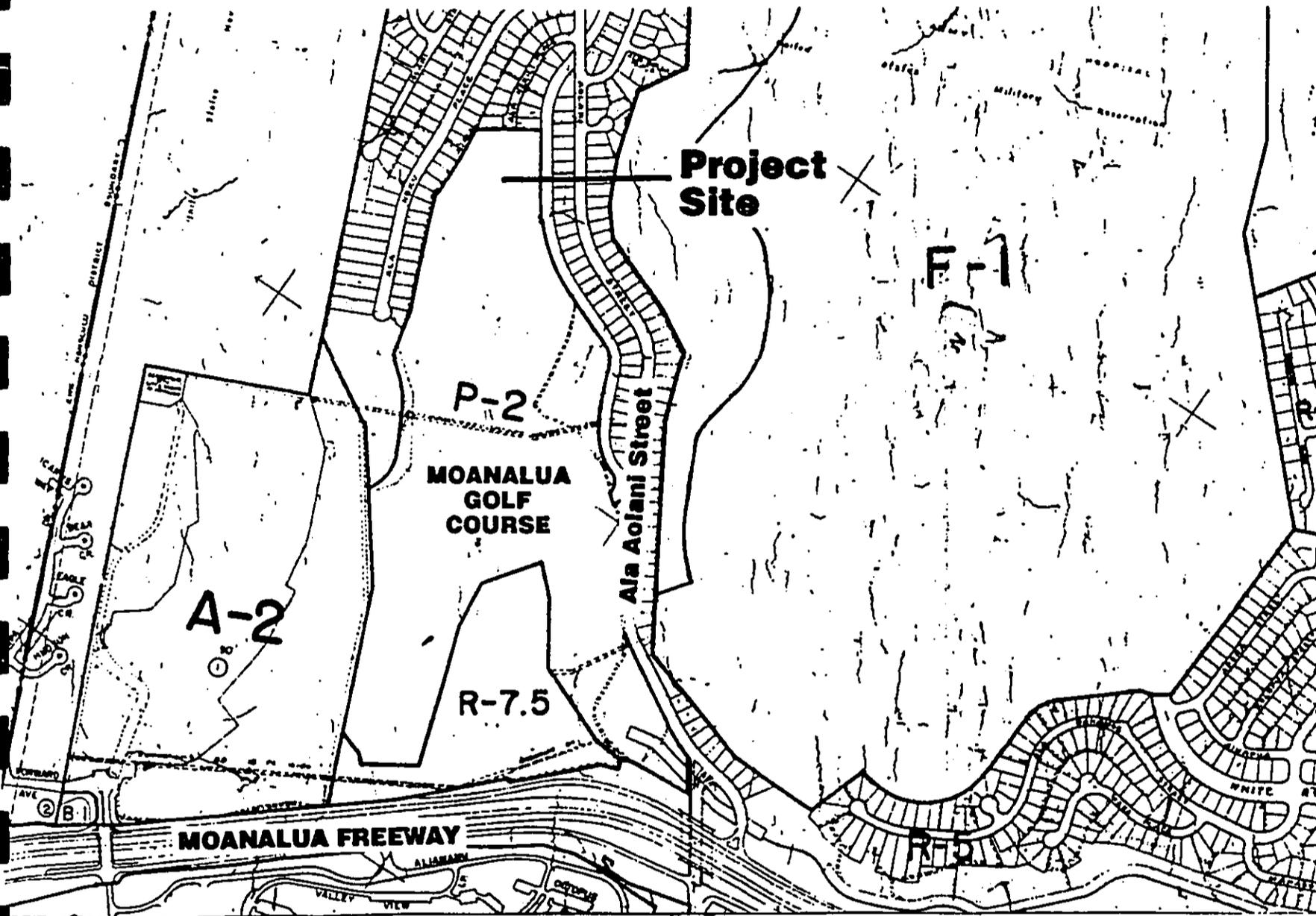


Figure 5-1
PROJECT ZONING



Not to Scale

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MOANALUA WELL
City and County of Honolulu

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August 1997

Chapter 6

ALTERNATIVES TO THE PROPOSED ACTION

6.1 NO ACTION ALTERNATIVE

BWS has a legal requirement to provide potable water to the residents of the City and County of Honolulu. The proposed project would help to meet this requirement while the no action alternative would prevent BWS from doing so. The no action alternative:

- does not address the mandate of BWS to develop safe and adequate water resources for the residents of the City and County of Honolulu; and,
- would result in the lost opportunity to increase Oahu's existing potable and non-potable water resources. The development of non-potable water resources at the Moanalua site would free up potable resources that are currently being used for irrigation purposes, thus contributing to the potable water supply for all Oahu residents.

6.2 DELAYED ACTION

Development of the proposed site at a later date was not considered to be viable. BWS has programmed development of the Moanalua Well as part of its overall strategy for ensuring availability of potable resources. The delayed action alternative:

- would delay the BWS implementation schedule and result in little to no change in the potential environmental impact of the project;
- would result in higher future costs due to inflation; and,

- increase the risk that population growth will generate water demands in excess of available, developed supplies.

6.3 ALTERNATIVE SITES

The Moanalua Nonpotable Well is one of several future proposed wells which are part of the BWS program for supply development. Although BWS has identified additional locations for possible new wells, the Moanalua Nonpotable Well site was determined to be the most viable location for development at this time. As required, other future proposed wells will be developed for the Honolulu Sector as needed.

In addition to the primary project site, BWS selected two alternative sites with potential for non-potable water development. Both sites are located on the grounds of the Moanalua Golf Course and were selected as back-up sites to the preferred, primary exploratory well location.

The first alternative site is located along the south-east border of the golf course immediately makai of the point where Moanalua Stream swings westward and enters the golf course grounds. The project site occupies approximately 10,000 square feet. It is bordered by Ala Aolani Street on the south-east side, Moanalua Stream on the mauka side, with a golf cart path and portion of fairway makai and west of the site. The nearest residences sit approximately 150 feet away to the east across Ala Aolani Street.

This site is similar to the primary site in that it is landscaped, with manicured Bermuda grass covering the ground around the location. The stream, along this section, is concrete-lined and channelized. A chain link fence and barrier of oleander bushes separates the golf course from Ala Aolani Street. A locked gate in the fence provides immediate access to the site, though access is also available via a service road originating from the golf course club house. An additional feature is the presence of a water backflow protector, consisting of exposed piping enclosed in a small chain link fence that covers approximately 40 square feet.

The second alternative site is located in an untended area of the golf course property, adjacent to the intersection of Ala Aolani, Ala Napunani, and Moanalua Road. The site occupies approximately 10,000 square feet of slightly sloping land. It is bordered along the eastern side by a steep embankment that drops off to the concrete-lined Moanalua Stream channel. To the north, the site opens up towards golf course fairway and greens, while the western border ascends approximately 40 feet up an overgrown embankment to Moanalua Road.

The nearest residences are approximately 200 yards east of the site, across the intersection of Ala Aolani and Ala Napunani. A low-density apartment building is situated about one-quarter mile away to the north-west. The surroundings are overgrown with common introduced weeds, including koa haole, Guinea grass, castor bean (*Ricinus communis* L.), Philippine violet (*Barleria cristata*), and spiny amaranth (*Amaranthus spinosus*). Coconut palm (*cocos nucifera*) and avocado are also found in the area.

6.4 ALTERNATIVE SOURCES

Source alternatives to development of irrigation water are relatively limited. Moanalua Stream which flows through the golf course has been recorded with an average flow of 3.26 mgd during the period 1926 to 1968 (CWRM, 1990). Recent site visits to the stream, however, indicate relatively low flows of approximately $\pm 200,000$ gallons per day along various portions of the stream as it passes through the golf course². These flows did not appear to be sufficient for sustained stream flow and irrigation requirements.

Any potential direct withdrawals from the stream would most probably affect stream flows at the point of withdrawal as well as downstream. Potential impacts associated with stream withdrawals would include, but not be limited to the following:

Based on site visits in July, 1997. Observed stream flow based on 4" depth x 12" width, and lineal stream flow of approximately 1 foot per second across concrete channelized sections.

- Impacts to area flora and fauna resources which depend on the stream, including plants, fishes, amphibians, aquatic invertebrates, and insects; and,
- Impacts to competing users downstream or adjacent to stream tributaries.

Regulatory requirements for use of the stream would also require filing of the following additional permits, administered by CWRM, DLNR:

- Stream Channel Alternation Permit
- Stream Diversion Works Permit
- Request for Amendment to the Interim In-Stream Flow Standards

A second source alternative involves use of the Kalauao Spring nonpotable system (Figure 6-1). The Kalauao Spring system could be extended from Halawa Valley to the golf course and other users in the vicinity. Capacity is available and an existing Halawa pipeline transmission tunnel under Red Hill could be utilized. The Kalauao Spring system was constructed in the early 1990s and provides nonpotable irrigation water to Honolulu International Airport, Aloha Stadium, and the Halawa Quarry. This alternative is not now practical for development due to costs associated with further development of the nonpotable system, as well as existing use of the Halawa transmission tunnel for potable purposes. This alternative, however, may be reexamined as further demands are placed on Oahu's limited groundwater resources.

No other source alternatives were considered for development.

Although not now feasible, alternatives to potable groundwater will grow in importance as existing aquifer resources approach the limits of their sustainable yield. It is possible that one day, technology improvements will permit development of these alternatives to supplement Oahu's potable groundwater resources. In so doing, alternative source development will help to protect and preserve the future of Oahu's potable aquifer resources.

Conservation efforts will continue to play a key role in helping to reduce demand on existing groundwater supplies. Conservation alone, however, cannot be relied upon to meet all of Oahu's future water demands. Until such time that alternative source development can reliably and economically supplement existing resources, conservation in conjunction with the development of potable groundwater will remain the preferred BWS management strategy.

6.5 RECOMMENDED ACTION

The recommended action is to proceed with development of the proposed project at Moanalua, Honolulu, Oahu. The proposed project is part of the BWS program for source development and has been carefully considered to meet the future water needs of the City and County of Honolulu.

Chapter 7

**RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF
THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-
TERM PRODUCTIVITY**

Development of the proposed project will commit the necessary human effort, and construction and fiscal resources. Use of these resources will benefit residents and visitors to the City and County of Honolulu by ensuring safe and clean potable water.

Long-term gains resulting from the proposed project include the long term use and benefits accruing from this resource. The proposed project, therefore, will assist in meeting increased population demands and will enhance economic productivity by making possible future development.

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Chapter 8

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES BY THE PROPOSED ACTION

Development of the proposed project will involve the irretrievable loss of certain environmental and fiscal resources. However, the costs associated with the use of these resources should be evaluated in light of recurring benefits to the residents of Honolulu.

It is anticipated that the construction of the proposed project will commit the necessary construction materials and human resources (in the form of planning, engineering, construction and labor). Reuse for much of these resources is not practicable. Although labor is compensated during the various stages of development, labor expended for project development is non-retrievable.

Chapter 9

NECESSARY PERMITS AND APPROVALS

9.1 DEPARTMENT OF HEALTH

A National Pollutant Discharge Elimination System (NPDES) permit is required for the discharge of non-potable well effluent into State waters through the City and County storm sewer system.

Development of the well will require filing of a Noise Permit from the State Department of Health (DOH), Noise and Radiation Branch. No other DOH permits for the well are expected.

**9.2 DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT (CWRM)**

The Commission on Water Resource Management (CWRM) will require Well Construction and Pump Installation permits. Both permits will be for work including the pump test. Once exploratory work is completed the production well will require a permanent Pump Installation Permit and Water Use Permit.

- The permanent Pump Installation Permit would be required if a change in pumps is needed (e.g., change in drawdown capacity or type, surface or submersible) during conversion from exploratory to production status. If a change in pumps is not needed, this permit would not apply.
- The Water Use Permit would be required to demonstrate there is sufficient available capacity within the Moanalua Aquifer to support the well. Both permits will need to be filed and approved by CWRM.

9.3 CITY AND COUNTY OF HONOLULU

Successful completion of exploratory well tests will lead to conversion into a *production* well which will require that an application be filed for a Development Plan Public Facilities Map amendment from the City and County of Honolulu, Department of Planning and Permitting. Review and approval for this permit is from the Honolulu City Council.

Pursuant to section 14-12.22 Revised Ordinances of Honolulu 1990, as amended, BWS must also obtain a permit from the City and County of Honolulu, Department of Public Works for disposal of non-potable well effluent into the city and county storm sewer system. As noted, the related discharge of non-potable well effluent into State waters through the county storm sewer system will require a National Pollutant Discharge Elimination System (NPDES) permit from the Department of Health.

9.4 PRIVATE EASEMENT, LICENSE, RIGHT OF ENTRY

9.4.1 Right-of-Entry

Prior to conducting site work, BWS will request a right-of-entry from the Moanalua Golf Club, the owner of the project site, to perform the test drilling operations.

9.4.2 Easement

If the well tests prove successful and BWS determines that a production well is feasible, a utility easement will be sought for installation of the permanent well and appurtenances.

Chapter 10

FINDINGS AND REASONS SUPPORTING DETERMINATION

In accordance with the provisions set forth in Chapter 343, Hawaii Revised Statutes, and the significance criteria in Section 11-200-12 of Title 11, Chapter 200, this assessment has determined that the project will have no significant adverse impact to water quality, air quality, existing utilities, noise, archaeological sites, or wildlife habitat. All anticipated impacts will be temporary and will not adversely impact the environmental quality of the area. According to the significance criteria:

1. *Irrevocable commitment to loss or destruction of any natural or cultural resources*

The proposed project is not anticipated to adversely impact any natural or cultural resources. The proposed well site is located in an area which has been previously disturbed to accommodate clearing, grading, and construction of a golf course. If any potential remains exist at the site, such remains would have been recovered or destroyed during prior development activities. For this reason, no significant archaeological or cultural sites are anticipated to be discovered. However, in the unlikely event that any remains or artifacts are encountered, work is to immediately cease and the DLNR, Historic Preservation Division notified at (808) 587-0047, to determine significance and treatment.

2. *Curtailement of range of beneficial uses of the environment*

The location of the well is on an land used for an existing golf course. The existing use of the site will facilitate well development activities and is not expected to curtail existing surrounding land uses including the Moanalua Valley residential neighborhood.

3. *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 project is consistent with the environmental polices, goals and guidelines as delineated in Chapter 344, HRS, and the National Environmental Policy Act.

4. *Substantially affects the economic or social welfare of the community or state*

The proposed project is intended to ensure the long-term provision of clean, potable water necessary for the future health, welfare, and growth of the community. The project will fulfill this objective by substitution of potable water with nonpotable water for irrigation purposes.

5. *Substantially affects public health*

The proposed project will be developed in accordance with federal, state, and City and County of Honolulu, rules and regulations governing public safety and health. Potential sources of adverse impacts have been identified and appropriate mitigative measures developed. The primary public health concerns will involve air, water, noise, and traffic impacts. However, it is expected that these impacts will be minimized or brought to negligible levels by appropriate use of the mitigation measures described in this document.

6. *Involves substantial secondary impacts, such as population changes or effects on public facilities*

The proposed project is part of the BWS program for development of water sources to serve the present and future needs of the surrounding Moanalua neighborhood and region. The project itself, however, will not generate new population growth.

7. *Involves a substantial degradation of environmental quality*

The proposed project will be developed in accordance with the environmental policies of Chapter 343, HRS, and the National Environmental Policy Act. The analysis provided in this Environmental Assessment indicates that no environmental degradation is anticipated.

8. *Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions*

The proposed project is intended for irrigation use by surrounding area users. CWRM, which regulates Hawaii's water resources, will ensure that permitted withdrawals from resources such as the Moanalua Aquifer System are within and do not exceed the available sustainable yield.

9. *Substantially affects a rare, threatened or endangered species or its habitat*

There are no endangered flora or fauna species within or surrounding the project site.

10. *Detrimentially affects air or water quality or ambient noise levels*

Any potential impacts to air, water quality, or noise levels will be addressed by use of appropriate measures described in the document.

11. *Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters;*

The proposed project is located in an area appropriate for installation of a well. The project site does not possess any sensitive characteristics that would detract from or adversely impact the surrounding environment.

12. *Substantially affects scenic vistas and view planes identified in county or state plans or studies*

No adverse impacts to scenic vistas or view planes are expected. The well, when installed, will be of relatively low height and will not adversely impact existing views surrounding the site.

13. *Requires substantial energy consumption*

Sufficient energy will be used to construct the well. Energy will also be used to transport construction equipment, materials, and personnel to the project site. None of these activities are expected to result in use of energy significantly greater than similar production well projects. The location of the well, however, will facilitate access because it is within the Honolulu region.

Based on analysis and review of the above factors, it has been determined that an Environmental Impact Statement (EIS) will not be required, and that an anticipated Finding of No Significant Impact (FONSI) be issued for this project.

Chapter 11

**ORGANIZATIONS AND AGENCIES CONSULTED IN THE PREPARATION OF THE
DRAFT ENVIRONMENTAL ASSESSMENT**

The following organizations and agencies were contacted during preparation of the Moanalua Nonpotable Well Environmental Assessments:

11.1 STATE AGENCIES

Department of Land and Natural Resources

Historic Preservation Division

Commission on Water Resource Management

Department of Health

Environmental Management Division

Office of Environmental Quality Control (OEQC)

11.2 CITY AND COUNTY OF HONOLULU

Department of Planning

Department of Land Utilization

Board of Water Supply

11.3 PRIVATE

Moanalua Golf Course

Chapter 12

**ADDITIONAL ORGANIZATIONS AND AGENCIES CONSULTED DURING THE
30-DAY DRAFT ENVIRONMENTAL ASSESSMENT COMMENT PERIOD**

The following organizations, agencies, and individuals were also notified during the 30-day Draft Environmental Assessment comment period:

12.1 FEDERAL AGENCIES

U.S. Geological Survey
U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers

12.2 STATE AGENCIES

Department of Business, Economic Development & Tourism
 Office of Planning
Department of Education
Department of Health
 Environmental Management Division
 Office of Environmental Quality Control
Department of Hawaiian Home Lands
Department of Land and Natural Resources
 Aquatic Resources Division
 Historic Preservation Division
 Commission on Water Resource Management
University of Hawaii
 Environmental Center
Office of Hawaiian Affairs

12.3 CITY AND COUNTY OF HONOLULU

Planning Department
Department of Land Utilization
Department of Transportation Services
Building Department
Board of Water Supply

12.4 PRIVATE AND COMMUNITY ORGANIZATIONS, AND ELECTED OFFICIALS

Moanalua Golf Club
Honolulu City Council
Aiea Neighborhood Board No. 20
State Senator Norman Mizuguchi
State House Representative Nathan Suzuki

0000 00 15 1867

Chapter 13
**COMMENTS AND RESPONSES TO THE DRAFT
ENVIRONMENTAL ASSESSMENT 30-DAY COMMENT PERIOD**

This section contains Draft EA comments received and responses to comments, and notices of availability of the Draft EA:

0000 00 15 1858



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPOLOAHI BOULEVARD, SUITE 600
HONOLULU, HAWAII 96813-5249
PHONE (808) 584-1888
FAX (808) 594-1845
February 06, 1998

OP
47
1998
BT

Letter to Mr. Brian Takeda
February 06, 1998
Page 2

Please contact Colin Kippen (594-1938), LNR Officer, or Luis Manrique (594-1758), should you have any questions on this matter.

Sincerely yours,

Randall Ogata
Administrator

Colin Kippen
Officer,
Land and Natural
Resources Division

Doc. No. EIS-136

Mr. Brian Takeda
R.M. Towill Corporation
420 Waiakamilo Rd., # 411
Honolulu, HI 96817-4941

Subject: Draft Environmental Assessment (DEA) for Moanalua Nonpotable Well,
Moanalua, Island of Oahu

cc: Board of Trustees

Dear Mr. Takeda:

Thank you for the opportunity to review the Draft Environmental Assessment (DEA) for Moanalua Nonpotable Well, Moanalua, Island of Oahu. The City & County of Honolulu is proposing to drill a well on Moanalua Golf Course property for future use as a non-potable production well to irrigate the course's greens and landscape areas. The estimated yield of the well is 0.2 MGD.

The Office of Hawaiian Affairs (OHA) has serious objections to the proposed well development. Using public funds, the City & County of Honolulu will develop a well intended to meet water demands of a private enterprise. OHA wonders whether the benefits listed in page 5 of the DEA truly justify the use of public funds.

Among benefits, the applicant states that (i) water from the proposed well will be used to replace a current golf course's allocation of 0.2 MGD of drinking water, and (ii) the proposed well will furnish data that will be added to Oahu's hydrogeological information data base. OHA finds these benefits marginal at best in view of the time, effort, and funds required to establish a production well. OHA urges the City & County of Honolulu to take a hard look at this project and develop alternatives with community oriented benefits. For example, OHA would find a more balanced benefit to the community if the golf course offsets the expenses of establishing the production well.

0000 00 15 1869

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2714



COPY

JEREMY HARRIS, Mayor
EODE FLORES, Jr., Chairman
FORREST C. MURPHY, Vice Chairman
KAZU HAYASHIDA
JANILLY ANN
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON
CHARLES A. STED

September 21, 1998

CLIFFORD S. JAMILE
Manager and Chief Engineer

DK	YES	NO	STG	MM	RF
RTT	gpd				
ALCD SEP 20 1998 RMIC					
OK					

Mr. Randall Ogata, Administrator
Mr. Colin Kippen, Officer
Land and Natural Resources Division
Office of Hawaiian Affairs
State of Hawaii
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813-5249

Dear Messrs. Ogata and Kippen:

Subject: Your Letter of February 6, 1998 to R. M. Towill Corporation on the Draft Environmental Assessment for the Moanalua Nonpotable Well, Oahu, Hawaii

Thank you for your comments on the draft Environmental Assessment (EA) for the proposed Moanalua nonpotable well project. We provide the following comments:

1. The Moanalua exploratory nonpotable well is expected to yield 0.2 million gallons per day and will be verified upon test pumping.
2. We understand your concerns of using public funds solely for private enterprise. However, the nonpotable well is expected to have multiple users. The Moanalua Golf Course uses about 0.075 mgd of potable water for irrigation of the nine-hole course. The remaining yield is expected to replace potable irrigation of the Moanalua Freeway landscaping, the Moanalua Gardens park and the Salt Lake regional park. Because there may be multiple users, the use of public funds have larger benefits and are appropriate. If the well has less yield than expected, the number of users and the feasibility of a production facility will be reduced.
3. If the exploratory well is successful, we will then initiate discussions with potential users to recover the cost of the infrastructure improvements. The cost of constructing a nonpotable irrigation well is much less than a potable source which must accommodate health and safety issues. Therefore, the lower capital costs for the nonpotable system and the cost recovery potential from the resale of the potable irrigation water that is made available, will offset the expenditures of public funds. Nonpotable water supply also appropriately matches lower water quality with irrigation uses and reserves high quality potable supplies for domestic consumption.



Mr. Randall Ogata
Page 2
September 21, 1998

4. As an alternative to the exploratory well, the Kalaueo Spring nonpotable system could be extended from Halawa Valley to the golf course and other users in the vicinity. Capacity is available and an existing pipeline transmission tunnel under Red Hill could be utilized. The Kalaueo Spring system was constructed in the early 1990's and provides nonpotable irrigation water to the airport, Aloha Stadium and the Halawa quarry.

If you have any questions, please contact Barry usagawa at 527-5235.

Very truly yours,

CLIFFORD S. JAMILE
Manager and Chief Engineer

cc: Brian Takeda, R.M. Towill

0000 00 15 1870



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

BENJAMIN J. CAYETANO
GOVERNOR
SELUF. HAVA
DIRECTOR
BRADLEY J. MOSSMAN
DEPUTY DIRECTOR
RICK EGGED
DIRECTOR, OFFICE OF PLANNING

OFFICE OF PLANNING

235 South Beretania Street, 6th Flr., Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Tel: (808) 587-2846
Fax: (808) 587-2824

REC'D FEB 9 6 1998 DMHC

Ref. No. P-7198

February 9, 1998

Mr. Brian Takeda
Senior Planner
R. M. Towill Corporation
420 Waiakamilo Road, #411
Honolulu, Hawaii 96817-4941

Dear Mr. Takeda:

Subject: Draft Environmental Assessment for Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

We have reviewed the draft environmental assessment and have the following comments. We understand that nonpotable water from a well to be drilled at TMK:1-1-12:13 was deemed the best alternative for supplying the Moanalua golf course with water for irrigation. Pages 5, 6, 7, S4, and S5 of the Draft Environmental Assessment (DEA) describe the alternatives considered. For your information, our Coastal Nonpoint Pollution Control Program Management Plan contains guidelines for golf course development and maintenance (Part III-B). This plan encourages the use of several best management practices for irrigation including:

1. A qualified golf course superintendent should administer the irrigation system.
2. Use appropriate methods to measure the evapotranspiration rate of water in the soil. Schedule irrigation on the basis of these measurements.
3. Encourage the use of R-1 and R-2 reclaimed water classifications, where appropriate, for irrigation.

We support the use of nonpotable water instead of potable for irrigation, where appropriate. Relative to this, the DEA should include more information as to how the golf course will implement a water conservation plan and more explanation as to why the use of R-1 or R-2 reclaimed water is not considered to be feasible or practical.

In addition, please clarify the information on page 7. In the second paragraph, the DEA states, "Potential for noise will result from cleaning, grading, [emphasis added] and use of the drill rig and pumps(s)." However, the third paragraph states, "Dust control measures are not expected to be required since grading [emphasis added] will not be necessary. . ." In addition to clarifying the extent of the grading for construction of the well, please describe the measures that will be used to control runoff from the drill rig site.

Mr. Brian Takeda
Page 2
February 9, 1998

If there are questions, please contact Steve Olive of our Coastal Zone Management Program at 587-2877.

Sincerely,

[Signature]
Rick Egged
Director
Office of Planning

0000 00 15 1871

COPY

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2716



JEREMY HARRIS, Chairman
WALTER O. WATSON, JR., Chairman
EDDIE FLORES, JR.
KAZU HAYASHIDA
JAN M. L. Y. AMMI
FOREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

BROOKS H. M. YUEN, Acting
Manager and Chief Engineer

June 26, 1998

Stamp: JUN 1 1998, with initials and a signature.

Mr. Rick Egged, Director
Office of Planning
Department of Business,
Economic Development and Tourism
State of Hawaii
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Egged:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Moanalua Nonpotable Well project.

We provide the following responses to your concerns:

1. Administration of Nonpotable Water. Should we reach an agreement with the Golf Course to develop the well, the Moanalua Golf Course Superintendent will administer the irrigation system to ensure maximum efficiency in use of the nonpotable well water. The Golf Course will be required to reimburse the Board to develop the source.
2. Efficiency of Use. We will ensure that the amount of water used for irrigation will not exceed the amount authorized by the Commission on Water Resource Management. The course superintendent will ensure that the actual amounts used will be sufficient to maintain the health and condition of the course greens, fairways, and vegetative cover.
3. Reclaimed Wastewater. Use of R-1 or R-2 reclaimed water is not considered a viable option due to transmission and logistical requirements associated with delivery. A second major consideration is the proximity of residences and vehicular and pedestrian traffic adjacent to the course. These factors would compound the ability to safely and efficiently apply reclaimed water to the course greens and fairways.
4. Use of Nonpotable Water for Irrigation. It is expected that use of the proposed nonpotable well water will conserve approximately 0.2 million gallons of potable water per day, which would be better used for domestic consumption.
5. Grading and Runoff Potential. Grading is not anticipated to be required to construct the well. Potential for runoff due to well effluent will be addressed by use of the Municipal Storm Sewer System. As noted in the project Draft EA, a City Department of Public Works discharge of effluent permit and a Department of Health National Pollutant Discharge Elimination System permit will be obtained before discharging any well related effluent.

Thank you for this opportunity to respond. If you have any additional comments, please contact Barry Usagawa at 527-5235.

Very truly yours,
Barry Usagawa
FOR BROOKS H. M. YUEN
Acting Manager and Chief Engineer

cc: Brian Takeda, R. M. Towill Corporation

0000 00 15 1872



BENJAMIN J. CATETANO
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P. O. BOX 631
HONOLULU, HAWAII 96809

February 10, 1998

FFR 17 1998

MICHAEL D. WELSON
CHAIRPERSON
ROBERT G. GALLO
DAVID A. HOSHINO
LAWRENCE H. SHINE
RICHARD H. COE
HEBERT M. RICHMOND, JR.
EDWIN T. SAKODA
ACTING DEPUTY DIRECTOR

[Handwritten signature]
[Handwritten initials]

Mr. Brian Takeda
R.M. Towill Corporation
420 Waiakamilo Rd., #411
Honolulu, HI 96817

Dear Mr. Takeda:

SUBJECT: Draft Environmental Assessment for Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

Thank you for the opportunity to review the subject document. Our comments related to water resources are marked below.

In general, the CWRM strongly promotes the efficient use of our water resources through conservation measures and use of alternative non-potable water resources whenever available, feasible, and there are no harmful effects to the ecosystem. Also, the CWRM encourages the protection of water recharge areas which are important for the maintenance of streams and the replenishment of aquifers.

- We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.
- We recommend coordination with the Land Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.
- We are concerned about the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.
- A Well Construction Permit and/or a Pump Installation Permit from the Commission would be required before ground water is developed as a source of supply for the project.
- The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit from the Commission would be required prior to use of this source.

Mr. Brian Takeda
Page 2
February 10, 1998

- Groundwater withdrawals from this project may affect streamflows which may require an instream flow standard amendment.
- We recommend that no development take place affecting highly erodible slopes which drain into streams within or adjacent to the project.
- If the proposed project includes construction of a stream diversion, the project may require a stream diversion works permit and amend the instream flow standard for the affected stream(s).
- If the proposed project alters the bed and banks of a stream channel, the project may require a stream channel alteration permit.

OTHER:

Page 12 of the report states that the well will tap into the Moanalua Alluvial Aquifer within the Honolulu Water Management Area (WMA). However, the CWRM-designated WMAs in Honolulu do not presently include an alluvial aquifer in Moanalua. Page 15 of the report states that the Moanalua basal aquifer has a sustainable yield of 18 million gallons per day (mgd). However, the sustainable yield of 18 mgd was derived using estimated recharge over the entire aquifer, including recharge over alluvial areas. Thus, should a new alluvial aquifer be delineated in Moanalua, the 18 mgd sustainable yield would need to be divided between the alluvial and basal aquifers.

Page 15 of the report correctly states that the Moanalua Aquifer System is presently over-allocated, with permitted uses totalling 18,570 mgd. Thus, no new water use permits may be approved by the CWRM unless the permitted uses are reduced or the sustainable yield is raised.

There is insufficient data to warrant an increase of the sustainable yield because, although permitted uses exceed the sustainable yield, actual uses (ie. 12-month moving average withdrawals) are only about 14.70 mgd. Further, we do not have a deep monitor well in Moanalua to monitor the aquifer's response to pumpage, even if system withdrawals had exceeded 18 mgd in the past.

If there are any questions, please contact Lenore Nakama at 587-0218.

Sincerely,

[Handwritten signature: Edwin T. Sakoda]
EDWIN T. SAKODA
Acting Deputy Director

0000 00 15 1873

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2714



COPY

JEREMY HARRIS, Mayor
EDDIE FLORES JR., Chairman
FORREST C. MURPHY, Vice Chairman
KAZU HAYASHIDA
JANIMILY ANN
JOHNTAVAKI SHELADA, PhD
BARBARA VAN STANTON

September 21, 1998

SEARCHED	INDEXED
SERIALIZED	FILED
RIT	
REC'D SEP 20 1998 RMT/C	
CLIFFORD S. JARVIS Manager and Chief Engineer	

Mr. Edwin T. Sakoda, Director
Commission on Water Resource Management
Department of Land and Natural Resources
State of Hawaii
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Sakoda:

Subject: Your Letter of February 10, 1998 to R. M. Towill Corporation on the Draft Environmental Assessment for the Board of Water Supply's Proposed Moanalua Nonpotable Well, Moanalua, Oahu, TMK: 1-1-12: 13

Thank you for reviewing the Draft Environmental Assessment for the proposed Moanalua Nonpotable Well project.

We provide the following response to your concerns:

1. If the proposed exploratory well project is developed into a production well, it will be integrated into the County's Water Use and Development Plan.
2. We acknowledge that a Well Construction and Pump Installation Permit will be required prior to developing the site as a source of nonpotable water supply. A water use permit will also be needed to utilize this source.
3. We understand that the Commission on Water Resource Management (CWRM) does not distinguish between perched, alluvial aquifers over the basal aquifer and that the Moanalua basal aquifer is over permitted by 0.57 million gallons per day (mgd). We recommend that the current update of CWRM's Water Resources Protection Plan evaluate perched alluvial aquifers for limited nonpotable use. Alluvial aquifers are largely an untapped resource and are worth investigating.
4. The Board of Water Supply is undertaking the construction of deep monitor wells in the Honolulu and Pearl Harbor areas to help refine the sustainable yield estimates. The information obtained will assist in refining the hydrologic budget and models on the basal aquifers in response to pumping. In 1980, the Department of Land and Natural Resources financed the deepening of the Moanalua Wells No. 2153-05 to 1,250 feet. This well has previously been used by the U.S. Geological Survey to measure head levels. With modifications, this well could be used to obtain transition zone data on the basal aquifer.



Mr. Edwin T. Sakoda
Page 2
September 21, 1998

5. As an alternative to the exploratory well, the Kalauao Spring nonpotable system could be extended from Halawa Valley to the golf course and other users in the vicinity. Capacity is available and an existing pipeline transmission tunnel under Red Hill could be utilized. The Kalauao Spring system was constructed in the early 1990's and provides nonpotable irrigation water to the airport, Aloha Stadium and the Halawa quarry.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

Clifford S. Jarvis
CLIFFORD S. JARVIS
Manager and Chief Engineer

cc: Brian Takeda, R.M. Towill Corporation

0000 00 15 1874

COPY

JEREMY HARRIS Mayor
WALTER O. WATSON Jr. Chairman
MARCUS H. YAMASATO Vice Chairman
KAZUHAYASHIDA
MELISSA Y. J. LUM
FORREST C. MURPHY
JOYATHANK SHAMADA PIO
BARBARA KIM STANTON
RAYMOND H. SATO
Manager and Chief Engineer



BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERTANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6190
FAX (808) 533-2714

March 9, 1998

CITY AND COUNTY OF HONOLULU

DEPARTMENT OF LAND UTILIZATION
880 SOUTH KING STREET, 37th FLOOR • HONOLULU, HAWAII 96813
PHONE (808) 523-6414 • FAX (808) 523-6415



SEARCHED	INDEXED	SERIALIZED	FILED
REC'D FEB 18 1998 RMITC			

JAN NADE SULLIVAN
DIRECTOR
LORETTA K. C. CHEE
DEPUTY DIRECTOR
98-00672 (ST)

'98 EA Comments Zone 1

February 17, 1998

Mr. Brian Takeda, Senior Planner
R. M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

Dear Mr. Takeda:

Draft Environmental Assessment (DEA):
Moanalua Nonpotable Well
Moanalua, Oahu
Tax Map Key: 1-1-12: POR. 13

We have reviewed the above-referenced DEA for an exploratory well development transmitted by your letter dated January 28, 1998, and concur that this use is permitted within the P-2 General Preservation District.

We have no other comments to offer at this time. Thank you for the opportunity to comment on this matter. Should you have any questions, please contact Steve Tagawa of our staff at 523-4817.

Very truly yours,

JAN NADE SULLIVAN
Director of Land Utilization

JNS:am

cc: Moanalua Golf Club
State Office of Environmental Quality Control

TO: JAN SULLIVAN, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: ~~FOR RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER~~
BOARD OF WATER SUPPLY

SUBJECT: YOUR LETTER OF FEBRUARY 17, 1998 TO R.M. TOWILL CORPORATION REGARDING THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED MOANALUA NONPOTABLE WELL, MOANALUA, OAHU, TMK: 1-1-12: 13

Thank you for reviewing the Draft Environmental Assessment for the proposed Moanalua Nonpotable Well project.

We acknowledge that this proposed exploratory well is permitted within the P-2, General Preservation District.

If you have any questions, please contact Barry Usagawa at 527-5235.

cc: Brian Takeda, R.M. Towill Corporation

0000 00 15 1875

COPY

JEFFREY HARRIS Mayor
WALTER O. WATSON, JR. Chairman
MAURICE H. YAMASATO Vice Chairman
KAZU HAYASHIDA
MELISSA Y. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA PhD
BARBARA KIM STANTON
RAYMOND H. SATO
Manager and Chief Engineer

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2714

PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU
830 SOUTH KING STREET, 8TH FLOOR • HONOLULU, HAWAII 96813-3017
PHONE (808) 523-4711 • FAX: (808) 523-4880

PATRICK T. ONISHI
CHIEF PLANNING OFFICER
DONALD HAWAIRE
DEPUTY CHIEF PLANNING OFFICER
RR 1/98-0148

DK	FILED	March 9, 1998
WES	FILED	
RTT	FILED	
RECD MAR 13 1998 RHTC		

February 17, 1998

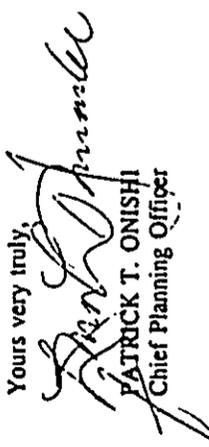
Mr. Brian Takeda, Senior Planner
R.M. Towill Corporation
420 Waiakamilo Road, #411
Honolulu, Hawaii 96817-4941

Dear Mr. Takeda:

Draft Environmental Assessment (DEA) for
Proposed Drilling-Moanalua Nonpotable Well,
Tax Map Key: J-1-12-13

In response to your company's request of January 28, 1998 on behalf of the City and County of Honolulu Board of Water Supply (BWS), we have reviewed the above EA with regard to the proposed project's impacts on the City and County of Honolulu's General Plan and the Primary Urban Center Development Plan and find the proposed project consistent with these Plans' objectives and provisions. We note as indicated in Chapter 5.3, page 50, that a Development Plan Public Facilities Map amendment will need to be filed by BWS.

Should you have any questions, please contact Robert Reed of our staff at 523-4402.

Yours very truly,

PATRICK T. ONISHI
Chief Planning Officer

TO: PATRICK T. ONISHI, CHIEF PLANNING OFFICER
PLANNING DEPARTMENT

FROM: ~~FOR RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER~~
BOARD OF WATER SUPPLY

SUBJECT: YOUR LETTER OF FEBRUARY 17, 1998 TO R.M. TOWILL CORPORATION, REGARDING THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED MOANALUA NONPOTABLE WELL, MOANALUA, OAHU, TMK: 1-1-12: 13

Thank you for reviewing the Draft Environmental Assessment for the proposed Moanalua Nonpotable Well project.

We acknowledge that the proposed project is consistent with the General Plan and Development Plans' objectives and provisions. In addition, we note that a Development Plan Public Facilities Map amendment will need to be filed.

If you have any questions, please contact Barry Usagawa at 527-5235.

cc: Brian Takeda, R.M. Towill Corporation

PTO:lh

cc: Board of Water Supply

0000 00 15 1876

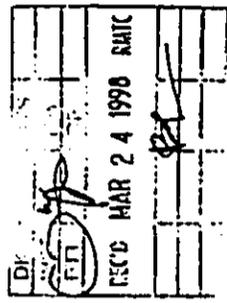
COPY

JEFFREY HARRIS, Mayor
WALTER D. WATSON, Jr., Chairman
EDDIE FLORES, Jr.
KAZU HAYASHIDA
JAN M. LY, AME
FORREST C. MURPHY
JOHNATHAN K. SHIMADA, PhD
SUPERINTENDENT
RAYMOND H. SATO
Manager and Chief Engineer



March 19, 1998

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2714



Mr. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
33 South King Street, Sixth Floor
Honolulu, Hawaii 96813

Dear Mr. Hibbard:

Subject: Your Letter of February 18, 1998 to R.M. Towill Corporation Regarding the Draft Environmental Assessment for the Board of Water Supply's Proposed Moanalua Nonpotable Well, Moanalua, Oahu. TMK: 1-1-12-13

Thank you for reviewing the Draft Environmental Assessment for the proposed Moanalua Nonpotable Well Project.

We acknowledge that the proposed project will have "no effect" on any historic sites.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

FOR RAYMOND H. SATO
Manager and Chief Engineer

cc: Brian Takeda, R.M. Towill Corporation

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
DEPUTIES
GABRIEL COLLA, AGASSA
AGRICULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES CONSERVATION AND
RESOURCES MANAGEMENT
CONTRIBUTES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND DIVISION
STATE PANEL
WATER AND LAND DEVELOPMENT



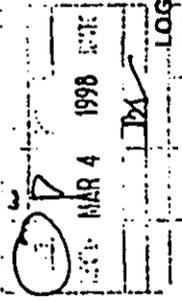
STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

February 18, 1998

Brian Takeda
Senior Planner
R. M. Towill Corporation
420 Waiakamilo Rd. #411
Honolulu, Hawaii 96817-4941

Dear Mr. Takeda:

SUBJECT: Chapter 6E-8 Historic Preservation Review -- Draft Environmental Assessment (DEA) for Moanalua Nonpotable Well
Moanalua, Kona, O'ahu
TMK: 1-1-12:13



LOG NO: 21046
DOC NO: 9802EJ09

Thank you for the opportunity to review the DEA for the proposed non-potable production well at the Moanalua Golf Course. A review of our records shows that there are no known historic sites at the project location. The proposed well and alternate well sites are located in areas that have been previously altered and landscaped for the existing golf course, making it highly unlikely that surface historic sites remain. Therefore we believe that the proposed production well will have "no effect" on historic sites.

If you have any questions please call Elaine Jourdana at 587-0014.

Aloha,

Don Hibbard, Administrator
Historic Preservation Division

EJ:jk

0000 00 15 1877

BENJAMIN J. CAYETANO
DIRECTOR



STATE OF HAWAII

OFFICE OF ENVIRONMENTAL QUALITY CONTROL

225 SOUTH BERETANIA STREET
SUITE 707
HONOLULU, HAWAII 96813
TELEPHONE (808) 585-4100
FACSIMILE (808) 585-4100

GARY DEL
DIRECTOR

SEARCHED	INDEXED	SERIALIZED	FILED
REC'D FEB 24 1998 RMC			
BT			

February 23, 1998

Mr. Raymond Sato, Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Sato:

Subject: Draft Environmental Assessment for the Moanalua
Nonpotable Well, Oahu

Thank you for the opportunity to review the subject document. We have the following comments.

1. Please provide maps that show the following:
 - a) known or assumed groundwater flowpaths; and
 - b) points of potential contamination such as individual wastewater disposal systems and injection wells.
2. In some instances, a well is developed by private financing, the transfer of public lands to government or private developers, or in return for a water allocation credit to supply an urban development. The EA should include a full discussion of any institutional, financial or land use arrangements or commitments related to developing the well and delivering water to end users.

These arrangements may include the formation of public utility companies and subsequent rate-setting, the establishment of county water commitments, the co-funding of state or county water system development, an executive order or other set-aside of state lands, and purchase of land or easements by public entities.

Any or all of these arrangements and all permits or governmental approvals required to fulfill these commitments should be listed.

Mr. Sato
Page 2

3. Please describe the precise criteria used to determine if the well should be converted to production.

4. Please discuss the findings and reasons for supporting the FONSI determination based on the significant criteria listed in §11-200-12 of the EIS rules. Please see the enclosed example.

Should you have any questions, please call Jeyan Thirugnanam at 586-4185.

Sincerely,

Gary Gill
Director

cc: K.M. Towill

0000 00 15 1878

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813
PHONE (808) 527-5180
FAX (808) 533-2714



COPY
JEREMY HARRIS, Mayor
EDDIE FLORES, Jr., Chairman
FORREST C. MAUPY, Vice Chairman
KAZUHIYASHIMA
JANILLY ANN
JOHN HAN K. SHIMADA, P.D.
DORCHESA KIM STANTON
CHARLES A. STED
August 25, 1998
REC'D SEP 1 1998
KIM PROS JAMILE
Manager and Chief Engineer

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed Moanalua Nonpotable Well, Moanalua, Oahu, TMK: 1-1-12:13

Thank you for reviewing the Draft Environmental Assessment for the proposed Moanalua Nonpotable Well project.

We provide the following response to your concerns:

1. Orientation Maps:
 - a. Groundwater flows from high potential to low potential. In this case, the general groundwater flowpath of the affected aquifer is from mountain to ocean.
 - b. There are no known sources of contamination upgradient of the proposed well. In addition, we have no record of any contamination problems in the affected aquifer.
2. Financial and Institutional Arrangements:
There are no financial or institutional arrangements or commitments related to drilling the exploratory nonpotable well. If the well is successful, we will then initiate discussions with potential users. The nonpotable well water is intended to replace the high-quality potable water presently being used for irrigation of the Moanalua Golf Course and other uses. The well project will be financed through the Board of Water Supply's Water System Facilities Charges for resource development.



Mr. Gary Gill
Page 2
August 25, 1998

3. Conversion of an Exploratory Well into a Production Well:

The conversion of the exploratory well to production status includes the following:

- a. The well will be test pumped to obtain hydro-geological data to determine if the quantity and quality of water is suitable for irrigation use. Approximately 0.2 million gallons per day of irrigation water is expected to be withdrawn. Production feasibility is then based on actual yield, construction costs and cost recovery options.
- b. Permission based on Commission on Water Resource Management evaluation as part of the Well Construction Permit, Pump Installation and Water Use Permit.
- c. Approval of a Development Plan Public Facilities Map amendment from the Planning Department, City and County of Honolulu.

4. Determination:

The findings and reasons for supporting the determination will be expanded to address the criteria listed in Chapter 11-200-12 of the EIS rules.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

CLIFFORD S. JAMILE
Manager and Chief Engineer

cc: Brian Takeda, R. M. Towill Corporation

0000 00 15 1879

BUILDING DEPARTMENT
CITY AND COUNTY OF HONOLULU
HONOLULU MUNICIPAL BUILDING
830 SOUTH KING STREET
HONOLULU, HAWAII 96813



JEREMY HARRIS
REC'D MAR 3 1998
BATIC

RANDALL K. FUJIKI
DIRECTOR AND BUILDING SUPERINTENDENT
SIDROM M. BAQUILAR
DEPUTY DIRECTOR AND BUILDING SUPERINTENDENT

PB 98-114

February 26, 1998

Mr. Brian Takeda, Senior Planner
R. M. Towill Corporation
420 Waikamilo Road, #411
Honolulu, Hawaii 96817

Dear Mr. Takeda:

Subject: Draft Environmental Assessment (DEA) for the
Moanalua Nonpotable Well, Moanalua
Honolulu, Oahu, Hawaii

This is in response to your request of January 28, 1998 to review and comment on the subject DEA.

We have no comments to offer but appreciate the opportunity to review the document.

Should there be any questions, please contact Douglas Collinson at 527-6375.

Very truly yours,

RANDALL K. FUJIKI
Director and Building Superintendent

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
620 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813
PHONE (808) 527-6180
FAX (808) 533-2714

REC'D JUN 1 1998
BATIC
June 24, 1998

COPY
JEREMY HARRIS
WALTER O. WATSON, JR., Chairman
EDDIE FLORES, JR.
KAZU HAYASHIDA
JAN M. L. Y. AMIL
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON
BROOKS H. M. YUEN, Acting
Manager and Chief Engineer

TO: RANDALL K. FUJIKI, DIRECTOR AND BUILDING SUPERINTENDENT
BUILDING DEPARTMENT
FROM: FOR BROOKS H. M. YUEN, ACTING MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY
SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED MOANALUA
NONPOTABLE WELL, MOANALUA, OAHU, TMK: 1-1-12-13

Thank you for reviewing the Draft Environmental Assessment for the proposed Moanalua Nonpotable Well project.

We acknowledge that you have no comments to offer.

If you have any questions, please contact Barry Usagawa at 527-5235.

Brian Takeda, R.M. Towill Corporation

0000 00 15 1880

cms/ah - COPY

JEFFREY HARRIS, Mayor
WALTER O. WATSON, JR., Chairman
EDDIE FLORES, Jr.
KAZU HAYASHIDA
JAN M. LY AM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON
RAYMOND H. SATO
Manager and Chief Engineer

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2714



REC'D MAR 19 1998 RATIC
MAR 17, 1998

TO: CHERYL D. SOON, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: ~~RAYMOND H. SATO~~ ^{RAYMOND H. SATO} MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: YOUR MEMORANDUM OF FEBRUARY 24, 1998 REGARDING
THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED
MOANALUA NONPOTABLE WELL, MOANALUA, OAHU,
TMK: 1-1-12: 13

Thank you for reviewing the Draft Environmental Assessment for the proposed Moanalua Nonpotable Well project.

We acknowledge that you have no objections or comments regarding the transportation or traffic impacts to the proposed well project.

If you have any questions, please contact Barry Usagawa at 527-5235.

cc: Brian Takeda, R.M. Towill Corporation

980750

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
RECEIVED
DEPT. OF PUBLIC WORKS PLAZA • 711 KAPIOLAN BOULEVARD SUITE 1200 • HONOLULU, HAWAII
PHONE (808) 523-4339 • FAX (808) 523-4720



FEB 25 9 28 AM '98

CHERYL D. SOON
DIRECTOR
JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TSPI/98-00501R

February 24, 1998

FEB 26 1 11 PM '98

MEMORANDUM

TO: RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

ATTN: BARRY USAGAWA

FROM: CHERYL D. SOON, DIRECTOR

SUBJECT: MOANALUA NONPOTABLE WELL

We reviewed the draft environmental assessment for the subject project transmitted with a January 28, 1998 letter from R. M. Towill Corporation. At this time, we have no objections or comments regarding the transportation or traffic impacts of this project.

Should you have any questions regarding this matter, please contact Faith Miyamoto of the Transportation System Planning Division at Local 6976.

Cheryl D. Soon
CHERYL D. SOON

cc: Mr. Brian Takeda, R. M. Towill Corporation

0000 00 15 188 1

MAR 12 1998 10:56AM E M COMMUNICATIONS SECTION 3000

STATE OF HAWAII
 DEPARTMENT OF HEALTH
 P.O. BOX 1378
 HONOLULU, HAWAII 96817-1378

March 12, 1998 98-012/epo

SEARCHED	INDEXED
SERIALIZED	FILED
MAR 23 1998	
FBI - HONOLULU	

98-012/epo

Mr. Brian Takeda
March 12, 1998
Page 2

98-012

applicant should ensure that the construction, drilling activities and water pumps comply with the provisions of Chapter 11-46.

Heavy vehicles traveling to and from the project site must comply with the provisions of Title 11, Chapter 42, Administrative Rules, "Vehicular Noise Control for Oahu."

Should there be any questions on these comments, please call Jerry Y. Haruno, Environmental Program Manager, Noise, Radiation and Indoor Air Quality Branch at 586-4701.

Sincerely,

Bruce S. Anderson

BRUCE S. ANDERSON, Ph.D.
Deputy Director for
Environmental Health

C: SDWB
NRRAQB

Mr. Brian Takeda
Senior Planner
R. M. Twill Corporation
420 Waiakamilo Road, #411
Honolulu, Hawaii 96817-4941

Dear Mr. Takeda:

Subject: Draft Environmental Assessment (DEA)
Moanalua Nonpotable Well
Moanalua Valley
Honolulu, Hawaii
TMX: 1-1-12: 13

Thank you for allowing us to review and comment on the subject project. We have the following comments to offer:

Safe Drinking Water Branch

The proposed well is intended for use as a nonpotable well to irrigate the greens and landscaping of Moanalua Golf Course. The potable and nonpotable water systems must be carefully designed and operated to prevent cross-connections and backflow conditions. The two systems must be clearly labeled and physically separated by air gaps or reduced pressure principle backflow preventers to avoid contaminating the potable water supply. In addition, all nonpotable spigots and irrigated areas should be clearly labeled with warning signs to prevent the inadvertent consumption of nonpotable water.

If you should have any question on these comments, please contact Ms. Queenie Konori of the Safe Drinking Water Branch, Engineering Section, at 586-4258.

Noise Concerns

The DEA on Page 7, Section 1.6, paragraph #2, refers to Hawaii Administrative Rules (HAR), Title 11, Chapter 43. Chapter 43 was repealed and replaced on September 26, 1996, by Title 11, Chapter 46, "Community Noise Control." In addition, "Chapter 53, Noise," is incorrectly stated on page 45 (Section 4.11.1). It should read "Chapter 11-46, Community Noise Control." The

0000 00 15 1882

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2714



COPY

JEREMY THURMS, Director
WALTER O. WATSON, Jr., Chairman
EDDIE FLORES, Jr.
KAZUHIYASHIMA
JANILLY ANN
FOREST C. MURPHY
JONATHAN K. USAGAWA, MD
BARBARA ANN STANTON

April 8, 1998

DATE	APR 15 1998
TIME	
BY	
RECEIVED	
INITIALS	
REMARKS	

Bruce S. Anderson, Ph.D.
Deputy Director for Environmental Health
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Anderson:

Subject: Your Letter of March 12, 1998 to R.M. Towill Corporation
Regarding the Draft Environmental Assessment for the Board
of Water Supply's Proposed Moanalua Nonpotable Well,
Moanalua, Oahu. THK: 1-1-12: 13

Thank you for reviewing the Draft Environmental Assessment for the
proposed Moanalua Nonpotable Well project.

We provide the following responses to your concerns:

- Safe Drinking Water Branch
We will coordinate with Moanalua Golf Course during their transition to use the new nonpotable system to ensure the integrity of the existing potable system. The two systems will be segregated in compliance with the plumbing code.
- Noise Concern
The construction activities will comply with the provisions of Chapter 11-46, HAR, "Community Noise Control". Heavy vehicles traveling to and from the project site will adhere to the provisions of Chapter 11-42, HAR, "Vehicular Noise Control for Oahu."

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

BROOKS H. M. YUEN
Acting Manager and Chief Engineer

cc: Brian Takeda, R.M. Towill

0000 00 15 1883

ADDITIONAL NOTICES OF AVAILABILITY OF DRAFT EA

R. M. TOWILL CORPORATION

450 WAIKAMUO RD #411 HONOLULU HI 96817-4941 (808) 842-1133 FAX (808) 842-1037

January 20, 1998

The Honorable Norman Mizuguchi
State Senate
State Capitol, Room 003
Honolulu, Hawaii 96813

Dear Senator Mizuguchi:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC Environmental Notice. The public has 30-days or until February 23, 1998 to comment on this project. Comments received by this date will be used to prepare the Final Environmental Assessment. Notice of availability for both the Draft and Final Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

R. M. TOWILL CORPORATION

450 WAIKAMUO RD #411 HONOLULU HI 96817-4941 (808) 842-1133 FAX (808) 842-1037

January 23, 1998

Librarian
Salt Lake/Moanalua Public Library
3225 Salt Lake Boulevard
Honolulu, Hawaii 96818

Dear Librarian:

SUBJECT: Transmittal of Draft Environmental Assessment for Moanalua
Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

Please find attached a copy of the subject Draft Environmental Assessment. This document is forwarded for the Office of Environmental Quality Control (OEQC) public comment period commencing January 23, 1998, and ending February 23, 1998. We ask that this copy be placed on reserve. Comments received during this 30-day review period may be directed to:

Mr. Raymond Sato, Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Sincerely,



Brian Takeda
Senior Planner

Attachment

0000 00 15 1885

R. M. TOWILL CORPORATION

420 WAIKAMIILO RD #411 HONOLULU, HI 96817-4941 (808) 842-1133 FAX (808) 842-1037

January 20, 1998

The Honorable Nathan Suzuki
House of Representatives
State Capitol, Room 316
Honolulu, Hawaii 96813

Dear Representative Suzuki:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC Environmental Notice. The public has 30-days or until February 23, 1998 to comment on this project. Comments received by this date will be used to prepare the Final Environmental Assessment. Notice of availability for both the Draft and Final Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

R. M. TOWILL CORPORATION

420 WAIKAMIILO RD #411 HONOLULU, HI 96817-4941 (808) 842-1133 FAX (808) 842-1037

January 20, 1998

District Chief
Department of the Interior
U.S. Geological Survey
677 Ala Moana Blvd., Room 415
Honolulu, Hawaii 96813

Dear Sir:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC Environmental Notice. The public has 30-days or until February 23, 1998 to comment on this project. Comments received by this date will be used to prepare the Final Environmental Assessment. Notice of availability for both the Draft and Final Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

0000 00 15 1885

R. M. TOWILL CORPORATION

420 Waiakamilo Rd #411 Honolulu HI 00817-4941 (808) 842-1133 Fax (808) 842-1037

January 20, 1998

Aiea Neighborhood Board No. 20
c/o Aiea Library
99-123 Moanalua Road
Aiea, Hawaii 96701

Gentlemen:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC, Environmental Notice. The public has 30-days or until February 23, 1998 to comment on this project. Comments received by this date will be used to prepare the Final Environmental Assessment. Notice of availability for both the Draft and Final Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

R. M. TOWILL CORPORATION

420 Waiakamilo Rd #411 Honolulu HI 00817-4941 (808) 842-1133 Fax (808) 842-1037

January 20, 1998

Moanalua Golf Club
1250 Aja Aolani
Honolulu, Hawaii 96819

Gentlemen:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC, Environmental Notice. The public has 30-days or until February 23, 1998 to comment on this project. Comments received by this date will be used to prepare the Final Environmental Assessment. Notice of availability for both the Draft and Final Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

0000 00 15 1887

R. M. TOWILL CORPORATION

480 Waiakamilo Rd #111 Honolulu HI 96817-4941 (808) 842-1133 Fax (808) 842-1937

January 20, 1998

Honolulu City Council
530 S. King Street
Honolulu, Hawaii 96813

Gentlemen:

SUBJECT: Notice of Availability of Draft Environmental Assessment for Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC, Environmental Notice. The public has 30-days or until February 23, 1998 to comment on this project. Comments received by this date will be used to prepare the Final Environmental Assessment. Notice of availability for both the Draft and Final Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

R. M. TOWILL CORPORATION

480 Waiakamilo Rd #111 Honolulu HI 96817-4941 (808) 842-1133 Fax (808) 842-1937

January 20, 1998

Mr. Brooks Harper, Field Supervisor
Ecological Services
U.S. Fish and Wildlife Service
Department of the Interior
P.O. Box 50156
Honolulu, Hawaii 96850

Dear Mr. Harper:

SUBJECT: Notice of Availability of Draft Environmental Assessment for Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC, Environmental Notice. The public has 30-days or until February 23, 1998 to comment on this project. Comments received by this date will be used to prepare the Final Environmental Assessment. Notice of availability for both the Draft and Final Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

0000 00 15 1888

R. M. TOWILL CORPORATION

420 WAIKAMILIO RD #411 HONOLULU, HI 96817-4041 (808) 842-1133 FAX (808) 842-1037

January 20, 1998

Ms. Linda Hihara-Eudo
Acting Chief, Operations Branch
U.S. Army Corps of Engineers
HED
DEPOD-ET-PO
Building T-1
Fort Shafter, Hawaii 96858-5440

Dear Ms. Eudo:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC, Environmental Notice. The public has 30-days or until February 23, 1998 to comment on this project. Comments received by this date will be used to prepare the Final Environmental Assessment. Notice of availability for both the Draft and Final Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

R. M. TOWILL CORPORATION

420 WAIKAMILIO RD #411 HONOLULU, HI 96817-4041 (808) 842-1133 FAX (808) 842-1037

January 20, 1998

Mr. Kali Watson, Chairman
Department of Hawaiian Home Lands
State of Hawaii
335 Merchant Street
Honolulu, Hawaii 96813

Dear Mr. Watson:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC, Environmental Notice. The public has 30-days or until February 23, 1998 to comment on this project. Comments received by this date will be used to prepare the Final Environmental Assessment. Notice of availability for both the Draft and Final Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

0000 00 15 1889

R. M. TOWILL CORPORATION

480 WAIAKAMILO RD #411 HONOLULU, HI 96817-4941 (808) 842-1133 FAX (808) 842-1037

January 20, 1998

Mr. Rick Egged, Director
Office of Planning
Department of Business, Economic
Development and Tourism
State of Hawaii
235 S. Beretania Street, 6th Floor
Honolulu, Hawaii 96813

Dear Mr. Egged:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua
Nonpotable Well project will be available for public review commencing January 23,
1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC,
Environmental Notice. The public has 30-days or until February 23, 1998 to comment on
this project. Comments received by this date will be used to prepare the Final
Environmental Assessment. Notice of availability for both the Draft and Final
Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

R. M. TOWILL CORPORATION

480 WAIAKAMILO RD #411 HONOLULU, HI 96817-4941 (808) 842-1133 FAX (808) 842-1037

January 20, 1998

Herman M. Aizawa, Ph.D.
Superintendent of Education
Department of Education
State of Hawaii
Queen Liliuokalani Building
1390 Miller Street
Honolulu, Hawaii 96813

Dear Dr. Aizawa:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua
Nonpotable Well project will be available for public review commencing January 23,
1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC,
Environmental Notice. The public has 30-days or until February 23, 1998 to comment on
this project. Comments received by this date will be used to prepare the Final
Environmental Assessment. Notice of availability for both the Draft and Final
Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

0000 00 15 1890

R. M. TOWILL CORPORATION

420 WAIAKAMILIO RD #411 HONOLULU HI 96817-4041 (808) 842-1133 FAX (808) 842-1037

January 20, 1998

Dr. Lawrence H. Miike, Director
Department of Health
Environmental Management Division
State of Hawaii
919 Ala Moana Blvd., Room 300
Honolulu, Hawaii 96814

Dear Dr. Miike:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC, Environmental Notice. The public has 30-days or until February 23, 1998 to comment on this project. Comments received by this date will be used to prepare the Final Environmental Assessment. Notice of availability for both the Draft and Final Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

R. M. TOWILL CORPORATION

420 WAIAKAMILIO RD #411 HONOLULU HI 96817-4041 (808) 842-1133 FAX (808) 842-1037

January 20, 1998

Mr. Michael D. Wilson, Chairperson
Board of Land and Natural Resources
Aquatic Resources Division/Historic Preservation Division
State of Hawaii
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Wilson:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Notice of availability will also be published in the January 23, 1998 edition of the OEQC, Environmental Notice. The public has 30-days or until February 23, 1998 to comment on this project. Comments received by this date will be used to prepare the Final Environmental Assessment. Notice of availability for both the Draft and Final Environmental Assessments will be published in the OEQC Environmental Notice.

Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

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R. M. TOWILL CORPORATION

480 Waiakamilo Rd #411 Honolulu HI 96817-4941 (808) 842-1133 Fax (808) 842-1037

January 20, 1998

Mr. Edwin Sakoda, Acting head
Commission on Water Resource Management
Department of Land and Natural Resources
State of Hawaii
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Sakoda:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

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Sincerely,



Brian Takeda
Senior Planner

R. M. TOWILL CORPORATION

480 Waiakamilo Rd #411 Honolulu HI 96817-4941 (808) 842-1133 Fax (808) 842-1037

January 20, 1998

Dr. John Harrison
Environmental Coordinator
University of Hawaii
Environmental Center
Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

Dear Dr. Harrison:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

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Sincerely,



Brian Takeda
Senior Planner

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R. M. TOWILL CORPORATION

420 Waiakamilo Rd #411 Honolulu, HI 96817-4041 (808) 842-1133 Fax: (808) 842-1037

January 20, 1998

Mr. Randall Ogata, Administrator
Office of Hawaiian Affairs
State of Hawaii
711 Kapiolani Blvd., 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Ogata:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

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Sincerely,



Brian Takeda
Senior Planner

R. M. TOWILL CORPORATION

420 Waiakamilo Rd #411 Honolulu, HI 96817-4041 (808) 842-1133 Fax: (808) 842-1037

January 20, 1998

Mr. Patrick Onishi, Director
Planning Department
City and County of Honolulu
550 S. King Street, City Hall Annex
Honolulu, Hawaii 96813

Dear Mr. Onishi:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
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Sincerely,



Brian Takeda
Senior Planner

R. M. TOWILL CORPORATION

180 WAIKAMILLO RD #411 HONOLULU HI 96817-1941 (808) 842-1133 FAX (808) 842-1037

January 20, 1998

Ms. Jan Sullivan, Director
Department of Land Utilization
City and County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813

Dear Ms. Sullivan:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

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236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

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Sincerely,



Brian Takeda
Senior Planner

R. M. TOWILL CORPORATION

180 WAIKAMILLO RD #411 HONOLULU HI 96817-1941 (808) 842-1133 FAX (808) 842-1037

January 20, 1998

Ms. Cheryl Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Blvd., Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

Office of Environmental Quality Control (OEQC)
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

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Should you have any questions please contact us at (808) 842-1133.

Sincerely,



Brian Takeda
Senior Planner

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R. M. TOWILL CORPORATION

420 WAIKAMILO RD #411 HONOLULU, HI 96817-1041 (808) 842-1133 FAX (808) 842-1037

January 20, 1998

Mr. Randall K. Fujiki
Director and Building Superintendent
Building Department
City and County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Fujiki:

SUBJECT: Notice of Availability of Draft Environmental Assessment for
Moanalua Nonpotable Well, Moanalua, Honolulu, Oahu, Hawaii

This is to inform you that a Draft Environmental Assessment (DEA) for the Moanalua Nonpotable Well project will be available for public review commencing January 23, 1998, at the following address:

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Sincerely,



Brian Takeda
Senior Planner

REFERENCES
(Listed in Chronological Order)

- Communication, Phone conversation regarding drinking water standards for selected toxic constituents, Department of Health, Safe Drinking Water Branch, State of Hawaii, October 24, 1997
- Communication, BWS review comments regarding preliminary Draft Environmental Assessment for Moanalua Nonpotable Well, City and County of Honolulu, Board of Water Supply, October 8, 1997
- Species List by Federal Status, U.S. Fish and Wildlife Service, November 7, 1996
- Final Draft Oahu Water Plan, Fifth Edition, Board of Water Supply, City and County of Honolulu, March 1995
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- Zoological Survey of Tripler Army Medical Center (TAMC), Oahu, Bruner, Phillip L., Prepared for R. M. Towill Corporation, July 1994
- Archaeological Assessment and Field Investigation of the Tripler Army Medical Center in the Ahupua'a of Moanalua, Kona District, Island of O'ahu (TMK 1-1-12:5), Hallett, Hammatt H. and R. Chiogioji, Cultural Surveys Hawaii, Prepared for R. M. Towill Corporation, 1994
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- State Water Projects Plan, Hawaii Water Plan, Commission on Water Resource Management, State of Hawaii, June 1990
- Oahu Water Management Plan, Hawaii Water Plan, Commission on Water Resource Management, State of Hawaii, June 1990
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