

Waipahu Wells III Station

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
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May 22, 1998 RECEIVED

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'98 MAY 27 P2:31

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



OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

Dear Mr. Gill:

Subject: Finding of No Significant Impact for the Board of Water Supply's Proposed Waipahu Wells III Station, Waipahu, Oahu, Hawaii, TMK: 9-4-05: 74

The Board of Water Supply has reviewed the comments received during the public comment period which began on November 8, 1997. 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 the proposed 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 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

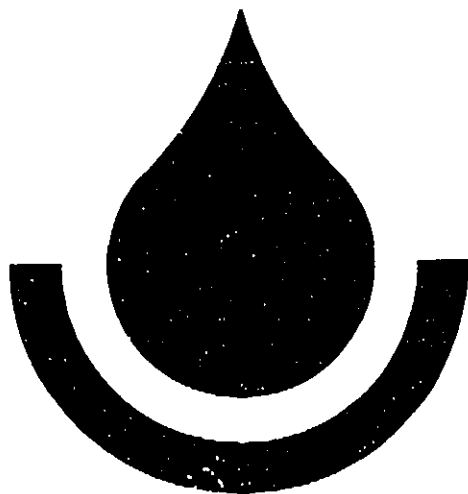
cc: Anna Lee, GMP Associates, Inc.

1998-06-08-0A-FEA-Waipahu Wells III

Station

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WAIPAHU WELLS III STATION



FINAL ENVIRONMENTAL ASSESSMENT

PROPOSING AGENCY:

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU



MAY 1998

ASSOCIATES, INC.
Engineers/Architects

238000CV

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SECTION 1
PURPOSE AND NEED FOR ACTION

SECTION 1 PURPOSE AND NEED FOR ACTION

1.1 Purpose

The purpose of developing the Waipahu Wells III site is to increase the water supply for the Honolulu Board of Water Supply's (BWS) 395' Waikele-Waipio system and the 228' low service water system. The 228' low service water system serves the Ewa, Waipahu, Kapolei, Nanakuli, Waianae, and Honolulu areas.

1.2 Need for Action

The State Housing Finance and Development Corporation (HFDC) was required to provide a water source for their development in Kapolei based on the area's anticipated potable water demand of two mgd (BWS). In cooperation with the Honolulu Board of Water Supply, they elected to participate in developing the Waipahu Wells III site to fulfill this water source requirement. In addition, the Department of Hawaiian Home Lands (DHHL) elected to participate in the project to provide potable water for its Princess Kahanu Estates subdivision in Lualualei, and Hawaiian homestead areas in Nanakuli, Papakolea, and Waianae. Copies of the Water Use Permits are included in Appendix A.

The BWS is proposing to develop the Waipahu Wells III project to produce the permitted amount of 2.684 mgd of potable water. This amount is expected to meet HFDC's and DHHL's water needs in addition to accommodating incremental growth in the BWS service areas. The cost of the project will be shared proportionately between BWS, HFDC, and DHHL. Of the total 2.684 mgd, 2.014 mgd is allocated to HFDC while 0.17 mgd is allocated for DHHL use. The remaining 0.5 mgd is reserved for the incremental growth in other BWS service areas. In this interim period before a water source can be developed, Kapolei, Papakolea, Waianae, Lualualei, and Nanakuli are using existing BWS potable water capacity reserves. The proposed development of Waipahu Wells III has been incorporated into the City and County of Honolulu's Water Use and Development Plan and is needed to permanently, and more adequately supply the Leeward region with water.

1.3 List of Necessary Permits and Approvals

The following permits and approvals are anticipated for the development of the proposed well station:

1.3.1 Miscellaneous Permits/Approvals

- Utility Company Approvals - HECO, HTEL, Cable TV
- Dirt Road Relocation Plan Review - Castle & Cooke

1.3.2 City and County Permits/Approvals

- Plan Approval - Department of Public Works
- Plan Approval - Honolulu Board of Water Supply
- Grading, Grubbing, Stockpiling Permit - Department of Public Works
- Building Permit - Department of Public Works, Building Department
- Discharge Permit - Department of Public Works

1.3.3 State of Hawaii Permits/Approvals

- Plan Approval - State Department of Transportation, Highways
- Plan Approval - State Commission of Persons with Disabilities
- Connection Permit - State Department of Transportation
- Discharge Permit - State Department of Transportation
- NPDES General Permit, Hydrotesting - State Department of Health, Clean Water Branch
- Well Construction Permit - State Department of Land and Natural Resources
- Pump Installation Permit - State Department of Land and Natural Resources
- Water Use Permit - State Department of Land and Natural Resources

1.4 Applicant

City and County of Honolulu, Board of Water Supply

1.5 Approving Agency

City and County of Honolulu, Board of Water Supply

SECTION 2
PROPOSED ACTION

SECTION 2 PROPOSED ACTION

The proposed project involves the installation of five (5) 1,000 gpm pumps, ten (10) Granular Activated Carbon (GAC) water treatment units, a 50,000-gallon backwash tank, a control building, transmission mains, access road, landscaping, fencing, irrigation system, electrical equipment, drainage improvements, and appurtenances as shown in Figure 2-1. Additional GAC units may be added in the future to centrally treat other Waipio source waters.

In addition, the proposed project includes approximately 2,417 feet of new 24-inch transmission main along Kamehameha Highway; approximately 1,089 feet of new 16-inch transmission main along Lumiaina Street to convey water to be pumped from the proposed Waipahu Wells III station; and a new transmission main that will connect the Waipahu Wells II, 395' system to the Waipahu Wells I, 228' system along Lumiaina Street for transmission to the Leeward region via an existing 36" main along the H-1 Freeway. The proposed layout of these new transmission lines are shown in Figure 2-2.

The five pumps will have a total maximum pump capacity of 7.5 mgd. Additional pumping above the 2.684 mgd allocation is sized to accommodate peak demand and fire flows with one pump as standby. The elevation of the Waipahu Wells III site is approximately 312 feet above mean sea level. The water level at the site varies from approximately 17 feet to 20 feet above mean sea level. The pump's suction will be set at approximately 28 feet below mean sea level. This value will vary slightly from pump to pump. Information on the submersible pumps can be found in Appendix B.

GAC treatment units are required to remove Ethylene Dibromide (EDB) which has been detected by water quality analyses performed by the BWS. GAC has an excellent adsorptive capacity for most organic and synthetic organic chemicals, such as EDB. Each pump is proposed to have two GAC contactors that can be operated in series or in parallel.

The pressurized GAC contactors are downflow fixed bed units, where untreated well water enters the top of the vessel and flows down through the bed of activated carbon. Treated water leaves the unit at the bottom. A schematic of a typical GAC unit is shown in Figure 2-3.

Before the GAC is installed, the contactor must be cleaned and disinfected. Once installed, the GAC bed needs to be defined, cleansed of carbon fines, stratified, forward flushed to adjust the pH, and consolidated. To conserve water, BWS purchases pre-washed carbon. These start-up processes typically use approximately 530,000 gallons of water per contactor. The actual amount of water used will depend on the characteristics of the carbon used. Upon approval from the State Department of Transportation (SDOT), the water generated from the start-up processes will be discharged through a blow-off discharge line (BDL) which will connect to the existing SDOT storm drain system along Kamehameha Highway as shown in Figure 2-4.

The BWS will typically hire a private contractor to periodically remove and dispose of the GAC once it is exhausted. The spent carbon is removed from the contactor as a slurry and pumped

Section 2

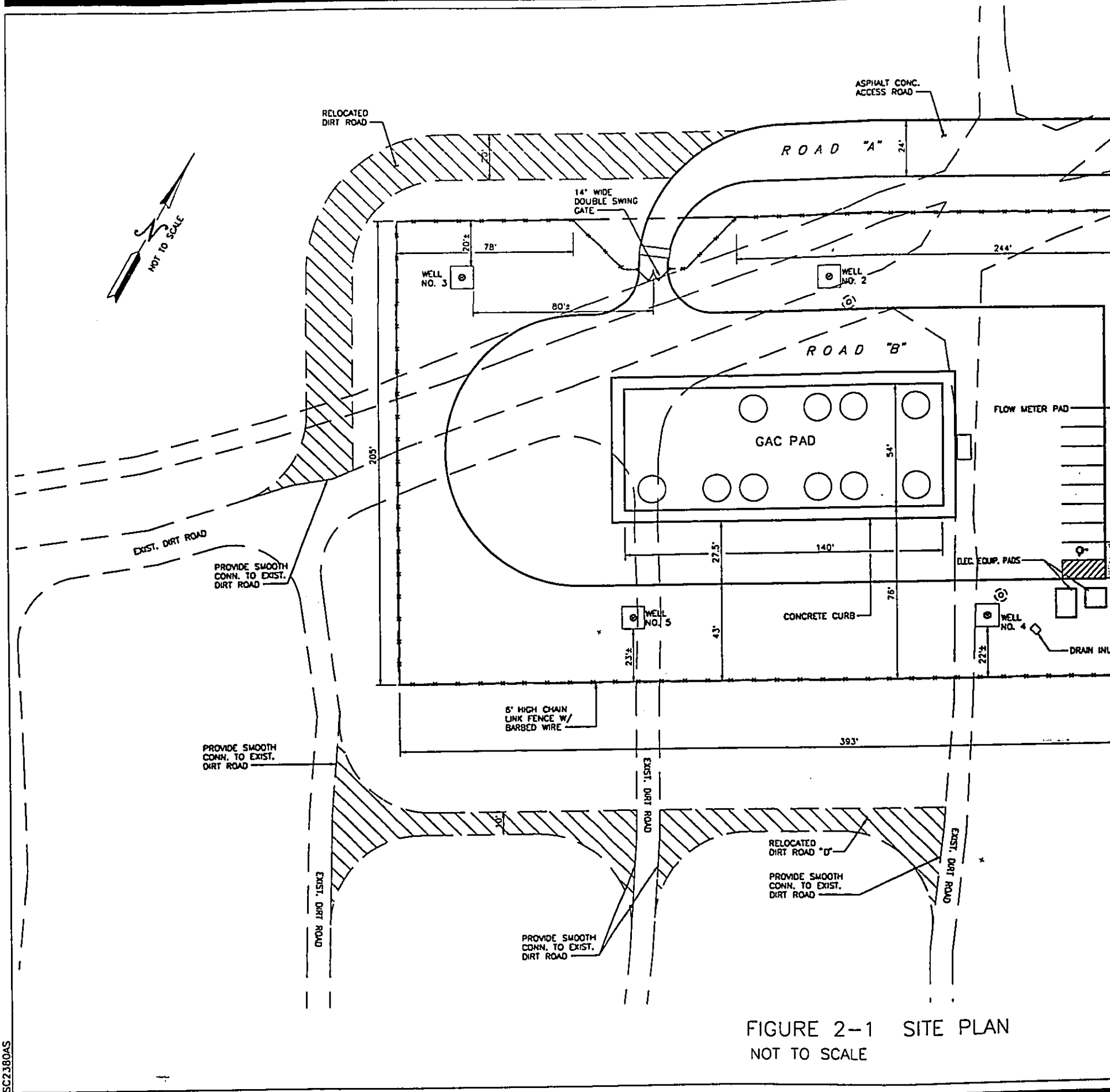
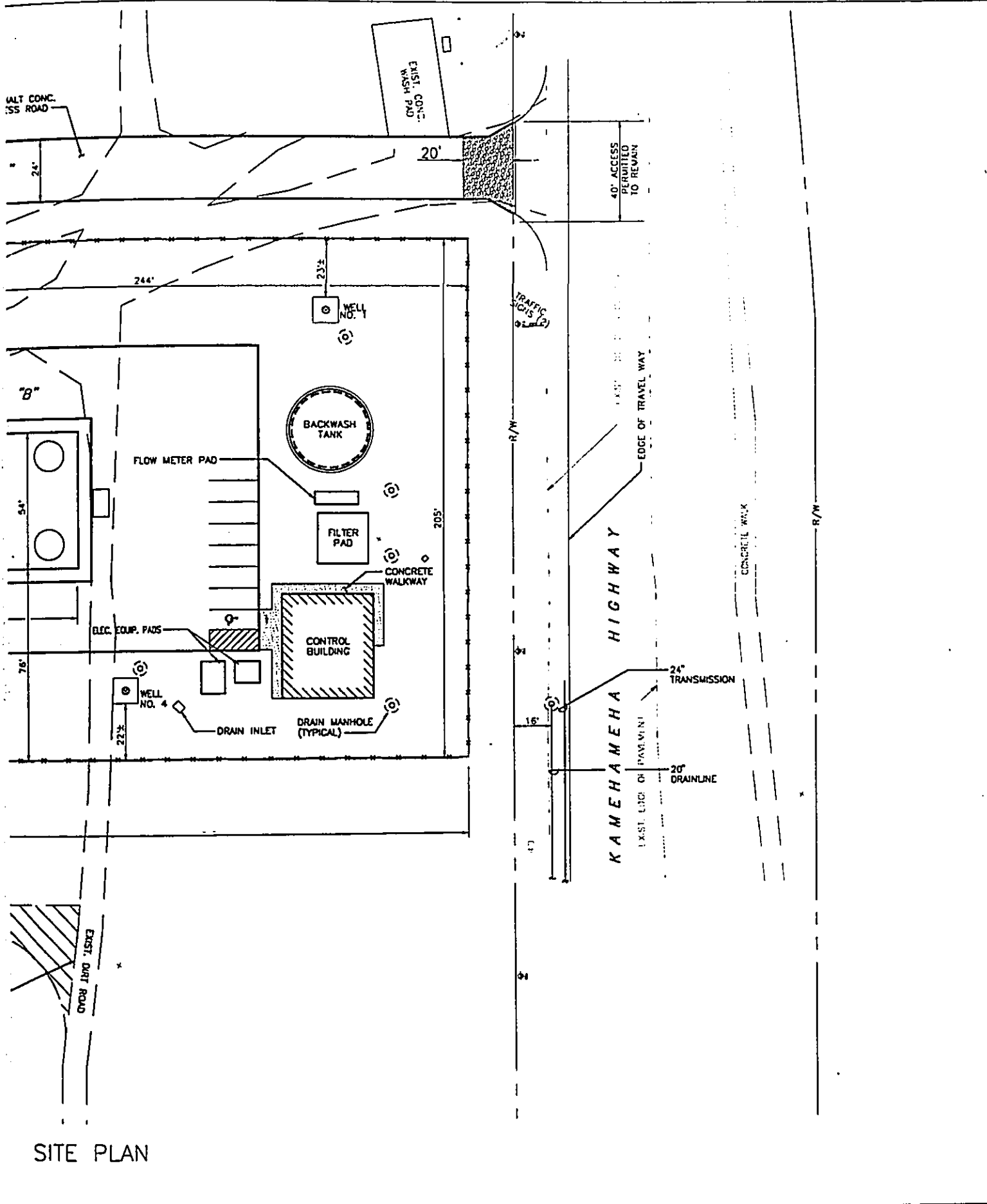


FIGURE 2-1 SITE PLAN
NOT TO SCALE



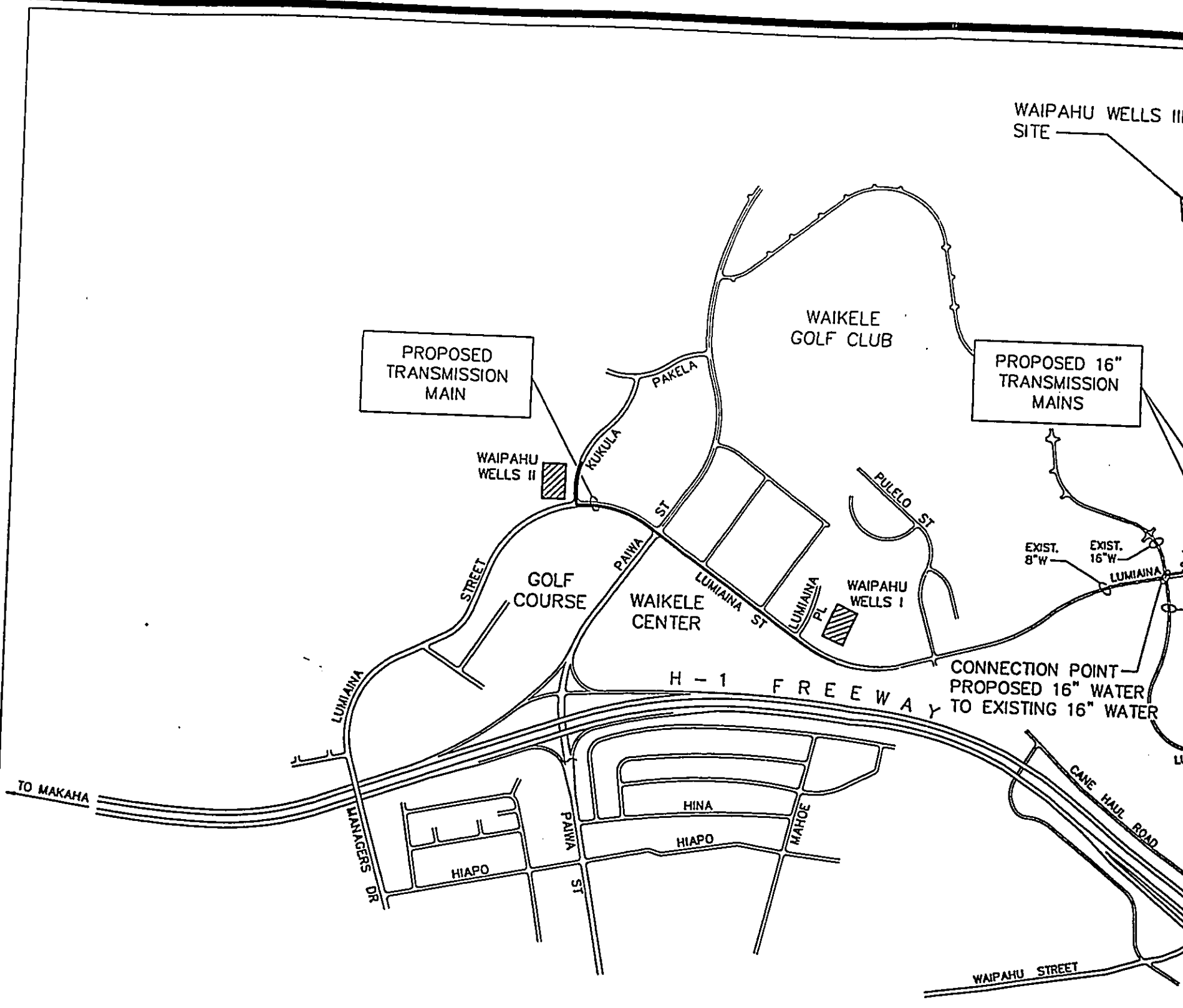


FIGURE 2-2 VICINITY MAP

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CORRECTION

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

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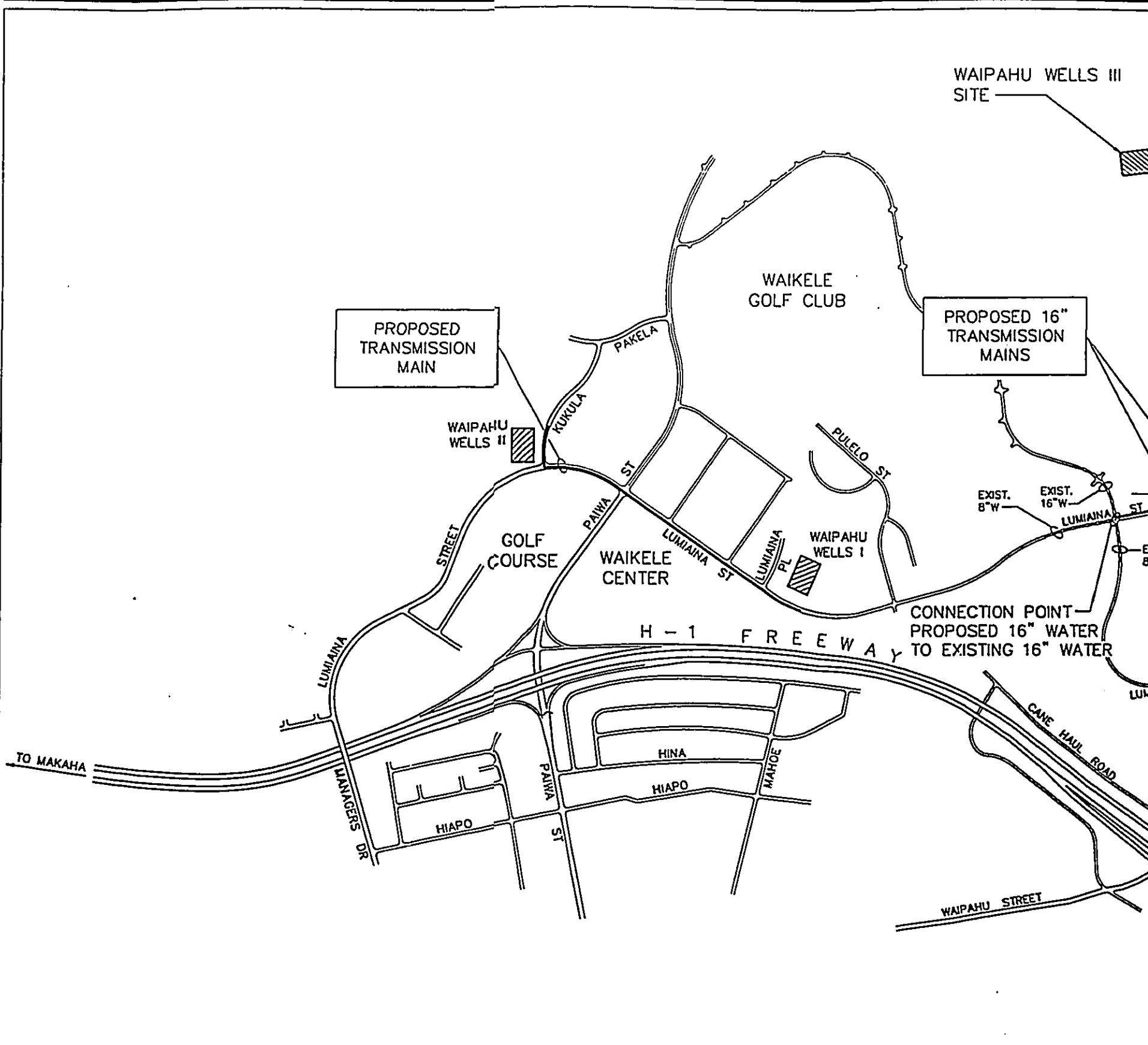
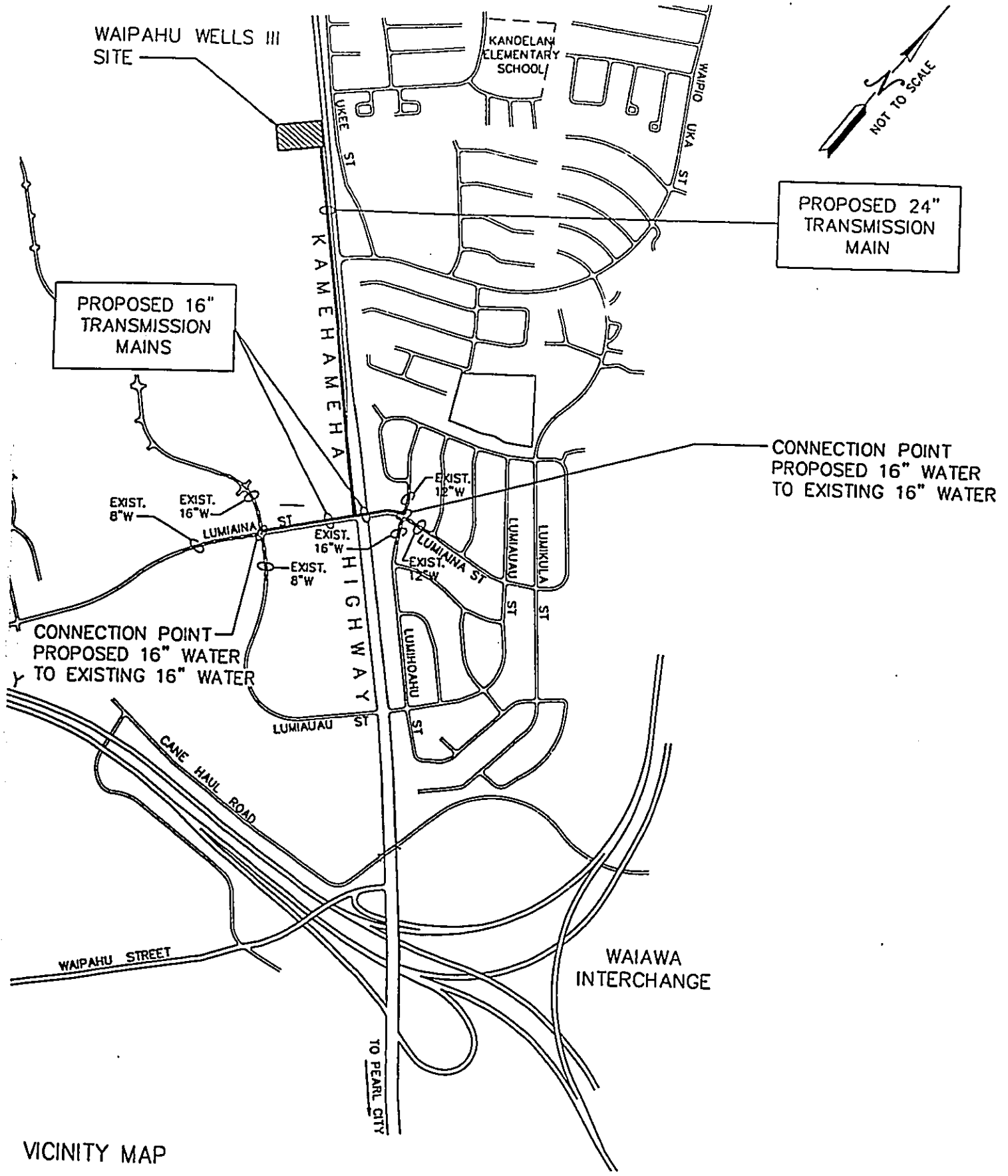


FIGURE 2-2 VICINITY MAP

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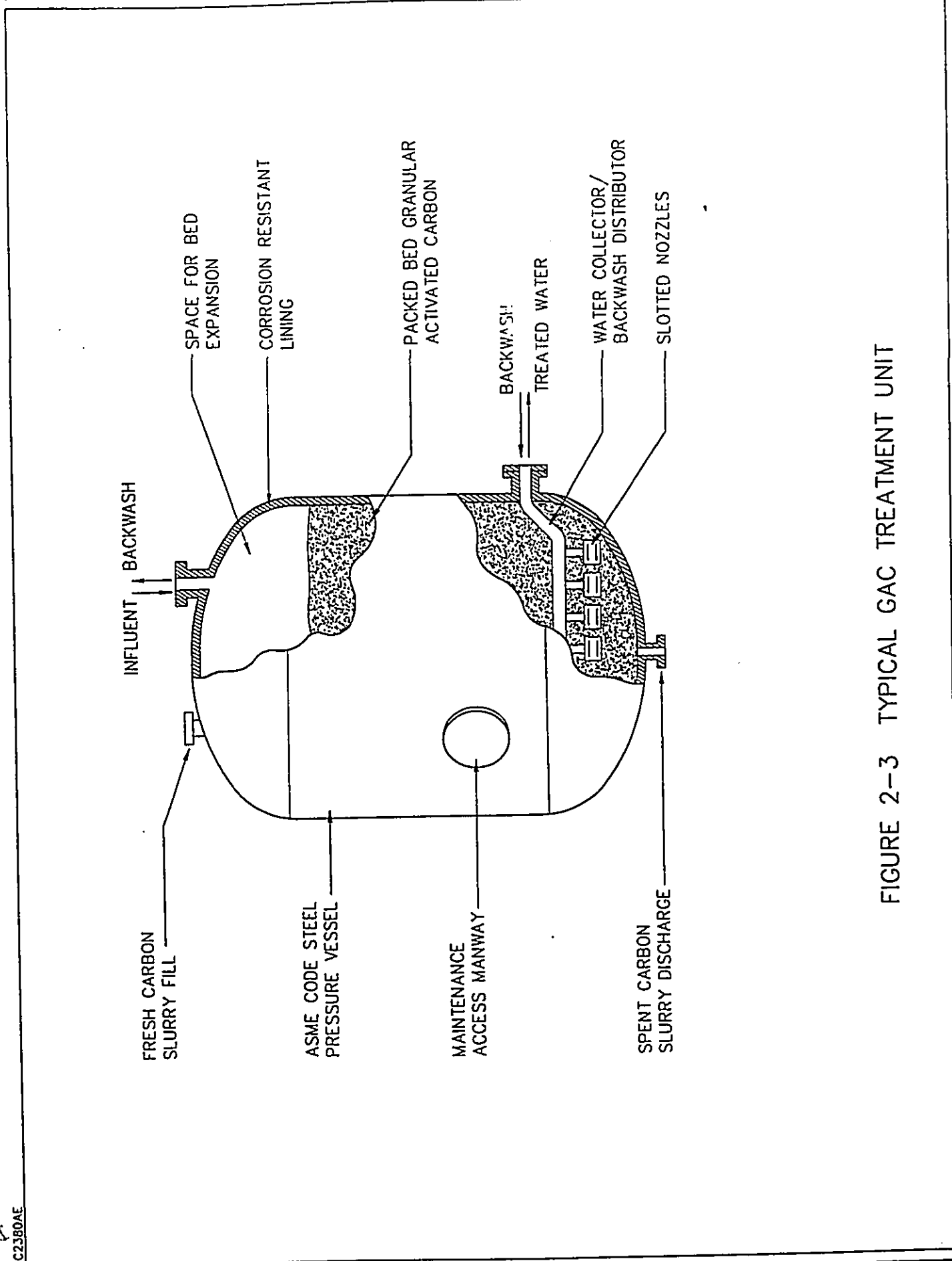
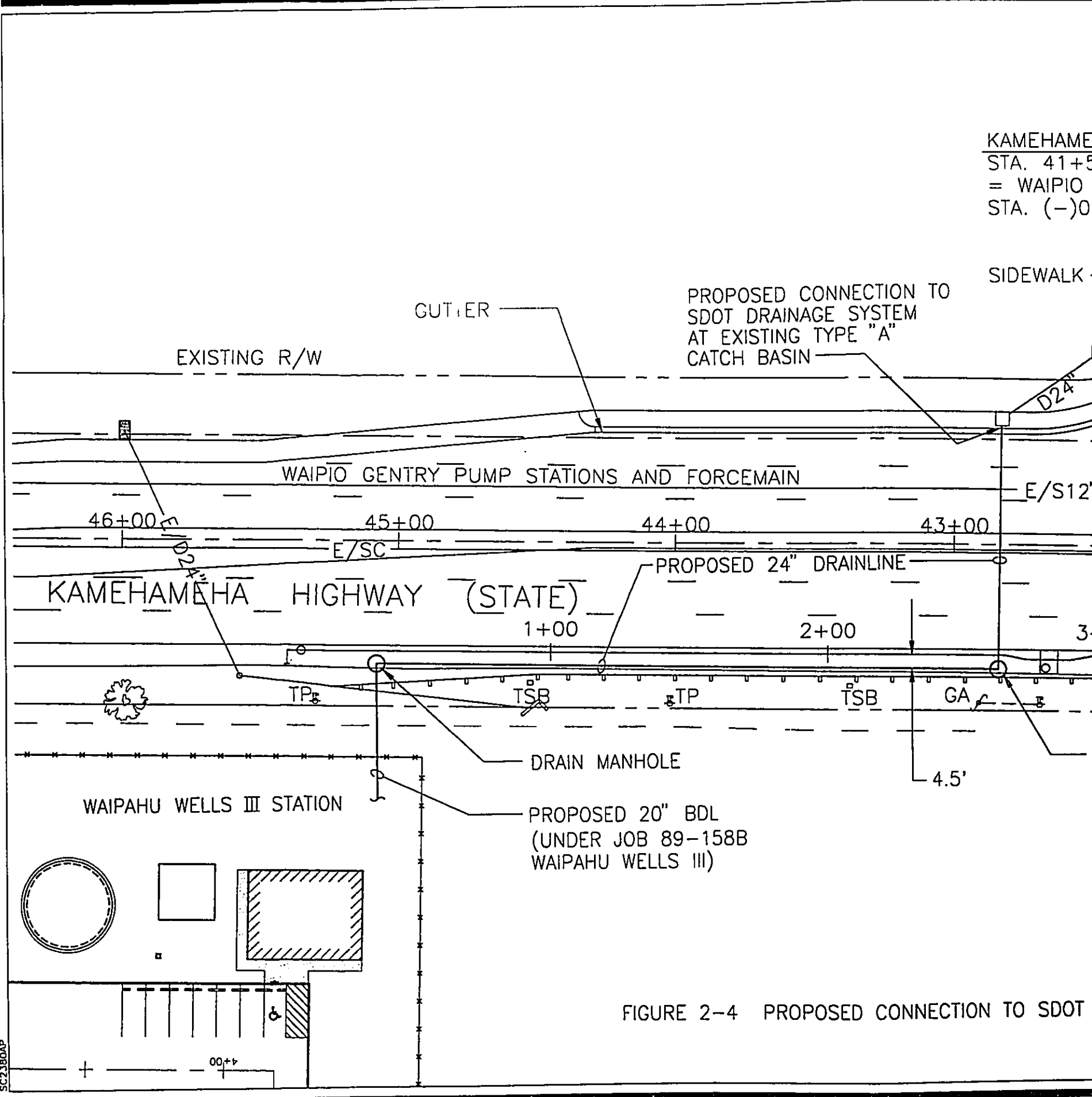


FIGURE 2-3 TYPICAL GAC TREATMENT UNIT

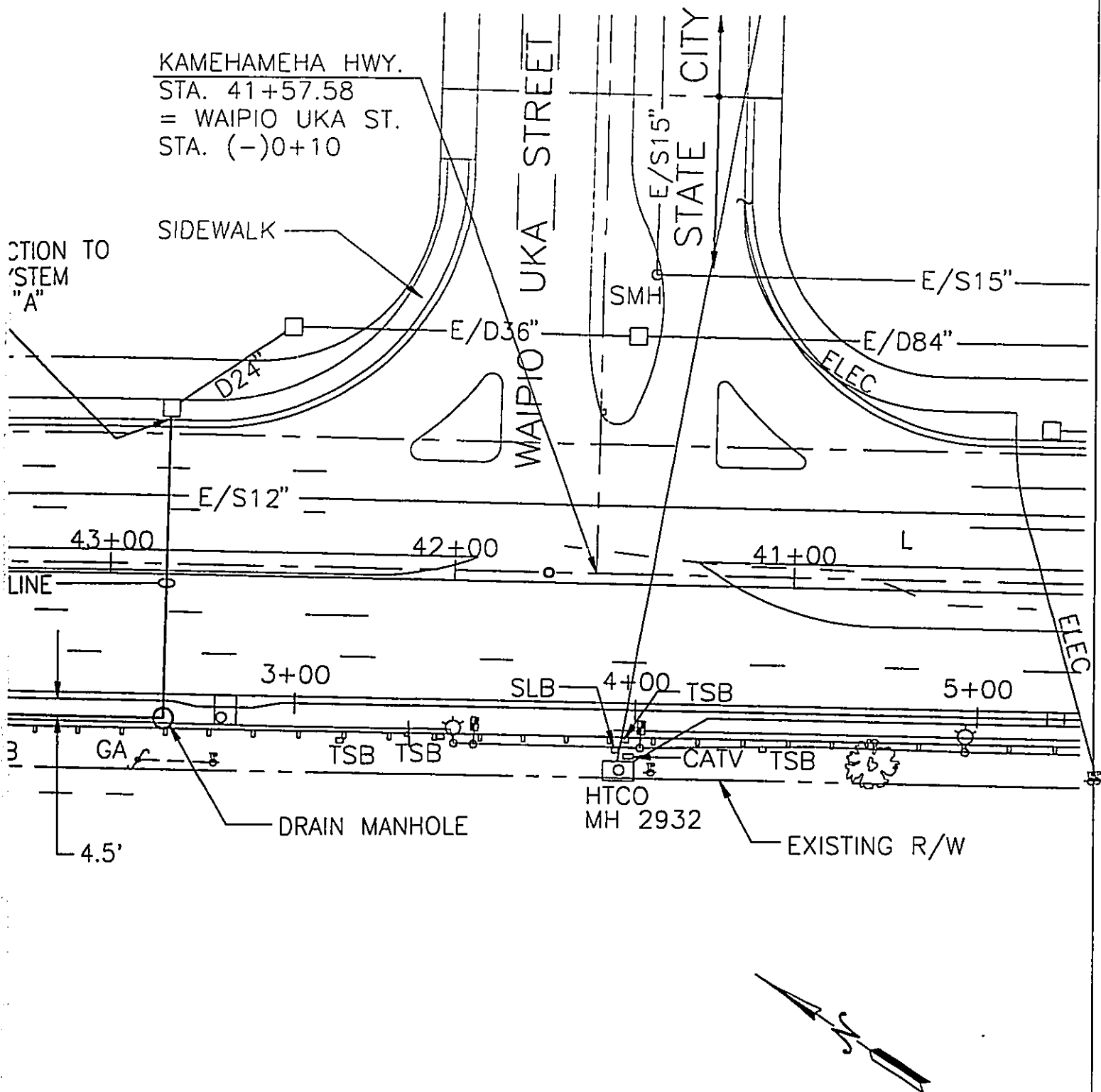
Section 2



KAMEHAMEHA
STA. 41+50
= WAIPAHU
STA. (-)00

FIGURE 2-4 PROPOSED CONNECTION TO SDOT

SC2380AP



CONNECTION TO SDOT DRAINAGE SYSTEM

SCALE: 1"=40'-0"

into a tanker truck, where it is dewatered. The contractor will be responsible for the proper treatment and disposal of the decanted water, as well as for obtaining the necessary discharge permits. The spent carbon from the Waipahu Wells III GAC treatment facility will most likely be landfilled in accordance with approved procedures. Spent carbon from the BWS's existing GAC facilities on Oahu has never been classified as a hazardous waste based on the results of a toxicity characteristic leaching procedure (TCLP) test. The TCLP test is used to determine the "mobility of both organic and inorganic analytes present in liquid, solid and multiphase wastes" (40 CFR 261, Appendix II).

Contactors that are on stand-by will also need to be periodically refreshed to prevent stagnation. The refreshing process uses approximately 50,000 gallons of water per contactor.

The five wells, numbered 2400-09 through 2400-13, extend to a depth of between 453 and 458 feet from ground elevation of between 311 and 318 above MSL to an elevation of between 140 and 144 below MSL. The coordinates for all five wells are Latitude 24° 24' 57" and Longitude 157° 00' 15". Figure 2-5 shows a well section for Well #1 and is typical of all five wells. Appendix C contains information on wells No. 1-5, including well completion reports, cross sections, and pump test results. The wells need to be flushed before being put into service. This will amount to approximately 5,000 gallons of water per well. The proposed GAC contactors, pumps, and backwash tank are estimated to cost approximately \$7.9 million.

The new Kamehameha Highway 24-inch transmission main, approximately 2,417 feet in length, will begin at the well site and connect to a new 16-inch transmission main at Lumiaina Street, where it will extend west to Lumiauau Street and east to Lumihoahu Street, for a total length of approximately 1,089 feet. The new transmission main that will connect the Waipahu Wells II, 395' system to the Waipahu Wells I, 228' system will run south along Kukula Street and east along Lumiaina Street. The new transmission line will be ultimately connected to the existing 36" main along the H-1 Freeway so that additional water can be provided to the Leeward area. The specific size and length of the new transmission line will be determined by the BWS following further system design.

All transmission mains, all process piping, and the GAC tanks will need to be hydrotested. A NPDES general permit for hydrotesting, as well as any other applicable discharge permits will be secured before any hydrotesting water is discharged. The new 24-inch and 16-inch transmission mains are estimated to cost approximately \$1.25 million.

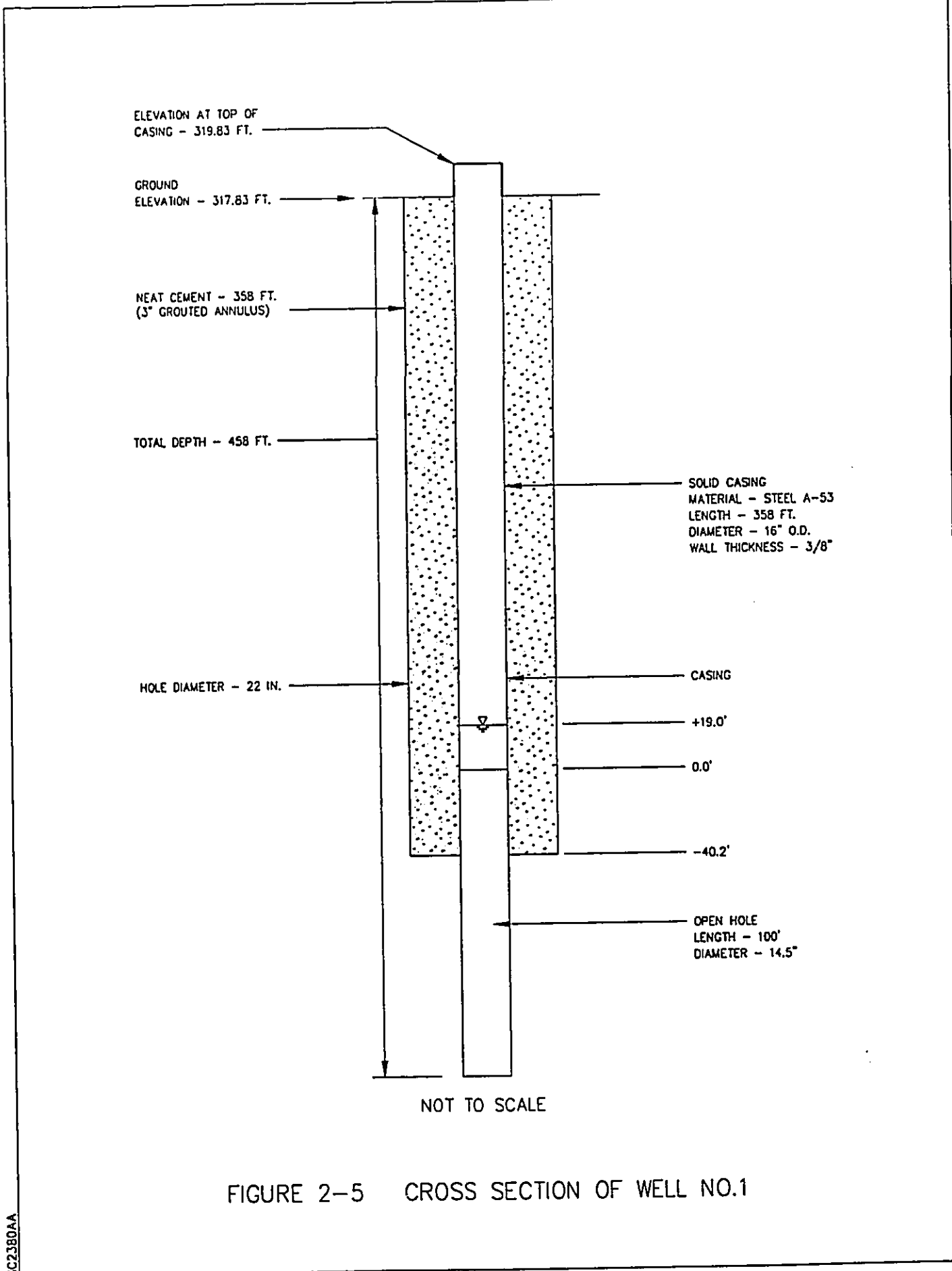


FIGURE 2-5 CROSS SECTION OF WELL NO.1

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SECTION 3
ALTERNATIVES TO THE
PROPOSED ACTION

SECTION 3 ALTERNATIVES TO THE PROPOSED ACTION

The alternatives to the proposed action are the no action alternative, delayed action, alternate sites, and alternate sources.

3.1 No Action

The no action alternative is not a viable option. The Waipahu Wells III Station and transmission main project is intended to add to the municipal water supply to meet the potable water needs of Kapolei, Waianae, Nanakuli, Papakolea, and Lualualei. Waipahu Wells III is also needed to provide for the incremental growth in water demand in other BWS service areas. Currently BWS is using its reserve capacity to meet the demands of these areas resulting in loss of flexibility to provide water for future area developments and to provide adequate supplies to ensure adequate pressure for fire fighting flows. Therefore, the no action alternative does not satisfy the need for meeting water demands in these areas. In addition, the BWS would lose the capital invested in the five exploratory wells at the Waipahu Wells III Station site.

3.2 Delayed Action

The delayed action is not considered a feasible option. Connection of the developments in Kapolei, Lualualei, and Hawaiian homestead areas to the BWS potable water system was contingent on the HFDC and DHHL providing a proportionate amount of resources for BWS to develop the Waipahu Wells III Station. BWS has lost some of its reserve capacity to provide potable water for these areas until Waipahu Wells III can be completed. Loss of this reserve capacity limits BWS's ability to provide potable water to new and existing service areas and insure adequate supplies for fire fighting flows. Therefore, delayed action is not a practical alternative.

3.3 Alternate Site

The current proposed location was selected due to its hydrogeologically favorable conditions, accessibility, hydraulic adequacy for integration into the existing water system, land acquisition, and water quality data based on nearby wells. The suitability of other sites for Waipahu Wells III station was investigated by the BWS and included locating the station near the Waikele Center. However, BWS hydrogeologist determined that pumping from this location would impact production rates at the nearby Waipahu Wells I and Waipahu Wells II sites.

3.4 Alternate Source

Alternate sources of potable water are currently not considered viable due to public perception problems, being technical infeasible, or not cost effective. The BWS has considered several alternate potable water sources such as desalination, utilization of surface water or brackish water,

and recycling of wastewater in the Oahu Water Management Plan as well as other specific studies.

Desalination will be implemented as groundwater withdrawals approach sustainable yields. A site and technology study is currently in progress. While the capital cost of a large scale desalination plant per gallon is equivalent to groundwater development in rural areas, the operation and maintenance (O&M) costs at \$3.00 per thousand gallons is 10 times the cost of pumping groundwater. The high O&M costs of desalination can directly affect water rates which the BWS aims to keep as low as possible.

The BWS has also investigated surface water as an alternate water source in a 1996 report titled, "Surface Water Study." The study indicated that surface water development for potable use was not feasible due to the small, variable flows, environmental impact, and the intense regulatory process involved with the instream flow standards, as well as the monitoring requirements of the Safe Drinking Water Act.

The reuse of wastewater effluent is a promising alternative resource that is being actively pursued by the City and County of Honolulu. Reclaimed water could not only help to replace potable use for irrigation and industrial process water, but could also relieve the development pressure for high quality groundwater supplies. However, public health concerns and high costs for dual water system infrastructure limit the extent of water reuse. The City is currently focussing their reuse efforts in the Ewa Plains, where dual water systems can be master planned into new developments rather than the more costly alternative of redeveloping existing urban areas with dual systems. The City is also planning to reuse the effluent from the Honouliuli Wastewater Treatment Plant (WWTP), located in the Ewa region, since the chloride content of the effluent is well suited for irrigation. Effluent from other facilities such as the Sand Island WWTP, located in the Honolulu area, have chloride contents that are too high for irrigation purposes.

High cost prohibits desalination from being a viable option, and use of surface or brackish waters are considered to have potentially damaging hydrogeological effects. In addition, current negative public perception and high cost make wastewater recycling infeasible. BWS is aggressively pursuing water conservation practices such as using dual water systems to extend the high quality potable water resource. Despite efforts by BWS to implement water conservation projects, demand for potable water is growing. The BWS continues to promote water conservation to all of its customers. Conservation efforts include: leak detection, installing low flow water fixtures, accelerating the BWS's pipeline replacement program islandwide, public education, and inverting residential water rates. While conservation efforts reduce average day demand, the ability to accommodate peak demand is also a function of available pump capacity, storage, and pipeline infrastructure. Until alternate potable water sources become feasible, groundwater will remain the primary source of Oahu's potable water.

SECTION 4
AFFECTED ENVIRONMENT

SECTION 4 AFFECTED ENVIRONMENT

The proposed Waipahu Wells III Station and transmission main project is located in Waipahu, on the island of Oahu, as shown in Figure 4-1. The well site is a relatively flat piece of abandoned pineapple land located on Kamehameha Highway, approximately one mile north of the Waiawa Interchange and above the Waikele and Crestview subdivisions, as shown in Figure 2-2. The site was chosen by the Board of Water Supply based upon availability, elevation, access, topography, hydrogeological characteristics, and constructability.

The elevation of the proposed well site is approximately 320 feet above sea level. The property is identified by Tax Map Key 9-4-05:74 and is currently owned by Castle & Cooke Homes Hawaii, Inc. The BWS, however, is planning to purchase the property in fee. The approximate size of the well site within the fence line is 200 feet x 385 feet with an additional easement for the access road of approximately 45 feet x 311 feet.

To convey water from the proposed well, a 24-inch transmission main will be constructed along Kamehameha Highway from the well site to Lumiaina Street. A 16-inch transmission main will be constructed along Lumiaina Street, between Lumiauau Street and Lumihoahu Street, to convey the water from the Waipahu Wells III Station to the existing water mains. The proposed project also includes a new transmission main to connect the Waipahu Wells II, 395' system to the Waipahu Wells I, 228' system along Lumiaina Street. The transmission mains will be installed underground within the road right-of-way.

4.1 Physical Setting

4.1.1 Geology And Topography

The central Oahu plateau was formed by the overlap of the Koolau volcano lava flows over the Waianae flank. The plateau was elevated by successive lava flows from the Koolau shield volcano. Subsequently, very hard volcanic rock formed bedrock in the project area.

According to the U.S. Geological Survey (USGS) Topographic Map, the land surface of the well site is relatively flat with a gentle slope of approximately 5 percent from the north to the south. Kipapa Gulch, a major drainage way, is located approximately 3/4 of a mile to the west of the project site. The topography of the area is shown in Figure 4-2.

4.1.2 Soils

Soil at the well site is classified by the U.S. Department of Agriculture Soil Conservation Service as Molokai silty clay loam with slopes of 3 to 15 percent. The Molokai series consists of well-drained soils formed by the weathering of igneous rock. Runoff is slow to medium and the erosion hazard is slight to moderate. Small areas of this soil were found as dark reddish-brown silty clay loams approximately 7 inches thick, which overlie fine, gravelly alluvium. This soil can be used for sugar cane, pineapple, pasture or wildlife habitat.

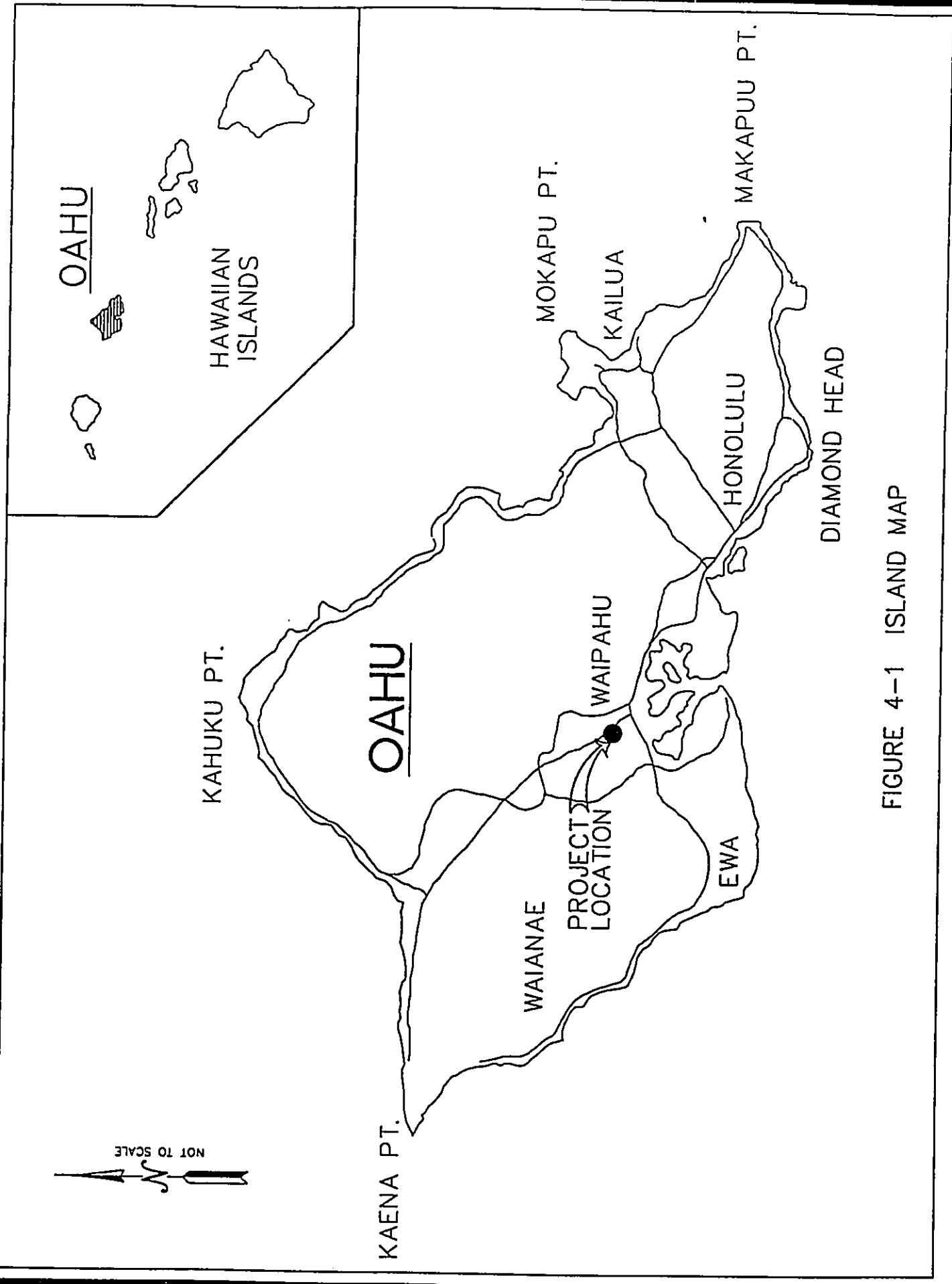
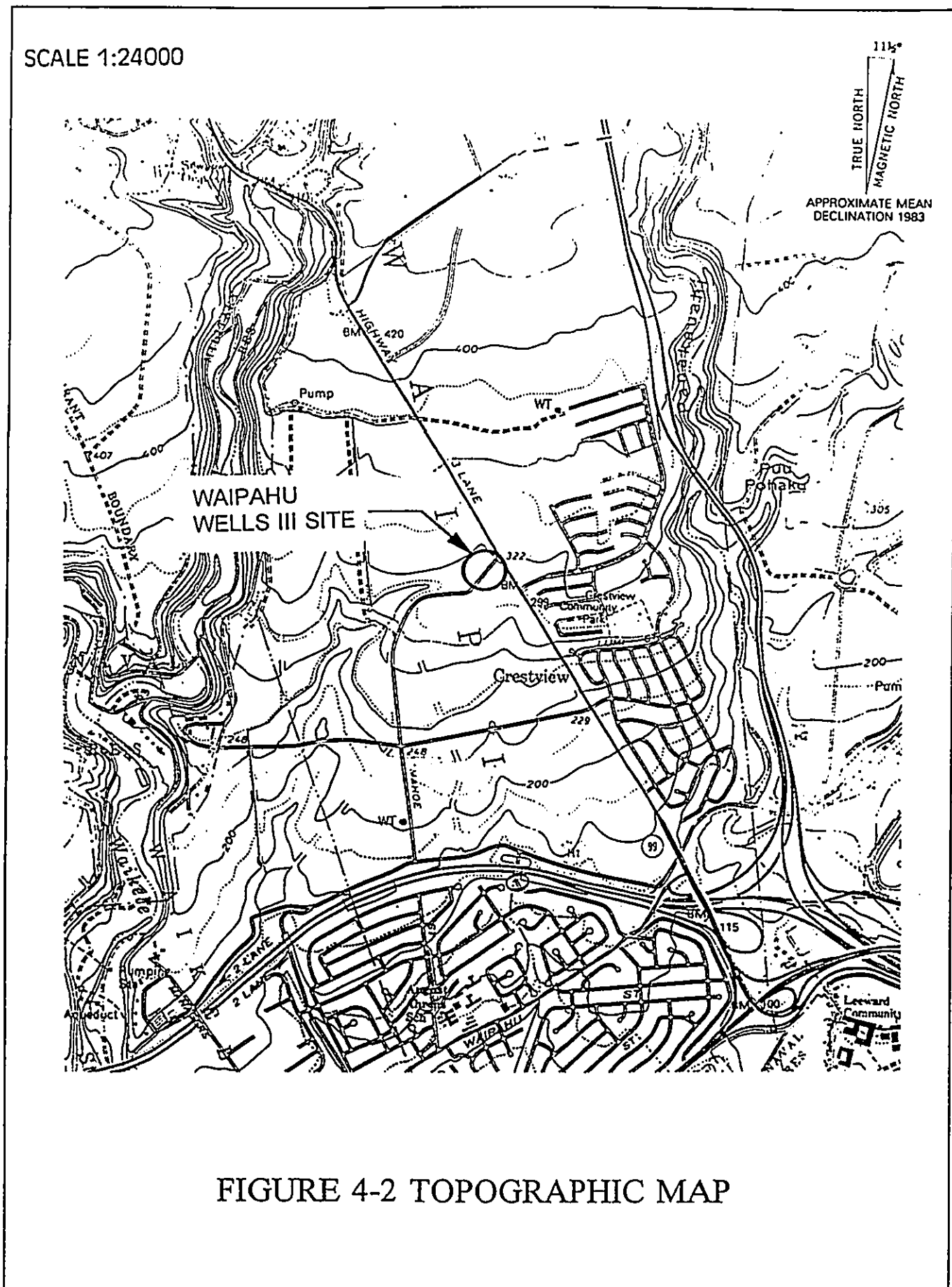


FIGURE 4-1 ISLAND MAP

SC2380AF



4.1.3 Climate

The mean rainfall in the Waipio area is approximately 30 to 35 inches per year. Most of this precipitation occurs during the winter months of October through April. The summer months of May through September are relatively drier.

The temperature in the area is consistent with areas of medium to higher elevations on Oahu and is influenced by the cooling effects of the prevailing north-northeast trade winds. The average year round temperature ranges from 66 degrees to 84 degrees Fahrenheit.

4.1.4 Flood Hazards

According to the Flood Insurance Rate Map by the Federal Emergency Management Agency, the well site and the transmission mains are in Zone "D", which means that flood hazards in the area are undetermined.

4.1.5 Earthquake Hazards

The island of Oahu is classified as a Seismic Zone 2B area as per the Uniform Building Code, 1988. Given that the least active zone is Zone 0, and the most active zone is Zone 4, the possibility of an earthquake occurring on Oahu is considered remote. The Board of Water Supply, however, has adopted the more conservative Zone 3 design standards for all of its structures, which offer a higher stability in the event of an earthquake.

4.2 Flora And Fauna

The project area has been under agricultural cultivation since the early 1900's when its original vegetation was removed. The majority of the existing project site consists of abandoned pineapple fields. The remaining vegetation consists mostly of introduced or exotic nuisance species of grasses, shrubs, and trees. No rare, endangered, or threatened plant species were found on the project site. Similar surveys done of neighboring sites have also found no rare or endangered species. The animals populating the site are mainly insects, birds and mammals most of which are not unique to the Hawaiian islands. Common bird species which may frequent the site are the barred dove, the lace-necked dove, the Japanese white-eye and the red-crested cardinals. Pests such as the house mouse, the Polynesian rat and the Indian mongoose also frequent the site.

4.3 Archaeology/Cultural Resources

The Waipahu Wells III station site is located in abandoned pineapple fields that were previously used for extensive agricultural use. Some archaeological sites were found in nearby gulch areas, but none at the proposed project site. It is unlikely that a new historic site will be found at the well site.

The transmission mains will be located underground within the road right-of-way. Due to the previous work performed on the site, it is unlikely that new historic sites will be uncovered during the construction of the transmission mains.

4.4 Recreational Resources

The City is currently proposing to develop a regional park and a sports complex on a 269-acre site adjacent to the Waipahu Wells III site. This development, called the Waiola Park and Sports Complex, would accommodate sports facilities which include baseball/softball fields, tennis courts, basketball/volleyball courts, skateboard bowls, in-line hockey courts, multipurpose fields, a boxcar racing course, an aquatic center, a community center, and a training field house. Bicycle/pedestrian paths, restrooms, parking and internal circulation roads are also proposed within the park. A conceptual plan of the park is shown in Figure 4-3.

The existing City parks near to the project site include the Waikele Neighborhood Park and the Waikele Community Park as shown in Figure 4-4. The Waikele Neighborhood Park is located east of the Lumiaina Street and Lumiauau Street intersection. The Waikele Community Park is located along the north side of Lumiaina Street and adjoins the easterly and northerly sides of the Waipahu Wells I station.

4.5 Land Use

The Waipahu Wells III Station and transmission main project boundaries fall within the State Agricultural and Urban Land Use Districts and outside of any designated Special Management Areas (SMA). A State Special Use Permit is not required because the proposals are considered a permissible use within the agricultural district under Section 205-4.5(a)(7), Hawaii Revised Statutes. A Conservation District Use permit is also not required. The existing state land use designations are shown in Figure 4-5.

The proposed well site is zoned AG-1 on the City and County of Honolulu Zoning Map as shown in Figure 4-6. A Development Plan Land Use Map for the area is shown in Figure 4-7.

4.6 Ground and Surface Water Hydrology

The island of Oahu depends upon three types of ground water sources for most of its potable drinking water. Basal water sources are the largest of the three, and underlie most of the southern and northern portions of the island. The second largest source is high-level dike water, which is found between impermeable vertical rock structures along the Koolau and Waianae ranges. The third type of water source is perched water, which is held up on horizontal impermeable lava flows or volcanic ash. Dike and perched water, both of which occur in mountainous regions, are of excellent quality and, unlike basal water, are not subject to saline contamination.

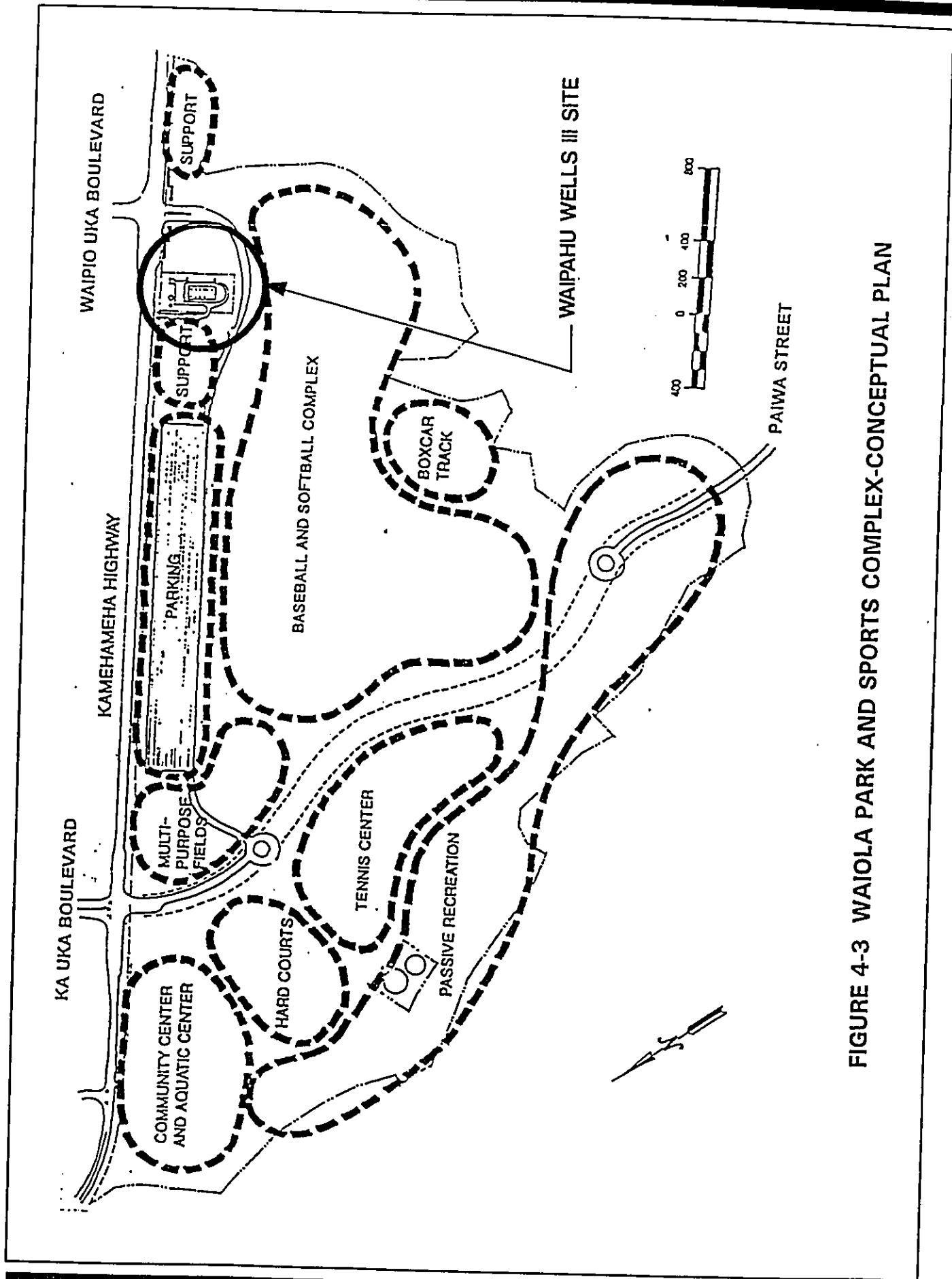


FIGURE 4-3 WAIOLA PARK AND SPORTS COMPLEX-CONCEPTUAL PLAN

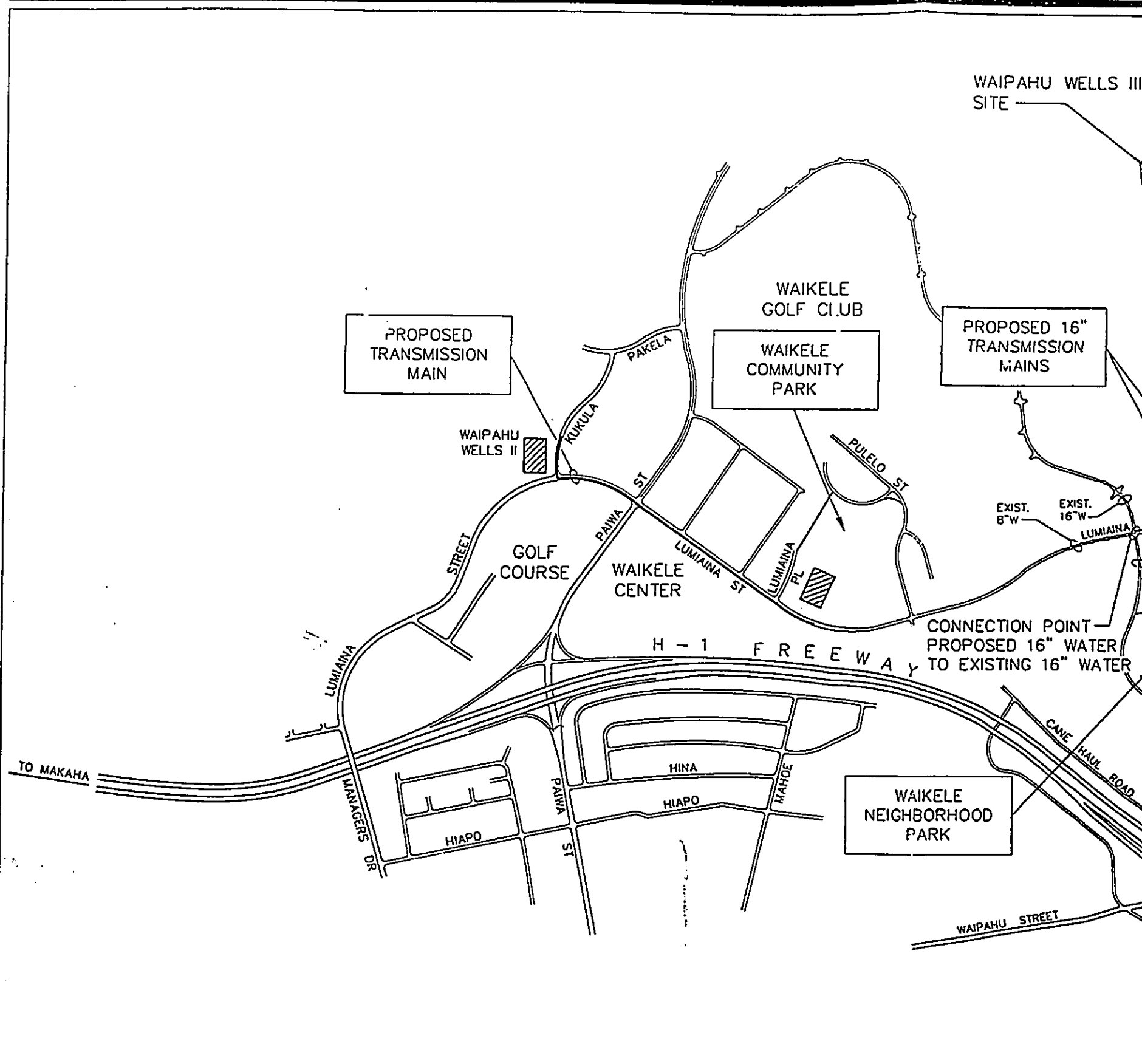
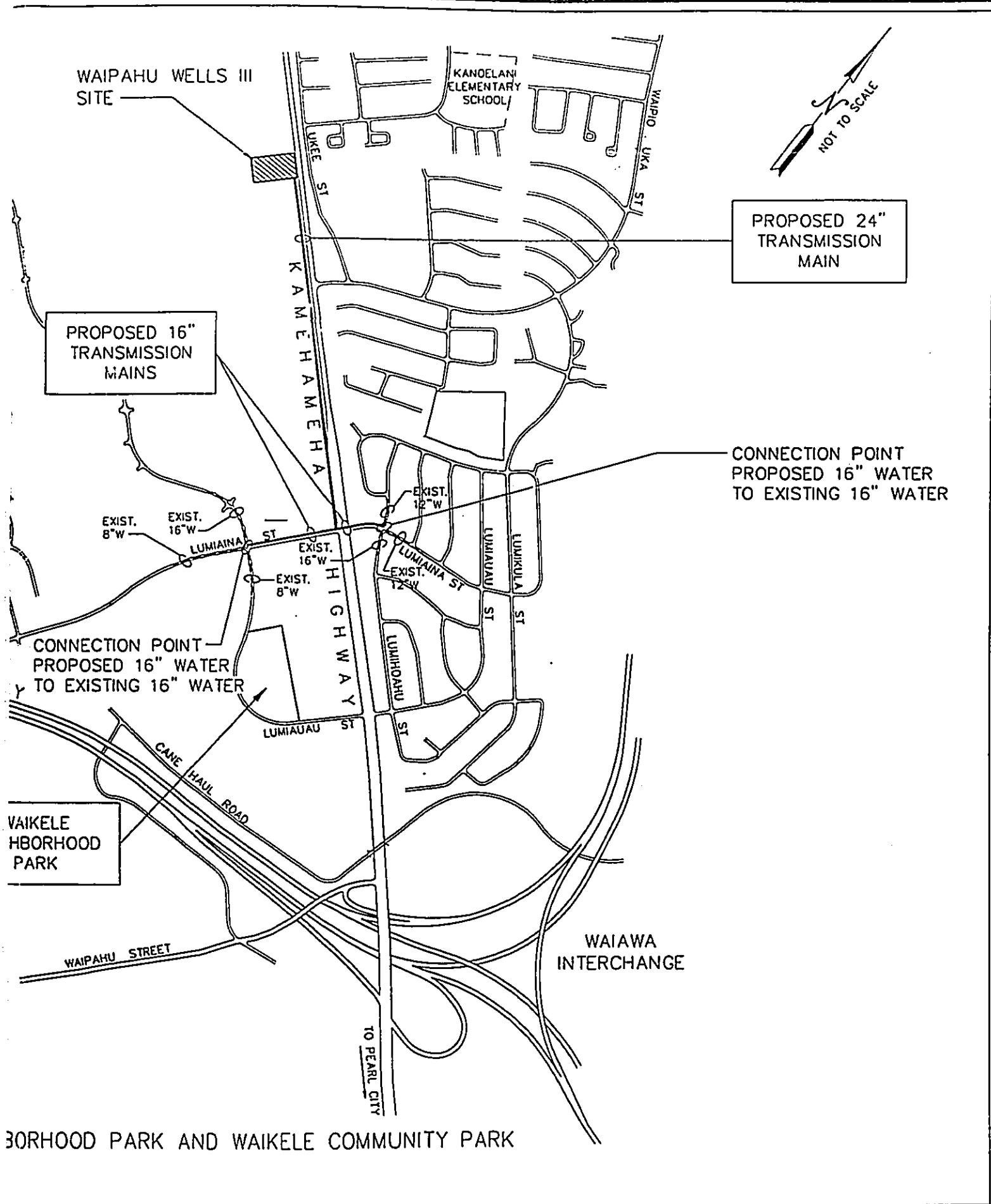
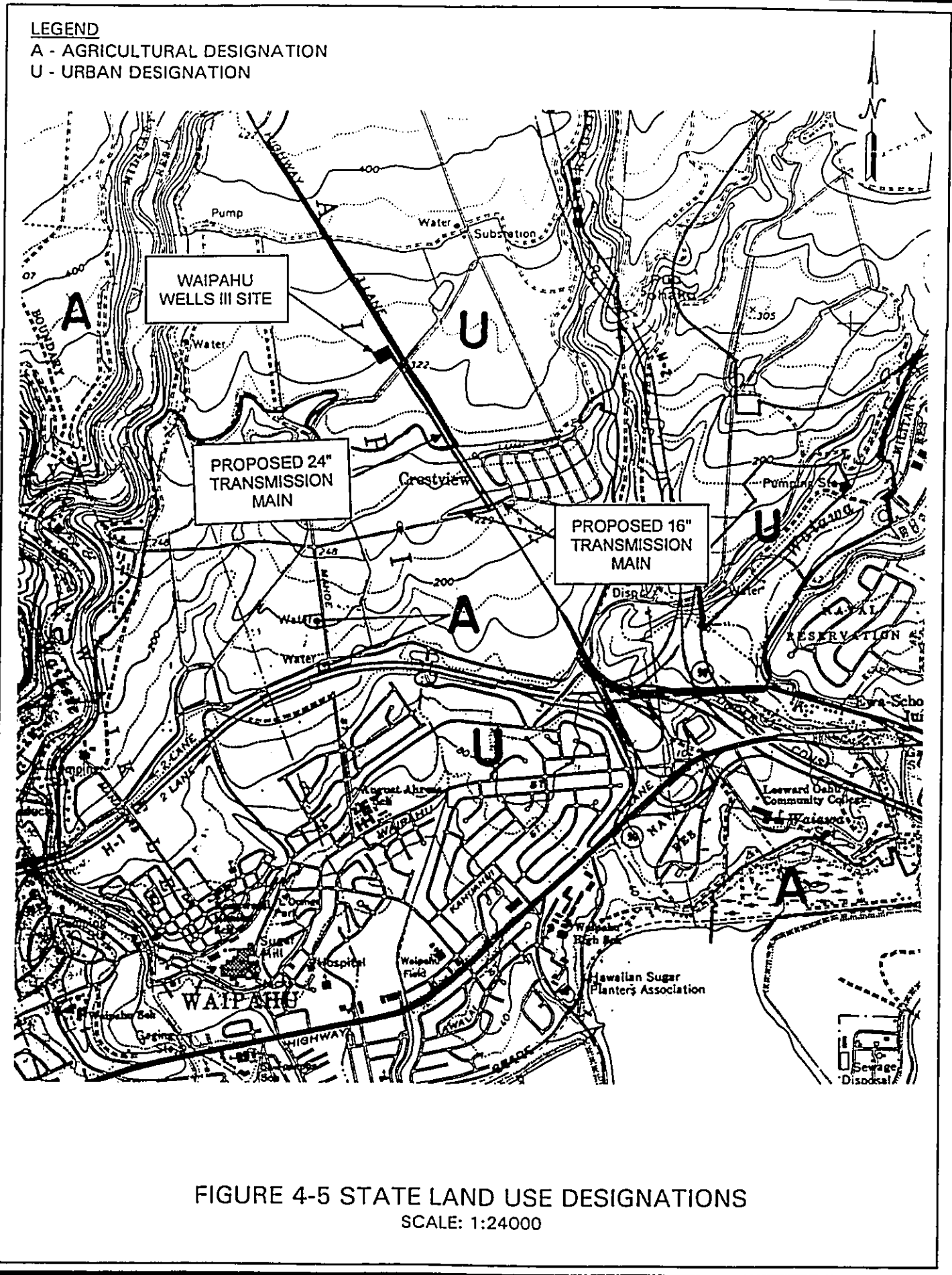
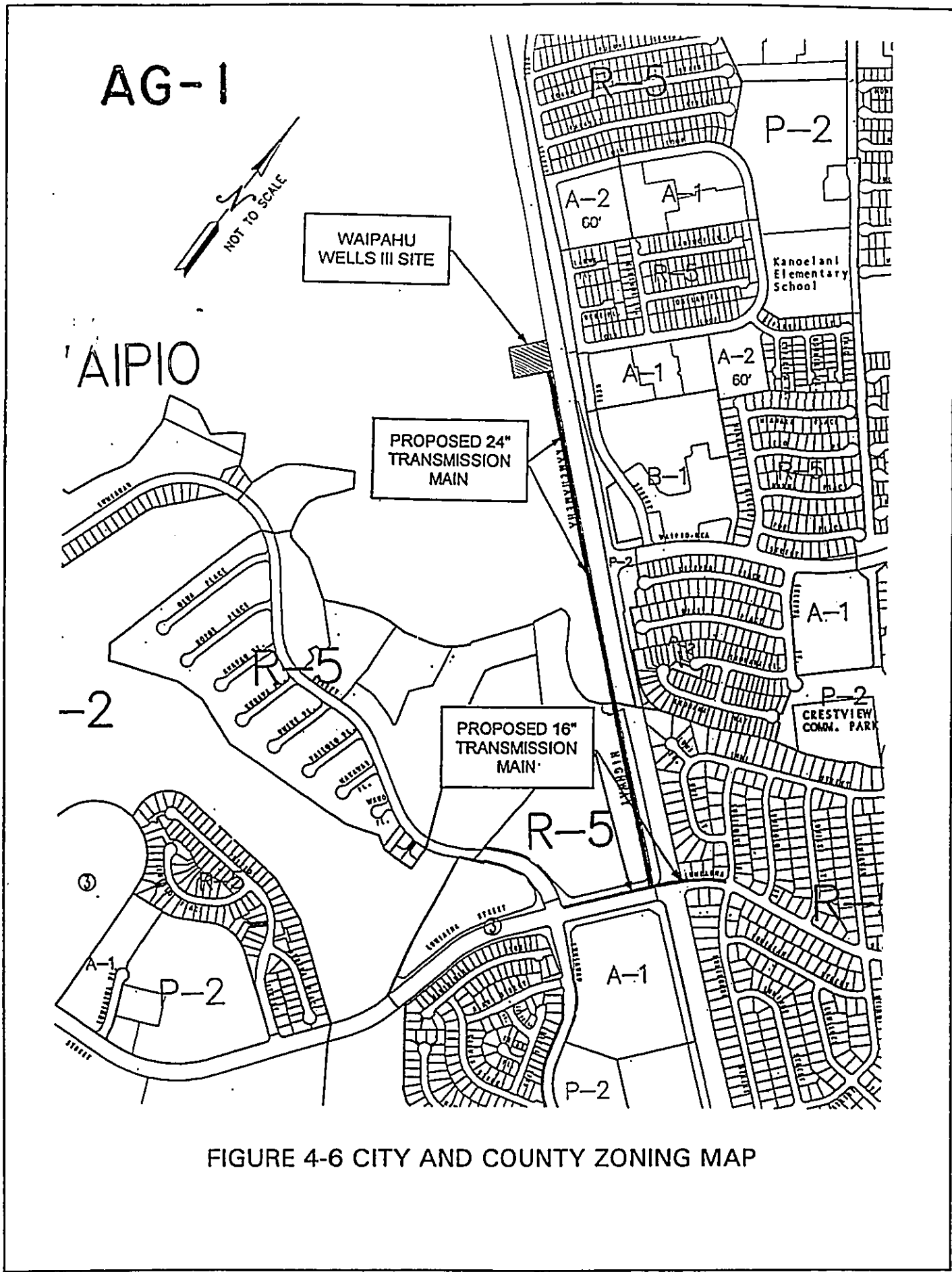


FIGURE 4-4 LOCATION OF WAIKĒLE NEIGHBORHOOD PARK AND WA







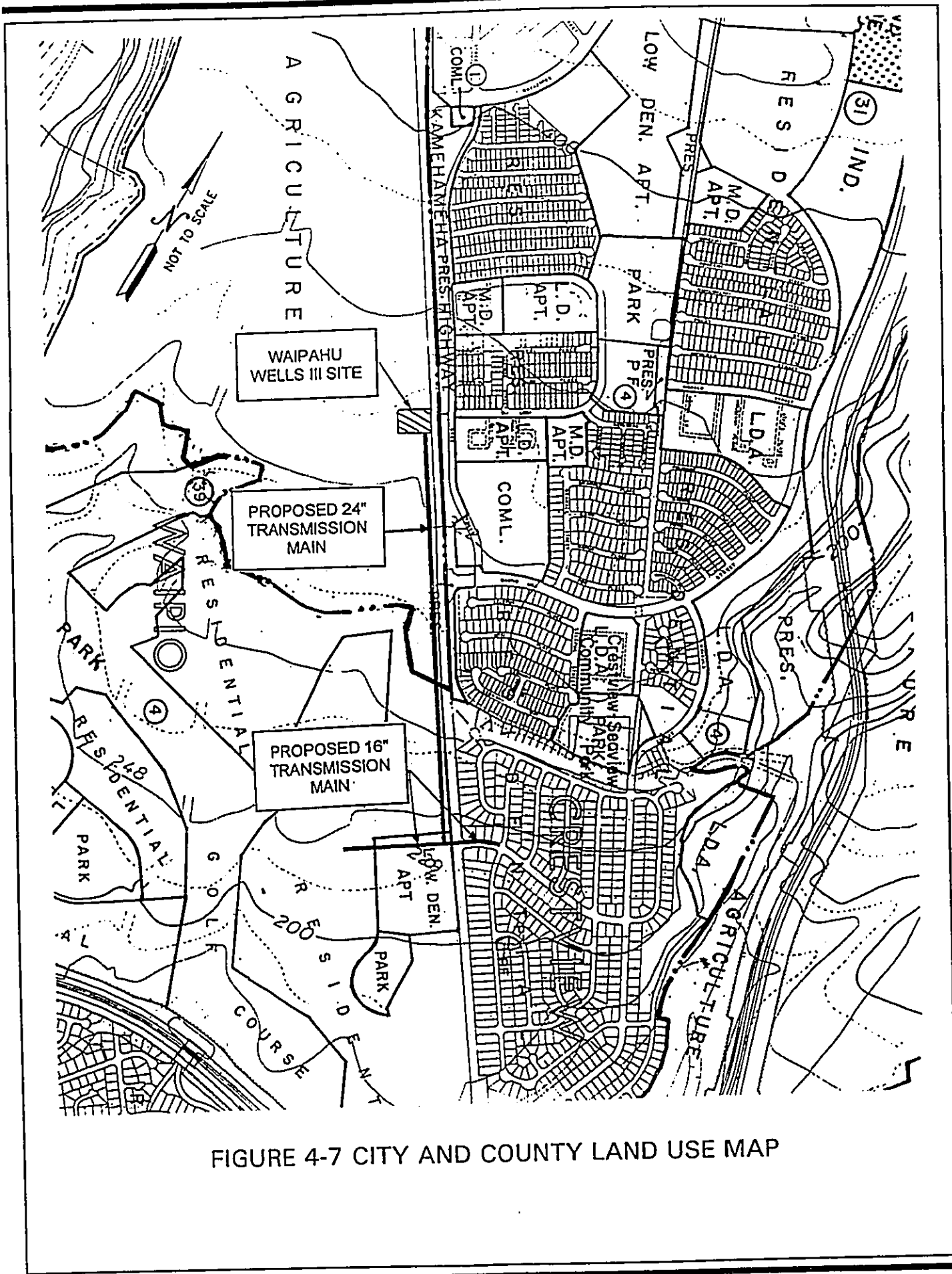


FIGURE 4-7 CITY AND COUNTY LAND USE MAP

The Commission on Water Resource Management (CWRM) has established six groundwater sectors for the island of Oahu which include the Honolulu, Pearl Harbor, Waianae, Central, North, and Windward. These sectors are further divided according to the underlying aquifer boundaries. The Waipahu Wells III station will draw water from the Waipahu-Waiawa aquifer, which is a part of the Pearl Harbor groundwater sector as shown in Figure 4-8.

The sustainable yield established for the Waipahu-Waiawa aquifer by the CWRM is 119 million gallons per day (mgd). The sustainable yield is the estimated amount of groundwater that can be withdrawn from the aquifer without adversely impacting the quality or quantity of the aquifer. Current CWRM allocations for the Waipahu-Waiawa aquifer are presented in the following table.

Table 4.1 Waipahu-Waiawa Aquifer - Permitted Uses

PERMITTEE	ALLOCATION (MGD)
Campbell Estates	21.571
Oahu Sugar Company	10.151
Board of Water Supply	41.601
U.S. Navy	14.977
Others	11.336
TOTAL:	99.636

Approximately 83.7 percent of the total sustainable yield has been allocated. However, less than 55 percent of the allocated amount is actually being drawn from the Waipahu-Waiawa Aquifer. Table 4.2 compares the actual water use recorded by CWRM in the past two years with the amount allocated.

Table 4.2 Waipahu-Waiawa Aquifer - Actual Use

PERMITTEE	1996 (MGD)	1997 (MGD)	ALLOCATION (MGD)
Campbell Estates	1.200	1.559	21.571
Oahu Sugar Company	1.729	0.563	10.151
Board of Water Supply	31.735	28.920	41.601
U.S. Navy	17.269	15.493	14.977
Others	2.690	2.355	11.336
TOTALS:	54.623	48.890	99.636

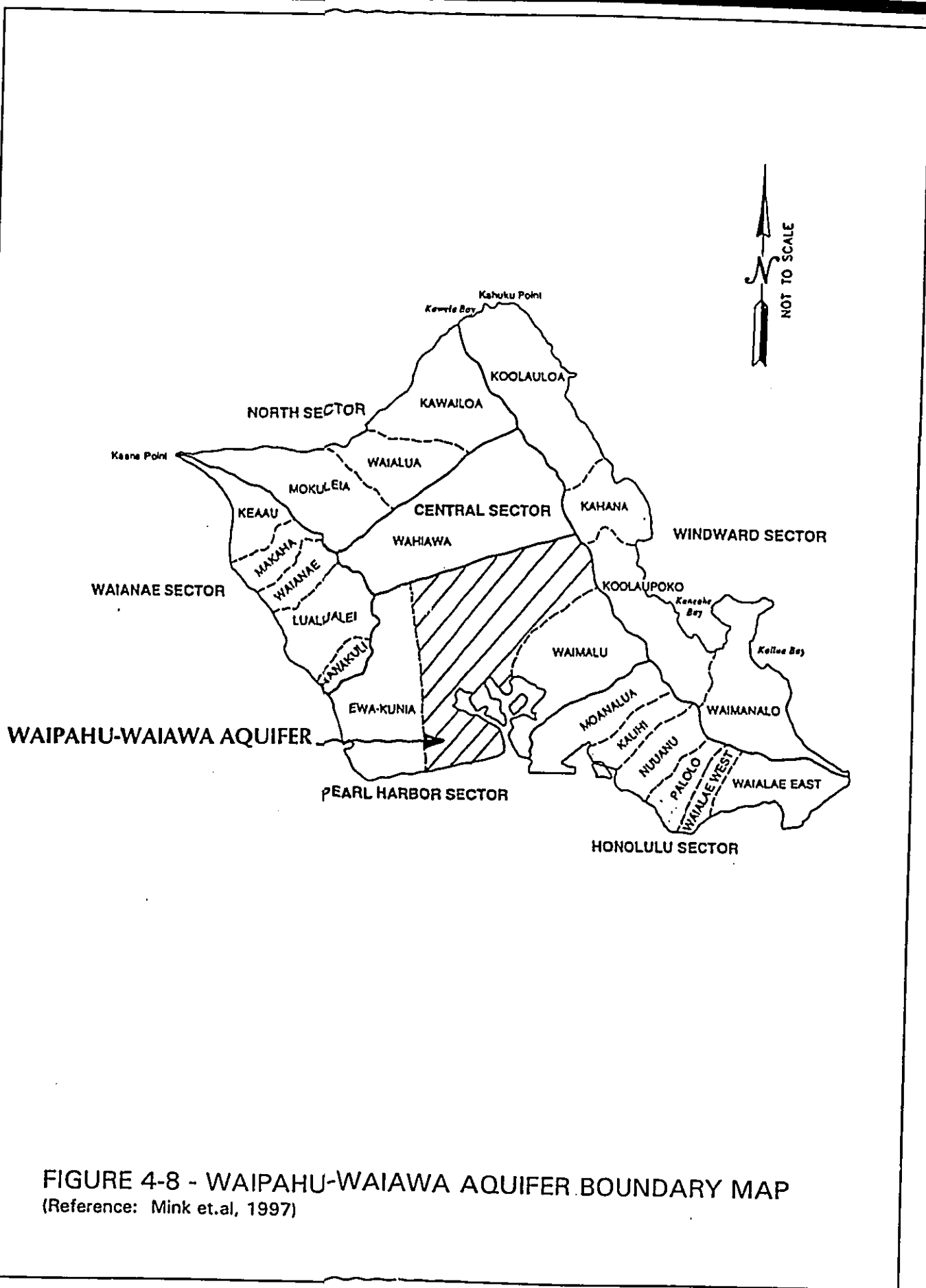


FIGURE 4-8 - WAIPAHU-WAIAWA AQUIFER BOUNDARY MAP
(Reference: Mink et.al, 1997)

4.6.1 Well Recharge

The Waipio area sits on the Pearl Harbor basal aquifer which is recharged by rainfall and the Schofield high-level aquifer. The Pearl Harbor aquifer consists of extensive permeable lavas and is contained by caprock in the coastal area. Together, these two geological features provide southern Oahu with high quality basalt water.

The water table at Waipahu Wells III varies from approximately 19 to 20 feet above MSL.

4.6.2 Wells in the Vicinity

The Waipahu Wells III Station is surrounded by five other well stations which are:

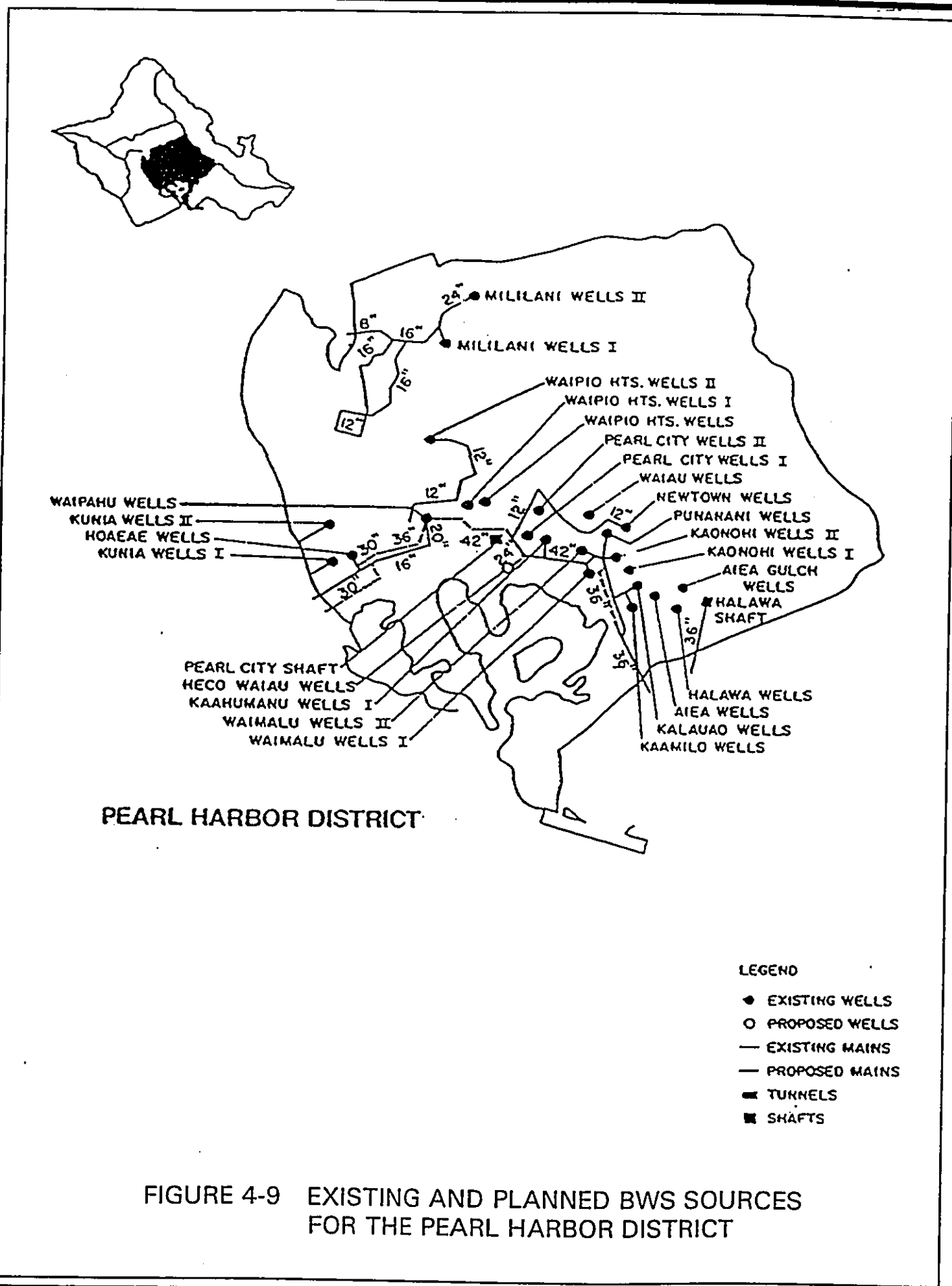
WELLS	NUMBER OF PUMPS	GPM	HD (FT)
Waipio Hts. Wells	2	1500	420
Waipio Hts. Wells I	2	1050	420
Waipio Hts. Wells II	2	1050	630
Waipahu Wells I	2	1900	230
Waipahu Wells II	2	1900	230

The approximate locations of these wells, except Waipahu Wells II, are shown in Figure 4-9.

4.6.3 Water Quality

To date, water samples from all five wells at the Waipahu Wells III Station have been collected and tested, and are included in Appendix D. The results indicate the presence of Ethylene Dibromide (EDB) in all five of the wells. Well Nos. 1 and 2 have concentrations of 30 parts per trillion (ppt) of EDB, while Well Nos. 3, 4, and 5 have concentrations of 20 ppt. The Maximum Contaminant Level (MCL) for EDB is 40 ppt based on the Hawaii Administrative Rules, 11-20-4. Although the concentrations of EDB are below the MCL, GAC treatment units are being installed by the BWS to ensure that the level of EDB is maintained below the MCL.

Lab results from Well No. 1 also indicated 70 ppt of Pentachlorophenol (PCP) and 6 ppt of cyanide. MCL's for PCP and cyanide, according the Primary Drinking Water Standards 40 CFR 141, are 1,000 ppt and 200,000 ppt, respectively. Arrangements will be made to re-sample and validate these initial findings. Lab results from Well No. 4 indicated the presence of 0.6 parts per billion (ppb) of Di-n-Butylphthalate. This initial finding will also be verified prior to distribution.



Wailani Stream is the nearest down grade surface water that may receive runoff from the Waipahu Wells III station. It is located approximately 0.9 miles from the site and receives discharge from the State Department of Transportation and the City and County Department of Public Works drainage systems.

4.7 Potential Sources of Contamination

Since 1982, several pesticides have been detected in the drinking water supply in central Oahu. The primary pesticides of concern are EDB (ethylene dibromide) and DBCP (dibromochloropropane) both of which are volatile organic carbons. The wells found with EDB and/or DBCP concentrations > 40 parts per trillion, the State Maximum Contaminant Level (MCL), are the Mililani, Del Monte Kunia, Kunia II, Waipahu and Waikele wells. Activated carbon units have been installed or are being installed to treat the water at all wells which exceed the MCL. Since the Waipahu Wells III Station is in the vicinity of wells which have been contaminated with EDB and/or DBCP and the proposed project site was formerly used for sugarcane cultivation, the presence of EDB at Waipahu Wells III was anticipated. A groundwater contamination map showing the latest contaminated groundwater wells on Oahu is shown in Figure 4-10.

The Waipahu Wells III Engineering Report, which will be submitted to the Department of Health, will identify all potential sources of contamination and evaluate alternative control measures that would be implemented to reduce or eliminate the potential for contamination, including the treatment of the water source.

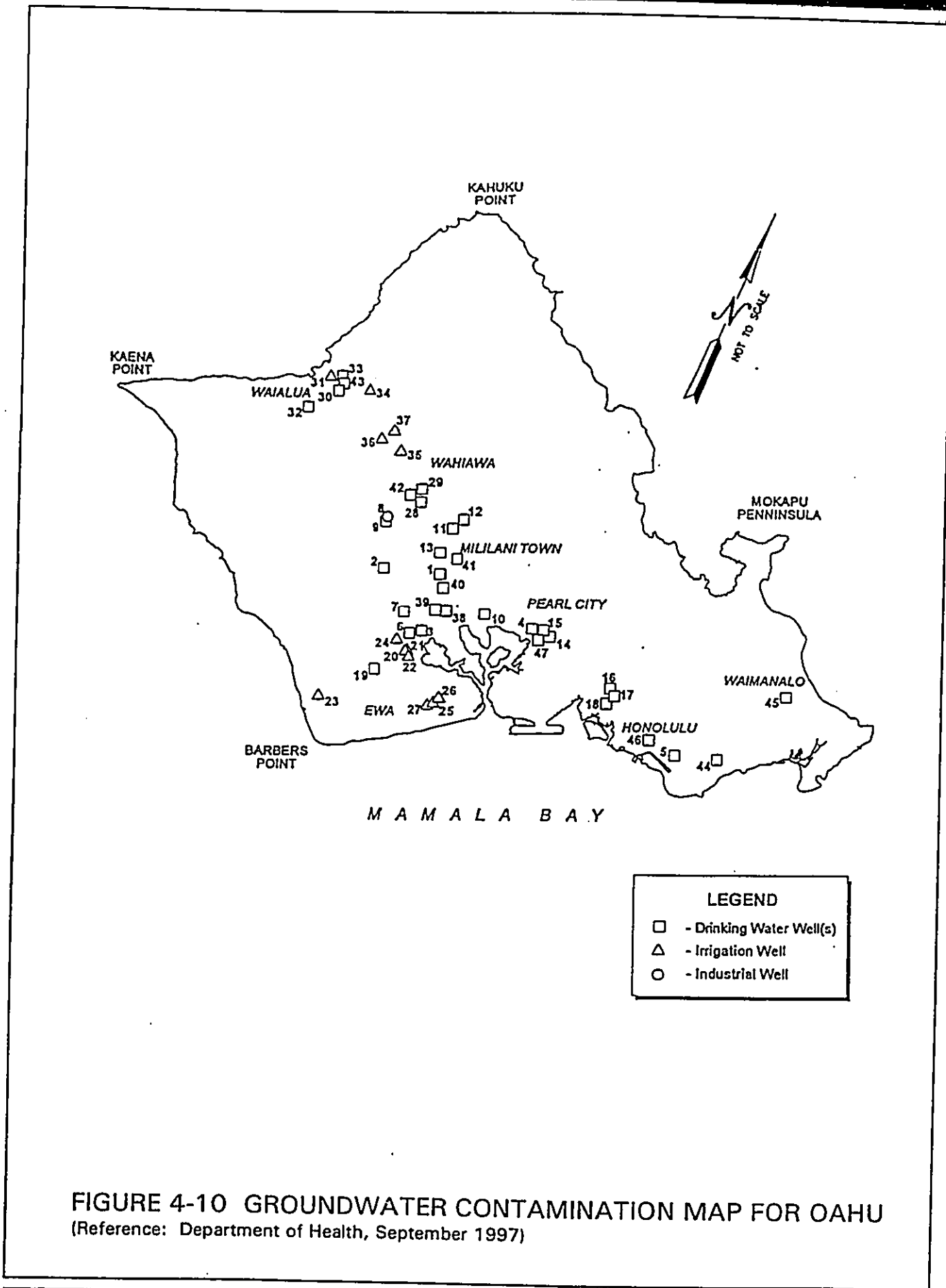
4.8 Aesthetics

The Waipahu Wells III Station site is a relatively flat piece of undeveloped, abandoned pineapple field. Existing flora consists of nuisance species of grasses, shrubs and trees.

4.9 Public Utilities

The existing utilities along the route of the proposed 24-inch transmission main on Kamehameha Highway include a cable TV line, a Hawaiian Telephone Company ductline, a street light and traffic signal duct, a 24-inch drain line and a 12-inch sewer force main. Hawaiian Electric Company also has existing overhead lines along Kamehameha Highway. However, a section of the existing poles will be removed and replaced to support the additional electrical lines that will feed the well site as shown in Figure 4-11.

The utilities existing along the portion of Lumiaina Street, where the proposed 16-inch transmission main will be installed include a 24-inch drain line, a 12-inch water line, and a 6-inch gas line.



Section 4

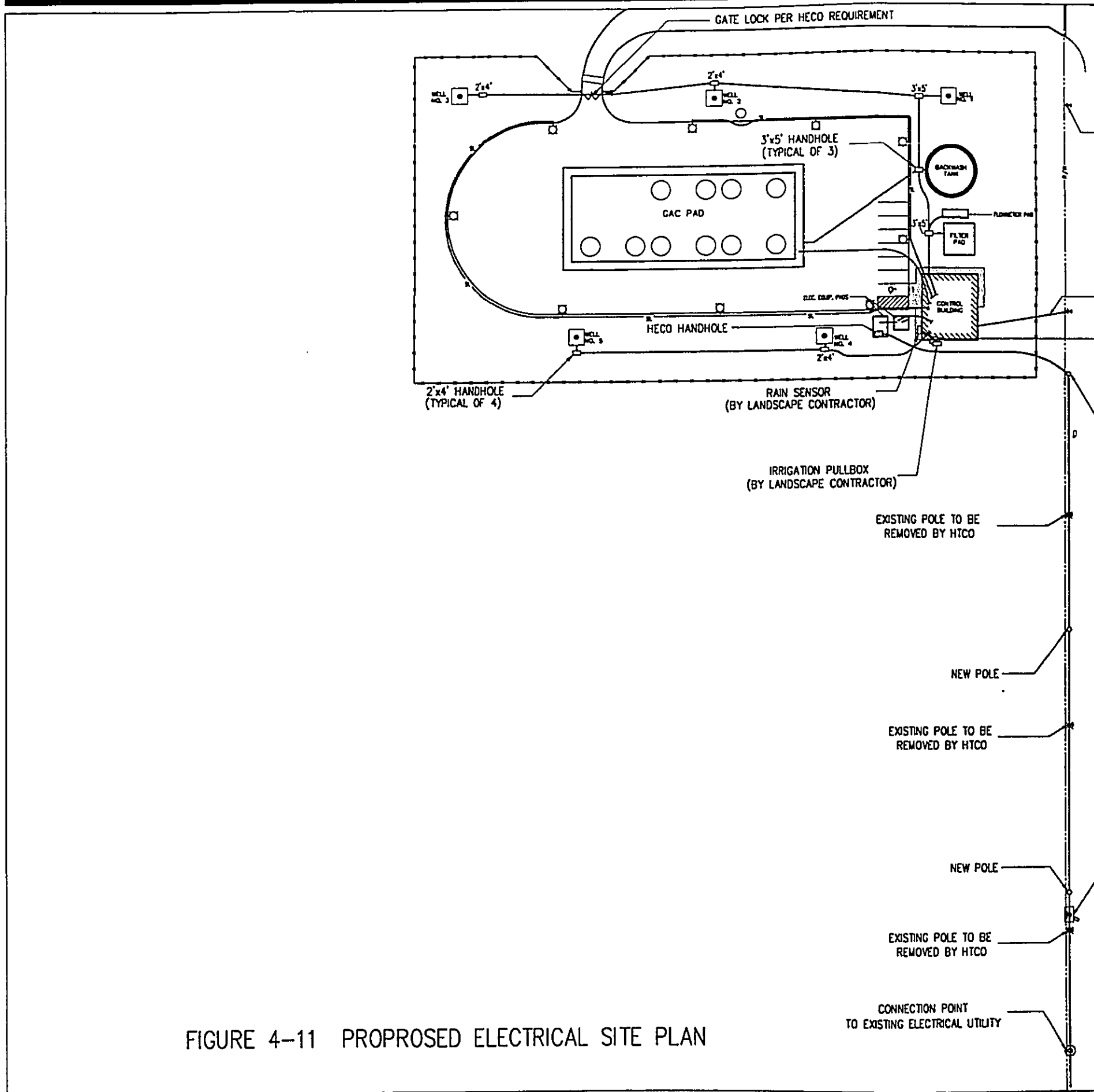
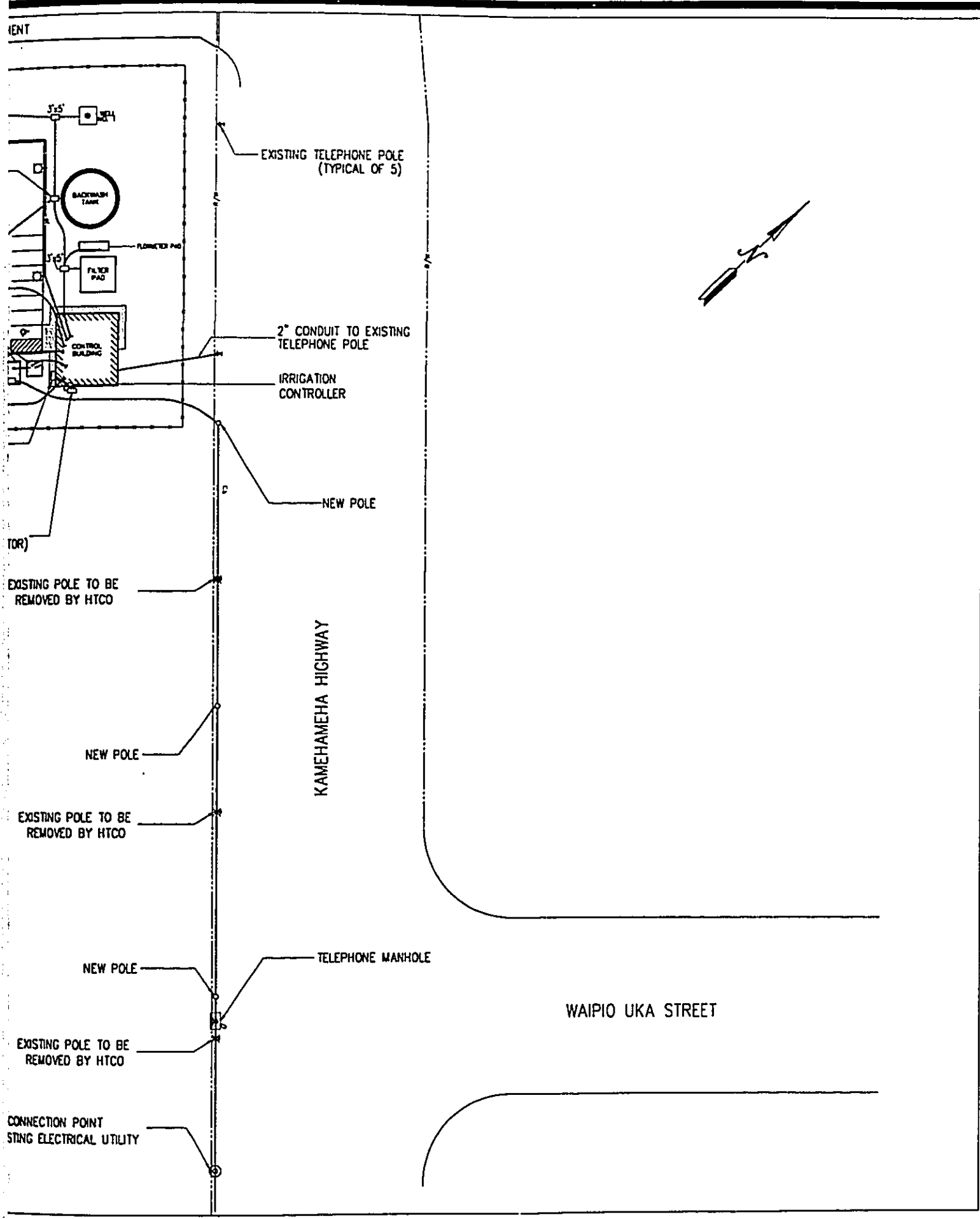


FIGURE 4-11 PROPOSED ELECTRICAL SITE PLAN



SECTION 5
ENVIRONMENTAL CONSEQUENCES
OF THE PROPOSED PROJECT

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SECTION 5 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED PROJECT

The following section describes the short term and long term impacts that the project will have on the surrounding environment and the mitigative measures to minimize these impacts.

5.1 Short Term Impacts

Short-term impacts will result from site clearing, grubbing and grading; well installation; building construction; landscaping; and transmission waterline installation. These activities will be limited to the project site during the construction period of a year. The following sections discuss the short-term impacts and their mitigative measures.

5.1.1 Physical Setting

Construction of the Waipahu Wells III site is not expected to affect the soils, geology, or climate of the area. Although grading will modify the existing topography, no significant impacts are expected due to the relatively small size of the site. Drainage impacts during construction are also expected to be minimal. Details of the site's drainage report can be found in Appendix E.

During construction activities, temporary erosion control measures such as drainage swales, grassing, and silt fences shall be implemented as necessary. Such erosion control measures will help to minimize soil loss.

5.1.2 Air Quality

Short term air pollution impacts from dust/dirt may result from clearing, grubbing, and grading activities (which involve vehicle movement and soil excavation). Such dust/dirt impacts can be reduced by the frequent watering of the site. In addition, the necessary erosion control measures and best management practices (BMPs) shall be taken to prevent foreseeable dust problems from construction activities. Areas which have been graded should be grassed as soon as possible to prevent dust from becoming a nuisance.

Emissions from trucks and construction equipment with diesel engines could also cause short term air pollution impacts. All construction equipment and trucks shall be kept in good operating condition and equipped with adequate emission controls. All open bed trucks shall be covered when transporting materials that have the potential to become airborne.

5.1.3 Noise Impacts

Noise is defined as any unwanted sound occurring in the ambient environment which may create short term or long term impacts to nearby populated areas or wildlife habitats. Noise levels at the site and in nearby residential areas are expected to increase due to waterline excavation and transporting of equipment and materials. Where residences line both sides of the highway, noise impacts are expected to be the most significant during construction of the new transmission main.

The contractor will be required to minimize any construction noise impacts that may inconvenience any residences near to the project site. In order to mitigate noise impacts, the necessary BMPs will be implemented. The use of muffled construction equipment is recommended and construction equipment is also expected to be properly maintained. The proposed project will comply with the provisions of the Hawaii Administrative Rules (H.A.R.), Title 11, Chapter 46, "Community Noise Control." Construction activities will be limited to the standard working hours as specified in these regulations. In addition, heavy vehicles must be in compliance with H.A.R. Title 11, Chapter 42, "Vehicular Noise Control for Hawaii."

5.1.4 Flora and Fauna

No known rare or endangered species of flora or fauna have been found at the site. Surveys of adjacent areas have also reported no known rare or endangered species. Therefore, no significant short-term impacts to flora and fauna are expected.

5.1.5 Archaeological/Cultural Resources

No significant archaeological or historic sites are known to exist at the proposed Waipahu Wells III Station site. Consultations with the State Historic Preservation Division (SHPD) noted that the parcel along Kamehameha Highway was previously used for agriculture. Thus, since the land surface has already been disturbed, the presence of archaeological or historic sites at the proposed Waipahu Wells III site is unlikely. The SHPD has determined that there will be "no effects" on historic sites from the proposed project. As a result, no significant short-term impacts to archaeological or cultural resources are expected.

In the event that evidence of historic sites are encountered during construction, work shall be stopped and the SHPD shall be notified. The SHPD shall be provided sufficient time to assess the situation and recommend appropriate mitigation measures. Any archaeological data recovery work that may be recommended by the Division shall be completed by a qualified archeologist prior to the commencement of work. Completion of mitigation work shall be confirmed by the SHPD, and a report of the findings shall be prepared and submitted to the SHPD for review and approval.

5.1.6 Land Use

The proposed Waipahu Wells III station is considered a permissible use within the current land designation as an agricultural district under Section 205-4.5 (a)(7). Therefore, the land use that is permitted under the specified land designations will not change.

5.1.7 Water Quality/Hydrogeology

The wells will not be in service during construction of the Waipahu Wells III station. Therefore, construction is not expected to have any short term effects on the hydrogeology of the area. The

nearest surface water is Wailani Stream located approximately 0.9 miles away. Wailani Stream receives discharge from both the SDOT and DPW drainage systems. The only anticipated impact on surface water is from stormwater runoff and silt which can be mitigated by erosion control measures. Erosion control measures will include: building berms around the project site to contain stormwater runoff; installing silt fences, if necessary; immediately landscaping areas that have been graded; and grading during dry weather.

5.1.8 Aesthetics

Construction of the Waipahu Wells III facility is anticipated to begin in May of 1998 and span a period of approximately one year. During that time the existing vegetation consisting of nuisance species of grasses, shrubs, and trees will be removed. The well site is currently surrounded by fallow pineapple fields. Construction of the Waipahu Wells III facility will not significantly impact the aesthetics of the area.

The transmission mains will be located along Kamehameha Highway and Lumiaina Street. The trees and landscaping along Lumiaina Street may be temporarily impacted because of the construction activity. However, once construction of the transmission mains have been completed, the transmission main will be buried underground within the road right-of-way.

5.1.9 Traffic

Traffic congestion along Kamehameha Highway, Lumiaina Street, and Paiwa Street, as well as in the neighboring communities of Waipio Gentry, Waikele, and Crestview, is expected to increase, especially during construction of the 24-inch and 16-inch waterlines. Construction is expected to proceed in increments, with each stage having its own State Highways-approved or City-approved traffic control plan. The contractor is responsible for following the control plan to regulate the flow of traffic, especially during the morning and afternoon rush hours when traffic along Kamehameha Highway is the heaviest. Working hours will be restricted to 8:30 a.m. to 3:30 p.m. and possibly nights, upon approval by the SDOT.

In addition to the traffic control plans, diversion of traffic to the H-2 freeway through the Ka Uka Boulevard will alleviate some of the congestion that is expected on Kamehameha Highway. Movement of heavy construction equipment should be restricted to periods of light traffic. Newspaper notices will be used as necessary, to inform the public of any impacts to traffic due to project construction.

In addition to traffic congestion, some bus stops, crosswalks and sidewalk ramps along Kamehameha Highway and Lumiaina Street will be temporarily relocated during the construction of the transmission mains. BWS will insure that affected bus riders will be notified of any changes to bus schedules as well as locations of the temporarily relocated bus stops. BWS will work with MTL to provide acceptable temporary bus shelters and bus stop locations in accordance with ADA requirements. The temporary relocation of crosswalks and sidewalk ramps will also be in compliance with ADA requirements. Following the completion of the construction

activities, the bus stops, crosswalks and sidewalk ramps will be re-installed.

5.1.10 Public Health and Safety

The project site is located nearby roads, residential homes, shopping centers, schools, parks and golf courses where vehicular and pedestrian traffic will be heavy. The Contractor shall be responsible for implementing appropriate measures to ensure public safety and health during the construction period. Construction areas will be delineated with appropriate signs. Highway right-of-way construction will be coned and signed to enhance automobile and pedestrian safety. During construction activities, provisions will be made to ensure public health while providing safe access to homes, schools and recreational facilities in the area. At the end of each work day, the construction site and equipment shall be secured. All open trenches shall be covered and secured to ensure the safety of the public. Water trucks will be used to reduce dust migration and all construction vehicles will have sound attenuating devices to minimize noise impacts to nearby residential areas.

5.1.11 Socioeconomic

Construction of the Waipahu Wells III Station and 24-inch and 16-inch transmission mains is expected to provide a small number of temporary jobs for local workers. The purchase of materials from local suppliers will also help the local economy.

5.2 Long Term Impacts

5.2.1 Physical Setting

Operation of the Waipahu Wells III station is not expected to affect the soils, geology or climate of the area. The topography will change very little from the existing topography. Due to the size of the site and the minimal amount of grading planned for the site, no significant impacts are expected. Any additional runoff that is created by the proposed project will also be directed to a new drain inlet as described in the drainage report. This drainage report has been prepared in accordance with the Drainage Report Ordinance 96-34 and is included in Appendix E.

5.2.2 Noise Impacts

Noise generated from the Waipahu Wells III facility will be minimal. Operation of the pumps will be the primary source of noise at the facility. To minimize the noise generated from the pumps, submersible pumps will be used to draw water from the wells. The pumps will be located approximately 375 feet below the surface. Any noise generated from the pumps will be muffled by the depth of the well.

5.2.3 Flora and Fauna

No known rare or endangered species of flora or fauna have been found at the site. Surveys of

adjacent areas have also reported no known rare or endangered species. Therefore, no significant long-term impacts to flora and fauna are expected.

5.2.4 Archaeological/Cultural Resources

Since no significant archaeological or historic sites are known to exist at the proposed Waipahu Wells III Station, no significant long-term impacts to archaeological or cultural resources are expected.

5.2.5 Land Use

The proposed Waipahu Wells III station is considered a permissible use within the current land designation as an agricultural district under Chapter 205-4.5 (a) (7). The Waipahu Wells III Station will serve to supplement the water supply in the rapidly developing Waikele, Waipahu, Ewa, Waianae, and Kapolei areas.

5.2.6 Water Quality/Ground and Surface Water Hydrology

No adverse effects to the aquifer are anticipated. The sustainable yield of the Waipahu/Waiawa aquifer is estimated at 119 mgd. In 1996, the BWS was permitted to draw 106.2 mgd of potable water from the aquifer of which 2.684 mgd is allocated to the Waipahu Wells III Station.

No significant impact to surface waters in the area are expected due to draw down from the Waipahu Wells III Station. The nearest surface waters are Wailani Stream, Panakauahi Gulch, and Waiawa Stream. These natural waterways are ephemeral which flow only during rains.

Minimal impacts to the quality of surface waters are expected from discharges resulting from forward flushing and defining activities. These discharges will be routed to the SDOT drainage system along Kamehameha Highway, Route 99. The SDOT drainage system eventually connects to the City DPW drainage system at the intersection of Kamehameha Highway and Lumiaina Street. The City DPW system runs west along Lumiaina Street and then south along Paiwa Street, until it is eventually discharged into Wailani Stream, which outlets Middle Loch. All discharges will be treated by either sedimentation or filtration, in accordance with the applicable discharge permit prior to disposal.

Contractors retained to maintain the GAC contactors will be responsible for the proper treatment and disposal of the water produced during the change-out of the activated carbon. The contractor will also be responsible for obtaining the necessary discharge permits for the disposal of these waters. Should the contractor elect to discharge any water produced during the carbon change-out procedure into a storm water collection system or an open body of water, then the contractor will treat the water in accordance with the applicable discharge permit prior to disposal. Thus, no significant long-term impacts should occur to the quality of the receiving water body.

Increased runoff generated by the well station will be taken care of by an area drain as specified

in the drainage report (Appendix E). The drain inlet will be connected to the new 20" drain line for the blow off discharge, which in turn will be connected to an existing catch basin that leads to the SDOT drainage system along Kamehameha Highway. The blow off discharge line is provided for the discharge of the initial water that is produced from the start-up of each well.

5.2.7 Aesthetics

The existing vegetation consisting of nuisance species of grasses, shrubs, and trees will be removed and replaced during the construction of the Waipahu Wells III station. Once completed, the site will be landscaped with ground cover which will consist of Golden Glory. Visual barriers will be provided by trees, shrubs, and vines consisting of Royal Poinciana, Podocarpus 'Maki', and Prince Kuhio Vine, respectively. A permanent landscape plan for the site is presented in Appendix F. In addition, BWS will use a paint scheme for the ten GAC contactors that will blend with the surrounding area.

Construction of the transmission mains will be performed within the road right-of-way. Once construction is complete, the transmission mains will be buried underground. The transmission mains should not impact the aesthetics of the trees and landscaping located along the northerly side of Lumiaina Street and the easterly and northerly sides of the existing Waipahu Wells I site.

5.2.8 Socioeconomic

The BWS is responsible for providing safe drinking water to the people of the City and County of Honolulu. As the number of residents in Leeward Oahu increases, so should the BWS's capacity to serve them.

The increase in water availability will provide support for both residential communities and commercial developments within the Leeward area. The area of Kapolei is currently under significant development. Several subdivisions have already been built, as well as a school, and further development of this area is expected. In order to sustain this development, adequate resources must be constructed to meet the directed growth requirements of the Ewa and Central Oahu development plans. The additional 2.684 mgd of water from the Waipahu Wells III Station will contribute to the feasibility of increased development in the Leeward area.

The proposed GAC contactors, pumps and backwash tank are estimated to cost \$7.9 million. The new transmission mains are estimated to cost \$1.25 million. Funding of the project will be shared proportionately between the BWS, HFDC, and DHHL.

5.2.9 Public Utilities

No significant impacts to the existing public utilities are expected during the construction of the well site and installation of the transmission mains. The existing utilities within the road right-of-way will be identified and staked prior to construction. In order to prevent any disruption of existing services, construction activities will be coordinated with the appropriate

private and government agencies. If disruptions cannot be avoided, then those persons in the affected area will be given advance notice to help minimize inconveniences. Should any of the existing utilities be accidentally damaged during construction, repair crews will be notified immediately so that service may be promptly restored.

SECTION 6
NOTICE OF FINDING
OF NO SIGNIFICANT IMPACT

SECTION 6
NOTICE OF FINDING OF NO SIGNIFICANT IMPACT

This document constitutes a Notice of Finding of No Significant Impact (FONSI). Although several potential negative impacts are expected from the proposed project during construction, these impacts are temporary and can be mitigated through measures identified in Section 5. The benefits from the proposed project are expected to outweigh the short term negative impacts. As a result, an Environmental Impact Statement is not anticipated for the proposed Waipahu Wells III Station.

6.1 SIGNIFICANCE CRITERIA

The FONSI determination was made in accordance with the Hawaii Revised Statutes, Chapter 343 and the "Significance Criteria" listed in the Department of Health Rules (11-200-12). The proposed project would have a significant impact on the environment if it meets any one of the following "Significance Criteria":

6.1.1 Involves an Irrevocable Commitment to Loss or Destruction of Any Natural or Cultural Resources

The Waipahu Wells III station site is located on a piece of undeveloped, abandoned pineapple field. Vegetation in the area consists of abandoned pineapple fields and introduced or exotic nuisance species of grasses, shrubs, and trees. No rare, endangered, or threatened plant species were found within the project site. The site was not found to be the habitat for endangered or threaten species of native birds or mammals. Animals populating the area consist primarily of insects, birds and mammals most of which are not unique to the Hawaiian islands.

There were no findings of significant archaeological or historical sites within the project site. The State Historic Preservation Division (SHPD) has determined that there will be "no effects" on historic sites from the proposed project and that the presence of archaeological or historical sites is unlikely. If archaeological artifacts or bones are discovered during construction, work in the area will cease. The Department of Land and Natural Resources will be notified immediately to access the find and recommend the appropriate mitigative measures to be taken.

6.1.2 Curtails the Range of Beneficial Uses of the Environment

The proposed project boundaries are within the State Agriculture and Urban Land Use Districts and outside of any designated Special Management Area. Although, the project site is suitable for agricultural use, the City is currently proposing to develop a regional park and sport complex on a 269-acre site adjacent to the Waipahu Wells III site. There are no plans in the future for using the project site or adjacent areas for agricultural use. The growing demand for potable water in the area will offset the potential agricultural benefit from the land.

6.1.3 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 State's Long-Term Environmental Policies established in Chapter 344, HRS.

6.1.4 Substantially Affects the Economic or Social Welfare of the Community or State

The proposed project will provide a significant contribution to the Ewa and Central Oahu areas by developing a potable water supply to meet the growing demand in those areas. Currently, the Board of Water Supply (BWS) is using its reserve capacity to meet these demands, and thus reducing its ability to provide potable water to new and existing service areas and sustaining adequate pressure for fire fighting flows. The demand for potable water will continue to increase with the population growth within the existing BWS service areas and new developments planned by the State Housing Finance and Development Corporation (HFDC) and Department of Hawaiian Home Lands (DHHL). The Waipahu Wells III station and transmission main project will generate and convey potable water needed for the HFDC's development in Kapolei, the DHHL's subdivision in Lualualei and Hawaiian homestead areas in Nanakuli, Papakolea, and Waianae, and the incremental growth expected for the BWS existing service areas.

The proposed project will help to improve the local economy. Construction of the Waipahu Wells III station and the 24-inch and 16-inch transmission mains is expected to provide a small number of temporary jobs for local workers. Also, the purchase of materials from local suppliers will help the State's economy.

6.1.5 Substantially Affects Public Health

During construction, the ambient air quality and noise levels near the project site will be temporarily affected. Particulates in the air will increase due to the dust and dirt resulting from clearing, grubbing, and grading activities. Emissions from trucks and construction equipment with diesel engines could also cause short term air pollution. Noise levels will increase due to the waterline excavation and transporting of equipment and materials. These short term impacts can be mitigated through compliance with the applicable Federal, State, and City and County regulations. Following the completion of the Waipahu Wells III station and transmission mains, the environment around the project site should return to its normal condition.

Benefits resulting from the proposed project are expected to outweigh the short term construction impacts. Delaying the project or proceeding with the "no action" alternative will stress the current supply of potable water require for the existing and future service areas.

6.1.6 Involves Substantial Secondary Impacts, Such as Population Changes or Effects on Public Facilities

The purpose of the proposed project is to produce potable water to accommodate the incremental growth of the BWS service areas as well as the HFDC and DHHL planned developments in Kapolei, Lualualei, Nanakuli, Papakolea, and Waianae. Currently, BWS is using its reserve capacity to accommodate the current demand for water. This project will alleviate the stress on the existing facilities as well as accommodate future demands. This project in itself will not generate an increase in population, but will support the expected growth in the area.

6.1.7 Involves a Substantial Degradation of Environmental Quality

The proposed project is not expected to substantially degrade the environmental quality of the area. Construction of the treatment facility and transmission mains will affect the air quality and noise levels in the area and the quality of nearby surface waters. The short term impacts anticipated during construction include: nuisance dust; increase in construction equipment emissions; increase noise due to construction activities; and added debris in the runoff entering nearby surface waters. These short term impacts can be mitigated through compliance with the applicable Federal, State, and City and County regulations. Once construction is complete, these problems will diminish and conditions should return to normal.

During the operation of the treatment facility, the water quality of Wailani Stream will be affected due to the discharge related to the maintenance of the granular activated carbon (GAC) contactors. The discharge water will be disposed through the existing State Department of Transportation (SDOT) and City and County Department of Public Works (DPW) drainage systems, which discharges into Wailani Stream. Prior to discharge, the contractor retained to maintain the GAC contactors will be responsible for the proper treatment of the discharge water to minimize the impact on Wailani Stream. Other sources of discharge water generated from the facility includes pump blow off water and increased on-site storm water runoff. Pump blow off water is the initial water produced by the start-up of each well and will be essentially clean. Therefore, treatment will not be required prior to the discharge of pump blow off water. The on-site storm water runoff may contain debris from the site. Mitigative measures will be taken to minimize the impact of the runoff into Wailani Stream.

6.1.8 Is Individually Limited But Cumulatively Has Considerable Effect on the Environment, or Involves a Commitment for Larger Actions

The proposed project is in response to the incremental growth of the BWS service area and new developments planned by HFDC and DHHL. BWS is using its reserve capacity to meet the current water demands. By tapping into the reserve capacity, BWS loses its flexibility to provide water for future areas and does not ensure adequate pressure for fire fighting flows.

6.1.9 Substantially Affects a Rare, Threatened or Endangered Species or Its Habitat

The proposed Waipahu Wells III site is located on a relatively flat piece of abandoned pineapple land on Kamehameha Highway, approximately one mile north of the Waiawa Interchange above the Waikele and Crestview subdivisions. The transmission mains will be located along Kamehameha Highway and Lumiaina Street to convey the water from the new Waipahu Wells III station and the existing Waipahu Wells I and II stations to the service areas. No rare, endangered, or threatened plant species were found within the project site and the site was not found to be the habitat of endangered or threaten species of native birds or mammals.

6.1.10 Detrimentially Affects Air or Water Quality or Ambient Noise Levels

Air quality, water quality, and noise levels will be temporarily impacted during the construction of the facility and transmission mains. These impacts can be mitigated through compliance with Federal, State, and City and County regulations. Once construction is complete, air quality and noise levels should return to normal. Operation and maintenance of the Waipahu Wells III GAC facility will generate discharge water that will be disposed through existing SDOT and City and County DPW drainage systems. These drainage systems eventually discharge into Wailani Stream. The contractor retained to maintain the GAC contactors will be responsible for the proper treatment of the discharge water to minimize the impact on the receiving waters.

6.1.11 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 Waipahu, on the island of Oahu. The Waipahu Wells III site is located on a relatively flat piece of abandoned pineapple land. The transmission mains are located along Kamehameha Highway and Lumiaina Street. The project site is not located in an environmentally sensitive area.

6.1.12 Substantially Affects Scenic Vistas and View Planes Identified in County or State Plans or Studies

The Waipahu Wells III site is located on a relatively flat piece of abandoned pineapple land and the transmission mains are located along Kamehameha Highway and Lumiaina Street. Once completed, the Waipahu Wells III station will be landscaped and visual barriers will be provided to blend the facility with the surrounding area. The transmission mains will be installed underground and within the road right-of-way. Therefore, the transmission mains will not visually impact the surrounding area. The project will not affect any scenic vistas and view plans identified in County or State plans or studies.

6.1.13 Requires Substantial Energy Consumption

Construction of the Waipahu Wells III station and transmission mains will not require a substantial amount of energy. Once in operation, the facility will not consume an excess amount of energy. Consumption will be typical to other similar types of treatment facilities.

SECTION 7
AGENCIES CONSULTED IN
THE PREPARATION OF THE EA

SECTION 7
AGENCIES CONSULTED IN THE PREPARATION OF THE EA

The following agencies were consulted in the preparation of the EA. Those agencies that responded with comments are indicated by an "*". A copy of all agency correspondence during the pre-assessment consultation period as well as the 30-day comment period has been included in Appendix I and J, respectively.

7.1 Federal Government

- *Department of Agriculture, State Conservationist
- *Department of the Army, U.S. Army Corps of Engineers
- Department of the Interior, U.S. Geological Survey, Water Resources Division

7.2 State Government

- *Department of Accounting and General Services, State Public Works Engineer
- *Department of Budget and Finance, Housing Finance and Development Corporation
- *Department of Business, Economic Development and Tourism, Land Use Commission
- *Department of Health, Environmental Management Division, Safe Drinking Water Branch
- Department of Health, Environmental Management Division, Clean Water Branch
- Department of Land and Natural Resources, Commission on Water Resource Management
- *Department of Land and Natural Resources, State Historic Preservation Office
- Department of Land and Natural Resources, Office of Conservation and Environ. Affairs
- *Department of Transportation, Highways Division
- *Office of Environmental Quality Control

7.3 City and County of Honolulu

- *Building Department
- *Department of Land Utilization
- *Department of Parks and Recreation
- *Department of Public Works
- Department of Transportation Services
- *Department of Wastewater Management
- *Planning Department

7.4 Other Organizations / Parties

Castle & Cooke Homes, Inc.

*Hawaiian Electric Company, Inc.

Honolulu City Council, Honorable Rene Mansho

Honolulu City Council, Honorable John DeSoto

*Office of Hawaiian Affairs

State Senator, Nineteenth Senatorial District, Honorable Calvin Kawamoto

State Representative, Thirty-sixth Representative District, Honorable Roy Takumi

Waipahu Neighborhood Board No. 22

University of Hawaii, Environmental Center

REFERENCES

REFERENCES

1. *Annual Report and Statistical Summary, July 1, 1992 - June 30, 1993.* Honolulu Board of Water Supply, City and County of Honolulu.
2. *Final Environmental Assessment Proposed Exploratory Wells - Waipahu Wells IV.* George A.L. Yuen & Associates, Inc. March, 1997.
3. *Final Environmental Impact Statement of Gentry 515, Waiawa, Central Oahu District, Island of Oahu, Hawaii.* (March 1987).
4. *Kamehameha Highway Widening, Central Oahu, Hawaii, TMK: 9-4-42,44,56 - Environmental Assessment.* Highways Division, Department of Transportation, State of Hawaii.
5. *Kamehameha Highway Widening, Lumiaina Street to Waipio Uka Street, Ewa, Hawaii - Negative Declaration.* Highways Division, Department of Transportation, State of Hawaii (May 1992).
6. *Oahu Water Plan.* Board of Water Supply, City and County of Honolulu (July 1982).
7. *Rainfall Atlas of Hawaii.* State of Hawaii, Department of Land and Natural Resources.
8. *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.* U.S. Department of Agriculture, Soil Conservation Service (Aug. 1972).
9. *Waiola Estates Subdivision Final Environmental Impact Statement.* City and County of Honolulu, Department of Housing and Community Development. (Sept. 1986).
10. *Waiola Regional Park and Sports Complex Environmental Impact Statement Preparation Notice.* Plan Pacific, Inc. January 23, 1998.

APPENDIX A
WATER USE PERMITS

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
Honolulu, Hawaii

October 19, 1994

Fax to:
Suzette Hokama
EMP
538 3269

Chairperson and Members
Commission on Water Resource Management
State of Hawaii
Honolulu, Hawaii

Gentlemen:

Department of Hawaiian Home Lands
Application for Water Use Permit
Waipahu Wells III (Well Nos. 2400-09 to 13)
Waipahu-Waiawa Ground Water Management Area, Oahu

Applicant:

Dept. of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805

Landowner:

Castle & Cooke Homes, Inc.
P.O. Box 2780
Honolulu, HI 96803

Background

The Department of Hawaiian Home Lands (DHHL) filed an application for water use permit on August 16, 1994 to transfer a portion of the 1,724 million gallons per day (mgd) of ground water reserved from state lands in the Waipahu-Waiawa Aquifer System for use in the Papakolea, Nanakuili, and Waianae-Lualualei Hawaiian homestead areas by HAR 13-171-61.

The water is to be supplied by the Waipahu III Wells (Well Nos. 2400-09 to 13). A combined well construction/pump installation permit was issued to the Honolulu Board of Water Supply (BWS) on December 29, 1993 to construct, test, and install 1,000 gpm capacity pumps in up to five Waipahu III Wells. A well completion report and pump test data have been received for Well No. 2400-09, and construction of the remaining wells is currently underway.

Specific information regarding the proposed source, use, notification, objections, and field investigation(s) are described in Attachment A and the attached exhibits.

Analysis & Issues

By letter agreement dated July 22, 1994, use of this BWS source by DHHL is conditioned on a confirmation from the Commission that the water use permit be transferred to BWS once all other terms of the agreement have been met. The water will be used to supply the municipal needs of the Princess Kaiulani Estates. The location of this DHHL development is consistent with homestead areas identified in HAR 13-171-61 and is also consistent with the justification provided by DHHL for the reserved quantity.

Development of Hawaiian homestead areas is in the public interest, as evidenced by the approval of DHHL's petition for reservation and the creation of Rule 13-171-61. Demand projections were made in accordance with the guideline developed by the county and used by the Commission for determination of reasonable use quantities. DHHL is afforded exemption from county zoning requirements. No objections or concerns have been raised to this proposed permit.

p. 1

AGENDA 1

Chairperson and Members
Commission on Water Resource Management

Minutes of
October 19, 1994

All written testimonies submitted at the meeting are filed in the Commission office and are available for review by interested parties.

AGENDA 1

ITEM 1 MINUTES OF THE SEPTEMBER 15 AND 28, 1994 MEETINGS

Unanimously approved (Nobriga/Ing).

ITEM 2 OLD BUSINESS/ANNOUNCEMENTS

None.

ITEM 3 DEPARTMENT OF TRANSPORTATION, APPLICATION FOR A STREAM CHANNEL ALTERATION PERMIT, BRIDGE WIDENING AND CULVERT CROSSING, PIKKA STREAM, KAU, HAWAII

Unanimously approved (Girald/Nobriga).

ITEM 4 DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES, APPLICATION FOR A STREAM CHANNEL ALTERATION PERMIT, INSTALLATION OF A SEWER CROSSING, WAIAKEA STREAM, HILO, HAWAII

Unanimously approved (Ing/Sybinsky).

ITEM 5 IIT SHERATON HOTELS, KYO-YA CO., LTD., APPLICATION FOR A WATER USE PERMIT, KOKUSAI KOGYO WELL (WELL NO. 1749-19), PALOLO GROUND WATER MANAGEMENT AREA, OAHU

The representative from the Board of Water Supply said they did not have any objections to the staff recommendations.

Mr. Marty Heede, representing IIT Sheraton Hotels, asked if the matter could be worked out administratively rather than going into a public hearing.

Unanimously approved the staff's recommendations to initiate public hearing proceedings (Ing/Sybinsky).

ITEM 6 DEPARTMENT OF HAWAIIAN HOMES LANDS, APPLICATION FOR WATER USE PERMIT, WAIPAHU WELLS III (WELL NOS. 2400-09 TO 13), WAIPAHU-WAIAWA GROUND WATER MANAGEMENT AREA, OAHU

Unanimously approved (Nobriga/Girald).

ITEM 7 DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT, APPLICATIONS FOR WELL CONSTRUCTION AND WATER USE PERMITS, KUNIA WELLS III (WELL NOS. 2301-40 TO 42), WAIPAHU-WAIAWA GROUND WATER MANAGEMENT AREA, OAHU

Ms. Nakama added the following recommendation:

STANDARD WATER USE PERMIT CONDITIONS

1. The ground water described in the water use permit may only be taken from the location described, used for the reasonable-beneficial use described, and at the location described above and in the attachments. Reasonable-beneficial use means "the use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is not wasteful and is both reasonable and consistent with the state and county land use plans and the public interest." (HAR §13-171-2).
2. The right to use ground water is a shared use right.
3. The water use must at all times meet the requirements set forth in HAR §13-171-13 which means that it:
 - a. Can be accommodated with the available water source;
 - b. Is a reasonable-beneficial use as defined in section §13-171-2;
 - c. Will not interfere with any existing legal use of water;
 - d. Is consistent with the public interest;
 - e. Is consistent with state and county general plans and land use designations;
 - f. Is consistent with county land use plans and policies; and
 - g. Will not interfere with the rights of the Department of Hawaiian Home Lands as provided in section 221 of the Hawaiian Homes Commission Act and 174C-101(a), HRS.
4. The ground water use approved must not interfere with surface or ground water rights or reservations.
5. The ground water use approved must not interfere with interim or permanent instream flow standards or policies as determined by the Commission. If it does, then:
 - a. A separate water use permit for surface water must be obtained in the case an area is also designated as a surface water management area;
 - b. The interim or permanent instream flow standard, as applicable, must be amended.
6. The water use permit is subject to the requirements of the Hawaiian Homes Commission Act, as amended, if applicable.
7. The water use permit application and staff submittal approved by the Commission at its October 19, 1994 meeting are incorporated into the permit by reference.
8. Any modification of the permit terms, conditions, or uses can only be made with the express written consent of the Commission on Water Resource Management.
9. The water use permit may be modified by the Commission and the amount of water initially granted to the permittee may be reduced if the Commission determines it is necessary to:
 - a. Protect water sources in quantity, quality, or both;
 - b. Meet other legal obligations including other correlative rights;
 - c. Insure adequate conservation measures;
 - d. Require efficiency of water uses;
 - e. Reserve water for future uses, provided that all legal existing uses of water as of June 1987, shall be protected;
 - f. Meet legal obligations to the Department of Hawaiian Homes, if applicable; or
 - g. Carry out such other necessary and proper exercise of the State's and the Commission's police powers under law as may be required.

September 16, 1994

Mr. Keith Ahue, Chairperson
Commission on Water Resource
Management
Department of Land and Natural
Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

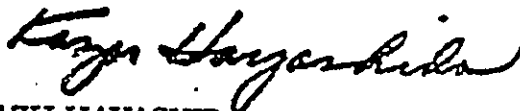
Dear Mr. Ahue:

Subject: Your Letter of August 29, 1994 Regarding Department of Hawaiian Home
Lands' (DHHL) Application for a Water Use Permit for Waipahu Wells III
(2400-09 to 13)

Thank you for the opportunity to comment on this application which is a transfer of
allocation to us from DHHL. We request favorable action on this application.

If you have any questions, please contact Herbert Minakami at 527-6183.

Very truly yours,



KAZU HAYASHIDA
Manager and Chief Engineer

Attachment

CL:do

cc: K. Hayashida, E. Lao

94-2362

JOHN WAIHEE
GOVERNOR OF HAWAII

RECEIVED
ED OF WATER SUPPLY
AUG 31 12 22 PM '94



AUG 31 1994

KEITH W. AHUE
CHAIRPERSON

DR. PETER SYBINSKY
ROBERT S. NAKATA
J. DOUGLAS ING, ESQ.
ROBERT G. GIRALD
DAVID NOBRIGA

RAE M. LOUL, P.E.
DEPUTY

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 121
HONOLULU, HAWAII 96800

REF:WRM:SS

AUG 29 1994

TO: Dr. Peter A. Sybinsky, Director
Department of Health

Clayton H. W. Hee, Chairperson
Office of Hawaiian Affairs

✓ Kazu Hayashida, Manager & Chief Engineer
Honolulu Board of Water Supply

Donald A. Clegg, Director
Department of Land Utilization

Robin Foster, Chief Planning Officer
Planning Department

FROM: Keith W. Ahue, Chairperson
Commission on Water Resource Management

SUBJECT: Water Use Permit Application
Waipahu-Waiawa Ground Water Management Area, Oahu

Transmitted for your review and comment is a copy of a water use permit application for the Department of Hawaiian Home Lands for Well Nos. 2400-09 to 13. Public notice of this application will be published in the Honolulu Star Bulletin issues of September 6, 1994 and September 13, 1994.

We would appreciate your review of the attached application for any conflicts or inconsistencies with the programs, plans, or objectives specific to your organization or department only. Please return this cover memo form by September 27, 1994.

If you have any questions regarding this application, please contact Lenore Nakama at 587-0218.

Attachment(s)

Response:

- We have no comments
- We have no objections
- Comments attached
- Additional information requested
- Extended review period requested

Contact person: Herbert H. Minakami Phone: 527-6183

Signed: Kazu Hayashida Date: 9/16/94
KAZU HAYASHIDA
Manager and Chief Engineer

JOHN WAIHEE
GOVERNOR
STATE OF HAWAII



HOALIKU L. DRAKE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96808

AUGUST 12, 1994

TO: The Honorable Keith W. Ahue, Chairperson
Department of Land and Natural Resources
Commission on Water Resource Management

FROM: Hoaliku L. Drake, Chairman
Hawaiian Homes Commission *Hoaliku Drake*

SUBJECT: Request to Transfer Water Allocation,
Princess Kahanu Estates, Lualualei, Oahu

51 AUG 10 10:58
RECEIVED

Thank you for your correspondence dated July 19, 1994, regarding our request to transfer water allocation from the Department of Hawaiian Home Lands to the Honolulu Board of Water Supply for the Princess Kahanu Estates subdivision. While our amended request dated July 7, 1994 identified a transfer of 143,000 gallons per day, we were informed by the Board of Water Supply that 143,500 gallons would be necessary. Their letter of July 22, 1994 is attached. Our water use permit application which is also attached reflects this change.

We are aware that the process for review and consideration of our request takes approximately three months. Your assistance to expedite the review period will be appreciated. Currently, five model homes are under construction and the mass building of homes will start in October. We are hopeful that the first homeowners can move into their homes by January 1994.

Should you have any questions, please call me at 586-3800 or your staff may call Stewart Matsunaga, Land Development Division, at 586-3844.

DEPT. OF LAND
& NATURAL RESOURCES
STATE OF HAWAII

94 AUG 15 3:47
RECEIVED

HLD:sm:5659B

Attachment

CC:Kazu Hayashida, Board of Water Supply
Craig Watase, Princess Kahanu Development Corporation

BOARD OF WATER SUPPLY (57)
CITY AND COUNTY OF HONOLULU
10 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843



July 22, 1994

JEREMY HARRIS, Mayor
WALTER C. WATSON, III, Chairman
MAURICE H. YAMASATO, Vice Chairman
SISTER M. DAVLYN AH CHICK, O.S.F.
REX D. JOHNSON
MELISSA Y.J. LUK
FORREST C. MURPHY
KENNETH E. SPRAGUE

KAZU HAYASHIDA
Manager and Chief Engineer

Mr. Mark H. Tagami
Calvin Kim & Associates, Inc.
1050 Queen Street, Suite 300
Honolulu, Hawaii 96814

Dear Mr. Tagami:

Subject: Your Letter of July 8, 1994 Regarding the Proposed Princess Kahanu Estates Subdivision, TMK: 8-7-07: 4, 8-7-33: 14 & 19

Thank you for your letter regarding the proposed development. We have the following comments on the Princess Kahanu Estates water master plan and water demand calculations:

1. The total water requirements should be 143,500 gallons per day.
2. The Department of Hawaiian Home Lands (DHHL) is required to:
 - a. Confirm that the State Commission on Water Resource Management will approve the assignment transfer of permitted use from DHHL to the Board of Water Supply.
 - b. Pay a proportionate share of our Waipahu Wells III project. The current estimated cost is \$3.60 per gallon. The final cost will be established when we complete construction of the project.
 - c. Pay a proportionate share of our proposed Nanakuli 242-foot Reservoir. The current estimated storage cost for the proposed reservoir is \$4.20 per gallon.
 - d. Pay our Water System Facilities Charges for transmission.
 - e. Submit construction drawings for our review and approval.

The availability of water will be confirmed when the construction drawings are submitted for our review and approval.

If you have any questions, please contact Joseph Kaakua at 527-6123.

Very truly yours,

FOR 
KAZU HAYASHIDA
Manager and Chief Engineer



State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
 Department of Land and Natural Resources

RECEIVED
 LAND DEVELOPMENT
 DIVISION

AUG 10 9 02 AM '94
 1 50 PM '94

APPLICATION FOR WATER USE PERMIT

Ground Water or Surface Water

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 821, Honolulu, Hawaii 96808. Application must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 597-0225 (in the islands) or 1-800-469-4644.

PERMITTEE INFORMATION

1. (a) APPLICANT

Firm/Name DEPT. of Hawaiian Home Lands
 Contact Person STEWART MATSUMURA 586-3845
 Address P.O. Box 1879
Honolulu, HI 96805

(b) LANDOWNER OF SOURCE

Firm/Name Castle & Cooke Homes, Inc.
 Contact Person Hally Marshida 548-4811
 Address P.O. Box 2780
Honolulu, HI 96803

SOURCE INFORMATION

2. WATER MANAGEMENT AREA: Pearl Harbor WAIPAHU-WAIALEA ISLAND; Oahu
 3. (a) EXISTING WELL/DIVERSION NAME AND STATE NUMBER: Waipahu III 2400-07-08-09-10011
 (b) PROPOSED (NEW) WELL/DIVERSION NAME: WAIPAHU III 2400-09 to 13
 (c) LOCATION: Address Waipahu Tax Map Key 9-4-05: 74
(Attach a USGS map, scale 1" = 2000', and a property tax map showing source location referenced to established property boundaries.)
 4. SOURCE TYPE (check one): Stream Basal Dike-confined Perched Caprock
 5. METHOD OF TAKING WATER (check one): Artesian Well & Pump Diverted Surface Other (explain)

USE INFORMATION

6. LOCATION OF PROPOSED WATER USE: (if possible, show on same maps as source location. Otherwise, attach alternate maps)
 (a) Proposed use of water is: Existing New Both existing & new uses
 (b) Tax Map Key: 8-7-07: 04 (if location of use is over multiple TMKs, please complete Table 1 on back of application)
 (c) Address: Princess Zahana Parken
 (d) Current Land Use District: Urban Agriculture Conservation Rural
 (e) Current County Zoning Code: R-5, PD-R, P-2
 7. QUANTITY OF WATER REQUESTED: ~~143,000~~ 143,500 gallons per day (averaged over 1 year)
 8. METHOD OF MEASUREMENT: Flowmeter Open-pipe Weir Orifice Other (explain)
 9. QUALITY OF WATER REQUESTED: Fresh Brackish Salt Potable Non-Potable
 10. PROPOSED USE: Municipal (including hotels, stores, etc.) Individual Domestic Irrigation
 Industrial Military Other (explain)
For questions 12 & 13: If multiple TMKs are involved, please complete Table 1 on back of application.
 11. TOTAL NUMBER OF RESIDENCES TO BE SERVED: 271 single-family homes
 12. TOTAL ACRES TO BE IRRIGATED AND TYPE OF CROP: N/A
 13. PROPOSED TIME OF WATER WITHDRAWAL OR DIVERSION: 2A hours/day (crop)
(daytime hours of operation, ex. 7 a.m. to 2 p.m.)
 14. APPLICANT MUST BRIEFLY DESCRIBE FOLLOWING POTENTIAL RESTRICTIONS ON WATER USE:
 (a) Impact on Sustainable yield (?): Reduction in pumpage by Oahu Sugar
 (b) Instream Flow Standards affected (?): none
 (c) Hawaiian Home Lands use affected (?): The project will be occupied by DHHL tenants.
 (d) Other existing legal uses affected (?): none
 (e) Other (pending permits, EIS, etc.) (?): none
 15. REMARKS, EXPLANATIONS: (see reverse)

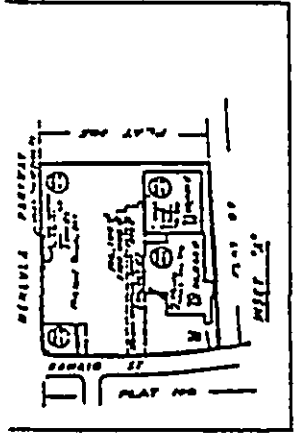
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NOTE: Signing below indicates that the applicant understands that, if a water use permit is granted by the Commission on Water Resource Management, a permit is subject to prior water permit laws, changes in sustainable yields and instream flow standards, reserved uses as defined by the Commission, and Hawaiian Home Lands future uses. In addition, the applicant understands that, upon permit approval, a water shortage plan must be submitted should the Commission require one.

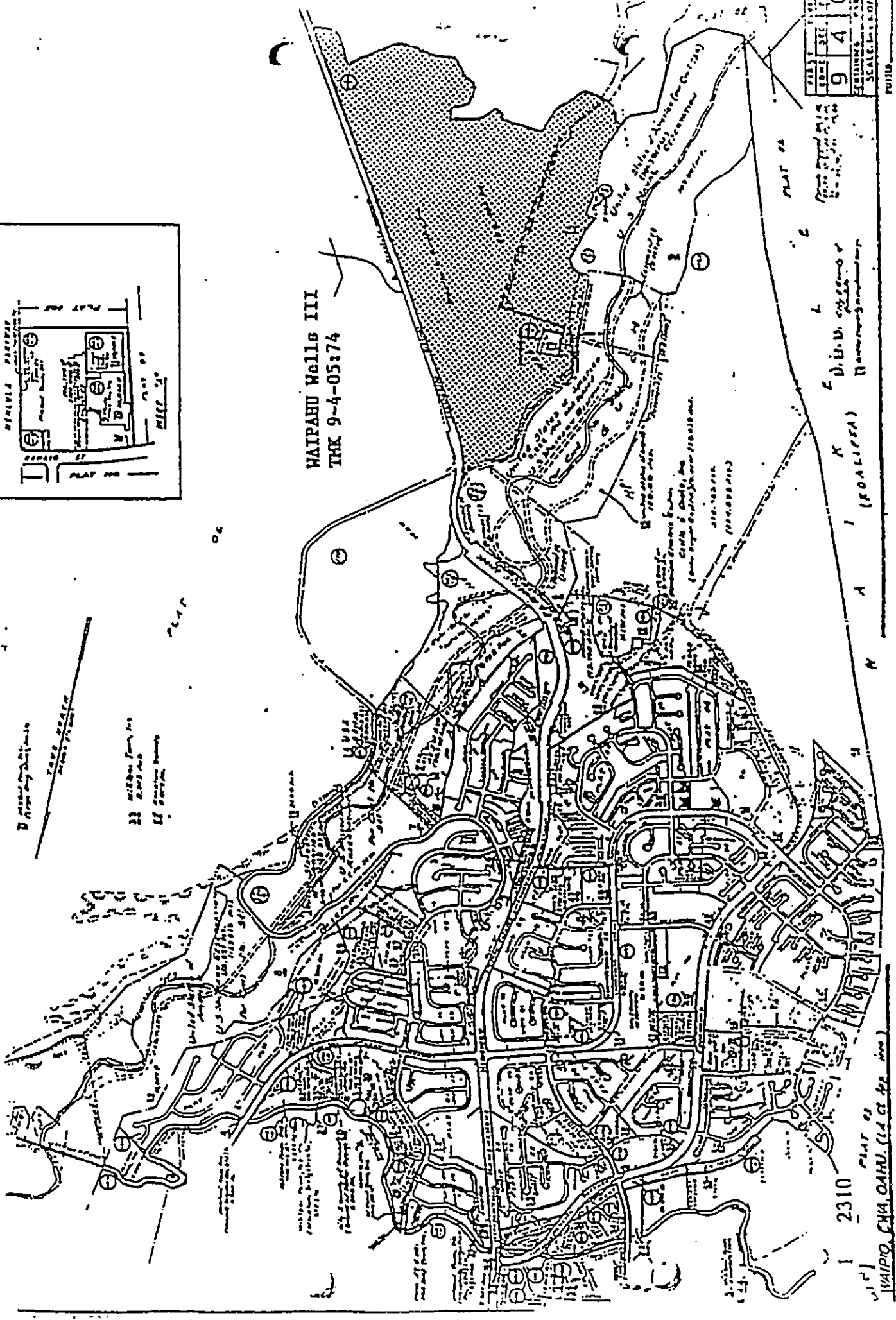
Applicant (print) Hosiliku L. Drake, Chairman
Hawaiian Homes Commission
 Signature [Signature]
 Date 8/4/94

Landowner (print) Castle & Cooke Homes, Hawaii
 Signature [Signature]
 Date August 9, 1994

For Official Use Only:
 Date Received _____ Hydrologic Unit No. _____
 Date Accepted _____ Diversion Works No. _____
 State Well No. 2400-09 to 1
 5/19/93 WUPA Fo



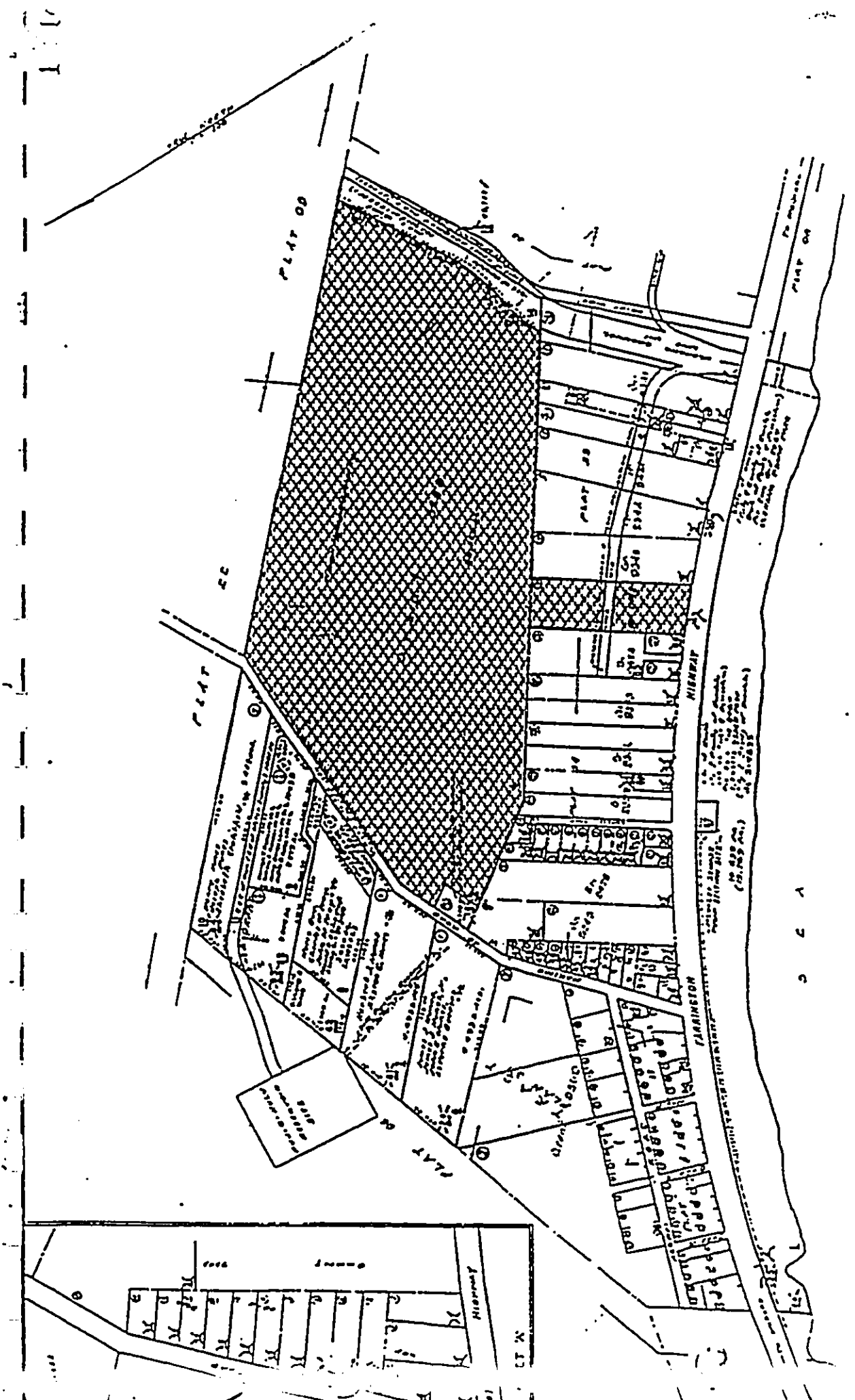
WAIPAHU Wells III
 TRK 9-4-05:74



NO.	DATE	BY
9	4	
SCALE: 1:50,000		

2310
 WAIPAHU, CHIA OAHU. (1:4 OF 20)

N A I (FOALIFEA) N
 L D. H. B. (FOALIFEA) N
 PLAT 20



Princess Kahanu Estates
 TMK 8-7-07:04, 8-7-33:14

UNIVERSAL MAPS AND SURVEYS
 101 LAMONA, HAWAII, HONOLULU

DATE	8	7	07
TIME	10:00	AM	
BY	UNIVERSAL MAPS AND SURVEYS		

SCALE: AS SHOWN

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

330 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843



FRANK F. FASI, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.
JOHN W. ANDERSON, JR.
REX D. JOHNSON
MELISSA Y.J. LUM
C. MICHAEL STREET

KAZU HAYASHIDA
Manager and Chief Engineer

August 28, 1992

Mr. William W. Paty, Chairperson
Department of Land and Natural
Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Attention: Ms. Rae Loui

Dear Mr. Paty:

Subject: Amendment to Our Water Use Permit Application for
Proposed Waipahu III Wells

DIV. OF WATER &
LAND DEVELOPMENT

52 AUG 28 P 3: 18

RECEIVED

We wish to amend the subject application by adding the drilling of two new wells each equipped with a 1.5 million gallon per day (mgd) pump at the Waipahu III site. The proposed change will result in a total of five wells at the Waipahu III site. A 1.5 mgd pump will be installed at each well.

The additional wells are for peaking purposes. The "Permitted Use" request from 3 mgd will remain the same.

Your assistance in amending our Water Use Permit Application to reflect the change is appreciated.

If you have any questions, please call George Hiu at 527-6134.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

Attachment



State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
 Department of Land and Natural Resources

APPLICATION FOR WATER USE PERMIT

Ground Water or Surface Water

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 821, Honolulu, Hawaii 96808. Application must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 647-0225.

1. (a) APPLICANT
 Firm/Name Board of Water Supply
 Contact Person Kazu Hayashida Ph: 527-6180
 Address 630 South Beretania Street
Honolulu, Hawaii 96843

(b) LANDOWNER
 Firm/Name Dole Food Company, Inc., fka
Castle and Cooke, Inc.
 Contact Person George Yim Ph: 548-6611
 Address P.O. Box 2990
Honolulu, Hawaii 96802

2. WATER MANAGEMENT AREA: Pearl Harbor ISLAND: Oahu

3. (a) EXISTING SOURCE NAME AND STATE NUMBER: _____
(well or stream diversion name/number)
 (b) PROPOSED (NEW) SOURCE NAME: Waipahu Wells III

4. SOURCE LOCATION: Address _____ Tax Map Key 4-4-5:74
8-4-02-1
(Attach a USGS map, scale 1"=2000', and a property tax map showing source location referenced to established property boundaries.)

5. SOURCE TYPE (check one): Stream Basal Dike-confined Perched Caprock

6. METHOD OF TAKING WATER (check one): Artesian Flow Well & Pump Diverted Surface Flow Other (explain)

7. LOCATION OF PROPOSED WATER USE: (If possible, show on same maps as source location. Otherwise, attach similar maps)
 (a) Address Municipal System Tax Map Key _____
 (b) Land Use District (check one): Urban Agriculture Conservation Rural
 (c) County Zoning (describe) _____

8. QUANTITY OF WATER REQUESTED: 3.0 million gallons per day

9. METHOD OF MEASUREMENT: Flowmeter Open-pipe Weir Orifice Other (explain)

10. QUALITY OF WATER REQUESTED: Fresh Brackish Salt Potable Non-Potable

11. PROPOSED USE: Municipal (including hotels, stores, etc.) Domestic (Individual, noncommercial, etc.) Irrigation
 Industrial Military Other (explain)

12. NUMBER AND TYPE OF UNITS TO BE SERVED (explain): _____

13. TOTAL ACRES PROPOSED FOR IRRIGATION AND TYPE OF CROP: _____
(acres) (crop)

14. PROPOSED TIME OF WATER WITHDRAWAL OR DIVERSION: 24 hours
(indicate hours of operation)

15. APPLICANT MUST BRIEFLY DESCRIBE FOLLOWING POTENTIAL RESTRICTIONS ON USE:
 (a) Impact on Sustainable yield (?): Reduce sustainable yield
 (b) Permanent or Interim
 Instream Flow Standards affected (?): N/A
 (c) Hawaiian Home Land uses affected (?): N/A
 (d) Other existing legal uses affected (?): N/A
 (e) Other: _____

16. REMARKS, EXPLANATIONS: Additional two wells (total of five) with capacities of 1.5 mgd each for proposed well field.
(If more space is needed, continue on back side)

NOTE: Signing below indicates that the applicant understands that, if a water use permit is granted by the Commission on Water Resource Management, a permit is subject to prior existing permitted uses, changes in sustainable yields and instream flow standards, reserved uses as defined by the Commission, and Hawaiian Home Lands future uses. In addition, applicant understands that, upon permit approval, a water shortage plan must be submitted should the Commission require one.

Applicant (print) Board of Water Supply Landowner (print) Dole Food Company, Inc., fka Castle and Cooke, Inc.
 Signature [Signature] Signature [Signature]
 Date 8/28/92 Date _____

For Official Use Only:
 Date Received 8/28/92 → 9/1/92 Hydrologic Unit No. 30203 Diversion Works No. _____
 Date Accepted _____ State Well No. _____
 Notice Dates:
 Public _____ Mayor _____ BWS _____ Mail List _____ Bulletin _____ Public Hearing _____

WATER SUPPLY
OF HONOLULU
KALANIANA'OLA STREET
HONOLULU, HAWAII 96843



RECEIVED

92 AUG 18 12:53

August 14, 1992
DEPT. OF LAND
& NATURAL RESOURCES
STATE OF HAWAII

FRANK F. FASI, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.
JOHN W. ANDERSON, JR.
REX D. JOHNSON
MELISSA Y.J. LUM
C. MICHAEL STREET

KAZU HAYASHIDA
Manager and Chief Engineer

RECEIVED
COMMISSIONER OF LAND &
NATURAL RESOURCES

92 AUG 18 13:21

RECEIVED

Mr. William W. Paty, Chairperson
Department of Land and Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Attention: Ms. Rae Loui

Dear Mr. Paty:

Subject: Water Use Permit Application For Proposed Waipahu III Wells

We submit our application for wells which we propose to drill and to install pumps at the location shown on the map attached to our application.

The proposed project will be constructed jointly with the State Housing Finance and Development Corporation for the State Kapolei housing development in Ewa. The Corporation indicated that they need about 2.0 million gallons per day (mgd) for their planned developments at Kapolei. We need about 1.0 mgd to handle the smaller developments that will need water in the next ~~six years~~ in the Ewa area.

should be 4 yrs.

If you have any questions, please contact Herbert H. Minakami at 527-6183.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

Attachment



State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
 Department of Land and Natural Resources

APPLICATION FOR WATER USE PERMIT

Ground Water or Surface Water

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 221, Honolulu, Hawaii 96809. Application must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 547-0223.

1. (a) APPLICANT
 Firm/Name Board of Water Supply
 Contact Person Kazu Hayashida Ph. 527-6180
 Address 630 SOUTH BEREHANIA ST.
Honolulu, Hawaii 96843

(b) LANDOWNER
 Firm/Name Dole Food Company, Inc. fka
Castle and Cooke, Inc.
 Contact Person George Yim Ph. 548-6611
 Address P. O. BOX 2990
Honolulu, Hawaii 96802

2. WATER MANAGEMENT AREA: Pearl Harbor ISLAND: Oahu

(a) EXISTING SOURCE NAME AND STATE NUMBER: _____
 (well or stream diversion name/number)
 (b) PROPOSED (NEW) SOURCE NAME: Waipahu Wells III

4. SOURCE LOCATION: Address _____ Tax Map Key 9-4-07: 1
 (Attach a USGS map, scale 1"=2000', and a property tax map showing source location referenced to established property boundaries.)

3. SOURCE TYPE (check one): Stream Basal Dike-confined Perched Caprock

METHOD OF TAKING WATER (check one): Artesian Flow Well & Pump Inverted Surface Flow Other (explain)

7. LOCATION OF PROPOSED WATER USE: (If possible, show on same maps as source location. Otherwise, attach similar maps)
 (a) Address Municipal System Tax Map Key _____
 (b) Land Use District (check one): Urban Agriculture Conservation Rural
 (c) County Zoning (describe) _____

8. QUANTITY OF WATER REQUESTED: 3.0 million gallons per day

9. METHOD OF MEASUREMENT: Flowmeter Open-pipe Weir Orifice Other (explain)

10. QUALITY OF WATER REQUESTED: Fresh Brackish Salt Potable Non-Potable

11. PROPOSED USE: Municipal (including hotels, stores, etc.) Domestic (individual, noncommercial, etc.) Irrigation
 Industrial Military Other (explain)

12. NUMBER AND TYPE OF UNITS TO BE SERVED (explain): _____

13. TOTAL ACRES PROPOSED FOR IRRIGATION AND TYPE OF CROP: _____ (acres) (crop)

14. PROPOSED TIME OF WATER WITHDRAWAL OR DIVERSION: 24 hours (Indicate hours of operation)

15. APPLICANT MUST BRIEFLY DESCRIBE FOLLOWING POTENTIAL RESTRICTIONS ON USE:
 (a) Impact on Sustainable yield (?): Reduction of available sustainable yield.
 (b) Permanent or Interim Instream Flow Standards affected (?): n/a
 (c) Hawaiian Home Land uses affected (?): n/a
 (d) Other existing legal uses affected (?): n/a
 (e) Other: _____

16. REMARKS, EXPLANATIONS: Construct new wellfield of three wells with capacities of 1.5 MGD each.
 (If more space is needed, continue on back side)

NOTE: Signing below indicates that the applicant understands that, if a water use permit is granted by the Commission on Water Resource Management, a permit is subject to prior existing permitted uses, changes in sustainable yields and instream flow standards, reserved uses as defined by the Commission, and Hawaiian Home Lands laws. In addition, applicant understands that, upon permit approval, a water shortage plan must be submitted should the Commission require one.

Applicant (print) Board of Water Supply Landowner (print) Dole Food Company, Inc. fka Castle and Cooke, Inc.
 Signature [Signature] Signature [Signature]
 Date AUG 26 1992 Date 8/13/92

For Official Use Only:
 Date Received 08/15/92 Hydrologic Unit No. 30903 Diversion Works No. _____
 Date Accepted _____ State Well No. _____
 Notice Dates: Public _____ Mayor _____ BWS _____ M&L Unit _____



State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
 Department of Land and Natural Resources

459-24-30

APPLICATION FOR PERMIT
 Well Construction or Pump Installation

Instructions: Please print in ink or type and send completed application with attachments to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96800. Application must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 567-0223.

1. APPLICANT: (may be a, b, or c, but all must be filled in)

(a) WELL OWNER
 Firm/Name Board of Water Supply
 Contact Person Kazu Hayashida Ph: 527-6180
 Address 630 S. Beretania Street
Honolulu, Hawaii 96843

(b) LANDOWNER
 Firm/Name Same
 Contact Person _____ Ph: _____
 Address _____

(c) CONTRACTOR:
 Firm/Name To be determined Ph: _____ Contractor's C-57 License No. _____
 Address _____

2. WELL LOCATION/NAME: Waipahu III Island Oahu
 Address _____ Tax Map Key 9-4-5:74
 (Attach a USGS map, scale 1"=2000', and a property tax map showing well location referenced to established property boundaries.)

3. (a) PROPOSED WORK: Drill New Well * Alter Location
 Modify Existing Well Redrill Deepen * Abandon/Seal
 Install New Pump Replace Pump Modify Pump
 * Be sure to complete and submit well abandonment report upon completion of work.

(b) WELL TYPE: Oug Bored Driven Drilled Radial
 Is this well a part of a battery of wells? Yes No
 (Briefly describe and fill in the diagram on the back of this form.)

4. PROPOSED PUMP INFORMATION: Rated Pump Capacity: 1,000 gallons per minute

Pump Type: Deep Well Turbine Rotary Propeller Motor
 Submersible Rotary-Displacement Reciprocating Diesel
 Centrifugal Rotary-Gear Impulse Electric, rated horsepower of _____

5. PROPOSED USE: Municipal (including hotels, stores, etc.) Military
 Domestic (individual, noncommercial water sys.) Industrial
 Irrigation (crop) _____ Other (explain) _____
 State Land Use District: Urban Agriculture Rural Conservation
 County Zoning (describe) _____
 (If more space is needed, continue below under remarks, explanations.)

6. (a) PROPOSED AMOUNT OF WITHDRAWAL: 3 Million gallons per day
 (b) METHOD OF FLOW MEASUREMENT: Flow-meter Open-pipe Orifice Plate Weir

7. PENDING ACTIONS: CDA SMA ES EA NONE Other(explain)

8. REMARKS, EXPLANATIONS: Drill up to 5 wells

(If more space is needed, continue on back)

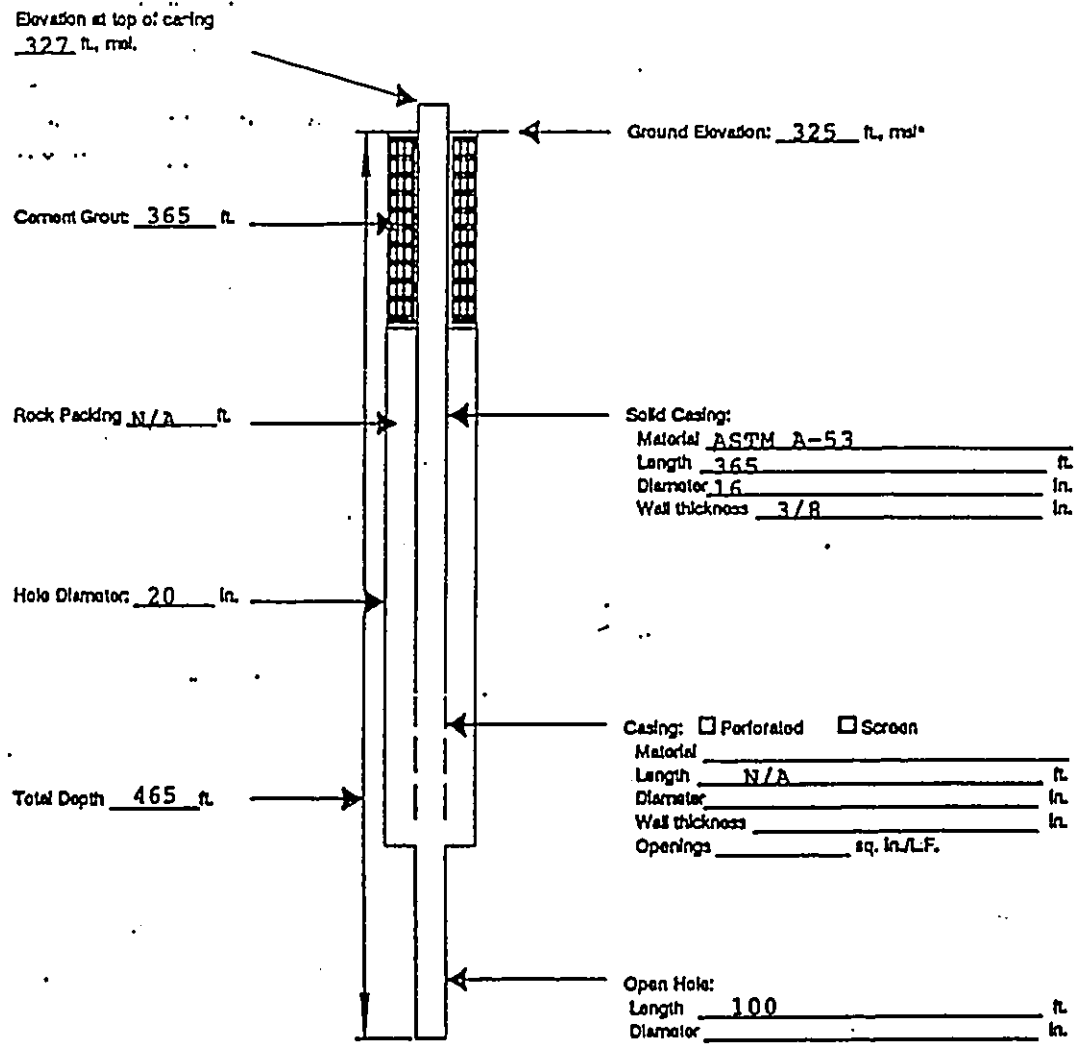
By signing below, the applicant understands that, if the permit requested is granted by the Commission on Water Resource Management, the proposed work is to be completed within (2) years of the approval date. In addition, the contractor shall submit to the Commission a well completion report, well abandonment report, or both, within 30 days after the abandonment date of the permitted work. The applicant also understands that monthly water use data shall be submitted to the Commission. The applicant further understands that approval of proposed permit shall not constitute a determination of correlative water rights and shall not guarantee the pump capacity or future use up to the permitted pump capacity.

Owner Board of Water Supply Landowner (Same) Contractor _____
 Signature [Signature] Signature _____ Signature _____
 Date 6/9/93 Date _____ Date _____

For Official Use Only:
 Date Received _____
 Date Accepted _____
 Field Checked By _____ Longitude _____ Aquifer System Name _____
 Date _____ Latitude _____ State Well No. _____

Remarks, Explanations (cont'd): Drill up to 5 wells for HFDC for permitted use of 2,013,700 gpd and for peaking and stand by purposes.

9. PROPOSED WELL SECTION



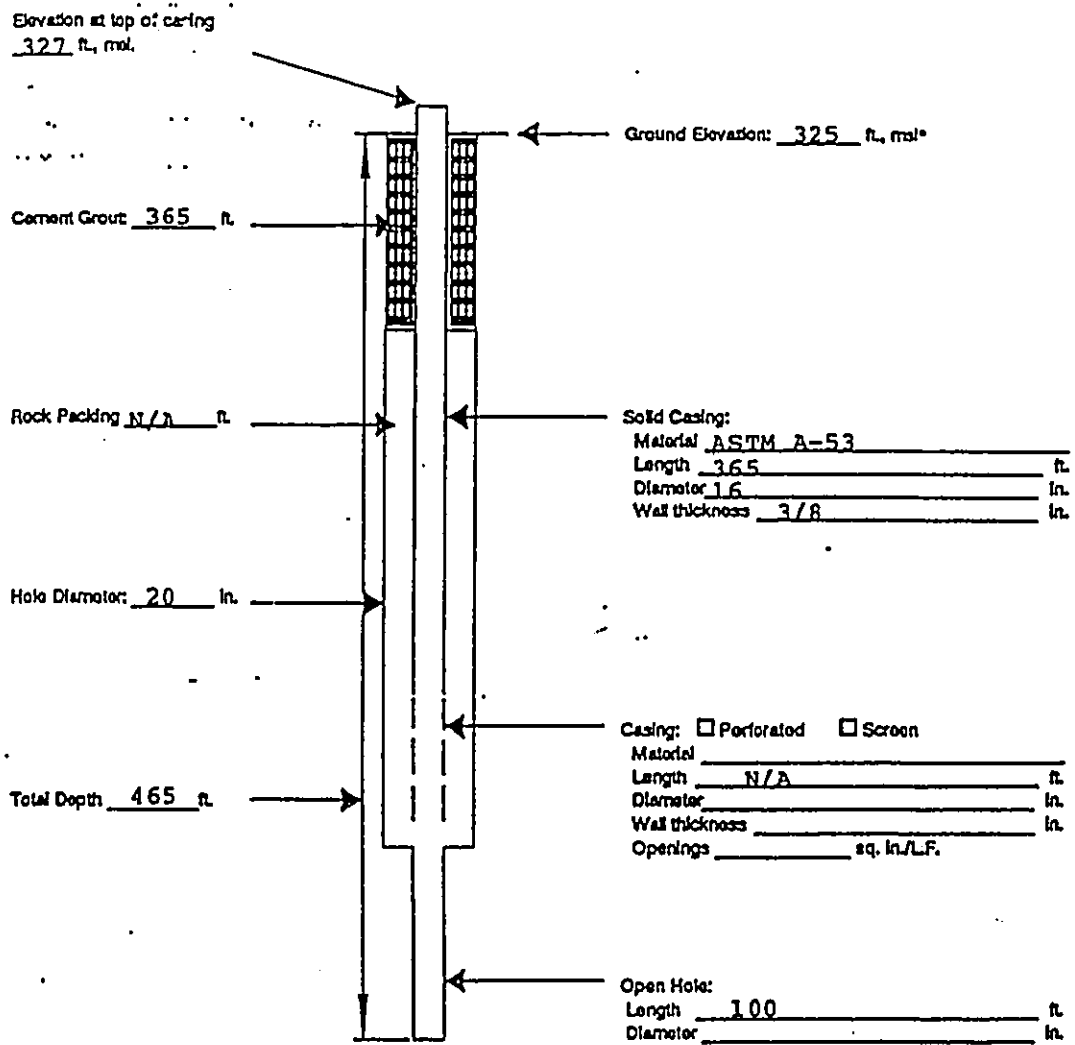
Approximate elevation at time of filing application. Ground elevation above mean sea level (msl) by a surveyor licensed by the State must be submitted at start of construction. Final elevations of well components shall be submitted in the well completion/well abandonment reports.

CORRECTION

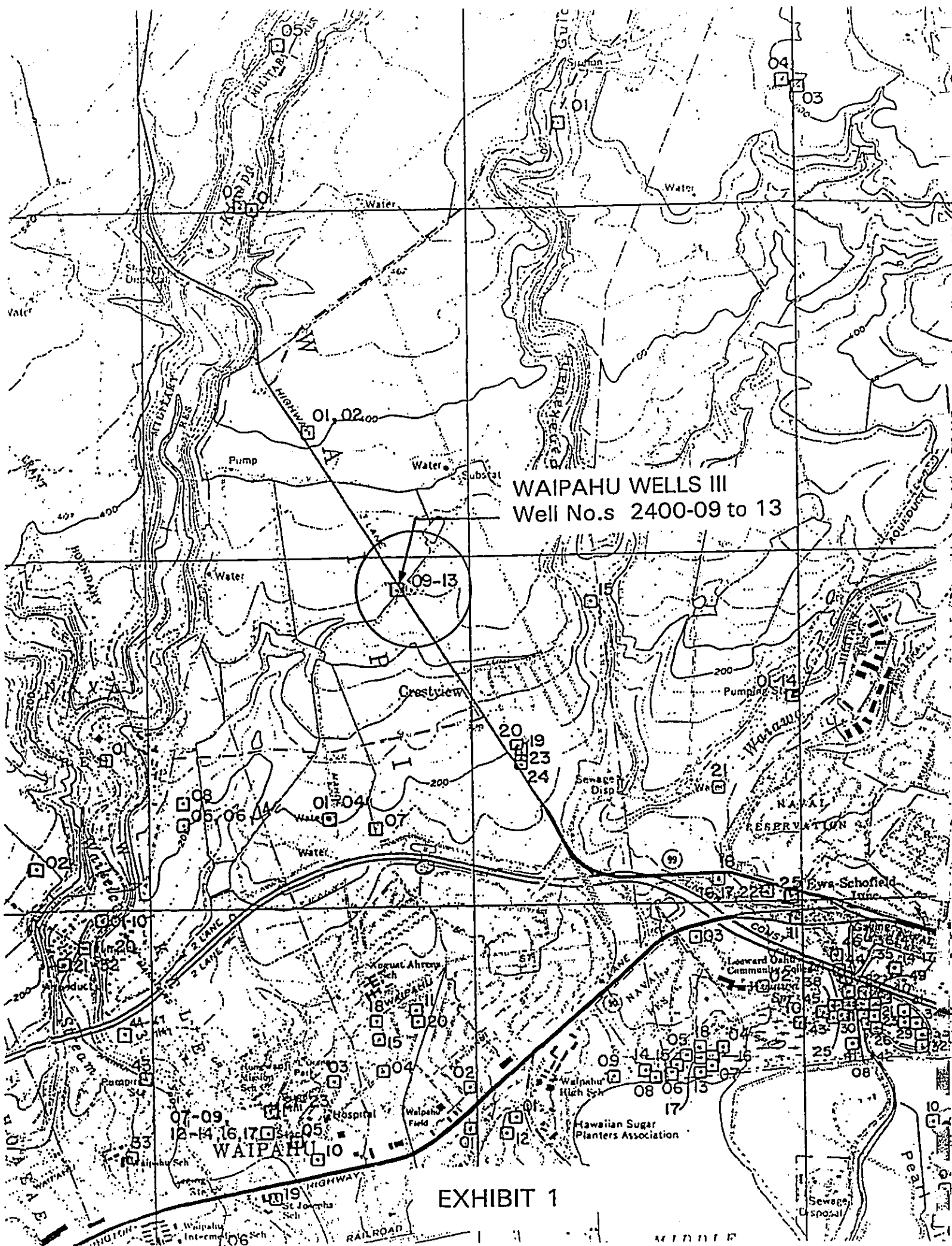
THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

Remarks, Explanations (cont'd): Drill up to 5 wells for HFDC for permitted use of
2,013,700 gpd and for peaking and stand by purposes.

9. PROPOSED WELL SECTION



Approximate elevation at time of filing application. Ground elevation above mean sea level (msl) by a surveyor licensed by the State must be submitted at start of construction. Final elevations of well components shall be submitted in the well completion/well abandonment reports.



WAIPAHU WELLS III
Well No.s 2400-09 to 13

EXHIBIT 1

MIDDLE

APPENDIX C
WELL INFORMATION FOR
WELLS #1, #2, #3, #4, AND #5

WELL COMPLETION REPORT

Instructions: Please print or type and submit completed report within 30 days after well completion to the Commission on Water Resource Management, P.O. Box 623, Honolulu, Hawaii 96808. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Acquisition Branch at 847-0023.

1. STATE WELL NO. 2400-08 WELL NAME WAIPAHU III #1 ISLAND OAHU
2. LOCATION: Address KAM HWY ACROSS FROM WAIPIO GENTRY Tax Map Key 9-4-03174
3. DRILLING OR PUMP INSTALLATION CONTRACTOR ROSCOE MOSS HAWAII, INC.
4. CONTRACTOR'S C-87 LICENSE NUMBER C-16437
5. NAME OF DRILLER WHO PERFORMED WORK JOHN CARROLL
6. TYPE OF RIG/CONSTRUCTION FAILING, AIR ROTARY
7. DATE OF WELL DRILLING COMPLETION 7/22/94

8. GROUND ELEVATION (msl) 317.83 ft.
 Top of Drilling Platform (msl) _____ ft.
 Height of Drilling Platform above Ground surface _____ ft.
 Bench Mark and Method Used to Determine Ground Elevation BMS SURVEY ft.

9. DRILLER'S LOG:

Depth (ft.)	Rock Description, Remarks, Data	Water Level (ft.)	Depth (ft.)	Rock Description, Remarks, Data	Water Level (ft.)
0 to 11	RED VERY SOFT		163 to 290	BLUE GREY VERY HARD	
11 to 28	BROWN GREY BOULDERS		290 to 312	BLUE GREY LITTLE BROWN	
28 to 78	BROWN MEDIUM HARD		312 to 338	GREY BROWN MED HARD	299
78 to 138	BROWN GREY MED HARD		338 to 358	GREY BROWN LOOSE	299
138 to 153	BLUR ROCK VERY HARD		358 to 443	GREY & BROWN LAYERS	299
153 to 163	BROWN GREY MED HARD		443 to 458	GREY & BROWN SOFT	299

(If more space is needed, continue on back.)

10. TOTAL DEPTH OF WELL BELOW GROUND 458 ft.
11. HOLE SIZE: 22 inch dia. from 0 ft. to 358 ft. below ground
14 3/4 inch dia. from 358 ft. to 458 ft. below ground
 _____ inch dia. from _____ ft. to _____ ft. below ground

12. CASING INSTALLED:
15 in. i.d. x .375 in. wall solid section to 358 ft. below ground
 _____ in. i.d. x _____ in. wall perforated section to _____ ft. below ground
 Type of Perforation N/A

13. ANNULUS:
 Gravelled from 0 ft. below ground to 358 ft. below ground
 Gravel backed from _____ ft. below ground to _____ ft. below ground

14. INITIAL WATER LEVEL 299 ft. below ground. Date and time of measurement 7/7/94
15. INITIAL CHLORIDE 34 ppm. Date and time of sampling 7/14/94
16. INITIAL TEMPERATURE 70.6 °F. Date and time of sampling 7/14/94
17. DATE OF PUMP INSTALLATION _____

18. PUMP INSTALLATION:
 Pump Type, Make, Serial No. _____ Capacity _____ gpm
 Motor type, H.P., Voltage, rpm _____
 Depth of Pump Intake Setting _____ ft. below _____, which elevation is _____ ft.
 Depth of bottom of airline _____ ft. below _____, which elevation is _____ ft.
 Pumping Head is _____ ft.
 19. PUMPING TESTS:
 Reference Point (R.P.) used: _____, which elevation is _____ ft.
 Date 7/14/94 Date 7/15/94
 Start water level _____ ft. below R.P. Start water level _____ ft. below R.P.
 End water level _____ ft. below R.P. End water level _____ ft. below R.P.
 Depth of well _____ ft. below R.P. Depth of well _____ ft. below R.P.
- | Elapsed Time (hours) | Flow (gpm) | Draw-down (ft.) | Cl. (ppm) | Temp. (°F) | Elapsed Time (hours) | Flow (gpm) | Draw-down (ft.) | Cl. (ppm) | Temp. (°F) |
|----------------------|------------|-----------------|-----------|------------|----------------------|------------|-----------------|-----------|------------|
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
- (If more space is needed, continue on back.)

Remarks: _____
 (If more space is needed, continue on back.)

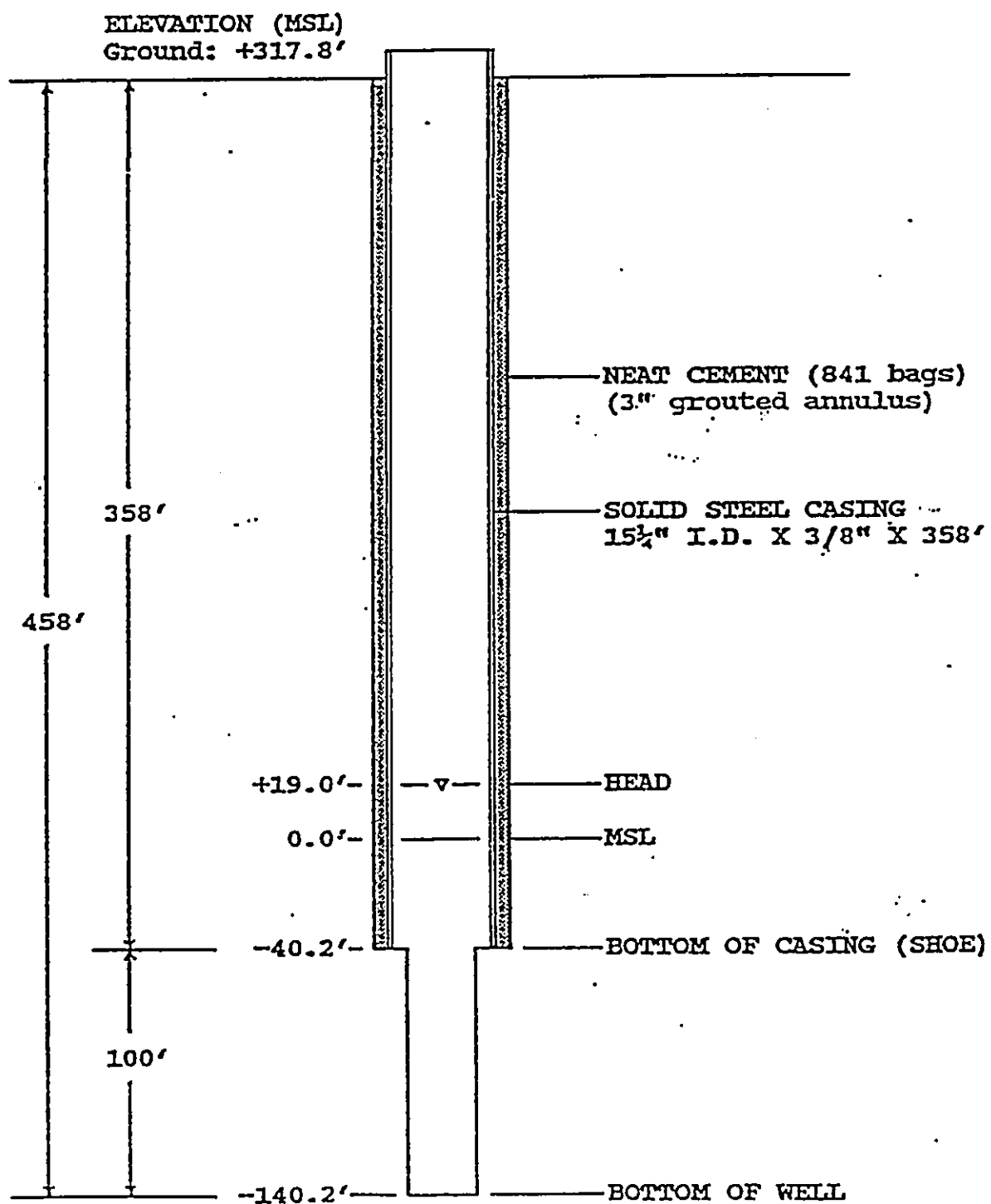
Contractor (print) ROSCOE MOSS HAWAII INC Title FIELD SUPERINTENDENT
 Signature [Signature] Date 9/9/94

For Owner's Use: Job Name _____	Job No _____
------------------------------------	--------------

For Official Use: Longitude _____	Well No. _____ Latitude _____
--------------------------------------	----------------------------------

WAIPAHU WELLS III NO. 2400-09 (WELL #1)
WAIPIO, OAHU, HAWAII
T.M.K.: 9-4-05:74

As-Built Section
Drilling Completed: July 9, 1994
Drilling Contractor: Roscoe Moss, Hawaii, Inc.



1994

(not to scale)

WAIPAHU WELLS III NO. 2400-09
Well #1

Plumbness Test: July 11, 1994
Ground Elevation: 317.8± ft. (msl)
Casing Length: 358.0 ft.
Casing Diameter: 15½ inches I.D.
Pulley Height: 20.00 ft.
Maximum allowable drift/any 100': 10.17"

<u>Depth</u> <u>(ft.)</u>	<u>Drift</u> <u>(inches)</u>	<u>Drift (inches per</u> <u>any 100 ft.)</u>
0		
20	1.00	
40	1.66	
60	2.41	
80	3.51	
100	4.54	4.54
120	5.30	4.35
140	6.12	4.55
160	6.99	* 4.67
180	7.43	4.22
200	8.18	3.80
220	8.92	3.83
240	9.66	3.73
260	10.66	3.90
280	10.74	3.55
300	11.45	3.57
320	12.17	3.60
340	12.89	3.60
358	13.53	3.10 (per 98 ft.)

* The maximum drift of 4.67 inches per any 100 feet of depth occurs between 60 feet and 160 feet.

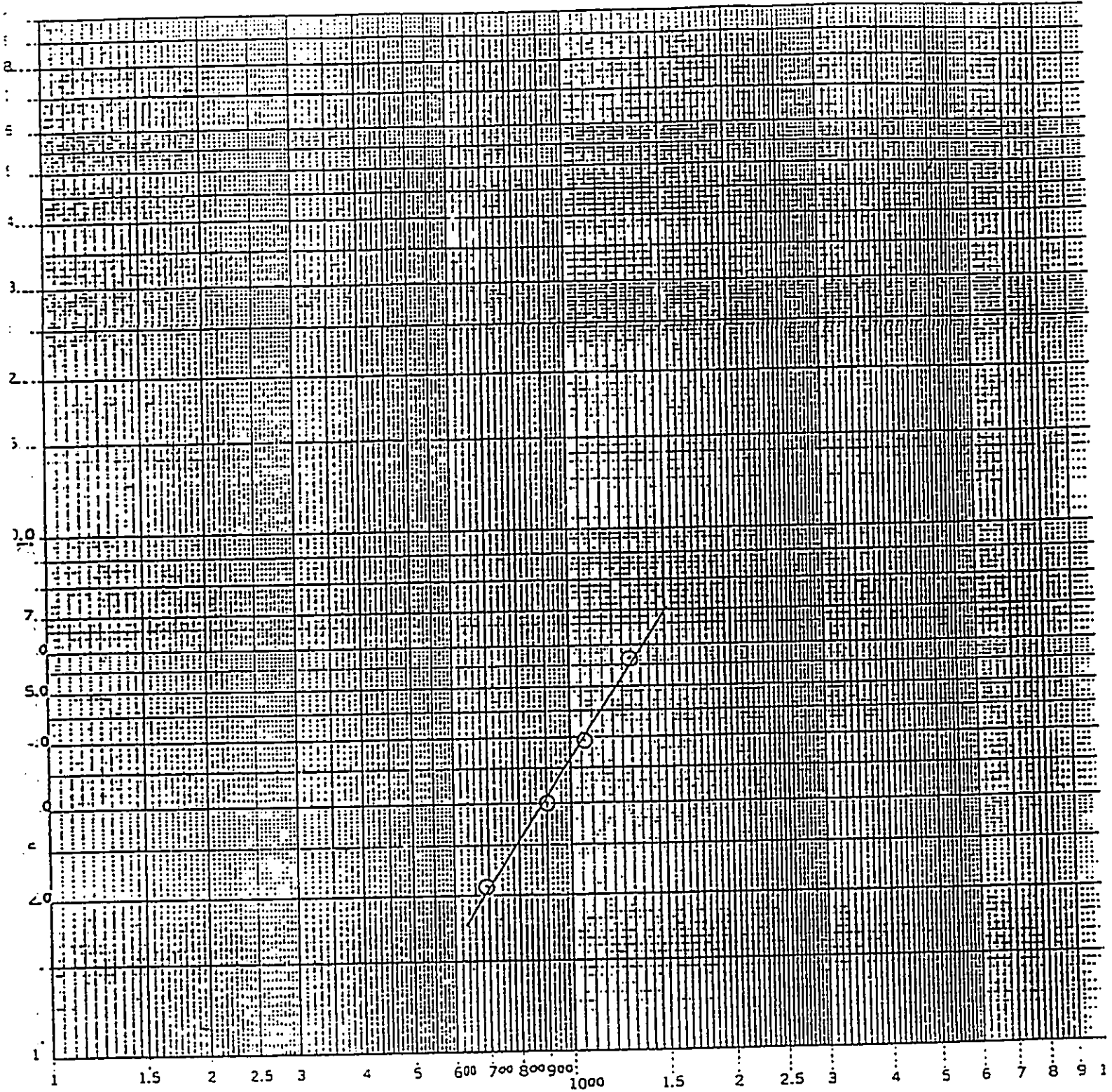
WAIPAHAU WELLS III NO. 2400-09
WELL #1

Location : THK: 9-4-05:74
 Elevation at ground : +317.8 ft.
 Elevation at bottom of well: -140.2 ft.
 Elevation at end of casing : -40.2 ft.
 Diameter of casing : 15 1/2 in. I.D.
 Head : +19.0 ft.
 Airline Depth : 340 ft.
 Pump Depth (Suction) : 351 ft.
 Drilling completed : July 1994
 Drilling company : Roscoe Moss Hawaii, Inc.
 Date of Yield-Drawdown test: July 14, 1994

<u>Time</u>	<u>Q (gpm)</u>	<u>Drawdown (ft.)</u>	<u>Cl (ppm)</u>	<u>Temperature (°F)</u>	<u>Remarks</u>
1115					(17.85 psi static)
1120					started pumping
1140	683	2.54	34	70.8	sample
1150	690	2.08		70.7	
1200	692	2.08	32	70.7	sample
1205					changed rate
1210	890	3.00		70.7	
1220	896	3.00		70.6	
1235	902	3.00		70.7	
1250	906	3.00		70.7	
1300	903	3.00	32	70.7	sample
1305					changed rate
1310	1073	3.92		70.6	
1320	1070	3.92		70.6	
1335	1059	3.92		70.6	
1345	1059	3.92	34	70.7	sample
1350					changed rate
1405	1298	5.66		70.6	
1420	1302	5.66		70.5	
1435	1294	5.66		70.6	
1445	1294	5.66	34	70.6	sample
1450					stopped pumping
1451		4.50			
1453		4.27			
1454		3.69			
1455		3.58			
1457		.11			cleared airline
1458		.00			recovered

WAIPAHU WELLS III NO. 2400-09

SPECIFIC CAPACITY



Q
(gpm)

WAIPAHU WELLS III NO. 2400-09
WELL #1
LONG TERM PUMPING TEST: 7/15/94 to 7/20/94

Date Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature °F	Remarks
7/15/94 (Fri)					
0945					17.70 psi (static)
1000					started pumping
1020	1019	3.24	34	70.7	first sample
1030	1029	3.47		70.7	
1045	1029	3.47		70.7	
1100	1026	3.47		70.7	
1115	1019	3.47		70.7	
1130	1019	3.47		70.7	
1145	1019	3.47		70.7	
1200	1014	3.47		70.7	
1300	1026	3.47		70.6	
1400	1019	3.47		70.6	
1500	1012	3.47		70.6	
1800	1007	3.47		70.7	
2100	1012	3.47		70.7	
2400	1014	3.24		70.7	
7/16/94 (Sat)					
0300	1014	3.70		70.7	
0600	1012	3.70		70.7	
0900	1019	3.24		70.7	
1000	1026	3.58	34	70.7	
1200	998	3.58		70.6	average rate: 1006 gpm
1500	997	3.58		70.7	
1800	998	3.14		70.7	
2100	1000	3.14		70.7	
2400	1000	3.14		70.7	
7/17/94 (Sun)					
0300	1000	3.14		70.7	
0600	1000	3.14		70.7	
0900	1000	3.03		70.7	
1000	995	3.70	34	70.7	
1200	984	4.05		70.6	average 2 day rate: 998 gpm
1500	984	4.05		70.7	
1800	984	2.66		70.7	
2100	984	2.66		70.7	
2400	984	2.66		70.7	
7/18/94 (Mon)					
0300	968	2.66		70.7	
0600	952	2.66		70.7	
0900	984	2.89		70.7	
1000	979	2.77	34	70.7	
1200	978	3.01		70.6	average 3 day rate: 986 gpm
1500	979	3.01		70.7	
1800	999	3.01		70.7	
2100	1013	3.01		70.7	
2400	1014	3.01		70.7	
7/19/94 (Tue)					
0300	1009	3.01		70.7	
0600	1014	3.12		70.7	
0900	1004	3.01		70.7	
1000	995	3.01	34	70.7	
1200	1000	2.89		70.6	average 4 day rate: 989 gpm
1500	986	2.89		70.7	
1800	1003	3.12		70.7	
2100	1006	3.01		70.7	
2400	1008	3.12		70.7	
7/20/94 (Wed)					
0300	1010	3.12		70.7	
0600	1022	3.24		70.7	
0955	995	3.01	34	70.6	
1000					
1001		2.54			stopped pumping
1002		2.54			average 5 day rate: 992 gpm
1003		1.16			
1004		.70			
1005		.12			
1006		.00			full recovery

Total pumpage (120 hours): 7,143,900 gallons
Average pumpage per day: 1,428,780 gallons per day
Average pumpage rate: 992 gallons per minute



State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
 Department of Land and Natural Resources

WELL COMPLETION REPORT

Instructions: Please print or type and submit completed report within 30 days after well completion to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96809. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Regulation Branch at 547-0223.

- STATE WELL NO. 2400-10 WELL NAME MAIPAHU III #2 ISLAND OAHU
- LOCATION: Address KAM HWY ACROSS FROM WAIPIO GENTRY Tax Map Key 9-4-05174
- DRILLING OR PUMP INSTALLATION CONTRACTOR ROSCOB MOSS HAWAII, INC.
- CONTRACTOR'S C-57 LICENSE NUMBER C-16437
- NAME OF DRILLER WHO PERFORMED WORK JOHN CARROLL
- TYPE OF RIG/CONSTRUCTION FAILING AIR ROTARY
- DATE OF WELL DRILLING COMPLETION 8/26/94
(NOTE: Report must be submitted within 30 days after well completion.)

RECEIVED
 01 OCT 20 10:20

- GROUND ELEVATION (msl) 316.88 ft.
 Top of Drilling Platform (msl) _____ ft.
 Height of Drilling Platform above Ground surface _____ ft.
 Bench Mark and Method Used to Determine Ground Elevation BWS SURVEY

9. DRILLER'S LOG:

Depth (ft.)	Rock Description, Remarks, Dates	Water Level (ft.)
0 to 23	RED SOFT DIRT	
23 to 53	BROWN GREY MED HARD	
53 to 70	RED BROWN MED SOFT	
70 to 146	BROWN GREY MED HARD	
146 to 163	BLUE GREY VERY HARD	
163 to 180	BROWN GREY MED HARD	
180 to 189	RED MEDIUM SOFT	
189 to 220	BLUE GREY VERY HARD	
220 to 234	RED BROWN MEDIUM SOFT	
234 to 348	BROWN GREY MED HARD 298	
348 to 381	BLUE GREY MED HARD 298	
381 to 442	GREY BROWN MED HARD 298	
442 to 457	BROWN BLUE MED SOFT	

- TOTAL DEPTH OF WELL BELOW GROUND 457 ft.
- HOLE SIZE: 22 inch dia. from 0 ft. to 357 ft. below ground
14.5 inch dia. from 397 ft. to 457 ft. below ground
 _____ inch dia. from _____ ft. to _____ ft. below ground

- CASING INSTALLED:
15.25 in. I.D. x .375 in. wall solid section to 357 ft. below ground
N/A in. I.D. x _____ in. wall perforated section to _____ ft. below ground
 Type of Perforation N/A

- ANNULUS:
 Grouted from 0 ft. below ground to 357 ft. below ground
 Gravel packed from N/A ft. below ground to N/A ft. below ground

- INITIAL WATER LEVEL 298 ft. below ground. Date and time of measurement 07/18/94
- INITIAL CHLORIDE 34 ppm Date and time of sampling 08/17/94
- INITIAL TEMPERATURE 70.6 °F Date and time of sampling 08/17/94

- PUMP INSTALLATION:
 Pump Type, Make, Serial No. _____ Capacity _____ gpm
 Motor type, H.P., Voltage, rpm _____
 Depth of Pump Intake Setting _____ ft. below _____, which elevation is _____ ft.
 Depth of bottom of airline _____ ft. below _____, which elevation is _____ ft.
 Pumping Head is _____ ft.

19. PUMPING TESTS: Reference Point (R.P.) used: _____, which elevation is _____ ft.

Date	Start water level (ft. below R.P.)	End water level (ft. below R.P.)	Depth of well (ft. below R.P.)	Elapsed Time (hours)	Rise (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. (°F)
<u>08/17/94</u>	_____	_____	_____	_____	_____	_____	_____	_____
<u>08/24/94</u>	_____	_____	_____	_____	_____	_____	_____	_____

(If more space is needed, continue on back.)

Remarks: _____
(If more space is needed, continue on back.)

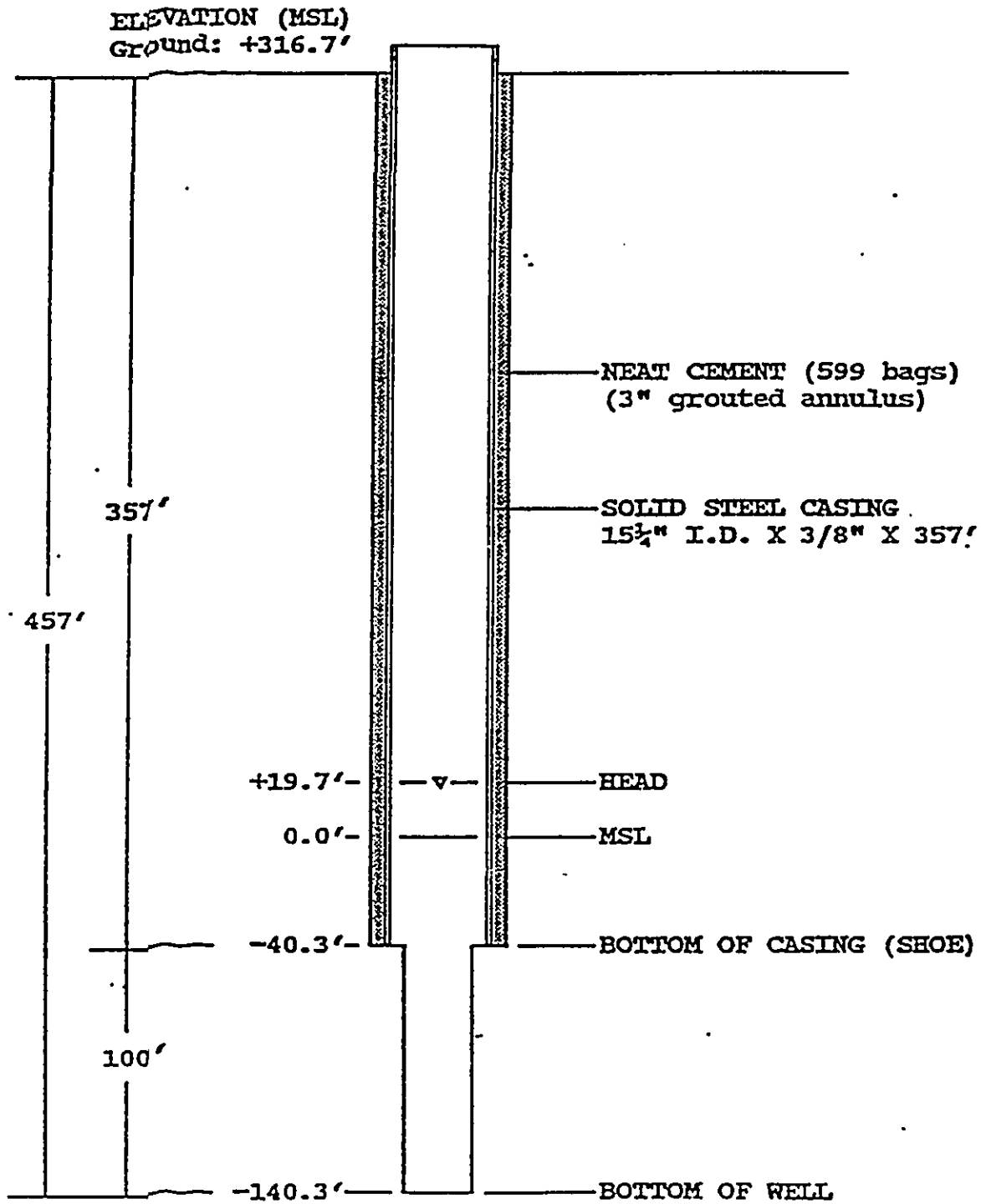
Contractor (print) ROSCOB MOSS HAWAII, INC. Title FIELD SUPERINTENDENT
 Signature [Signature] Date 10/18/94

For Driller's Use:
 Job Name _____ Job No. _____

For Official Use:
 Well No. 2400-10
 Longitude 158 00 13 Latitude 21 24 55

WAIPIHU WELLS III NO. 2400-10 (WELL #2)
WAIPIO, OAHU, HAWAII
T.M.K.: 9-4-05:74

As-Built Section
Drilling Completed: August 8, 1994
Drilling Contractor: Roscoe Moss, Hawaii, Inc.



September 1994

(not to scale)

WAIPAHU WELLS III NO. 2400-10
Well #2

Plumbness Test: August 9, 1994
Ground Elevation: 316.7± ft. (msl)
Casing Length: 357.0 ft.
Casing Diameter: 15½ inches I.D.
Pulley Height: 20.00 ft.
Maximum allowable drift/any 100': 10.17"

<u>Depth</u> <u>(ft.)</u>	<u>Drift</u> <u>(inches)</u>	<u>Drift (inches per</u> <u>any 100 ft.)</u>
0		
20	.42	
40	1.38	
60	2.00	
80	2.50	
100	3.42	3.42
120	3.99	3.58
140	4.56	3.17
160	4.63	2.68
180	4.92	2.58
200	6.07	3.50
220	7.22	5.17
240	7.80	4.73
260	9.21	* 6.35
280	8.28	4.52
300	8.04	2.37
320	8.54	1.43
340	9.00	1.24
357	9.42	1.41 (per 97 ft.)

* The maximum drift of 6.35 inches per any 100 feet of depth occurs between 160 feet and 260 feet.

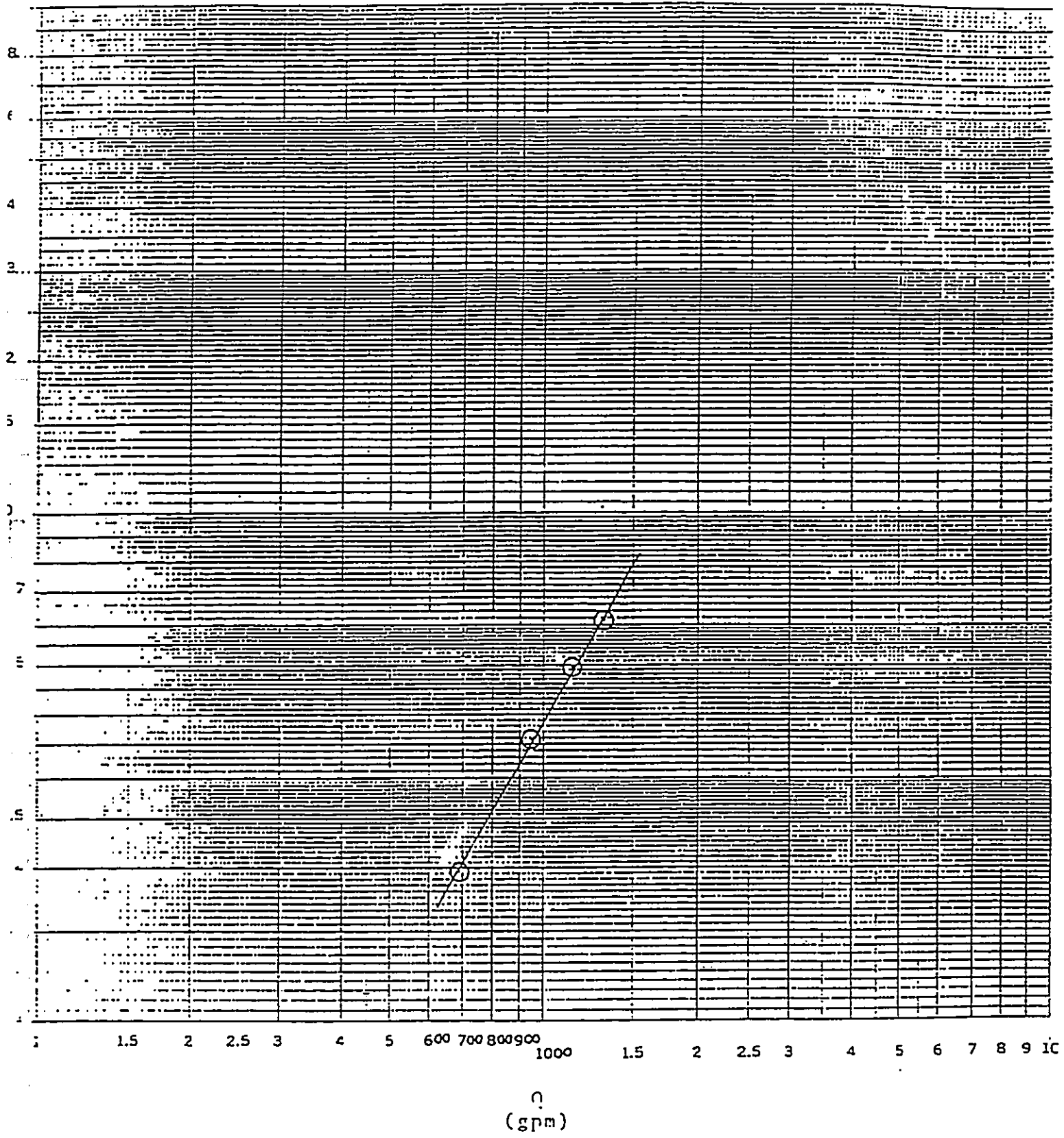
WAIPAHU WELLS III NO. 2400-10
WELL #2

Location : TMK: 9-4-05:74
 Elevation at ground : +316.7 ft.
 Elevation at bottom of well: -140.3 ft.
 Elevation at end of casing : -40.3 ft.
 Diameter of casing : 15 1/4 in. I.D.
 Head : +19.7 ft.
 Airline Depth : 340 ft.
 Pump Depth (Suction) : 354 ft.
 Drilling completed : August 1994
 Drilling company : Roscoe Moss Hawaii, Inc.
 Date of Yield-Drawdown test: August 17, 1994

<u>Time</u>	<u>Q (gpm)</u>	<u>Drawdown (ft.)</u>	<u>Cl (ppm)</u>	<u>Temperature (°F)</u>	<u>Remarks</u>
0845					(18.10 psi static)
0850					started pumping
0900	695	1.96			
0910	683	1.96			
0930	700	1.96			
0945	690	1.96	34	70.6	sample #1 changed rate
0950					
0955	956	3.58			
1010	956	3.58			
1025	956	3.58			
1045	951	3.58	34	70.6	sample #2 changed rate
1050					
1055	1148	4.97			
1110	1150	4.97			
1125	1148	4.97			
1145	1148	4.97	34	70.6	sample #3 changed rate
1150					
1155	1327	6.12			
1210	1309	6.12			
1225	1322	6.12			
1245	1313	6.12	34	70.6	sample #4 stopped pumping
1250					
1255		.35			
1300		.11			
1305		.11			

KAIPAHU WELLS III NO. 2400-10

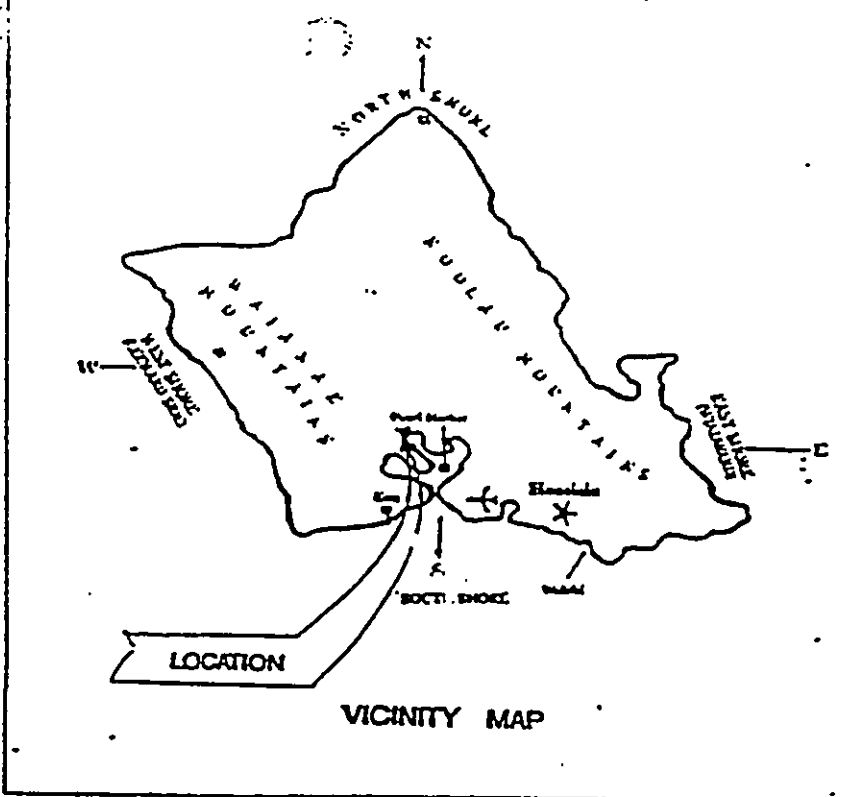
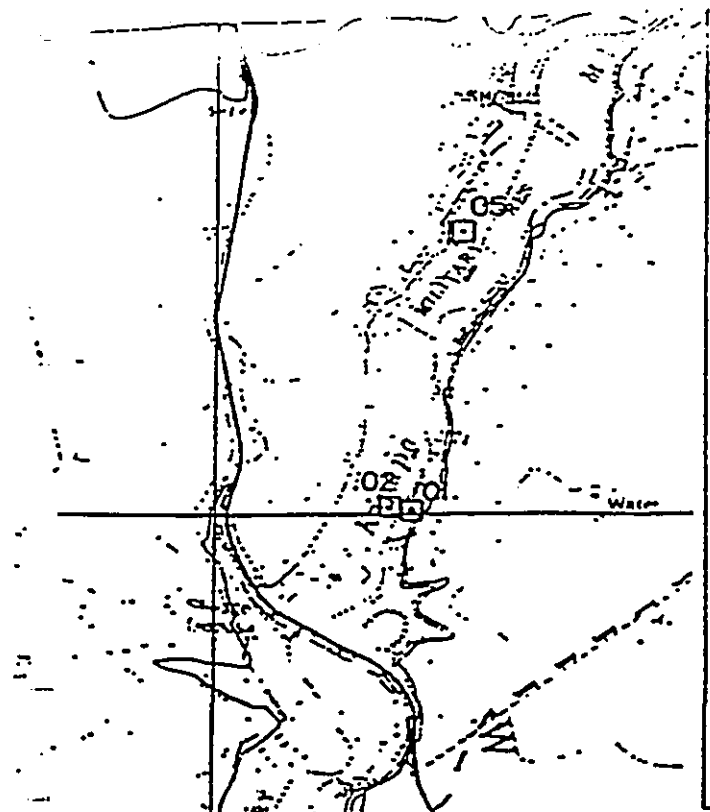
SPECIFIC CAPACITY



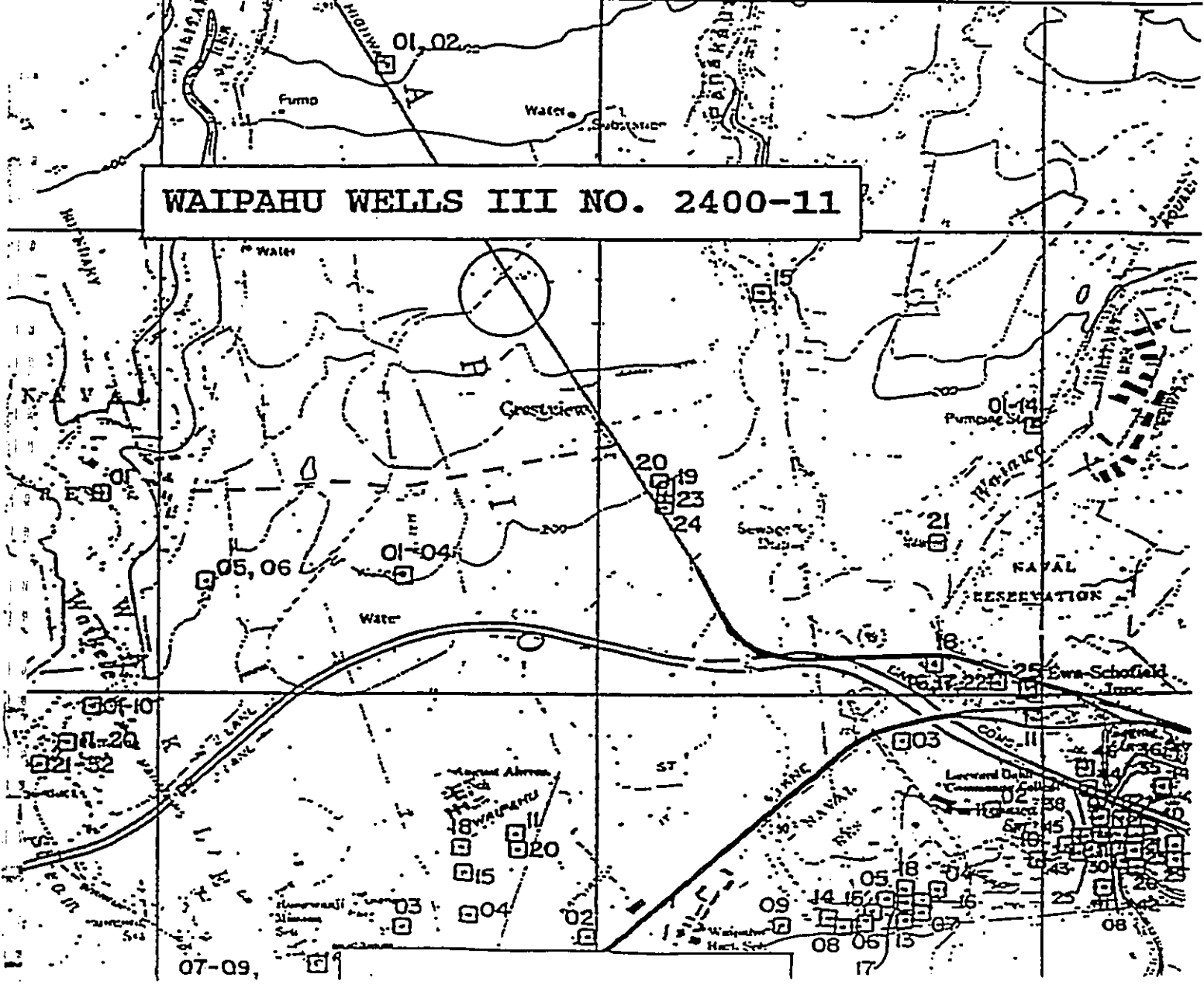
WAIPAHU WELLS III NO. 2400-10
 WELL #2
 LONG TERM PUMPING TEST: 8/22/94 to 8/25/94

Date Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature °F	Remarks
8/22/94 (Mon)					18.10 psi (static)
0945					started pumping
1000					sample
1010	1014	3.35	34	70.7	
1020	1017	3.35			
1030	1033	3.46			
1040	1033	3.46			
1050	1034	3.46			
1100	1034	3.46			
1110	1031	3.46			
1120	1029	3.35			
1130	1020	3.35			
1140	1014	3.23			
1150	1014	3.23			
1200	1014	3.23			
1300	1008	3.12			
1400	1002	3.23			
1500	1000	3.23			
1800	1000	3.35			
1830	1000	3.35			
2100	1000	3.23			
2400	1000	3.23			
8/23/94 (Tue)					
0100	1000	3.35			
0300	1000	3.23			
0600	1000	3.35			
0800	1000	3.35			
0900	1000	3.35			
1000	1007	3.23			
1005			34	70.6	average rate: 1012 gpm sample
1100	1005	3.23			
1200	1000	3.35			
1300	1000	3.23			
1400	1000	3.23			
1500	1000	3.23			
1800	1000	3.23			
2100	1000	3.23			
2400	1000	3.23			
8/24/94 (Wed)					
0300	1000	3.23			
0600	1000	3.23			
0800	1000	3.46			
0900	1000	3.46			
1000	1012	3.35	34	70.6	average 2 day rate: 1005 gpm sample
1200	1000	3.35			
1500	1000	3.35			
1800	1000	3.35			
2100	1000	3.35			
2400	1000	3.35			
8/25/94 (Thur)					
0300	1000	3.35			
0600	1000	3.35			
0900	1000	3.35			
0950	988	3.23	34	70.6	average 3 day rate: 1000 gpm sample stopped pumping
1000					
1001		2.42			
1003		2.31			
1004		2.08			
1005		1.96			
1006		1.85			
1007		1.73			
1008		1.62			
1009		1.50			
1010		1.38			
1011		1.25			
1012		1.04			
1013		.92			
1015		.11			clear airline

Total pumpage (72 hours): 4,219,300 gallons
 Average pumpage per day: 1,439,767 gallons
 Average pumpage rate: 1,000 gallons per minute



WAIPAHU WELLS III NO. 2400-11





State of Hawaii
 COMMISSION ON WATER RESOURCE MANAGEMENT
 Department of Land and Natural Resources

WELL COMPLETION REPORT

Instructions: Please print or type and submit completed report within 30 days after well completion to the Commission on Water Resource Management, P.O. Box 221, Honolulu, Hawaii 96808. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Regulation Branch at 587-0223.

- STATE WELL NO. 2400-11 WELL NAME WAIPAHU WELLS III #3 ISLAND OAHU
- LOCATION: Address XAM HWY ACROSS FROM WAIPAO GENTRY Tax Map Key 9-4-05:74
- DRILLING OR PUMP INSTALLATION CONTRACTOR ROSCOE MOSS HAWAII, INC.
- CONTRACTOR'S C-57 LICENSE NUMBER C-16437
- NAME OF DRILLER WHO PERFORMED WORK JOHN CARROLL
- TYPE OF RIG/CONSTRUCTION FAILING 150 AIR ROTARY
- DATE OF WELL DRILLING COMPLETION 09/23/94
(NOTE: report must be submitted within 30 days after the date)

- GROUND ELEVATION (msl) 311.1 ft.
 Top of Drilling Platform (msl) 313.1 ft.
 Height of Drilling Platform above Ground surface 2 ft.
 Bench Mark and Method Used to Determine Ground Elevation BWS SURVEY ft.

9. DRILLER'S LOG:

Depth (ft.)	Rock Description, Remarks, Dates	Water Level (ft.)	Depth (ft.)	Rock Description, Remarks, Dates	Water Level (ft.)
0 to 31	RED BROWN SOFT		251 to 288	GREY BROWN VERY HARD	
31 to 147	BROWN GREY MED HARD		288 to 314	BROWN GREY MED HARD	203
147 to 164	BLUE GREY HARD		314 to 400	BLUE GREY LITTLE BROWN	293
164 to 201	GREY MED HARD		400 to 455	Blue Grey Little Brown	293
201 to 227	BLUE GREY HARD TO MED HARD				
227 to 251	GREY BROWN HARD LOOSE				

(If more space is needed, continue on back.)

- TOTAL DEPTH OF WELL BELOW GROUND _____ ft.
- HOLE SIZE: _____ 22 inch dia. from _____ 0 ft. to _____ 355 ft. below ground
 _____ 13 inch dia. from _____ 355 ft. to _____ 455 ft. below ground
 _____ inch dia. from _____ ft. to _____ ft. below ground
- CASING INSTALLED:
 _____ 15 1/2 in. I.D. x _____ 375 in. wall solid section to _____ 55 ft. below ground
 _____ in. I.D. x _____ in. wall perforated section to _____ ft. below ground
 Type of Perforation N/A
- ANNULUS:
 Grouted from _____ 0 ft. below ground to _____ 355 ft. below ground
 Gravel packed from N/A ft. below ground to N/A ft. below ground
- INITIAL WATER LEVEL 293.1 ft. below ground. Date and time of measurement 09/23/94
- INITIAL CHLORIDE 30 ppm. Date and time of sampling 09/23/94
- INITIAL TEMPERATURE 70.5 °F. Date and time of sampling 09/23/94
- DATE OF PUMP INSTALLATION _____

- PUMP INSTALLATION:
 Pump Type, Make, Serial No. _____ Capacity _____ gpm
 Motor type, H.P., Voltage, rpm _____
 Depth of Pump Intake Setting _____ ft. below _____, which elevation is _____ ft.
 Depth of bottom of airline _____ ft. below _____, which elevation is _____ ft.
 Pumping Head is _____ ft.

- PUMPING TESTS: Reference Point (R.P.) used: _____, which elevation is _____ ft.
 Date 9/30/94 Date 10/17/94
 Start water level _____ ft. below R.P. Start water level 293.1 ft. below R.P.
 End water level 293.1 ft. below R.P. End water level 293.1 ft. below R.P.
 Depth of well 455 ft. below R.P. Depth of well 455 ft. below R.P.

Elapsed Time (hours)	Rate (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. °F	Elapsed Time (hours)	Rate (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. °F
_____ to _____	_____	_____	_____	_____	_____ to _____	_____	_____	_____	_____
_____ to _____	_____	_____	_____	_____	_____ to _____	_____	_____	_____	_____
_____ to _____	_____	_____	_____	_____	_____ to _____	_____	_____	_____	_____
_____ to _____	_____	_____	_____	_____	_____ to _____	_____	_____	_____	_____
_____ to _____	_____	_____	_____	_____	_____ to _____	_____	_____	_____	_____

(If more space is needed, continue on back.)

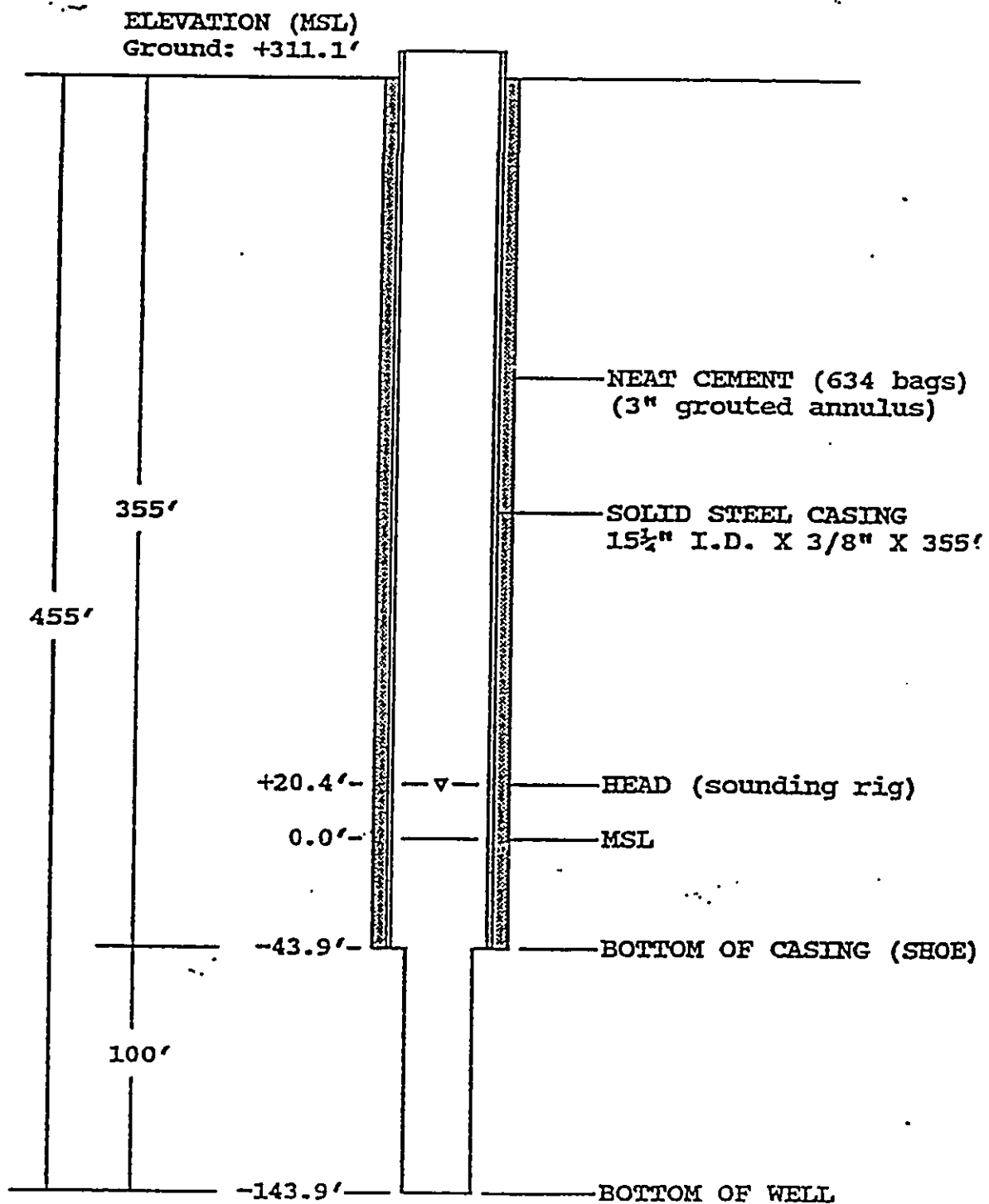
Remarks: _____
(If more space is needed, continue on back.)

Contractor (print) ROSCOE MOSS HAWAII, INC. Title FIELD SUPERINTENDENT
 Signature [Signature] Date 11/22/94

For Driller's Use: Job Name _____ Job No _____	For Office Use: Longitude _____ Well No. _____ Latitude _____
---	---

WAIPAHU WELLS III NO. 2400-11 (WELL #3)
WAIPIO, OAHU, HAWAII
T.M.K.: 9-4-05:74

As-Built Section
Drilling Completed: September 23, 1994
Drilling Contractor: Roscoe Moss Hawaii, Inc.



October 1994

(not to scale)

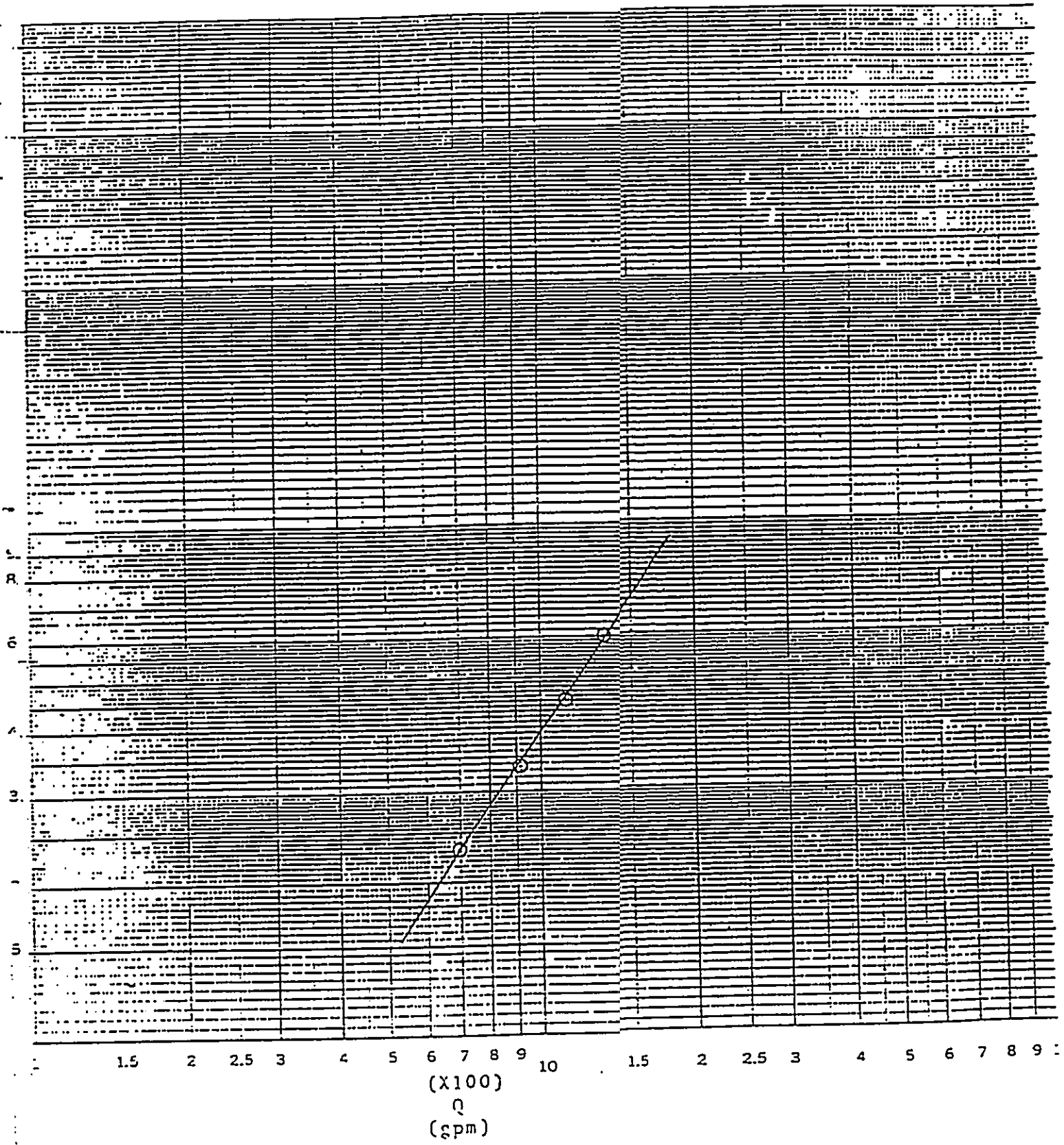
WAIPAHU WELLS III NO. 2400-11
WELL #3

Location : TMK: 9-4-05:74
 Elevation at ground : +311.1 ft.
 Elevation at bottom of well: -143.9 ft.
 Elevation at end of casing : -43.9 ft.
 Diameter of casing : 15½ in. I.D.
 Head : +18.0 ft.
 Airline Depth : 340 ft.
 Pump Depth (Suction) : 352 ft.
 Drilling completed : September 23, 1994
 Drilling company : Roscoe Moss Hawaii, Inc.
 Date of Yield-Drawdown test: September 30, 1994

<u>Time</u>	<u>Q (gpm)</u>	<u>Drawdown (ft.)</u>	<u>Cl (ppm)</u>	<u>Temperature (°F)</u>	<u>Remarks</u>
0855					17.97' static head (airline)
0905					started pumping
0910	715	2.31	30	70.5	sample #1
0920	692	2.31		70.5	
0935	705	2.31		70.4	
0950	697	2.31		70.4	
1000		2.54			
1005	692	2.42		70.4	
1020	691	2.31		70.4	
1030	692	2.31	30	70.4	sample #2
1035					changed rate
1050	922	3.46		70.3	
1105	917	3.46		70.3	
1120	906	3.35		70.3	
1130	912	3.35	30	70.3	sample #3
1135					changed rate
1140	1113	4.50		70.2	
1155	1101	4.50		70.2	
1215	1105	4.50		70.2	
1230	1105	4.50	30	70.2	sample #4
1235					changed rate
1240	1285	6.00		70.2	
1255	1330	6.00		70.3	
1320	1319	6.00		70.2	
1340	1325	6.00		70.3	
1345	1325	6.00		70.3	sample #5
1350					stopped pumping
1351		1.50			
1352					well recovered

KAIPAHU WELLS III NO. 1400-11

WELL #3
SPECIFIC CAPACITY



WAIPAHA WELLS III NO. 2400-11
Well #3

Plumbness Test: September 26, 1994
Ground Elevation: 311.1± ft. (msl)
Casing Length: 355.0 ft.
Casing Diameter: 15½ inches I.D.
Pulley Height: 20.00 ft.
Maximum allowable drift/any 100': 10.17"

<u>Depth</u> <u>(ft.)</u>	<u>Drift</u> <u>(inches)</u>	<u>Drift (inches per</u> <u>any 100 ft.)</u>
0		
20	.30	
40	1.28	
60	2.13	
80	3.01	
100	3.61	3.61
120	4.21	4.02
140	5.66	* 4.53
160	5.42	3.53
180	6.40	3.40
200	7.17	3.64
220	8.34	4.28
240	8.14	3.14
260	8.77	3.68
280	8.75	2.58
300	8.94	2.00
320	8.37	.98
340	8.49	1.10
350	8.27	1.10 (per 90 ft.)

* A maximum drift of 4.53 inches per 100 feet of casing occurs between 40 feet and 140 feet.

WAIPAHU WELLS III NO. 2400-11
WELL #3
LONG TERM PUMPING TEST: 10/17/94 to 10/20/94

<u>Date Time</u>	<u>Q (gpm)</u>	<u>Drawdown (ft.)</u>	<u>Cl (ppm)</u>	<u>Temperature °F</u>	<u>Remarks</u>
10/17/94 (Monday)					
0955					18.20' static head
1000					started pumping
1011	1043	3.69	30	70.2	sample #1
1025	1073	3.81		70.3	
1045	1043	3.58		70.3	
1100	1045	3.58		70.3	
1120	1042	3.58		70.2	
1145	1042	3.58		70.2	
1200	1034	3.58			
1500	1026	3.58			
1800	997	3.58			
2100	990	3.35			
2400	991	3.35			
10/18/94 (Tuesday)					
0300	989	3.35			
0600	989	3.92			
0900	982	3.81			
1000	985	3.46	32		sample #2
1200	982	3.81			average rate:
1500	979	3.81			1001 gpm
1800	997	3.46			
2100	995	3.46			
2400	993	3.46			
10/19/94 (Wednesday)					
0300	990	3.46			
0600	986	3.46			
0900	986	3.58			
1000	1054	3.69	32		sample #3
1200	1020	3.69			average 2 day
1500	1020	3.69			rate: 995 gpm
1800	1031	3.92			
2100	1026	3.81			
2400	1045	3.81			
10/20/94 (Thursday)					
0300	1025	3.81			
0600	1032	3.81			
0900	1040	3.69			
0930	1043	3.58		70.3	
0950	1045	3.58	32	70.3	sample #4
1000					stopped pumping

Total pumpage (72 hours): 4,366,000 gallons
Average pumpage per day: 1,455,333 gallons
Average pumpage rate: 1,011 gallons per minute



io
from
subject

ENGINEERING BRANCH

PLANNING BRANCH *BK*

WAIPAHI WELLS III NO. 2400-13
(WELL #4)

date

FEB. 2, 1995

Enclosed are results of the Waipahu Wells III No. 2400-13 (well #4) plumbness test which was performed on November 7, 1994. A maximum drift of 6.92 inches per any 100 ft. of casing occurs between 0 ft. and 100 ft. The maximum allowable drift per any 100 ft. of casing for this well is 10.17 inches. This well meets our plumbness specifications.

Other attachments include the data obtained during construction and subsequent pumping test. The yield-drawdown test was conducted at rates of 700, 900, 1100, and 1300 gpm which produced corresponding drawdowns of 2.08, 3.00, 3.46, and 4.27 ft., respectively.

Pumpage rate in the long term test averaged 1003 gpm producing an eventual drawdown of 5.08 ft. The increasing trend of drawdown over the course of the test may have resulted from problems attendant in the use of a weighted small diameter plastic airline. Although drawdown in both tests were characteristic of previous wells, recovery was abbreviated and cropped. A drawdown of 3.46 ft., achieved prior to the onset of airline deviation in the sustained test, approximates the 3.15 ft. at 1,000 gpm obtained from the step test. This value would be more representative of the achievable result of pumpage at the proposed rate.

Test pumping shows that well #4, with the exception of well #5, is more efficient than the other wells. Recovery abnormalities are not believed to be associated with aquifer properties but are probably mechanical in nature. Well #4 can be expected to meet the proposed pump capacity of 1,000 gpm.

Attachment

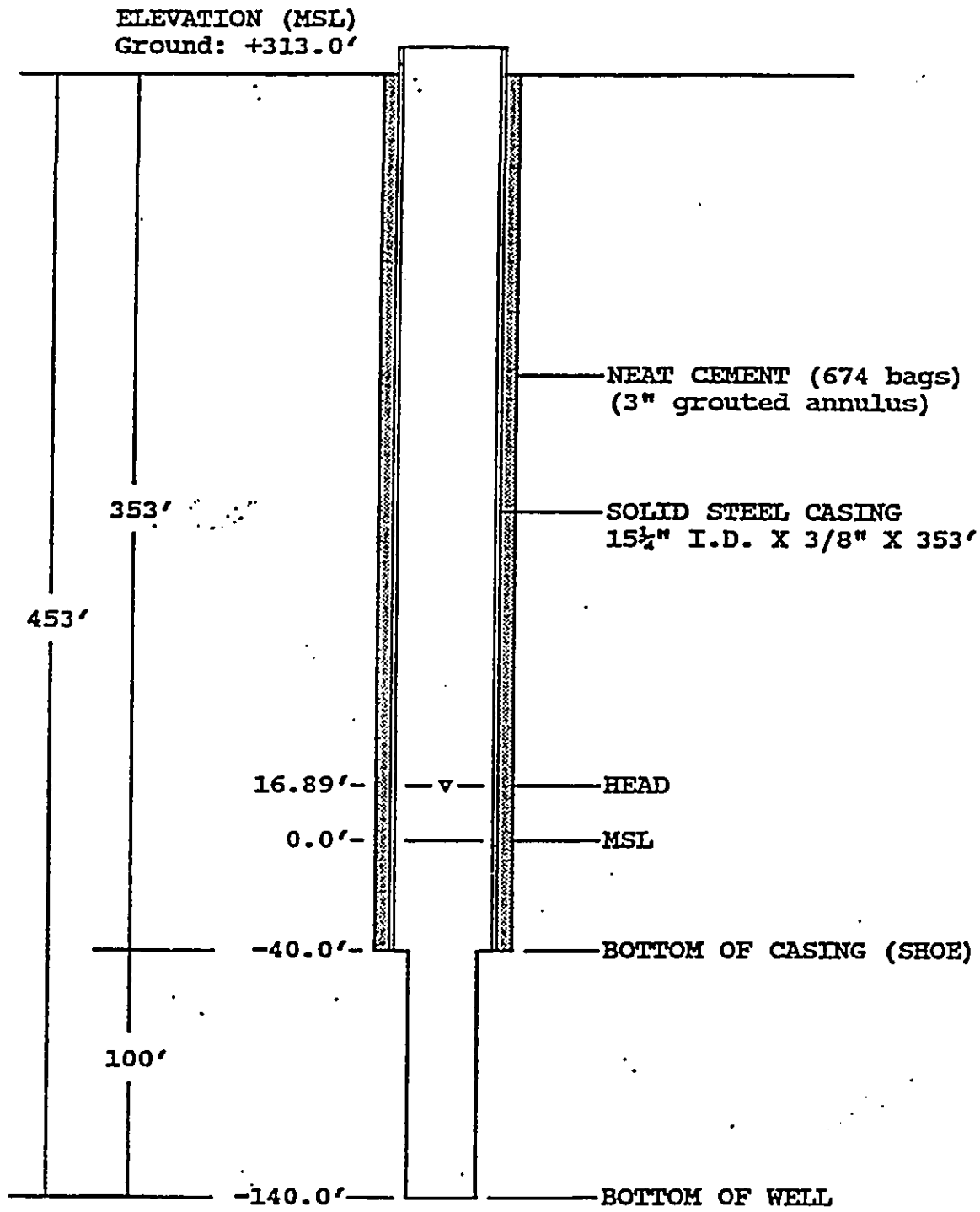
GHO:rk

cc: Plant Operations
H. Minakami
Engineering (A. Okada)
C. Lao

FEB 3 3 29 11/1995

WAIPAHA WELLS III NO. 2400-13 (WELL #4)
WAIPIO, OAHU, HAWAII
T.M.K.: 9-4-05:74

As-Built Section
Drilling Completed: November 7, 1994
Drilling Contractor: Roscoe Moss Hawaii, Inc.



GHO
January 1995

(not to scale)

WAIPAHU WELLS III NO. 2400-13
Well #4

Plumbness Test: November 7, 1994
Ground Elevation: 313.0± ft. (msl)
Casing Length: 353.0 ft.
Casing Diameter: 15½ inches I.D.
Pulley Height: 20.00 ft.
Maximum allowable drift/any 100': 10.17"

<u>Depth</u> <u>(ft.)</u>	<u>Drift</u> <u>(inches)</u>	<u>Drift (inches per</u> <u>any 100 ft.)</u>
0		
20	1.73	
40	3.24	
60	4.95	
80	6.19	
100	6.92	* 6.92
120	7.87	6.19
140	9.14	5.96
160	8.49	4.29
180	8.14	3.54
200	8.25	4.21
220	9.37	4.07
240	10.15	4.04
260	11.40	3.62
280	11.25	3.49
300	10.77	3.28
320	9.62	2.16
340	8.91	2.83
345	8.41	3.01 (per 85 ft.)

* A maximum drift of 6.92 inches per 100 feet of casing occurs between 0 feet and 100 feet.



State of Hawaii
 COMMISSION ON WATER RESOURCE MANAGEMENT
 Department of Land and Natural Resources

WELL COMPLETION REPORT

Instructions: Please print or type and submit completed report within 30 days after well completion to the Commission on Water Resource Management, P.O. Box 821, Honolulu, Hawaii 96809. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Regulation Branch at 547-0225.

1. STATE WELL NO. 2400-13 WELL NAME WAIPAHU III #4 ISLAND OAHU
 2. LOCATION: Address KAM HWY ACROSS HAIPIO GENTRY Tax Map Key 9-4-05:74
 3. DRILLING OR PUMP INSTALLATION CONTRACTOR ROSCOE MOSS HAWAII, INC.
 4. CONTRACTOR'S C-57 LICENSE NUMBER C-16437
 5. NAME OF DRILLER WHO PERFORMED WORK JOHN CARROLL
 6. TYPE OF RIG/CONSTRUCTION FALLING 150 AIR ROTARY
 7. DATE OF WELL DRILLING COMPLETION 01/20/95
 (NOTE: Report must be submitted within 30 days after the date.)

8. GROUND ELEVATION (msl) 313.0 ft.
 Top of Drilling Platform (msl) 315.0 ft.
 Height of Drilling Platform above Ground surface 2 ft.
 Bench Mark and Method Used to Determine Ground Elevation BWS SURVEY ft.

9. DRILLER'S LOG:

Depth (ft.)	Rock Description, Remarks, Date	Water Level (ft.)	Depth (ft.)	Rock Description, Remarks, Date	Water Level (ft.)
0 to 19	RED BROWN MED SOFT		362 to 375	GREY red brown	297
19 to 141	GREY LITTLE BROWN HARD		375 to 392	BLUE GREY MED HARD	297
141 to 181	GREY VERY HARD		392 to 453	GREY BROWN MED HARD	297
181 to 319	GREY BLUE VERY HARD	297			
319 to 333	GREY BROWN MED HARD	297			
333 to 362	GREY BLUE MED HARD	297			

(If more space is needed, continue on back.)

10. TOTAL DEPTH OF WELL BELOW GROUND _____ ft.
 11. HOLE SIZE: _____ Inch dia. from _____ ft. to _____ ft. below ground
 _____ Inch dia. from _____ ft. to _____ ft. below ground
 _____ Inch dia. from _____ ft. to _____ ft. below ground
 12. CASING INSTALLED:
 _____ 15.25 in. I.D. x .375 in. wall solid section to _____ ft. below ground
 _____ NA in. I.D. x _____ in. wall perforated section to _____ ft. below ground
 Type of Perforation _____ NA
 13. ANNULUS: Grouted from _____ ft. below ground to _____ ft. below ground
 Gravel packed from _____ ft. below ground to _____ ft. below ground
 14. INITIAL WATER LEVEL _____ ft. below ground. Date and time of measurement 10/27/94
 15. INITIAL CHLORIDE _____ ppm. Date and time of sampling 1/5/95
 16. INITIAL TEMPERATURE 71.2 °F. Date and time of sampling 1/5/95
 17. DATE OF PUMP INSTALLATION _____
 18. PUMP INSTALLATION:
 Pump Type, Make, Serial No. _____ Capacity _____ gpm
 Motor type, H.P., Voltage, rpm _____
 Depth of Pump Intake Setting _____ ft. below _____, which elevation is _____ ft.
 Depth of bottom of airlog _____ ft. below _____, which elevation is _____ ft.
 Pumping Head is _____ ft.

19. PUMPING TESTS: Reference Point (R.P.) used: _____, which elevation is _____ ft.

Date	Start water level	End water level	Depth of well	Date	Start water level	End water level	Depth of well
<u>1/5/95</u>	<u>297</u> ft. below R.P.	<u>297</u> ft. below R.P.	<u>453</u> ft. below R.P.	<u>1/10/95</u>	<u>297</u> ft. below R.P.	<u>297</u> ft. below R.P.	<u>453</u> ft. below R.P.

Elapsed Time (hours)	Rate (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. (°F)	Elapsed Time (hours)	Rate (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. (°F)
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

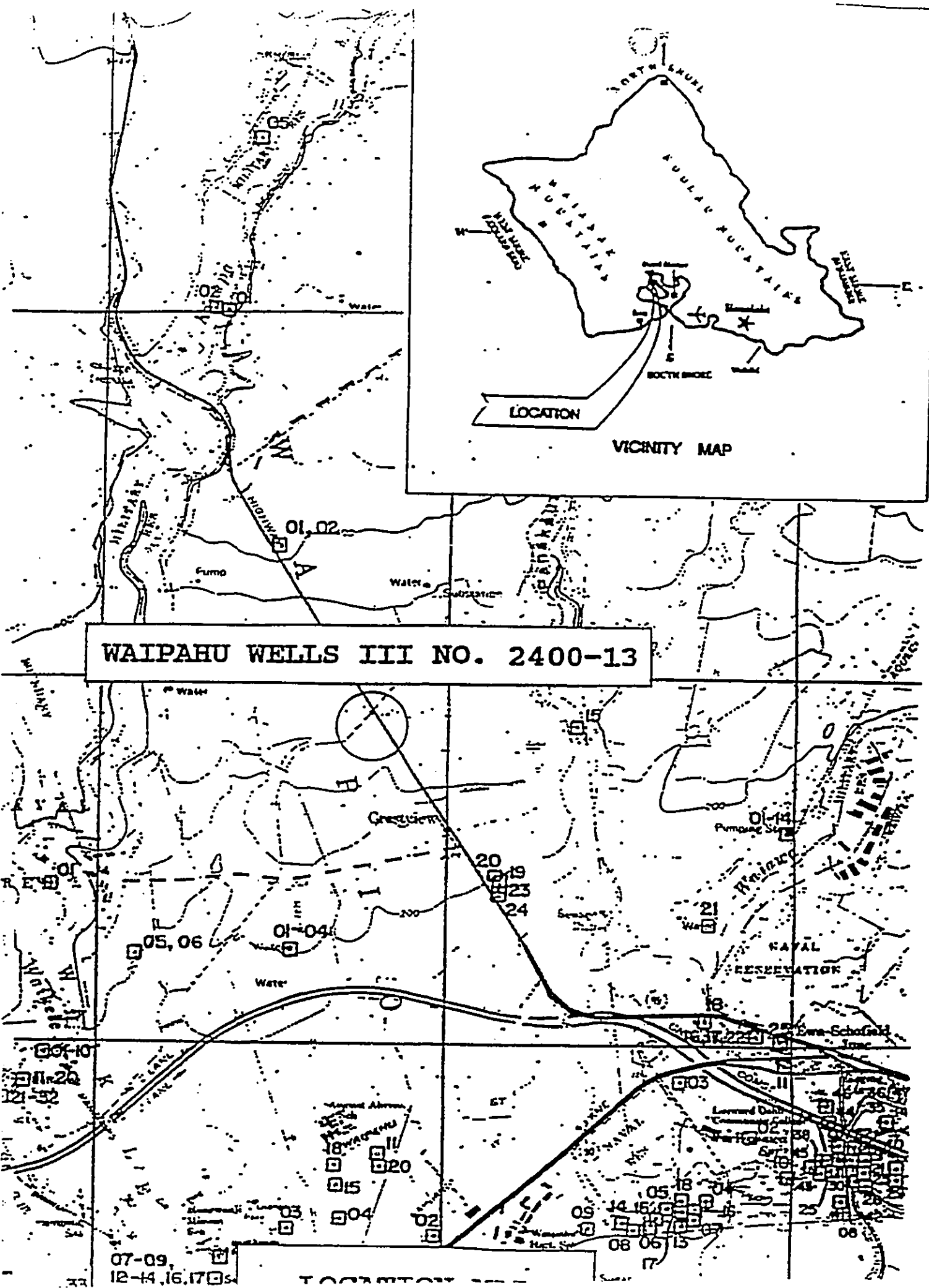
(If more space is needed, continue on back.)

Remarks: _____
 (If more space is needed, continue on back.)

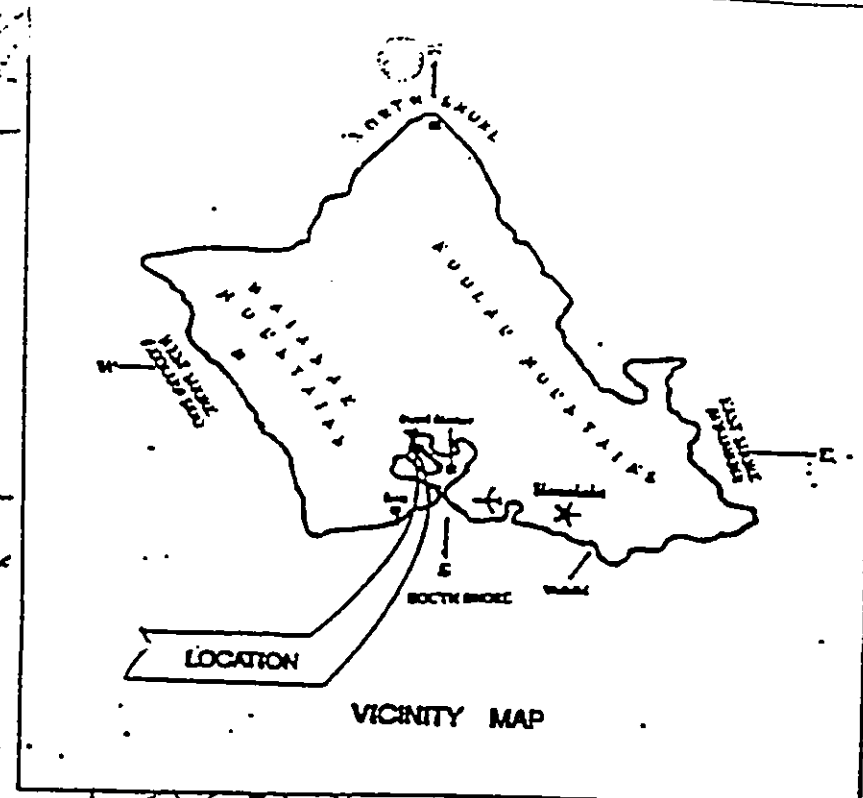
Contractor (print) ROSCOE MOSS HAWAII, INC. Title FIELD SUPERINTENDENT
 Signature Tracy Carroll Date 2/09/95

For Owner's Use:
 Job Name _____ Job No. _____

For Official Use:
 Well No. _____ Longitude _____ Latitude _____



WAIPAHU WELLS III NO. 2400-13



07-09, 12-14, 16, 17

TOCANTON

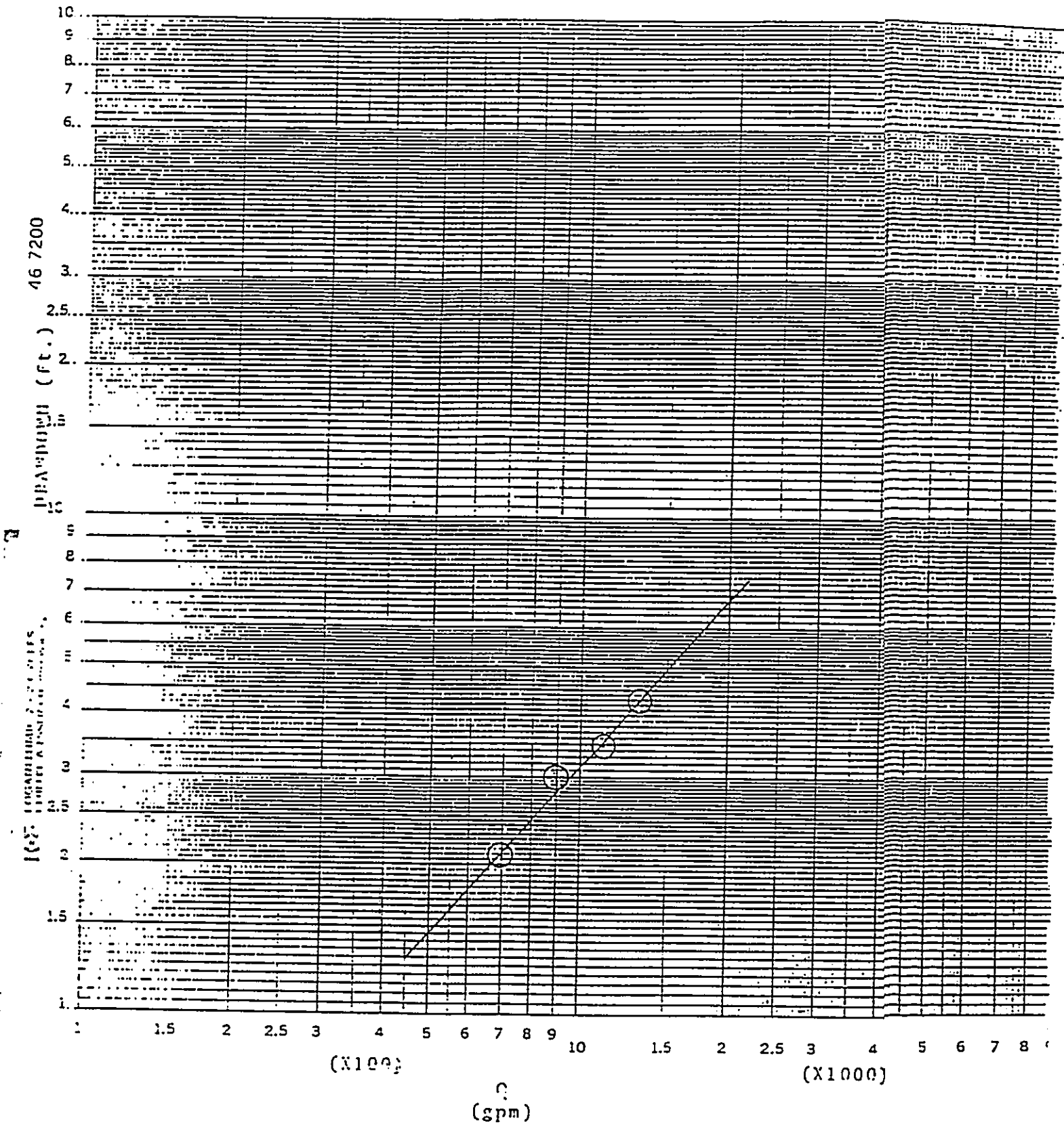
WAIPAHU WELLS III NO. 2400-13
WELL #4

Location : TMK: 9-4-05:74
 Elevation at ground : +313.0 ft.
 Elevation at bottom of well: -140.0 ft.
 Elevation at end of casing : -40.0 ft.
 Diameter of casing : 15 $\frac{1}{2}$ in. I.D.
 Head : 16.89 ft.
 Airline Depth : 340 ft.
 Pump Depth (suction) : 352 ft.
 Drilling completed : November 7, 1994
 Drilling company : Roscoe Moss Hawaii, Inc.
 Date of Yield-Drawdown test: January 5, 1995

<u>Time</u>	<u>Q</u> <u>(gpm)</u>	<u>Drawdown</u> <u>(ft.)</u>	<u>Cl</u> <u>(ppm)</u>	<u>Temperature</u> <u>(°F)</u>	<u>Remarks</u>
0850					16.89' static head (airline)
0905					started pumping
0917	710	1.73	36	71.2	sample #1
0923	706	1.73		71.4	
0930	706	2.08		71.4	
0945	697	1.85		71.4	
1000	699	2.08		71.4	
1010	697	2.08	36		sample #2
1015					changed rate
1017	898	2.66		71.1	
1025	889	3.00		71.1	
1029	920				
1035	935	3.00		71.1	
1040	901				
1050	906	3.00		71.2	
1110	896	3.00	36	71.2	sample #3
1115					changed rate
1119	1105	3.35		71.0	
1140	1093	3.46		71.0	
1200	1101	3.46		71.0	
1210	1101	3.46	36	70.9	sample #4
1215					changed rate
1219	1307	4.27		71.0	
1230	1319	4.27		70.9	
1250	1310	4.27		70.8	
1310	1310	4.27		70.8	
1330	1310	4.27	36	70.8	sample #5
1335					stopped pumping

WAIPAPU WELLS III No. 2400-13
(Well #4)

SPECIFIC CAPACITY



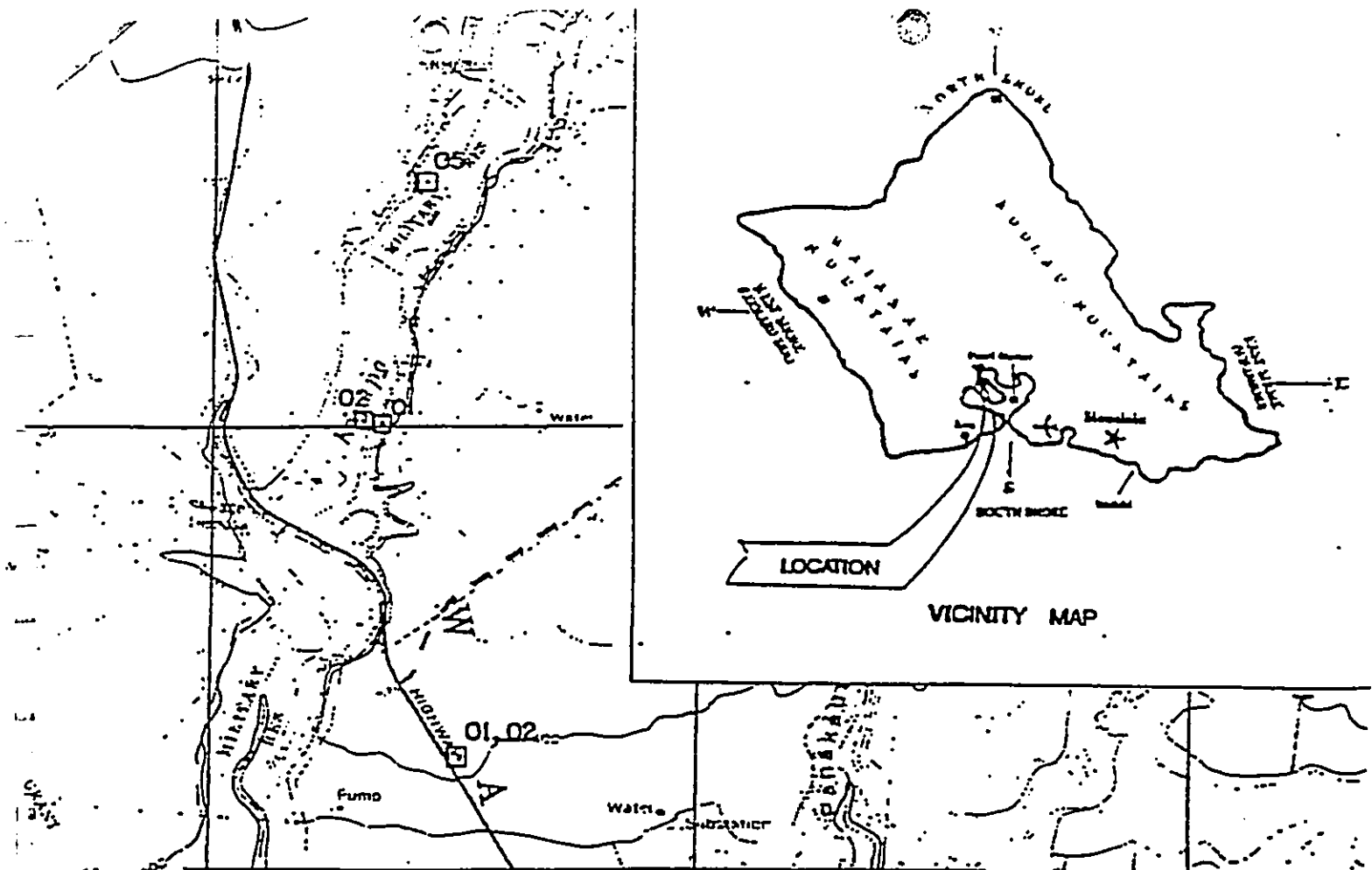
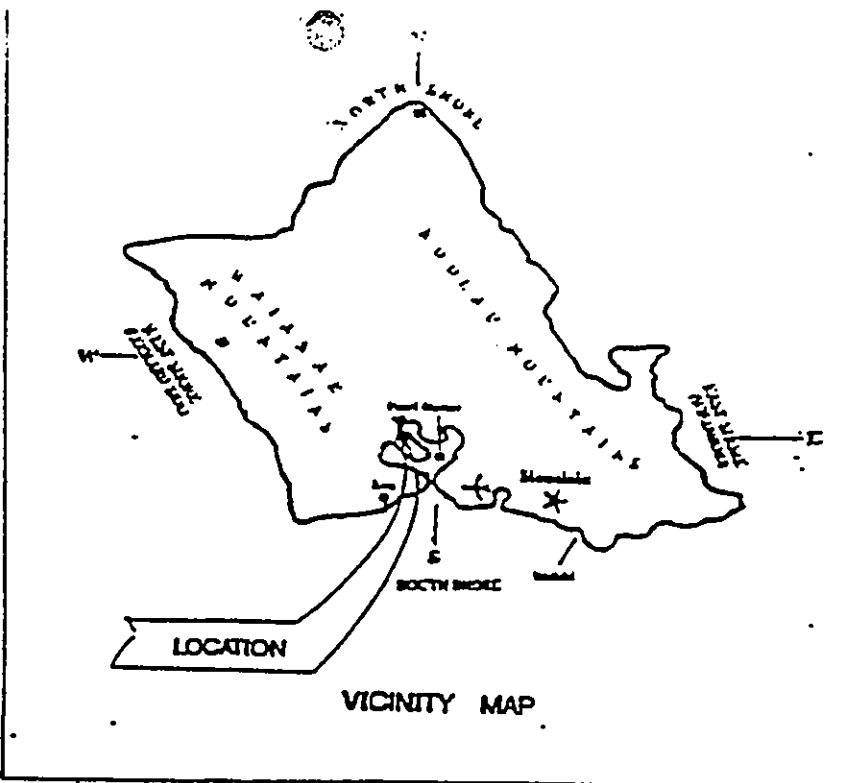
WAIPAHA WELLS III NO. 2400-13
WELL #4
LONG TERM PUMPING TEST: 1/10/95 to 1/13/95

<u>Date Time</u>	<u>Q (gpm)</u>	<u>Drawdown (ft.)</u>	<u>Cl (ppm)</u>	<u>Temperature °F</u>	<u>Remarks</u>
1/10/95 (Tuesday)					
0950					16.54' static head (airline) started pumping sample #1
1000					
1010	995	2.42	36	70.9	
1030	1008	2.54		71.0	
1050	1015	2.65		70.9	
1110	1008	2.77		71.0	
1130	1015	2.88		71.0	
1200	1005	2.88			
1300	1008	3.00			
1400	1010	3.23			
1500	1008	3.35			
1600	1009	3.46			
1700	1010	3.58			
1800	1008	3.81			
1900	1006	3.81			
2000	1010	4.04			
2100	1008	4.04			
2200	1005	4.27			
2300	1005	4.27			
2400	1005	4.27			
1/11/95 (Wednesday)					
0100	1000	4.27			
0200	1000	4.27			
0300	1000	4.27			
0400	1000	4.27			
0500	1000	4.27			
0600	1000	4.27			
0700	1002	4.39			
0800	1001	4.39			
0900	1001	4.39			
1000	1012	4.39	38	71.0	sample #2 average rate: 1006 gpm
1100	1009	4.39			
1200	1006	4.39			
1300	1002	4.39			
1400	1004	4.39			
1500	1000	4.27			
1600	1003	4.27			
1700	1004	4.39			
1800	1003	4.50			
1900	1004	4.50			
2000	1004	4.62			
2100	1005	4.62			
2200	1002	4.62			
2300	1001	4.62			
2400	1001	4.73			

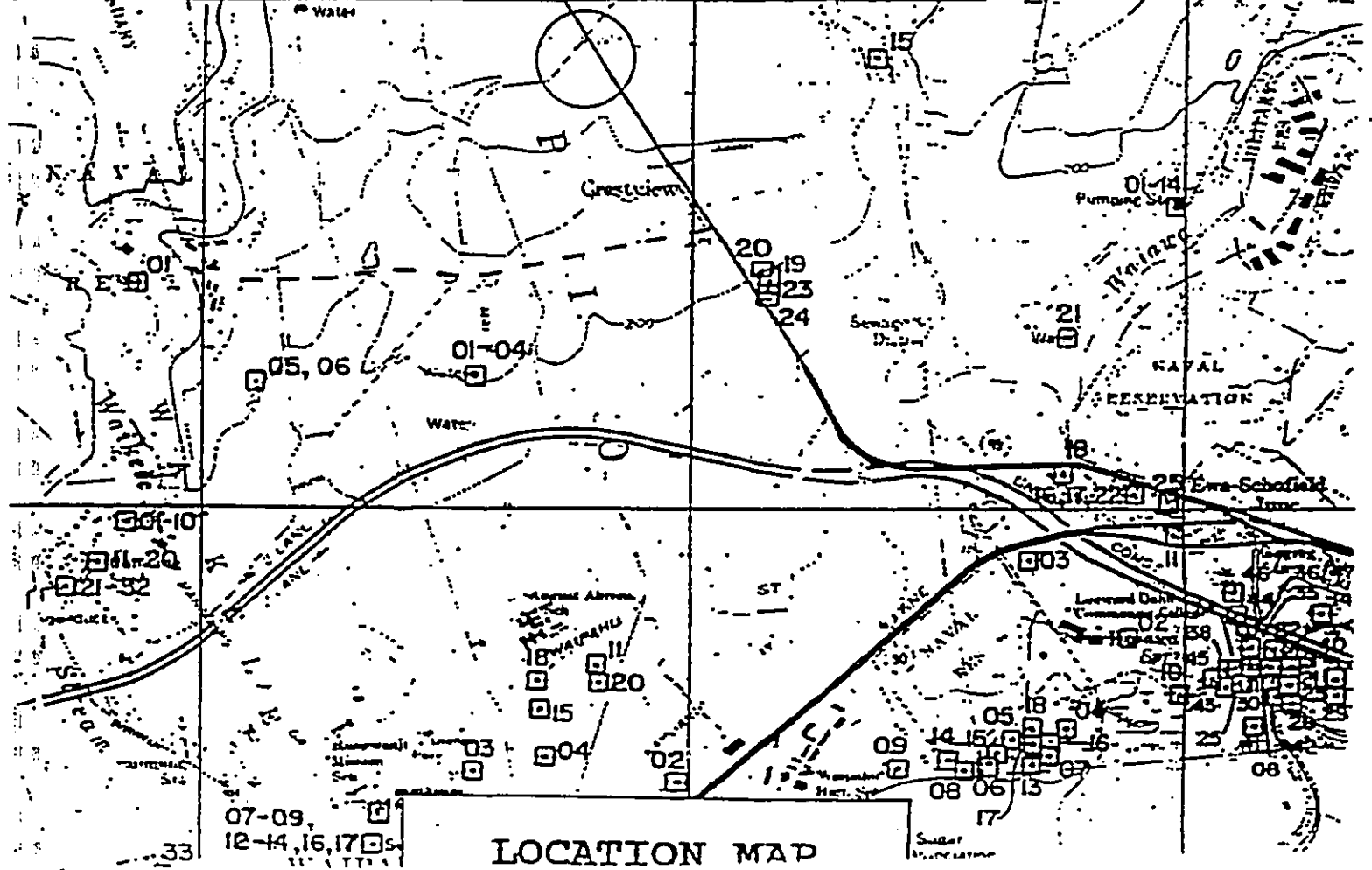
1/12/95 (Thursday)

0100	1002	4.73			
0200	1002	4.73			
0300	1002	4.85			
0400	1000	4.85			
0500	1017	4.85			
0600	1018	4.73			
0700	1010	4.73			
0800	1003	4.73			
0900	999	4.73			
1000	998	4.96	38	71.0	sample #3
1100	996	4.96			average 2 day
1200	994	4.96			rate: 1004 gpm
1300	996	4.85			
1400	1000	4.85			
1500	1001	4.85			
1600	1001	4.85			
1700	1001	4.85			
1800	1001	4.85			
1900	1002	4.96			
2000	1001	4.96			
2100	1000	5.08			
2200	1001	5.08			
2300	1009	5.08			
2400	1011	5.08			
1/13/95 (Friday)					
0100	1010	5.19			
0200	1019	4.96			
0300	1002	5.08			
0400	1003	5.08			
0500	1002	5.08			
0600	1003	5.08			
0700	1012	5.08			
0800	1009	5.08			
0900	1000	5.08			
0940	1007	5.08		71.0	
0955	1002	5.08	38	71.5	sample #4
1000					stopped pumping

Total pumpage (72 hours): 4,331,000 gallons
 Average pumpage per day: 1,443,667 gallons
 Average pumpage rate: 1,003 gallons per minute



WAIPAHA WELLS III NO. 2400-12





COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources

WELL COMPLETION REPORT

Instructions: Please print or type and submit completed report within 30 days after well completion to the Commission on Water Resource Management, P.O. Box 621, Honolulu, Hawaii 96808. An as-built drawing of the well and chemical analysis should also be submitted. For assistance call the Commission Regulation Branch at 587-0223.

1. STATE WELL NO. 2400-12 WELL NAME WAIPAHI III #5 ISLAND: KAHUI

2. LOCATION: Address KAM HWY ACROSS FROM WAIPIO GENTRY Tax Map Key 9-4-0574

3. DRILLING OR PUMP INSTALLATION CONTRACTOR ROSCOE MOSS HAWAII, INC.

4. CONTRACTOR'S C-67 LICENSE NUMBER C-16437

5. NAME OF DRILLER WHO PERFORMED WORK JOHN CARROLL

6. TYPE OF RIG/CONSTRUCTION FALLING 150 AIR ROTARY

7. DATE OF WELL DRILLING COMPLETION 10/22/94
(NOTE: Report must be submitted within 30 days after drilling)

8. GROUND ELEVATION (msl) +314.4 ft.
Top of Drilling Platform (msl) 316.4 ft.
Height of Drilling Platform above Ground surface 2 ft.
Bench Mark and Method Used to Determine Ground Elevation BWS SURVEY ft.

9. DRILLER'S LOG:

Depth (ft.)	Rock Description, Remarks, Data	Water Level (ft.)	Depth (ft.)	Rock Description, Remarks, Data	Water Level (ft.)
0 to 37	RED BROWN SOFT		319 to 346	BLUE GREY MED HARD	297'
37 to 86	BROWN GREY MED HARD		346 to 362	BLUE GREY HARD	297'
86 to 147	BROWN GREY MED HARD		362 to 391	BLUE GREY MED HARD	297'
147 to 165	BLUE GREY HARD		391 to 456	GREY BROWN MED HARD	297'
165 to 288	BLUE GREY VERY HARD				
288 to 319	BLUE GREY SOME RED	297'			

(If more space is needed, continue on back.)

10. TOTAL DEPTH OF WELL BELOW GROUND 456 ft.

11. HOLE SIZE: 22 inch dia. from 0 ft. to 356 ft. below ground
14 k inch dia. from 356 ft. to 456 ft. below ground

12. CASING INSTALLED:
15.25 in. I.D. x .375 in. wall solid section to 356 ft. below ground
NA in. I.D. x _____ in. wall perforated section to _____ ft. below ground
Type of Perforation NA

13. ANNULUS: Grouted from 0 ft. below ground to 356 ft. below ground
Gravel packed from NA ft. below ground to _____ ft. below ground

14. INITIAL WATER LEVEL 295.2 ft. below ground. Date and time of measurement 10/10/94

15. INITIAL CHLORIDE 38 ppm Date and time of sampling 10/10/94

16. INITIAL TEMPERATURE 70.5° °F Date and time of sampling 10/10/94

17. DATE OF PUMP INSTALLATION _____

18. PUMP INSTALLATION:
Pump Type, Make, Serial No. _____ Capacity _____ gpm
Motor type, H.P., Voltage, rpm _____
Depth of Pump Intake Setting _____ ft. below _____, which elevation is _____ ft.
Depth of bottom of airline _____ ft. below _____, which elevation is _____ ft.
Pumping Head is _____ ft.

19. PUMPING TESTS: Reference Point (R.P.) used: _____, which elevation is _____ ft.

Date	Start water level	End water level	Depth of well	Elapsed Time (hours)	Flow (gpm)	Draw-down (ft.)	Cl. (ppm)	Temp. (°F)
<u>10/10/94</u>	_____ ft. below R.P.	_____ ft. below R.P.	_____ ft. below R.P.	_____	_____	_____	_____	_____
<u>11/28/94</u>	_____ ft. below R.P.	_____ ft. below R.P.	_____ ft. below R.P.	_____	_____	_____	_____	_____

(If more space is needed, continue on back.)

Remarks: _____
(If more space is needed, continue on back.)

Contractor (print) ROSCOE MOSS HAWAII, INC. Title FIELD SUPERINTENDENT

Signature [Signature] Date 12/13/94

For Owner's Use: Job Name _____ Job No. _____	For Official Use: Longitude <u>158 00 13</u> Well No. <u>2400-12</u> Latitude <u>21 24 35</u>
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WAIAPAHU WELLS III NO. 2400-12
Well #5

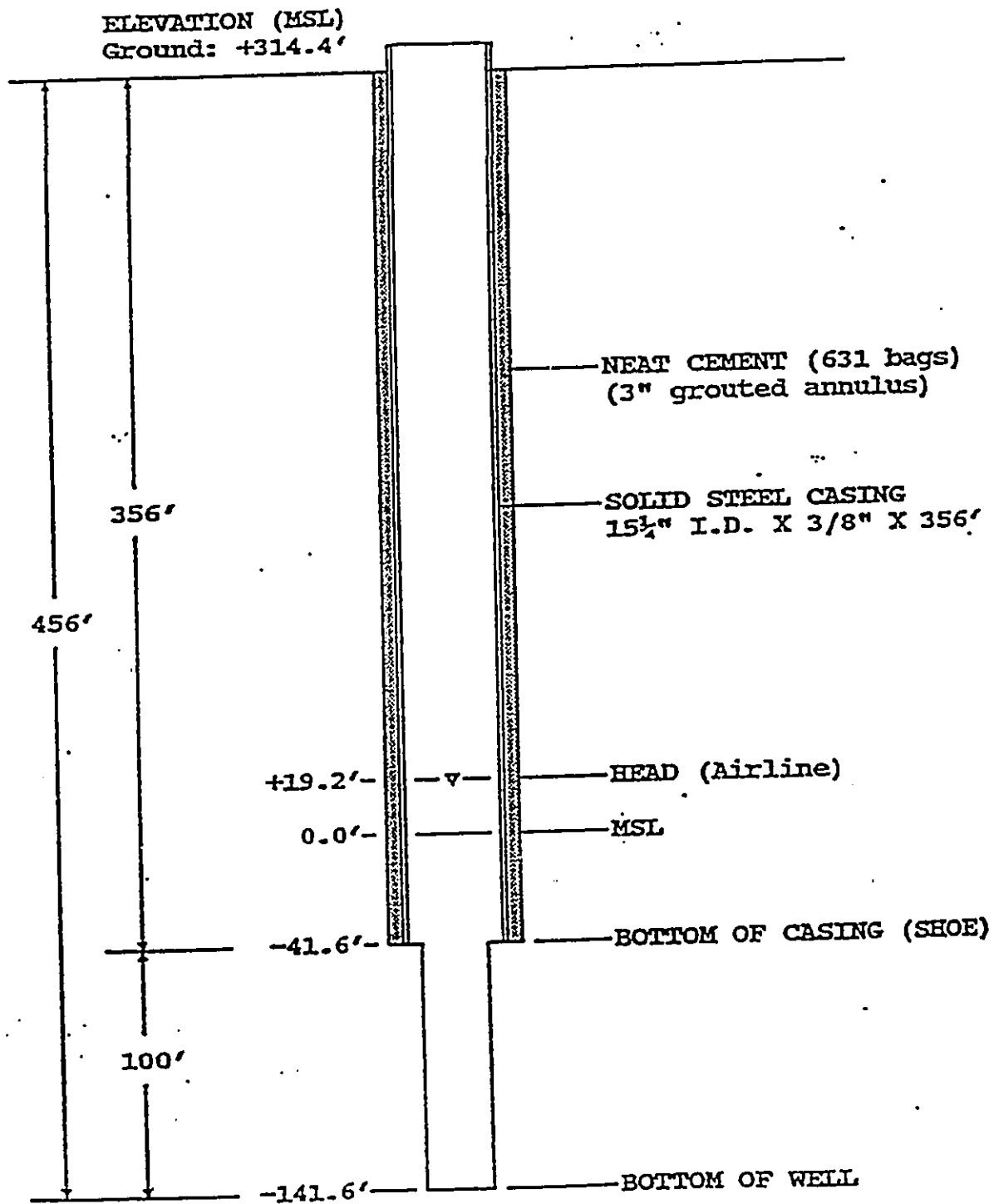
Plumbness Test: October 21, 1994
Ground Elevation: 314.4± ft. (msl)
Casing Length: 356.0 ft.
Casing Diameter: 15½ inches I.D.
Pulley Height: 20.00 ft.
Maximum allowable drift/any 100': 10.17"

<u>Depth</u> <u>(ft.)</u>	<u>Drift</u> <u>(inches)</u>	<u>Drift (inches per</u> <u>any 100 ft.)</u>
0		
20	.72	
40	1.75	
60	2.34	
80	2.71	
100	3.19	3.19
120	3.50	2.83
140	4.88	3.35
160	5.87	4.25
180	7.91	5.46
200	8.70	5.54
220	8.86	5.42
240	10.48	5.65
260	12.04	6.21
280	13.52	5.63
300	14.42	5.73
320	15.13	* 6.63
340	16.02	5.90
350	16.47	4.49 (per 90 ft.)

* A maximum drift of 6.63 inches per 100 feet of casing occurs between 220 feet and 320 feet.

WAIPIHU WELLS III NO. 2400-12 (WELL #5)
WAIPIO, OAHU, HAWAII
T.M.K.: 9-4-05:74

As-Built Section
Drilling Completed: October 22, 1994
Drilling Contractor: Roscoe Moss Hawaii, Inc.



October 1994

(not to scale)

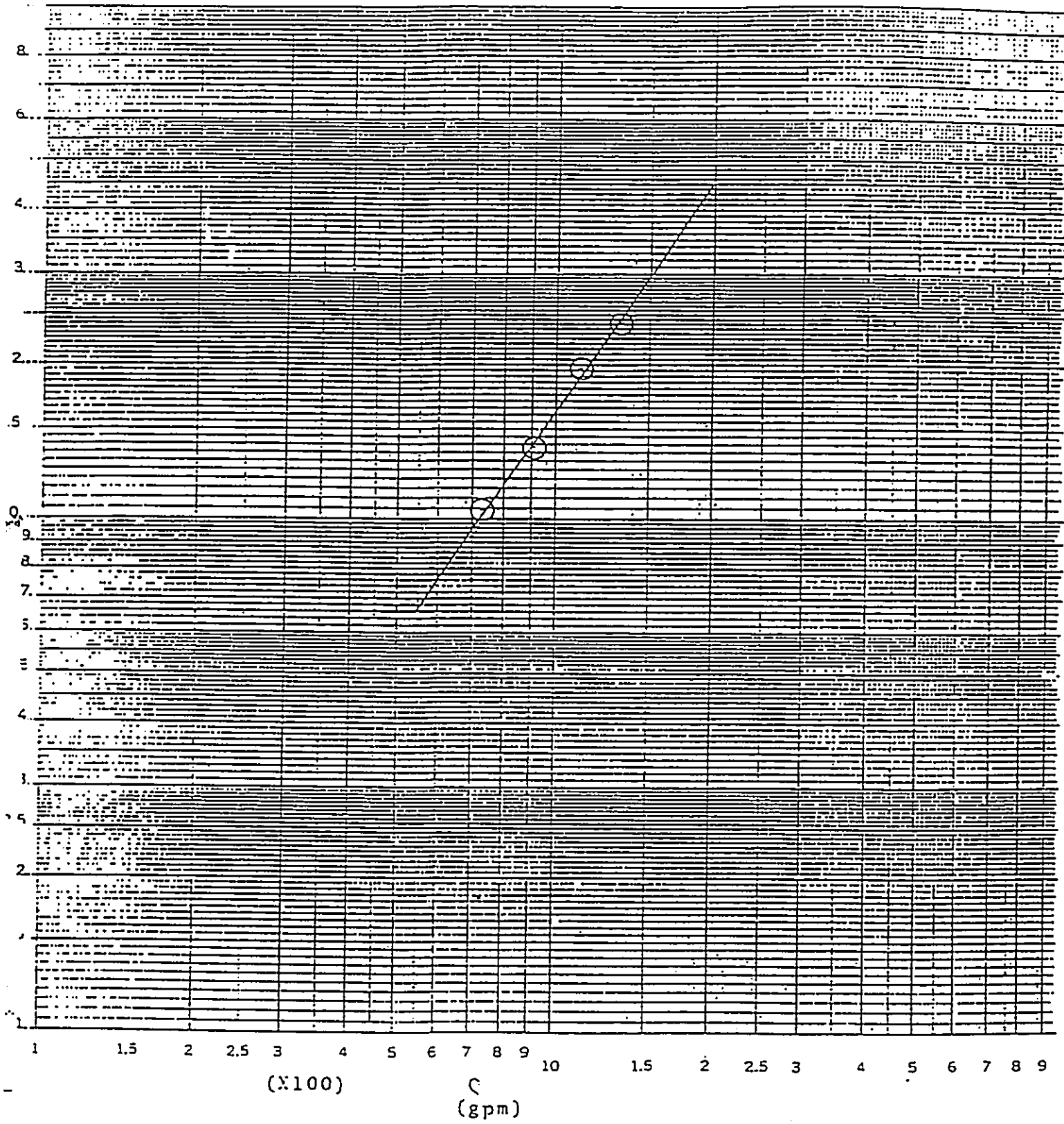
WAIPAHU WELLS III NO. 2400-12
WELL #5

Location : THK: 9-4-05:74
 Elevation at ground : +314.4 ft.
 Elevation at bottom of well: -141.6 ft.
 Elevation at end of casing : -41.6 ft.
 Diameter of casing : 15 $\frac{1}{4}$ in. I.D.
 Head : +19.2 ft.
 Airline Depth : 340 ft.
 Pump Depth (suction) : 352 ft.
 Drilling completed : October 22, 1994
 Drilling company : Roscoe Moss Hawaii, Inc.
 Date of Yield-Drawdown test: November 10, 1994

<u>Time</u>	<u>Q</u> (gpm)	<u>Drawdown</u> (ft.)	<u>Cl</u> (ppm)	<u>Temperature</u> (°F)	<u>Remarks</u>
0905	(19.40 psi, 44.81 ft.)				19.2' static
0928	same as above				head (airline)
0930					started pumping
0936	705	1.04	38	70.9	sample #1
0945	787	1.15		70.8	
1000	711	1.15		70.8	
1015	726	1.15		70.8	
1025	726	1.15	38	-	sample #2
1030					changed rate
1034	908	1.38		70.7	
1045	910	1.38		70.7	
1100	901	1.38		70.7	
1115	902	1.38		70.7	
1125	902	1.38	36		sample #3
1130					changed rate
1134		1.84			
1137	1095	1.96		70.7	
1145	1095	1.96		70.7	
1200	1105	1.96		70.7	
1215	1089	1.96		70.7	
1225	1109	1.96	36	70.6	sample #4
1230					changed rate
1236	1345	2.42		70.6	
1255	1333	2.42		70.7	
1315	1336	2.42		70.7	
1325	1333	2.42	36	70.7	sample #5
1330					stopped pumping
1331		.80			
1332		.00			

WAIPAHU WELLS - III NO. 2406-12

SPECIFIC CAPACITY



WAIPAHU WELLS III NO. 2400-12

WELL #5

LONG TERM PUMPING TEST: 11/28/94 to 12/01/94

Date Time	Q (gpm)	Drawdown (ft.)	Cl (ppm)	Temperature °F	Remarks
11/28/94 (Monday)					
0945					19.2' static head (airline)
1000					started pumping
1004	1027	1.38	38	70.8	sample #1
1009	1038				
1015	1038	1.84		70.7	
1030	1045	1.84		70.7	
1045	1045	1.84		70.7	
1100	1045	1.61		70.7	
1130	1038	1.61		70.6	
1200	1034	1.61		70.7	
1330	1022	1.61		70.7	
1500	1000				
1800	1000	1.50			
2100	1035	1.61			
2400	1043	1.73			
11/29/94 (Tuesday)					
0300	1043	1.73			
0600	1043	1.73			
0900	1034	1.64			
1000	1027	1.61	36	70.7	sample #2
1200	1000	1.68			average rate:
1500	1026	1.80			1036 gpm
1800	1034	1.73			
2100	1017	1.61			
2400	1026	1.64			
11/30/94 (Wednesday)					
0300	1026	1.84			
0600	1034	1.84			
0900	1053	1.73			
1000	1031	1.61	36	70.7	sample #3
1200	1034	1.66			average 2 day
1500	1026	1.73			rate: 1035 gpm
1800	1017	1.66			
2100	1026	1.59			
2400	1008	1.82			
12/01/94 (Thursday)					
0300	1000	1.80			
0600	1008	1.61			
0900	1017	1.80			
0945	1017	1.50			
1005	1017	1.61	36	70.7	sample #4
1010					stopped pumping
1011		.46			
1012		.00			
Total pumpage (72.17 hours): 4,452,000 gallons					
Average pumpage per day: 1,480,667 gallons					
Average pumpage rate: 1,028 gallons per minute					

APPENDIX D
WATER QUALITY DATA



MONTGOMERY LABORATORIES

555 East Walnut Street
Pasadena, California 91101
818 568 6400; FAX 818 568 6324;
1 800 566 LABS (1 800 566 5227)

1

Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstermacher

MONTGOMERY LABORATORIES
Submitted on
AUG 23 1994
HDS
Willay

Report#: 15038



MONTGOMERY LABORATORIES
 555 East Walnut Street
 Pasadena, California 91101
 818 568 6400; FAX 818 568 6324;
 1 800 566 LABS (1 800 566 5227)

Laboratory Report

Honolulu, City of
 Board of Water Supply Lab
 630 S Beretania St
 Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Sample # 940816017 Sample ID WAIPAHU III (940721008) Project _____
 Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 23-Aug-1994

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared By	Analyzed By
Turbidity	1/mg/l	100				0.001	18-Aug-1994 eya	22-Aug-1994 yjn



MONTGOMERY LABORATORIES

555 East Walnut Street
Pasadena, California 91101
818 568 6400; FAX 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 940816017 Sample ID WAIPAHU III (940721008) Project _____
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 23-aug-1994

**Single Determination Analytes
Quality Control**

Control	Parameter	Units	Actual	Found	XRecv
LCS1	Thallium, GF	mg/l	0.040	0.0466	117
LCS2	Thallium, GF	mg/l	0.040	0.0462	116
Blank	Thallium, GF	mg/l	ND	ND	
MS	Thallium, GF	mg/l	0.040	0.0463	116
HSD	Thallium, GF	mg/l	0.040	0.0450	112

[REDACTED]

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Report #: 15038



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Sample # 940721008 Sample ID WAIPARU_III Project _____
Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 17-Aug-1994

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Barium, Total, GF	mg/L	ND				0.001	02-aug-1994	gto	22-Jul-1994	jps
Cadmium, Total, GF	mg/L	ND				0.001	02-aug-1994	gto	02-aug-1994	gto
Chloride, Total, ICAP	mg/L	ND				0.12	22-Jul-1994	gto	22-Jul-1994	gto
Copper, Total, ICAP	mg/L	ND				0.01	01-aug-1994	gto	01-aug-1994	jps
Antimony, Total, GF	mg/L	ND				0.005	25-Jul-1994	col	09-aug-1994	col
2,3,7,8 - Dioxin	Picograms/L	ND				5.91	25-Jul-1994	col	09-aug-1994	col



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Laboratory Report

Honolulu, City of
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Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 940721008 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 17-aug-1994

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Beryllium, Total, ICAP	mg/l	0.05	0.0492	98
LCS2	Beryllium, Total, ICAP	mg/l	0.05	0.0504	101
MBLK	Beryllium, Total, ICAP	mg/l	ND	ND	
MS	Beryllium, Total, ICAP	mg/l	0.05	0.0496	99
HSD	Beryllium, Total, ICAP	mg/l	0.05	0.0491	98
LCS1	Cadmium, Total, GF	mg/l	0.0100	0.0102	102
LCS2	Cadmium, Total, GF	mg/l	0.0100	0.0099	99
MBLK	Cadmium, Total, GF	mg/l	ND	ND	
MS	Cadmium, Total, GF	mg/l	0.0100	0.0104	104
HSD	Cadmium, Total, GF	mg/l	0.0100	0.0098	98
LCS1	Mercury	ug/l	1.50	1.42	95
LCS2	Mercury	ug/l	1.50	1.49	99
MBLK	Mercury	ug/l	ND	ND	
MS	Mercury	ug/l	1.50	1.57	105
HSD	Mercury	ug/l	1.50	1.56	104
LCS1	Nickel, Total, ICAP	mg/l	0.5	0.495	99
LCS2	Nickel, Total, ICAP	mg/l	0.5	0.500	100
MBLK	Nickel, Total, ICAP	mg/l	ND	ND	
MS	Nickel, Total, ICAP	mg/l	0.5	0.486	97
HSD	Nickel, Total, ICAP	mg/l	0.5	0.486	97
LCS1	Antimony, Total, GF	mg/l	0.040	0.041	102
LCS2	Antimony, Total, GF	mg/l	0.040	0.042	105
MBLK	Antimony, Total, GF	mg/l	ND	ND	
MS	Antimony, Total, GF	mg/l	0.040	0.042	105
HSD	Antimony, Total, GF	mg/l	0.040	0.042	105

Report #: 14571

Report 14571 Comment Page

Group Validation Comments

Result for TCDD analysis is submitted by Pace, Inc.

Sample# 940721008
Source: WAIPAHU III

Validation Test Comments

Sample needs to be analyzed for Tl-low rather than TL-GF. M (TL-GF)
Martin will correct in database. Please rerun and re-enter w (TL-GF)
ith 1 ppb dl. (TL-GF)



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Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstemacher

MONTGOMERY LABORATORIES Submitted on AUG 19 1994 HDS <i>R. Eaton</i>

Report#: 14569



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Sample # 240721006 Sample ID HAIPAHU III Project _____
 Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 02-aug-1994

AB1803 - EDB and DBCP (ML/EPA 504)

Laboratory Report

Honolulu, City of
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Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Dibromochloropropane (DBCP)	ug/l	0.03				0.01	02-aug-1994	hth	02-aug-1994	hth
Ethylene Dibromide (EDB)						0.01	02-aug-1994	hth	02-aug-1994	hth
data entry		08/03/94				0	02-aug-1994	hth	02-aug-1994	hth



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ATTN: Ron Fenstermacher

Sample # 940721006 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

AB1803 - EDB and DBCP (ML/EPA 504)
Quality Control

Control	Parameter	Units	Actual	Found	XRecv
LCS1	Dibromochloropropane (DBCP)	ug/l	0.10	0.10	100
LCS1	Ethylene Dibromide (EDB)	ug/l	0.10	0.10	100
LCS2	Dibromochloropropane (DBCP)	ug/l	0.10	0.10	100
LCS2	Ethylene Dibromide (EDB)	ug/l	0.10	0.10	100
MBLK	Dibromochloropropane (DBCP)	ug/l	ND	NA	
MBLK	Ethylene Dibromide (EDB)	ug/l	ND	NA	
MS	Dibromochloropropane (DBCP)	ug/l	0.10	NA	
MS	Ethylene Dibromide (EDB)	ug/l	0.10	NA	

Report #: 14569



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sample # 940721006 Sample ID WAIERAW_111 Project
sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

Laboratory Report

Honolulu, City of
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Honolulu, HI 96843
ATTN: Ron Fenstermacher

525 Semivolatiles by GC/MS (ML/EPA 525.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
alpha-chlorobenz	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Acenaphthylene	ug/l	ND				0.1	26-Jul-1994	LIJ	29-Jul-1994 CRM
Alachlor	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Aldrin	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Anthracene	ug/l	ND				0.02	26-Jul-1994	LIJ	29-Jul-1994 CRM
Atrazine	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Benzo(a)anthracene	ug/l	ND				0.02	26-Jul-1994	LIJ	29-Jul-1994 CRM
Benzo(a)pyrene	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Benzo(b)fluoranthene	ug/l	ND				0.02	26-Jul-1994	LIJ	29-Jul-1994 CRM
Benzo(g,h,i)perylene	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Benzo(k)fluoranthene	ug/l	ND				0.02	26-Jul-1994	LIJ	29-Jul-1994 CRM
Di(2-ethylhexyl)phthalate	ug/l	ND				0.6	26-Jul-1994	LIJ	29-Jul-1994 CRM
Dibenz(a,h)anthracene	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Bromacil	ug/l	ND				2	26-Jul-1994	LIJ	29-Jul-1994 CRM
Chrysene	ug/l	ND				0.02	26-Jul-1994	LIJ	29-Jul-1994 CRM
Diethylhexyladipate	ug/l	ND				0.6	26-Jul-1994	LIJ	29-Jul-1994 CRM
Diethylphthalate	ug/l	ND				0.1	26-Jul-1994	LIJ	29-Jul-1994 CRM
Diazinon	ug/l	ND				0.1	26-Jul-1994	LIJ	29-Jul-1994 CRM
Dibenzofuran	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Dimethylphthalate	ug/l	ND				0.5	26-Jul-1994	LIJ	29-Jul-1994 CRM
Dibenzodioxin	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Di-n-Butylphthalate	ug/l	ND				0.5	26-Jul-1994	LIJ	29-Jul-1994 CRM
Endrin	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Fluorene	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Gamma-chlorobenz	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Hexachlorobenzene	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM
Hexachlorocyclopentadiene	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994 CRM



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Sample # 240721006 Sample ID WAIIPAHU-III Project
 Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1.)

LABORATORY REPORT

Honolulu, City of
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 ATTH: Ron Fenstermacher

Parameter	Units	Result	Conc.	Xrec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Heptachlor	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994	CFM
Heptachlor Epoxide	ug/l	ND				0.02	26-Jul-1994	LIJ	29-Jul-1994	CFM
Endosulfan Sulfate	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994	CFM
Isophorone	ug/l	ND				0.5	26-Jul-1994	LIJ	29-Jul-1994	CFM
Endrin	ug/l	ND				0.02	26-Jul-1994	LIJ	29-Jul-1994	CFM
Methoxychlor	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994	CFM
Heptachlor Epoxide	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994	CFM
Hollinate	ug/l	ND				0.2	26-Jul-1994	LIJ	29-Jul-1994	CFM
Endosulfan	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994	CFM
trans-Nonachlor	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994	CFM
Permethrin	ug/l	ND				0.1	26-Jul-1994	LIJ	29-Jul-1994	CFM
Phenanthrene	ug/l	ND				0.02	26-Jul-1994	LIJ	29-Jul-1994	CFM
Propachlor	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994	CFM
Pyrene	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994	CFM
Simazine	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994	CFM
Triphenylmethane	ug/l	ND				0.05	26-Jul-1994	LIJ	29-Jul-1994	CFM
Trifluralin	ug/l	ND				0.1	26-Jul-1994	LIJ	29-Jul-1994	CFM



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Laboratory Report

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Sample # 940721006 Sample ID WAIPAHU 111 Project _____
 Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

**525 Semivolatiles by GC/MS (ML/EPA 525.1)
 Surrogate Summary**

Parameter	Percent Recovery	Acceptable Range
Perylene-d12	94	70-130

Report #: 14569



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Sample # 940721006 Sample ID WAIPAHU III Project _____
 Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	alpha-Chlordane	ug/l	2	2.25	112
LCS1	Acenaphthylene	ug/l	2	2.12	106
LCS1	Alachlor	ug/l	2	2.07	103
LCS1	Aldrin	ug/l	2	1.95	98
LCS1	Anthracene	ug/l	2	2.08	104
LCS1	Atrazine	ug/l	2	2.17	108
LCS1	Benzo(a)Anthracene	ug/l	2	1.77	88
LCS1	Benzo(a)pyrene	ug/l	2	2.03	102
LCS1	Benzo(b)Fluoranthene	ug/l	2	2.12	106
LCS1	Benzo(g,h,i)Perylene	ug/l	2	2.02	101
LCS1	Benzo(k)Fluoranthene	ug/l	2	2.25	112
LCS1	Di(2-Ethylhexyl)phthalate	ug/l	2	2.36	118
LCS1	Dibutylphthalate	ug/l	2	1.97	98
LCS1	Chrysene	ug/l	2	1.98	99
LCS1	Dibenz(a,h)Anthracene	ug/l	2	2.01	100
LCS1	Di-(2-Ethylhexyl)adipate	ug/l	2	2.08	104
LCS1	Diethylphthalate	ug/l	2	2.27	113
LCS1	Dimethylphthalate	ug/l	2	2.34	117
LCS1	Dioctylphthalate	ug/l	2	2.32	116
LCS1	Endrin	ug/l	2	1.88	94
LCS1	Fluorene	ug/l	2	2.16	108
LCS1	gamma-Chlordane	ug/l	2	2.35	118
LCS1	Hexachlorobenzene	ug/l	2	1.96	97
LCS1	Hexachlorocyclopentadiene	ug/l	2	2.03	102
LCS1	Heptachlor	ug/l	2	2.05	102
LCS1	Heptachlor Epoxide	ug/l	2	2.31	116
LCS1	Indeno(1,2,3-cd)Pyrene	ug/l	2	1.95	97
LCS1	Lindane	ug/l	2	2.17	108
LCS1	Methoxychlor	ug/l	2	2.56	127
LCS1	Nolinate	ug/l	2	2.38	119
LCS1	trans-Nonachlor	ug/l	2	2.31	115

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Sample # 940721006 Sample ID WAIPAHU 111 Project _____
Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Pentachlorobenzene	ug/L	2	1.57	78
LCS1	Phenanthrene	ug/L	2	2.10	105
LCS1	Pyrene	ug/L	2	2.37	118
LCS1	Simazine	ug/L	2	1.78	89
LCS1	Thiobenzene	ug/L	2	2.37	118
MBLK	alpha-Chlordane	ug/L	ND	ND	
MBLK	Achrochlor	ug/L	ND	ND	
MBLK	Alachlor	ug/L	ND	ND	
MBLK	Aldrin	ug/L	ND	ND	
MBLK	Anthracene	ug/L	ND	ND	
MBLK	Atrazine	ug/L	ND	ND	
MBLK	Benz(a)Anthracene	ug/L	ND	ND	
MBLK	Benzo(b)Pyrene	ug/L	ND	ND	
MBLK	Benzo(b)Fluoranthene	ug/L	ND	ND	
MBLK	Benzo(g,h,i)Perylene	ug/L	ND	ND	
MBLK	Benzo(k)Fluoranthene	ug/L	ND	ND	
MBLK	Di(2-Ethylhexyl)phthalate	ug/L	ND	ND	
MBLK	Butylbenzylphthalate	ug/L	ND	ND	
MBLK	Bromacil	ug/L	ND	ND	
MBLK	Butachlor	ug/L	ND	ND	
MBLK	Chrysene	ug/L	ND	ND	
MBLK	Dibenz(a,h)Anthracene	ug/L	ND	ND	
MBLK	Di(2-Ethylhexyl)adipate	ug/L	ND	ND	
MBLK	Diethylphthalate	ug/L	ND	ND	
MBLK	Diazinon	ug/L	ND	ND	
MBLK	Dieldrin	ug/L	ND	ND	
MBLK	Dimethylphthalate	ug/L	ND	ND	
MBLK	Dimethoate	ug/L	ND	ND	
MBLK	Dibutylphthalate	ug/L	ND	ND	
MBLK	Endrin	ug/L	ND	ND	
MBLK	Fluorene	ug/L	ND	ND	

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Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

**525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control**

Control	Parameter	Units	Actual	Found	%Recv
MBLK	gamma-Chlordane	ug/l	ND	ND	
MBLK	Hexachlorobenzene	ug/l	ND	ND	
MBLK	Hexachlorocyclopentadiene	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Indeno(1,2,3,c,d)Pyrene	ug/l	ND	ND	
MBLK	Isophorone	ug/l	ND	ND	
MBLK	Lindane	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Metribuzin	ug/l	ND	ND	
MBLK	Nalirate	ug/l	ND	ND	
MBLK	Metolachlor	ug/l	ND	ND	
MBLK	trans-Nonachlor	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Phenanthrene	ug/l	ND	ND	
MBLK	Prometryn	ug/l	ND	ND	
MBLK	Propachlor	ug/l	ND	ND	
MBLK	Pyrene	ug/l	ND	ND	
MBLK	Siazine	ug/l	ND	ND	
MBLK	Thiobencarb	ug/l	ND	ND	
MBLK	Trialluridin	ug/l	ND	ND	
MS	alpha-Chlordane	ug/l	2	2.16	108
MS	Acenaphthylene	ug/l	2	2.08	104
MS	Alachlor	ug/l	2	2.32	116
MS	Aldrin	ug/l	3	1.91	64
MS	Anthracene	ug/l	2	1.92	96
MS	Atrazine	ug/l	2	2.08	104
MS	Benz(a)Anthracene	ug/l	2	1.61	80
MS	Benzo(a)pyrene	ug/l	2	1.71	86
MS	Benzo(b)Fluoranthene	ug/l	2	1.68	84
MS	Benzo(g,h,i)Perylene	ug/l	2	1.72	86

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Sample # 940721006 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

**525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control**

Control	Parameter	Units	Actual	Found	%Recv
MS	Benzo(b)fluoranthene	ug/l	2	1.95	98
MS	Di(2-Ethylhexyl)phthalate	ug/l	2	1.91	96
MS	Butylbenzylphthalate	ug/l	2	1.94	97
MS	Chrysene	ug/l	2	1.83	92
MS	Dibenz(a,h)Anthracene	ug/l	2	1.55	78
MS	Di-(2-Ethylhexyl)adipate	ug/l	2	1.95	98
MS	Diethylphthalate	ug/l	2	2.37	118
MS	Dimethylphthalate	ug/l	2	2.24	112
MS	Di-n-Butylphthalate	ug/l	2	2.08	104
MS	Endrin	ug/l	2	2.09	104
MS	Fluorene	ug/l	2	2.18	109
MS	gamma-Chlordane	ug/l	2	2.16	108
MS	Hexachlorobenzene	ug/l	2	1.94	97
MS	Hexachlorocyclopentadiene	ug/l	2	1.41	70
MS	Heptachlor	ug/l	2	1.98	99
MS	Heptachlor Epoxide	ug/l	2	2.12	106
MS	Indeno(1,2,3-cd)Pyrene	ug/l	2	1.50	75
MS	Lindane	ug/l	2	2.05	102
MS	Methoxychlor	ug/l	2	2.05	102
MS	Mollinate	ug/l	2	2.34	117
MS	trans-Nonachlor	ug/l	2	2.20	110
MS	Pentachlorophenol	ug/l	8	10.0	125
MS	Phenanthrene	ug/l	2	2.05	102
MS	Pyrene	ug/l	2	2.09	104
MS	Simazine	ug/l	2	1.57	78
MS	Thiobencarb	ug/l	2	2.16	108

Report #: 14569



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Sample # 240721006 Sample ID VAIPAHU 111 Project _____
 Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

SDWA Pesticides (ML/EPA 508)

LABORATORY REPORT

Honolulu, City of
 Board of Water Supply Lab
 630 S Beretania St

Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
PCB 1016 (Arochlor)	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994 kah
PCB 1221 (Arochlor)	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994 kah
PCB 1232 (Arochlor)	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994 kah
PCB 1242 (Arochlor)	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994 kah
PCB 1246 (Arochlor)	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994 kah
PCB 1254 (Arochlor)	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994 kah
PCB 1260 (Arochlor)	ug/l	ND				0.1	23-Jul-1994	kah	04-aug-1994 kah
Alpha-BHC	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994 kah
Gamma-BHC	ug/l	ND				0.05	23-Jul-1994	kah	04-aug-1994 kah
Delta-BHC	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994 kah
Chlordane	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994 kah
Endosulfan I (alpha)	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994 kah
Endosulfan II (beta)	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994 kah
Endosulfan sulfate	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994 kah
Heptachlor	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994 kah
Heptachlor Epoxide	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994 kah
Lindane (gamma-BHC)	ug/l	ND				0.01	23-Jul-1994	kah	04-aug-1994 kah
Methoxychlor	ug/l	ND				0.05	23-Jul-1994	kah	04-aug-1994 kah
Toxaphene	ug/l	ND				0.5	23-Jul-1994	kah	04-aug-1994 kah
Data Entry		08/05/94							



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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 940721006 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

SDWA Pesticides Surrogate Summary (ML/FPA 508)

Parameter	Percent Recovery	Acceptable Range
Dibromochloropentane	108	70 - 130
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]

Report #: 14569



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Laboratory Report

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Sample # 940721006 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recy
LCS1	Aldrin	ug/l	0.05	0.03	60
LCS1	p,p' DDT	ug/l	0.10	0.08	80
LCS1	Dieldrin	ug/l	0.10	0.09	90
LCS1	Endrin	ug/l	0.10	0.08	80
LCS1	Gamma-BHC (Lindane)	ug/l	0.05	0.04	80
LCS1	Heptachlor	ug/l	0.05	0.04	80
LCS2	Aldrin	ug/l	0.05	0.03	60
LCS2	p,p' DDT	ug/l	0.10	0.08	80
LCS2	Dieldrin	ug/l	0.10	0.09	90
LCS2	Endrin	ug/l	0.10	0.09	90
LCS2	Gamma-BHC (Lindane)	ug/l	0.05	0.04	80
LCS2	Heptachlor	ug/l	0.05	0.04	80
HBLK	PCB 1016 Arochlor	ug/l	ND	ND	
HBLK	PCB 1221 Arochlor	ug/l	ND	ND	
HBLK	PCB 1238 Arochlor	ug/l	ND	ND	
HBLK	PCB 1242 Arochlor	ug/l	ND	ND	
HBLK	PCB 1248 Arochlor	ug/l	ND	ND	
HBLK	PCB 1254 Arochlor	ug/l	ND	ND	
HBLK	PCB 1260 Arochlor	ug/l	ND	ND	
HBLK	Alpha-BHC	ug/l	ND	ND	
HBLK	Alachlor (Alarox)	ug/l	ND	ND	
HBLK	Aldrin	ug/l	ND	ND	
HBLK	Chlordane	ug/l	ND	ND	
HBLK	Chlorthalonil (Drconil, Bravo)	ug/l	ND	ND	
HBLK	Gamma-BHC	ug/l	ND	ND	
HBLK	p,p' DDD	ug/l	ND	ND	
HBLK	p,p' DDE	ug/l	ND	ND	
HBLK	p,p' DDT	ug/l	ND	ND	
HBLK	Dieldrin	ug/l	ND	ND	
HBLK	Endrin Aldehyde	ug/l	ND	ND	
HBLK	Endrin	ug/l	ND	ND	

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Sample # 940721006 Sample ID WAIPAHU III Project _____
 Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

**SDWA Pesticides (ML/EPA 508)
 Quality Control**

Control	Parameter	Units	Actual	Found	XRecv
HBLK	Endosulfan I (alpha)	ug/l	ND	ND	
HBLK	Endosulfan II (beta)	ug/l	ND	ND	
HBLK	Endosulfan sulfate	ug/l	ND	ND	
HBLK	Gamma-BHC (Lindane)	ug/l	ND	ND	
HBLK	Heptachlor	ug/l	ND	ND	
HBLK	Heptachlor Epoxide	ug/l	ND	ND	
HBLK	Methoxychlor	ug/l	ND	ND	
HBLK	Toxaphene	ug/l	ND	ND	
NS	Aldrin	ug/l	0.05	NA	
NS	p,p' DDT	ug/l	0.10	NA	
NS	Dieldrin	ug/l	0.10	NA	
NS	Endrin	ug/l	0.10	NA	
NS	Gamma-BHC (Lindane)	ug/l	0.05	NA	
NS	Heptachlor	ug/l	0.05	NA	

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Sample # 240721006 Sample ID VAIPAHU 111 Project _____
Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

Regulated VOCs plus Lists 1&3 (ML/SPA 524.2)

Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
1,1,1-Trichloroethane	ug/l	ND				0.5			25-Jul-1994 col
1,1,1-Trichloroethane	ug/l	ND				0.5			25-Jul-1994 col
1,1,2-Trichloroethane	ug/l	ND				0.5			25-Jul-1994 col
1,1,2-Trichloroethane	ug/l	ND				0.5			25-Jul-1994 col
1,1,2-Trichloroethane	ug/l	ND				0.5			25-Jul-1994 col
1,1-Dichloroethylene	ug/l	ND				0.5			25-Jul-1994 col
1,1-Dichloroethylene	ug/l	ND				0.5			25-Jul-1994 col
1,2,3-Trichlorobenzene	ug/l	ND				0.5			25-Jul-1994 col
1,2,3-Trichlorobenzene	ug/l	ND				0.5			25-Jul-1994 col
1,2,4-Trichlorobenzene	ug/l	ND				0.5			25-Jul-1994 col
1,2,4-Trichlorobenzene	ug/l	ND				0.5			25-Jul-1994 col
1,2,4-Trichlorobenzene	ug/l	ND				0.5			25-Jul-1994 col
1,2-Dichloroethane	ug/l	ND				0.5			25-Jul-1994 col
1,2-Dichloroethane	ug/l	ND				0.5			25-Jul-1994 col
1,3,5-Trimethylbenzene	ug/l	ND				0.5			25-Jul-1994 col
1,3,5-Trimethylbenzene	ug/l	ND				0.5			25-Jul-1994 col
p-Dichlorobenzene (1,4-DCB)	ug/l	ND				0.5			25-Jul-1994 col
p-Dichlorobenzene (1,4-DCB)	ug/l	ND				0.5			25-Jul-1994 col
2-Butanone (MEK)	ug/l	ND				5			25-Jul-1994 col
2-Butanone (MEK)	ug/l	ND				5			25-Jul-1994 col
o-Chlorotoluene	ug/l	ND				0.5			25-Jul-1994 col
o-Chlorotoluene	ug/l	ND				0.5			25-Jul-1994 col
4-Methyl-2-Pentanone (MIBK)	ug/l	ND				5			25-Jul-1994 col
4-Methyl-2-Pentanone (MIBK)	ug/l	ND				5			25-Jul-1994 col
Bromobenzene	ug/l	ND				0.5			25-Jul-1994 col
Bromobenzene	ug/l	ND				0.5			25-Jul-1994 col
cis-1,2-Dichloroethylene	ug/l	ND				0.5			25-Jul-1994 col
cis-1,2-Dichloroethylene	ug/l	ND				0.5			25-Jul-1994 col
Carbon Tetrachloride	ug/l	ND				0.5			25-Jul-1994 col
Carbon Tetrachloride	ug/l	ND				0.5			25-Jul-1994 col



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Sample # 940721006 Sample ID WAIPEARU 111 Project _____
Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed
Chloroform (Trichloromethane)	ug/l	ND			0.15	0.5			25-Jul-1994 col
Chloroethane	ug/l	ND			0.15	0.5			25-Jul-1994 col
Chlorodibromomethane	ug/l	ND			0.15	0.5			25-Jul-1994 col
Chlorodibromomethane	ug/l	ND			0.15	0.5			25-Jul-1994 col
Bromodichloromethane	ug/l	ND			0.15	0.5			25-Jul-1994 col
Dibromomethane	ug/l	ND			0.15	0.5			25-Jul-1994 col
Ethyl benzene	ug/l	ND			0.15	0.5			25-Jul-1994 col
Fluorotrichloromethane (Freon11)	ug/l	ND			0.15	0.5			25-Jul-1994 col
Hexachlorocyclopentadiene	ug/l	ND			0.15	0.5			25-Jul-1994 col
Isopropylbenzene	ug/l	ND			0.15	0.5			25-Jul-1994 col
m-Dichlorobenzene (1,3-DCB)	ug/l	ND			0.15	0.5			25-Jul-1994 col
m,p-Xylenes	ug/l	ND			0.15	0.5			25-Jul-1994 col
Hexachlorocyclopentadiene	ug/l	ND			0.15	0.5			25-Jul-1994 col
n-Butylbenzene	ug/l	ND			0.15	0.5			25-Jul-1994 col
o-Dichlorobenzene	ug/l	ND			0.15	0.5			25-Jul-1994 col
o-Xylene	ug/l	ND			0.15	0.5			25-Jul-1994 col
o-Dichlorobenzene (1,2-DCB)	ug/l	ND			0.15	0.5			25-Jul-1994 col
Tetrachloroethylene (PCE)	ug/l	ND			0.15	0.5			25-Jul-1994 col
sec-Butylbenzene	ug/l	ND			0.15	0.5			25-Jul-1994 col
Styrene	ug/l	ND			0.15	0.5			25-Jul-1994 col
trans-1,2-Dichloroethylene	ug/l	ND			0.15	0.5			25-Jul-1994 col
tert-Butylbenzene	ug/l	ND			0.15	0.5			25-Jul-1994 col
Trichloroethylene (TCE)	ug/l	ND			0.15	0.5			25-Jul-1994 col
Trichloroethylene (1,1,1-trichloroethane)	ug/l	ND			0.15	0.5			25-Jul-1994 col



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Sample # 240721006 Sample ID WAIIPAHU III Project _____
 Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-aug-1994

Laboratory Report

Honolulu, City of
 Board of Water Supply Lab
 630 S Beretania St

Honolulu, HI 96843
 ATTN: Ron Fenstemacher

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed
Trichloroethylene	ug/l	ID			0.15	0.15			25-Jul-1994 col
Toluene	ug/l	ID			0.5	0.5			25-Jul-1994 col
Vinyl Chloride (VC)	ug/l	ID			0.15	0.15			25-Jul-1994 col



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Sample # 940721006 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
1,1-Dichloroethane-d2	91	80 - 120
1,2-Dichloroethane-d4	101	80 - 120
1,4-Dibromobenzene	101	80 - 120

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Laboratory Report

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Sample # 940721006 Sample ID WAIPAHU 111 Project _____
Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	1,1-Dichloroethylene	ug/l	4	3.95	98
LCS1	1,2,4-Trichlorobenzene	ug/l	4	4.56	114
LCS1	p-Dichlorobenzene (1,4-DCB)	ug/l	4	3.92	97
LCS1	p-Chlorotoluene	ug/l	4	4.68	117
LCS1	Benzene	ug/l	4	4.55	109
LCS1	Chlorobenzene	ug/l	4	4.76	119
LCS1	Chloroform (Trichloromethane)	ug/l	4	3.99	100
LCS1	Trichloroethylene (TCE)	ug/l	4	4.61	115
LCS1	Toluene	ug/l	4	4.55	114
LCS2	1,1-Dichloroethylene	ug/l	4	3.31	83
LCS2	1,2,4-Trichlorobenzene	ug/l	4	3.93	98
LCS2	p-Dichlorobenzene (1,4-DCB)	ug/l	4	3.91	98
LCS2	p-Chlorotoluene	ug/l	4	4.19	105
LCS2	Benzene	ug/l	4	3.99	100
LCS2	Chlorobenzene	ug/l	4	4.03	101
LCS2	Chloroform (Trichloromethane)	ug/l	4	3.55	89
LCS2	Trichloroethylene (TCE)	ug/l	4	3.80	95
LCS2	Toluene	ug/l	4	3.84	96
MBLK	1,1,1,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,1-Trichloroethane	ug/l	ND	ND	
MBLK	1,1,2,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,2-Trichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethylene	ug/l	ND	ND	
MBLK	1,1-Dichloropropane	ug/l	ND	ND	
MBLK	1,2,3-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,3-Trichloropropane	ug/l	ND	ND	
MBLK	1,2,4-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,4-Tetramethylbenzene	ug/l	ND	ND	
MBLK	1,2-Dichloroethane	ug/l	ND	ND	
MBLK	1,2-Dichloropropane	ug/l	ND	ND	

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Laboratory Report

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Sample # 940721006 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	1,2,4-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,3-Dichloropropane	ug/l	ND	ND	
MBLK	p-Dichlorobenzene (1,4-DCB)	ug/l	ND	ND	
MBLK	2,2-Dichloropropane	ug/l	ND	ND	
MBLK	2-Butanone (MEQ)	ug/l	ND	ND	
MBLK	2-Chloroethylvinylether	ug/l	ND	ND	
MBLK	o-Chlorotoluene	ug/l	ND	ND	
MBLK	p-Chlorotoluene	ug/l	ND	ND	
MBLK	4-Methyl-2-Pentanone (MIBK)	ug/l	ND	ND	
MBLK	Benzene	ug/l	ND	ND	
MBLK	Bromobenzene	ug/l	ND	ND	
MBLK	Bromomethane (Methyl Bromide)	ug/l	ND	ND	
MBLK	cis-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	Chlorobenzene	ug/l	ND	ND	
MBLK	Carbon Tetrachloride	ug/l	ND	ND	
MBLK	cis-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Bromoforn	ug/l	ND	ND	
MBLK	Chloroform (Trichloromethane)	ug/l	ND	ND	
MBLK	Bromochloromethane	ug/l	ND	ND	
MBLK	Chloroethane	ug/l	ND	ND	
MBLK	Chloromethane (Methyl Chloride)	ug/l	ND	ND	
MBLK	Chlorodibromomethane	ug/l	ND	ND	
MBLK	Dibromomethane	ug/l	ND	ND	
MBLK	Bromodichloromethane	ug/l	ND	ND	
MBLK	Dichloroethane	ug/l	ND	ND	
MBLK	Ethyl benzene	ug/l	ND	ND	
MBLK	Dichlorodifluoromethane	ug/l	ND	ND	
MBLK	Fluorotrchloromethane (Freon1)	ug/l	ND	ND	
MBLK	Hexachlorobutadiene	ug/l	ND	ND	
MBLK	Isopropylbenzene	ug/l	ND	ND	
MBLK	m-Dichlorobenzene (1,3-DCB)	ug/l	ND	ND	

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Laboratory Report

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Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Sample # 940721006 Sample ID WAIAPAHU III Project _____
 Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 09-Aug-1994

**Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
 Quality Control**

Control	Parameter	Units	Actual	Found	%Recv
MBLK	m,p-Xylenes	ug/l	ND	ND	
MBLK	Naphthalene	ug/l	ND	ND	
MBLK	n-Butylbenzene	ug/l	ND	ND	
MBLK	n-Propylbenzene	ug/l	ND	ND	
MBLK	o-Xylene	ug/l	ND	ND	
MBLK	o-Dichlorobenzene (1,2-DCB)	ug/l	ND	ND	
MBLK	Tetrachloroethylene (PCE)	ug/l	ND	ND	
MBLK	p-Isopropyltoluene	ug/l	ND	ND	
MBLK	sec-Butylbenzene	ug/l	ND	ND	
MBLK	Styrene	ug/l	ND	ND	
MBLK	trans-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	tert-Butylbenzene	ug/l	ND	ND	
MBLK	Trichloroethylene (TCE)	ug/l	ND	ND	
MBLK	Trichlorotrifluoroethane (Freon)	ug/l	ND	ND	
MBLK	trans-1,5-Dichloropropene	ug/l	ND	ND	
MBLK	Toluene	ug/l	ND	ND	
MBLK	Vinyl Chloride (Vc)	ug/l	ND	ND	
HS	1,1-Dichloroethylene	ug/l	4	NA	
HS	1,2,4-Trichlorobenzene	ug/l	4	NA	
HS	p-Dichlorobenzene (1,4-DCB)	ug/l	4	NA	
HS	p-Chlorotoluene	ug/l	4	NA	
HS	Benzene	ug/l	4	NA	
HS	Chlorobenzene	ug/l	4	NA	
HS	Chloroform (Trichloromethane)	ug/l	4	NA	
HS	Trichloroethylene (TCE)	ug/l	4	NA	
HS	Toluene	ug/l	4	NA	
HSD	1,1-Dichloroethylene	ug/l	4	NA	
HSD	1,2,4-Trichlorobenzene	ug/l	4	NA	
HSD	p-Dichlorobenzene (p-DCB)	ug/l	4	NA	
HSD	p-Chlorotoluene	ug/l	4	NA	
HSD	Benzene	ug/l	4	NA	

Report #: 14569



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Laboratory Report

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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstermacher

Sample # 940721006 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 09-aug-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
HSD	Chlorobenzene	ug/l	4	NA	
HSD	Chloroform (Trichloromethane)	ug/l	4	NA	
HSD	Trichloroethylene (TCE)	ug/l	4	NA	
HSD	Toluene	ug/l	4	NA	

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role# 940721006
Location: WAIPAHU III

Data Entry Comments

The spike recoveries of bromoform and 1,2,4-Trichlorobenzene (@VOASDWA)
are above the control limit of 120%(at 122%)in the LCS (@VOASDWA)
analyzed on 7/25/94. No significant impact on sample data. (@VOASDWA)
Reference QIR-MS-94-032. (@VOASDWA)



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Attention: Ron Fenstermacher

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Submitted on

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Report#: 14570



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Sample # 940721007 Sample ID WAIPAHU III Project
Sample Type Water Sampled 21-Jul-1994 Received 21-Jul-1994 Reported 04-Aug-1994

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ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	Xrec	Dilution	Det.Limit	Prepared	BY	Analyzed	By
Endothal	CHL/EPA/510	ND					26-Jul-1994	U	03-Aug-1994	cpm
Glyphosate	CHL/EPA 547	ND			6		28-Jul-1994			dil



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Sample # 240721007 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 21-Jul-1994 Received 21-Jul-1994 Reported 04-Aug-1994

Diquat and Paraquat (EPA 549)

LABORATORY REPORT

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ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
Diquat	ug/l	ND				0.5	24-Jul-1994	LL	26-Jul-1994 dlj
Paraquat	ug/l	ND				2.	24-Jul-1994	LL	26-Jul-1994 dlj



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ATTN: Ron Fenstermacher

Sample # 940721007 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 21-jul-1994 Received 21-jul-1994 Reported 04-aug-1994

Diquat and Paraquat (EPA 549)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Diquat	ug/l	5.0	4.56	91
LCS1	Paraquat	ug/l	10.0	8.37	84
LCS2	Diquat	ug/l	5.0	NA	
LCS2	Paraquat	ug/l	10.0	NA	
HBLK	Diquat	ug/l	ND	ND	
HBLK	Paraquat	ug/l	ND	ND	
HS	Diquat	ug/l	5.0	4.55	91
HS	Paraquat	ug/l	10.0	7.14	71
HSD	Diquat	ug/l	5.0	NA	
HSD	Paraquat	ug/l	10.0	NA	

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Sample # 940721007 Sample ID WAIIPAHU III Project _____
 Sample Type Water Sampled 21-Jul-1994 Received 21-Jul-1994 Reported 04-Aug-1994

Aldicarb

(ML/EPA 531.1)

Laboratory Report

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Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Oxamyl (Vydate)	ug/l	ND			2	2			26-Jul-1994	dfl
Aldicarb (Temik)	ug/l	ND			0.5	0.5			26-Jul-1994	dfl
Aldicarb sulfone	ug/l	ND			0.18	0.18			26-Jul-1994	dfl
Aldicarb sulfoxide	ug/l	ND			0.5	0.5			26-Jul-1994	dfl
Baygon	ug/l	ND			2	2			26-Jul-1994	dfl
Carbofuran (Furadan)	ug/l	ND			0.9	0.9			26-Jul-1994	dfl
Carbaryl	ug/l	ND			2	2			26-Jul-1994	dfl
Methiocarb	ug/l	ND			2	2			26-Jul-1994	dfl
Methomyl	ug/l	ND			2	2			26-Jul-1994	dfl
Oxamyl (Vydate)	ug/l	ND			2	2			26-Jul-1994	dfl



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Sample # 940721007 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 21-jul-1994 Received 21-jul-1994 Reported 04-aug-1994

Aldicarb (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	3-Hydroxycarbofuran	ug/l	20.0	21.6	108
LCS1	Aldicarb (Temik)	ug/l	20.0	20.3	102
LCS1	Aldicarb sulfone	ug/l	20.0	22.8	114
LCS1	Aldicarb sulfoxide	ug/l	20.0	23.9	120
LCS1	Baygon	ug/l	20.0	20.6	103
LCS1	Carbofuran (Furadan)	ug/l	20.0	20.4	102
LCS1	Carbaryl	ug/l	20.0	22.6	113
LCS1	Methiocarb	ug/l	20.0	22.7	114
LCS1	Methomyl	ug/l	20.0	20.2	101
LCS1	Oxamyl (Vydate)	ug/l	20.0	21.1	106
LCS2	3-Hydroxycarbofuran	ug/l	20.0	21.9	110
LCS2	Aldicarb (Temik)	ug/l	20.0	19.2	96
LCS2	Aldicarb sulfone	ug/l	20.0	22.8	114
LCS2	Aldicarb sulfoxide	ug/l	20.0	25.2	126
LCS2	Baygon	ug/l	20.0	20.9	105
LCS2	Carbofuran (Furadan)	ug/l	20.0	20.5	102
LCS2	Carbaryl	ug/l	20.0	22.7	114
LCS2	Methiocarb	ug/l	20.0	22.3	112
LCS2	Methomyl	ug/l	20.0	20.6	103
LCS2	Oxamyl (Vydate)	ug/l	20.0	22.0	110
MBLK	3-Hydroxycarbofuran	ug/l	ND	ND	
MBLK	Aldicarb (Temik)	ug/l	ND	ND	
MBLK	Aldicarb sulfone	ug/l	ND	ND	
MBLK	Aldicarb sulfoxide	ug/l	ND	ND	
MBLK	Baygon	ug/l	ND	ND	
MBLK	Carbofuran (Furadan)	ug/l	ND	ND	
MBLK	Carbaryl	ug/l	ND	ND	
MBLK	Methiocarb	ug/l	ND	ND	
MBLK	Methomyl	ug/l	ND	ND	
MBLK	Oxamyl (Vydate)	ug/l	ND	ND	
CS	3-Hydroxycarbofuran	ug/l	20	21.1	106

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Sample # 940721007 Sample ID WAIPAHA III Project _____
Sample Type Water Sampled 21-Jul-1994 Received 21-Jul-1994 Reported 04-Aug-1994

Aldicarb Quality Control (ML/EPA 531.1)

Control	Parameter	Units	Actual	Found	XRecv
MS	Aldicarb (Seal)	ug/l	20	21.5	106
MS	Aldicarb sulfone	ug/l	20	20.7	104
MS	Aldicarb sulfoxide	ug/l	20	23.0	125
MS	Baygon	ug/l	20	20.7	104
MS	Carbofuran (Furadan)	ug/l	20	20.6	102
MS	Carbaryl	ug/l	20	22.4	112
MS	Methiocarb	ug/l	20	23.6	118
MS	Methomyl	ug/l	20	20.2	101
MS	Oxamyl (Vydate)	ug/l	20	21.2	106
HSD	3-Hydroxycarbofuran	ug/l	20	21.0	105
HSD	Aldicarb (Amik)	ug/l	20	21.8	106
HSD	Aldicarb sulfone	ug/l	20	20.8	104
HSD	Aldicarb sulfoxide	ug/l	20	26.0	130
HSD	Baygon	ug/l	20	20.7	104
HSD	Carbofuran (Furadan)	ug/l	20	20.4	102
HSD	Carbaryl	ug/l	20	22.6	113
HSD	Methiocarb	ug/l	20	24.6	122
HSD	Methomyl	ug/l	20	20.3	102
HSD	Oxamyl (Vydate)	ug/l	20	23.8	119

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Sample Type Water Sampled 21-Jul-1994 Received 21-Jul-1994 Reported 04-Aug-1994

Laboratory Report

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ATTN: Ron Fenstermacher

Chlorinated Acids in Water (ML/EPA 515.1)

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed
2,4,5-T	ug/l	ND				0.2	22-Jul-1994	wpt	26-Jul-1994
2,4,5-TP (Silvex)	ug/l	ND				0.2	22-Jul-1994	wpt	26-Jul-1994
2,4,6-T	ug/l	ND				0.1	22-Jul-1994	wpt	26-Jul-1994
2,4-DB	ug/l	ND				2	22-Jul-1994	wpt	26-Jul-1994
Dibutylphos	ug/l	ND				0.5	22-Jul-1994	wpt	26-Jul-1994
5-Hydroxydicamba	ug/l	ND				0.2	22-Jul-1994	wpt	26-Jul-1994
Acetochloric acid (qualitative)	ug/l	ND				0.2	22-Jul-1994	wpt	26-Jul-1994
Bentazon	ug/l	ND				0.5	22-Jul-1994	wpt	26-Jul-1994
Chloramben (qualitative)	ug/l	ND				0.5	22-Jul-1994	wpt	26-Jul-1994
Delapone (qualitative)	ug/l	ND				1	22-Jul-1994	wpt	26-Jul-1994
2,5-Dichlorobenzic acid	ug/l	ND				0.6	22-Jul-1994	wpt	26-Jul-1994
DCPA	ug/l	ND				0.2	22-Jul-1994	wpt	26-Jul-1994
Dicamba	ug/l	ND				0.2	22-Jul-1994	wpt	26-Jul-1994
Dinoseb	ug/l	ND				0.2	22-Jul-1994	wpt	26-Jul-1994
Pentachlorophenol	ug/l	0.07				0.04	22-Jul-1994	wpt	26-Jul-1994
Picloram	ug/l	ND				0.1	22-Jul-1994	wpt	26-Jul-1994
2,4,6-Trichlorobenzoic acid (qualitative)	ug/l	ND				0.1	22-Jul-1994	wpt	26-Jul-1994
Data Entry	--	07/28/94				0	22-Jul-1994	wpt	26-Jul-1994



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Sample # 940721007 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 21-Jul-1994 Received 21-Jul-1994 Reported 04-Aug-1994

**Chlorinated Acids in Water (ML/EPA 515.1)
Surrogate Summary**

Parameter	Percent Recovery	Acceptable Range
2,4-Dichlorophenylacetic acid	89	70-130

Report #: 14570



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Sample # 940721007 Sample ID WAIPAHU III Project _____
 Sample Type Water Sampled 21-jul-1994 Received 21-jul-1994 Reported 04-aug-1994

**Chlorinated Acids in Water (ML/EPA 515.1)
 Quality Control**

Control	Parameter	Units	Actual	Found	%Recv
LCS1	2,4,5-TP (Silvex)	ug/l	0.500	0.62	124
LCS1	2,4-D	ug/l	1.00	0.98	98
LCS1	Bentazon	ug/l	1.00	1.01	101
LCS2	2,4,5-TP (Silvex)	ug/l	0.500	NA	
LCS2	2,4-D	ug/l	1.00	NA	
LCS2	Bentazon	ug/l	1.00	NA	
MBLK	2,4,5-TP	ug/l	ND	ND	
MBLK	2,4,5-TP (Silvex)	ug/l	ND	ND	
MBLK	2,4-D	ug/l	ND	ND	
MBLK	2,4-DB	ug/l	ND	ND	
MBLK	Dichloroprop	ug/l	ND	ND	
MBLK	5-Hydroxydicamba	ug/l	ND	ND	
MBLK	Acifluorfen (qualitative)	ug/l	ND	ND	
MBLK	Bentazon	ug/l	ND	ND	
MBLK	Chloramben (qualitative)	ug/l	ND	ND	
MBLK	Dalapon (qualitative)	ug/l	ND	ND	
MBLK	3,5-Dichlorobenzic acid	ug/l	ND	ND	
MBLK	DCPA	ug/l	ND	ND	
MBLK	Dicamba	ug/l	ND	ND	
MBLK	Dinoseb	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Picloram	ug/l	ND	ND	
MBLK	4-Nitrophenol (qualitative)	ug/l	ND	ND	
MS	2,4,5-TP (Silvex)	ug/l	0.500	0.42	84
MS	2,4-D	ug/l	1.00	0.95	95
MS	Bentazon	ug/l	1.00	0.77	77
HSD	2,4,5-TP (Silvex)	ug/l	0.500	NA	
HSD	2,4-D	ug/l	1.00	NA	
HSD	Bentazon	ug/l	1.00	NA	

Report #: 14570



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Laboratory Report

for

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstermacher

MONTGOMERY LABORATORIES Submitted on AUG 11 2 1994 HDS <i>[Signature]</i>

Report#: 14572



MONTGOMERY LABORATORIES
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Sample # 940721009 Sample ID WAIPAHU III Project
 Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 02-Aug-1994

Laboratory Report

Honolulu, City of Board of Water Supply Lab 630 S Beretania St Honolulu , HI 96843 ATTN: Ron Fenstermacher
--

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Cyanide	mg/L	0.006				0.005			24-Jul-1994	mba



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ATTN: Ron Fenstermacher

Sample # 940721009 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-jul-1994 Received 21-jul-1994 Reported 02-aug-1994

Single Determination Analytes Quality Control

Control	Parameter	Units	Actual	Found	XRecv
LCS1	Cyanide	mg/l	0.05	0.0483	97
LCS2	Cyanide	mg/l	0.05	0.0565	113
MBLK	Cyanide	mg/l	ND	ND	
HS	Cyanide	mg/l	0.05	0.0531	106
MSD	Cyanide	mg/l	0.05	0.0486	97

Report #: 14572

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Sample # 940721009 Sample ID WAIPAHU III Project _____
Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 02-Aug-1994

GROSS Alpha and Beta Radiation (ML/EPA 900.0)

Laboratory Report

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ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Alpha, Gross	pCi/l	2.6			1:5	0.5			28-Jul-1994	gub
Alpha, Two Sigma Error	pCi/l	1.4				0			28-Jul-1994	gub
Beta, Gross	pCi/l	6.0			1:5	1.2			28-Jul-1994	gub
Beta, Two Sigma Error	pCi/l	1.0				0			28-Jul-1994	gub



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 ATTN: Ron Fenstermacher

Sample # 940721009 Sample ID WAIPAHU III Project _____
 Sample Type Water Sampled 20-Jul-1994 Received 21-Jul-1994 Reported 02-Aug-1994

**Gross Alpha and Beta Radiation (ML/EPA 900.0)
 Quality Control**

Control	Parameter	Units	Actual	Found	XRecv
LCS1	Alpha, Gross	pCi/l	9.2	10.0	109
LCS1	Beta, Gross	pCi/l	28.1	31.2	111
LCS2	Alpha, Gross	pCi/l	9.2	9.8	107
LCS2	Beta, Gross	pCi/l	28.1	29.8	106

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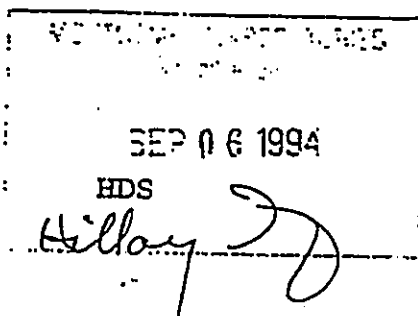
Laboratory Report

for

Honolulu, City of
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Honolulu, HI 96843

Attention: Ron Fenstermacher



Report#: 15299



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Sample # 940826082 Sample ID HAIPAHU 111 HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

AB1803 - EDB and DBCP (ML/EPA 504)

LABORATORY ADDRESS

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Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
Dibromochloropropane (DBCP)	ug/l	ND				0.01	29-aug-1994	hth	30-aug-1994
Ethylene Dibromide (EDB)	ug/l	0.03				0.01	29-aug-1994	hth	30-aug-1994
Date Entry		08/30/94				0	29-aug-1994	hth	30-aug-1994



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Sample # 940826082 Sample ID WAIPAHA III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

AB1803 - EDB and DBCP (ML/EPA 504)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Dibromochloropropane (DBCP)	ug/l	0.10	0.10	100
LCS1	Ethylene Dibromide (EDB)	ug/l	0.10	0.10	100
LCS2	Dibromochloropropane (DBCP)	ug/l	0.10	0.10	100
LCS2	Ethylene Dibromide (EDB)	ug/l	0.10	0.12	120
NBLK	Dibromochloropropane (DBCP)	ug/l	ND	ND	
NBLK	Ethylene Dibromide (EDB)	ug/l	ND	ND	
MS	Dibromochloropropane (DBCP)	ug/l	0.10	0.09	90
MS	Ethylene Dibromide (EDB)	ug/l	0.10	0.09	90

Report #: 15299



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Sample # 240826082 Sample ID HAIPAHU_III_HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Allyl Chloride	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Acenaphthylene	ug/l	ND				0.1	30-aug-1994	csk	01-sep-1994	crw
Alachlor	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Aldrin	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Anthracene	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Atrazine	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Benzo(a)Anthracene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Benzo(a)pyrene	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Benzo(b)Fluoranthene	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Benzo(g,h,i)Perylene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Benzo(k)Fluoranthene	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Di(2-Ethylhexyl)phthalate	ug/l	ND				0.6	30-aug-1994	csk	01-sep-1994	crw
Diethylbenzylphthalate	ug/l	ND				0.5	30-aug-1994	csk	01-sep-1994	crw
Bromocf1	ug/l	ND				2	30-aug-1994	csk	01-sep-1994	crw
Butachlor	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Chrysene	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crw
Dibenz(a,h)Anthracene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Di-(2-Ethylhexyl)adipate	ug/l	ND				0.6	30-aug-1994	csk	01-sep-1994	crw
Diethylphthalate	ug/l	ND				0.5	30-aug-1994	csk	01-sep-1994	crw
Diazinon	ug/l	ND				0.1	30-aug-1994	csk	01-sep-1994	crw
Dib(2NF)	ug/l	ND				0.2	30-aug-1994	csk	01-sep-1994	crw
Dimethylphthalate	ug/l	ND				0.5	30-aug-1994	csk	01-sep-1994	crw
Dimethoate	ug/l	ND				0.5	30-aug-1994	csk	01-sep-1994	crw
Di-n-Butylphthalate	ug/l	ND				0.5	30-aug-1994	csk	01-sep-1994	crw
Endrin	ug/l	ND				0.1	30-aug-1994	csk	01-sep-1994	crw
Fluorene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
GammaChlorodane	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Hexachlorobenzene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw
Hexachlorocyclopentadiene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crw

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MONTGOMERY LABORATORIES

555 East Walnut Street
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1 800 566 LABS (1 800 566 5227)

Sample # 240826082 Sample ID HAIPAHU III HOLE #2
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Project Reported 06-sep-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Heptachlor Epoxide	ug/l	ND				0.01	30-aug-1994	csk	01-sep-1994	crh
Endosulfan Sulfate	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crh
Isophorone	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crh
Indane	ug/l	ND				0.5	30-aug-1994	csk	01-sep-1994	crh
Methoxychlor	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crh
Heptachlor	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crh
Molinate	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crh
Heptachlor	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crh
trans-Nonachlor	ug/l	ND				0.2	30-aug-1994	csk	01-sep-1994	crh
Pentachlorophenol	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crh
Phenanthrene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crh
Propylthiuron	ug/l	ND				0.02	30-aug-1994	csk	01-sep-1994	crh
Propachlor	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crh
Symazine	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crh
Triphenylethylene	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crh
Trifluralin	ug/l	ND				0.05	30-aug-1994	csk	01-sep-1994	crh
						0.1	30-aug-1994	csk	01-sep-1994	crh



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Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
 Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Perylene-d12	88	70 - 130

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525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	alpha-Chlordane	ug/l	2	2.50	125
LCS1	Acenaphthylene	ug/l	2	1.93	96
LCS1	Alachlor	ug/l	2	2.41	120
LCS1	Aldrin	ug/l	2	2.13	106
LCS1	Anthracene	ug/l	2	1.75	88
LCS1	Atrazine	ug/l	2	2.28	114
LCS1	Benz(a)Anthracene	ug/l	2	1.81	90
LCS1	Benzo(a)pyrene	ug/l	2	1.76	88
LCS1	Benzo(b)fluoranthene	ug/l	2	1.89	94
LCS1	Benzo(g,h,i)Perylene	ug/l	2	1.98	99
LCS1	Benzo(k)fluoranthene	ug/l	2	2.03	102
LCS1	Di(2-Ethylhexyl)phthalate	ug/l	2	2.27	114
LCS1	Di(2-Propyl)phthalate	ug/l	2	1.90	95
LCS1	Chrysene	ug/l	2	1.84	92
LCS1	Di(2-Ethylhexyl)adipate	ug/l	2	1.92	96
LCS1	Diethylphthalate	ug/l	2	2.23	116
LCS1	Dimethylphthalate	ug/l	2	2.11	106
LCS1	Di-n-Butylphthalate	ug/l	2	2.07	103
LCS1	Endrin	ug/l	2	1.71	86
LCS1	Fluorene	ug/l	2	2.08	104
LCS1	gamma-Chlordane	ug/l	2	2.29	114
LCS1	Hexachlorobenzene	ug/l	2	1.92	96
LCS1	Hexachlorocyclopentadiene	ug/l	2	1.32	66
LCS1	Heptachlor	ug/l	2	1.91	95
LCS1	Heptachlor Epoxide	ug/l	2	2.18	109
LCS1	Indeno(1,2,3-cd)Pyrene	ug/l	2	1.74	87
LCS1	Lindane	ug/l	2	1.94	97
LCS1	Methoxychlor	ug/l	2	2.05	102
LCS1	Molinate	ug/l	2	2.31	116
LCS1	trans-Nonachlor	ug/l	2	2.15	107

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Laboratory Report

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 ATTN: Ron Fenstermacher

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 Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
 Quality Control

Control	Parameter	Units	Actual	Found	ZRecv
LCS1	Pentachlorophenol	ug/l	0	0.579	110
LCS1	Phenanthrene	ug/l	2	2.03	102
LCS1	Pyrene	ug/l	2	2.32	115
LCS1	Simazine	ug/l	2	2.31	116
LCS1	Thiocarb	ug/l	2	2.38	119
MBLK	alpha-Chlordane	ug/l	ND	ND	
MBLK	Acenaphthylene	ug/l	ND	ND	
MBLK	Alachlor	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Anthracene	ug/l	ND	ND	
MBLK	Atrazine	ug/l	ND	ND	
MBLK	Benzo(a)Anthracene	ug/l	ND	ND	
MBLK	Benzo(a)pyrene	ug/l	ND	ND	
MBLK	Benzo(b)Fluoranthene	ug/l	ND	ND	
MBLK	Benzo(g,h,i)Perylene	ug/l	ND	ND	
MBLK	Benzo(k)Fluoranthene	ug/l	ND	ND	
MBLK	Di(2-Ethylhexyl)phthalate	ug/l	ND	ND	
MBLK	Butylbenzylphthalate	ug/l	ND	ND	
MBLK	Bromochl	ug/l	ND	ND	
MBLK	Butachlor	ug/l	ND	ND	
MBLK	Chrysene	ug/l	ND	ND	
MBLK	Dibenz(a,h)Anthracene	ug/l	ND	ND	
MBLK	Di(2-Ethylhexyl)adipate	ug/l	ND	ND	
MBLK	Diethylphthalate	ug/l	ND	ND	
MBLK	Diazinon	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Dimethylphthalate	ug/l	ND	ND	
MBLK	Dimethoate	ug/l	ND	ND	
MBLK	Di-n-Butylphthalate	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	
MBLK	Fluorene	ug/l	ND	ND	

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Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	gamma-Chlordane	ug/l	ND	ND	
MBLK	Hexachlorobenzene	ug/l	ND	ND	
MBLK	Hexachlorocyclopentadiene	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Indeno(1,2,3,c,d)Pyrene	ug/l	ND	ND	
MBLK	Isophorone	ug/l	ND	ND	
MBLK	Lindane	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Metribuzin	ug/l	ND	ND	
MBLK	Nolinates	ug/l	ND	ND	
MBLK	Metolachlor	ug/l	ND	ND	
MBLK	Trans-Nonachlor	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Phenanthrene	ug/l	ND	ND	
MBLK	Prometryn	ug/l	ND	ND	
MBLK	Propachlor	ug/l	ND	ND	
MBLK	Pyrene	ug/l	ND	ND	
MBLK	Simazine	ug/l	ND	ND	
MBLK	Thiobencarb	ug/l	ND	ND	
MBLK	Tri-fluralin	ug/l	ND	ND	
HS	alpha-Chlordane	ug/l	2	1.88	94
HS	Acenaphthylene	ug/l	2	1.83	92
HS	Alachlor	ug/l	2	2.34	117
HS	Aldrin	ug/l	2	2.07	104
HS	Anthracene	ug/l	2	1.03	52
HS	Atrazine	ug/l	2	2.19	110
HS	Benz(a)Anthracene	ug/l	2	1.59	80
HS	Benzo(a)pyrene	ug/l	2	2.19	110
HS	Benzo(b)Fluoranthene	ug/l	2	2.26	113
HS	Benzo(g,h,i)Perylene	ug/l	2		

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Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
 Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

**525 Semivolatiles by GC/MS (ML/EPA 525.1)
 Quality Control**

Control	Parameter	Units	Actual	Found	%Recv
KS	Benzo(a)fluoranthene	ug/l	2	2.20	110
KS	Di(2-Ethylhexyl)phthalate	ug/l	2	2.84	142
KS	Butylbenzylphthalate	ug/l	2	2.40	120
KS	Chrysene	ug/l	2	1.95	98
KS	Dibenz(a,h)Anthracene	ug/l	2	2.51	126
KS	Di-(2-Ethylhexyl)adipate	ug/l	2	2.48	124
KS	Dioctylphthalate	ug/l	2	2.13	106
KS	Dimethylphthalate	ug/l	2	2.16	108
KS	Dio-n-Butylphthalate	ug/l	2	2.50	125
KS	Endrin	ug/l	2	2.12	106
KS	Fluorene	ug/l	2	1.90	95
KS	gamma-Chlordane	ug/l	2	2.18	109
KS	Hexachlorobenzene	ug/l	2	1.91	96
KS	Hexachlorocyclopentadiene	ug/l	2	1.30	65
KS	Heptachlor	ug/l	2	1.96	98
KS	Heptachlor Epoxide	ug/l	2	2.05	102
KS	Indeno(1,2,3-c,d)Pyrene	ug/l	2	2.24	112
KS	Lindane	ug/l	2	1.87	94
KS	Methoxychlor	ug/l	2	2.38	119
KS	Molinate	ug/l	2	2.20	110
KS	trans-Nonachlor	ug/l	2	2.13	106
KS	Pentachlorophenol	ug/l	8	10.3	129
KS	Phenanthrene	ug/l	2	1.96	98
KS	Pyrene	ug/l	2	2.16	108
KS	Simazine	ug/l	2	2.07	104
KS	Thiobencarb	ug/l	2	2.31	116

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Laboratory Report

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 Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Sample # 240826082 Sample ID WAIIPAHU III_HOLE #2 Project
 Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

Regulated VOCs plus Data 1&3 (ML/ERR 524.2)

Parameter	Units	Result	Conc.	%Rec	Offlution	Det.Limit	Prepared	By	Analyzed	By
1,1,1-Trichloroethane	ug/l	ND				0.5			30-aug-1994	col
1,1,1-Trichloroethane	ug/l	ND				0.5			30-aug-1994	col
1,1,2-Trichloroethane	ug/l	ND				0.5			30-aug-1994	col
1,1,2-Trichloroethane	ug/l	ND				0.5			30-aug-1994	col
1,1-Dichloroethane	ug/l	ND				0.5			30-aug-1994	col
1,1-Dichloroethane	ug/l	ND				0.5			30-aug-1994	col
1,1-Dichloroethylene	ug/l	ND				0.5			30-aug-1994	col
1,1-Dichloroethylene	ug/l	ND				0.5			30-aug-1994	col
1,2,3-Trichlorobenzene	ug/l	ND				0.5			30-aug-1994	col
1,2,3-Trichlorobenzene	ug/l	ND				0.5			30-aug-1994	col
1,2,4-Trichlorobenzene	ug/l	ND				0.5			30-aug-1994	col
1,2,4-Trichlorobenzene	ug/l	ND				0.5			30-aug-1994	col
1,2,4,6-Tetrachlorobenzene	ug/l	ND				0.5			30-aug-1994	col
1,2-Dichloroethane	ug/l	ND				0.5			30-aug-1994	col
1,2-Dichloroethane	ug/l	ND				0.5			30-aug-1994	col
1,2-Dibromopropane	ug/l	ND				0.5			30-aug-1994	col
1,3,5-Trimethylbenzene	ug/l	ND				0.5			30-aug-1994	col
1,3,5-Trimethylbenzene	ug/l	ND				0.5			30-aug-1994	col
p-Dichlorobenzene (1,4-DCB)	ug/l	ND				0.5			30-aug-1994	col
p-Dichlorobenzene (1,4-DCB)	ug/l	ND				0.5			30-aug-1994	col
2,2-Dibromopropane	ug/l	ND				0.5			30-aug-1994	col
2,2-Dibromopropane	ug/l	ND				0.5			30-aug-1994	col
2-Butanone (HEK)	ug/l	ND				5			30-aug-1994	col
2-Butanone (HEK)	ug/l	ND				5			30-aug-1994	col
2-Chloroethylvinyl ether	ug/l	ND				0.5			30-aug-1994	col
2-Chloroethylvinyl ether	ug/l	ND				0.5			30-aug-1994	col
o-Chlorotoluene	ug/l	ND				0.5			30-aug-1994	col
o-Chlorotoluene	ug/l	ND				0.5			30-aug-1994	col
4-Methyl-2-Pentanone (MIBK)	ug/l	ND				5			30-aug-1994	col
4-Methyl-2-Pentanone (MIBK)	ug/l	ND				5			30-aug-1994	col
Bromobenzene	ug/l	ND				0.5			30-aug-1994	col
Bromobenzene	ug/l	ND				0.5			30-aug-1994	col
Bromobenzene (Methyl Bromide)	ug/l	ND				0.5			30-aug-1994	col
Bromobenzene (Methyl Bromide)	ug/l	ND				0.5			30-aug-1994	col
cis-1,2-Dichloroethylene	ug/l	ND				0.5			30-aug-1994	col
cis-1,2-Dichloroethylene	ug/l	ND				0.5			30-aug-1994	col
Carbon Tetrachloride	ug/l	ND				0.5			30-aug-1994	col
Carbon Tetrachloride	ug/l	ND				0.5			30-aug-1994	col

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Sample # 240826082 - Sample ID HAIPAHU III HOLE #2 Project _____
Sample Type Water - Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
Bromobenzene	ug/l	ND				0.5			30-aug-1994 col
Chloroform (Trichloromethane)	ug/l	ND				0.5			30-aug-1994 col
Bromochloromethane	ug/l	ND				0.5			30-aug-1994 col
Chloroethane	ug/l	ND				0.5			30-aug-1994 col
Chloroethane (Methyl Chloride)	ug/l	ND				0.5			30-aug-1994 col
Chlorodibromomethane	ug/l	ND				0.5			30-aug-1994 col
Dibromomethane	ug/l	ND				0.5			30-aug-1994 col
Bromodichloromethane	ug/l	ND				0.5			30-aug-1994 col
Dibromochloromethane	ug/l	ND				0.5			30-aug-1994 col
Ethyl benzene	ug/l	ND				0.5			30-aug-1994 col
Dichlorodifluoromethane	ug/l	ND				0.5			30-aug-1994 col
Fluorotrifluoromethane (Freon 11)	ug/l	ND				0.5			30-aug-1994 col
Hexachlorocyclopentadiene	ug/l	ND				0.5			30-aug-1994 col
Isopropylbenzene	ug/l	ND				0.5			30-aug-1994 col
1,1-Dichloroethane (1,1-DCE)	ug/l	ND				0.5			30-aug-1994 col
m,p-Xylenes	ug/l	ND				0.5			30-aug-1994 col
Heptahalene	ug/l	ND				0.5			30-aug-1994 col
n-Butylbenzene	ug/l	ND				0.5			30-aug-1994 col
Propylbenzene	ug/l	ND				0.5			30-aug-1994 col
o-Xylene	ug/l	ND				0.5			30-aug-1994 col
1,2-Dichlorobenzene (1,2-DCE)	ug/l	ND				0.5			30-aug-1994 col
Tetrachloroethylene (PCE)	ug/l	ND				0.5			30-aug-1994 col
p-Propyltoluene	ug/l	ND				0.5			30-aug-1994 col
sec-Butylbenzene	ug/l	ND				0.5			30-aug-1994 col
Styrene	ug/l	ND				0.5			30-aug-1994 col
trans-1,2-Dichloroethylene	ug/l	ND				0.5			30-aug-1994 col
tert-Butylbenzene	ug/l	ND				0.5			30-aug-1994 col
Trichloroethylene (TCE)	ug/l	ND				0.5			30-aug-1994 col
Trichloroethylchloroethane	ug/l	ND				0.5			30-aug-1994 col

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Sample # 240826082 Sample ID WAIPAHU III_HOLE #2 Project _____
 Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

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 630 S Beretania St

Honolulu , HI 96843
 ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	Xrec	Dilution	Det.Limt	Prepared	By	Analyzed
Trihaloethenes	ug/l	ND	0.5						30-aug-1994 col
Toluene	ug/l	ND	0.5						30-aug-1994 col
Volatile Organics	ug/l	ND	0.5						30-aug-1994 col
Data Entry	--	ND	0						30-aug-1994 col



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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
1,1-Dichloroethene	95	80 - 120
1,2-Dichloroethane-d4	100	80 - 120
1,1-Dibromoethene	102	80 - 120
1,1,2-Trichloroethane		
1,1-Dichloroethane		
1,2-Dichloroethane		
1,1,1-Trichloroethane		
1,1,2-Trichloroethane		
1,1,2,2-Tetrachloroethane		
1,2-Dibromoethane		
1,1,2,2-Tetrachloroethane		
1,1,1-Trichloroethane		
1,1-Dibromoethane		
1,1,1-Trichloroethane		
1,1,2-Trichloroethane		
1,2-Dibromoethane		

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Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	1,1-Dichloroethylene	ug/l	4	3.57	84
LCS1	1,2,4-Trichlorobenzene	ug/l	4	4.80	120
LCS1	p-Dichlorobenzene (1,4-DCB)	ug/l	4	3.76	94
LCS1	p-Chlorotoluene	ug/l	4	3.72	93
LCS1	Benzene	ug/l	4	4.10	102
LCS1	Chlorobenzene	ug/l	4	4.18	104
LCS1	Chloroform (Trichloromethane)	ug/l	4	3.75	93
LCS1	Trichloroethylene (TCE)	ug/l	4	3.84	96
LCS1	Toluene	ug/l	4	4.02	100
LCS2	1,1-Dichloroethylene	ug/l	4	4.09	102
LCS2	1,2,4-Trichlorobenzene	ug/l	4	4.42	110
LCS2	p-Dichlorobenzene (1,4-DCB)	ug/l	4	4.15	104
LCS2	p-Chlorotoluene	ug/l	4	4.55	109
LCS2	Benzene	ug/l	4	4.39	110
LCS2	Chlorobenzene	ug/l	4	4.52	113
LCS2	Chloroform (Trichloromethane)	ug/l	4	4.21	105
LCS2	Trichloroethylene (TCE)	ug/l	4	4.48	112
LCS2	Toluene	ug/l	4	4.48	112
MBLK	1,1,1,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,1-Trichloroethane	ug/l	ND	ND	
MBLK	1,1,2,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,2-Trichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethylene	ug/l	ND	ND	
MBLK	1,2-Dichlorobenzene	ug/l	ND	ND	
MBLK	1,2,3-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,4-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,4,6-Tetrachlorobenzene	ug/l	ND	ND	
MBLK	1,2,4-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2-Dichloroethane	ug/l	ND	ND	
MBLK	1,2-Dichloropropane	ug/l	ND	ND	

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	XRecv
MBLK	1,3,5-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,3-Dichloropropane	ug/l	ND	ND	
MBLK	p-Dichlorobenzene (1,4-DCB)	ug/l	ND	ND	
MBLK	2,2-Dichloropropane	ug/l	ND	ND	
MBLK	2-Butanone (MEQ)	ug/l	ND	ND	
MBLK	2-Chloroethylvinylether	ug/l	ND	ND	
MBLK	o-Chlorotoluene	ug/l	ND	ND	
MBLK	p-Chlorotoluene	ug/l	ND	ND	
MBLK	4-Methyl-2-Pentane (HIBK)	ug/l	ND	ND	
MBLK	Benzene	ug/l	ND	ND	
MBLK	Bromobenzene	ug/l	ND	ND	
MBLK	Bromomethane (Methyl Bromide)	ug/l	ND	ND	
MBLK	cis-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	Chlorobenzene	ug/l	ND	ND	
MBLK	Carbon tetrachloride	ug/l	ND	ND	
MBLK	cis-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Bromoform	ug/l	ND	ND	
MBLK	Chloroform (Trichloromethane)	ug/l	ND	ND	
MBLK	Bromochloromethane	ug/l	ND	ND	
MBLK	Chloroethane	ug/l	ND	ND	
MBLK	Chloromethane (Methyl Chloride)	ug/l	ND	ND	
MBLK	Chlorodibromomethane	ug/l	ND	ND	
MBLK	Dibromomethane	ug/l	ND	ND	
MBLK	Bromodichloromethane	ug/l	ND	ND	
MBLK	Dichloromethane	ug/l	ND	ND	
MBLK	Ethyl benzene	ug/l	ND	ND	
MBLK	Dichlorodifluoromethane	ug/l	ND	ND	
MBLK	Fluorotrichloromethane (Freon1)	ug/l	ND	ND	
MBLK	Hexachlorobutadiene	ug/l	ND	ND	
MBLK	Isopropylbenzene	ug/l	ND	ND	
MBLK	m-Dichlorobenzene (1,3-DCB)	ug/l	ND	ND	

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 940826082 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 06-sep-1994

**Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control**

Control	Parameter	Units	Actual	Found	XRecv
MBLK	o,p-Xylenes	ug/l	ND	ND	
MBLK	Naphthalene	ug/l	ND	ND	
MBLK	n-Butylbenzene	ug/l	ND	ND	
MBLK	n-Propylbenzene	ug/l	ND	ND	
MBLK	o-Xylene	ug/l	ND	ND	
MBLK	o-Dichlorobenzene (1,2-DCB)	ug/l	ND	ND	
MBLK	1,1-Dichloroethylene (DCE)	ug/l	ND	ND	
MBLK	p-Isopropyltoluene	ug/l	ND	ND	
MBLK	sec-Butylbenzene	ug/l	ND	ND	
MBLK	Styrene	ug/l	ND	ND	
MBLK	trans-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	tert-Butylbenzene	ug/l	ND	ND	
MBLK	Trichloroethylene (TCE)	ug/l	ND	ND	
MBLK	Trichlorotrifluoroethane (Freon	ug/l	ND	ND	
MBLK	trans-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Toluene	ug/l	ND	ND	
MBLK	Vinyl Chloride (VC)	ug/l	ND	ND	

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Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstermacher

MONTGOMERY LABORATORIES
Submitted on

SEP 09 1994
HDS

Hillary J

Report#: 15300



MONTGOMERY LABORATORIES
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Sample # 240826083 Sample ID HAIPARD J III HOLE #2 Project
 Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Laboratory Report

Honolulu, City of
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 630 S Beretania St

Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Parameter	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Calcium Total				0.0001	31-aug-1994	H/m	31-aug-1994	H/m
Mercury				0.2	31-aug-1994	eym	31-aug-1994	eym



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 ATTN: Ron Fenstermacher

Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project _____
 Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Single Determination Analytes
 Quality Control

Control	Parameter	Units	Actual	Found	XRecv
LCS1	Cadmium, Total, GF	mg/l	0.01	0.0101	101
LCS2	Cadmium, Total, GF	mg/l	0.01	0.0111	111
HBLK	Cadmium, Total, GF	mg/l	ND	ND	
HS	Cadmium, Total, GF	mg/l	0.01	0.0114	114
HSD	Cadmium, Total, GF	mg/l	0.01	0.0116	116
LCS1	Mercury	ug/l	1.50	1.35	90
LCS2	Mercury	ug/l	1.50	1.28	85
HBLK	Mercury	ug/l	ND	ND	
HS	Mercury	ug/l	1.50	1.52	101
HSD	Mercury	ug/l	1.50	1.45	97



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Sample # 240826083 Sample ID MAIPAHU III HOLE #2 Project _____
 Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Aldicarb (ML/EPA 531.1)

Laboratory Report

Honolulu, City of
 Board of Water Supply Lab
 630 S Beretania St
 Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	BY
Aldicarb (Temik)	ug/l	ND				0.5			31-aug-1994	dfl
Aldicarb sulfone	ug/l	ND				0.5			31-aug-1994	dfl
Aldicarb sulfoxide	ug/l	ND				0.5			31-aug-1994	dfl
Carbofuran (Furadan)	ug/l	ND				0.9			31-aug-1994	dfl
Carbaryl	ug/l	ND				2			31-aug-1994	dfl
Methiocarb	ug/l	ND				2			31-aug-1994	dfl
Methoxy	ug/l	ND				2			31-aug-1994	dfl
Oxamyl (Vydate)	ug/l	ND				2			31-aug-1994	dfl



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ATTN: Ron Fenstermacher

Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Aldicarbs (ML/EPA 531.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
EDVC	90	80-120

Report #: 15300



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Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project _____
 Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Aldicarbs (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	3-Hydroxycarbofuran	ug/l	20.0	21.0	105
LCS1	Aldicarb (Temik)	ug/l	20.0	19.9	100
LCS1	Aldicarb sulfone	ug/l	20.0	21.6	108
LCS1	Aldicarb sulfoxide	ug/l	20.0	23.6	118
LCS1	Baygon	ug/l	20.0	20.2	101
LCS1	Carbofuran (Furadan)	ug/l	20.0	20.0	100
LCS1	Carbaryl	ug/l	20.0	20.8	104
LCS1	Methiocarb	ug/l	20.0	19.7	98
LCS1	Mathionyl	ug/l	20.0	19.8	99
LCS1	Oxamyl (Vydate)	ug/l	20.0	20.5	102
LCS2	3-Hydroxycarbofuran	ug/l	20.0	21.1	105
LCS2	Aldicarb (Temik)	ug/l	20.0	19.7	98
LCS2	Aldicarb sulfone	ug/l	20.0	21.8	109
LCS2	Aldicarb sulfoxide	ug/l	20.0	23.9	120
LCS2	Baygon	ug/l	20.0	20.3	102
LCS2	Carbofuran (Furadan)	ug/l	20.0	20.2	101
LCS2	Carbaryl	ug/l	20.0	21.9	110
LCS2	Methiocarb	ug/l	20.0	21.1	106
LCS2	Mathionyl	ug/l	20.0	20.1	100
LCS2	Oxamyl (Vydate)	ug/l	20.0	20.9	104
HBLK	3-Hydroxycarbofuran	ug/l	ND	ND	
HBLK	Aldicarb (Temik)	ug/l	ND	ND	
HBLK	Aldicarb sulfone	ug/l	ND	ND	
HBLK	Aldicarb sulfoxide	ug/l	ND	ND	
HBLK	Baygon	ug/l	ND	ND	
HBLK	Carbofuran (Furadan)	ug/l	ND	ND	
HBLK	Carbaryl	ug/l	ND	ND	
HBLK	Methiocarb	ug/l	ND	ND	
HBLK	Mathionyl	ug/l	ND	ND	
HBLK	Oxamyl (Vydate)	ug/l	ND	ND	
MS 1	3-Hydroxycarbofuran	ug/l	20.0	20.5	102

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Sample # 940826083 Sample ID WAIPAHA III HOLE #2 Project _____
 Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Aldicarb (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Aldicarb (Temik)	ug/l	20.0	20.1	100
MS	Aldicarb sulfone	ug/l	20.0	20.6	103
MS	Aldicarb sulfoxide	ug/l	20.0	20.1	100
MS	Baygon	ug/l	20.0	20.6	103
MS	Carbofuran (Furadan)	ug/l	20.0	20.5	102
MS	Carbaryl	ug/l	20.0	20.6	103
MS	Methiocarb	ug/l	20.0	21.1	106
MS	Methomyl	ug/l	20.0	20.3	102
MS	Oxamyl (Vydate)	ug/l	20.0	20.5	102
HSD	3-Hydroxycarbofuran	ug/l	20.0	20.7	104
HSD	Aldicarb (Temik)	ug/l	20.0	20.4	102
HSD	Aldicarb sulfone	ug/l	20.0	20.5	102
HSD	Aldicarb sulfoxide	ug/l	20.0	20.1	100
HSD	Baygon	ug/l	20.0	20.5	102
HSD	Carbofuran (Furadan)	ug/l	20.0	20.4	102
HSD	Carbaryl	ug/l	20.0	20.8	104
HSD	Methiocarb	ug/l	20.0	21.7	108
HSD	Methomyl	ug/l	20.0	20.2	101
HSD	Oxamyl (Vydate)	ug/l	20.0	20.5	102

Report #: 15300



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Sample # 940824083 Sample ID HAIPAHU III MOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Chlorinated Acids in Water (ML/EPA 515.1)

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed
2,4,5-TP (Silvex)	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994
2,4,6-TCP	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994
2,4-DB	ug/l	ND				2	29-aug-1994	rey	02-sep-1994
Dichloroacetic acid	ug/l	ND				0.5	29-aug-1994	rey	02-sep-1994
5-Hydroxydicamba	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994
2,4-Dichlorophenoxyacetic acid (Qualitative)	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994
Bentazon	ug/l	ND				0.5	29-aug-1994	rey	02-sep-1994
2,4-Dichlorophenoxyacetic acid (Qualitative)	ug/l	ND				0.5	29-aug-1994	rey	02-sep-1994
Dalapon (Qualitative)	ug/l	ND				1	29-aug-1994	rey	02-sep-1994
2,4,6-Trichlorophenoxyacetic acid	ug/l	ND				0.6	29-aug-1994	rey	02-sep-1994
DCPA	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994
Dicamba	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994
Dinoseb	ug/l	ND				0.2	29-aug-1994	rey	02-sep-1994
2,4-Dichlorophenoxyacetic acid	ug/l	ND				0.10	29-aug-1994	rey	02-sep-1994
Picloram	ug/l	ND				0.1	29-aug-1994	rey	02-sep-1994
2,4,6-Trichlorophenoxyacetic acid (Qualitative)	ug/l	ND				5	29-aug-1994	rey	02-sep-1994
Data Entry	..	09/06/94				0	29-aug-1994	rey	02-sep-1994



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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstermacher

Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Chlorinated Acids in Water (ML/EPA 515.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
2,4-dichlorophenylacetic acid	105	70-130

Report #: 15300



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 ATTN: Ron Fenstermacher

Sample # 940826083 Sample ID WAIAPAHU III HOLE #2 Project _____
 Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

Chlorinated Acids in Water (ML/EPA 515.1)
Quality Control

Control	Parameter	Units	Actual	Found	XRecv
LCS1	2,4,5-TP (Silvex)	ug/l	0.500	0.50	116
LCS1	2,4-D	ug/l	1.00	1.01	101
LCS1	Bentazon	ug/l	1.00	1.17	117
LCS2	2,4,5-TP (Silvex)	ug/l	0.500	NA	
LCS2	2,4-D	ug/l	1.00	NA	
LCS2	Bentazon	ug/l	1.00	NA	
MBLK	2,4,5-TP	ug/l	ND	ND	
MBLK	2,4,5-TP (Silvex)	ug/l	ND	ND	
MBLK	2,4-D	ug/l	ND	ND	
MBLK	2,4-DB	ug/l	ND	ND	
MBLK	Dichlorprop	ug/l	ND	ND	
MBLK	5-Hydroxydicamba	ug/l	ND	ND	
MBLK	Acifluorfen (qualitative)	ug/l	ND	ND	
MBLK	Bentazon	ug/l	ND	ND	
MBLK	Chloramben (qualitative)	ug/l	ND	ND	
MBLK	Dalapon (qualitative)	ug/l	ND	ND	
MBLK	3,5-Dichlorobenzoic acid	ug/l	ND	ND	
MBLK	DCPA	ug/l	ND	ND	
MBLK	Dicamba	ug/l	ND	ND	
MBLK	Dinoseb	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Picloram	ug/l	ND	ND	
MBLK	2,4-Dichlorophenol (qualitative)	ug/l	ND	ND	
HS	2,4,5-TP (Silvex)	ug/l	0.500	0.72	144
HS	2,4-D	ug/l	1.00	1.23	123
HS	Bentazon	ug/l	1.00	1.33	133
KSD	2,4,5-TP (Silvex)	ug/l	0.500	NA	
KSD	2,4-D	ug/l	1.00	NA	
KSD	Bentazon	ug/l	1.00	NA	

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Sample # 240826083 Sample ID HAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

SDWA Pesticides

(ML/EPA 508)

LABORATORY REPORT

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
PCB 1016 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994 kah
PCB 1221 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994 kah
PCB 1232 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994 kah
PCB 1242 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994 kah
PCB 1248 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994 kah
PCB 1254 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994 kah
PCB 1260 Aroclor	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994 kah
Alpha-BHC	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Alachlor (Alamox)	ug/l	ND				0.05	01-sep-1994	csk	07-sep-1994 kah
Aldrin	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Beta-BHC	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Chlordane	ug/l	ND				0.1	01-sep-1994	csk	07-sep-1994 kah
Chlorfentoinil (Threbit/Aravo)	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Delta-BHC	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
D,P DDE	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
D,P DDT	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Dieldrin	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Endrin Aldehyde	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Endrin	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Endosulfan (Alpha)	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Endosulfan II (beta)	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Endosulfan sulfate	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Heptachlor	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Heptachlor Epoxide	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Lindane (gamma-BHC)	ug/l	ND				0.01	01-sep-1994	csk	07-sep-1994 kah
Malathion	ug/l	ND				0.05	01-sep-1994	csk	07-sep-1994 kah
Toxophene	ug/l	ND				0.5	01-sep-1994	csk	07-sep-1994 kah
Data Entry		09/07/94							

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Laboratory Report

Honolulu, City of
 Board of Water Supply Lab
 630 S Beretania St
 Honolulu , HI 96843
 ATTN: Ron Fenstermacher

Sample # 940826083 Sample ID WAIPAHAU 111 HOLE #2 Project _____
 Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

SDWA Pesticides (ML/EPA 508)
 Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Dibutyl Chlorodacta	98	70-130
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		
[REDACTED]		

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Honolulu, HI 96843
ATTN: Ron Fenstemacher

Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

SDWA Pesticides (ML/32A 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Aldrin	ug/l	0.05	0.05	100
LCS1	p,p' DDT	ug/l	0.10	0.10	100
LCS1	Dieldrin	ug/l	0.10	0.10	100
LCS1	Endrin	ug/l	0.10	0.09	90
LCS1	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
LCS1	Heptachlor	ug/l	0.05	0.04	80
LCS2	Aldrin	ug/l	0.05	NA	
LCS2	p,p' DDT	ug/l	0.10	NA	
LCS2	Dieldrin	ug/l	0.10	NA	
LCS2	Endrin	ug/l	0.10	NA	
LCS2	Gamma-BHC (Lindane)	ug/l	0.05	NA	
LCS2	Heptachlor	ug/l	0.05	NA	
HBLK	PCB 1016 Aroclor	ug/l	ND	ND	
HBLK	PCB 1221 Aroclor	ug/l	ND	ND	
HBLK	PCB 1232 Aroclor	ug/l	ND	ND	
HBLK	PCB 1242 Aroclor	ug/l	ND	ND	
HBLK	PCB 1248 Aroclor	ug/l	ND	ND	
HBLK	PCB 1254 Aroclor	ug/l	ND	ND	
HBLK	PCB 1260 Aroclor	ug/l	ND	ND	
HBLK	Alpha-BHC	ug/l	ND	ND	
HBLK	Alachlor (Alarex)	ug/l	ND	ND	
HBLK	Aldrin	ug/l	ND	ND	
HBLK	Chlordane	ug/l	ND	ND	
HBLK	Chlorthalonil (Drconil, Bravo)	ug/l	ND	ND	
HBLK	Delta-BHC	ug/l	ND	ND	
HBLK	p,p' DDD	ug/l	ND	ND	
HBLK	p,p' DDE	ug/l	ND	ND	
HBLK	p,p' DDT	ug/l	ND	ND	
HBLK	Dieldrin	ug/l	ND	ND	
HBLK	Endrin Aldehyde	ug/l	ND	ND	
HBLK	Endrin	ug/l	ND	ND	

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Laboratory Report

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Board of Water Supply Lab
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Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 940826083 Sample ID WAIPAHU III HOLE #2 Project _____
Sample Type Water Sampled 25-aug-1994 Received 26-aug-1994 Reported 09-sep-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Endosulfan I (alpha)	ug/l	ND	ND	
MBLK	Endosulfan II (beta)	ug/l	ND	ND	
MBLK	Endosulfan sulfate	ug/l	ND	ND	
MBLK	Gamma-BHC (Lindane)	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Malathion	ug/l	ND	ND	
MBLK	Toxaphene	ug/l	ND	ND	
MS	Aldrin	ug/l	0.05	0.05	100
MS	p,p' DDT	ug/l	0.10	0.10	100
MS	Dieldrin	ug/l	0.10	0.11	110
MS	Endrin	ug/l	0.10	0.09	90
MS	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
MS	Heptachlor	ug/l	0.05	0.04	80

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Draft # 1 of 2

MINERAL ANALYSES

AREA			
LOCATION	Waipahu III - W1111 (2400-09)	Waipahu III - W1112 (2400-10)	
Year	1994	1994	
Date collected	July 20	Aug 25	
Time collected	0946	0925	
Laboratory number			
Regional head, feet			
Specific conductance micromhos @ 25°C	289	372	
pH value	7.37	7.55	
Turbidity	0.09	0.16	
Color	0	0	
IN PARTS PER MILLION:			
Dissolved oxygen			
Free carbon dioxide			
Silica	40	44	
Calcium	6.2	6.6	
Magnesium	6.9	7.0	
Sodium	38	47	
Potassium	2.1	2.2	
Bicarbonate	62	43	
Sulfate	15	14	
Chloride	36	34	
Fluoride	0.10	0.10	
Nitrate	13	13	
Phosphate	0.85	0.80	
Iron	0.01	0.01	
Manganese } .....	.01	.01	
Copper } .....	.01	.01	
Lead } less than .....	.01	.01	
Arsenic } .....	.01	.01	
Selenium } .....	.01	.01	
Chromium ^a} } .....	.01	.01	
Total dissolved solids	270	218	
Alkalinity	51	76	
Total hardness	44	45	
IN EQUIVALENTS PER MILLION:			
Calcium (Ca)	0.309	0.329	
Magnesium (Mg) .....	.567	.576	
Sodium (Na)	1.655	2.054	
Potassium (K) .....	.054	.052	
Bicarbonate (HCO ₃)	1.016	1.525	
Sulfate (SO ₄) .....	.312	.291	
Chloride (Cl) ^b	1.047	.989	
Nitrate (NO ₃) .....	.210	.210	
TOTALS	5.170	6.030	

a Hexavalent only.

b Includes fluoride and phosphate as PO₄.

{ SILVER } { BARIUM } { CADMIUM } less than	(.01)	(.01)
		(.01)	(.01)
		(.01)	(.01)



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Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstermacher

MONTGOMERY LABORATORIES Submission
: NOV 04 1994
HDS <i>Ellary</i>

Report#: 16364



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Sample # 241021265 Sample ID KALIPAHU WELL III GFI Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

AB1803 - EDB and DBCP (ML/EPA 504)

LABORATORY ADDRESS

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	Dilution	Det.Limit	Prepared By	Analyzed By
Dibromochloropropane (DBCP)	ug/L	ND			0.01	22-oct-1994 hth	23-oct-1994 hth
Ethylene Dibromide (EDB)	ug/L	0.02			0.01	22-oct-1994 hth	23-oct-1994 hth
DatEntry		10/22/94			0	22-oct-1994 hth	23-oct-1994 hth



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Board of Water Supply Lab
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ATTN: Ron Fenstermacher

Sample # 941021265 Sample ID WAIPAHA WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

AB1803 - EDB and DBCP (ML/EPA 504)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Dibromochloropropane (DBCP)	ug/l	0.10	0.09	90
LCS1	Ethylene Dibromide (EDB)	ug/l	0.10	0.11	110
LCS2	Dibromochloropropane (DBCP)	ug/l	0.10	0.09	90
LCS2	Ethylene Dibromide (EDB)	ug/l	0.10	0.09	90
NBLK	Dibromochloropropane (DBCP)	ug/l	ND	ND	
NBLK	Ethylene Dibromide (EDB)	ug/l	ND	ND	
HS	Dibromochloropropane (DBCP)	ug/l	0.10	NA	
HS	Ethylene Dibromide (EDB)	ug/l	0.10	NA	

Report #: 16364



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Sample # 241021265 Sample ID WAIPAHU WELL 111.G#1 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

LABORATORY LOG

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
1,1-Dichloroethane	ug/l	ND				0.05	24-oct-1994	esk	27-oct-1994
Acenaphthylene	ug/l	ND				0.1	24-oct-1994	esk	27-oct-1994
Acetophenone	ug/l	ND				0.05	24-oct-1994	esk	27-oct-1994
Aldrin	ug/l	ND				0.05	24-oct-1994	esk	27-oct-1994
Anthracene	ug/l	ND				0.02	24-oct-1994	esk	27-oct-1994
Atrazine	ug/l	ND				0.05	24-oct-1994	esk	27-oct-1994
Benzo(a)Anthracene	ug/l	ND				0.05	24-oct-1994	esk	27-oct-1994
Benzo(a)pyrene	ug/l	ND				0.02	24-oct-1994	esk	27-oct-1994
Benzo(b)Fluoranthene	ug/l	ND				0.02	24-oct-1994	esk	27-oct-1994
Benzo(g,h,i)Perylene	ug/l	ND				0.05	24-oct-1994	esk	27-oct-1994
Benzo(k)Fluoranthene	ug/l	ND				0.02	24-oct-1994	esk	27-oct-1994
Di(2-Ethylhexyl)phthalate	ug/l	ND				0.6	24-oct-1994	esk	27-oct-1994
Dibenzylphthalate	ug/l	ND				0.15	24-oct-1994	esk	27-oct-1994
Bromacfl	ug/l	ND				2	24-oct-1994	esk	27-oct-1994
Butachlor	ug/l	ND				0.05	24-oct-1994	esk	27-oct-1994
Chrysenes	ug/l	ND				0.02	24-oct-1994	esk	27-oct-1994
Dibenz(a,h)Anthracene	ug/l	ND				0.05	24-oct-1994	esk	27-oct-1994
Di-(2-Ethylhexyl)adipate	ug/l	ND				0.6	24-oct-1994	esk	27-oct-1994
Dibutylphthalate	ug/l	ND				0.5	24-oct-1994	esk	27-oct-1994
Diazinon	ug/l	ND				0.1	24-oct-1994	esk	27-oct-1994
Dieldrin	ug/l	ND				0.12	24-oct-1994	esk	27-oct-1994
Dimethylphthalate	ug/l	ND				0.5	24-oct-1994	esk	27-oct-1994
Dimethoate	ug/l	ND				10	24-oct-1994	esk	27-oct-1994
Di-n-Butylphthalate	ug/l	ND				0.5	24-oct-1994	esk	27-oct-1994
Dieldrin	ug/l	ND				0.11	24-oct-1994	esk	27-oct-1994
Fluorene	ug/l	ND				0.05	24-oct-1994	esk	27-oct-1994
Benzothiochloraldehyde	ug/l	ND				0.05	24-oct-1994	esk	27-oct-1994
Hexachlorobenzene	ug/l	ND				0.05	24-oct-1994	esk	27-oct-1994
Hexachlorocyclopentadiene	ug/l	ND				0.05	24-oct-1994	esk	27-oct-1994



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Sample # 241021265 Sample ID HAIPANU WELL III G#1 Project _____
 Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

525 Semivolatiles by GC/MS (M/EPA 525.1)

Laboratory Report

Honolulu, City of
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Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	X Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Heptachlor Epoxide	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	CFM
Endosulfan	ug/l	ND				0.02	24-oct-1994	csk	27-oct-1994	CFM
Isophorone	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	CFM
Endrin	ug/l	ND				0.5	24-oct-1994	csk	27-oct-1994	CFM
Methoxychlor	ug/l	ND				0.02	24-oct-1994	csk	27-oct-1994	CFM
Permethrin	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	CFM
Molinate	ug/l	ND				0.2	24-oct-1994	csk	27-oct-1994	CFM
Heptachlor	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	CFM
trans-Nonachlor	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	CFM
Endosulfan S	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	CFM
Phenanthrene	ug/l	ND				0.02	24-oct-1994	csk	27-oct-1994	CFM
Propachlor	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	CFM
Cyfluthrin	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	CFM
Simazine	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	CFM
Triphenylethylene	ug/l	ND				0.05	24-oct-1994	csk	27-oct-1994	CFM
Trifluralin	ug/l	ND				0.1	24-oct-1994	csk	27-oct-1994	CFM



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Honolulu, HI 96843
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Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Perylene-G12	90	70 - 130

Report #: 16364



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Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	alpha-Chlordane	ug/l	2	1.95	96
LCS1	Acenaphthylene	ug/l	2	1.90	95
LCS1	Alachlor	ug/l	2	1.98	99
LCS1	Aldrin	ug/l	2	1.88	94
LCS1	Anthracene	ug/l	2	1.85	92
LCS1	Atrazine	ug/l	2	1.92	96
LCS1	Benzo(a)Anthracene	ug/l	2	1.77	88
LCS1	Benzo(a)pyrene	ug/l	2	1.92	96
LCS1	Benzo(b)Fluoranthene	ug/l	2	1.95	98
LCS1	Benzo(g,h,i)Perylene	ug/l	2	1.95	98
LCS1	Benzo(k)Fluoranthene	ug/l	2	1.80	90
LCS1	Di(2-Ethylhexyl)phthalate	ug/l	2	1.73	86
LCS1	Dibutylphthalate	ug/l	2	1.80	90
LCS1	Chrysene	ug/l	2	1.82	91
LCS1	Dibenz(a,h)Anthracene	ug/l	2	1.85	92
LCS1	Di-(2-Ethylhexyl)adipate	ug/l	2	2.20	110
LCS1	Diethylphthalate	ug/l	2	1.90	95
LCS1	Dimethylphthalate	ug/l	2	1.96	98
LCS1	Diphenylphthalate	ug/l	2	1.78	89
LCS1	Endrin	ug/l	2	1.67	84
LCS1	Gamma-Chlordane	ug/l	2	1.82	91
LCS1	gamma-Chlordane	ug/l	2	1.92	96
LCS1	Hexachlorobenzene	ug/l	2	1.85	92
LCS1	Hexachlorocyclopentadiene	ug/l	2	1.61	80
LCS1	Heptachlor	ug/l	2	1.75	88
LCS1	Heptachlor Epoxide	ug/l	2	1.90	95
LCS1	Indeno(1,2,3-cd)Pyrene	ug/l	2	1.83	92
LCS1	Lindane	ug/l	2	1.87	94
LCS1	Methoxychlor	ug/l	2	1.71	86
LCS1	Nolinate	ug/l	2	1.93	96
LCS1	trans-Nonachlor	ug/l	2	1.86	93

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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

**525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control**

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Pentachlorophenol	ug/l	8	6.63	80
LCS1	Phenanthrene	ug/l	2	1.89	94
LCS1	Pyrene	ug/l	2	1.92	96
LCS1	Simazine	ug/l	2	1.88	94
LCS1	Thiobencarb	ug/l	2	1.85	92
MBLK	alpha-Chlordane	ug/l	ND	ND	
MBLK	Acenaphthylene	ug/l	ND	ND	
MBLK	Alachlor	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Anthracene	ug/l	ND	ND	
MBLK	Atrazine	ug/l	ND	ND	
MBLK	Benz(a)Anthracene	ug/l	ND	ND	
MBLK	Benzo(a)pyrene	ug/l	ND	ND	
MBLK	Benzo(b)Fluoranthene	ug/l	ND	ND	
MBLK	Benzo(g,h,i)Perylene	ug/l	ND	ND	
MBLK	Benzo(k)Fluoranthene	ug/l	ND	ND	
MBLK	Di(2-Ethylhexyl)phthalate	ug/l	ND	ND	
MBLK	Butylbenzylphthalate	ug/l	ND	ND	
MBLK	Bromocikl	ug/l	ND	ND	
MBLK	Butachlor	ug/l	ND	ND	
MBLK	Chrysene	ug/l	ND	ND	
MBLK	Dibenz(a,h)Anthracene	ug/l	ND	ND	
MBLK	Di(2-Ethylhexyl)adipate	ug/l	ND	ND	
MBLK	Diethylphthalate	ug/l	ND	ND	
MBLK	Diazinon	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Diethylphthalate	ug/l	ND	ND	
MBLK	Dimethoate	ug/l	ND	ND	
MBLK	Di-n-Butylphthalate	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	
MBLK	Fluorene	ug/l	ND	ND	

Report #: 16364



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555 East Walnut Street
Pasadena, California 91101
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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941021265 Sample ID WAIPAHA WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	gamma-Chlordane	ug/l	ND	ND	
MBLK	Hexachlorobenzene	ug/l	ND	ND	
MBLK	Hexachlorocyclopentadiene	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Indeno(1,2,3,c,d)Pyrene	ug/l	ND	ND	
MBLK	Isodrinone	ug/l	ND	ND	
MBLK	Lindane	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Metribuzin	ug/l	ND	ND	
MBLK	Molinate	ug/l	ND	ND	
MBLK	Metolachlor	ug/l	ND	ND	
MBLK	trans-Honachlor	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Phenanthrene	ug/l	ND	ND	
MBLK	Prometryn	ug/l	ND	ND	
MBLK	Propachlor	ug/l	ND	ND	
MBLK	Pyrene	ug/l	ND	ND	
MBLK	Simazine	ug/l	ND	ND	
MBLK	Thiobencarb	ug/l	ND	ND	
MBLK	Trifluralin	ug/l	ND	ND	
MS	alpha-Chlordane	ug/l	2	2.04	102
MS	Acenaphthylene	ug/l	2	1.74	87
MS	Alachlor	ug/l	2	2.18	109
MS	Aldrin	ug/l	2	1.73	86
MS	Anthracene	ug/l	2	0.57	18
MS	Atrazine	ug/l	2	2.01	100
MS	Benz(a)Anthracene	ug/l	2	1.39	70
MS	Benzo(a)Pyrene	ug/l	2	0.72	36
MS	Benzo(b)Fluoranthene	ug/l	2	2.05	102
MS	Benzo(g,h,i)Perylene	ug/l	2	0.85	42

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 Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project _____
 Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

**525 Semivolatiles by GC/MS (ML/EPA 525.1)
 Quality Control**

Control	Parameter	Units	Actual	Found	%Recv
MS	Benzo(b)fluoranthene	ug/l	2	1.90	95
MS	Di(2-Ethylhexyl)phthalate	ug/l	2	1.90	95
MS	Bis(2-ethylhexyl)phthalate	ug/l	2	1.81	90
MS	Chrysene	ug/l	2	1.89	94
MS	Dibenz(a,h)anthracene	ug/l	2	1.82	91
MS	Di-(2-Ethylhexyl)adipate	ug/l	2	1.57	78
MS	Diethylphthalate	ug/l	2	2.18	109
MS	Dimethylphthalate	ug/l	2	2.20	110
MS	Dibenz(b,f)quaterphenyl	ug/l	2	2.04	102
MS	Endrin	ug/l	2	1.69	84
MS	Fluorene	ug/l	2	2.04	102
MS	gamma-Chlordane	ug/l	2	2.06	103
MS	Hexachlorobenzene	ug/l	2	1.82	91
MS	Hexachlorocyclopentadiene	ug/l	2	0.36	18
MS	Heptachlor	ug/l	2	1.82	91
MS	Heptachlor Epoxide	ug/l	2	1.98	99
MS	Indeno(1,2,3-c,d)Pyrene	ug/l	2	1.77	88
MS	Lindane	ug/l	2	1.94	97
MS	Methoxychlor	ug/l	2	1.95	97
MS	Molinate	ug/l	2	2.23	112
MS	trans-Nonachlor	ug/l	2	1.66	83
MS	Pentachlorophenol	ug/l	8	8.04	100
MS	Phenanthrene	ug/l	2	1.90	95
MS	Pyrene	ug/l	2	1.98	99
MS	Simazine	ug/l	2	2.08	104
MS	Thiobencarb	ug/l	2	1.97	98

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Sample # 241021265 Sample ID WAIPAHU WELL III GR1 Project
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St
Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
1,1,1-Trichloroethane	ug/l	ND			0.5	0.5			01-nov-1994 col
1,1,2-Trichloroethane	ug/l	ND			0.5	0.5			01-nov-1994 col
1,1,2,2-Tetrachloroethane	ug/l	ND			0.5	0.5			01-nov-1994 col
1,1,2-Trichloroethane	ug/l	ND			0.5	0.5			01-nov-1994 col
1,1-Dichloroethane	ug/l	ND			0.5	0.5			01-nov-1994 col
1,1-Dichloroethylene	ug/l	ND			0.5	0.5			01-nov-1994 col
1,2-Dichloroethane	ug/l	ND			0.5	0.5			01-nov-1994 col
1,2,3-Trichlorobenzene	ug/l	ND			0.5	0.5			01-nov-1994 col
1,2,3-Trichlorobenzene	ug/l	ND			0.5	0.5			01-nov-1994 col
1,2,4-Trichlorobenzene	ug/l	ND			0.5	0.5			01-nov-1994 col
1,2,4-Trichlorobenzene	ug/l	ND			0.5	0.5			01-nov-1994 col
1,2-Dichloroethane	ug/l	ND			0.5	0.5			01-nov-1994 col
1,2-Dichloroethane	ug/l	ND			0.5	0.5			01-nov-1994 col
1,3,5-Trimethylbenzene	ug/l	ND			0.5	0.5			01-nov-1994 col
1,3,5-Trimethylbenzene	ug/l	ND			0.5	0.5			01-nov-1994 col
1,3-Dichlorobenzene	ug/l	ND			0.5	0.5			01-nov-1994 col
1,3-Dichlorobenzene	ug/l	ND			0.5	0.5			01-nov-1994 col
p-Dichlorobenzene (1,4-DCB)	ug/l	ND			0.5	0.5			01-nov-1994 col
p-Dichlorobenzene	ug/l	ND			0.5	0.5			01-nov-1994 col
2-Butanone (MEK)	ug/l	ND			5	5			01-nov-1994 col
2-Butanone (MEK)	ug/l	ND			5	5			01-nov-1994 col
o-Chlorotoluene	ug/l	ND			0.5	0.5			01-nov-1994 col
o-Chlorotoluene	ug/l	ND			0.5	0.5			01-nov-1994 col
4-Methyl-2-Pentanone (MIBK)	ug/l	ND			0.5	0.5			01-nov-1994 col
4-Methyl-2-Pentanone (MIBK)	ug/l	ND			5	5			01-nov-1994 col
Benzene	ug/l	ND			0.5	0.5			01-nov-1994 col
Bromobenzene	ug/l	ND			0.5	0.5			01-nov-1994 col
Bromobenzene	ug/l	ND			0.5	0.5			01-nov-1994 col
cis-1,2-Dichloroethylene	ug/l	ND			0.5	0.5			01-nov-1994 col
cis-1,2-Dichloroethylene	ug/l	ND			0.5	0.5			01-nov-1994 col
Carbon Tetrachloride	ug/l	ND			0.5	0.5			01-nov-1994 col
Carbon Tetrachloride	ug/l	ND			0.5	0.5			01-nov-1994 col

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Laboratory Report

Honolulu, City of
 Board of Water Supply Lab
 630 S Beretania St

Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Sample # 241021265 Sample ID WAIIPANU WELLS III G#1 Project
 Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Regulated VOCs plus Lists 1&3 (ML/BPA 524.2)

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed
Acetone	ug/l	ND				0.15			01-nov-1994 col
Chloroform (Trichloromethane)	ug/l	ND				0.5			01-nov-1994 col
Bromochloroethane	ug/l	ND				0.15			01-nov-1994 col
Chloroethane	ug/l	ND				0.5			01-nov-1994 col
Chloromethane (Methyl Chloride)	ug/l	ND				0.15			01-nov-1994 col
Chlorodibromomethane	ug/l	ND				0.5			01-nov-1994 col
Dibromomethane	ug/l	ND				0.15			01-nov-1994 col
Bromodichloromethane	ug/l	ND				0.5			01-nov-1994 col
Dichloromethane	ug/l	ND				0.15			01-nov-1994 col
Ethyl benzene	ug/l	ND				0.5			01-nov-1994 col
Dibromodichloromethane	ug/l	ND				0.15			01-nov-1994 col
Fluorotrifluoromethane (Freon1)	ug/l	ND				0.5			01-nov-1994 col
Hexachlorocyclopentadiene	ug/l	ND				0.15			01-nov-1994 col
Isopropylbenzene	ug/l	ND				0.5			01-nov-1994 col
1,1-Dichlorobenzene (o-DCB)	ug/l	ND				0.15			01-nov-1994 col
m,p-Xylenes	ug/l	ND				0.5			01-nov-1994 col
Heptane	ug/l	ND				0.15			01-nov-1994 col
n-Butylbenzene	ug/l	ND				0.5			01-nov-1994 col
Isopropylbenzene	ug/l	ND				0.15			01-nov-1994 col
o-Xylene	ug/l	ND				0.5			01-nov-1994 col
1,1-Dichloroethane (1,1-DCE)	ug/l	ND				0.15			01-nov-1994 col
Tetrachloroethylene (PCE)	ug/l	ND				0.5			01-nov-1994 col
1,1,1-Trichloroethane	ug/l	ND				0.15			01-nov-1994 col
sec-Butylbenzene	ug/l	ND				0.5			01-nov-1994 col
Styrene	ug/l	ND				0.15			01-nov-1994 col
trans-1,2-Dichloroethylene	ug/l	ND				0.5			01-nov-1994 col
tert-Butylbenzene	ug/l	ND				0.15			01-nov-1994 col
Trichloroethylene (TCE)	ug/l	ND				0.5			01-nov-1994 col
Trichloroethylbenzene (Freon)	ug/l	ND				0.15			01-nov-1994 col

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Laboratory Report

Honolulu, City of
 Board of Water Supply Lab
 630 S Beretania St
 Honolulu , HI 96843
 ATTN: Ron Fenstermacher

Sample # 241021265 Sample ID KAIPARU WELL III_G#1 Project
 Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Regulated VOCs plus Lists 1&3 (MCL/EPA 524.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared By	Analyzed By
Toluene	ug/l	ND				0.5		01-nov-1994 col
Xylenes (m)	ug/l	ND				0.5		01-nov-1994 col
Xylenes (o)	ug/l	ND				0.5		01-nov-1994 col
Xylenes (p)	ug/l	ND				0		01-nov-1994 col
Styrene	ug/l	ND						
1,1-Dichloroethene	ug/l	ND						
1,2-Dichloroethene	ug/l	ND						
1,1,1-Trichloroethene	ug/l	ND						
1,1,2-Trichloroethene	ug/l	ND						
1,1-Dibromoethene	ug/l	ND						
1,2-Dibromoethene	ug/l	ND						
1,1,2,2-Tetrachloroethane	ug/l	ND						
1,1,1,2-Tetrachloroethane	ug/l	ND						
1,1,2,2-Tetrachloroethane	ug/l	ND						
1,1,1-Trichloroethane	ug/l	ND						
1,1,2-Trichloroethane	ug/l	ND						
1,1,1,1-Tetrahaloethane	ug/l	ND						
1,1,2,2-Tetrahaloethane	ug/l	ND						
1,1,1,2-Tetrahaloethane	ug/l	ND						
1,1,2,2-Tetrahaloethane	ug/l	ND						
1,1,1,2-Tetrahaloethane	ug/l	ND						
1,1,2,2-Tetrahaloethane	ug/l	ND						
1,1,1,2-Tetrahaloethane	ug/l	ND						
1,1,2,2-Tetrahaloethane	ug/l	ND						
1,1,1,2-Tetrahaloethane	ug/l	ND						
1,1,2,2-Tetrahaloethane	ug/l	ND						



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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Bromo Chlorobenzene	100	80 - 120
Toluene-d8	95	80 - 120
1,2-Dichloroethane-d4	100	80 - 120

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Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	1,1,1-Trichloroethane	ug/l	4	3.83	96
LCS1	1,1,2,2-Tetrachloroethane	ug/l	4	3.87	97
LCS1	1,1,2-Trichloroethane	ug/l	4	3.79	95
LCS1	1,1-Dichloroethane	ug/l	4	4.11	103
LCS1	1,2-Dichlorobenzene	ug/l	4	3.77	95
LCS1	1,2-Dichloroethane	ug/l	4	3.92	98
LCS1	1,2-Dichloropropane	ug/l	4	3.84	96
LCS1	1,3-Dichloropropane	ug/l	8	7.45	93
LCS1	p-Dichlorobenzene (1,4-DCB)	ug/l	4	3.55	89
LCS1	Benzene	ug/l	4	4.13	103
LCS1	cis-1,2-Dichloroethylene	ug/l	4	3.83	96
LCS1	Chlorobenzene	ug/l	4	3.86	96
LCS1	Carbon tetrachloride	ug/l	4	3.92	98
LCS1	Bromoform	ug/l	4	3.60	90
LCS1	Chloroform (trichloromethane)	ug/l	4	3.68	92
LCS1	Bromodichloromethane	ug/l	4	3.39	85
LCS1	Dichloromethane	ug/l	4	4.10	102
LCS1	Ethyl benzene	ug/l	4	4.22	106
LCS1	Fluorotrichloromethane (Freon 11)	ug/l	4	4.80	120
LCS1	m,p-Xylenes	ug/l	8	8.02	100
LCS1	o-Xylene	ug/l	4	3.89	97
LCS1	o-Dichlorobenzene (1,2-DCB)	ug/l	4	3.53	88
LCS1	Tetrachloroethylene (PCE)	ug/l	4	3.80	95
LCS1	Styrene	ug/l	4	4.04	101
LCS1	trans-1,2-Dichloroethylene	ug/l	4	3.92	98
LCS1	Trichloroethylene (TCE)	ug/l	4	3.87	97
LCS1	Trichlorotrifluoroethane (Freon 113)	ug/l	4	5.36	134
LCS1	Toluene	ug/l	4	4.00	100
LCS1	Vinyl chloride (VC)	ug/l	4	4.24	106
MBLK	1,1,1,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,2-Trichloroethane	ug/l	ND	ND	

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ATTN: Ron Fenstermacher

Sample # 941021265 Sample ID WAIPAHU WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	1,1,2,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,2-Trichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethylene	ug/l	ND	ND	
MBLK	1,1-Dichloropropene	ug/l	ND	ND	
MBLK	1,2,3-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,3-Trichloropropane	ug/l	ND	ND	
MBLK	1,2,4-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,4-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,2-Dichloroethane	ug/l	ND	ND	
MBLK	1,2-Dichloropropane	ug/l	ND	ND	
MBLK	1,3,5-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,3-Dichloropropane	ug/l	ND	ND	
MBLK	p-Dichlorobenzene (1,4-DCB)	ug/l	ND	ND	
MBLK	2,2-Dichloropropane	ug/l	ND	ND	
MBLK	2-Butanone (MEK)	ug/l	ND	ND	
MBLK	2-Chloroethylvinylether	ug/l	ND	ND	
MBLK	o-Chlorotoluene	ug/l	ND	ND	
MBLK	p-Chlorotoluene	ug/l	ND	ND	
MBLK	4-Methyl-2-Pentanone (MIBK)	ug/l	ND	ND	
MBLK	Benzene	ug/l	ND	ND	
MBLK	Bromobenzene	ug/l	ND	ND	
MBLK	Bromoethane (Ethyl Bromide)	ug/l	ND	ND	
MBLK	cis-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	Chlorobenzene	ug/l	ND	ND	
MBLK	Carbon Tetrachloride	ug/l	ND	ND	
MBLK	cis-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Bromoform	ug/l	ND	ND	
MBLK	Chloroform (Trichloromethane)	ug/l	ND	ND	
MBLK	Bromochloromethane	ug/l	ND	ND	
MBLK	Chloroethane	ug/l	ND	ND	

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Laboratory Report

Honolulu, City of
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Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941021265 Sample ID HAIPAHU WELL III G#1 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Chloromethane (Methyl Chloride)	ug/l	ND	ND	
MBLK	Chlorodibromomethane	ug/l	ND	ND	
MBLK	Dibromomethane	ug/l	ND	ND	
MBLK	Bromodichloromethane	ug/l	ND	ND	
MBLK	Dichloromethane	ug/l	ND	ND	
MBLK	Ethyl benzene	ug/l	ND	ND	
MBLK	Dichlorodifluoromethane	ug/l	ND	ND	
MBLK	Fluorotrichloromethane (Freon1)	ug/l	ND	ND	
MBLK	Hexachlorobutadiene	ug/l	ND	ND	
MBLK	Isopropylbenzene	ug/l	ND	ND	
MBLK	m-Dichlorobenzene (1,3-DCB)	ug/l	ND	ND	
MBLK	o,p-Xylenes	ug/l	ND	ND	
MBLK	Naphthalene	ug/l	ND	ND	
MBLK	n-Butylbenzene	ug/l	ND	ND	
MBLK	n-Propylbenzene	ug/l	ND	ND	
MBLK	o-Xylene	ug/l	ND	ND	
MBLK	o-Dichlorobenzene (1,2-DCB)	ug/l	ND	ND	
MBLK	Tetrachloroethylene (PCE)	ug/l	ND	ND	
MBLK	p-Isopropyltoluene	ug/l	ND	ND	
MBLK	sec-Butylbenzene	ug/l	ND	ND	
MBLK	Styrene	ug/l	ND	ND	
MBLK	trans-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	tert-Butylbenzene	ug/l	ND	ND	
MBLK	Trichloroethylene (TCE)	ug/l	ND	ND	
MBLK	Trichloroethylfluoroethane (Freon)	ug/l	ND	ND	
MBLK	trans-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Toluene	ug/l	ND	ND	
MBLK	Vinyl chloride (VC)	ug/l	ND	ND	

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Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstermacher

MONTGOMERY LABORATORIES
Submitted on
: NOV 04 1994
HDS
<i>William J.</i>

Report#: 16365



MONTGOMERY LABORATORIES

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretani St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Report# 04-nov-1994

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Barium, Total, ICAP	mg/L	1.0	0.989	99
LCS2	Barium, Total, ICAP	mg/L	1.0	1.00	100
MBLK	Barium, Total, ICAP	mg/L	ND	ND	
MS	Barium, Total, ICAP	mg/L	1.0	0.943	94
MSD	Barium, Total, ICAP	mg/L	1.0	0.918	92
LCS1	Beryllium, Total, ICAP	mg/L	0.05	0.0471	94
LCS2	Beryllium, Total, ICAP	mg/L	0.05	0.0477	95
MBLK	Beryllium, Total, ICAP	mg/L	ND	ND	
MS	Beryllium, Total, ICAP	mg/L	0.05	0.046	93
MSD	Beryllium, Total, ICAP	mg/L	0.05	0.0449	90
LCS1	Cadmium, Total, GF	mg/L	0.01	0.0101	101
LCS2	Cadmium, Total, GF	mg/L	0.01	0.0102	102
MBLK	Cadmium, Total, GF	mg/L	ND	ND	
MS	Cadmium, Total, GF	mg/L	0.01	0.0087	87
MSD	Cadmium, Total, GF	mg/L	0.01	0.008	80
LCS1	Mercury	ug/L	1.50	1.41	94
LCS2	Mercury	ug/L	1.50	1.38	92
MBLK	Mercury	ug/L	ND	ND	
MS	Mercury	ug/L	1.50	1.48	99
MSD	Mercury	ug/L	1.50	1.49	99
LCS1	Nickel, Total, ICAP	mg/L	0.5	0.49	98
LCS2	Nickel, Total, ICAP	mg/L	0.5	0.493	99
MBLK	Nickel, Total, ICAP	mg/L	ND	ND	
MS	Nickel, Total, ICAP	mg/L	0.5	0.462	92
MSD	Nickel, Total, ICAP	mg/L	0.5	0.457	91
LCS1	Antimony, Total, GF	mg/L	0.04	0.0365	91
LCS2	Antimony, Total, GF	mg/L	0.04	0.0362	90
MBLK	Antimony, Total, GF	mg/L	ND	ND	
MS	Antimony, Total, GF	mg/L	0.040	0.040	100
MSD	Antimony, Total, GF	mg/L	0.040	0.0465	116
LCS1	Thallium, GF	mg/L	0.008	0.0072	90

Report #: 16365



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Sample # 241021266 Sample ID HAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Aldicarb

(ML/EPA 531.1.)

LABORATORY

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
2,4-Dichloroacetylurea	ug/l	ND				2			24-oct-1994	(U)
Aldicarb (Temk)	ug/l	ND				0.5			24-oct-1994	(U)
Aldicarb sulfate	ug/l	ND				0.18			24-oct-1994	(U)
Aldicarb sulfoxide	ug/l	ND				0.5			24-oct-1994	(U)
Baygon	ug/l	ND				2			24-oct-1994	(U)
Carbofuran (Furadan)	ug/l	ND				0.9			24-oct-1994	(U)
Carbaryl	ug/l	ND				2			24-oct-1994	(U)
Methiocarb	ug/l	ND				2			24-oct-1994	(U)
Methoxy	ug/l	ND				2			24-oct-1994	(U)
Oxamyl (Vydate)	ug/l	ND				2			24-oct-1994	(U)



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Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstemacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Aldicarb (ML/EPA 531.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
BDND	37	80 - 120

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 ATTN: Ron Fenstermacher

Sample # 941021266 Sample ID WAIPAHA WELL III G#2 Project _____
 Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Aldicarb (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	3-Hydroxycarbofuran	ug/l	20.0	18.9	94
LCS1	Aldicarb (Temik)	ug/l	20.0	18.7	94
LCS1	Aldicarb sulfone	ug/l	20.0	19.0	95
LCS1	Aldicarb sulfoxide	ug/l	20.0	15.4	77
LCS1	Baygon	ug/l	20.0	19.6	98
LCS1	Carbofuran (Furadan)	ug/l	20.0	19.6	98
LCS1	Carbaryl	ug/l	20.0	18.6	93
LCS1	Methiocarb	ug/l	20.0	16.7	84
LCS1	Methomyl	ug/l	20.0	18.9	94
LCS1	Oxamyl (Vydate)	ug/l	20.0	18.0	90
LCS2	3-Hydroxycarbofuran	ug/l	20.0	NA	
LCS2	Aldicarb (Temik)	ug/l	20.0	NA	
LCS2	Aldicarb sulfone	ug/l	20.0	NA	
LCS2	Aldicarb sulfoxide	ug/l	20.0	NA	
LCS2	Baygon	ug/l	20.0	NA	
LCS2	Carbofuran (Furadan)	ug/l	20.0	NA	
LCS2	Carbaryl	ug/l	20.0	NA	
LCS2	Methiocarb	ug/l	20.0	NA	
LCS2	Methomyl	ug/l	20.0	NA	
LCS2	Oxamyl (Vydate)	ug/l	20.0	NA	
MBLK	3-Hydroxycarbofuran	ug/l	ND	ND	
MBLK	Aldicarb (Temik)	ug/l	ND	ND	
MBLK	Aldicarb sulfone	ug/l	ND	ND	
MBLK	Aldicarb sulfoxide	ug/l	ND	ND	
MBLK	Baygon	ug/l	ND	ND	
MBLK	Carbofuran (Furadan)	ug/l	ND	ND	
MBLK	Carbaryl	ug/l	ND	ND	
MBLK	Methiocarb	ug/l	ND	ND	
MBLK	Methomyl	ug/l	ND	ND	
MBLK	Oxamyl (Vydate)	ug/l	ND	ND	
MS	3-Hydroxycarbofuran	ug/l	20.0	20.0	100

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Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Aldicarb (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Aldicarb (total)	ug/l	20.0	19.6	98
MS	Aldicarb sulfone	ug/l	20.0	19.3	96
MS	Aldicarb sulfoxide	ug/l	20.0	19.6	98
MS	Baygon	ug/l	20.0	20.1	100
MS	Carbofuran (furalan)	ug/l	20.0	19.9	100
MS	Carbaryl	ug/l	20.0	20.3	102
MS	Methoacarb	ug/l	20.0	18.5	92
MS	Methomyl	ug/l	20.0	18.5	92
MS	Oxamyl (Vydate)	ug/l	20.0	18.7	94
HSD	3-Hydroxycarbofuran	ug/l	20.0	20.2	101
HSD	Aldicarb (total)	ug/l	20.0	19.5	98
HSD	Aldicarb sulfone	ug/l	20.0	19.5	98
HSD	Aldicarb sulfoxide	ug/l	20.0	19.7	98
HSD	Baygon	ug/l	20.0	20.3	102
HSD	Carbofuran (furalan)	ug/l	20.0	20.2	101
HSD	Carbaryl	ug/l	20.0	20.4	102
HSD	Methoacarb	ug/l	20.0	20.3	102
HSD	Methomyl	ug/l	20.0	18.6	93
HSD	Oxamyl (Vydate)	ug/l	20.0	18.9	94

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Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Sample # 941021266 Sample ID WAIAPAHU WELL 111 GR2 Project 04-nov-1994
 Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Chlorinated Acids in Water (ML/EPA 515.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
2,4-D	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994
2,4,5-TP (Silvex)	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994
2,4,6-Tr	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994
2,4-DB	ug/l	ND				2	26-oct-1994	rvd	30-oct-1994
Dichloroprop	ug/l	ND				0.5	26-oct-1994	rvd	30-oct-1994
5-Hydroxydicamba	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994
Acifluorfen (qualitative)	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994
Bentazon	ug/l	ND				0.5	26-oct-1994	rvd	30-oct-1994
Chloramben (qualitative)	ug/l	ND				0.5	26-oct-1994	rvd	30-oct-1994
Dalapon (qualitative)	ug/l	ND				1	26-oct-1994	rvd	30-oct-1994
3,5-Dichlorobenzoic acid	ug/l	ND				0.6	26-oct-1994	rvd	30-oct-1994
DCPA	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994
Dinoseb	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994
pentachlorophenol	ug/l	ND				0.2	26-oct-1994	rvd	30-oct-1994
Picloram	ug/l	ND				0.1	26-oct-1994	rvd	30-oct-1994
3-Nitrophenol (qualitative)	ug/l	ND				0.5	26-oct-1994	rvd	30-oct-1994
Data Entry	--	11/03/94				0	26-oct-1994	rvd	30-oct-1994



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ATTN: Ron Fenstermacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

**Chlorinated Acids in Water (ML/EPA 515.1)
Surrogate Summary**

Parameter	Percent Recovery	Acceptable Range
2,4-Dichlorophenoxyacetic Acid	118	70 - 130

Report #: 16365



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ATTN: Ron Fenstermacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

Chlorinated Acids in Water (ML/EPA 515.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	2,4,5-TP (Silvex)	ug/l	0.500	0.52	104
LCS1	2,4-D	ug/l	1.00	1.01	101
LCS1	Bentazon	ug/l	1.00	1.06	106
LCS2	2,4,5-TP (Silvex)	ug/l	0.500	NA	
LCS2	2,4-D	ug/l	1.00	NA	
LCS2	Bentazon	ug/l	1.00	NA	
MBLK	2,4,5-TP	ug/l	ND	ND	
MBLK	2,4,5-TP (Silvex)	ug/l	ND	ND	
MBLK	2,4-D	ug/l	ND	ND	
MBLK	2,4-DB	ug/l	ND	ND	
MBLK	Dichloroprop	ug/l	ND	ND	
MBLK	5-Hydroxydicamba	ug/l	ND	ND	
MBLK	Acifluorfen (qualitative)	ug/l	ND	ND	
MBLK	Bentazon	ug/l	ND	ND	
MBLK	Chloramben (qualitative)	ug/l	ND	ND	
MBLK	Dalapon (qualitative)	ug/l	ND	ND	
MBLK	3,5-Dichlorobenzole acid	ug/l	ND	ND	
MBLK	DCPA	ug/l	ND	ND	
MBLK	Dicamba	ug/l	ND	ND	
MBLK	Dinoseb	ug/l	ND	ND	
MBLK	Bentachlorophenol	ug/l	ND	ND	
MBLK	Picloram	ug/l	ND	ND	
MBLK	2,4,6-Trichlorophenol (qualitative)	ug/l	ND	ND	
MS	2,4,5-TP (Silvex)	ug/l	0.500	0.53	106
MS	2,4-D	ug/l	1.00	1.06	106
MS	Bentazon	ug/l	1.00	1.14	114
MSD	2,4,5-TP (Silvex)	ug/l	0.500	NA	
MSD	2,4-D	ug/l	1.00	NA	
MSD	Bentazon	ug/l	1.00	NA	

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Sample # 941021266 Sample ID WAIIPAHU WELL_111_G#2 Project
 Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 02-nov-1994

SDWA Pesticides (ML/EPA 508)

Laboratory Report

Honolulu, City of
 Board of Water Supply Lab
 630 S Beretania St

Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
PCB 1016 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994 dst
PCB 1221 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994 dst
PCB 1232 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994 dst
PCB 1242 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994 dst
PCB 1248 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994 dst
PCB 1254 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994 dst
PCB 1260 Aroclor	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994 dst
Alpha-BHC	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Alachlor (Alamex)	ug/l	ND				0.05	24-oct-1994	rvd	30-oct-1994 dst
Aldrin	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Beta-BHC	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Chlordane	ug/l	ND				0.1	24-oct-1994	rvd	30-oct-1994 dst
Chlorothalonil (Dreco/HL 9545)	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Delta-BHC	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
P,p'-DDD	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
P,p'-DDE	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
P,p'-DDT	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Dieldrin	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Endrin Aldehyde	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Endrin	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Endosulfan I (alpha)	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Endosulfan II (beta)	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Ethion sulfate	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Heptachlor	ug/l	NA							
Heptachlor Epoxide	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Lindane (gamma-BHC)	ug/l	ND				0.01	24-oct-1994	rvd	30-oct-1994 dst
Methoxychlor	ug/l	ND				0.05	24-oct-1994	rvd	30-oct-1994 dst
Toxaphene	ug/l	ND				0.5	24-oct-1994	rvd	30-oct-1994 dst
Data Entry		11/03/94							

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Laboratory Report

<p>Honolulu, City of Board of Water Supply Lab 630 S Beretania St</p> <p>Honolulu, HI 96843 ATTN: Ron Fenstermacher</p>

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

<p>SDWA Pesticides (ML/EPA 508) Surrogate Summary</p>
--

Parameter	Percent Recovery	Acceptable Range
Dibromochloroacetate	100	70 - 130

Report #: 16365



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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941021266 Sample ID WAIPAHU WELL III G#2 Project _____
Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Aldrin	ug/l	0.05	0.03	60
LCS1	p,p' DDT	ug/l	0.10	0.09	90
LCS1	Dieldrin	ug/l	0.10	0.10	100
LCS1	Endrin	ug/l	0.10	0.10	100
LCS1	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
LCS1	Heptachlor	ug/l	0.05	0.03	60
LCS2	Aldrin	ug/l	0.05	NA	
LCS2	p,p' DDT	ug/l	0.10	NA	
LCS2	Dieldrin	ug/l	0.10	NA	
LCS2	Endrin	ug/l	0.10	NA	
LCS2	Gamma-BHC (Lindane)	ug/l	0.05	NA	
LCS2	Heptachlor	ug/l	0.05	NA	
MBLK	PCB 1016 Aroclor	ug/l	ND	ND	
MBLK	PCB 1221 Aroclor	ug/l	ND	ND	
MBLK	PCB 1232 Aroclor	ug/l	ND	ND	
MBLK	PCB 1242 Aroclor	ug/l	ND	ND	
MBLK	PCB 1248 Aroclor	ug/l	ND	ND	
MBLK	PCB 1254 Aroclor	ug/l	ND	ND	
MBLK	PCB 1260 Aroclor	ug/l	ND	ND	
MBLK	Alpha-BHC	ug/l	ND	ND	
MBLK	Acetochlor (Aterox)	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Chlordane	ug/l	ND	ND	
MBLK	Chlorthalonil (Drconil, Bravo)	ug/l	ND	ND	
MBLK	Delta-BHC	ug/l	ND	ND	
MBLK	p,p' DDD	ug/l	ND	ND	
MBLK	p,p' DDE	ug/l	ND	ND	
MBLK	p,p' DDT	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Endrin Aldehyde	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	

Report #: 16365



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Laboratory Report

Honolulu, City of
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 Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Sample # 941021266 Sample ID WAIPAHU WELL III GH2 Project _____
 Sample Type Water Sampled 20-oct-1994 Received 21-oct-1994 Reported 04-nov-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	XRecv
MBLK	Endosulfan I (alpha)	ug/l	ND	ND	
MBLK	Endosulfan II (beta)	ug/l	ND	ND	
MBLK	Endosulfan sulfate	ug/l	ND	ND	
MBLK	Gamma-BHC (Lindane)	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Toxaphene	ug/l	ND	ND	
HS	Aldrin	ug/l	0.05	0.05	100
HS	P,p' DDT	ug/l	0.10	0.10	100
HS	Dieldrin	ug/l	0.10	0.10	100
HS	Endrin	ug/l	0.10	0.10	100
HS	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
HS	Heptachlor	ug/l	0.05	0.05	100

Report #: 16365

Group Validation Comments

(508) Heptachlor reported as NA due to QC failure on LCS,
use 525.1 results for heptachlor. Reference QIR-GC-94-150.



MONTGOMERY LABORATORIES

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Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstemacher

MONTGOMERY LABORATORIES Submitted on FEB 14 1995 HDS <i>Hillary J</i>

Report#: 17843



MONTGOMERY LABORATORIES

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Sample # 950118021 Sample ID WAIIPAHU III - WELL 4 (2400-13) Project
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Beryllium, Total, ICAP	(ML/6010-200.7) mg/l	ND				0.02	30-Jan-1995	JPS	30-Jan-1995	JPS
Beryllium, Total, ICAP	(ML/6010-200.7) mg/l	ND				0.001	30-Jan-1995	JPS	30-Jan-1995	JPS
Cadmium, Total, GF	(ML/EPA200.9) ug/l	ND				0.001	02-Feb-1995	Wfm	02-Feb-1995	Wfm
Mercury	(ML/EPA 245.1) ug/l	ND				0.2	21-Jan-1995	gub	21-Jan-1995	gub
Beryllium, Total, ICAP	(ML/6010-200.7) mg/l	ND				0.01	30-Jan-1995	JPS	30-Jan-1995	JPS
Antimony, Total, GF	(ML/EPA200.9) mg/l	ND				0.005	01-Feb-1995	Wfm	01-Feb-1995	Wfm
Fluoride, Total, GF	(ML/EPA 200.9) mg/l	ND				0.001	29-Jan-1995	gub	01-Feb-1995	Wfm



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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

**Single Determination Analytes
Quality Control**

Control	Parameter	Units	Actual	Found	XRecv
LCS1	Barium, Total, ICAP	mg/L	1.0	0.92	92
LCS2	Barium, Total, ICAP	mg/L	1.0	1.06	106
MBLK	Barium, Total, ICAP	mg/L	ND	ND	
MS	Barium, Total, ICAP	mg/L	1.0	0.88	88
HSD	Barium, Total, ICAP	mg/L	1.0	0.88	88
LCS1	Beryllium, Total, ICAP	ng/L	0.05	0.0485	97
LCS2	Beryllium, Total, ICAP	ng/L	0.05	0.0476	95
MBLK	Beryllium, Total, ICAP	ng/L	ND	ND	
MS	Beryllium, Total, ICAP	ng/L	0.05	0.0476	95
HSD	Beryllium, Total, ICAP	ng/L	0.05	0.0482	96
LCS1	Cadmium, Total, GF	ng/L	0.01	0.0102	102
LCS2	Cadmium, Total, GF	ng/L	0.01	0.0117	117
MBLK	Cadmium, Total, GF	ng/L	ND	ND	
MS	Cadmium, Total, GF	ng/L	0.01	0.0105	105
HSD	Cadmium, Total, GF	ng/L	0.01	0.0106	106
LCS1	Mercury	ug/L	1.52	1.38	91
LCS2	Mercury	ug/L	1.52	1.40	92
MBLK	Mercury	ug/L	ND	nd	
MS	Mercury	ug/L	1.52	1.44	95
HSD	Mercury	ug/L	1.52	1.50	99
LCS1	Nickel, Total, ICAP	ng/L	0.5	0.498	100
LCS2	Nickel, Total, ICAP	ng/L	0.5	0.536	107
MBLK	Nickel, Total, ICAP	ng/L	ND	ND	
MS	Nickel, Total, ICAP	ng/L	0.5	0.485	97
HSD	Nickel, Total, ICAP	ng/L	0.5	0.511	96
LCS1	Antimony, Total, GF	ng/L	0.04	0.0380	95
LCS2	Antimony, Total, GF	ng/L	0.04	0.0390	94
MBLK	Antimony, Total, GF	ng/L	ND	ND	
MS	Antimony, Total, GF	ng/L	0.040	0.0372	93
HSD	Antimony, Total, GF	ng/L	0.040	0.0358	90
LCS1	Thallium, GF	ng/L	0.003	0.0037	117

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

**Single Determination Analytes
Quality Control**

Control	Parameter	Units	Actual	Found	±Recv
CS2	Thallium, GF	mg/l	0.008	0.00897	132
MBLK	Thallium, GF	mg/l	ND	ND	
MS	Thallium, GF	mg/l	0.008	0.00827	103
MSD	Thallium, GF	mg/l	0.008	0.00822	103

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Sample # 250118021 Sample ID WAIPAHU_III-WELL_4_(2400-13) Project _____
 Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

AB1803 - EDB and DECP (MI/EPA 504)

Laboratory Report

Honolulu, City of
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 630 S Beretania St
 Honolulu , HI 96843
 ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Ethylene Dibromide (EDB)	ug/l	0.02			0.01	0.01	24-Jan-1995	om	31-Jan-1995	mer
		02/13/95					24-Jan-1995	om	31-Jan-1995	mer



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 ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHA III-WELL 4 (2400-13) Project _____
 Sample Type Water Sampled 13-jan-1995 Received 18-jan-1995 Reported 14-feb-1995

AB1803 - EDB and DBCP (ML/EPA 504)
Quality Control

Control	Parameter	Units	Actual	Found	XRecv
LCS1	Dibromochloropropane (DBCP)	ug/l	0.10	0.13	150
LCS1	Ethylene Dibromide (EDB)	ug/l	0.10	0.12	120
LCS2	Dibromochloropropane (DBCP)	ug/l	0.10	NA	
LCS2	Ethylene Dibromide (EDB)	ug/l	0.10	NA	
MBLK	Dibromochloropropane (DBCP)	ug/l	ND	ND	
MBLK	Ethylene Dibromide (EDB)	ug/l	ND	ND	
MS	Dibromochloropropane (DBCP)	ug/l	0.10	NA	
MS	Ethylene Dibromide (EDB)	ug/l	0.10	NA	

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 ATTN: Ron Fenstermacher

Sample # 250118021 Sample ID WAIIPARU III-Well 4 (2400-13) Project
 Sample Type Water Sampled 13-Jan-1992 Received 18-Jan-1992 Reported 14-Feb-1992

525 Semivolatiles by GC/MS (ML/EPA 525.2)

Parameter	Units	Result	Conc.	Xrec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Alpha Chloridans	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
Acenaphthylene	ug/l	ND				0.1	26-Jan-1995	esk	30-Jan-1995	CRM
Arochlor	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
Aldrin	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
Althene	ug/l	ND				0.02	26-Jan-1995	esk	30-Jan-1995	CRM
Atrazine	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
Benzo(a)anthracene	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
Benzo(a)pyrene	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
Benzo(b)fluoranthene	ug/l	ND				0.02	26-Jan-1995	esk	30-Jan-1995	CRM
Benzo(g,h,i)Perylene	ug/l	ND				0.02	26-Jan-1995	esk	30-Jan-1995	CRM
Benzo(k)fluoranthene	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
D(2-Ethylhexyl)phthalate	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
Diethylphthalate	ug/l	ND				0.6	26-Jan-1995	esk	30-Jan-1995	CRM
Bromacil	ug/l	ND				0.5	26-Jan-1995	esk	30-Jan-1995	CRM
Chrysene	ug/l	ND				2	26-Jan-1995	esk	30-Jan-1995	CRM
Dibenz(a,h)anthracene	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
D(2-Ethylhexyl)adipate	ug/l	ND				0.02	26-Jan-1995	esk	30-Jan-1995	CRM
Diethylphthalate	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
Diflazon	ug/l	ND				0.6	26-Jan-1995	esk	30-Jan-1995	CRM
Dieldrin	ug/l	ND				0.5	26-Jan-1995	esk	30-Jan-1995	CRM
Dimethylphthalate	ug/l	ND				0.1	26-Jan-1995	esk	30-Jan-1995	CRM
Dimethylterephthalate	ug/l	ND				0.2	26-Jan-1995	esk	30-Jan-1995	CRM
Di-n-Butylphthalate	ug/l	ND				0.5	26-Jan-1995	esk	30-Jan-1995	CRM
Endrin	ug/l	0.6				0.5	26-Jan-1995	esk	30-Jan-1995	CRM
Fluorene	ug/l	ND				0.5	26-Jan-1995	esk	30-Jan-1995	CRM
Hexachlorocyclopentadiene	ug/l	ND				0.5	26-Jan-1995	esk	30-Jan-1995	CRM
Hexachlorobenzene	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
Hexachlorocyclopentadiene	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
Hexachlorocyclopentadiene	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM
Hexachlorocyclopentadiene	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995	CRM

Report #: 17843

CORRECTION

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



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Laboratory Report

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Sample # 25018021 - Sample ID WAIIPAMU 111-WELL 4 (2400-13) Project
 Sample Type Water - - - - - Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

Honolulu, HI 96843
 ATTN: Ron Fenstermacher

525 Semivolatiles by GC/MS (ML/EPA 525.2)

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed	By
1,1,1-Trichloroethane	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM
Acenaphthylene	ug/l	ND				0.1	26-Jan-1995	csk	30-Jan-1995	CFM
Arochlor 1248	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM
Aldrin	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM
Anthracene	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM
Atrazine	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM
Benz(a)anthracene	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM
Benzo(a)pyrene	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM
Benz(b)fluoranthene	ug/l	ND				0.02	26-Jan-1995	csk	30-Jan-1995	CFM
Benzo(g,h,i)perylene	ug/l	ND				0.02	26-Jan-1995	csk	30-Jan-1995	CFM
Benzo(k)fluoranthene	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM
Di(2-Ethylhexyl)phthalate	ug/l	ND				0.6	26-Jan-1995	csk	30-Jan-1995	CFM
Bis(2-Ethylhexyl)phthalate	ug/l	ND				0.6	26-Jan-1995	csk	30-Jan-1995	CFM
Bromacil	ug/l	ND				2	26-Jan-1995	csk	30-Jan-1995	CFM
Bis(2-Ethylhexyl)phthalate	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM
Chrysene	ug/l	ND				0.02	26-Jan-1995	csk	30-Jan-1995	CFM
Di(2-Ethylhexyl)sebacate	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM
Di-(2-Ethylhexyl)adipate	ug/l	ND				0.6	26-Jan-1995	csk	30-Jan-1995	CFM
Dibutylphthalate	ug/l	ND				0.6	26-Jan-1995	csk	30-Jan-1995	CFM
Diazinon	ug/l	ND				0.1	26-Jan-1995	csk	30-Jan-1995	CFM
Dieldrin	ug/l	ND				0.1	26-Jan-1995	csk	30-Jan-1995	CFM
Dimethylphthalate	ug/l	ND				0.2	26-Jan-1995	csk	30-Jan-1995	CFM
Dimethylterephthalate	ug/l	ND				0.5	26-Jan-1995	csk	30-Jan-1995	CFM
Di-n-Butylphthalate	ug/l	0.6				10	26-Jan-1995	csk	30-Jan-1995	CFM
Endrin	ug/l	ND				0.5	26-Jan-1995	csk	30-Jan-1995	CFM
Fluorene	ug/l	ND				0.1	26-Jan-1995	csk	30-Jan-1995	CFM
Gamma-Hexachlorocyclopentadiene	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM
Hexachlorobenzene	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM
Hexachlorocyclopentadiene	ug/l	ND				0.05	26-Jan-1995	csk	30-Jan-1995	CFM

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Laboratory Report

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 630 S Beretania St

Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIIPAW III-BELL 4 (2400-13) Project
 Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)

Parameter	Units	Result	Conc.	Rec	Dilution	Det.Limit	Prepared	By	Analyzed
Acetone	ug/l	ND				0.04	26-Jan-1995	esk	30-Jan-1995
Heptachlor Epoxide	ug/l	ND				0.02	26-Jan-1995	esk	30-Jan-1995
Endosulfan S	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995
Isophorone	ug/l	ND				0.5	26-Jan-1995	esk	30-Jan-1995
Endosulfan S	ug/l	ND				0.02	26-Jan-1995	esk	30-Jan-1995
Methoxychlor	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995
Heptachlor	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995
Mollinate	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995
Heptachlor	ug/l	ND				0.2	26-Jan-1995	esk	30-Jan-1995
trans-Nonachlor	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995
Pentachloroethane	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995
Phenanthrene	ug/l	ND				0.02	26-Jan-1995	esk	30-Jan-1995
Propachlor	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995
Propachlor	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995
Simazine	ug/l	ND				0.05	26-Jan-1995	esk	30-Jan-1995
Trifluralin	ug/l	ND				0.1	26-Jan-1995	esk	30-Jan-1995



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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	alpha-Chlordane	ug/l	2	2.12	106
LCS1	Acenaphthylene	ug/l	2	1.87	94
LCS1	Alachlor	ug/l	2	2.05	102
LCS1	Aldrin	ug/l	2	1.64	82
LCS1	Anthracene	ug/l	2	1.76	88
LCS1	Atrazine	ug/l	2	2.01	100
LCS1	Benzo(a)Anthracene	ug/l	2	1.75	88
LCS1	Benzo(a)pyrene	ug/l	2	1.99	100
LCS1	Benzo(b)Fluoranthene	ug/l	2	2.04	102
LCS1	Benzo(g,h,i)Perylene	ug/l	2	2.07	104
LCS1	Benzo(k)Fluoranthene	ug/l	2	2.04	102
LCS1	Di(2-Ethylhexyl)phthalate	ug/l	2	1.99	100
LCS1	Di(2-Propyl)phthalate	ug/l	2	1.75	88
LCS1	Chrysene	ug/l	2	1.81	90
LCS1	Di(2-Benz(e,h)Anthracene	ug/l	2	1.91	96
LCS1	Di-(2-Ethylhexyl)adipate	ug/l	2	1.87	94
LCS1	Diethylphthalate	ug/l	2	1.99	100
LCS1	Di(2-n-Butyl)phthalate	ug/l	2	1.69	84
LCS1	Endrin	ug/l	2	1.55	78
LCS1	Gamma-Chlordane	ug/l	2	1.90	95
LCS1	gamma-Chlordane	ug/l	2	1.92	96
LCS1	Hexachlorobutadiene	ug/l	2	1.77	89
LCS1	Hexachlorocyclopentadiene	ug/l	2	1.49	74
LCS1	Heptachlor	ug/l	2	1.70	85
LCS1	Heptachlor Epoxide	ug/l	2	1.89	94
LCS1	Indene(1,2,3-c,d)Pyrene	ug/l	2	2.06	103
LCS1	Lindane	ug/l	2	1.78	89
LCS1	Methoxychlor	ug/l	2	1.95	98
LCS1	Molinate	ug/l	2	1.82	91
LCS1	trans-Nonachlor	ug/l	2	2.15	108

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Laboratory Report

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Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
 Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

**525 Semivolatiles by GC/MS (ML/EPA 525.2)
 Quality Control**

Control	Parameter	Units	Actual	Found	XRecv
LCS1	Pentachlorophenol	ug/l	6	7.99	100
LCS1	Phenanthrene	ug/l	2	1.80	90
LCS1	Pyrene	ug/l	2	2.21	110
LCS1	Simazine	ug/l	2	2.20	110
MBLK	Triobencarb	ug/l	5	1.98	99
MBLK	alpha-Chlordane	ug/l	ND	ND	
MBLK	Acanaphthylene	ug/l	ND	ND	
MBLK	Alachlor	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Anthracene	ug/l	ND	ND	
MBLK	Atrazine	ug/l	ND	ND	
MBLK	Benz(a)Anthracene	ug/l	ND	ND	
MBLK	Benzo(a)Pyrene	ug/l	ND	ND	
MBLK	Benzo(b)Fluoranthene	ug/l	ND	ND	
MBLK	Benzo(g,h,i)Perylene	ug/l	ND	ND	
MBLK	Benzo(k)Fluoranthene	ug/l	ND	ND	
MBLK	Di(2-Ethylhexyl)phthalate	ug/l	ND	ND	
MBLK	Butylbenzylphthalate	ug/l	ND	ND	
MBLK	Bromocil	ug/l	ND	ND	
MBLK	Butachlor	ug/l	ND	ND	
MBLK	Chrysene	ug/l	ND	ND	
MBLK	Dibenz(a,h)Anthracene	ug/l	ND	ND	
MBLK	Di(2-Ethylhexyl)adipate	ug/l	ND	ND	
MBLK	Diethylphthalate	ug/l	ND	ND	
MBLK	Diazinon	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Dimethylphthalate	ug/l	ND	ND	
MBLK	Dimethoate	ug/l	ND	ND	
MBLK	Di-n-butylphthalate	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	
MBLK	Fluorene	ug/l	ND	ND	

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Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

**525 Semivolatiles by GC/MS (ML/EPA 525.2)
Quality Control**

Control	Parameter	Units	Actual	Found	Recv
MBLK	gamma-Chlordane	ug/l	ND	ND	
MBLK	Hexachlorobenzene	ug/l	ND	ND	
MBLK	Hexachlorocyclopentadiene	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Indeno(1,2,3,c,d)Pyrene	ug/l	ND	ND	
MBLK	Lachlor	ug/l	ND	ND	
MBLK	Lindane	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Metribuzin	ug/l	ND	ND	
MBLK	Nolimitz	ug/l	ND	ND	
MBLK	Metolachlor	ug/l	ND	ND	
MBLK	trans-nonachlor	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Phenanthrene	ug/l	ND	ND	
MBLK	Prometryn	ug/l	ND	ND	
MBLK	Propachlor	ug/l	ND	ND	
MBLK	Pyrene	ug/l	ND	ND	
MBLK	Simazine	ug/l	ND	ND	
MBLK	Thiobencarb	ug/l	ND	ND	
MBLK	Trifluralin	ug/l	ND	ND	
MS	alpha-Chlordane	ug/l	2	2.23	112
MS	Acephenylene	ug/l	2	1.82	91
MS	Alachlor	ug/l	2	2.22	111
MS	Aldrin	ug/l	2	1.84	92
MS	Anthracene	ug/l	2	1.13	56
MS	Atrazine	ug/l	2	2.14	107
MS	Benz(a)Anthracene	ug/l	2	1.72	86
MS	Benzo(a)pyrene	ug/l	2	2.10	105
MS	Benzo(b)Fluoranthene	ug/l	2	2.09	104
MS	Benzo(g,h,i)Perylene	ug/l	2	2.57	128

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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)
Quality Control

Control	Parameter	Units	Actual	Found	XRecv
MS	Benzo(a)fluoranthene	ug/l	2	2.12	106
MS	Di(2-Ethylhexyl)phthalate	ug/l	2	6.15	308
MS	Butylbenzylphthalate	ug/l	2	2.06	103
MS	Chrysene	ug/l	2	1.80	90
MS	Dibenz(a,h)anthracene	ug/l	2	2.28	112
MS	Di-(2-Ethylhexyl)adipate	ug/l	2	2.18	109
MS	Dioctylphthalate	ug/l	2	2.10	110
MS	Dimethylphthalate	ug/l	2	1.90	95
MS	Din-Butylphthalate	ug/l	2	2.36	118
MS	Endrin	ug/l	2	1.72	86
MS	Fluorene	ug/l	2	1.95	96
MS	gamma-Chlordane	ug/l	2	2.14	107
MS	Hexachlorobenzene	ug/l	2	1.55	78
MS	Hexachlorocyclopentadiene	ug/l	2	0.86	43
MS	Heptachlor	ug/l	2	1.61	80
MS	Heptachlor Epoxide	ug/l	2	2.00	100
MS	Indeno(1,2,3-cd)perylene	ug/l	2	2.39	120
MS	Lindane	ug/l	2	1.90	95
MS	Methoxychlor	ug/l	2	2.10	105
MS	Molinate	ug/l	2	1.93	96
MS	trans-Nonachlor	ug/l	2	2.04	102
MS	Pentachlorophenol	ug/l	8	10.1	126
MS	Phenanthrene	ug/l	2	1.53	76
MS	Pyrene	ug/l	2	2.25	112
MS	Simazine	ug/l	2	2.21	111
MS	Thiobencarb	ug/l	2	2.13	106

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Sample # 250118021 Sample ID WAIPAKU III-WELL 4 (2400-13) Project
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

Aldicarb

(ML/EPA 531.1)

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATM: Ron Fenstermacher

Parameter	Units	Result	Conc.	Xrec	Dilution	Det.Limit	Prepared	By	Analyzed
Aldicarb (Temkt)	ug/l	ND				2			26-Jan-1995 Yks
Aldicarb sulfide	ug/l	ND				0.5			26-Jan-1995 Yks
Aldicarb sulfoxide	ug/l	ND				0.5			26-Jan-1995 Yks
Carbofuran (Furadan)	ug/l	ND				2			26-Jan-1995 Yks
Carbofuryl	ug/l	ND				0.9			26-Jan-1995 Yks
Methiocarb	ug/l	ND				2			26-Jan-1995 Yks
Methomyl	ug/l	ND				2			26-Jan-1995 Yks
Oxemyl (Vydate)	ug/l	ND				2			26-Jan-1995 Yks



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ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

Aldicarbs	(ML/EPA 531.1)
Surrogate Summary	

Parameter	Percent Recovery	Acceptable Range
BDP	91%	80 - 120

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ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-jan-1995 Received 18-jan-1995 Reported 14-feb-1995

Aldicarb (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	3-Hydroxycarbofuran	ug/l	20.0	19.3	96
LCS1	Aldicarb (Temik)	ug/l	20.0	18.1	90
LCS1	Aldicarb sulfone	ug/l	20.0	19.7	98
LCS1	Aldicarb sulfoxide	ug/l	20.0	19.0	95
LCS1	Baygon	ug/l	20.0	19.5	98
LCS1	Carbofuran (Furadan)	ug/l	20.0	19.2	96
LCS1	Carbaryl	ug/l	20.0	19.2	97
LCS1	Methiocarb	ug/l	20.0	18.8	94
LCS1	Methomyl	ug/l	20.0	19.3	96
LCS1	Oxamyl (Vydate)	ug/l	20.0	19.3	96
LCS2	3-Hydroxycarbofuran	ug/l	20.0	NA	
LCS2	Aldicarb (Temik)	ug/l	20.0	NA	
LCS2	Aldicarb sulfone	ug/l	20.0	NA	
LCS2	Aldicarb sulfoxide	ug/l	20.0	NA	
LCS2	Baygon	ug/l	20.0	NA	
LCS2	Carbofuran (Furadan)	ug/l	20.0	NA	
LCS2	Carbaryl	ug/l	20.0	NA	
LCS2	Methiocarb	ug/l	20.0	NA	
LCS2	Methomyl	ug/l	20.0	NA	
LCS2	Oxamyl (Vydate)	ug/l	20.0	NA	
MBLK	3-Hydroxycarbofuran	ug/l	ND	ND	
MBLK	Aldicarb (Temik)	ug/l	ND	ND	
MBLK	Aldicarb sulfone	ug/l	ND	ND	
MBLK	Aldicarb sulfoxide	ug/l	ND	ND	
MBLK	Baygon	ug/l	ND	ND	
MBLK	Carbofuran (Furadan)	ug/l	ND	ND	
MBLK	Carbaryl	ug/l	ND	ND	
MBLK	Methiocarb	ug/l	ND	ND	
MBLK	Methomyl	ug/l	ND	ND	
MBLK	Oxamyl (Vydate)	ug/l	ND	ND	
MBLK	3-Hydroxycarbofuran	ug/l	20.0	20.5	102

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Laboratory Report

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Honolulu , HI 96843
ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-jan-1995 Received 18-jan-1995 Reported 14-feb-1995

Aldicarb (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	XRecv
MS	Aldicarb (1ml)	ug/l	20.0	19.5	98
MS	Aldicarb sulfone	ug/l	20.0	20.4	102
MS	Aldicarb sulfoxide	ug/l	20.0	22.0	110
MS	Baygon	ug/l	20.0	20.4	102
MS	Carbofuran (Furadan)	ug/l	20.0	20.2	101
MS	Carbaryl	ug/l	20.0	21.6	108
MS	Mehtiocarb	ug/l	20.0	21.6	108
MS	Methoaml	ug/l	20.0	19.7	98
MS	Oramyl (Oxydate)	ug/l	20.0	19.8	99
HSD	3-Hydroxycarbofuran	ug/l	20.0	20.7	104
HSD	Aldicarb (1ml)	ug/l	20.0	19.0	95
HSD	Aldicarb sulfone	ug/l	20.0	20.6	103
HSD	Aldicarb sulfoxide	ug/l	20.0	22.0	110
HSD	Baygon	ug/l	20.0	20.4	102
HSD	Carbofuran (Furadan)	ug/l	20.0	20.5	102
HSD	Carbaryl	ug/l	20.0	21.4	107
HSD	Mehtiocarb	ug/l	20.0	21.5	108
HSD	Methoaml	ug/l	20.0	20.1	100
HSD	Oramyl (Oxydate)	ug/l	20.0	20.1	100

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Sample # 920118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu HI 96843
ATTN: Ron Fenstermacher

Chlorinated Acids in Water (ML/EPA 515.1)

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed
2,4,5-TP (Silvex)	ug/l	ND				0.2	19-Jan-1995	rod	29-Jan-1995 dst
2,4-DB	ug/l	ND				0.2	19-Jan-1995	rod	29-Jan-1995 dst
2,4,6-TCP	ug/l	ND				0.2	19-Jan-1995	rod	29-Jan-1995 dst
5-Hydroxydicamba	ug/l	ND				0.2	19-Jan-1995	rod	29-Jan-1995 dst
Bentazon	ug/l	ND				0.2	19-Jan-1995	rod	29-Jan-1995 dst
Dalapon (qualitative)	ug/l	ND				0.5	19-Jan-1995	rod	29-Jan-1995 dst
DCPA	ug/l	ND				0.2	19-Jan-1995	rod	29-Jan-1995 dst
Dinoseb	ug/l	ND				0.2	19-Jan-1995	rod	29-Jan-1995 dst
Picloram	ug/l	ND				0.2	19-Jan-1995	rod	29-Jan-1995 dst
Data Entry	--	01/31/95				0	19-Jan-1995	rod	29-Jan-1995 dst



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 Honolulu , HI 96843
 ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
 Sample Type Water Sampled 13-jan-1995 Received 18-Jan-1995 Reported 14-feb-1995

Chlorinated Acids in Water (ML/EPA 515.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
2,4-Dichlorophenoxyacetic acid	69	70 - 130

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ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-jan-1995 Received 18-jan-1995 Reported 14-feb-1995

**Chlorinated Acids in Water (ML/EPA 515.1)
Quality Control**

Control	Parameter	Units	Actual	Found	%Recv
LCS1	2,4,5-TP (Silvex)	ug/l	0.500	0.52	104
LCS1	2,4-D	ug/l	1.00	0.90	90
LCS1	Bentazon	ug/l	1.00	1.03	103
LCS2	2,4,5-TP (Silvex)	ug/l	0.500	NA	
LCS2	2,4-D	ug/l	1.00	NA	
LCS2	Bentazon	ug/l	1.00	NA	
MBLK	2,4,5-TP	ug/l	ND	ND	
MBLK	2,4,5-TP (Silvex)	ug/l	ND	ND	
MBLK	2,4-D	ug/l	ND	ND	
MBLK	2,4-DB	ug/l	ND	ND	
MBLK	Dichloroprop	ug/l	ND	ND	
MBLK	5-Hydroxydicamba	ug/l	ND	ND	
MBLK	Acifluorfen (qualitative)	ug/l	ND	ND	
MBLK	Bentazon	ug/l	ND	ND	
MBLK	Chloramben (qualitative)	ug/l	ND	ND	
MBLK	Dalapon (qualitative)	ug/l	ND	ND	
MBLK	3,5-Dichlorobenzoic acid	ug/l	ND	ND	
MBLK	DCPA	ug/l	ND	ND	
MBLK	DTcamba	ug/l	ND	ND	
MBLK	Dinoseb	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Picloram	ug/l	ND	ND	
MBLK	Trifluroxeneol (qualitative)	ug/l	ND	ND	
NS	2,4,5-TP (Silvex)	ug/l	0.500	0.49	98
NS	2,4-D	ug/l	1.00	0.98	98
NS	Bentazon	ug/l	1.00	0.99	99
MSD	2,4,5-TP (Silvex)	ug/l	0.500	NA	
MSD	2,4-D	ug/l	1.00	NA	
MSD	Bentazon	ug/l	1.00	NA	

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Sample # 250118021 Sample ID WAIIPAMU III-WELL 4 (2400-13) Project
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

SDWA Pesticides

(ML/EPA 508)

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St.

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	X Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
PCB 101	ug/l	ND				0.1	18-Jan-1995	cfl	25-Jan-1995	dst
PCB 1221 Aroclor	ug/l	ND				0.1	18-Jan-1995	cfl	25-Jan-1995	dst
PCB 1221 B	ug/l	ND				0.1	18-Jan-1995	cfl	25-Jan-1995	dst
PCB 1242 Aroclor	ug/l	ND				0.1	18-Jan-1995	cfl	25-Jan-1995	dst
PCB 1242 B	ug/l	ND				0.1	18-Jan-1995	cfl	25-Jan-1995	dst
PCB 1254 Aroclor	ug/l	ND				0.1	18-Jan-1995	cfl	25-Jan-1995	dst
PCB 1254 B	ug/l	ND				0.1	18-Jan-1995	cfl	25-Jan-1995	dst
Alpha-BHC	ug/l	ND				0.01	18-Jan-1995	cfl	25-Jan-1995	dst
Beta-BHC	ug/l	ND				0.01	18-Jan-1995	cfl	25-Jan-1995	dst
Gamma-BHC	ug/l	ND				0.01	18-Jan-1995	cfl	25-Jan-1995	dst
Chlordane	ug/l	ND				0.1	18-Jan-1995	cfl	25-Jan-1995	dst
Chlorobenzene	ug/l	ND				0.01	18-Jan-1995	cfl	25-Jan-1995	dst
Delta-BHC	ug/l	ND				0.01	18-Jan-1995	cfl	25-Jan-1995	dst
Dieldrin	ug/l	ND				0.01	18-Jan-1995	cfl	25-Jan-1995	dst
Endrin	ug/l	ND				0.01	18-Jan-1995	cfl	25-Jan-1995	dst
Endosulfan II (beta)	ug/l	ND				0.01	18-Jan-1995	cfl	25-Jan-1995	dst
Heptachlor	ug/l	ND				0.01	18-Jan-1995	cfl	25-Jan-1995	dst
Lindane (gamma-BHC)	ug/l	ND				0.01	18-Jan-1995	cfl	25-Jan-1995	dst
Toxaphene	ug/l	ND				0.01	18-Jan-1995	cfl	25-Jan-1995	dst
Water Entry		0.25/95				0.5	18-Jan-1995	cfl	25-Jan-1995	dst

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Laboratory Report

Honolulu, City of
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ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHA 111-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

**SDWA Pesticides (ML/EPA 508)
Surrogate Summary**

Parameter	Percent Recovery	Acceptable Range
Dibutyl Chlorodate	100	70-130

Report #: 17843 -



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ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

SDWA Pesticides (ML/EPA 508) Quality Control

Control	Parameter	Units	Actual	Found	XRecv
LCS1	Aldrin	ug/l	0.05	0.05	100
LCS1	p,p' DDT	ug/l	0.10	0.10	100
LCS1	Dieldrin	ug/l	0.10	0.12	120
LCS1	Endrin	ug/l	0.10	0.12	120
LCS1	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
LCS1	Heptachlor	ug/l	0.05	0.05	100
LCS2	Aldrin	ug/l	0.05	NA	
LCS2	p,p' DDT	ug/l	0.10	NA	
LCS2	Dieldrin	ug/l	0.10	NA	
LCS2	Endrin	ug/l	0.10	NA	
LCS2	Gamma-BHC (Lindane)	ug/l	0.05	NA	
LCS2	Heptachlor	ug/l	0.05	NA	
MBLK	PCB 1016 Aroclor	ug/l	ND	ND	
MBLK	PCB 1221 Aroclor	ug/l	ND	ND	
MBLK	PCB 1232 Aroclor	ug/l	ND	ND	
MBLK	PCB 1242 Aroclor	ug/l	ND	ND	
MBLK	PCB 1248 Aroclor	ug/l	ND	ND	
MBLK	PCB 1254 Aroclor	ug/l	ND	ND	
MBLK	PCB 1260 Aroclor	ug/l	ND	ND	
MBLK	Alpha-BHC	ug/l	ND	ND	
MBLK	Lambda-BHC (Alarod)	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Chlordane	ug/l	ND	ND	
MBLK	Chlorthalonil (Orconil, Bravo)	ug/l	ND	ND	
MBLK	Delta-BHC	ug/l	ND	ND	
MBLK	p,p' DDD	ug/l	ND	ND	
MBLK	p,p' DDE	ug/l	ND	ND	
MBLK	p,p' DDT	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Endrin Aldehyde	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	

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Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Endosulfan II (alpha)	ug/l	ND	ND	
MBLK	Endosulfan II (beta)	ug/l	ND	ND	
MBLK	Endosulfan sulfate	ug/l	ND	ND	
MBLK	Gamma-BHC (Lindane)	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Toxaphene	ug/l	ND	ND	
MS	Aldrin	ug/l	0.05	0.05	100
MS	p,p' DDT	ug/l	0.10	0.10	100
MS	Dieldrin	ug/l	0.10	0.12	120
MS	Endrin	ug/l	0.10	0.12	120
MS	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
MS	Heptachlor	ug/l	0.05	0.06	120

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Sample # 250118021 - Sample ID HAIPARU III-CELL 4 (2400-13) - Project
Sample Type Water - Sampled 13-Jan-1992 Received 18-Jan-1992 Reported 14-Feb-1992

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	Xrec	Dilution	Det.Limit	Prepared	By	Analyzed
1,1,1-Trichloroethane	ug/l	ND			0.15	0.5			27-Jan-1995 yom
1,1,2-Trichloroethane	ug/l	ND			0.15	0.5			27-Jan-1995 yom
1,1,2-Dichloroethane	ug/l	ND			0.15	0.5			27-Jan-1995 yom
1,1,2-Trichloroethylene	ug/l	ND			0.15	0.5			27-Jan-1995 yom
1,1,2-Dichloroethene	ug/l	ND			0.15	0.5			27-Jan-1995 yom
1,2,3-Trichlorobenzene	ug/l	ND			0.15	0.5			27-Jan-1995 yom
1,2,4-Trichlorobenzene	ug/l	ND			0.15	0.5			27-Jan-1995 yom
1,2,4,5-Tetrachlorobenzene	ug/l	ND			0.15	0.5			27-Jan-1995 yom
1,2-Dichlorobenzene	ug/l	ND			0.15	0.5			27-Jan-1995 yom
1,3,5-Trimethylbenzene	ug/l	ND			0.15	0.5			27-Jan-1995 yom
p-Dichlorobenzene (1,4-DCB)	ug/l	ND			0.15	0.5			27-Jan-1995 yom
2-Butanone (MEK)	ug/l	ND			5	5			27-Jan-1995 yom
o-Chlorotoluene	ug/l	ND			0.5	0.5			27-Jan-1995 yom
4-Methyl-2-Pentanone (MIBK)	ug/l	ND			0.15	0.5			27-Jan-1995 yom
Bromobenzene	ug/l	ND			0.15	0.5			27-Jan-1995 yom
cis-1,2-Dichloroethylene	ug/l	ND			0.15	0.5			27-Jan-1995 yom
Carbon Tetrachloride	ug/l	ND			0.15	0.5			27-Jan-1995 yom

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Sample # 250118021 Sample ID WAIPAHU III-HELL 4 (2400-13) Project
 Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Laboratory Report

Honolulu, City of
 Board of Water Supply Lab
 630 S Beretania St
 Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	Rec	Dilution	Det.Limit	Prepared	By	Analyzed
Chloroform (Trichloromethane)	ug/l	ND				0.5			27-Jan-1995 yom
Chloroethane	ug/l	ND				0.5			27-Jan-1995 yom
1,1-Dichloroethane	ug/l	ND				0.5			27-Jan-1995 yom
1,1,1-Trichloroethane	ug/l	ND				0.5			27-Jan-1995 yom
1,1,2-Trichloroethane	ug/l	ND				0.5			27-Jan-1995 yom
1,2-Dichloroethane	ug/l	ND				0.5			27-Jan-1995 yom
Bromodichloromethane	ug/l	ND				0.5			27-Jan-1995 yom
Bromoform	ug/l	ND				0.5			27-Jan-1995 yom
Ethyl benzene	ug/l	ND				0.5			27-Jan-1995 yom
1,2-Dichlorobenzene	ug/l	ND				0.5			27-Jan-1995 yom
1,4-Dichlorobenzene	ug/l	ND				0.5			27-Jan-1995 yom
Fluorotrichloromethane (Freon 11)	ug/l	ND				0.5			27-Jan-1995 yom
1,1,1-Trichloroethane	ug/l	ND				0.5			27-Jan-1995 yom
Isopropylbenzene	ug/l	ND				0.5			27-Jan-1995 yom
1,2-Dichlorobenzene (o-Xylene)	ug/l	ND				0.5			27-Jan-1995 yom
m,p-Xylenes	ug/l	ND				0.5			27-Jan-1995 yom
1,3-Dichlorobenzene	ug/l	ND				0.5			27-Jan-1995 yom
n-Butylbenzene	ug/l	ND				0.5			27-Jan-1995 yom
1,2,4-Trichlorobenzene	ug/l	ND				0.5			27-Jan-1995 yom
o-Xylene	ug/l	ND				0.5			27-Jan-1995 yom
1,2,3-Trichlorobenzene	ug/l	ND				0.5			27-Jan-1995 yom
Tetrachloroethylene (PCE)	ug/l	ND				0.5			27-Jan-1995 yom
1,1,1,2-Tetrachloroethane	ug/l	ND				0.5			27-Jan-1995 yom
sec-Butylbenzene	ug/l	ND				0.5			27-Jan-1995 yom
1,2,4-Trichlorobenzene	ug/l	ND				0.5			27-Jan-1995 yom
trans-1,2-Dichloroethylene	ug/l	ND				0.5			27-Jan-1995 yom
1,1,2,2-Tetrachloroethane	ug/l	ND				0.5			27-Jan-1995 yom
Trichloroethylene (TCE)	ug/l	ND				0.5			27-Jan-1995 yom
1,1,1-Trichloroethane	ug/l	ND				0.5			27-Jan-1995 yom

Report #: 17843



MONTGOMERY LABORATORIES

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Pasadena, California 91101
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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-jan-1995 Received 18-jan-1995 Reported 14-feb-1995

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
4-Bromofluorobenzene	109	80 - 120
Toluene-d8	96	80 - 120
1,2-Dichloroethane-d6	103	80 - 120

Report #: 17843



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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St
Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	1,1,1-Trichloroethane	ug/l	4	6.97	102
LCS1	1,1,2,2-Tetrachloroethane	ug/l	4	4.37	109
LCS1	1,1,2-Trichloroethane	ug/l	4	4.03	101
LCS1	1,1-Dichloroethane	ug/l	4	4.06	102
LCS1	1,2-Dichloroethylene	ug/l	4	4.30	108
LCS1	1,2,4-Trichlorobenzene	ug/l	4	4.01	100
LCS1	1,2-Dichloroethane	ug/l	4	4.17	104
LCS1	1,2-Dichloropropane	ug/l	4	3.92	98
LCS1	1,3-Dichloropropane	ug/l	8	7.73	97
LCS1	p-Dichlorobenzene (1,4-DCB)	ug/l	4	4.10	102
LCS1	Benzene	ug/l	4	4.11	103
LCS1	cis-1,2-Dichloroethylene	ug/l	4	4.06	102
LCS1	Chlorobenzene	ug/l	4	3.93	98
LCS1	Carbon Tetrachloride	ug/l	4	4.24	106
LCS1	Bromoform	ug/l	4	3.92	98
LCS1	Chloroform (Trichloromethane)	ug/l	4	4.06	102
LCS1	Chlorodibromomethane	ug/l	4	3.56	89
LCS1	Bromodichloromethane	ug/l	4	3.55	89
LCS1	Dichloromethane	ug/l	4	3.66	92
LCS1	Ethyl benzene	ug/l	4	4.23	106
LCS1	1,1-Dibromoethane (E-501)	ug/l	4	4.16	104
LCS1	m,p-Xylenes	ug/l	8	8.56	107
LCS1	o-Xylenes	ug/l	4	4.11	103
LCS1	o-Dichlorobenzene (1,2-DCB)	ug/l	4	4.13	103
LCS1	1,2-Dichloroethylene (DCE)	ug/l	4	4.07	102
LCS1	Styrene	ug/l	4	4.16	104
LCS1	trans-1,2-Dichloroethylene	ug/l	4	4.10	102
LCS1	Trichloroethylene (TCE)	ug/l	4	4.05	101
LCS1	Trichlorotrifluoroethane (Freon)	ug/l	4	4.06	102
LCS1	Toluene	ug/l	4	4.02	100
LCS1	Vinyl Chloride (VC)	ug/l	4	3.99	100

Report #: 17843



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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 95011B021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-Jan-1995 Received 18-Jan-1995 Reported 14-Feb-1995

**Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control**

Control	Parameter	Units	Actual	Found	XRecv
MBLK	1,1,1,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,1-Trichloroethane	ug/l	ND	ND	
MBLK	1,1,2,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,2-Trichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethylene	ug/l	ND	ND	
MBLK	1,2-Dichloropropane	ug/l	ND	ND	
MBLK	1,2,3-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,5-Trichloropropene	ug/l	ND	ND	
MBLK	1,2,4-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,4-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,2-Dichloroethane	ug/l	ND	ND	
MBLK	1,2-Dichloropropane	ug/l	ND	ND	
MBLK	1,3,5-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,3-Dichloropropane	ug/l	ND	ND	
MBLK	p-Dichlorobenzene (1,4-DCB)	ug/l	ND	ND	
MBLK	2,2-Dichloropropane	ug/l	ND	ND	
MBLK	2-Butanone (MEK)	ug/l	ND	ND	
MBLK	2-Chloroethylvinyl ether	ug/l	ND	ND	
MBLK	o-Chlorotoluene	ug/l	ND	ND	
MBLK	p-Chlorotoluene	ug/l	ND	ND	
MBLK	4-Methyl-2-Pentanone (MIBK)	ug/l	ND	ND	
MBLK	Benzene	ug/l	ND	ND	
MBLK	Bromobenzene	ug/l	ND	ND	
MBLK	Bromochloroethane (Methyl Bromide)	ug/l	ND	ND	
MBLK	cis-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	Chlorobenzene	ug/l	ND	ND	
MBLK	Carbon Tetrachloride	ug/l	ND	ND	
MBLK	1,1,1,3-Tetrachloropropane	ug/l	ND	ND	
MBLK	Bromoform	ug/l	ND	ND	
MBLK	Chloroform (Trichloromethane)	ug/l	ND	ND	

Report #: 17845



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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 950118021 Sample ID WAIPAHU III-WELL 4 (2400-13) Project _____
Sample Type Water Sampled 13-jan-1995 Received 18-jan-1995 Reported 14-feb-1995

**Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control**

Control	Parameter	Units	Actual	Found	XRecv
MBLK	Bromochloromethane	ug/l	ND	ND	
MBLK	Chloroethane	ug/l	ND	ND	
MBLK	Chloromethane (Methyl Chloride)	ug/l	ND	ND	
MBLK	Chlorodibromomethane	ug/l	ND	ND	
MBLK	Dibromomethane	ug/l	ND	ND	
MBLK	Bromodichloromethane	ug/l	ND	ND	
MBLK	Dichloromethane	ug/l	ND	ND	
MBLK	Ethyl benzene	ug/l	ND	ND	
MBLK	Dichlorodifluoromethane	ug/l	ND	ND	
MBLK	Fluorotrichloromethane (Freon1)	ug/l	ND	ND	
MBLK	Hexachlorobutadiene	ug/l	ND	ND	
MBLK	Isopropylbenzene	ug/l	ND	ND	
MBLK	m-Dichlorobenzene (1,3-DCB)	ug/l	ND	ND	
MBLK	m,p-Xylenes	ug/l	ND	ND	
MBLK	Naphthalene	ug/l	ND	ND	
MBLK	n-Butylbenzene	ug/l	ND	ND	
MBLK	n-Propylbenzene	ug/l	ND	ND	
MBLK	o-Xylene	ug/l	ND	ND	
MBLK	o-Dichlorobenzene (1,2-DCB)	ug/l	ND	ND	
MBLK	Tetrachloroethylene (PCE)	ug/l	ND	ND	
MBLK	p-Isopropyltoluene	ug/l	ND	ND	
MBLK	sec-Butylbenzene	ug/l	ND	ND	
MBLK	Styrene	ug/l	ND	ND	
MBLK	trans-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	tert-Butylbenzene	ug/l	ND	ND	
MBLK	Trichloroethylene (TCE)	ug/l	ND	ND	
MBLK	Trichlorotrifluoroethane (Freon)	ug/l	ND	ND	
MBLK	trans-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Toluene	ug/l	ND	ND	
MBLK	Vinyl chloride (VC)	ug/l	ND	ND	

Report #: 17843



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5

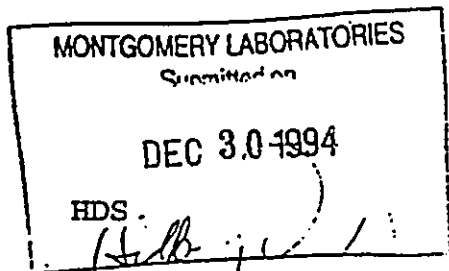
Laboratory Report

for

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843

Attention: Ron Fenstemacher



Report#: 17105

Report Summary of positive results, PR17105

			Result	MDL	UNITS
Analyzed	941202078	WAIPAHU WELL III HOLE #5			
12/09/94	Data Entry		12/12/94		--
12/09/94	Ethylene Dibromide (EDB)		0.02	.010	UGL
12/12/94	Data Entry		12/15/94		--
12/10/94	Data Entry		12/19/94		--
12/02/94	Data Entry		12/09/94		--



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Sample # 241202078 Sample ID WAIPIAHU WELL 111 HOLE #5 Project
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

LABORATORY REPORT

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed
Boron, Total, ICAP	(HL/6010:200.7) mg/l	ND				0.02			09-dec-1994 Jpn
Beryllium, Total, ICAP	(HL/6010:200.7) mg/l	ND			1	0.001			09-dec-1994 Jpn
Cadmium, Total, ICAP	(HL/EPA206.2) mg/l	ND				0.001	12-dec-1994 MIm		12-dec-1994 MIm
Mercury	(HL/EPA 245.1) ug/l	ND				0.2	09-dec-1994 eyw		10-dec-1994 gub
Lead, Total, ICAP	(HL/6010:200.7) mg/l	ND				0.01			09-dec-1994 Jpn
Antimony, Total, GF	(HL/EPA200.9) mg/l	ND				0.005	10-dec-1994 MIm		10-dec-1994 MIm
Thallium, Total, GF	(HL/EPA206.9) mg/l	ND				0.001	09-dec-1994 gub		28-dec-1994 MIm



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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

**Single Determination Analytes
Quality Control**

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Barium, Total, ICAP	mg/l	1.0	0.994	99
LCS2	Barium, Total, ICAP	mg/l	1.0	0.982	98
HBLK	Barium, Total, ICAP	mg/l	ND	ND	
HS	Barium, Total, ICAP	mg/l	1.0	1.01	101
HSD	Barium, Total, ICAP	mg/l	1.0	1.03	103
LCS1	Beryllium, Total, ICAP	ug/l	0.05	0.0473	95
LCS2	Beryllium, Total, ICAP	ug/l	0.05	0.0462	92
HBLK	Beryllium, Total, ICAP	ug/l	ND	ND	
HS	Beryllium, Total, ICAP	ug/l	0.05	0.0474	95
HSD	Beryllium, Total, ICAP	ug/l	0.05	0.0495	99
LCS1	Cadmium, Total, GF	ug/l	0.01	0.0113	113
LCS2	Cadmium, Total, GF	ug/l	0.01	0.0113	113
HBLK	Cadmium, Total, GF	ug/l	ND	ND	
HS	Cadmium, Total, GF	ug/l	0.01	0.0096	96
HSD	Cadmium, Total, GF	ug/l	0.01	0.0104	104
LCS1	Mercury	ug/l	1.50	1.30	87
LCS2	Mercury	ug/l	1.50	1.29	86
HBLK	Mercury	ug/l	ND	ND	
HS	Mercury	ug/l	1.50	1.27	85
HSD	Mercury	ug/l	1.50	1.27	85
LCS1	Nickel, Total, ICAP	mg/l	0.5	0.499	100
LCS2	Nickel, Total, ICAP	mg/l	0.5	0.484	97
HBLK	Nickel, Total, ICAP	mg/l	ND	ND	
HS	Nickel, Total, ICAP	mg/l	0.5	0.509	102
HSD	Nickel, Total, ICAP	mg/l	0.5	0.517	103
LCS1	Antimony, Total, GF	ug/l	0.04	0.0457	114
LCS2	Antimony, Total, GF	ug/l	0.04	0.0440	110
HBLK	Antimony, Total, GF	ug/l	ND	ND	
HS	Antimony, Total, GF	ug/l	0.040	0.0440	110
HSD	Antimony, Total, GF	ug/l	0.040	0.0479	120
LCS1	Thallium, GF	ug/l	0.008	0.00783	123

Report #: 17105



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Laboratory Report

Honolulu, City of
 Board of Water Supply Lab
 630 S Beretania St
 Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHA WELL III HOLE #5 Project _____
 Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Single Determination Analytes Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Barium, Total, ICAP	mg/l	1.0	0.994	99
LCS2	Barium, Total, ICAP	mg/l	1.0	0.982	98
MBLK	Barium, Total, ICAP	mg/l	ND	ND	
MS	Barium, Total, ICAP	mg/l	1.0	1.01	101
MSD	Barium, Total, ICAP	mg/l	1.0	1.03	103
LCS1	Beryllium, Total, ICAP	mg/l	0.05	0.0473	95
LCS2	Beryllium, Total, ICAP	mg/l	0.05	0.0462	92
MBLK	Beryllium, Total, ICAP	mg/l	ND	ND	
MS	Beryllium, Total, ICAP	mg/l	0.05	0.0474	95
MSD	Beryllium, Total, ICAP	mg/l	0.05	0.0495	99
LCS1	Cadmium, Total, GF	mg/l	0.01	0.0113	113
LCS2	Cadmium, Total, GF	mg/l	0.01	0.0115	115
MBLK	Cadmium, Total, GF	mg/l	ND	ND	
MS	Cadmium, Total, GF	mg/l	0.01	0.0096	96
MSD	Cadmium, Total, GF	mg/l	0.01	0.0102	102
LCS1	Mercury	ug/l	1.50	1.30	87
LCS2	Mercury	ug/l	1.50	1.29	86
MBLK	Mercury	ug/l	ND	ND	
MS	Mercury	ug/l	1.50	1.27	85
MSD	Mercury	ug/l	1.50	1.27	85
LCS1	Nickel, Total, ICAP	mg/l	0.5	0.499	100
LCS2	Nickel, Total, ICAP	mg/l	0.5	0.484	97
MBLK	Nickel, Total, ICAP	mg/l	ND	ND	
MS	Nickel, Total, ICAP	mg/l	0.5	0.509	102
MSD	Nickel, Total, ICAP	mg/l	0.5	0.517	103
LCS1	Antimony, Total, GF	mg/l	0.04	0.0457	114
LCS2	Antimony, Total, GF	mg/l	0.04	0.0440	110
MBLK	Antimony, Total, GF	mg/l	ND	ND	
MS	Antimony, Total, GF	mg/l	0.040	0.0440	110
MSD	Antimony, Total, GF	mg/l	0.040	0.0479	120
LCS1	Thallium, GF	mg/l	0.008	0.00733	92

Report #: 17105



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Pasadena, California 91101
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Sample # 24120278 Sample ID HAIPAHU WELL 111 HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

AB1803 - EDB and DBCP (ML/EPA 504)

Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
Dibromochloroacetic Acid (DBCP)	ug/l	0.02				0.01	08-dec-1994	hth	09-dec-1994
Ethylene Dibromide (EDB)	ug/l					0.01	08-dec-1994	hth	09-dec-1994
DATA ENTRY		12/12/94				0.01	08-dec-1994	hth	09-dec-1994



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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

AB1803 - EDB and DBCP (ML/EPA 504)
Quality Control

Control	Parameter	units	Actual	Found	XRecv
LCS1	Dibromochloropropane (DBCP)	ug/L	0.10	0.11	110
LCS1	Ethylene Dibromide (EDB)	ug/L	0.10	0.11	110
LCS2	Dibromochloropropane (DBCP)	ug/L	0.10	0.10	100
LCS2	Ethylene Dibromide (EDB)	ug/L	0.10	0.10	100
MBLK	Dibromochloropropane (DBCP)	ug/L	ND	ND	
MBLK	Ethylene Dibromide (EDB)	ug/L	ND	ND	
NS	Dibromochloropropane (DBCP)	ug/L	0.10	NA	
NS	Ethylene Dibromide (EDB)	ug/L	0.10	NA	

Report #: 17105



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Laboratory Report

Honolulu, City of
 Board of Water Supply Lab
 630 S Beretania St

 Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Sample # 241202078 Sample ID WAIPAHU WELL III HOLE #5 Project -
 Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed
1,1-Dichloroethane	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994
Acenaphthylene	ug/l	ND				0.1	05-dec-1994	csk	08-dec-1994
Acenaphthylene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994
Aldrin	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994
Atrazine	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994
Atrazine	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994
Benzo(a)anthracene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994
Benzo(a)pyrene	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994
Benzo(b)fluoranthene	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994
Benzo(g,h,i)perylene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994
Benzo(k)fluoranthene	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994
Benzothiazole	ug/l	ND				0.6	05-dec-1994	csk	08-dec-1994
Di(2-Ethylhexyl)phthalate	ug/l	ND				0.6	05-dec-1994	csk	08-dec-1994
Dibenz(a,h)anthracene	ug/l	ND				0.15	05-dec-1994	csk	08-dec-1994
Bromacil	ug/l	ND				2	05-dec-1994	csk	08-dec-1994
Butadiol	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994
Chrysene	ug/l	ND				0.02	05-dec-1994	csk	08-dec-1994
Dibenz(a,h)anthracene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994
Di-(2-Ethylhexyl)adipate	ug/l	ND				0.6	05-dec-1994	csk	08-dec-1994
Dibenzophthalate	ug/l	ND				0.15	05-dec-1994	csk	08-dec-1994
Diazinon	ug/l	ND				0.1	05-dec-1994	csk	08-dec-1994
Dieldrin	ug/l	ND				0.12	05-dec-1994	csk	08-dec-1994
Dimethylphthalate	ug/l	ND				0.5	05-dec-1994	csk	08-dec-1994
Bimethate	ug/l	ND				10	05-dec-1994	csk	08-dec-1994
Di-n-Butylphthalate	ug/l	ND				0.5	05-dec-1994	csk	08-dec-1994
Endrin	ug/l	ND				0.1	05-dec-1994	csk	08-dec-1994
Fluorene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994
Gamma-chlorane	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994
Hexachlorobenzene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994
Hexachlorocyclopentadiene	ug/l	ND				0.05	05-dec-1994	csk	08-dec-1994



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Sample # 241202078 Sample ID WAIPIHU WELL III_HOLE #5 Project
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)

LABORATORY REPORT

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Heptachlor	ug/l	ND				0.05	05-dec-1994	esk	08-dec-1994	cfw
Heptachlor Epoxide	ug/l	ND				0.02	05-dec-1994	esk	08-dec-1994	cfw
Heptachlor Epoxide	ug/l	ND				0.05	05-dec-1994	esk	08-dec-1994	cfw
Isophorone	ug/l	ND				0.5	05-dec-1994	esk	08-dec-1994	cfw
Isophorone	ug/l	ND				0.02	05-dec-1994	esk	08-dec-1994	cfw
Methoxychlor	ug/l	ND				0.05	05-dec-1994	esk	08-dec-1994	cfw
Methoxychlor	ug/l	ND				0.05	05-dec-1994	esk	08-dec-1994	cfw
Molinate	ug/l	ND				0.2	05-dec-1994	esk	08-dec-1994	cfw
Molinate	ug/l	ND				0.05	05-dec-1994	esk	08-dec-1994	cfw
trans-Nonachlor	ug/l	ND				0.05	05-dec-1994	esk	08-dec-1994	cfw
trans-Nonachlor	ug/l	ND				0.05	05-dec-1994	esk	08-dec-1994	cfw
Phenanthrene	ug/l	ND				0.02	05-dec-1994	esk	08-dec-1994	cfw
Phenanthrene	ug/l	ND				0.05	05-dec-1994	esk	08-dec-1994	cfw
Propachlor	ug/l	ND				0.05	05-dec-1994	esk	08-dec-1994	cfw
Propachlor	ug/l	ND				0.05	05-dec-1994	esk	08-dec-1994	cfw
Sifmazine	ug/l	ND				0.05	05-dec-1994	esk	08-dec-1994	cfw
Thiobencarb	ug/l	ND				0.05	05-dec-1994	esk	08-dec-1994	cfw
Trifluralin	ug/l	ND				0.1	05-dec-1994	esk	08-dec-1994	cfw



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630 S Beretania St

Honolulu , HI 96843
ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

**525 Semivolatiles by GC/MS (ML/EPA 525.1)
Surrogate Summary**

Parameter	Percent Recovery	Acceptable Range
Per/dec-d1E	102	70 - 130

Report #: 17105



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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

**525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control**

Control	Parameter	Units	Actual	Found	XRecv
LCS1	alpha-Chlordane	ug/L	2	1.93	96
LCS1	Acenaphthylene	ug/L	2	1.82	91
LCS1	Alachlor	ug/L	2	2.08	104
LCS1	Aldrin	ug/L	2	1.83	92
LCS1	Anthracene	ug/L	2	1.71	86
LCS1	Atrazine	ug/L	2	1.86	93
LCS1	Benzo(a)Anthracene	ug/L	2	1.74	87
LCS1	Benzo(a)pyrene	ug/L	2	1.78	89
LCS1	Benzo(b)fluoranthene	ug/L	2	1.94	97
LCS1	Benzo(g,h,i)Perylene	ug/L	2	1.87	94
LCS1	Benzo(k)fluoranthene	ug/L	2	1.79	90
LCS1	Di(2-Ethylhexyl)phthalate	ug/L	2	2.00	100
LCS1	Butylbenzylphthalate	ug/L	2	1.76	87
LCS1	Chrysene	ug/L	2	1.81	90
LCS1	DiBenz(a,h)Anthracene	ug/L	2	1.78	89
LCS1	Di-(2-Ethylhexyl)adipate	ug/L	2	1.56	78
LCS1	Diethylphthalate	ug/L	2	1.94	97
LCS1	Dimethylphthalate	ug/L	2	1.89	94
LCS1	Di-n-butylphthalate	ug/L	2	2.07	104
LCS1	Endrin	ug/L	2	1.95	98
LCS1	Fluorene	ug/L	2	1.87	94
LCS1	gamma-Chlordane	ug/L	2	1.90	95
LCS1	Hexachlorobenzene	ug/L	2	1.68	84
LCS1	Hexachlorocyclopentadiene	ug/L	2	1.18	59
LCS1	Heptachlor	ug/L	2	1.96	98
LCS1	Heptachlor Epoxide	ug/L	2	1.86	93
LCS1	Indeno(1,2,3-c,d)Pyrene	ug/L	2	1.81	90
LCS1	Lindane	ug/L	2	1.76	88
LCS1	Methoxychlor	ug/L	2	1.92	96
LCS1	Molinate	ug/L	2	1.90	95
LCS1	trans-Nonachlor	ug/L	2	1.85	92

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Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Pentachlorophenol	ug/l	2	6.57	80
LCS1	Phenanthrene	ug/l	2	1.79	90
LCS1	Pyrene	ug/l	2	2.01	100
LCS1	Simazine	ug/l	2	1.90	95
LCS1	Thiobencarb	ug/l	2	1.89	94
NBLK	alpha-Chlordane	ug/l	ND	ND	
NBLK	Acenaphthylene	ug/l	ND	ND	
NBLK	Alachlor	ug/l	ND	ND	
NBLK	Aldrin	ug/l	ND	ND	
NBLK	Anthracene	ug/l	ND	ND	
NBLK	Atrazine	ug/l	ND	ND	
NBLK	Benz(a)Anthracene	ug/l	ND	ND	
NBLK	Benzo(a)pyrene	ug/l	ND	ND	
NBLK	Benzo(b)Fluoranthene	ug/l	ND	ND	
NBLK	Benzo(g,h,i)Perylene	ug/l	ND	ND	
NBLK	Benzo(k)Fluoranthene	ug/l	ND	ND	
NBLK	Di(2-Ethylhexyl)phthalate	ug/l	ND	ND	
NBLK	Butylbenzylphthalate	ug/l	ND	ND	
NBLK	Bromacil	ug/l	ND	ND	
NBLK	Butachlor	ug/l	ND	ND	
NBLK	Chrysene	ug/l	ND	ND	
NBLK	Dibenz(a,h)Anthracene	ug/l	ND	ND	
NBLK	Di(2-Ethylhexyl)adipate	ug/l	ND	ND	
NBLK	Diethylphthalate	ug/l	ND	ND	
NBLK	Diazinon	ug/l	ND	ND	
NBLK	Dieldrin	ug/l	ND	ND	
NBLK	Dimethylphthalate	ug/l	ND	ND	
NBLK	Dimethoate	ug/l	ND	ND	
NBLK	Di-n-butylphthalate	ug/l	ND	ND	
NBLK	Endrin	ug/l	ND	ND	
NBLK	Fluorene	ug/l	ND	ND	

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Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	XRecv
MBLK	gamma-Chlordane	ug/l	ND	ND	
MBLK	Hexachlorobenzene	ug/l	ND	ND	
MBLK	Hexachlorocyclopentadiene	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Indeno(1,2,3,c,d)Pyrene	ug/l	ND	ND	
MBLK	Isophorone	ug/l	ND	ND	
MBLK	Lindane	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Metribuzin	ug/l	ND	ND	
MBLK	Nolinate	ug/l	ND	ND	
MBLK	Metolachlor	ug/l	ND	ND	
MBLK	trans-Nonachlor	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Phenanthrene	ug/l	ND	ND	
MBLK	Prometryn	ug/l	ND	ND	
MBLK	Propachlor	ug/l	ND	ND	
MBLK	Pyrene	ug/l	ND	ND	
MBLK	Stiazine	ug/l	ND	ND	
MBLK	Thiobencarb	ug/l	ND	ND	
MBLK	Trifluralin	ug/l	ND	ND	
MS	alpha-Chlordane	ug/l	2	2.02	101
MS	Acenaphthylene	ug/l	2	1.78	89
MS	Alachlor	ug/l	2	2.09	104
MS	Aldrin	ug/l	2	1.89	94
MS	Anthracene	ug/l	2	1.77	88
MS	Atrazine	ug/l	2	1.98	99
MS	Benz(a)Anthracene	ug/l	2	1.79	90
MS	Benzo(a)Pyrene	ug/l	2	1.87	93
MS	Benzo(b)Fluoranthene	ug/l	2	1.94	97
MS	Benzo(p,i)Fluoranthene	ug/l	2	1.90	95

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ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

525 Semivolatiles by GC/MS (ML/EPA 525.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Benzo(b)fluoranthene	ug/l	2	1.86	93
MS	Di(2-Ethylhexyl)phthalate	ug/l	2	2.08	104
MS	Butylbenzylphthalate	ug/l	2	1.78	89
MS	Chrysene	ug/l	2	1.85	92
MS	Dibenz(a,h)Anthracene	ug/l	2	1.86	93
MS	Di-(2-Ethylhexyl)adipate	ug/l	2	1.70	85
MS	Diethylphthalate	ug/l	2	1.97	98
MS	Dimethylphthalate	ug/l	2	1.91	96
MS	Din-butylphthalate	ug/l	2	2.12	106
MS	Endrin	ug/l	2	2.06	103
MS	Fluorene	ug/l	2	1.92	96
MS	gamma-Chlordane	ug/l	2	1.93	96
MS	Hexachlorobenzene	ug/l	2	1.83	92
MS	Hexachlorocyclopentadiene	ug/l	2	1.30	65
MS	Heptachlor	ug/l	2	1.92	96
MS	Heptachlor Epoxide	ug/l	2	1.93	96
MS	Indeno(1,2,3-cd)Pyrene	ug/l	2	1.82	91
MS	Lindane	ug/l	2	1.87	94
MS	Methoxychlor	ug/l	2	1.92	96
MS	Molinate	ug/l	2	1.87	94
MS	trans-nonachlor	ug/l	2	1.97	98
MS	Pentachlorophenol	ug/l	8	5.88	74
MS	Perfluorobenzene	ug/l	2	1.88	94
MS	Pyrene	ug/l	2	2.09	104
MS	Simazine	ug/l	2	1.90	95
MS	Thiobencarb	ug/l	2	1.93	96

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Sample # 241202078 Sample ID WAIIPAHU WELL L11 HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Aldicarb

(ML/EPA 531.1)

LABORATORY REPORT

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed	BY
Aldicarb (Temik)	ug/l	RD				0.5			10-dec-1994	LIJ
Aldicarb sulfone	ug/l	RD				0.5			10-dec-1994	LIJ
Aldicarb sulfoxide	ug/l	RD				0.5			10-dec-1994	LIJ
Baygon	ug/l	RD				0.9			10-dec-1994	LIJ
Carbofuran (Furadan)	ug/l	RD				0.9			10-dec-1994	LIJ
Carbaryl	ug/l	RD				2			10-dec-1994	LIJ
Methiocarb	ug/l	RD				2			10-dec-1994	LIJ
Methoxy	ug/l	RD				2			10-dec-1994	LIJ
Oxamyl (Vydate)	ug/l	RD				2			10-dec-1994	LIJ



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 Honolulu, HI 96843
 ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
 Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

**Aldicarb (ML/EPA 531.1)
 Surrogate Summary**

Parameter	Percent Recovery	Acceptable Range
EDHC	69	60-120

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 ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
 Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Aldicarb (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	3-Hydroxycarbofuran	ug/l	20.0	18.8	94
LCS1	Aldicarb (Temik)	ug/l	20.0	18.7	94
LCS1	Aldicarb sulfone	ug/l	20.0	18.1	90
LCS1	Aldicarb sulfoxide	ug/l	20.0	17.8	89
LCS1	Baygon	ug/l	20.0	19.0	95
LCS1	Carbofuran (Furadan)	ug/l	20.0	19.0	95
LCS1	Carbaryl	ug/l	20.0	19.3	96
LCS1	Methiocarb	ug/l	20.0	19.3	96
LCS1	Methomyl	ug/l	20.0	18.0	90
LCS1	Oxamyl (Vydate)	ug/l	20.0	18.1	90
LCS2	3-Hydroxycarbofuran	ug/l	20.0	NA	
LCS2	Aldicarb (Temik)	ug/l	20.0	NA	
LCS2	Aldicarb sulfone	ug/l	20.0	NA	
LCS2	Aldicarb sulfoxide	ug/l	20.0	NA	
LCS2	Baygon	ug/l	20.0	NA	
LCS2	Carbofuran (Furadan)	ug/l	20.0	NA	
LCS2	Carbaryl	ug/l	20.0	NA	
LCS2	Methiocarb	ug/l	20.0	NA	
LCS2	Methomyl	ug/l	20.0	NA	
LCS2	Oxamyl (Vydate)	ug/l	20.0	NA	
MBLK	3-Hydroxycarbofuran	ug/l	ND	ND	
MBLK	Aldicarb (Temik)	ug/l	ND	ND	
MBLK	Aldicarb sulfone	ug/l	ND	ND	
MBLK	Aldicarb sulfoxide	ug/l	ND	ND	
MBLK	Baygon	ug/l	ND	ND	
MBLK	Carbofuran (Furadan)	ug/l	ND	ND	
MBLK	Carbaryl	ug/l	ND	ND	
MBLK	Methiocarb	ug/l	ND	ND	
MBLK	Methomyl	ug/l	ND	ND	
MBLK	Oxamyl (Vydate)	ug/l	ND	ND	
MS	3-Hydroxycarbofuran	ug/l	20.0	19.0	95

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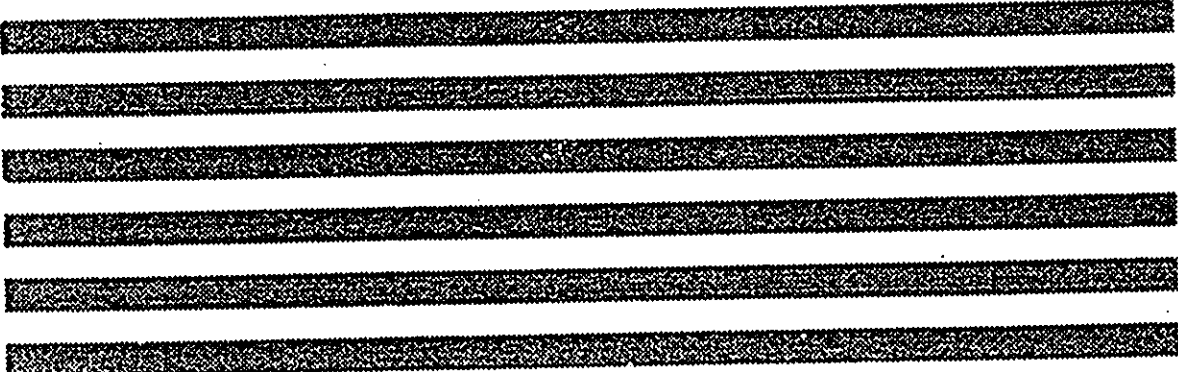
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHA WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Aldicarb (ML/EPA 531.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Aldicarb (Gemik)	ug/l	20.0	19.8	99
MS	Aldicarb sulfone	ug/l	20.0	18.5	92
MS	Aldicarb sulfoxide	ug/l	20.0	18.0	90
MS	Baygon	ug/l	20.0	19.3	96
MS	Carbofuran (Furadan)	ug/l	20.0	19.2	96
MS	Carbaryl	ug/l	20.0	19.3	96
MS	Methiocarb	ug/l	20.0	19.9	100
MS	Methomyl	ug/l	20.0	18.5	92
MS	Oxamyl (Vydate)	ug/l	20.0	18.6	93
HSD	3-Hydroxycarbofuran	ug/l	20.0	19.2	96
HSD	Aldicarb (Gemik)	ug/l	20.0	19.8	99
HSD	Aldicarb sulfone	ug/l	20.0	18.5	92
HSD	Aldicarb sulfoxide	ug/l	20.0	18.0	90
HSD	Baygon	ug/l	20.0	19.4	97
HSD	Carbofuran (Furadan)	ug/l	20.0	19.5	98
HSD	Carbaryl	ug/l	20.0	19.7	98
HSD	Methiocarb	ug/l	20.0	20.6	103
HSD	Methomyl	ug/l	20.0	18.3	92
HSD	Oxamyl (Vydate)	ug/l	20.0	18.6	93



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Sample # 941202078 Sample ID WAIIPAHU WELL 111 HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Chlorinated Acids in Water (ML/EPA 515.1)

LABORATORY REPORT

Honolulu, City of
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Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
2,4,5-TP (Silvex)	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
2,4,5-TP (Silvex)	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
2,4,5-TP (Silvex)	ug/l	ND				0.1	07-dec-1994	wpt	12-dec-1994	dst
2,4-DB	ug/l	ND				2	07-dec-1994	wpt	12-dec-1994	dst
2,4-DB	ug/l	ND				0.5	07-dec-1994	wpt	12-dec-1994	dst
5-hydroxydicamba	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
5-hydroxydicamba	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
Bentazon	ug/l	ND				0.5	07-dec-1994	wpt	12-dec-1994	dst
Bentazon	ug/l	ND				0.5	07-dec-1994	wpt	12-dec-1994	dst
Dalapon (qualitative)	ug/l	ND				1	07-dec-1994	wpt	12-dec-1994	dst
Dalapon (qualitative)	ug/l	ND				0.6	07-dec-1994	wpt	12-dec-1994	dst
DCPA	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
Dinoseb	ug/l	ND				0.1	07-dec-1994	wpt	12-dec-1994	dst
Dinoseb	ug/l	ND				0.2	07-dec-1994	wpt	12-dec-1994	dst
Pantachlorophenol	ug/l	ND				0.04	07-dec-1994	wpt	12-dec-1994	dst
Picloram	ug/l	ND				0.1	07-dec-1994	wpt	12-dec-1994	dst
4-Hydroxyphenol (Qualitative)	ug/l	ND				3	07-dec-1994	wpt	12-dec-1994	dst
Data Entry	..	12/15/94				0	07-dec-1994	wpt	12-dec-1994	dst



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Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Chlorinated Acids in Water (ML/EPA 515.1)
Quality Control

Control	Parameter	Units	Actual	Found	XRecv
LCS1	2,4,5-TP (Silvex)	ug/l	0.500	0.49	98
LCS1	2,4-D	ug/l	1.00	0.99	99
LCS1	Bentazon	ug/l	1.00	1.11	111
LCS2	2,4,5-TP (Silvex)	ug/l	0.500	NA	
LCS2	2,4-D	ug/l	1.00	NA	
LCS2	Bentazon	ug/l	1.00	NA	
HBLK	2,4,5-T	ug/l	ND	ND	
HBLK	2,4,5-TP (Silvex)	ug/l	ND	ND	
HBLK	2,4-D	ug/l	ND	ND	
HBLK	2,4-DB	ug/l	ND	ND	
HBLK	Dichlorprop	ug/l	ND	ND	
HBLK	5-Hydroxydicamba	ug/l	ND	ND	
HBLK	Acifluorfen (qualitative)	ug/l	ND	ND	
HBLK	Bentazon	ug/l	ND	ND	
HBLK	Chloramben (qualitative)	ug/l	ND	ND	
HBLK	Dalapon (qualitative)	ug/l	ND	ND	
HBLK	3,5-Dichlorobenzoic acid	ug/l	ND	ND	
HBLK	DCPA	ug/l	ND	ND	
HBLK	Dicamba	ug/l	ND	ND	
HBLK	Dinoseb	ug/l	ND	ND	
HBLK	Pentachlorophenol	ug/l	ND	ND	
HBLK	Picloram	ug/l	ND	ND	
HBLK	5-Triflorfendi (qualitative)	ug/l	ND	ND	
MS	2,4,5-TP (Silvex)	ug/l	0.500	0.51	102
MS	2,4-D	ug/l	1.00	1.01	101
MS	Bentazon	ug/l	1.00	0.96	96
MSD	2,4,5-TP (Silvex)	ug/l	0.500	NA	
MSD	2,4-D	ug/l	1.00	NA	
MSD	Bentazon	ug/l	1.00	NA	

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ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

SDWA Pesticides (ML/EPA 508)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Dibutyl Chlorodate	92	70 - 130

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Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Aldrin	ug/l	0.05	0.05	100
LCS1	p,p' DDT	ug/l	0.10	0.08	80
LCS1	Dieldrin	ug/l	0.10	0.10	100
LCS1	Endrin	ug/l	0.10	0.09	90
LCS1	Gamma-BHC (lindane)	ug/l	0.05	0.05	100
LCS1	Heptachlor	ug/l	0.05	0.03	60
LCS2	Aldrin	ug/l	0.05	NA	
LCS2	p,p' DDT	ug/l	0.10	NA	
LCS2	Dieldrin	ug/l	0.10	NA	
LCS2	Endrin	ug/l	0.10	NA	
LCS2	Gamma-BHC (lindane)	ug/l	0.05	NA	
LCS2	Heptachlor	ug/l	0.05	NA	
MBLK	PCB 1016 Aroclor	ug/l	ND	ND	
MBLK	PCB 1221 Aroclor	ug/l	ND	ND	
MBLK	PCB 1222 Aroclor	ug/l	ND	ND	
MBLK	PCB 1242 Aroclor	ug/l	ND	ND	
MBLK	PCB 1249 Aroclor	ug/l	ND	ND	
MBLK	PCB 1254 Aroclor	ug/l	ND	ND	
MBLK	PCB 1260 Aroclor	ug/l	ND	ND	
MBLK	Alpha-BHC	ug/l	ND	ND	
MBLK	Alachlor (Atabex)	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Chlordane	ug/l	ND	ND	
MBLK	Chlorthalonil (Drconil, Bravo)	ug/l	ND	ND	
MBLK	Delta-BHC	ug/l	ND	ND	
MBLK	p,p' DDD	ug/l	ND	ND	
MBLK	p,p' DDE	ug/l	ND	ND	
MBLK	p,p' DDT	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Endrin Aldehyde	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	

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Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
HBLK	Endosulfan II (alpha)	ug/l	ND	ND	
HBLK	Endosulfan II (beta)	ug/l	ND	ND	
HBLK	Endosulfan sulfate	ug/l	ND	ND	
HBLK	Gamma-BHC (Lindane)	ug/l	ND	ND	
HBLK	Heptachlor	ug/l	ND	ND	
HBLK	Heptachlor Epoxide	ug/l	ND	ND	
HBLK	Heptachlor	ug/l	ND	ND	
HBLK	Toxaphene	ug/l	ND	ND	
MS	Aldrin	ug/l	0.05	0.02	40
MS	p,p' DDT	ug/l	0.10	0.07	70
MS	Dieldrin	ug/l	0.10	0.08	80
MS	Endrin	ug/l	0.10	0.08	80
MS	Gamma-BHC (Lindane)	ug/l	0.05	0.05	100
MS	Heptachlor	ug/l	0.05	0.02	40

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Sample # 241202078 Sample ID WAIPIRY WELLS 111 HOLE #5 Project
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Laboratory Report

Honolulu, City of
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630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Parameter	Units	Result	Conc.	Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
1,1,1-Trichloroethane	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,1,2-Trichloroethane	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,1,2-Trichloroethane	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,1,2-Trichloroethane	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,1-Dichloroethylene	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,1,1-Trichloroethane	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,2,3-Trichlorobenzene	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,2,3-Trichlorobenzene	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,2,4-Trichlorobenzene	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,2,4-Trichlorobenzene	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,2-Dichloroethane	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,2-Dichloroethane	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,3,5-Trimethylbenzene	ug/l	ND	0.5			0.5			02-dec-1994	yom
1,3,5-Trimethylbenzene	ug/l	ND	0.5			0.5			02-dec-1994	yom
p-Dichlorobenzene (1,4-DCB)	ug/l	ND	0.5			0.5			02-dec-1994	yom
p-Dichlorobenzene (1,4-DCB)	ug/l	ND	0.5			0.5			02-dec-1994	yom
2-Butanone (MEK)	ug/l	ND	5			5			02-dec-1994	yom
2-Butanone (MEK)	ug/l	ND	5			5			02-dec-1994	yom
o-Chlorotoluene	ug/l	ND	0.5			0.5			02-dec-1994	yom
o-Chlorotoluene	ug/l	ND	0.5			0.5			02-dec-1994	yom
4-Methyl-2-Pentanone (MIBK)	ug/l	ND	5			5			02-dec-1994	yom
4-Methyl-2-Pentanone (MIBK)	ug/l	ND	5			5			02-dec-1994	yom
Bromobenzene	ug/l	ND	0.5			0.5			02-dec-1994	yom
Bromobenzene	ug/l	ND	0.5			0.5			02-dec-1994	yom
cis-1,2-Dichloroethylene	ug/l	ND	0.5			0.5			02-dec-1994	yom
cis-1,2-Dichloroethylene	ug/l	ND	0.5			0.5			02-dec-1994	yom
Carbon Tetrachloride	ug/l	ND	0.5			0.5			02-dec-1994	yom
Carbon Tetrachloride	ug/l	ND	0.5			0.5			02-dec-1994	yom



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Sample # 241202078 Sample ID WAIPAKU WELL III HOLE #5 Project
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

LABORATORY REPORT

Honolulu, City of
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ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed
Chloroform (Trichloromethane)	ug/l	ND				0.15			02-dec-1994 yom
Chloroethane	ug/l	ND				0.5			02-dec-1994 yom
Chloroethane (1,1-Dichloroethane)	ug/l	ND				0.5			02-dec-1994 yom
Chlorodibromomethane	ug/l	ND				0.15			02-dec-1994 yom
Chlorodibromomethane	ug/l	ND				0.5			02-dec-1994 yom
Dibromomethane	ug/l	ND				0.15			02-dec-1994 yom
Bromodichloromethane	ug/l	ND				0.5			02-dec-1994 yom
Dibromomethane	ug/l	ND				0.15			02-dec-1994 yom
Ethyl benzene	ug/l	ND				0.5			02-dec-1994 yom
1,1-Dichloroethane	ug/l	ND				0.15			02-dec-1994 yom
Fluorotrichloromethane (Freon11)	ug/l	ND				0.5			02-dec-1994 yom
Hexachlorocyclopentadiene	ug/l	ND				0.15			02-dec-1994 yom
Isopropylbenzene	ug/l	ND				0.5			02-dec-1994 yom
1,1,1-Trichloroethane (TCE)	ug/l	ND				0.15			02-dec-1994 yom
m,p-Xylenes	ug/l	ND				0.5			02-dec-1994 yom
1,1,2-Trichloroethane	ug/l	ND				0.15			02-dec-1994 yom
n-Butylbenzene	ug/l	ND				0.5			02-dec-1994 yom
1,1,1-Trichloroethane	ug/l	ND				0.15			02-dec-1994 yom
o-Xylene	ug/l	ND				0.5			02-dec-1994 yom
1,1,1-Trichloroethane (TCE)	ug/l	ND				0.15			02-dec-1994 yom
Tetrachloroethylene (PCE)	ug/l	ND				0.5			02-dec-1994 yom
1,1,1-Trichloroethane	ug/l	ND				0.15			02-dec-1994 yom
sec-Butylbenzene	ug/l	ND				0.5			02-dec-1994 yom
1,1,1-Trichloroethane	ug/l	ND				0.15			02-dec-1994 yom
trans-1,2-Dichloroethylene	ug/l	ND				0.5			02-dec-1994 yom
1,1,1-Trichloroethane	ug/l	ND				0.15			02-dec-1994 yom
Trichloroethylene (TCE)	ug/l	ND				0.5			02-dec-1994 yom
1,1,1-Trichloroethane	ug/l	ND				0.15			02-dec-1994 yom



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Sample # 941202078 Sample ID HAIPAMU WELL 111_HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)

Laboratory Report

Honolulu, City of
Board of Water Supply Lab
630 S Beretania St

Honolulu, HI 96843
ATTN: Ron Fenstermacher

Parameter	Units	Result	Conc.	XRec	Dilution	Det.Limit	Prepared	By	Analyzed	By
1,1,1-trichloroethane	ug/l	ND				0.5			02-dec-1994	Yom
Toluene	ug/l	ND				0.5			02-dec-1994	Yom
1,1,1-trichloroethane (VC)	ug/l	ND				0.5			02-dec-1994	Yom
Data Entry		12/09/94				0			02-dec-1994	Yom



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Laboratory Report

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Board of Water Supply Lab
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Honolulu, HI 96843
ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Bromochlorobenzene	105	80 - 120
Toluene-d8	93	80 - 120
1,2-Dichloroethane-d4	99	80 - 120

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Sample # 941202078 Sample ID WAIPAHU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	1,1-Dichloroethane	ug/l	4	4.28	107
LCS1	1,1,2,2-Tetrachloroethane	ug/l	4	3.93	98
LCS1	1,1,2-Trichloroethane	ug/l	4	4.07	102
LCS1	1,1-Dichloroethane	ug/l	4	4.65	116
LCS1	1,1-Dichloroethylene	ug/l	4	4.29	107
LCS1	1,2,4-Trichlorobenzene	ug/l	4	3.76	94
LCS1	1,2-Dichloroethane	ug/l	4	4.16	104
LCS1	1,2-Dichloropropane	ug/l	4	4.20	105
LCS1	1,3-Dichloropropane	ug/l	4	3.99	101
LCS1	p-Dichlorobenzene (1,4-DCB)	ug/l	4	4.07	102
LCS1	Benzene	ug/l	4	4.29	107
LCS1	cis-1,2-Dichloroethylene	ug/l	4	4.27	107
LCS1	Chlorobenzene	ug/l	4	4.22	106
LCS1	Carbon Tetrachloride	ug/l	4	4.62	116
LCS1	Bromoform	ug/l	4	3.85	96
LCS1	Chloroform (Trichloromethane)	ug/l	4	4.21	105
LCS1	Chlorodibromomethane	ug/l	4	4.08	102
LCS1	Bromodichloromethane	ug/l	4	4.20	105
LCS1	Dichloromethane	ug/l	4	3.58	90
LCS1	Ethyl benzene	ug/l	4	4.36	109
LCS1	1,1,1,2-Tetrachloroethane (Freon 1)	ug/l	4	4.18	104
LCS1	m,p-Xylenes	ug/l	8	8.99	112
LCS1	o-Xylene	ug/l	4	4.08	102
LCS1	o-Dichlorobenzene (1,2-DCB)	ug/l	4	4.01	100
LCS1	Tetrachloroethylene (PCE)	ug/l	4	4.25	107
LCS1	Styrene	ug/l	4	4.34	108
LCS1	trans-1,2-Dichloroethylene	ug/l	4	4.18	104
LCS1	Trichloroethylene (TCE)	ug/l	4	4.25	106
LCS1	Trichlorotrifluoroethane (Freon 1)	ug/l	4	4.58	115
LCS1	Toluene	ug/l	4	4.30	108
LCS1	Vinyl Chloride (VC)	ug/l	4	3.71	93

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ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHA WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	2Recv
MBLK	1,1,1,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,1-Trichloroethane	ug/l	ND	ND	
MBLK	1,1,2,2-Tetrachloroethane	ug/l	ND	ND	
MBLK	1,1,2-Trichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethane	ug/l	ND	ND	
MBLK	1,1-Dichloroethylene	ug/l	ND	ND	
MBLK	1,1-Dichloropropene	ug/l	ND	ND	
MBLK	1,2,3-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,3-Trichloropropane	ug/l	ND	ND	
MBLK	1,2,4-Trichlorobenzene	ug/l	ND	ND	
MBLK	1,2,4,6-Tetramethylbenzene	ug/l	ND	ND	
MBLK	1,2-Dichloroethane	ug/l	ND	ND	
MBLK	1,2-Dichloropropane	ug/l	ND	ND	
MBLK	1,3,5-Trimethylbenzene	ug/l	ND	ND	
MBLK	1,3-Dichloropropane	ug/l	ND	ND	
MBLK	p-Dichlorobenzene (1,4-DCB)	ug/l	ND	ND	
MBLK	2,2-Dichloropropane	ug/l	ND	ND	
MBLK	2-Butanone (MEK)	ug/l	ND	ND	
MBLK	2-Chloroethylvinyl ether	ug/l	ND	ND	
MBLK	o-Chlorotoluene	ug/l	ND	ND	
MBLK	p-Chlorotoluene	ug/l	ND	ND	
MBLK	4-Methyl-2-Pentanone (MIBK)	ug/l	ND	ND	
MBLK	Benzene	ug/l	ND	ND	
MBLK	Bromobenzene	ug/l	ND	ND	
MBLK	Bromomethane (Methyl Bromide)	ug/l	ND	ND	
MBLK	cis-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	Chlorobenzene	ug/l	ND	ND	
MBLK	Carbon Tetrachloride	ug/l	ND	ND	
MBLK	cis-1,2-Dichloropropane	ug/l	ND	ND	
MBLK	Bromoform	ug/l	ND	ND	
MBLK	Chloroform (trichloromethane)	ug/l	ND	ND	

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Laboratory Report

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ATTN: Ron Fenstermacher

Sample # 941202078 Sample ID WAIPAHAU WELL III HOLE #5 Project _____
Sample Type Water Sampled 01-dec-1994 Received 02-dec-1994 Reported 30-dec-1994

Regulated VOCs plus Lists 1&3 (ML/EPA 524.2)
Quality Control

Control	Parameter	Units	Actual	Found	XRecv
MBLK	Bromochloromethane	ug/l	ND	ND	
MBLK	Chloroethane	ug/l	ND	ND	
MBLK	Chloromethane (Methyl Chloride)	ug/l	ND	ND	
MBLK	Chlorodibromomethane	ug/l	ND	ND	
MBLK	Dibromomethane	ug/l	ND	ND	
MBLK	Bromodichloromethane	ug/l	ND	ND	
MBLK	Dichloromethane	ug/l	ND	ND	
MBLK	Ethyl benzene	ug/l	ND	ND	
MBLK	Dichlorodifluoromethane	ug/l	ND	ND	
MBLK	Fluorotrichloromethane (Freon1)	ug/l	ND	ND	
MBLK	Hexachlorobutadiene	ug/l	ND	ND	
MBLK	Isopropylbenzene	ug/l	ND	ND	
MBLK	m-Dichlorobenzene (1,3-DCB)	ug/l	ND	ND	
MBLK	m,p-Xylenes	ug/l	ND	ND	
MBLK	napthalene	ug/l	ND	ND	
MBLK	n-Butylbenzene	ug/l	ND	ND	
MBLK	n-Propylbenzene	ug/l	ND	ND	
MBLK	o-Xylene	ug/l	ND	ND	
MBLK	o-Dichlorobenzene (1,2-DCB)	ug/l	ND	ND	
MBLK	Tetrachloroethylene (PCE)	ug/l	ND	ND	
MBLK	p-Isopropyltoluene	ug/l	ND	ND	
MBLK	sec-Butylbenzene	ug/l	ND	ND	
MBLK	Styrene	ug/l	ND	ND	
MBLK	trans-1,2-Dichloroethylene	ug/l	ND	ND	
MBLK	tert-Butylbenzene	ug/l	ND	ND	
MBLK	Trichloroethylene (TCE)	ug/l	ND	ND	
MBLK	Trichlorotrifluoroethane (Freon)	ug/l	ND	ND	
MBLK	trans-1,3-Dichloropropene	ug/l	ND	ND	
MBLK	Toluene	ug/l	ND	ND	
MBLK	Vinyl chloride (VC)	ug/l	ND	ND	

Report #: 17105

Report 17105 Comment Page

Group Validation Comments

(508) Heptachlor reported as NA due to QC failure on LCS recovery; see results reported from 525.1 analysis. Reference QIR-GC-94-171.

MINERAL ANALYSIS

MINERAL ANALYSES

AREA	
LOCATION	Waipahu III Well #1 (2400-09)
Year.....	1994
Date collected.....	July 20
Time collected.....	0940
Laboratory number.....	199,843
Regional head, feet	18.83
Specific conductance, micromhos @ 25°C	289
pH value	7.37
Turbidity	0.09
Color	0
IN PARTS PER MILLION	
Silica	40
Calcium	6.2
Magnesium	6.9
Sodium	38
Potassium	2.1
Bicarbonate	62
Sulfate	15
Chloride	36
Fluoride	0.10
Nitrate	13
Phosphate	0.85
Iron)	0.01
Manganese)	0.01
Copper)	0.01
Lead).....Less than.....	0.01
Arsenic)	0.01
Selenium)	0.01
Chromium ^a)	0.01
Silver)	0.01
Barium)	0.01
Cadmium)	0.01
Total dissolved solids	220
Alkalinity	51
Total hardness	44
IN EQUIVALENTS PER MILLION	
Calcium (Ca)	0.309
Magnesium (Mg)	0.567
Sodium (Na)	1.655
Potassium (K)	0.054
Bicarbonate (HCO ₃)	1.016
Sulfate (SO ₄)	0.312
Chloride (Cl) ^b	1.047
Nitrate (NO ₃)	0.210
TOTALS	5.170

a/ Hexavalent only
b/ Includes fluoride and phosphate as PO₄

MINERAL ANALYSES

AREA	
LOCATION	Waipahu III Well #2 (2400-10)
Year.....	1994
Date collected.....	Aug. 25
Time collected.....	0925
Laboratory number.....	199,844
Regional head, feet	18.49
Specific conductance, micromhos @ 25°C	322
pH value	7.55
Turbidity	0.16
Color	0
IN PARTS PER MILLION	
Silica	44
Calcium	6.6
Magnesium	7.0
Sodium	47
Potassium	2.2
Bicarbonate	93
Sulfate	14
Chloride	34
Fluoride	0.10
Nitrate	13
Phosphate	0.80
Iron)	0.01
Manganese)	0.01
Copper)	0.01
Lead).....Less than.....	0.01
Arsenic)	0.01
Selenium)	0.01
Chromium ^a)	0.01
Silver)	0.01
Barium)	0.01
Cadmium)	0.01
Total dissolved solids	218
Alkalinity	76
Total hardness	45
IN EQUIVALENTS PER MILLION	
Calcium (Ca)	0.329
Magnesium (Mg)	0.576
Sodium (Na)	2.054
Potassium (K)	0.056
Bicarbonate (HCO ₃)	1.525
Sulfate (SO ₄) ^b	0.291
Chloride (Cl) ^b	0.989
Nitrate (NO ₃)	0.210
TOTALS	6.030

a/ Hexavalent only

b/ Includes fluoride and phosphate as PO₄

MINERAL ANALYSES

AREA

LOCATION	Waipahu III Well 3 (2400-11)
Year.....	1994
Date collected.....	Oct. 20
Time collected.....	0900
Laboratory number.....	199,853
Regional head, feet	17.97
Specific conductance, micromhos @ 25°C	309
pH value	7.43
Turbidity	0.06
Color	0

IN PARTS PER MILLION

Silica	33
Calcium	7.7
Magnesium	7.0
Sodium	43
Potassium	2.1
Bicarbonate	90
Sulfate	13
Chloride	33
Fluoride	0.12
Nitrate	12
Phosphate	0.75
Iron)	0.01
Manganese)	0.01
Copper)	0.01
Lead)	0.01
Arsenic).....Less than.....	0.01
Selenium)	0.01
Chromium ^a)	0.01
Silver)	0.01
Barium)	0.01
Cadmium)	0.01
Total dissolved solids	242
Alkalinity	74
Total hardness	48

IN EQUIVALENTS PER MILLION

Calcium (Ca)	0.384
Magnesium (Mg)	0.576
Sodium (Na)	1.887
Potassium (K)	0.054
Bicarbonate (HCO ₃)	1.475
Sulfate (SO ₄)	0.271
Chloride (Cl) ^b	0.961
Nitrate (NO ₃)	0.194
TOTALS	5.802

a/ Hexavalent only

b/ Includes fluoride and phosphate as PO₄

MINERAL ANALYSES

AREA	
Waipahu III	
Well 4	
(2400-13)	
LOCATION	
Year.....	1995
Date collected.....	Jan. 13
Time collected.....	0920
Laboratory number.....	199,857
Regional head, feet.....	16.54
Specific conductance, micromhos @ 25°C.....	336
pH value.....	7.37
Turbidity.....	0.12
Color.....	0
IN PARTS PER MILLION -	
Silica.....	35
Calcium.....	6.7
Magnesium.....	6.7
Sodium.....	52.4
Potassium.....	2.2
Bicarbonate.....	95
Sulfate.....	15
Chloride.....	38
Fluoride.....	0.17
Nitrate.....	15
Phosphate.....	0.93
Iron).....	0.01
Manganese).....	0.01
Copper).....	0.01
Lead).....	0.01
Arsenic).....Less than.....	0.01
Selenium).....	0.01
Chromium ^a).....	0.01
Silver).....	0.02
Barium).....	0.01
Cadmium).....	0.01
Total dissolved solids.....	267
Alkalinity.....	78
Total hardness.....	44
IN EQUIVALENTS PER MILLION	
Calcium (Ca).....	0.334
Magnesium (Mg).....	0.551
Sodium (Na).....	2.280
Potassium (K).....	0.056
Bicarbonate (HCO ₃).....	1.557
Sulfate (SO ₄).....	0.312
Chloride (Cl) ^b	1.110
Nitrate (NO ₃).....	0.242
TOTALS.....	6.442

a/ Hexavalent only

b/ Includes fluoride and phosphate as PO₄

* MINERAL ANALYSES

AREA	
LOCATION	Waipahu III Well 5 (2400-12)
Year.....	1994
Date collected.....	Dec. 1
Time collected.....	0950
Laboratory number.....	199,855
Regional head, feet	19.25
Specific conductance; micromhos @ 25°C	337
pH value	7.38
Turbidity	0.10
Color	0
IN PARTS PER MILLION	
Silica	38
Calcium	6.5
Magnesium	6.2
Sodium	51
Potassium	2.3
Bicarbonate	93
Sulfate	14
Chloride	36
Fluoride	0.16
Nitrate	15
Phosphate	0.86
Iron)	0.01
Manganese)	0.01
Copper)	0.01
Lead)	0.01
Arsenic).....Less than.....	0.01
Selenium)	0.01
Chromium ^a)	0.01
Silver)	0.01
Barium)	0.02
Cadmium)	0.01
Total dissolved solids	263
Alkalinity	76
Total hardness	42
IN EQUIVALENTS PER MILLION	
Calcium (Ca)	0.324
Magnesium (Mg)	0.510
Sodium (Na)	2.214
Potassium (K)	0.059
Bicarbonate (HCO ₃)	1.524
Sulfate (SO ₄)	0.291
Chloride (Cl) ^b	1.050
Nitrate (NO ₃)	0.242
TOTALS	6.214

a/ Hexavalent only

b/ Includes fluoride and phosphate as PO₄

APPENDIX E
DRAINAGE REPORT

DRAINAGE REPORT FOR
WAIPAHU WELLS III STATION

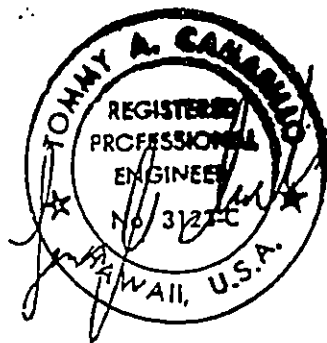
TMK 9-4-05:74

Prepared for:
City and County of Honolulu
Board of Water Supply

Prepared by:
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813



ASSOCIATES, INC.
Engineers/Architects



SEPTEMBER 1997

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SECTION 1

INTRODUCTION

1.1 PROJECT DESCRIPTION

The Board of Water Supply (BWS), City and County of Honolulu, is proposing a new well site in the Waipio area of Waipahu, Oahu, Hawaii. This new well site will be known as the Waipahu Wells III Station. The improvements consist of five (5) deep well pumps, ten (10) Granular Activated Carbon (GAC) tanks and appurtenances, a control building, grading, paved roadways, drainage facilities, underground piping, electrical work, security fencing, landscaping and irrigation. The proposed well site is being constructed to increase the water supply for the Waikele-Waipio water system and to supplement the water systems serving the Ewa, Waipahu, Waianae, and Honolulu areas.

1.2 SCOPE AND PURPOSE OF REPORT

GMP Associates, Inc. has been retained by the Board of Water Supply, City and County of Honolulu, to prepare the plans, specifications, and cost estimates (PS&E) for the improvements of the new well site and transmission mains. Plans for the well site are being prepared as "Job No. 98-158A, Waipahu Wells III." Plans for the transmission mains from the well site are concurrently being prepared as "Job No. 98-158B, 24 Inch and 16 Inch Transmission Mains Along Kamehameha Highway and Lumiaina Street." It is the BWS's current intent to have both jobs

constructed under one contract. However, the plans are being prepared separately to provide the BWS the flexibility to build either one of the two projects before the other. Construction of improvements being designed on both plans must be completed before operating the well site.

As a part of the design phase for the well site (Job No. 98-158A), a drainage report is required. This drainage report will be limited to the development of the well site and include hydrology studies, storm runoff calculations, and recommendations for the drainage improvements for the well site.

SECTION 2

PROPERTY CHARACTERISTICS

The following section of this report describes the general physical characteristics of the proposed well site and the property surrounding the project. It is based upon a topographic survey performed by GMP Associates, Inc., geotechnical investigations by PSC Associates Inc., and a visual examination of the area.

2.1 LOCATION

The project is located in the Waipio area in the northern section of Waipahu. It is on the southwest side of Kamehameha Highway approximately 400 feet northwest of the intersection of Kamehameha Highway and Waipio Uka Street as shown on the Location Map (Exhibit 1).

2.2 LAND USE

The proposed well site, containing 1.85 acres, is vacant with the exception of five (5) previously drilled wells. The project site and surrounding area southwest of Kamehameha Highway is currently owned by Castle & Cooke Homes Hawaii and is zoned for agricultural use (AG-1). It is currently fallow but was previously used as pineapple fields. The area to the northeast of Kamehameha Highway is developed with residential and commercial uses. There are existing dirt roads traversing the

project site and a drainage ditch carrying water in a general southwesterly direction. There is also a drainage ditch between the project site and the right-of-way for Kamehameha Highway which conveys water along Kamehameha Highway in a southeasterly direction. The existing conditions are shown on the Topographic Survey (Exhibit 2).

2.3 TOPOGRAPHIC AND GEOTECHNICAL FEATURES

The project site is relatively flat with a mild slope of approximately two percent (2%) towards the south. The existing elevations on the site range between 319 feet and 310 feet.

The entire area of the proposed well site is underlain by clayey silt of the Molokai soil series. These soils are derived from weathering of the underlying igneous rocks of the Koolau Volcanic Series. Geotechnical field investigations and borings have determined that the depth of the soil mantle, consisting predominantly of clayey silt, varies from 26 to 32-1/2 feet, underlain by soft to hard saprolite which is derived from weathered basaltic rocks.

SECTION 3

DRAINAGE ANALYSIS

3.1 FLOOD HAZARD DESIGNATIONS

A review of the Flood Insurance Rate Map Index prepared for the City and County of Honolulu by the Federal Emergency Management Agency reveals that the project site should be on Community Panel No. 150001 0080A. However, the entire panel has not been printed. Only areas within said panel which are subject to flooding have been printed as an inset on Panel No. 150001 0065B. All other areas within Panel No. 150001 0080A are in Zone "D" (areas in which flood hazards are undetermined). An examination of the inset on Panel No. 150001 0065B discloses that the project site is not within any areas subject to flooding.

3.2 HYDROLOGY STUDY

Two separate hydrology studies and calculations were performed for this report. The first study was to determine the surface runoff for the existing or undeveloped condition. The second study was to determine the surface runoff after the development of the proposed well site. Both studies and calculations were based upon the following hydrologic criteria and design charts contained in the "Storm Drainage Standards," Department of Public Works, City and County of Honolulu, dated May 1988:

1. A recurrence interval (Tm) of 10 years was used as the drainage areas are less than 100 acres.
2. Runoff quantities were determined using the Rational Method as the drainage areas are less than 100 acres.
3. For the Rational Method formula $Q=CIA$, the following values were determined:

The runoff coefficient (C) of 0.50 was determined from Table 1 for the existing condition. For the developed site, a weighted average of 0.66 was calculated based upon the proposed finished surfaces as shown below:

<u>Description</u>	<u>Acres</u>	X	<u>C</u>	=	<u>Subtotal</u>
Offsite (grass)	0.07		0.45		0.03
Onsite (grass or ground cover)	0.40		0.45		0.18
Onsite (graveled)	0.58		0.55		0.32
Onsite (asphalt)	0.60		0.80		0.48
Onsite (concrete)	0.21		0.90		0.19
Onsite (roofed)	<u>0.06</u>		0.95		<u>0.06</u>
Totals:	1.92				1.26
Weighted average:	1.26/1.92=0.66				

The 1-hour rainfall value of 1.88 inches was determined for the area from Plate 1 for a Tm of 10 years.

Times of concentration (Tc) of 12.5 minutes for the existing condition and 13.5 minutes for the developed site were determined from Plate 3.

Using the Tc values for the existing and developed site, correction factors of 2.15 and 2.00, respectively, were obtained from Plate 4. Multiplying the correction factors with the 1-hour rainfall value resulted in design rainfall intensities (I) of 4.04 inches per hour for the existing condition and 3.76 inches per hour for the developed site.

The contributory drainage area for the existing condition was determined using the topographic survey. The total contributory drainage area (A) contains 2.10 acres. This drainage area consists of two separate sub-drainage areas identified as DA1 and DA2 on the Drainage Map (Exhibit 3). DA1 contains 0.25 acres and is the offsite sub-drainage area. DA2 contains 1.85 acres and is the area within the project site. The area of Kamehameha Highway was not included in the offsite sub-drainage area due to the existing drainage ditch between the project site and the southwesterly right-of-way of Kamehameha Highway. This drainage ditch intercepts surface runoff from Kamehameha Highway and conveys it southeasterly along the side of the roadway.

The contributory drainage area for the developed site was determined using the Grading Plan (Exhibit 4). In this case, the total contributory drainage area (A) contains 1.92 acres which

consists of an offsite sub-drainage area (DA1) of 0.07 acres and the onsite sub-drainage area (DA2) of 1.85 acres. Again, the area of Kamehameha Highway was not included in the offsite sub-drainage area due to the existing drainage ditch mentioned above.

Utilizing the values determined above, the Rational Method formula resulted in a calculated flow rate (Q) of 4.24 cubic feet per second (cfs) for the existing condition and 4.76 cfs for the developed site.

3.3 CONCLUSIONS AND RECOMMENDATIONS

Based upon the hydrology studies and calculations, the total surface runoff will be increased by 0.52 cfs by the proposed development if no drainage facilities are provided. Pursuant to Ordinance No. 96-34, drainage facilities should be provided to handle the increased surface runoff caused by this development. Also, during construction, temporary erosion control measures should be provided as shown on the Erosion Control Plan (Exhibit 5). After completion of all site improvements, the surface of the offsite and onsite areas will be covered with grass, ground cover, gravel, asphalt, concrete, or roofs which will result in minimizing the current soil erosion occurring on the existing undeveloped land.

SECTION 4

DRAINAGE FACILITIES

4.1 EXISTING FACILITIES

As shown on Exhibit 2, there is an existing culvert under the dirt road from Kamehameha Highway near the most northern corner of the proposed site. This culvert conveys water into the drainage ditch along the southwesterly side of Kamehameha Highway. There is also an existing drainage ditch between the two dirt roads which run through the property. This ditch conveys water through the project site towards the southwest. The closest existing storm drain system begins at a catch basin located at the north corner of the intersection of Kamehameha Highway and Waipio Uka Street. The storm drain from this catch basin connects to an 84-inch storm drain running along the northeast side of Kamehameha Highway.

4.2 PROPOSED FACILITIES

In conjunction with the development of the underground piping for the proposed well site, a blowoff discharge line (BDL) system will be provided from each well as shown on the Blowoff Discharge System (Exhibit 6). The purpose of this system is to discharge the initial water pumped from each well at its startup. The pumps are electronically controlled so that only one pump can startup at any time with a maximum flow of 1,000 gallons per minute (gpm) or 2.23 cfs. Also connected to the BDL system is

the overflow line (OFL) from the backwash tank and the drain line for treated backwash water (TBW) from the filter pad. These two lines can contribute an additional maximum flow of 1,250 gpm or 2.79 cfs to the system. The BDL system to be constructed as a part of the well site development (Job No. 98-158A) will be from the five existing wells to the new manhole to be constructed in Kamehameha Highway. The remainder of the BDL system will be designed and constructed as a part of the plans for the transmission mains (Job No. 98-158B) previously discussed in Section 1.2. The BDL system in Kamehameha Highway will be connected to the existing catch basin described in Section 4.1 above.

In grading the proposed project, the site will be lowered approximately 2.5' if measured at the center of the GAC Pad. Berms will be constructed along portions of the property lines and trees will be planted on top of the berms to provide visual screening of the GAC tanks. Although the surrounding area southwest of Kamehameha Highway is currently vacant, the berms and trees for the visual screening is being required at this time to alleviate the BWS's concern about possible future objections from residents or occupants if the surrounding area is developed. As a result of the berm to be constructed along the southeasterly property line, a portion of the rainfall runoff which currently sheet flows southeasterly parallel to Kamehameha Highway, will be blocked and diverted southwesterly towards the existing ditch. However, this diversion should not cause any significant impact to the adjacent vacant property.

As previously discussed, the total surface runoff will be increased by 0.52 cfs as a result of this project. In order to provide for this additional surface runoff, a drain inlet will also be constructed in the BDL system described above. The 0.52 cfs will surface flow to the drain inlet, located at BDL ② Sta. 1+78.07 as shown on Exhibit 6, and be conveyed in the 18" and 20" BDL lines to the new manhole in Kamehameha Highway to be constructed as a part of this development (Job No. 98-158A). The remaining surface runoff will flow to the existing drainage ditches described in Section 4.1 above.

REFERENCES

1. *Flood Insurance Rate Map, National Flood Insurance Program, Federal Emergency Management Agency, September 1990.*
2. *Geotechnical Engineering Investigation Report, Waipahu Wells III Project, Waipio, Waipahu, Oahu, Hawaii, PSC Associates, Inc., January 25, 1995.*
3. *Storm Drainage Standards, Department of Public Works, City and County of Honolulu, May 1988.*
4. *Topographic Survey, GMP Associates, Inc., April 1995.*

TO MILILANI

UKEE

WAIPIO LUKA ST.

ST

LUMIKULA ST

LUMIAUUAU ST

ST

KAMEHAMEHA

LUMIANA ST

LUMIHOAHU ST

ST

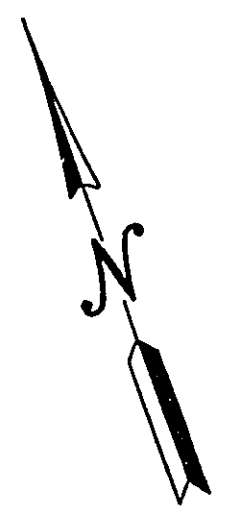
PROJECT SITE
WAIPAHU WELLS III SITE
TMK 9-4-05-74
(JOB NO. 98-158A)

TRANSMISSION MAINS
(JOB NO. 98-158B)

HIGHWAY

LUMIANA ST

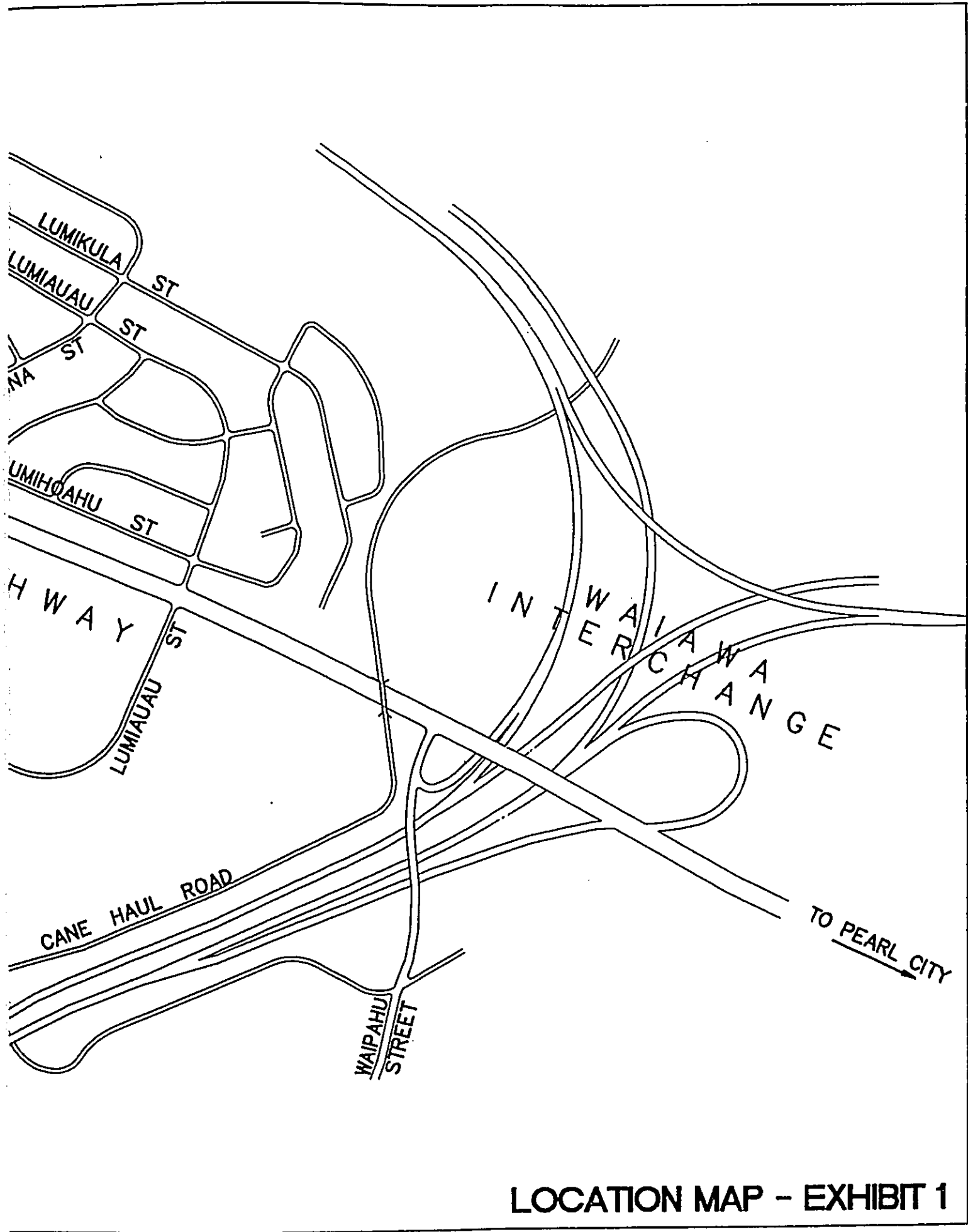
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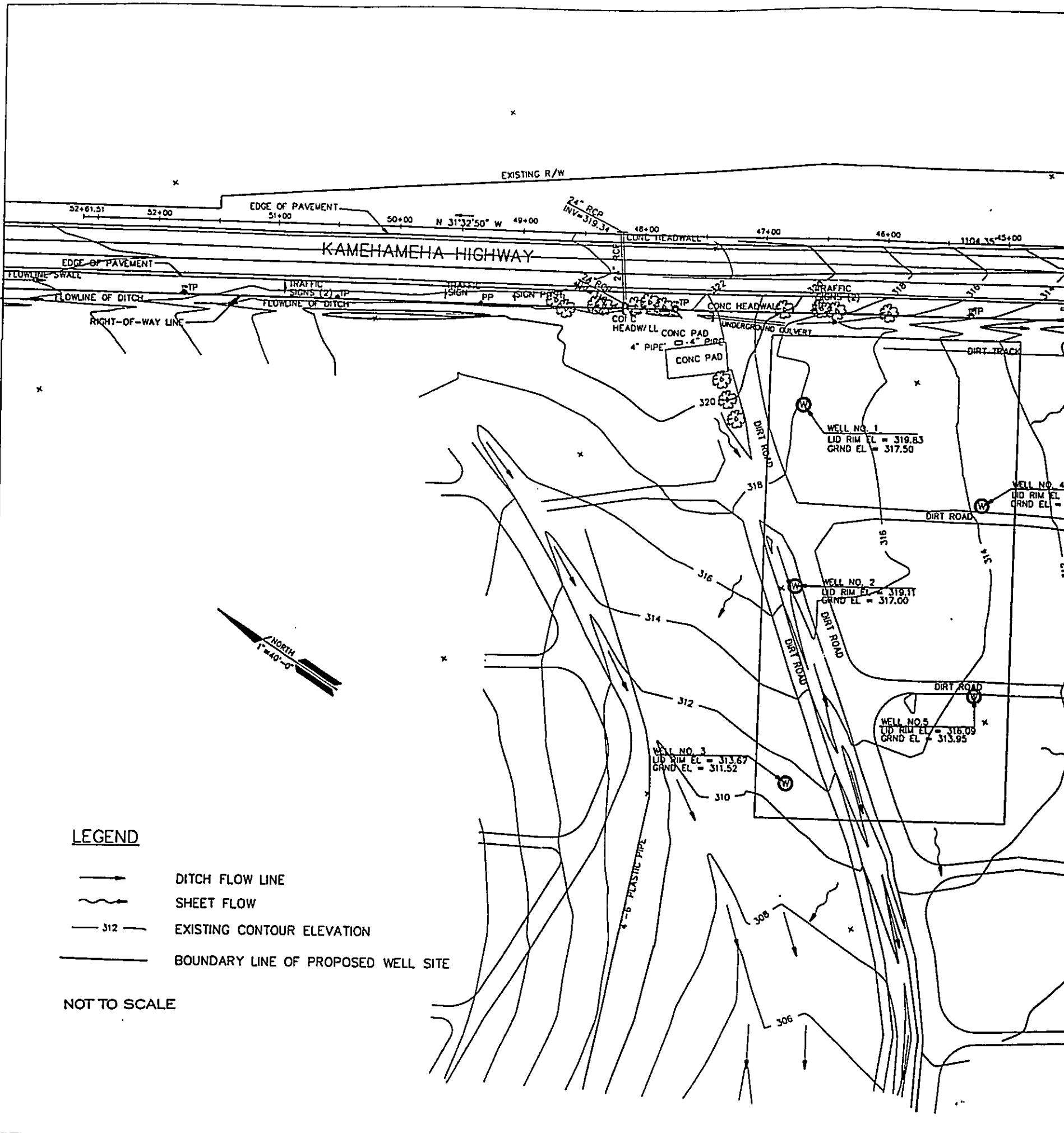
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CANE HAUL ROAD

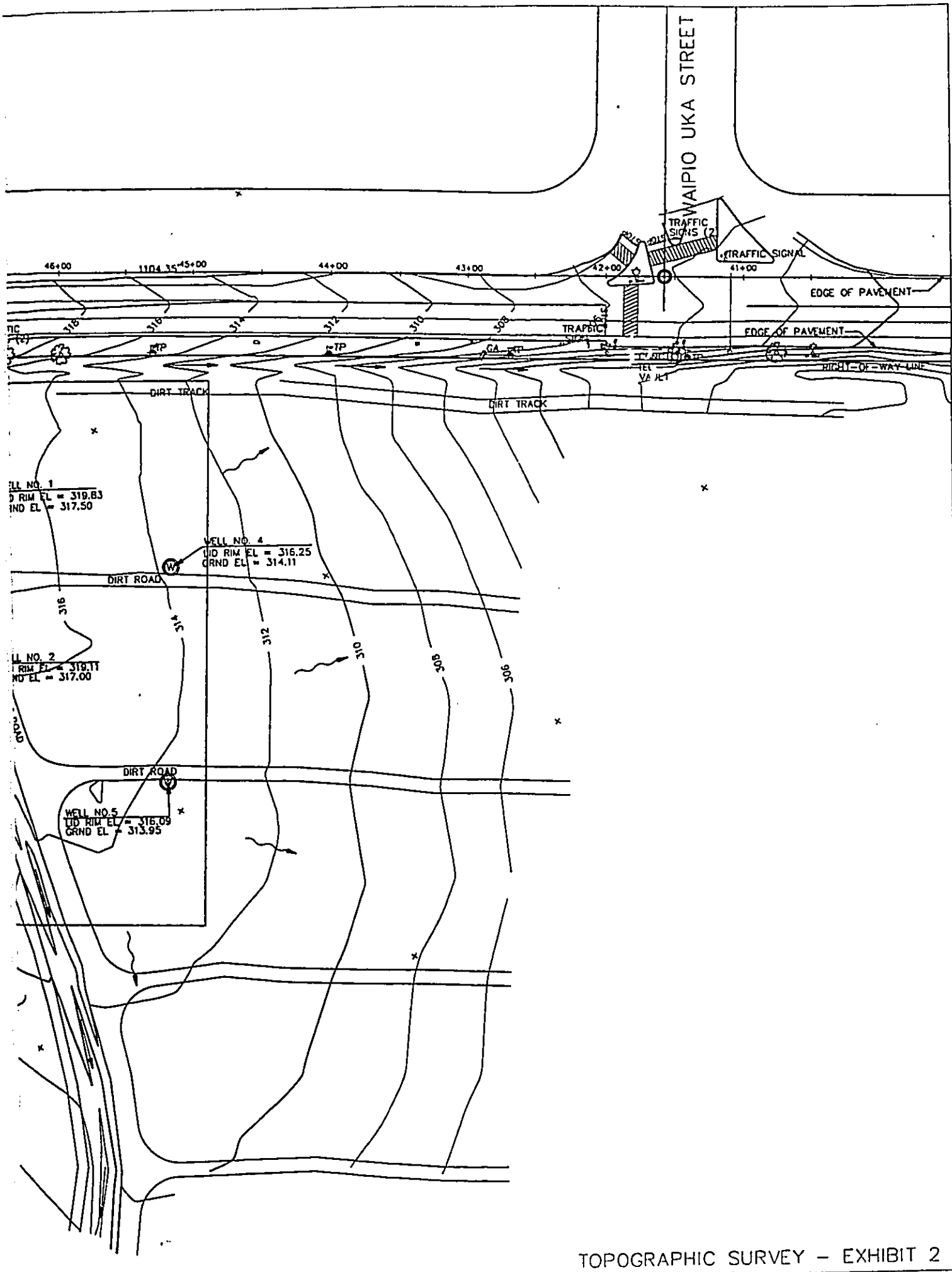
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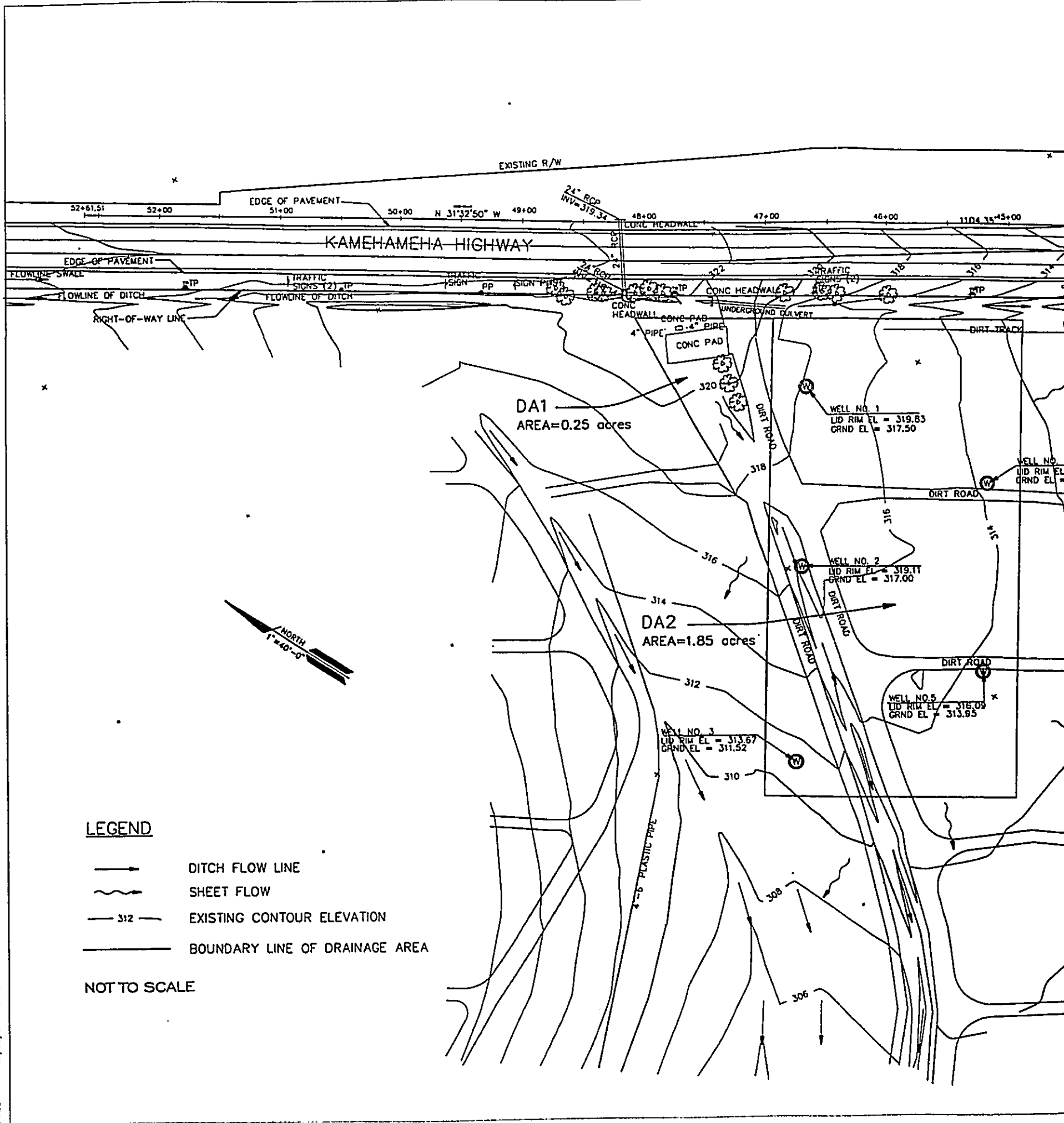
LOCATION MAP - EXHIBIT 1



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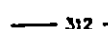



TOPOGRAPHIC SURVEY - EXHIBIT 2



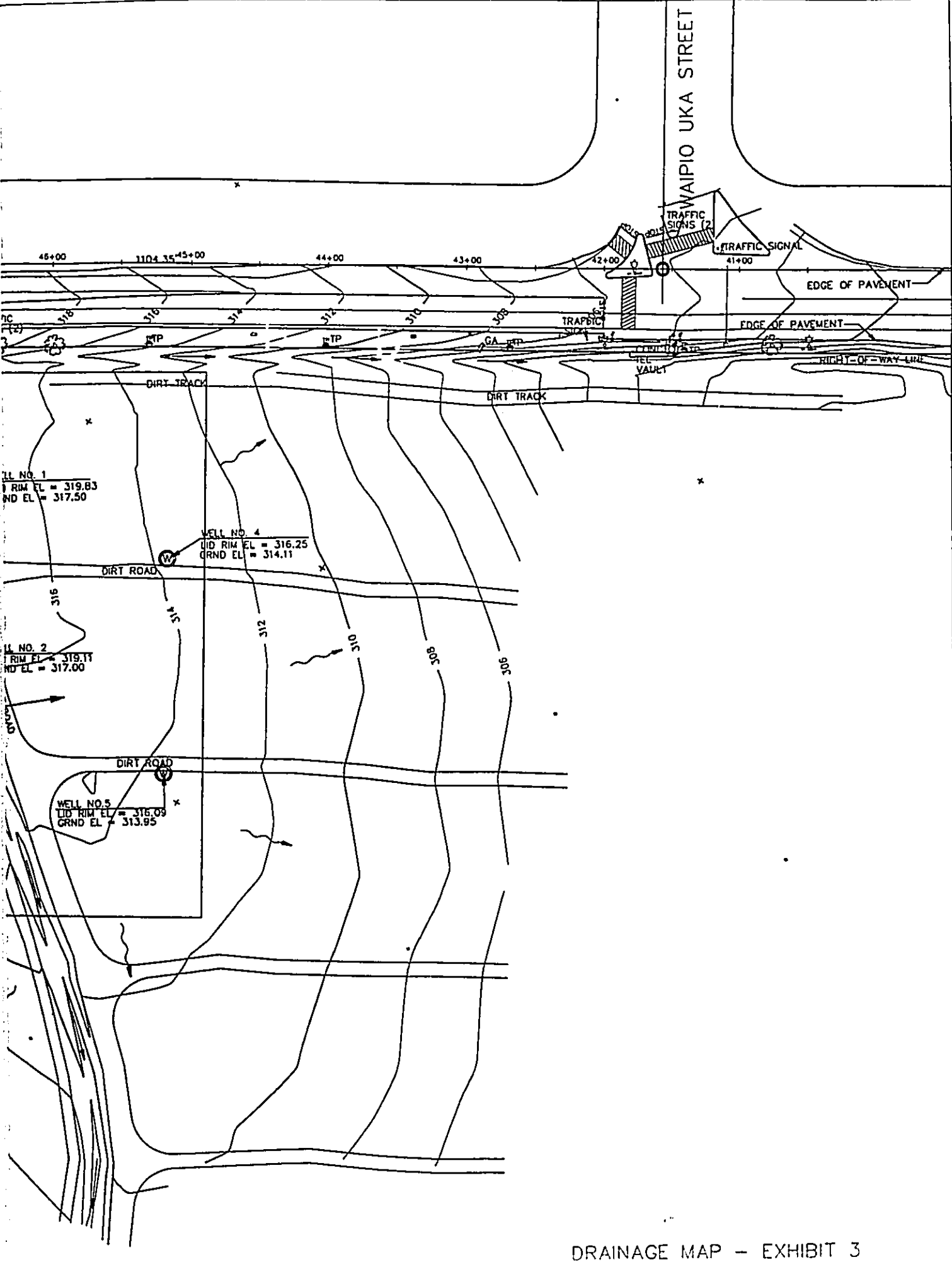
2.580x214 05/05/97 07.37

LEGEND

-  DITCH FLOW LINE
-  SHEET FLOW
-  EXISTING CONTOUR ELEVATION
-  BOUNDARY LINE OF DRAINAGE AREA

NOT TO SCALE

WAIPIO UKA STREET



WELL NO. 1
RIM EL = 319.83
GRND EL = 317.50

WELL NO. 4
LID RIM EL = 316.25
GRND EL = 314.11

WELL NO. 2
RIM EL = 319.11
GRND EL = 317.00

WELL NO. 5
LID RIM EL = 315.09
GRND EL = 313.95

DRAINAGE MAP - EXHIBIT 3

2380473 05/77/91 04:57

ABBREVIATIONS

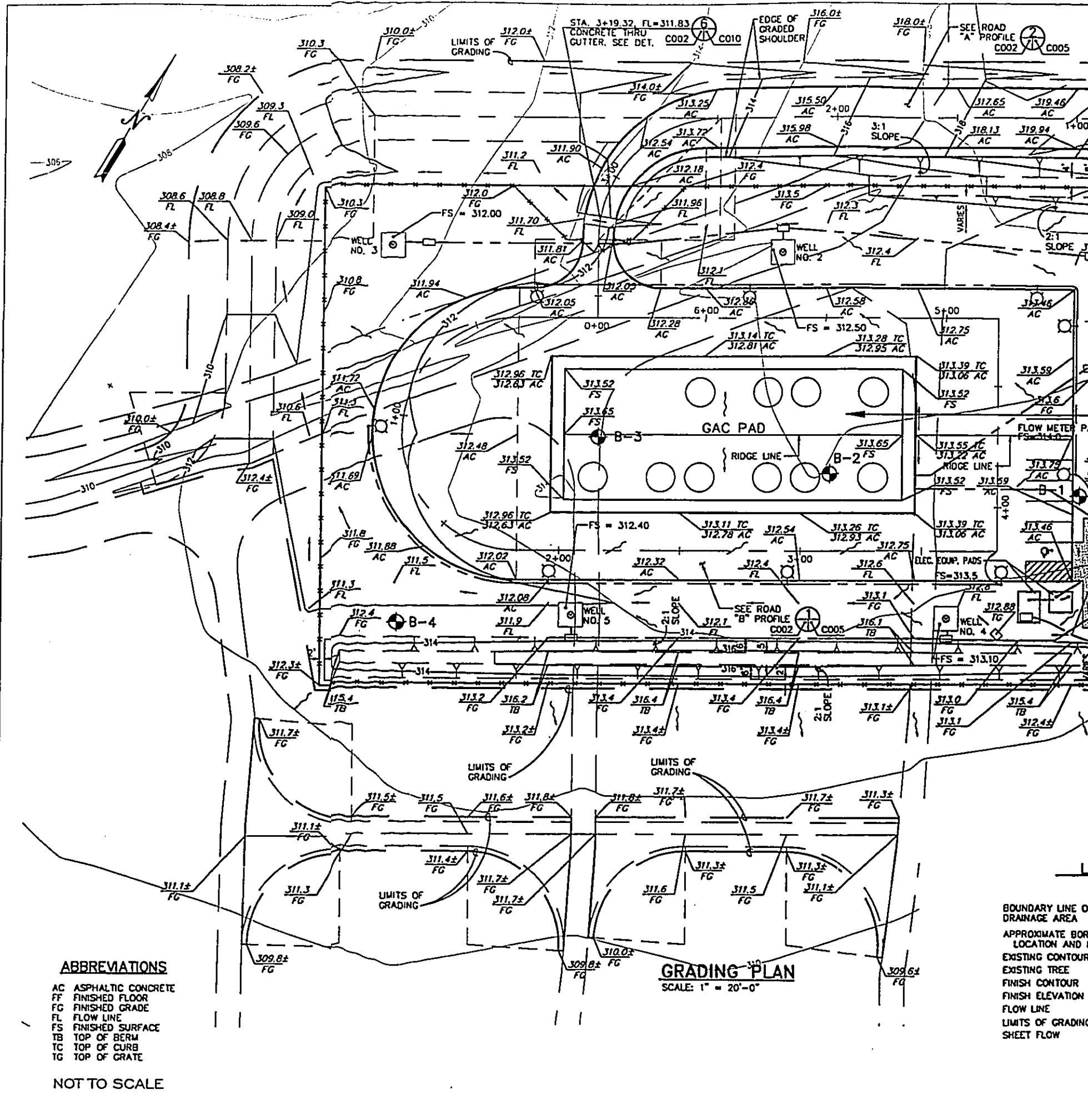
- AC ASPHALTIC CONCRETE
- FF FINISHED FLOOR
- FG FINISHED GRADE
- FL FLOW LINE
- FS FINISHED SURFACE
- TB TOP OF BERM
- TC TOP OF CURB
- TG TOP OF GRATE

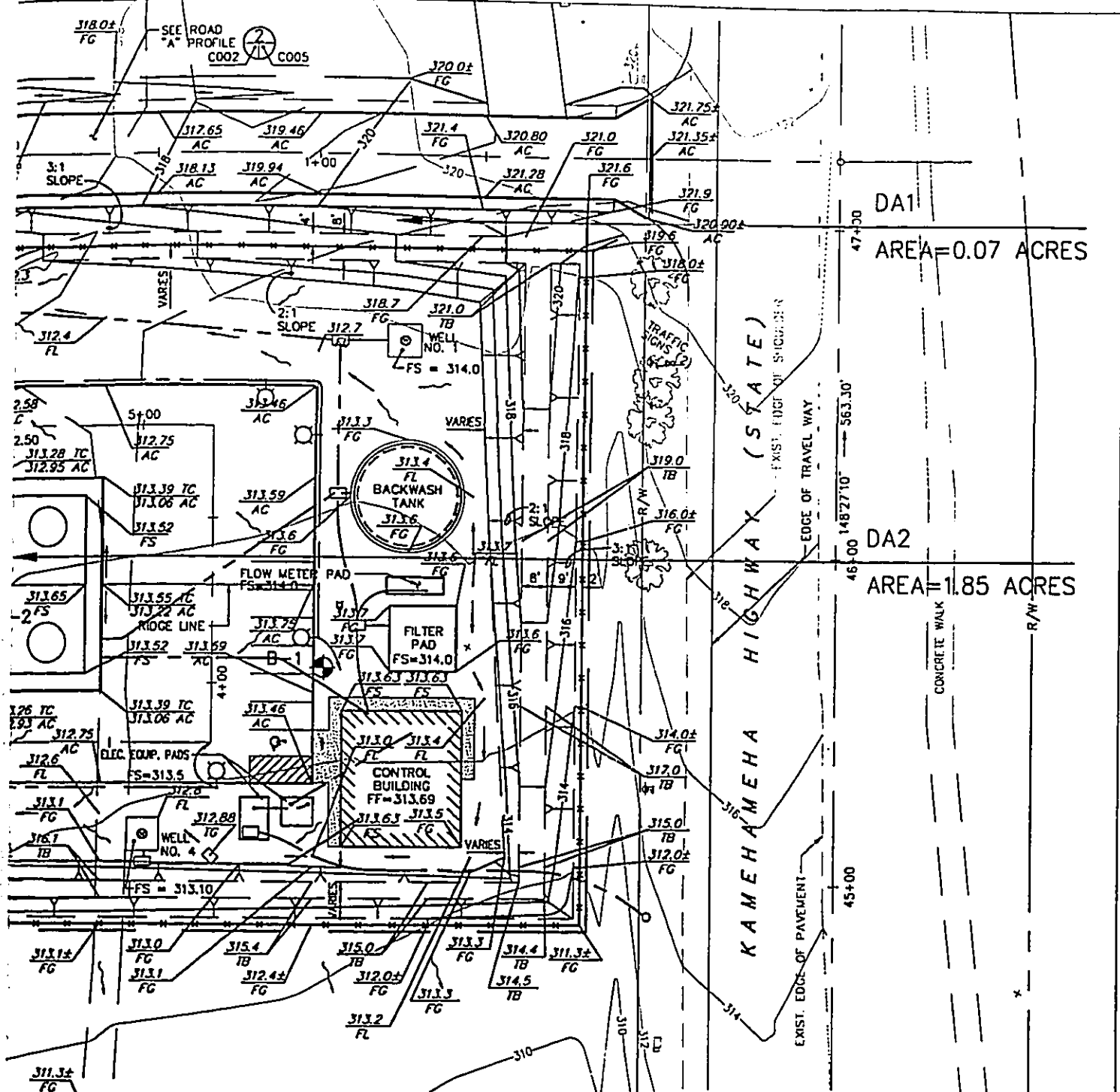
NOT TO SCALE

GRADING PLAN

SCALE: 1" = 20'-0"

- BOUNDARY LINE OF DRAINAGE AREA
- APPROXIMATE BOUNDARY LOCATION AND DRAINAGE AREA
- EXISTING CONTOUR
- EXISTING TREE
- FINISH CONTOUR
- FINISH ELEVATION
- FLOW LINE
- LIMITS OF GRADING
- SHEET FLOW

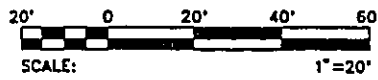




LEGEND

- BOUNDARY LINE OF DRAINAGE AREA
- APPROXIMATE BORING LOCATION AND NO. B-3
- EXISTING CONTOUR 310
- EXISTING TREE (Tree Symbol)
- FINISH CONTOUR 310
- FINISH ELEVATION 316.0
- FLOW LINE
- LIMITS OF GRADING
- SHEET FLOW

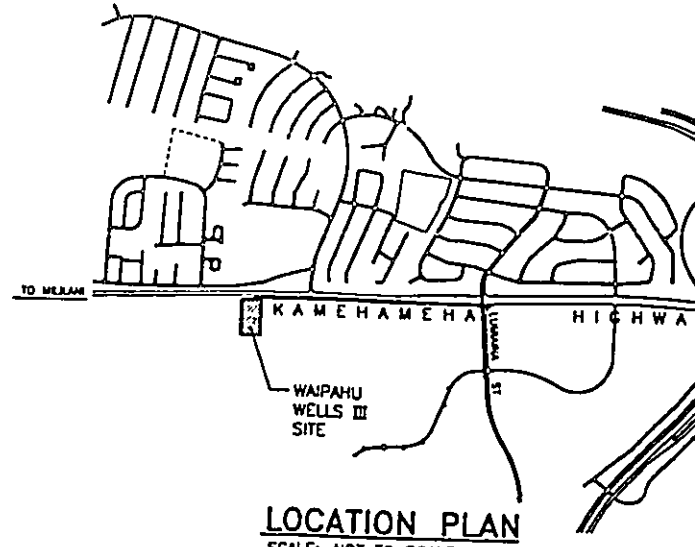
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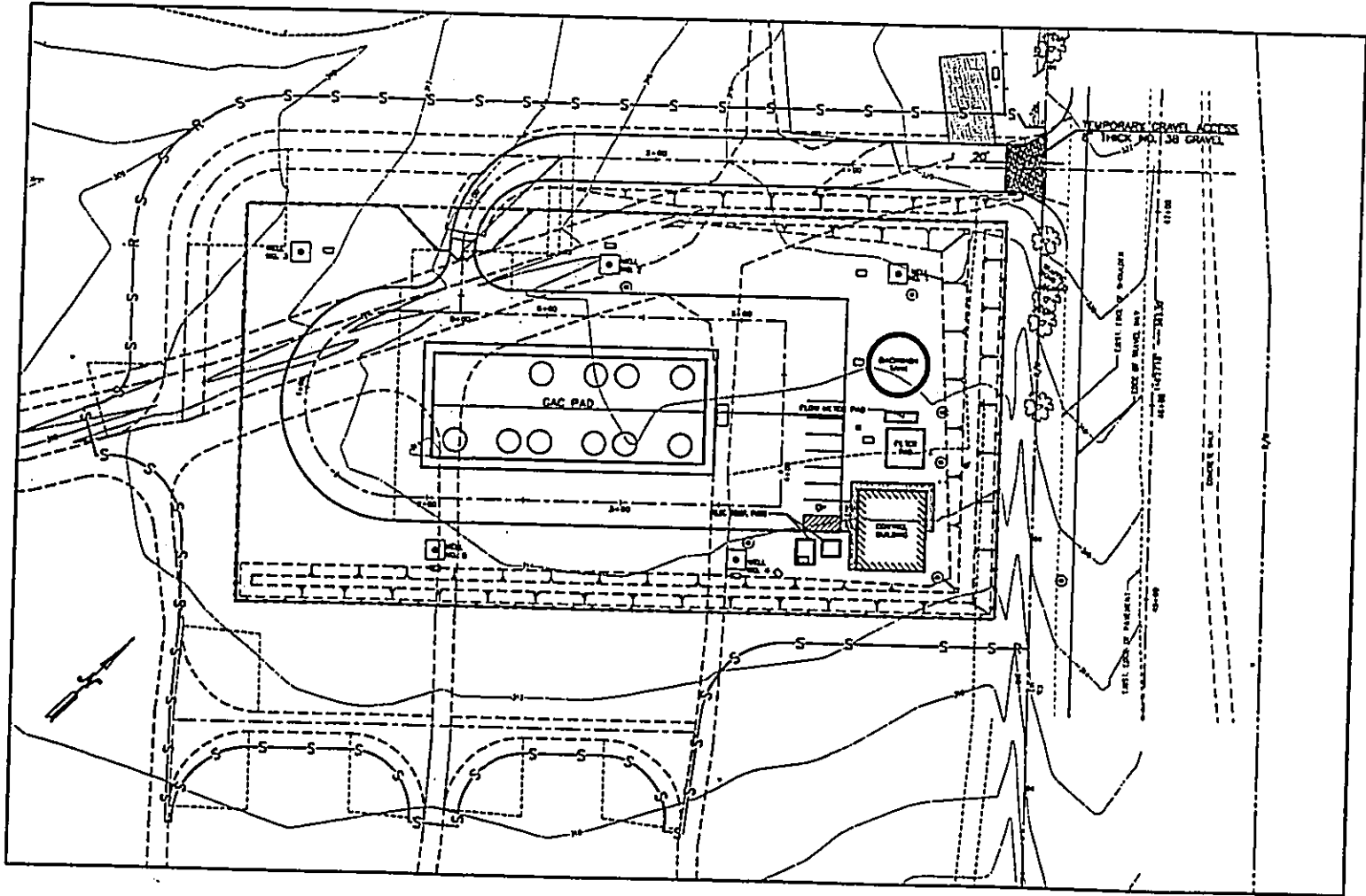
GRADING PLAN - EXHIBIT 4

BEST MANAGEMENT PRACTICES NOTES:

1. SILT FENCES SHALL BE CONSTRUCTED PRIOR TO COMMENCEMENT OF CLEARING AND GRUBBING AND ON THE DOWNHILL SIDE OF ALL SLOPES BEING GRADED.
2. SILT FENCES SHALL BE IMMEDIATELY REPAIRED WHEN DAMAGED DURING CLEARING AND GRUBBING OR GRADING OPERATIONS.
3. ALL UNPAVED SITE INGRESS AND EGRESS SHALL BE GRAVELED AND THE CONTRACTOR SHALL INSURE THAT ALL VEHICLES LEAVING THE CONSTRUCTION SITE WILL BE FREE OF MUD.
4. GRASSING SHALL BE BERMUDA GRASS ON 4" OF TOPSOIL.
5. CONTRACTOR SHALL REMOVE AND DISPOSE OF OFF SITE THE SILT FENCES WHEN THE PROJECT IS COMPLETED AND THE GRASS IS ESTABLISHED.



LOCATION PLAN
SCALE: NOT TO SCALE



EROSION CONTROL PLAN

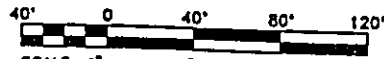
SCALE: 1" = 40'-0"

LEGEND

- S— SILT FENCE
- R— REINFORCED SILT FENCE

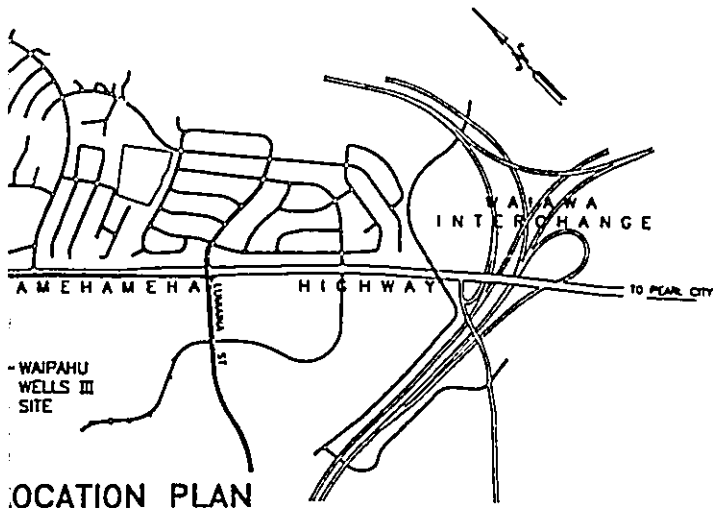
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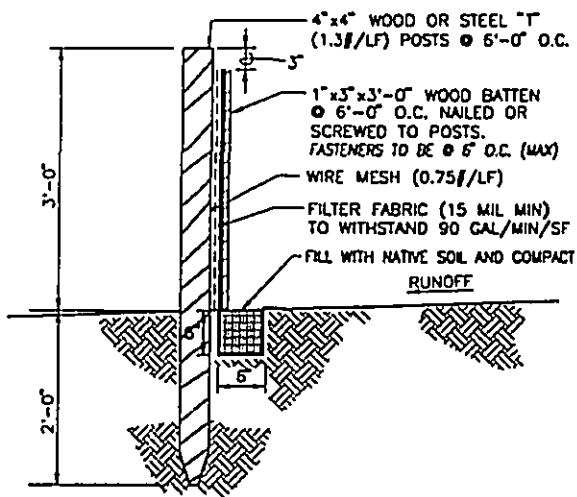


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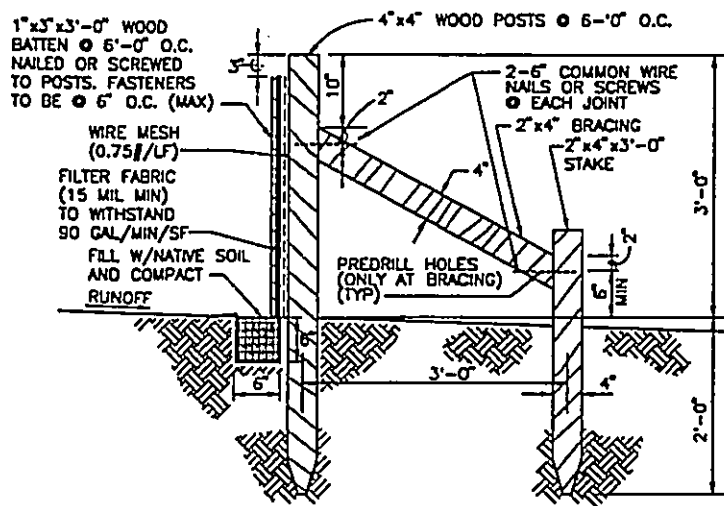
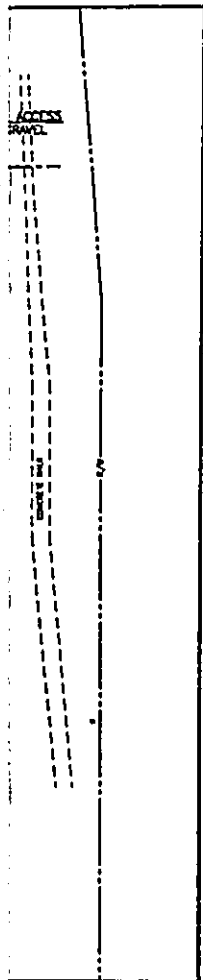
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LOCATION PLAN
SCALE: NOT TO SCALE



DETAIL - SILT FENCE
SCALE: SCALE: NOT TO SCALE



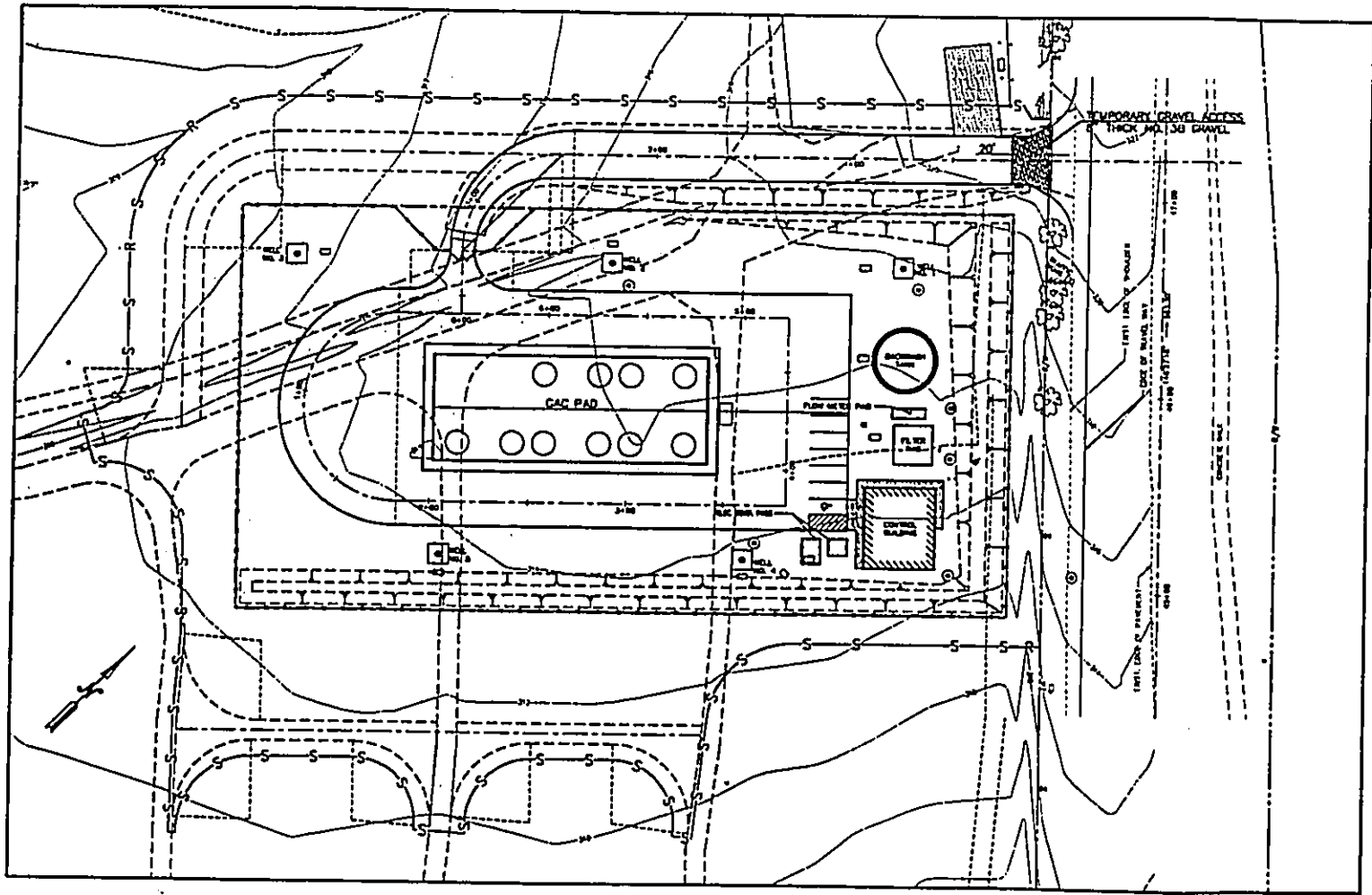
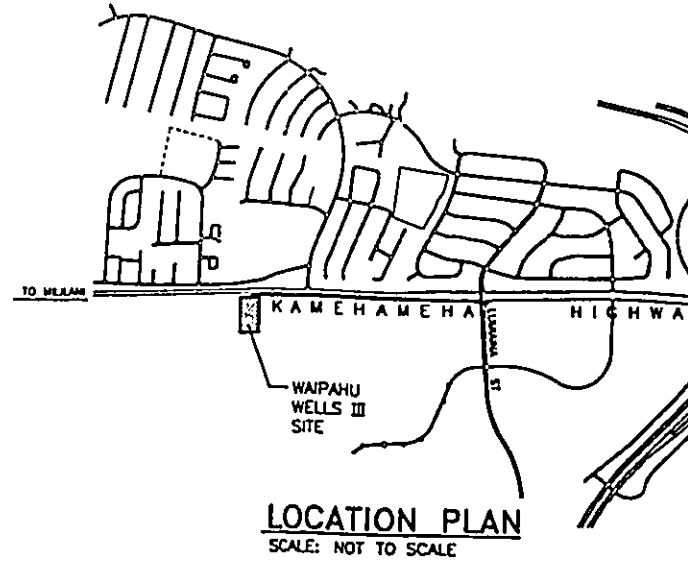
DETAIL - REINFORCED SILT FENCE
SCALE: SCALE: NOT TO SCALE

CORRECTION

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

BEST MANAGEMENT PRACTICES NOTES:

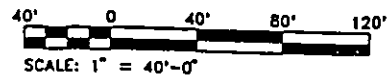
1. SILT FENCES SHALL BE CONSTRUCTED PRIOR TO COMMENCEMENT OF CLEARING AND GRUBBING AND ON THE DOWNHILL SIDE OF ALL SLOPES BEING GRADED.
2. SILT FENCES SHALL BE IMMEDIATELY REPAIRED WHEN DAMAGED DURING CLEARING AND GRUBBING OR GRADING OPERATIONS.
3. ALL UNPAVED SITE INGRESS AND EGRESS SHALL BE GRAVELED AND THE CONTRACTOR SHALL INSURE THAT ALL VEHICLES LEAVING THE CONSTRUCTION SITE WILL BE FREE OF MUD.
4. GRASSING SHALL BE BERMUDA GRASS ON 4" OF TOPSOIL.
5. CONTRACTOR SHALL REMOVE AND DISPOSE OF OFF SITE THE SILT FENCES WHEN THE PROJECT IS COMPLETED AND THE GRASS IS ESTABLISHED.

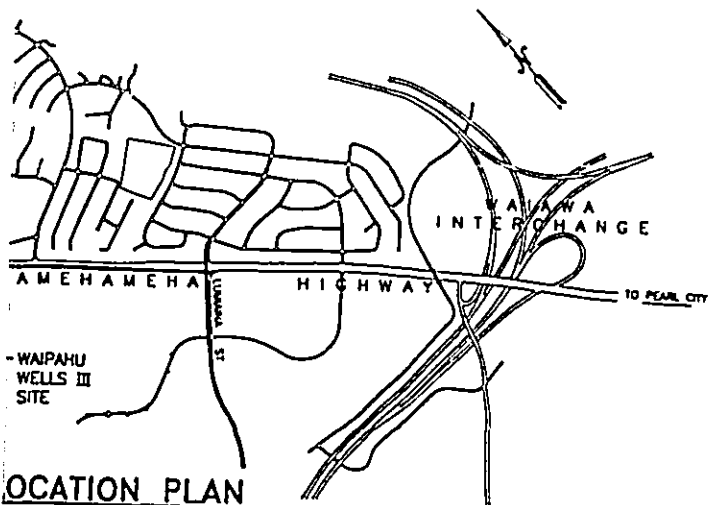


LEGEND
 -S- SILT FENCE
 -R- REINFORCED SILT FENCE

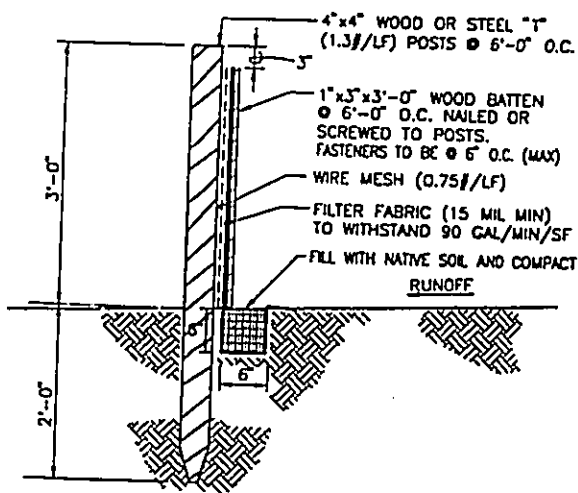
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GRAPHIC SCALE:



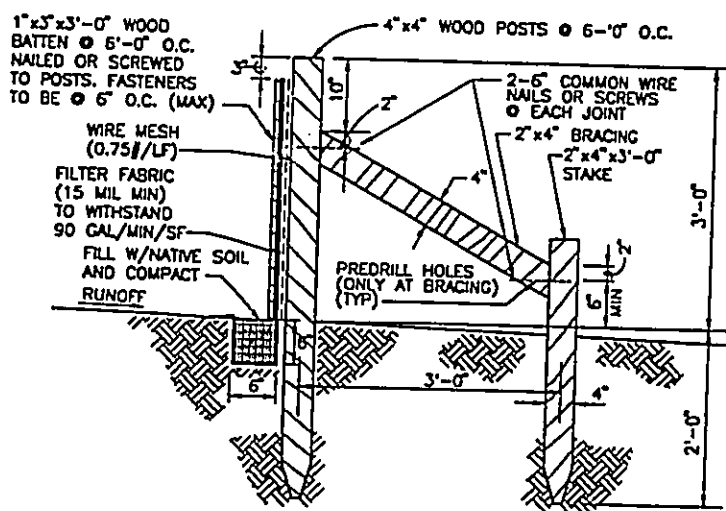


LOCATION PLAN
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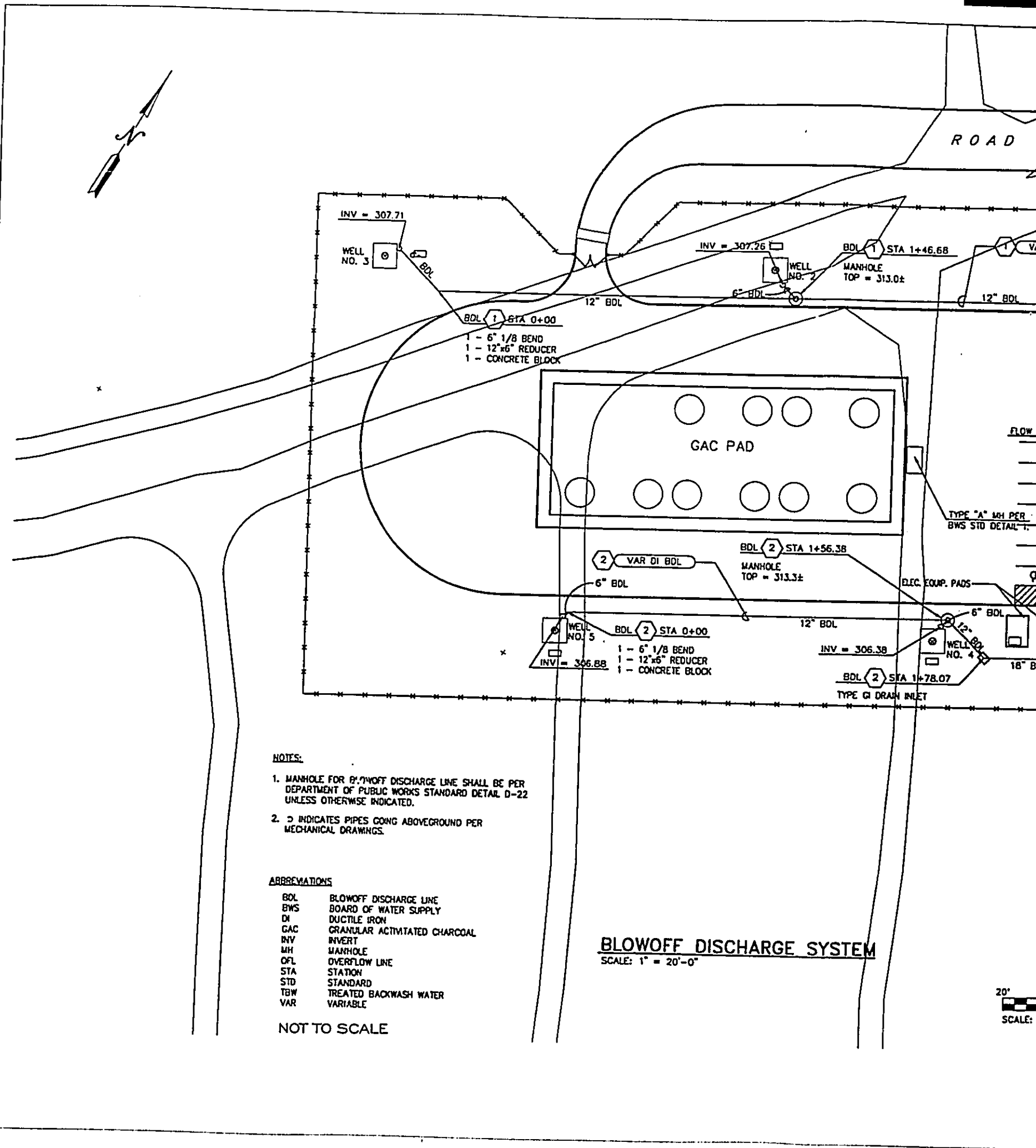
DETAIL - SILT FENCE

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DETAIL - REINFORCED SILT FENCE

SCALE: SCALE: NOT TO SCALE



NOTES:

1. MANHOLE FOR 12" OFF DISCHARGE LINE SHALL BE PER DEPARTMENT OF PUBLIC WORKS STANDARD DETAIL D-22 UNLESS OTHERWISE INDICATED.
2. > INDICATES PIPES GOING ABOVEGROUND PER MECHANICAL DRAWINGS.

ABBREVIATIONS

BDL	BLOWOFF DISCHARGE LINE
BWS	BOARD OF WATER SUPPLY
DI	DUCTILE IRON
GAC	GRANULAR ACTIVATED CHARCOAL
INV	INVERT
MH	MANHOLE
OFL	OVERFLOW LINE
STA	STATION
STD	STANDARD
TBW	TREATED BACKWASH WATER
VAR	VARIABLE

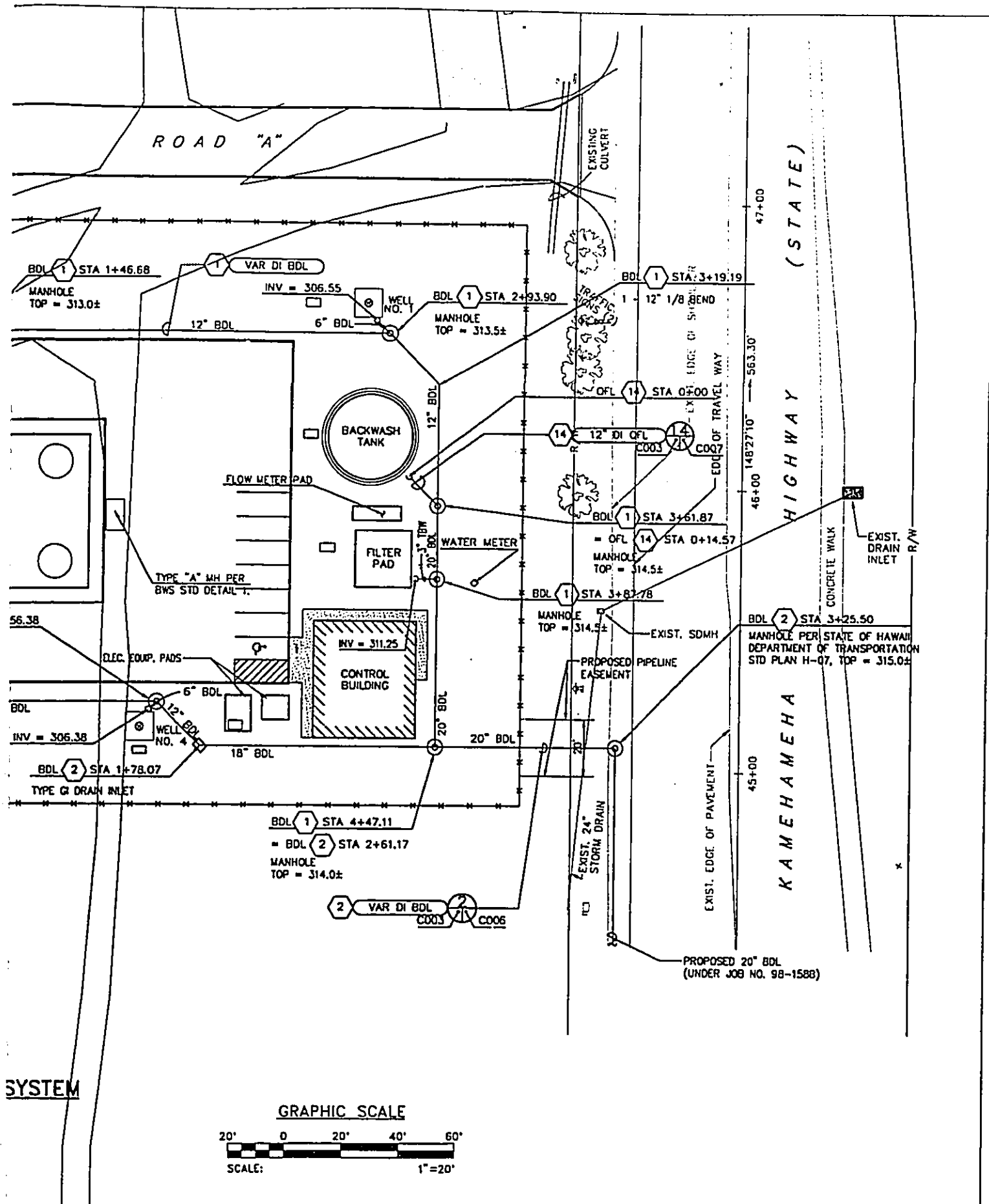
NOT TO SCALE

BLOWOFF DISCHARGE SYSTEM

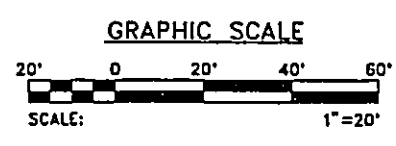
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20'
SCALE:

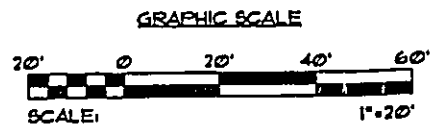
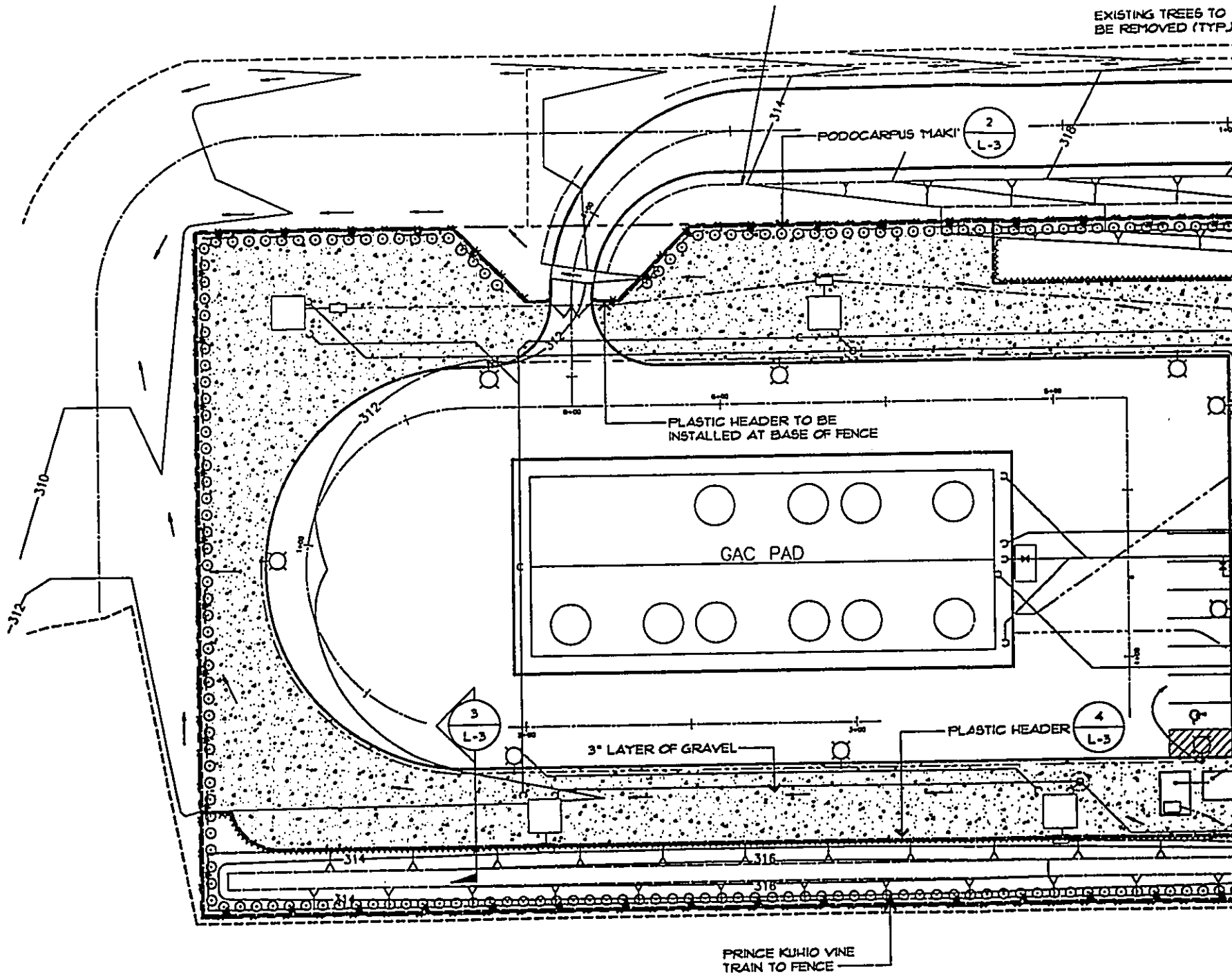


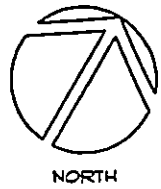
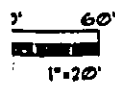
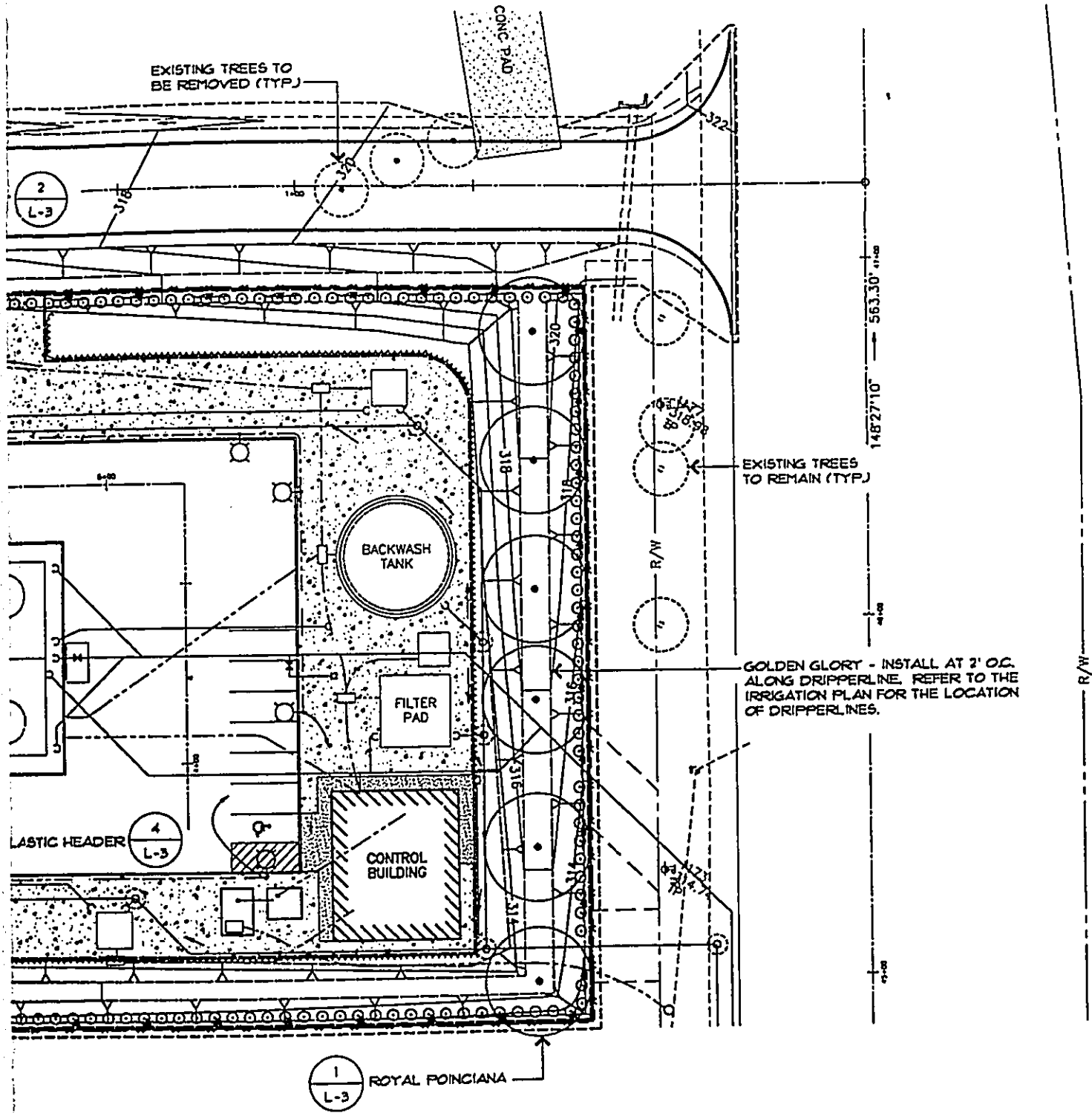
SYSTEM



BLOWOFF DISCHARGE SYSTEM — EXHIBIT 6

APPENDIX F
LANDSCAPING PLAN





APPENDIX G
PARTIAL CONSTRUCTION PLANS
"PART A"

98-158A

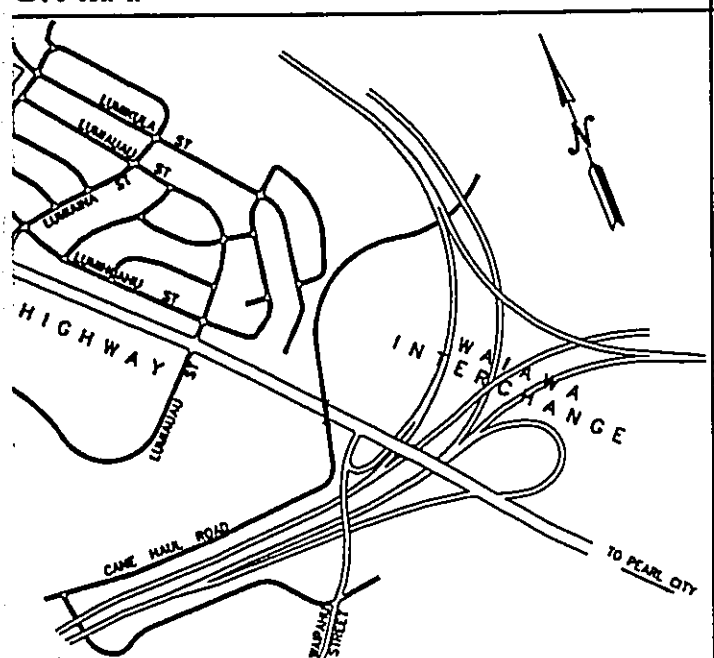
WELLS III

WATER SUPPLY
CITY OF HONOLULU
HONOLULU, HAWAII

DESIGNED BY:

ASSOCIATES, INC.

ENGINEERS/ARCHITECTS
HONOLULU, HAWAII
PHONE: 521-4711

LOCATION ON MAP	APPROVED	
	_____ MANAGER AND CHIEF ENGINEER BOARD OF WATER SUPPLY	_____ DATE
	_____ ADMINISTRATOR, HIGHWAYS DIVISION STATE DEPARTMENT OF TRANSPORTATION (APPROVAL GRANTED FOR WORK WITHIN STATE RIGHT-OF-WAY ONLY ID NO. _____, LETTER OF APPROVAL NO. HWY-CM _____, DATED _____)	_____ DATE
	_____ DIRECTOR AND CHIEF ENGINEER DEPARTMENT OF PUBLIC WORKS CITY AND COUNTY OF HONOLULU	_____ DATE

INDEX OF DRAWINGS

SHEET NO.	DRAWING NO.	TITLE	
GENERAL	1	T001 TITLE SHEET, LOCATION MAP AND VICINITY MAP	
	2	T002 INDEX OF DRAWINGS, NOTES, AND ABBREVIATIONS	
	3	T003 WATER NOTES	
	4	T004 LOCATION PLAN, LEGEND, AND SURVEY CONTROL	
	5	P001 PROCESS AND INSTRUMENTATION DIAGRAM LEGEND	
	6	P002 PROCESS AND INSTRUMENTATION DIAGRAM BACKWASH WATER DISPOSAL SYSTEM	
CIVIL	7	C001 SITE PLAN	
	8	C002 GRADING PLAN	
	9	C003 UTILITY PLAN	
	10	C004 SITE SECTIONS	
	11	C005 ROAD PROFILES	
	12	C006 UTILITY PROFILES - 1	
	13	C007 UTILITY PROFILES - 2	
	14	C008 TRAFFIC CONTROL PLAN	
	15	C009 EROSION CONTROL PLAN	
	16	C010 CIVIL DETAILS - 1	
	17	C011 CIVIL DETAILS - 2	
	18	C012 BORING LOGS	
ARCHITECTURAL	19	A301 FLOOR PLAN, INTERIOR & EXTERIOR ELEVATIONS ROOM FINISH SCHEDULE	
	20	A302 ROOF & REFLECTED CEILING PLANS AND DETAILS	
	21	A303 BUILDING SECTIONS AND DETAILS	
	22	A304 DOOR TYPES, DOOR SCHEDULE AND DETAILS	
	23	A305 SECURITY LATCHSET DETAIL	
	STRUCTURAL	24	S001 STRUCTURAL GENERAL NOTES
		25	S002 TYPICAL DETAILS AND SECTIONS
		26	S101 WELLS-PUMP PAD DETAILS
		27	S201 GAC PADS FOUNDATION PLAN
		28	S202 PLATFORM FRAMING PLAN
29		S203 PAD DETAILS AND SECTIONS	
30		S204 TYPICAL PLATFORM DETAILS	
31		S205 STAIR DETAILS	
32		S206 DETAILS AND SECTIONS	
33		S211 BACKWASH TANK FDN & ROOF FRAMING PLANS	
34		S212 BACKWASH TANK-SECTION AND DETAILS	
35		S213 SECTIONS AND DETAILS	
36		S301 FOUNDATION AND ROOF FRAMING PLANS	
37		S302 TYPICAL DETAILS	
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MECHANICAL		39	M001 MECHANICAL LEGEND AND ABBREVIATIONS
		40	M002 DETAILS - 1
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	42	M101 SITE PLAN	
	43	M102 WELL PUMP-PLAN AND SECTIONS	
	44	M103 WELL PUMP DETAILS	
	45	M201 PLAN-TANK PAD	
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	47	M203 GAC CONTACTOR TANKS	
	48	M211 BACKWASH TANK	
	49	M212 FILTER PAD PLAN AND SECTION	
	50	M221 VENTURI FLOW TUBE PLAN AND SECTION	
	51	M301 CONTROL BUILDING - PLUMBING AND ISOMETRIC DETAILS	

INDEX OF DRAWINGS (CONTINUED)

SHEET NO.	DRAWING NO.	TITLE
ELECTRICAL	52	E001 ELECTRICAL LEGEND & ABBREVIATIONS
	53	E002 DETAILS - 1
	54	E003 DETAILS - 2
	55	E004 DETAILS - 3
	56	E005 MCC-1 SINGLE LINE DIAGRAM
	57	E006 MCC-1 ELEVATION
	58	E007 ELEMENTARY CONTROL DIAGRAM
	59	E008 CONTROL DIAGRAMS - 2 AND TELEMETRY DETAILS
	60	E009 TELEMETRY AND SUPERVISORY CONTROL SCHEMATIC & CIRCUIT DIAGRAMS
	61	E101 SITE PLAN
	62	E201 TANK PAD ELECTRICAL PLAN
	63	E301 CONTROL BUILDING POWER PLAN
	64	E302 CONTROL BUILDING LIGHTING PLAN & FIXTURE SCHEDULE
	LANDSCAPE	65	L001 LANDSCAPE PLANTING PLAN
66		L002 LANDSCAPE IRRIGATION PLAN
67		L003 PLANT LIST, DETAILS AND NOTES
68		L004 IRRIGATION EQUIPMENT LIST, DETAILS AND NOTES

GENERAL NOTES:

- ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER 1986, AND THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER 1984, AS AMENDED, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, AND THE COUNTIES OF KAUAI, MAUI, AND HAWAII.
- THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES AS SHOWN ON THE PLANS ARE FROM THE LATEST AVAILABLE DATA BUT IS NOT GUARANTEED AS TO THE ACCURACY OR THE ENCOUNTERING OF OTHER OBSTACLES DURING THE COURSE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGES TO EXISTING UTILITIES. THE CONTRACTOR SHALL NOT ASSUME THAT WHERE THERE ARE NO UTILITIES, SHOWN, THAT NONE EXISTS.
- NO BLASTING SHALL BE PERMITTED ON THIS PROJECT.
- THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL RESPOND TO COMPLAINTS MADE BY THE PUBLIC AND NEARBY RESIDENTS REGARDING DUST AND NOISE POLLUTION RESULTING FROM HIS WORK.
- THE CONTRACTOR SHALL PROVIDE SAFE ACCESS TO AND FROM ALL DRIVEWAYS AND STREETS.
- THE CONTRACTOR SHALL NOTIFY THE BWS INSPECTOR UPON UNCOVERING ANY POTENTIAL HISTORICAL ARTIFACTS OR ITEMS OF ARCHAEOLOGICAL SIGNIFICANCE.
- THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION SECTION, DIVISION OF ENGINEERING, DEPARTMENT OF PUBLIC WORKS AT 523-4883 TO ARRANGE FOR INSPECTIONAL SERVICES AND SUBMIT THREE (3) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK.
- THE CONTRACTOR SHALL OBTAIN A GRADING PERMIT PRIOR TO THE COMMENCEMENT OF GRADING OR CLEARING AND GRUBBING. A DUST AND TEMPORARY EROSION CONTROL PLAN SATISFACTORY TO THE CITY AND COUNTY OF HONOLULU DEPARTMENT OF PUBLIC WORKS SHALL BE SUBMITTED FOR APPROVAL BY THE CONTRACTOR BEFORE OBTAINING A GRADING PERMIT.
- TEMPORARY EROSION CONTROL MEASURES, INCLUDING DRAINAGE SWALES, GRASSING, AND SILT FENCES SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AT NO EXTRA COST TO THE CITY AND COUNTY OF HONOLULU.
- UPON COMPLETION OF THE GRADING WORK, THE CONTRACTOR SHALL TEST THE GRADED AREA WITH WATER FOR PROPER DRAINAGE. PONDING AREAS SHALL BE REGRADED. THE COSTS INCURRED FOR THE TESTS AND ANY REGRADED WORK SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- UNLESS OTHERWISE NOTED, ALL DISTURBED AREAS ADJACENT TO ROAD "A" AND ROAD "D" LEFT UNPAVED SHALL BE TOPSOILED (4" THICK) AND PLANTED WITH BERNUDA GRASS (CYNODON DACTYLON).
- THE FOOTING EXCAVATION SHALL BE OBSERVED BY A SOILS ENGINEER DURING CONSTRUCTION TO VERIFY THAT THE BEARING SURFACE CONDITIONS ARE CONSISTENT WITH THE FINDINGS OF THE SOIL EXPLORATION REPORT.

GRADING NOTES:

- ALL GRADING WORK SHALL BE DONE IN ACCORDANCE WITH THE REVISIONS OF ORDINANCES OF HONOLULU, "GEOTECHNICAL ENGINEERING INVESTIGATION WAIPIO, WAIPAHAU, OAHU, HAWAII" BY PSC AS
- NO CONTRACTOR SHALL PERFORM ANY GRADING OF ROCKS, SOIL, OR DEBRIS IN ANY FORM TO FULFILL THE REQUIREMENTS OF THE CITY AND COUNTY OF HONOLULU. THE COSTS INCURRED FOR ANY REMEDIAL WORK SHALL BE PAID BY THE CONTRACTOR.
- THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL SURROUNDING AREA FREE FROM DUST AND NOISE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL ACT, CHAPTER 345, HRS, AND THE AIR POLLUTION CONTROL ACT, CHAPTER 345-60, "AIR POLLUTION CONTROL".
- THE UNDERGROUND PIPES, CABLES OR DUCTS FROM HIS SEARCH OF RECORDS ARE INDICATED. THE CONTRACTOR SHALL VERIFY THE LOCATION AND EXERCISE PROPER CARE IN EXCAVATING IN ORDER TO PREVENT DAMAGE TO EXISTING UTILITIES. NEW UTILITIES ARE SHOWN ON THE PLANS. EXISTING LINES AT THE PROPOSED CONNECTIONS SHALL BE IDENTIFIED PRIOR TO EXCAVATION FOR THE NEW LINES.
- ADEQUATE PROVISIONS SHALL BE MADE TO DAMAGING THE CUT FACE OF AN EXCAVATION. FURTHERMORE, ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE SITE.
- ALL SLOPES AND EXPOSED AREAS SHALL BE PROTECTED UNTIL FINAL GRADES HAVE BEEN ESTABLISHED. PRIOR TO THE COMMENCEMENT OF GRADING WORK, ALL GRADING WORK HAS BEEN COMPLETED. CONTINUOUS, AND ANY AREA WITHIN WHICH WORK SHALL BE PLANTED.
- FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE PROTECTED.
- THE CITY SHALL BE INFORMED OF THE LOCATION OF THE BORROW/DISPOSAL SITE MUST ALSO FULFILL THE CITY ORDINANCE.
- NO GRADING WORK SHALL BE DONE ON SLOPES STEEPER THAN 5:1 WITHOUT PRIOR NOTICE TO THE CHIEF OF THE DIVISION OF ENGINEERING, DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, AND THE COMMUNITY NOISE CONTROL FOR OAHU.
- THE LIMITS OF THE AREA TO BE GRADED SHALL BE SHOWN ON THE PLANS AT THE COMMENCEMENT OF THE GRADING WORK.
- ALL GRADING OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE WATER POLLUTION CONTROL ACT, CHAPTER 345, HRS, AND THE WATER POLLUTION CONTROL ACT, CHAPTER 345-60, HRS, AND IF APPLICABLE, THE NPDES PERMIT OBTAINED BY THE CITY AND COUNTY OF HONOLULU.
- WHERE APPLICABLE AND FEASIBLE THE MEASURES TO PREVENT POLLUTANTS SHALL BE IN PLACE BEFORE THE GRADING IS INITIATED.
- TEMPORARY EROSION CONTROLS SHALL NOT BE REMOVED UNTIL EROSION CONTROLS ARE IN-PLACE AND EFFECTIVE.
- TEMPORARY EROSION CONTROL PROCEDURES SHALL BE IN PLACE PRIOR TO APPLICATION FOR GRADING PERMIT.
- IF GRADING WORK INVOLVES CONTAMINATED AREAS, THE CONTRACTOR SHALL BE DONE IN CONFORMANCE WITH APPLICABLE REGULATIONS.
- NON-COMPLIANCE TO ANY OF THE ABOVE PROVISIONS SHALL BE CAUSE FOR SUSPENSION OF ALL WORK, AND REMEDIAL WORK SHALL BE REQUIRED. ALL COSTS INCURRED SHALL BE BILLED TO THE CONTRACTOR. VIOLATORS SHALL BE SUBJECT TO ADMINISTRATIVE PENALTIES.
- BUILDING PERMIT FOR RETAINING WALLS SHALL BE OBTAINED PRIOR TO COMMENCEMENT OF GRADING WORK ON SUCH AREAS.
- FOR BENCH MARK, SEE SHEET T004.

APPROVED:

CHIEF, DIVISION OF ENGINEERING, DPW
(FOR GRADING ONLY)

GRADING NOTES:

1. ALL GRADING WORK SHALL BE DONE IN ACCORDANCE WITH CHAPTER 14, ARTICLES 13, 14, 15 AND 16 AS RELATED TO GRADING, SOIL EROSION AND SEDIMENT CONTROL OF THE REVISED ORDINANCES OF HONOLULU, 1990, AS AMENDED AND SOILS REPORT "GEO TECHNICAL ENGINEERING INVESTIGATION REPORT, WAIPAHU WELLS III PROJECT, WAIPHO, WAIPAHU, OAHU, HAWAII" BY PSC ASSOCIATES, INC. DATED JANUARY 25, 1995.
2. NO CONTRACTOR SHALL PERFORM ANY GRADING OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL, OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATER COURSES. SHOULD VIOLATIONS OCCUR, THE COSTS INCURRED FOR ANY REMEDIAL ACTION BY THE CHIEF ENGINEER SHALL BE PAID BY THE CONTRACTOR.
3. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS CONTAINED IN CHAPTER 11-60, "AIR POLLUTION CONTROL".
4. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.
5. ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SURFACE WATERS FROM DAMAGING THE CUT FACE OF AN EXCAVATION OR THE SLOPED SURFACES OF A FILL. FURTHERMORE, ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE SITE.
6. ALL SLOPES AND EXPOSED AREAS SHALL BE SODDED OR PLANTED AS SOON AS FINAL GRADES HAVE BEEN ESTABLISHED. PLANTING SHALL NOT BE DELAYED UNTIL ALL GRADING WORK HAS BEEN COMPLETED. GRADING TO FINAL GRADE SHALL BE CONTINUOUS, AND ANY AREA WITHIN WHICH WORK HAS BEEN INTERRUPTED OR DELAYED, SHALL BE PLANTED.
7. FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.
8. THE CITY SHALL BE INFORMED OF THE LOCATION OF THE BORROW/DISPOSAL SITE FOR THE PROJECT WHEN THE APPLICATION FOR A GRADING PERMIT IS MADE. THE BORROW/DISPOSAL SITE MUST ALSO FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCE.
9. NO GRADING WORK SHALL BE DONE ON SATURDAYS, SUNDAYS OR HOLIDAYS AT ANY TIME WITHOUT PRIOR NOTICE TO THE CHIEF ENGINEER, PROVIDED SUCH GRADING WORK IS ALSO IN CONFORMANCE WITH HAWAII ADMINISTRATIVE RULES, CHAPTER 11-43, "COMMUNITY NOISE CONTROL FOR OAHU".
10. THE LIMITS OF THE AREA TO BE GRADED SHALL BE FLAGGED BEFORE THE COMMENCEMENT OF THE GRADING WORK.
11. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, CHAPTER 11-55, "WATER POLLUTION CONTROL" AND CHAPTER 11-54, "WATER QUALITY STANDARDS", AND IF APPLICABLE, THE NPDES PERMIT OF THE PROJECT.
12. WHERE APPLICABLE AND FEASIBLE THE MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTH MOVING PHASE OF THE GRADING IS INITIATED.
13. TEMPORARY EROSION CONTROLS SHALL NOT BE REMOVED UNTIL THE PERMANENT EROSION CONTROLS ARE IN-PLACE AND ESTABLISHED.
14. TEMPORARY EROSION CONTROL PROCEDURES SHALL BE SUBMITTED FOR APPROVAL PRIOR TO APPLICATION FOR GRADING PERMIT.
15. IF GRADING WORK INVOLVES CONTAMINATED SOIL, THEN ALL GRADING WORK SHALL BE DONE IN CONFORMANCE WITH APPLICABLE STATE AND FEDERAL REQUIREMENTS.
16. NON-COMPLIANCE TO ANY OF THE ABOVE REQUIREMENTS SHALL MEAN IMMEDIATE SUSPENSION OF ALL WORK, AND REMEDIAL WORK SHOULD COMMENCE IMMEDIATELY. ALL COSTS INCURRED SHALL BE BILLED TO THE PERMITTEE. FURTHERMORE, VIOLATORS SHALL BE SUBJECT TO ADMINISTRATIVE, CIVIL, AND/OR CRIMINAL PENALTIES.
17. BUILDING PERMIT FOR RETAINING WALLS SHALL BE OBTAINED PRIOR TO COMMENCEMENT OF GRADING WORK ON SITE.
18. FOR BENCH MARK, SEE SHEET T004.

ABBREVIATIONS

∅	AND	SD	STORM DRAIN
⊙	AT	SDMH	STORM DRAIN MANHOLE
∅	DIAMETER	SF	SQUARE FEET
#	NUMBER, POUNDS	ST	STREET
		STA	STATION
		STD	STANDARD
AC	ASPHALTIC CONCRETE, ACRES	TB	TOP OF BERM
AWWA	AMERICAN WATER WORKS ASSOCIATION	IBW	TREATED BACKWASH WATER
BDL	BLOWOFF DISCHARGE LINE	TC	TOP OF CURB
BFP	BACKFLOW PREVENTER	TG	TOP OF GRATE
B	BASELINE	TMK	TAX MAP KEY
BLK	BLOCK	TP	TELEPHONE POLE
BV	BOTTOM VERTICAL	TV	TOP VERTICAL
BVC	BEGINNING OF VERTICAL CURVE	TW	TREATED WATER
BW	BACKWASH WATER	TYP	TYPICAL
BWS	BOARD OF WATER SUPPLY		
		UW	UNTREATED WATER
CI	CAST IRON	VAR	VARIABLE
C	CENTERLINE	VERT	VERTICAL
CO	CLEANOUT		
CONC	CONCRETE	W	WATERLINE
CONN	CONNECTION	W'	WITH
CU	CUBIC	YD	YARDS
DET	DETAIL		
DI	DUCTILE IRON		
DL	DRAIN LINE		
DWG	DRAWING		
ELEC	ELECTRIC		
ELEV	ELEVATION		
EVC	END OF VERTICAL CURVE		
EW	EACH WAY		
EXIST	EXISTING		
FAP	FEDERAL AID PROJECT		
FF	FINISHED FLOOR		
FG	FINISHED GRADE		
FH	FIRE HYDRANT		
FL	FLOW LINE		
FS	FINISHED SURFACE		
FT	FEET		
GAC	GRANULAR ACTIVATED CARBON		
GAL	GALLONS		
GALV	GALVANIZED		
GB	GRADE BREAK		
HORIZ	HORIZONTAL		
HWY	HIGHWAY		
INV	INVERT		
LF	LINEAL FEET		
MAX	MAXIMUM		
MIN	MINIMUM, MINUTE		
MH	MANHOLE		
MON	MONUMENT		
MPH	MILES PER HOUR		
NO	NUMBER		
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM		
OC	ON CENTER		
OFL	OVERFLOW LINE		
PIVC	POINT OF INTERSECTION OF VERTICAL CURVE		
POC	POINT ON CURVE		
PSI	POUNDS PER SQUARE INCH		
PT	POINT		
PVMT	PAVEMENT		
R	RADIUS		
RD	ROAD		
R/W	RIGHT OF WAY		

Job No. 2180/00

FINAL
09:43
01/07/98
2380K111

APPROVED:

CHIEF, DIVISION OF ENGINEERING, DPW
(FOR GRADING ONLY)

DATE

Prepared by:



GTP
ASSOCIATES, INC.
Engineers/Architects

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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

JOB 98-158A
WAIPAHU WELLS III

INDEX OF DRAWINGS, NOTES, AND ABBREVIATIONS

APPROVED:	CHIEF, PLANNING AND ENGINEERING DIVISION	DATE:	
DRAWN BY:	APL, PDE, ENGINEER	DTM	CHECKED BY: AKA
FILE NO.			
FIELD BOOK NO.		SCALE:	NONE
		SHEET	2 OF 67 SHEETS

WATER NOTES:

1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE CITY AND COUNTY OF HONOLULU, BOARD OF WATER SUPPLY'S "WATER SYSTEM STANDARDS", VOLUME 1, DATED 1985, THE "APPROVED MATERIAL LIST AND STANDARD DETAILS FOR WATER SYSTEM CONSTRUCTION", VOLUME 2, DATED 1985, AND THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 1991, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.
2. THE CONTRACTOR SHALL NOTIFY THE BOARD OF WATER SUPPLY IN WRITING ONE WEEK PRIOR TO COMMENCING WORK ON THE WATER SYSTEM.
3. PAYMENT FOR ITEMS OF WORK CALLED FOR IN THE PLANS, SPECIAL PROVISIONS AND SPECIFICATIONS FOR WHICH PAYMENT IS NOT SPECIFIED SHALL NOT BE MADE DIRECTLY BUT SHALL BE INCLUDED IN THE VARIOUS ITEMS IN THE PROPOSAL AND NO ADDITIONAL COMPENSATION SHALL BE MADE.
4. THE CONTRACTOR IS ALERTED TO THE ENCOUNTERING OF OBSTACLES WHETHER SHOWN ON THE PLANS OR NOT, OR WHICH MAY DIFFER IN LOCATION FROM THAT SHOWN ON THE PLANS WHICH MAY INTERFERE WITH HIS NORMAL METHOD OF OPERATIONS. THE CONTRACTOR SHALL TAKE INTO ACCOUNT ANY ADDITIONAL COSTS ANTICIPATED DUE TO THESE CONDITIONS AND SHALL HAVE THESE COSTS INCLUDED IN THE BID ITEMS WHICH HE/SHE FEELS MOST APPROPRIATE. NO SEPARATE ADDITIONAL COMPENSATION SHALL BE MADE.
5. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL ASSUMPTIONS, DEDUCTIONS, OR CONCLUSIONS HE/SHE MAY MAKE OR DERIVE FROM THE SUBSURFACE INFORMATION OR DATA FURNISHED ON THE PLANS. THE CONTRACTOR MUST SATISFY HIMSELF/HERSELF THROUGH HIS/HER OWN INVESTIGATIONS AS TO WHAT SUBSURFACE CONDITIONS ARE TO BE ENCOUNTERED.
6. PRIOR TO START OF EXCAVATION, THE CONTRACTOR SHALL NOTIFY ALL AGENCIES AND UTILITIES AND HAVE THEM LOCATE THEIR RESPECTIVE LINES AFFECTED. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ALL OF HIS/HER CONSTRUCTION AND SHALL PAY FOR ALL DAMAGES TO AND FOR THE PROTECTION OF EXISTING UTILITIES AND STRUCTURES.
7. THE CONTRACTOR SHALL EXPOSE, VERIFY AND BACKFILL ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES AT CROSSINGS PRIOR TO EXCAVATION OF PIPELINE TRENCH. THE WATER MAIN ALIGNMENT AND GRADE MAY BE CHANGED IF THERE ARE CONFLICTS WITH ANY EXISTING UNDERGROUND UTILITIES AND STRUCTURES, WHETHER SHOWN ON THE PLANS OR NOT. PAYMENT FOR WORK INCLUDED IN THIS PARAGRAPH WILL BE MADE UNDER THE APPROPRIATE BID ITEMS UNDER THE PROPOSAL, AND NO ADDITIONAL COMPENSATION WILL BE CONSIDERED.
8. EXISTING UTILITIES CROSSING THE WATER MAIN ARE TO REMAIN IN SERVICE AND IN PLACE. IF RELOCATED FOR THE CONTRACTOR'S CONVENIENCE, INTERRUPTION OF SERVICE SHALL BE FOR A MINIMUM PERIOD OF TIME AND SHALL BE DONE AT THE CONTRACTOR'S EXPENSE AND ONLY WITH THE APPROVAL OF THE BOARD OF WATER SUPPLY.
9. ANY COST INCURRED BY GASCO, HECO, OR HICO BY THIS PROJECT SHALL BE PAID BY THE BOARD OF WATER SUPPLY THROUGH THE CONTRACTOR. PAYMENT SHALL BE ONLY FOR THE ACTUAL COST AS SHOWN ON THE UTILITY COMPANY'S INVOICE. NO PAYMENT WILL BE MADE FOR PROFIT, TAX, OVERHEAD, AND BOND COST.
10. IF THE CONTRACTOR ELECTS NOT TO EXPOSE AND VERIFY ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES AT CROSSINGS PRIOR TO PIPELINE EXCAVATION, HE FORFEITS HIS RIGHTS FOR ANY CLAIMS FOR COMPENSATION CAUSED BY ANY CONFLICTS WITH EXISTING UTILITIES AND STRUCTURES.
11. ALL A.C. AND CONCRETE PAVEMENT TO BE TRENCHED (FOR PIPELINE OR ANY WATER SYSTEM INSTALLATION) SHALL BE "SAW-CUT" TO THE REQUIRED WIDTH PRIOR TO REPAVING.
12. PAYMENT FOR RESTORATION OF DRIVEWAYS, CURBS AND GUTTERS WILL NOT BE MADE DIRECTLY BUT SHALL BE INCLUDED IN THE UNIT PRICES BID IN THE VARIOUS ITEMS OF THE BID.
13. RESTORATION OF PAVEMENT SHALL BE IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS AND DONE WITH EQUIVALENT TO OR BETTER QUALITY MATERIALS.
14. UNLESS OTHERWISE SPECIFIED, CONNECTIONS TO EXISTING WATER MAINS AND CHLORINATION OF NEW MAINS SHALL BE DONE BY THE CONTRACTOR, WITH THE BOARD OF WATER SUPPLY'S INSPECTOR COORDINATING THE WORK. FOR DETAILS, CONTACT THE BWS PLANNING AND ENGINEERING DIVISION, ENGINEERING BRANCH, CONSTRUCTION SECTION.
15. WHEREVER CONNECTIONS TO EXISTING MAINS ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING MAINS PRIOR TO EXCAVATION OF MAIN TRENCH. THE REMAINING EXCAVATION FOR THE CONNECTION SHALL BE EXCAVATED WHEN THE CONTRACTOR IS READY TO MAKE THE CONNECTION.

16. ~~THE BRIDGE DECKS FOR TEMPORARY BRIDGE INSTALLATIONS SHALL BE FLUSH WITH ADJOINING PAVEMENT OR SIDEWALK. NO DUMPS OR ELEVATED BRIDGE DECKS WILL BE ALLOWED.~~
17. ALL WATER MAIN TRENCHES SHALL BE BACKFILLED AS CALLED FOR UNDER PART III, SECTION 1.2.2, TRENCH BACKFILL, OF THE "WATER SYSTEM STANDARDS", DATED 1985. COMPACTION OF TRENCH BACKFILL SHALL MEET APPLICABLE REQUIREMENTS OF "THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER 1986, OF THE COUNTIES OF THE STATE OF HAWAII.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF CHLORINATED WATER TO SAFEGUARD PUBLIC HEALTH AND ENVIRONMENT IN ACCORDANCE WITH APPLICABLE DEPARTMENT OF HEALTH REQUIREMENTS.
19. SHOULD MAJOR TREE ROOTS 2" AND GREATER BE ENCOUNTERED DURING CONSTRUCTION, THESE ROOTS SHALL BE CUT AND SEALED WITH ASPHALTIC PAINT.
20. ~~DURING NON-WORKING HOURS, THE TRENCHES ON CITY STREETS SHALL BE COVERED WITH NON-SKID STEEL PLATES AND ALL LANES MAINTAINED OPEN FOR TRAFFIC.~~
21. UNLESS OTHERWISE SPECIFIED, ALL ABANDONED LINES SHALL BE CUT AND PLUGGED WITH CLASS DWS 2000 CONCRETE. PAYMENT FOR CUTTING AND PLUGGING WILL NOT BE MADE DIRECTLY BUT WILL BE INCIDENTAL TO THE VARIOUS ITEMS OF THE PROPOSAL. THE CONTRACTOR SHALL VERIFY THE SIZE AND TYPE OF LINE TO BE PLUGGED.
22. ~~ALL SALVAGE MATERIALS SHALL BE CLEANED, REPAINTED AND DELIVERED TO THE KALIHI BWS CORPORATION YARD.~~
23. ALL WATER MAINS AND APPURTENANCES INCLUDING SERVICE LATERALS AND SERVICE CONNECTIONS SHALL BE SUBJECT TO A HYDROSTATIC TEST PRESSURE OF 150 PSI BY THE CONTRACTOR IN THE PRESENCE OF THE BOARD OF WATER SUPPLY INSPECTOR.
24. ~~ALL LATERALS (1" TO 2-1/2") SHALL BE REPLACED OR RECONNECTED WITH EITHER COPPER OR PLASTIC TUBING.~~
25. THE CONTRACTOR SHALL FURNISH AND INSTALL DIELECTRIC COUPLINGS FOR ALL SERVICE LATERAL CONNECTIONS. PAYMENTS FOR DIELECTRIC COUPLINGS WILL NOT BE MADE DIRECTLY, BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS ITEMS IN THE PROPOSAL.
26. PAYMENT FOR SERVICE LATERALS AND SERVICE CONNECTIONS SHALL BE MADE AT THE UNIT PRICE BID IN THE PROPOSAL. PAYMENT SHALL INCLUDE TAPS INTO MAINS, RECONNECTIONS TO EXISTING SERVICES, TRANSFERRAL OF METERS, AND INSTALLING PIPE LATERALS, FITTINGS, BALL CORPS, BALL STOPS, GLOBE VALVES, METER SPLICES, BRASS PIPES, CAPS AND ALL APPURTENANCES, AS REQUIRED, IN PLACE COMPLETE. PAYMENT FOR METER BOXES, INCLUSIVE OF C.I. FRAMES AND COVERS AND TYPE "A" VALVES BOXES SHALL BE MADE AT THE RESPECTIVE UNIT PRICE BID IN THE BID.
27. ~~DEMOLISH AND BACKFILL ALL ABANDONED MANHOLES, VALVE BOXES AND METER BOXES. SALVAGE ALL CAST IRON FRAMES AND COVERS.~~
28. AFTER INSTALLATION OF TAPPING SLEEVE AND TAPPING VALVE AND PRIOR TO TAPPING THE EXISTING WATER MAIN, THE ASSEMBLY SHALL BE PRESSURE TESTED AT 150 PSI ON BOTH SIDES OF THE VALVE AND IN ACCORDANCE WITH THE WATER SYSTEM STANDARDS, DATED 1985.
29. ~~THE NEW WATER MAIN SHALL BE COMPLETED IN PHASES AS SHOWN ON THE PLANS. THE CONTRACTOR SHALL COMPLETE EACH PHASE INCLUDING INSTALLATION AND TESTING OF THE WATER MAIN, TRANSFER OF SERVICES AND FINAL PAVING OF THE STREET PRIOR TO BEGINNING THE NEXT PHASE. HOWEVER, THE CONTRACTOR MAY COMMENCE WORK ON THE NEXT PHASE UPON SATISFACTORY PROGRESS OF ALL REMAINING WORK ON THE PREVIOUS PHASE AS APPROVED IN WRITING BY BWS.~~
30. THE CONTRACTOR SHALL INSTALL THE FIRE HYDRANT REFLECTIVE MARKERS. THE CONTRACTOR SHALL NOTIFY THE NEAREST FIRE DEPARTMENT BATTALION CHIEF FOR THE INSTALLATION OR RELOCATION OF FIRE HYDRANT REFLECTIVE MARKERS. PAYMENT FOR INSTALLATION OF REFLECTIVE HYDRANT MARKERS SHALL BE MADE AT THE RESPECTIVE UNIT PRICE IN THE BID.
31. MECHANICAL JOINT GLANDS SHALL BE "STRAIGHT-SIDED" AND POLYGON IN SHAPE AS DESCRIBED IN AWWA C111 AND SHALL BE APPLICABLE TO BOTH CAST IRON AND DUCTILE IRON GLANDS OR AN APPROVED EQUAL ON A JOB TO JOB BASIS.
32. ALL AIR RELIEF VALVES SHALL HAVE A MINIMUM WORKING PRESSURE RANGE OF 0 TO 150 PSI.
33. ~~ALL PVC FITTINGS SHALL CONFORM TO AMERICAN WATER WORKS ASSOCIATION (AWWA) C-907. THE USE OF HUB CLAMPS AND SET SCREWS ON PVC FITTINGS IS NOT APPROVED. PRIOR TO THE PVC FITTING INSTALLATION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE BOARD OF WATER SUPPLY, THE MANUFACTURER'S CERTIFICATION THAT ALL PVC FITTINGS CONFORM IN ALL RESPECTS TO AWWA C-907.~~

34. PIPE CUSHION SHALL BE OF HIGH RESISTANT CUSHION MATERIAL HAS A 5,000 OHM-CM. REMAINDER OF THE CUSHION AND BACKFILL MATERIAL SHALL BE AS SPECIFIED IN VOLUME 1 OF THE STANDARDS. SUBSTANCES ABOVE REGULATORY LIMITS TO LEAD, ASBESTOS, MERCURY, STRONTIUM, AND POLYCHLORINATED BIPHENYLS SHALL NOT BE USED.
35. ALL SECTIONS OF THE WATER MAIN RUST PROTECTIVE JACKETING SHALL BE DUCTILE IRON RUST PROTECTIVE FITTINGS.
36. ~~ALL POLYVINYL CHLORIDE (PVC) PIPE SHALL BE ACCOMPLISHED ONLY BY THE USE OF DIELECTRIC COUPLINGS. DEFLECTION AROUND CURVES SHALL BE ACCOMPLISHED BY THE USE OF PVC DEFLECTOR COUPLINGS.~~
37. CLEANING SHALL BE BY THE USE OF "PIG" PIPELINE AND RUN COMPLETELY THROUGH ALL BRANCH LINES FOR FIRE HYDRANT SERVICE LATERALS IS NOT REQUIRED. USED TO SWAB PIPING CLEAN AS EACH "PIG" SHALL CONSIST OF POLYURETHANE FOAM WITH A DENSITY OF 1.00 AND A VINYL-COATED NOSE. THE "PIG" SHALL BE EQUAL TO 1-1/4 TO 1-1/2 OF THE PIPE BEING INSTALLED. THE "PIG" SHALL BE 1-1/2 TO 2 TIMES ITS DIAMETER. THE "PIG" SHALL BE SUBMERGED IN A CHLORINE BLEACH IN 5 GALLONS OF WATER. PIPELINE SHALL BE CONSIDERED CLEAN WHEN THE "PIG" IS INSTALLED.
38. BALL CORPS AND BALL STOPS SHALL BE INSTALLED IN THE CORPUS AND STOPCOCKS.
39. ~~PIPE ALTERNATIVES:~~
 - A. DUCTILE IRON PIPES SHALL BE COATED WITH POLYETHYLENE.
 - B. ~~POLYVINYL CHLORIDE (PVC) PIPE SHALL BE DOUBLE WRAPPED WITH POLYETHYLENE. POLYVINYL CHLORIDE (PVC) PIPE SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS AS BID ON BY THE CONTRACTOR. ADDITIONAL DESIGN WORK, ADDITIONAL COUPLINGS, NOT SPECIFIED IN THE PROPOSAL, SHALL BE CONSIDERED INCIDENTAL TO THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL FITTINGS AND SPECIAL WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. TONING WIRE SHALL BE INSTALLED ALONG ALL PVC PIPE.~~

PAYMENT FOR POLYETHYLENE WRAP SHALL BE MADE AT THE UNIT PRICE BID FOR DI PIPE, VALVES AND FITTINGS.

DOUBLE POLYETHYLENE WRAP SHALL BE USED FOR ALL DI PIPE, VALVES AND FITTINGS.

CLASS 150 OR 200 FOR DIAMETERS GREATER THAN 12 INCHES.

FOR EXTERNAL CORROSION CONTROL, WHEN NECESSARY.

39. PIPE ALTERNATIVES:
 - A. DUCTILE IRON PIPES SHALL BE COATED WITH POLYETHYLENE.
 - B. ~~POLYVINYL CHLORIDE (PVC) PIPE SHALL BE DOUBLE WRAPPED WITH POLYETHYLENE. POLYVINYL CHLORIDE (PVC) PIPE SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS AS BID ON BY THE CONTRACTOR. ADDITIONAL DESIGN WORK, ADDITIONAL COUPLINGS, NOT SPECIFIED IN THE PROPOSAL, SHALL BE CONSIDERED INCIDENTAL TO THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL FITTINGS AND SPECIAL WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. TONING WIRE SHALL BE INSTALLED ALONG ALL PVC PIPE.~~

34. PIPE CUSHION SHALL BE OF HIGH RESISTIVITY MATERIAL. THE CONTRACTOR SHALL SUBMIT A SOIL CERTIFICATION THAT HIGH RESISTANT CUSHION MATERIAL HAS A RESISTIVITY GREATER THAN 5,000 OHM-CM. REMAINDER OF THE BACKFILL MATERIAL SHALL BE AS SPECIFIED IN VOLUME 1 OF THE WATER SYSTEM STANDARDS. PIPE CUSHION AND BACKFILL MATERIAL SHALL CONTAIN NO HAZARDOUS SUBSTANCES ABOVE REGULATORY ACTION LEVELS INCLUDING BUT NOT LIMITED TO LEAD, ASBESTOS, MERCURY, CHROMIUM, CADMIUM, ZINC, STRONTIUM, AND POLYCHLORINATED BIPHENYLS (PCB).

35. ALL SECTIONS OF THE WATER MAIN REQUIRING REINFORCED CONCRETE JACKETING SHALL BE DUCTILE IRON PIPE WITH DUCTILE IRON FITTINGS.

36. ~~ALL POLYVINYL CHLORIDE (PVC) PIPE DEFLECTIONS SHALL BE ACCOMPLISHED ONLY BY THE USE OF SPECIAL PVC DEFLECTION COUPLINGS. DEFLECTION AROUND CURVES SHALL BE ACCOMPLISHED ONLY BY THE USE OF PVC DEFLECTION COUPLINGS.~~

37. CLEANING SHALL BE BY THE USE OF "PIGS" INTRODUCED INTO THE PIPELINE AND RUN COMPLETELY THROUGH ALL INSTALLED PIPELINES AND ALL BRANCH LINES FOR FIRE HYDRANTS. "PIGGING" OF SERVICE LATERALS IS NOT REQUIRED. BARE FOAM "PIGS" SHALL BE USED TO SWAB PIPING CLEAN AS EACH LENGTH OF THE PIPELINE IS INSTALLED. EACH "PIG" SHALL CONSIST OF A CYLINDRICAL PIECE OF POLYURETHANE FOAM WITH A DENSITY OF 3-7 POUNDS PER CUBIC FOOT AND A VINYL-COATED NOSE. OUTSIDE DIAMETER OF THE "PIG" SHALL BE EQUAL TO 1-1/4 TO 1-1/2 TIMES THE INSIDE DIAMETER OF THE PIPE BEING INSTALLED. THE LENGTH OF THE "PIG" SHALL BE 1-1/2 TO 2 TIMES ITS DIAMETER. PRIOR TO USE, THE "PIG" SHALL BE SUBMERGED IN A CHLORINE SOLUTION OF 1 OZ. OF 5% CHLORINE BLEACH IN 5 GALLONS OF WATER. "PIGGING" OF THE PIPELINE SHALL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE NEW PIPELINE.

38. BALL CORPS AND BALL STOPS SHALL BE INSTALLED IN LIEU OF THE CORPORATION STOPS AND STOPCOCKS, RESPECTIVELY.

39. ~~PIPE ALTERNATIVES:~~

A. DUCTILE IRON PIPES SHALL BE CLASS 52, DOUBLE WRAPPED WITH POLYETHYLENE.

~~B. POLYVINYL CHLORIDE (PVC) PIPES SHALL BE CLASS 150 OR 200 FOR DIAMETERS 12" AND SMALLER CLASS 150 FOR DIAMETERS GREATER THAN 12" ALL VALVES, CAST IRON PIPES AND FITTINGS SHALL BE DOUBLE WRAPPED WITH POLYETHYLENE. NO BENDING OF POLYVINYL CHLORIDE PIPES WILL BE PERMITTED. THE INSTALLATION OF PVC PIPE ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID ON BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS, NOT SPECIFIED IN THE PLANS AND SPECIFICATIONS. PAYMENT FOR ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID IN THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COPPER TONING WIRE SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF THE PIPELINE.~~

PAYMENT FOR POLYETHYLENE WRAP SHALL BE INCIDENTAL TO THE UNIT PRICE BID FOR DI PIPE, VALVES AND FITTINGS.

DOUBLE POLYETHYLENE WRAP SHALL NOT BE LESS THAN 16 MILS.

~~CLASS 150 OR 200 FOR DIAMETERS 12" AND SMALLER CLASS 150 FOR DIAMETERS GREATER THAN 12"~~

~~FOR EXTERNAL CORROSION CONTROL, WHEN REQUIRED:~~

39. PIPE ALTERNATIVES:

A. DUCTILE IRON PIPES SHALL BE CLASS 52. ALL DUCTILE IRON PIPES, FITTINGS, AND VALVES SHALL HAVE BONDED COATING, WITH AN EXTERNAL CORROSION CONTROL SYSTEM APPLIED. POLYVINYL CHLORIDE (PVC) PIPES USED TO ELECTRICALLY ISOLATE THE SYSTEM SHALL BE CLASS 150 OR 200 FOR DIAMETERS 12" AND SMALLER CLASS 150 FOR DIAMETERS GREATER THAN 12". NO BENDING OF PVC PIPES WILL BE PERMITTED. COPPER TONING WIRE SHALL BE INSTALLED ALONG ALL PVC PORTIONS OF THE PIPELINE.

~~B. POLYVINYL CHLORIDE (PVC) PIPES SHALL BE CLASS 150 OR 200 FOR DIAMETERS 12" AND SMALLER CLASS 150 FOR DIAMETERS GREATER THAN 12" ALL VALVES, CAST IRON PIPES AND FITTINGS SHALL BE DOUBLE WRAPPED WITH POLYETHYLENE. NO BENDING OF POLYVINYL CHLORIDE PIPES WILL BE PERMITTED. THE INSTALLATION OF PVC PIPE ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID ON BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS, NOT SPECIFIED IN THE PLANS AND SPECIFICATIONS. PAYMENT FOR ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID IN THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COPPER TONING WIRE SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF THE PIPELINE.~~

FOR BOTH ALTERNATIVES: PAYMENT FOR THE FURNISHING AND INSTALLATION OF THE EXTERNAL CORROSION CONTROL SYSTEM WILL BE MADE AT THE UNIT PRICE BID, OR LUMP SUM BID, WHICHEVER IS SPECIFIED, FOR THE ITEM OF WHICH THE EXTERNAL CORROSION CONTROL IS A PART.

DOUBLE POLYETHYLENE WRAP SHALL NOT BE LESS THAN 16 MILS.

• CLASS 150 OR 200 FOR DIAMETERS 12" AND SMALLER CLASS 150 FOR DIAMETERS GREATER THAN 12"

~~FOR CONCRETE CYLINDER PIPE ALTERNATIVE:~~

39. PIPE ALTERNATIVES:

A. DUCTILE IRON PIPES SHALL BE CLASS 52. ALL DUCTILE IRON WITH POLYETHYLENE.

~~B. POLYVINYL CHLORIDE (PVC) PIPES SHALL BE CLASS 150 OR 200 FOR DIAMETERS 12" AND SMALLER CLASS 150 FOR DIAMETERS GREATER THAN 12" ALL VALVES, CAST IRON PIPES AND FITTINGS SHALL BE DOUBLE WRAPPED WITH POLYETHYLENE. NO BENDING OF POLYVINYL CHLORIDE PIPES WILL BE PERMITTED. THE INSTALLATION OF PVC PIPE ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID ON BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS, NOT SPECIFIED IN THE PLANS AND SPECIFICATIONS. PAYMENT FOR ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID IN THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COPPER TONING WIRE SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF THE PIPELINE.~~

C. CONCRETE CYLINDER PIPES SHALL BE CLASS 150 OR 200 FOR DIAMETERS 12" AND SMALLER CLASS 150 FOR DIAMETERS GREATER THAN 12" AND SHALL BE MANUFACTURED AFTER ALL UNDERGROUND STRUCTURES AND UTILITIES ARE EXPOSED AND VERIFIED.

PAYMENT FOR POLYETHYLENE WRAP SHALL BE INCIDENTAL TO THE UNIT PRICE BID FOR DI PIPE, VALVES AND FITTINGS.

DOUBLE POLYETHYLENE WRAP SHALL NOT BE LESS THAN 16 MILS.

• CLASS 150 OR 200 FOR DIAMETERS 12" AND SMALLER CLASS 150 FOR DIAMETERS GREATER THAN 12"

40. THE CONTRACTOR/DEVELOPER SHALL OBTAIN A NPDES PERMIT PRIOR TO CHLORINATION AND/OR DEWATERING. A COPY OF THE PERMIT SHALL BE SUBMITTED TO THE BOARD OF WATER SUPPLY, PLANNING AND ENGINEERING DIVISION, CONSTRUCTION SECTION.

Prepared by:



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FAX: 531-2204

T003

THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.

Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

**JOB 98-158A
WAIPAHU WELLS III**

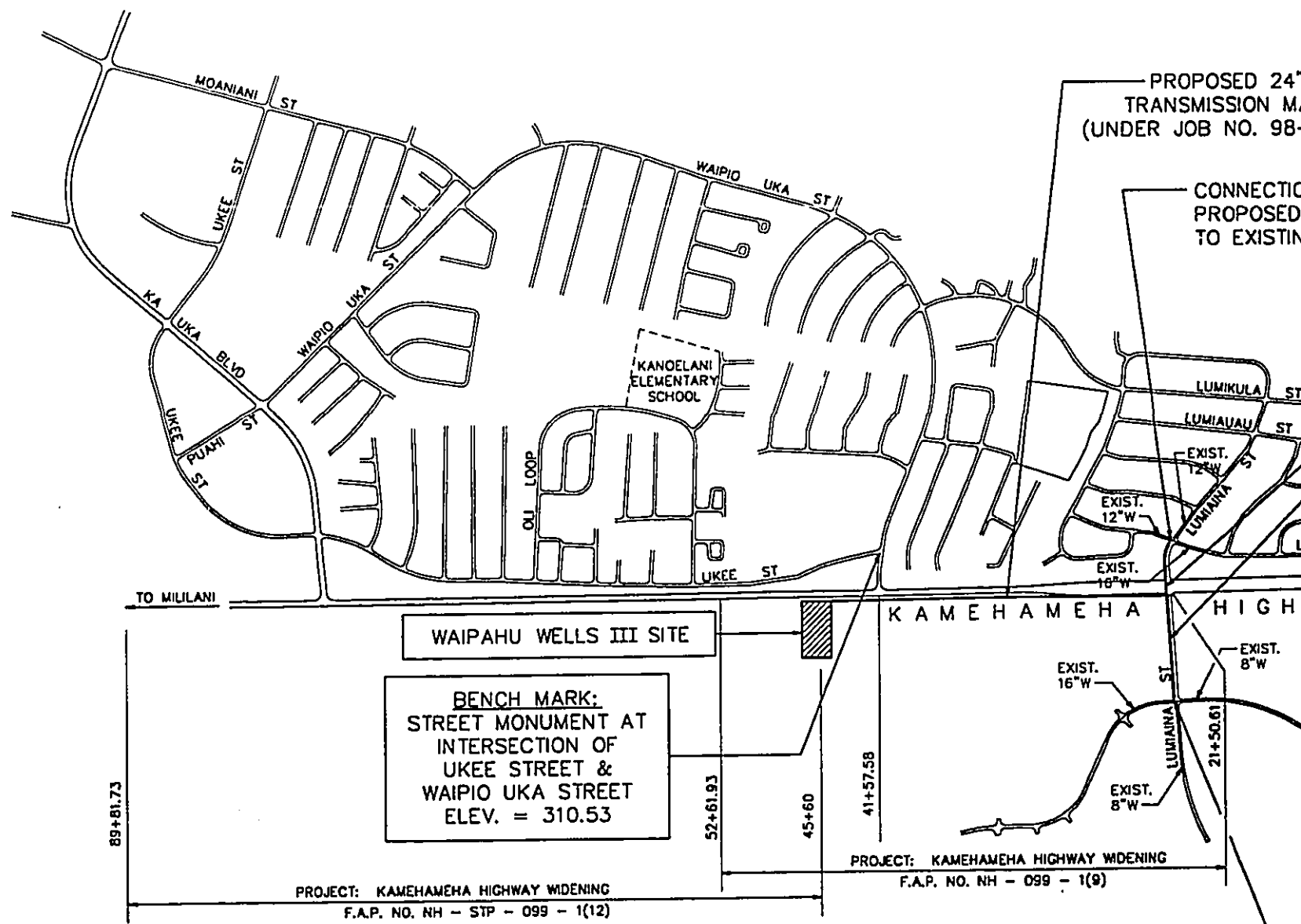
WATER NOTES

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

DRAWN BY: MDC ENGINEER EMS CHECKED BY: TAC FILE NO.

FIELD BOOK NO. SCALE: AS NOTED SHEET 3 OF 67 SHEETS

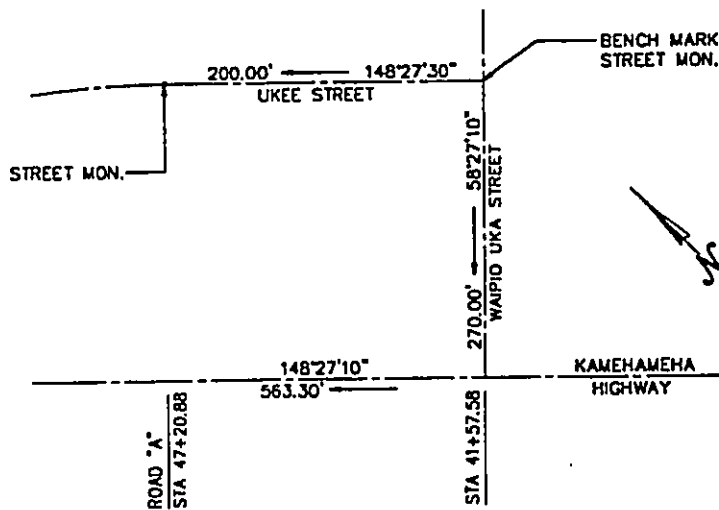
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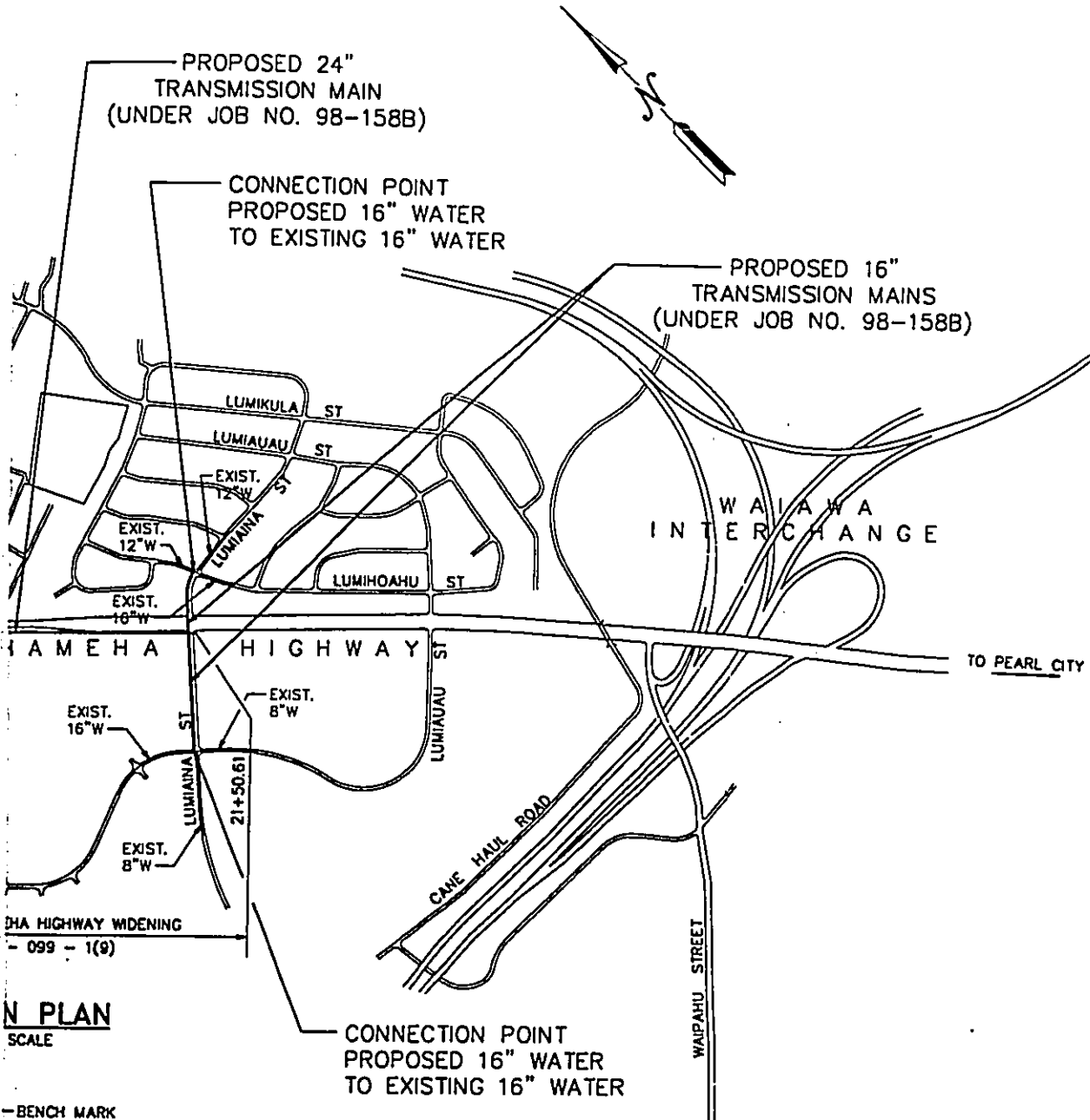
LOCATION PLAN
SCALE: NOT TO SCALE

LEGEND

APPROXIMATE BORING LOCATION AND NO.	B-3
KAMEHAMEHA HWY. BASELINE	0+00
EXISTING RIGHT-OF-WAY	
EXISTING EDGE OF PAVEMENT	
EXISTING CONTOURS	306
EXISTING TREES	
FINISH CONTOUR	310
FINISH ELEVATION	316.0
FLOW LINE	
LIMITS OF GRADING	
NEW CHAIN LINK FENCE	
SHEET FLOW	



SURVEY CONTROL
SCALE: NOT TO SCALE



N PLAN
SCALE

- BENCH MARK STREET MON.

APPROVED:

CHIEF, DIVISION OF ENGINEERING, DPW
DEPARTMENT OF PUBLIC WORKS
(FOR GRADING ONLY)

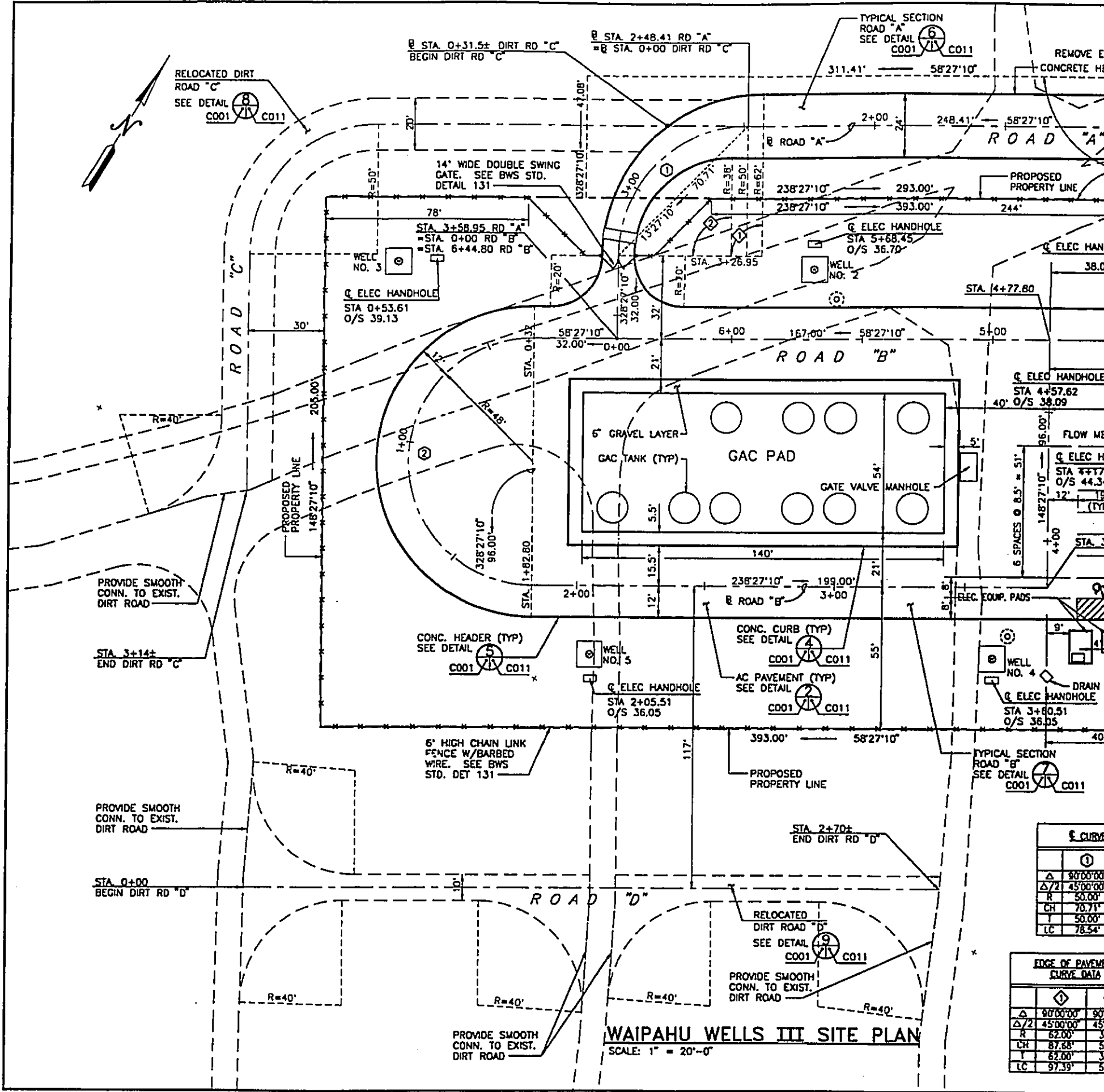
DATE

AMEHAMEHA HIGHWAY

DL

Prepared by: GMP ASSOCIATES, INC. <small>ENGINEERS/ARCHITECTS</small> 641 KEELE STREET, 21ST FLOOR HONOLULU, HAWAII 96813 TEL: 531-2276 FAX: 531-2270	THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. Signature _____	BOARD OF WATER SUPPLY CITY AND COUNTY OF HONOLULU JOB 98-158A WAIPAHU WELLS III LOCATION PLAN, LEGEND, AND SURVEY CONTROL	
		APPROVED: _____ <small>CHIEF, PLANNING AND ENGINEERING DIVISION</small>	DATE: _____
T004	DRAWN BY: <u>APL</u> CHECKED BY: <u>DTM</u> FILE NO: _____ FIELD BOOK NO: _____ SCALE: <u>AS NOTED</u> SHEET <u>4</u> OF <u>67</u> SHEETS		

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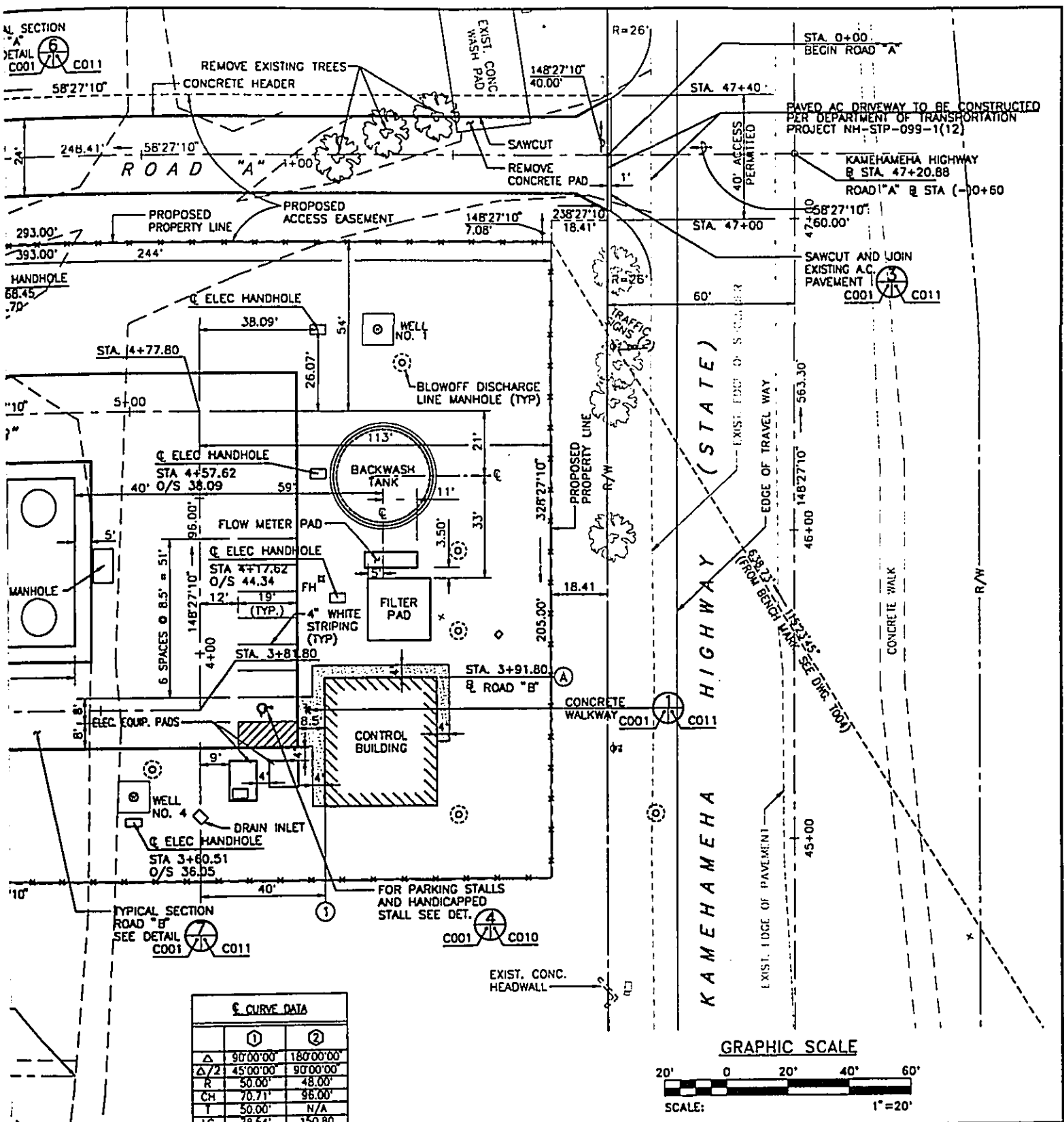


Curve Data

Curve	Stationing	Radius (R)	Chord (CH)	Tangent (T)	Length of Curve (LC)
1	90°00'00"	45°00'00"	50.00'	70.71'	50.00'
					78.54'

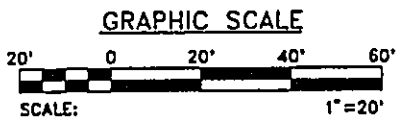
Edge of Pavement Curve Data

Curve	Stationing	Radius (R)	Chord (CH)	Tangent (T)	Length of Curve (LC)
1	90°00'00"	45°00'00"	62.00'	87.68'	62.00'
					97.39'



	①	②
Δ	90°00'00"	180°00'00"
Δ/2	45°00'00"	90°00'00"
R	50.00'	48.00'
CH	70.71'	98.00'
T	50.00'	N/A
LC	78.54'	150.80'

	①	②
Δ	90°00'00"	90°00'00"
Δ/2	45°00'00"	45°00'00"
R	62.00'	38.00'
CH	87.68'	53.74'
T	62.00'	38.00'
LC	97.39'	59.69'



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C001

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature _____

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 98-158A
WAIPAHU WELLS III

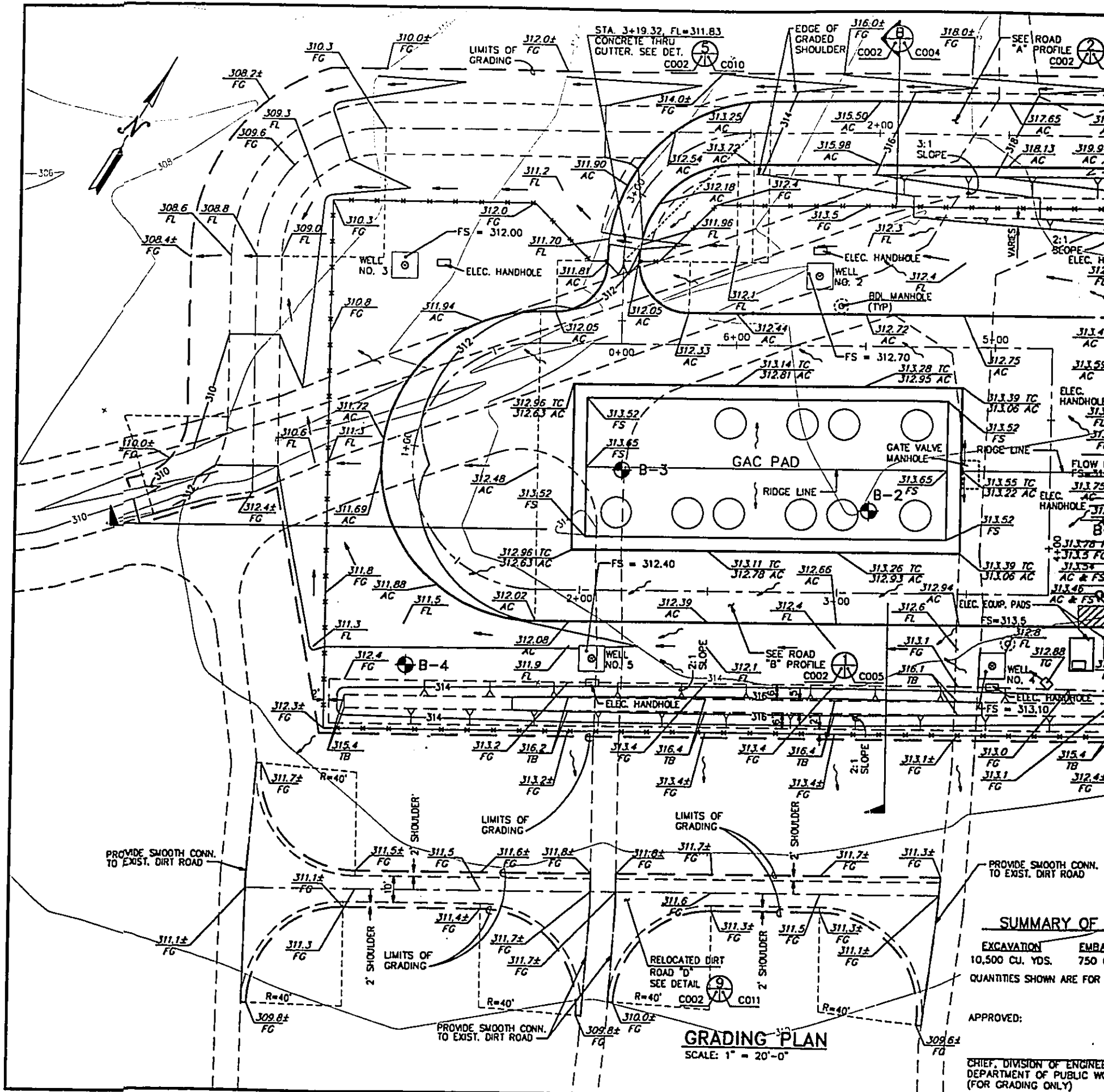
SITE PLAN

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

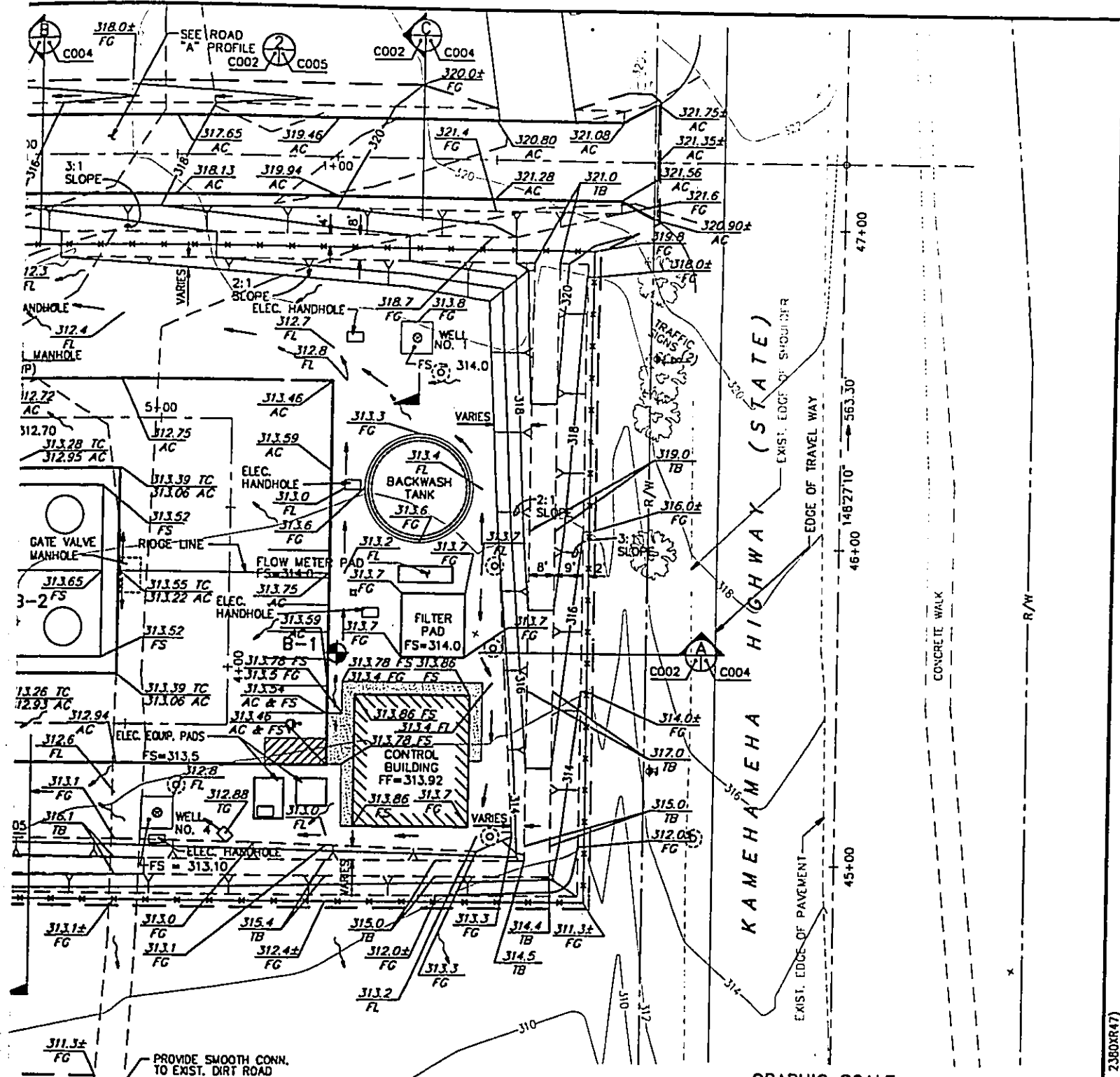
DRAWN BY: NFP CHECKER: DTM CHECKED BY: AKA FILE NO: _____

FIELD BOOK NO: _____ SCALE: AS NOTED SHEET 7 OF 67 SHEETS

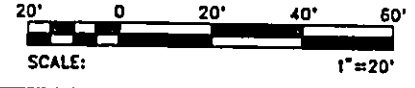
2380X133 10/23/97 08:17 FINAL (XREF: 2380XR47)



SUMMARY OF
 EXCAVATION 10,500 CU. YDS.
 EMBANKMENT 750 CU. YDS.
 QUANTITIES SHOWN ARE FOR
 APPROVED:
 CHIEF, DIVISION OF ENGINEERING
 DEPARTMENT OF PUBLIC WORKS
 (FOR GRADING ONLY)



GRAPHIC SCALE



SUMMARY OF EARTHWORK

EXCAVATION	EMBANKMENT	AREA
10,500 CU. YDS.	750 CU. YDS.	2.8 AC.

QUANTITIES SHOWN ARE FOR PERMIT PURPOSES ONLY.

APPROVED: _____
 CHIEF, DIVISION OF ENGINEERING
 DEPARTMENT OF PUBLIC WORKS
 (FOR GRADING ONLY)

DATE _____

Prepared by:

GTP ASSOCIATES, INC.
 Engineers/Architects

ON BOARD THESE AND SIMILAR PROJECTS
 1121 KALANANUOULI DRIVE, SUITE 200
 HONOLULU, HAWAII 96813
 TEL: 534-2211
 FAX: 534-2206

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C002

Signature _____

BOARD OF WATER SUPPLY
 CITY AND COUNTY OF HONOLULU

JOB 98-158A
WAIPAHU WELLS III

GRADING PLAN

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

DRAWN BY: NFP ENGINEER: DTM CHECKED BY: AKA FILE NO: _____
 FIELD BOOK NO: _____ SCALE: _____ SHEET: 8 OF 87 SHEETS

2380K134 12/17/97 13:48 FINAL (XREF: 2380K47)

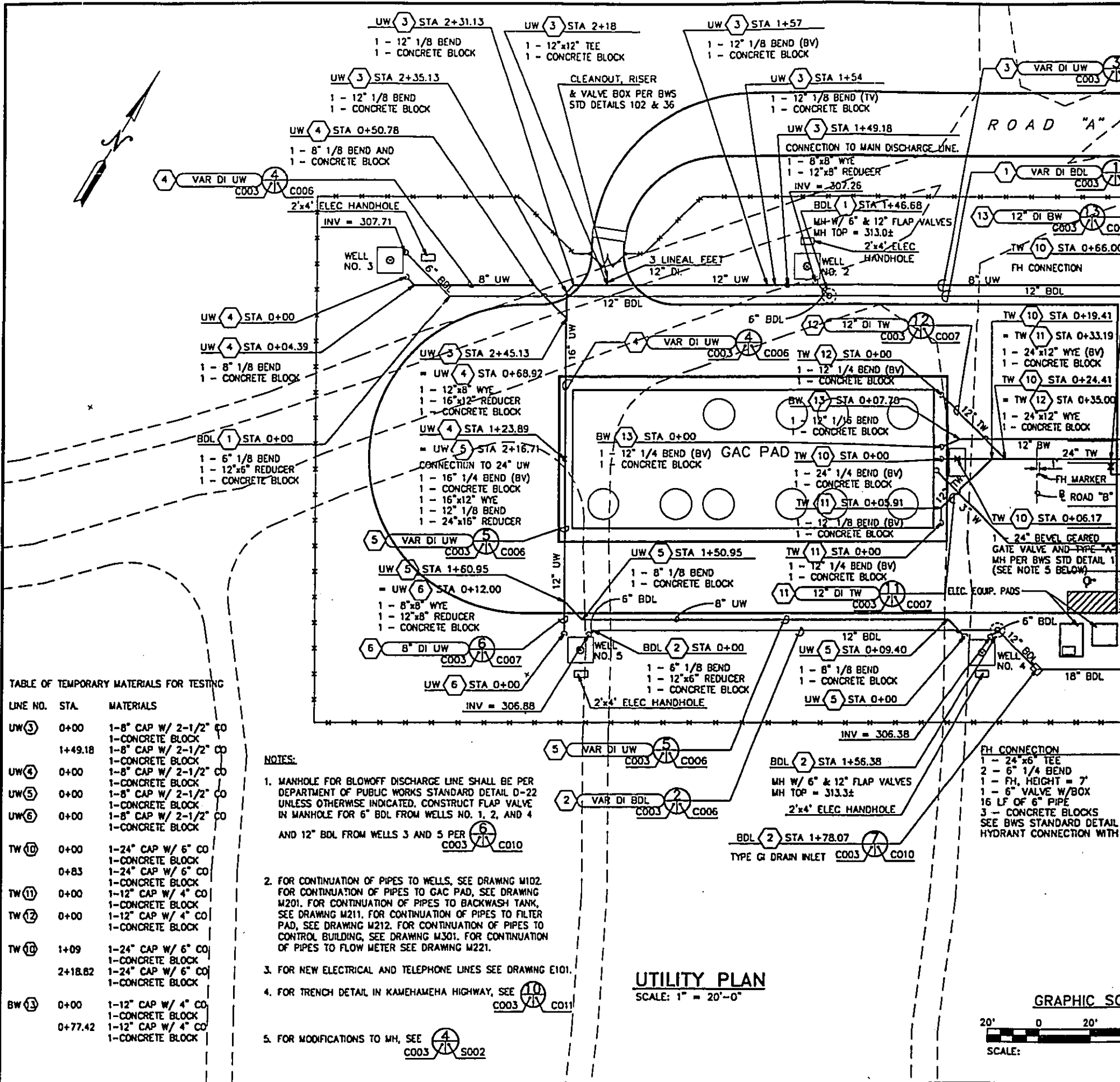





TABLE OF TEMPORARY MATERIALS FOR TESTING

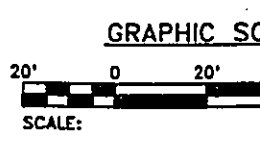
LINE NO.	STA.	MATERIALS
UW 3	0+00	1-8" CAP W/ 2-1/2" CO 1-CONCRETE BLOCK
	1+49.18	1-8" CAP W/ 2-1/2" CO 1-CONCRETE BLOCK
UW 4	0+00	1-8" CAP W/ 2-1/2" CO 1-CONCRETE BLOCK
UW 5	0+00	1-8" CAP W/ 2-1/2" CO 1-CONCRETE BLOCK
UW 6	0+00	1-8" CAP W/ 2-1/2" CO 1-CONCRETE BLOCK
TW 10	0+00	1-24" CAP W/ 6" CO 1-CONCRETE BLOCK
	0+83	1-24" CAP W/ 6" CO 1-CONCRETE BLOCK
TW 11	0+00	1-12" CAP W/ 4" CO 1-CONCRETE BLOCK
TW 12	0+00	1-12" CAP W/ 4" CO 1-CONCRETE BLOCK
TW 10	1+09	1-24" CAP W/ 6" CO 1-CONCRETE BLOCK
	2+18.82	1-24" CAP W/ 6" CO 1-CONCRETE BLOCK
BW 13	0+00	1-12" CAP W/ 4" CO 1-CONCRETE BLOCK
	0+77.42	1-12" CAP W/ 4" CO 1-CONCRETE BLOCK

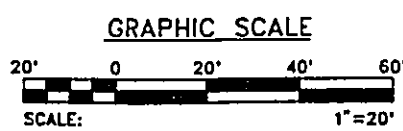
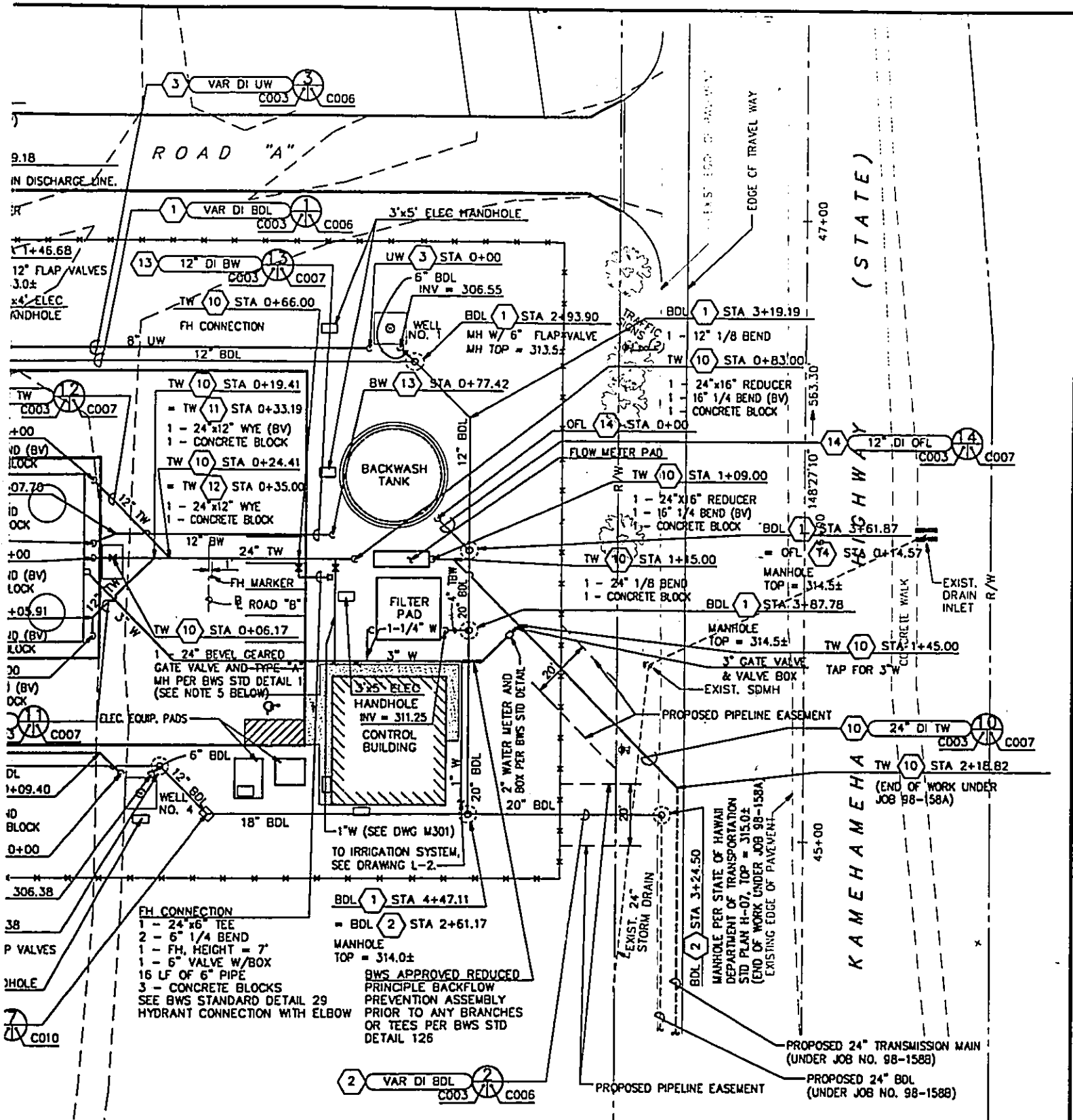
NOTES:

- MANHOLE FOR BLOWOFF DISCHARGE LINE SHALL BE PER DEPARTMENT OF PUBLIC WORKS STANDARD DETAIL D-22 UNLESS OTHERWISE INDICATED. CONSTRUCT FLAP VALVE IN MANHOLE FOR 6" BDL FROM WELLS NO. 1, 2, AND 4 AND 12" BDL FROM WELLS 3 AND 5 PER  CO10
- FOR CONTINUATION OF PIPES TO WELLS, SEE DRAWING M102. FOR CONTINUATION OF PIPES TO GAC PAD, SEE DRAWING M201. FOR CONTINUATION OF PIPES TO BACKWASH TANK, SEE DRAWING M211. FOR CONTINUATION OF PIPES TO FILTER PAD, SEE DRAWING M212. FOR CONTINUATION OF PIPES TO CONTROL BUILDING, SEE DRAWING M301. FOR CONTINUATION OF PIPES TO FLOW METER SEE DRAWING M221.
- FOR NEW ELECTRICAL AND TELEPHONE LINES SEE DRAWING E101.
- FOR TRENCH DETAIL IN KAMEHAMEHA HIGHWAY, SEE  CO11
- FOR MODIFICATIONS TO MH, SEE  S002

UTILITY PLAN

SCALE: 1" = 20'-0"





Prepared by:

C003



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Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

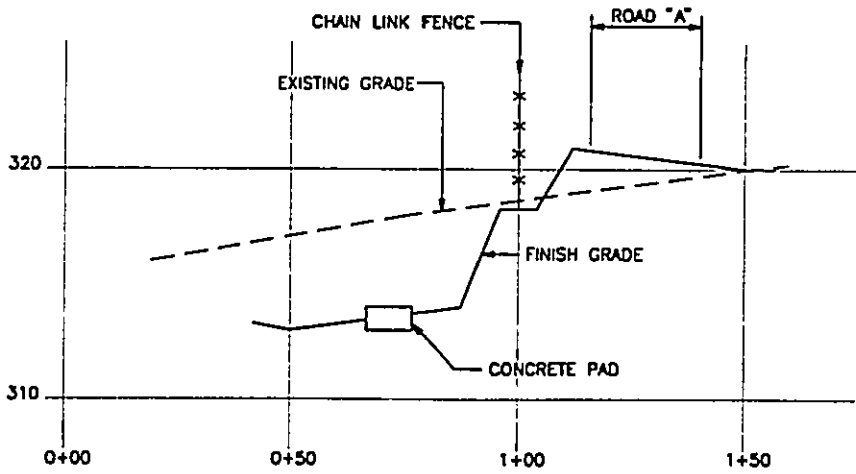
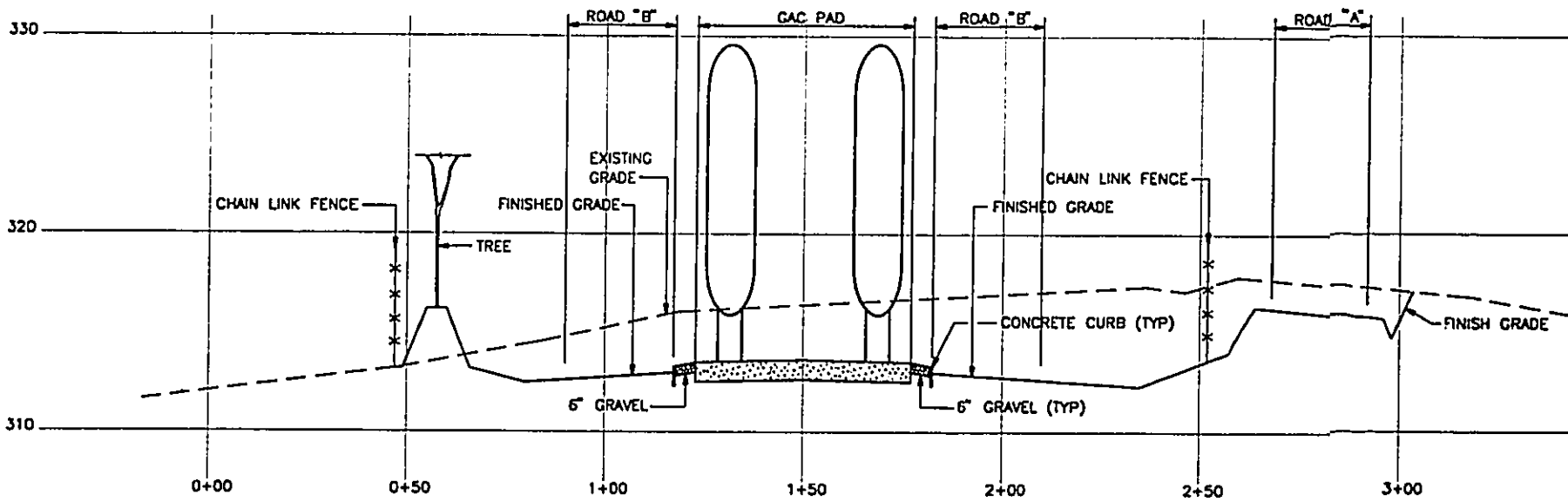
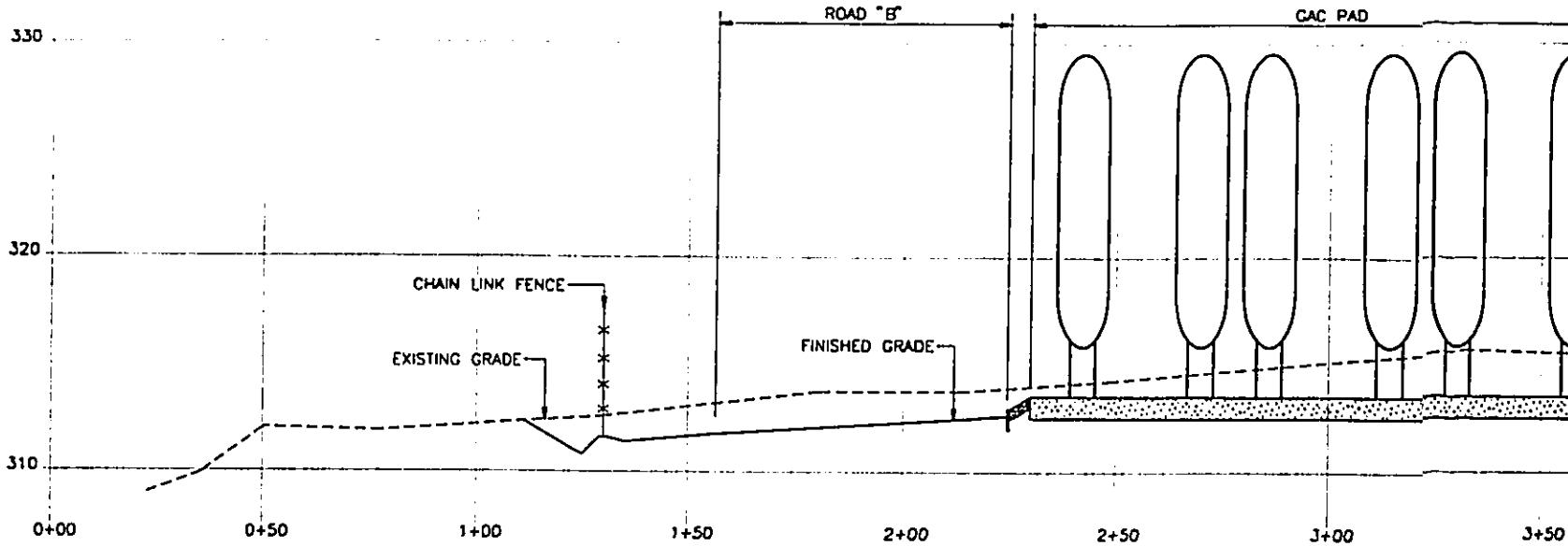
JOB 98-158A
WAIPAHU WELLS III

UTILITY PLAN

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

DRAWN BY: NFP CHECKED BY: DTM DESIGNED BY: AKA FILE NO: _____
FIELD BOOK NO. SCALE: SHEET 9 OF 67 SHEETS

2350K135 12/17/97 13:48 FINAL (XREF: 2350K447)



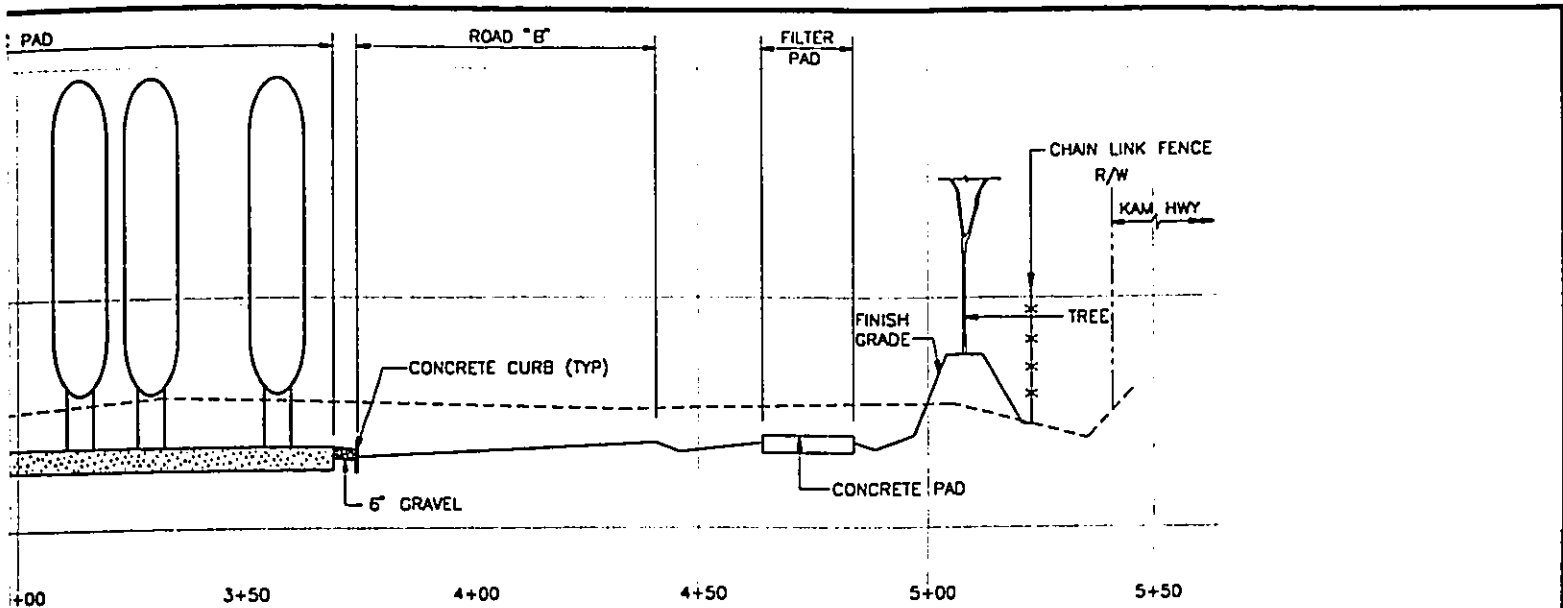
APPROVED:

CHIEF, DIVISION OF ENGINEERING
 DEPARTMENT OF PUBLIC WORKS
 (FOR GRADING ONLY)

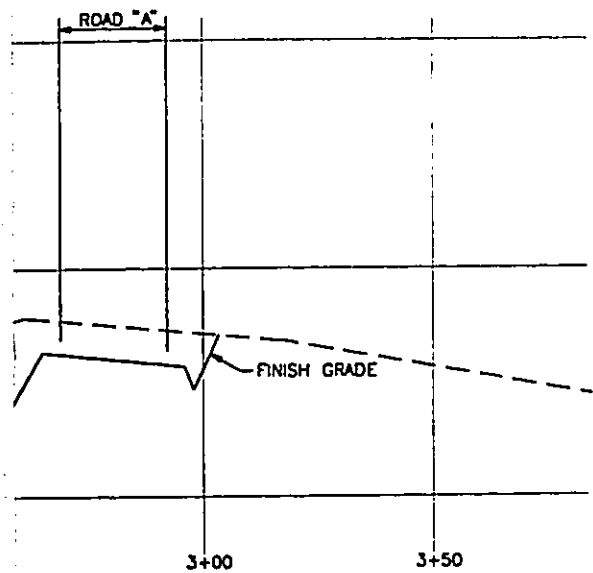
DATE

GRAPHIC

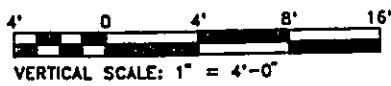
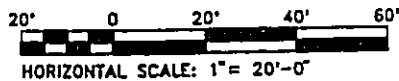




SECTION
 1" = 20'-0" (HORIZ)
 1" = 4'-0" (VERT)



GRAPHIC SCALES:



Prepared by:

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C004

Signature _____

BOARD OF WATER SUPPLY
 CITY AND COUNTY OF HONOLULU

JOB 98-158A
WAIPAHU WELLS III

SITE SECTIONS

APPROVED: _____ DATE: _____
CHEF, PLANNING AND ENGINEERING DIVISION

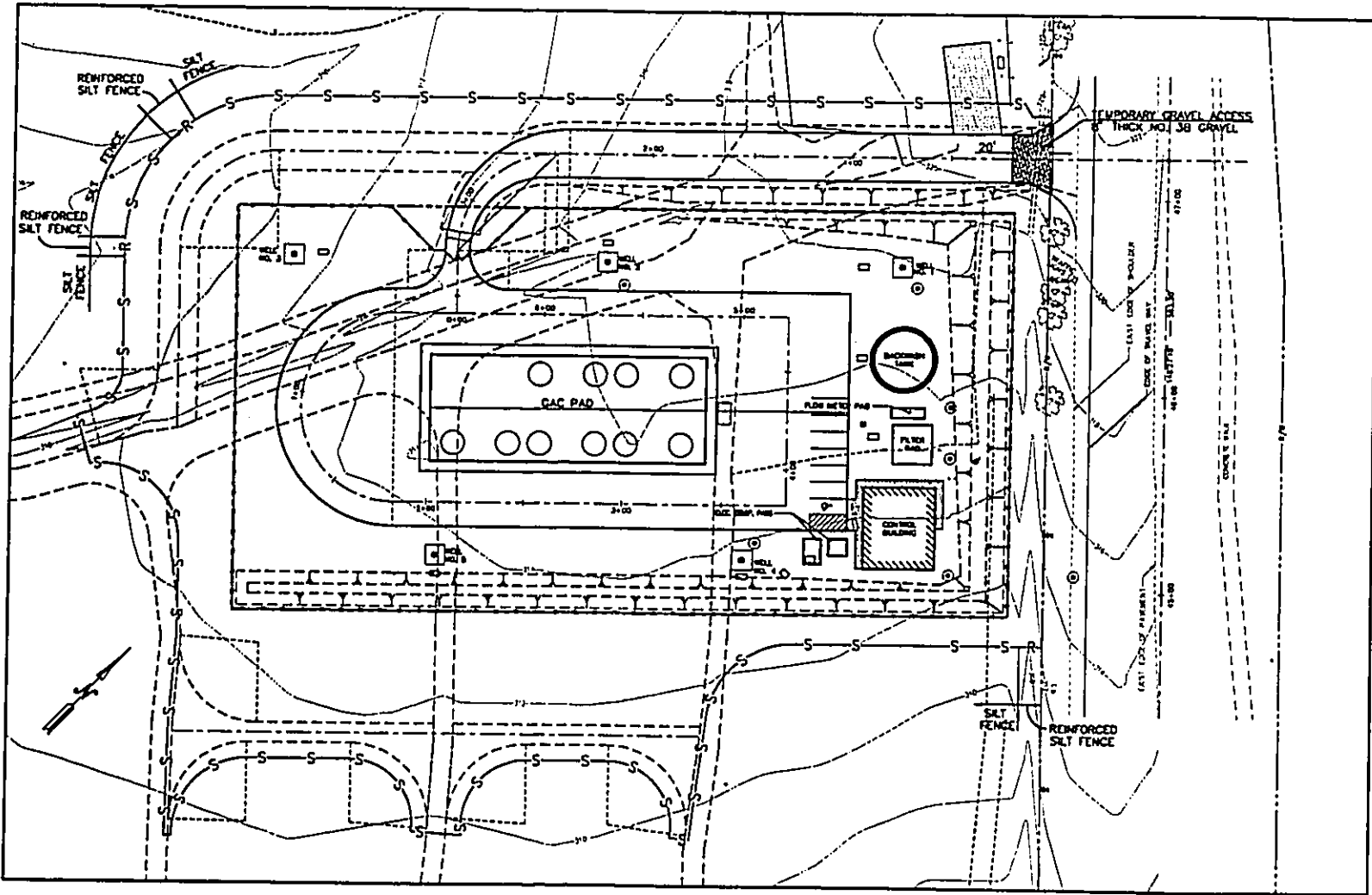
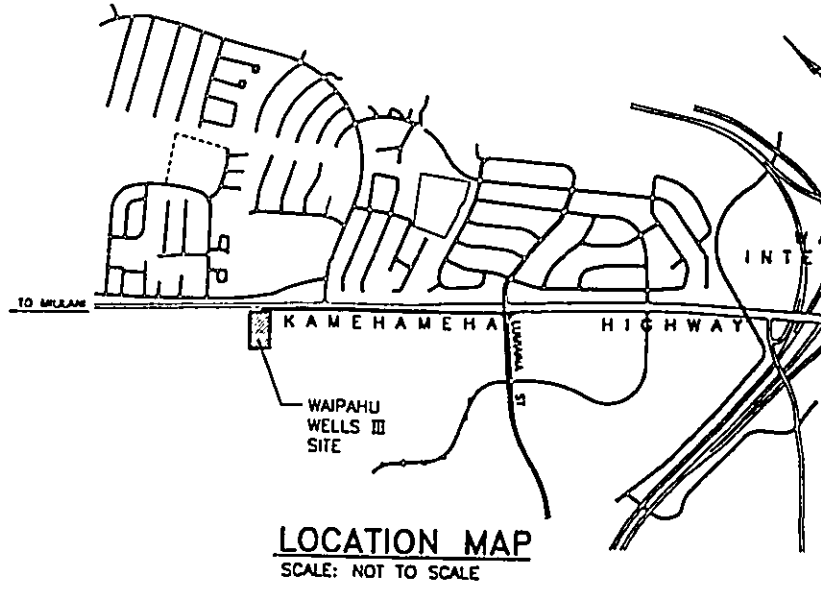
DRAWN BY: RDS CHECKED BY: DTM CHECKED BY: AJKA FILE NO. _____

FIELD BOOK NO. _____ SCALE: AS NOTED SHEET 10 OF 67 SHEETS

FINAL 10/25/97 14:05 2380K130

BEST MANAGEMENT PRACTICES NOTES:

1. SILT FENCES SHALL BE CONSTRUCTED PRIOR TO COMMENCEMENT OF CLEARING AND GRUBBING AND ON THE DOWNHILL SIDE OF ALL SLOPES BEING GRADED.
2. SILT FENCES SHALL BE IMMEDIATELY REPAIRED WHEN DAMAGED DURING CLEARING AND GRUBBING OR GRADING OPERATIONS.
3. ALL UNPAVED SITE INGRESS AND EGRESS SHALL BE GRAVELED AND THE CONTRACTOR SHALL INSURE THAT ALL VEHICLES LEAVING THE CONSTRUCTION SITE WILL BE FREE OF MUD.
4. GRASSING SHALL BE BERMUDA GRASS ON 4" OF TOPSOIL.
5. CONTRACTOR SHALL REMOVE AND DISPOSE OF OFF SITE THE SILT FENCES WHEN THE PROJECT IS COMPLETED AND THE GRASS IS ESTABLISHED.



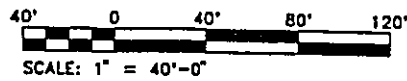
EROSION CONTROL PLAN

SCALE: 1" = 40'-0"

LEGEND

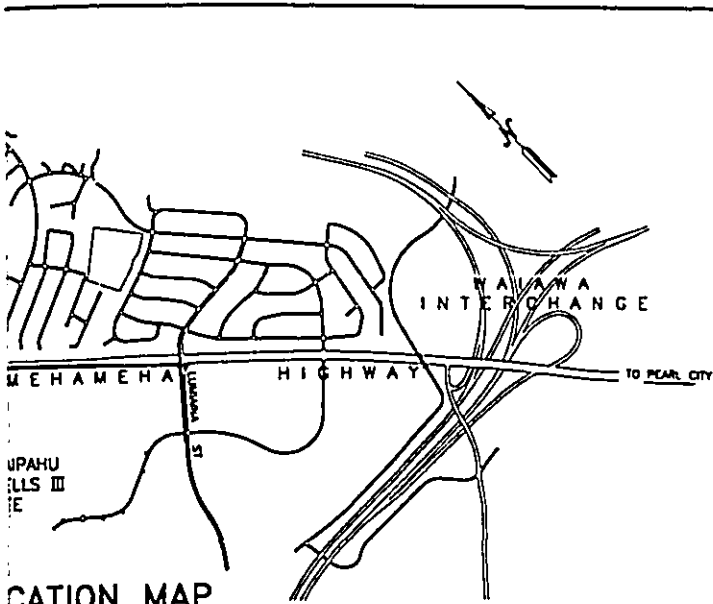
- S- SILT FENCE
- R- REINFORCED SILT FENCE
- ▢ TEMPORARY GRAVEL ACCESS

GRAPHIC SCALE:

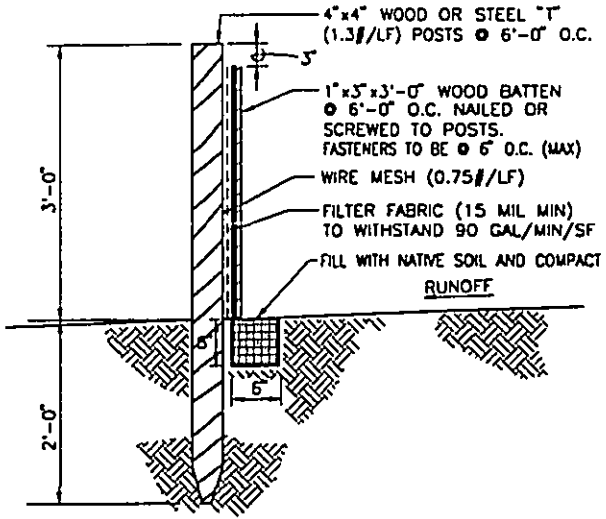


APPROVED:

CHIEF, DIVISION OF ENGINEERING, DPW
(FOR EROSION CONTROL ONLY)

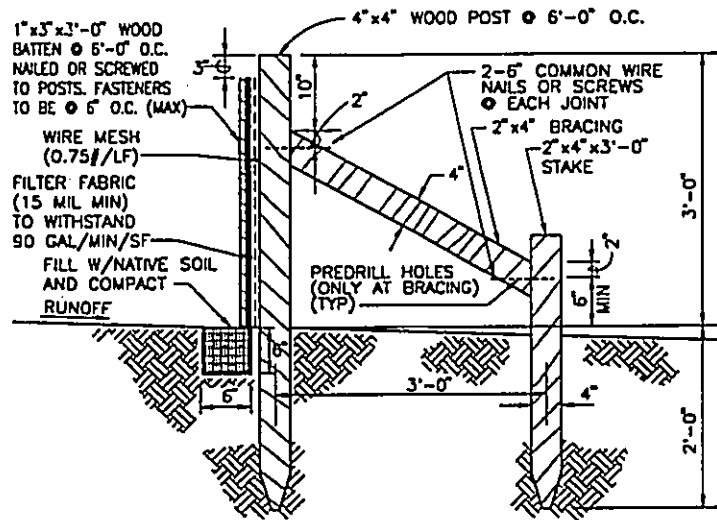
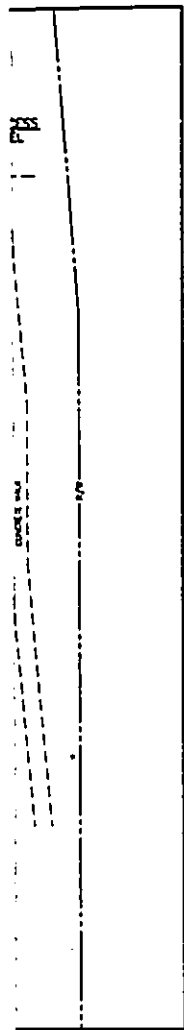


LOCATION MAP
SCALE: NOT TO SCALE



1 DETAIL - SILT FENCE
SCALE: NOT TO SCALE

C009



2 DETAIL - REINFORCED SILT FENCE
SCALE: NOT TO SCALE

C009

APPROVED:

CHIEF, DIVISION OF ENGINEERING, DPW
(FOR EROSION CONTROL ONLY)

DATE

Prepared by:



C009

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Signature

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 98-158A
WAIPAHU WELLS III

EROSION CONTROL PLAN

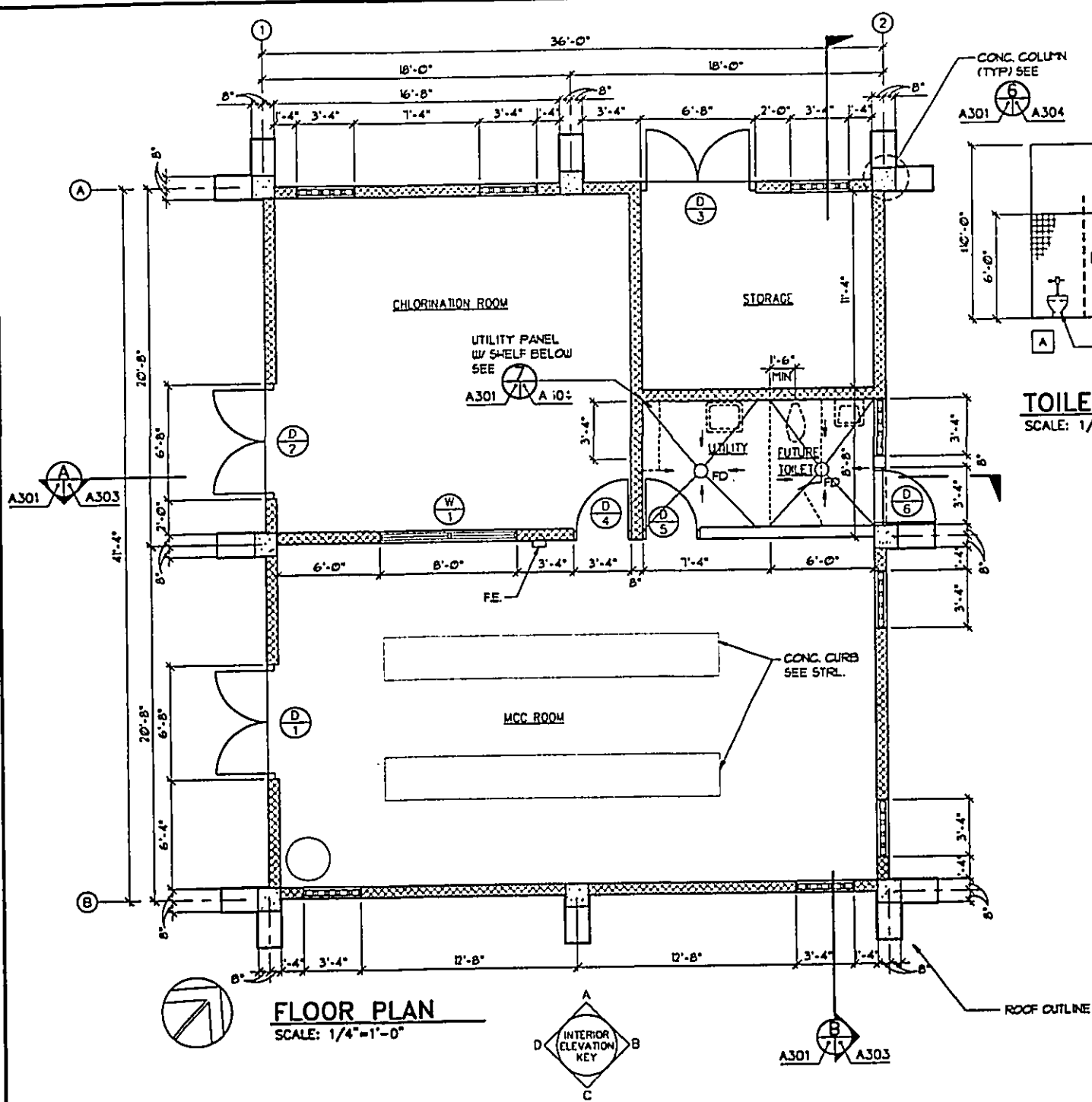
APPROVED: _____ DATE: _____

CHIEF, PLANNING AND ENGINEERING DIVISION

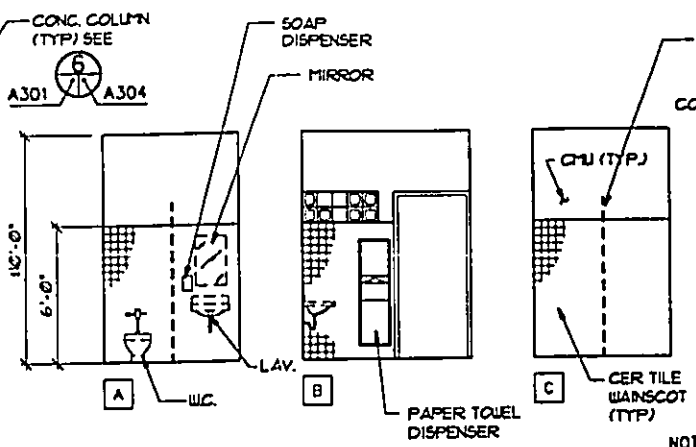
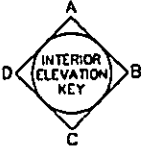
DRAWN BY: NFP ENGINEER: DTH CHECKED BY: AKA FILE NO:

FIELD BOOK NO. SCALE: AS NOTED SHEET 15 OF 67 SHEETS

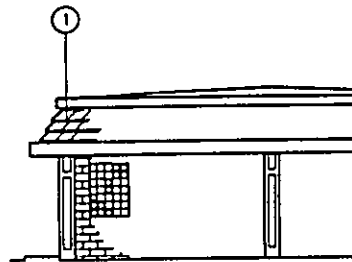
2380K136 10/25/97 14:33 FINAL (XREF: 2380XR47)



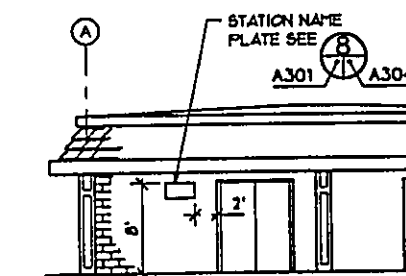
FLOOR PLAN
SCALE: 1/4"=1'-0"



TOILET INTERIOR ELEVATIONS
SCALE: 1/4"=1'-0"



FRONT ELEVATION
SCALE: 1/8"=1'-0"

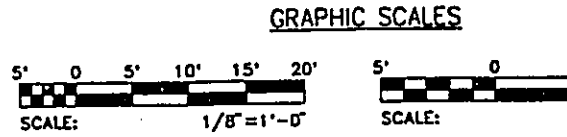


RIGHT ELEVATION
SCALE: 1/8"=1'-0"

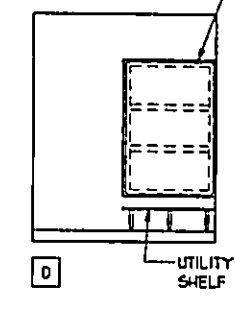
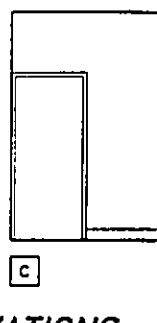
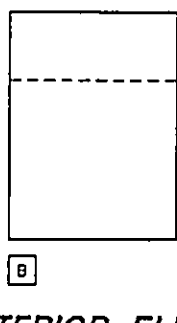
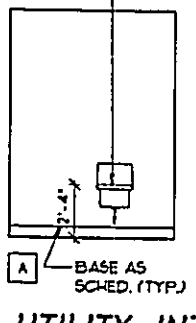
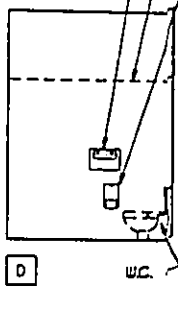
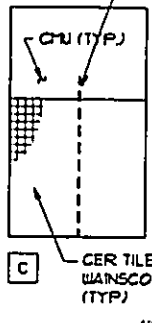
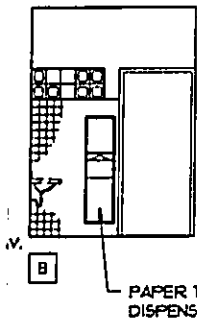
ROOM FINISH SCHEDULE											
BLDG	ROOM NAME	FLOOR	BASE	WAINSCOT	WALLS				CEILING	CEILING HEIGHT	REMARKS
					EL "A"	EL "B"	EL "C"	EL "D"			
CONTROL BUILDING	MCC	E	E	-	A	A	A	A	D	10'-0"	
	CHLORINATION	E	E	-	A	A	A	A	D	10'-0"	
	UTILITY	E	E	-	A	A	A	A	C	10'-0"	
	TOILET	F	-	F	A	A	A	A	C	10'-0"	
	STORAGE	B	-	-	A	A	A	A	C	10'-0"	

NOTE: 1. FOR THE MATERIAL EXPLANATION SEE MATERIAL CODE LIST.
2. "-" INDICATES NO ENTRY FOR THAT CATEGORY.

ROOM MATERIAL CODE LIST	
A	CMU - PAINT
B	CONCRETE
C	GYP.BD. - PAINT
D	ACOUSTICAL TILE
E	QUARRY TILE
F	CERAMIC TILE



SOAP DISPENSER
MIRROR

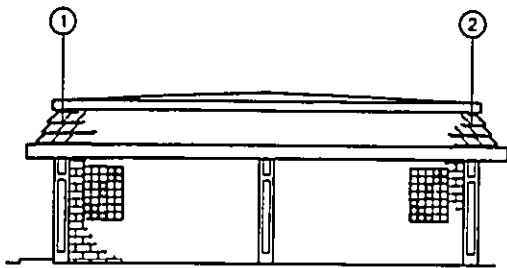


INTERIOR ELEVATIONS

NOTE:
ALL TOILET FIXTURES
AND ACCESSORIES
ARE INDICATED FOR
FUTURE REFERENCE

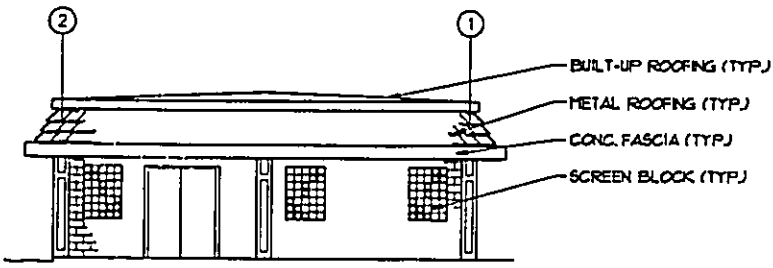
UTILITY INTERIOR ELEVATIONS

SCALE: 1/4"=1'-0"



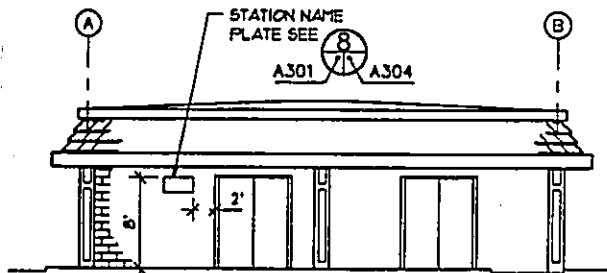
FRONT ELEVATION

SCALE: 1/8"=1'-0"



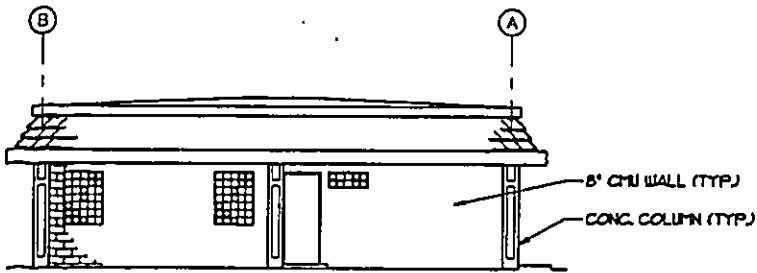
BACK ELEVATION

SCALE: 1/8"=1'-0"



RIGHT ELEVATION

SCALE: 1/8"=1'-0"



LEFT ELEVATION

SCALE: 1/8"=1'-0"

MATERIAL CODE LIST

GRAPHIC SCALES



Prepared by: GMP ASSOCIATES, INC. Engineers/Architects <small>200 SOUTH KEELE STREET PHOENIX, ARIZONA 85004 TEL: 602-998-1111 FAX: 602-998-1100</small>	THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. Signature: _____	BOARD OF WATER SUPPLY CITY AND COUNTY OF HONOLULU JOB 97-127 WAIPAHU WELLS III FLOOR PLAN, INTERIOR & EXTERIOR ELEVATIONS ROOM FINISH SCHEDULE	
		APPROVED: _____ <small>CHIEF, PLANNING AND ENGINEERING DIVISION</small>	DATE: _____
A301		DRAWN BY: VGR ENGINEER: CCK CHECKED BY: CPP FILE NO: _____ FIELD BOOK NO: _____ SCALE: AS NOTED SHEET _____ OF _____ SHEETS	2380Y113 11/06/97 11:39 FINAL (2380XR51)

APPENDIX H
PARTIAL CONSTRUCTION PLANS
"PART B"

JOB NO. 98 - 158B

24 INCH AND 16 INCH TRANSMISSION LINES ALONG KAMEHAMEHA HIGHWAY AND ADJACENT AREAS

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

TMK; 9-4-05,07,42 AND 44

PREPARED BY:

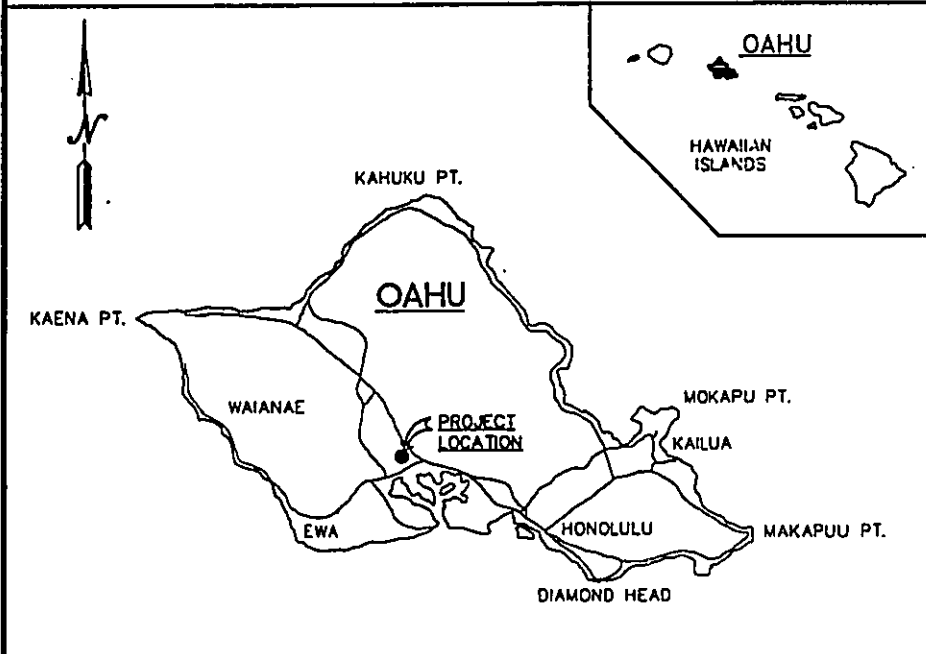
GMP ASSOCIATES, INC.

ENGINEERS/ARCHITECTS

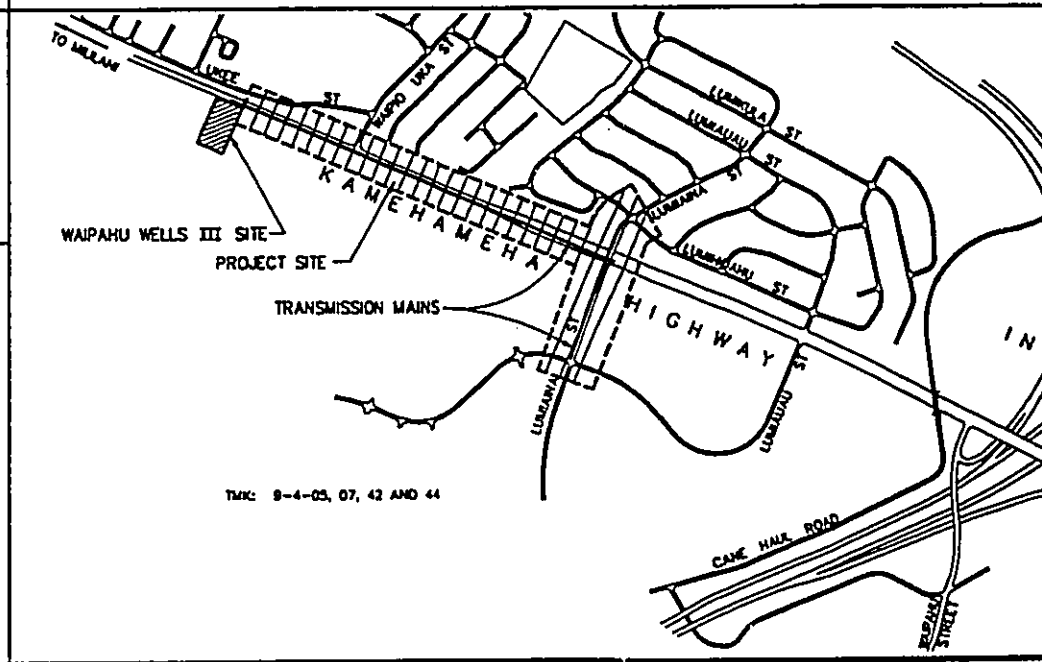
HONOLULU, HAWAII

PHONE: 521-4711

VICINITY MAP



LOCATION MAP



JOB No. 2382/03

98 - 158B

TRANSMISSION MAINS HIGHWAY AND LUMIAINA STREET

WATER SUPPLY CITY OF HONOLULU HAWAII

5,07,42 AND 44

DESIGNED BY:

ASSOCIATES, INC.

ENGINEERS/ARCHITECTS

HONOLULU, HAWAII

521-4711

LOCATION MAP	APPROVED	
	_____ MANAGER AND CHIEF OF ENGINEERING BOARD OF WATER SUPPLY	_____ DATE
	_____ ADMINISTRATOR, HIGHWAYS DIVISION STATE DEPARTMENT OF TRANSPORTATION (APPROVAL GRANTED FOR WORK WITHIN STATE RIGHT-OF-WAY ONLY. ID NO. _____ LETTER OF APPROVAL NO. HWY-CM _____ DATED _____)	_____ DATE
	_____ DIRECTOR, DEPARTMENT OF TRANSPORTATION SERVICES CITY AND COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY R/W ONLY)	_____ DATE
	_____ DIRECTOR, DEPARTMENT OF WASTEWATER MANAGEMENT CITY AND COUNTY OF HONOLULU (FOR SEWER WORK WITHIN PUBLIC R/W AND EASEMENT ONLY)	_____ DATE
	_____ DIRECTOR AND CHIEF ENGINEER DEPARTMENT OF PUBLIC WORKS CITY AND COUNTY OF HONOLULU	_____ DATE

2380K175 01/22/98 15:28 60%

SHEET - OF -

T-1

INDEX OF DRAWINGS

SHEET NO.	DRAWING NO.	TITLE
1	T-1	TITLE SHEET, VICINITY MAP AND LOCATION MAP
2	T-2	INDEX OF DRAWINGS AND ABBREVIATIONS
3	T-3	WATER NOTES
4	T-4	UTILITY NOTES
5	T-5	LOCATION PLAN AND LEGEND
6	T-6	TYPICAL UTILITY DETAILS
7	C-1	TYPICAL WATER SECTIONS - 1
8	C-2	TYPICAL WATER SECTIONS - 2
9	C-3	PLAN AND PROFILE - 24" W.L. STA. 0+00 TO 7+00
10	C-4	PLAN AND PROFILE - 24" W.L. STA. 7+00 TO 15+00
11	C-5	PLAN AND PROFILE - 24" W.L. STA. 15+00 TO 24+16.32
12	C-6	PLAN AND PROFILE - 16" W.L. STA. 0+00 TO 10+59.08
13	C-7	CONNECTION DETAILS
14	C-8	TRAFFIC CONTROL PLAN AND NOTES
15	C-9	TRAFFIC CONTROL PLAN - 2
16	C-10	TRAFFIC CONTROL PLAN - 3
17	C-11	TRAFFIC CONTROL PLAN - 4
18	C-12	TRAFFIC CONTROL PLAN - 5
19	C-13	TRAFFIC CONTROL PLAN - 6
20	C-14	TRAFFIC CONTROL PLAN - 7
21	C-15	DETOUR PLAN
22	E-1	TRAFFIC SIGNAL PLAN AT LUMIAINA STREET AND KAMEHAMEHA HIGHWAY
23	E-2	TRAFFIC SIGNAL PLAN AT WAIPIO UKA STREET AND KAMEHAMEHA HIGHWAY
24	E-3	TRAFFIC SIGNAL PLAN AT LUMIAINA STREET AND LUMIAUJU STREET
25	E-4	LOOP DETECTOR DETAILS - 1
26	E-5	LOOP DETECTOR DETAILS - 2
27	E-6	LOOP DETECTOR DETAILS - 3

A		AND
&	ABAND.	ABANDONED
A. C.	APPROX.	ASPHALTIC CONCRETE
ARV.		APPROXIMATE
ATB		AIR RELIEF VALVE
		ASPHALT TREATED BASE
B		
BDL		BLOWOFF DRAINLINE
BCCV		BEVEL GEARED GATE VALVE
BL		BASELINE
BLK		BLOCK
BV		BOTTOM VERTICAL
BWS		BOARD OF WATER SUPPLY
C		
C. B.		CATCH BASIN
CL		CENTERLINE
CONC.		CONCRETE
CCP		CONCRETE CYLINDER PIPE
D		
D. I.		DUCTILE IRON
D. DL		DRAINLINE
DEPT.		DEPARTMENT
DMH		DRAIN MANHOLE
DPW		DEPARTMENT OF PUBLIC WORKS
DWG.		DRAWING
E		
E. ELEC.		ELECTRICAL
EL. ELEV.		ELEVATION
E. EXIST., E/		EXISTING
F		
FLG.		FLANGE
G		
G		GASLINE
H		
HORIZ.		HORIZONTAL
HWY.		HIGHWAY
I		
I. D.		IDENTIFICATION
INTERS.		INTERSECTION
L		
L. LT.		LEFT
LF.		LINEAR FEET
M		
MAX.		MAXIMUM
MIN.		MINIMUM
MPH		MILES PER HOUR
MON.		MONUMENT

N		NUMBER
#. NO.		
O		
O. C.		ON CENTER
O. D.		OUTSIDE D
O/S		OFFSET
P		
PAVT.		PAVEMENT
P. E.		PUSH END
PH.		PHASE
PT.		POINT
P. P.		POWER PO
PSI		POUND PEI
PVC		POLYVINYL
R		
R, RT		RIGHT
R/W		RIGHT-OF-
RD.		ROAD
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S		
S		SEWER
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SLB		STREET L
SMH		SEWER M
ST.		STREET
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T		
TMK		TAX MAP
TS		TRAFFIC
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W. L., W		WATERL
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APPROVED:

CHEF, DIVISION OF PLANNING AND SERVICE CON
(FOR SEWER WORK WITHIN PUBLIC R/W AND L)

CHEF, DIVISION OF ENGINEERING, DPW
(FOR CONSTRUCTION WITHIN CITY R/W ONLY)

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O
O. C. ON CENTER
O. D. OUTSIDE DIAMETER
O/S OFFSET

P
PAVT. PAVEMENT
P. E. PUSH END
PH. PHASE
PT. POINT
P. P. POWER POLE
PSI POUND PER INCH SQUARED
PVC POLYVINYL CHLORIDE

R
R, RT RIGHT
R/W RIGHT-OF-WAY
RD. ROAD
REINF. REINFORCED

S
S SEWER
SC SIGNAL CABLE
SL STREET LIGHT
SLB STREET LIGHT BOX
SMH SEWER MANHOLE
ST. STREET
STA. STATION
STD. STANDARD

T
TMK TAX MAP KEY
TS TRAFFIC SIGNAL
TSB TRAFFIC SIGNAL BOX
TV. TOP VERTICAL
TW TREATED WATER
TYP. TYPICAL

V
VERT. VERTICAL
VF VERIFY IN FIELD
VL. VAULT
VOL. VOLUME

W
W/ WITH
W. L. W WATERLINE
WMH WATER MANHOLE
WWM WASTEWATER MANAGEMENT

Job No. 2380703

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APPROVED: _____ DATE _____
 CHIEF, DIVISION OF PLANNING AND SERVICE CONTROL, WWM
 (FOR SEWER WORK WITHIN PUBLIC R/W AND EASEMENT ONLY)

_____ DATE _____
 CHIEF, DIVISION OF ENGINEERING, DPW
 (FOR CONSTRUCTION WITHIN CITY R/W ONLY)

Prepared by:



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T-2

THIS WORK WAS PREPARED BY
 ME OR UNDER MY SUPERVISION.

 Signature

BOARD OF WATER SUPPLY CITY AND COUNTY OF HONOLULU JOB 98-158B 24 INCH AND 16 INCH TRANSMISSION MAINS ALONG KAMEHAMEHA HIGHWAY AND LUMIAINA STREET INDEX OF DRAWINGS AND ABBREVIATIONS			
APPROVED: _____		DATE: _____	
CHIEF, PLANNING AND ENGINEERING DIVISION			
DRAWN BY: DAD	DESIGNED: TAC	CHECKED BY: TAC	FILE NO:
FIELD BOOK NO:	SCALE: AS NOTED	SHEET _____ OF _____ SHEETS	

WATER NOTES:

1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE CITY AND COUNTY OF HONOLULU, BOARD OF WATER SUPPLY'S "WATER SYSTEM STANDARDS", VOLUME 1, DATED 1985, THE "APPROVED MATERIAL LIST AND STANDARD DETAILS FOR WATER SYSTEM CONSTRUCTION", VOLUME 2, DATED 1985, AND THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 1991, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.
2. THE CONTRACTOR SHALL NOTIFY THE BOARD OF WATER SUPPLY IN WRITING ONE WEEK PRIOR TO COMMENCING WORK ON THE WATER SYSTEM.
3. PAYMENT FOR ITEMS OF WORK CALLED FOR IN THE PLANS, SPECIAL PROVISIONS AND SPECIFICATIONS FOR WHICH PAYMENT IS NOT SPECIFIED SHALL NOT BE MADE DIRECTLY BUT SHALL BE INCLUDED IN THE VARIOUS ITEMS IN THE PROPOSAL AND NO ADDITIONAL COMPENSATION SHALL BE MADE.
4. THE CONTRACTOR IS ALERTED TO THE ENCOUNTERING OF OBSTACLES WHETHER SHOWN ON THE PLANS OR NOT, OR WHICH MAY DIFFER IN LOCATION FROM THAT SHOWN ON THE PLANS WHICH MAY INTERFERE WITH HIS NORMAL METHOD OF OPERATIONS. THE CONTRACTOR SHALL TAKE INTO ACCOUNT ANY ADDITIONAL COSTS ANTICIPATED DUE TO THESE CONDITIONS AND SHALL HAVE THESE COSTS INCLUDED IN THE BID ITEMS WHICH HE/SHE FEELS MOST APPROPRIATE. NO SEPARATE ADDITIONAL COMPENSATION SHALL BE MADE.
5. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL ASSUMPTIONS, DEDUCTIONS, OR CONCLUSIONS HE/SHE MAY MAKE OR DERIVE FROM THE SUBSURFACE INFORMATION OR DATA FURNISHED ON THE PLANS. THE CONTRACTOR MUST SATISFY HIMSELF/HERSELF THROUGH HIS/HER OWN INVESTIGATIONS AS TO WHAT SUBSURFACE CONDITIONS ARE TO BE ENCOUNTERED.
6. PRIOR TO START OF EXCAVATION, THE CONTRACTOR SHALL NOTIFY ALL AGENCIES AND UTILITIES AND HAVE THEM LOCATE THEIR RESPECTIVE LINES AFFECTED. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ALL OF HIS/HER CONSTRUCTION AND SHALL PAY FOR ALL DAMAGES TO AND FOR THE PROTECTION OF EXISTING UTILITIES AND STRUCTURES.
7. THE CONTRACTOR SHALL EXPOSE, VERIFY AND BACKFILL ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES AT CROSSINGS PRIOR TO EXCAVATION OF PIPELINE TRENCH. THE WATER MAIN ALIGNMENT AND GRADE MAY BE CHANGED IF THERE ARE CONFLICTS WITH ANY EXISTING UNDERGROUND UTILITIES AND STRUCTURES, WHETHER SHOWN ON THE PLANS OR NOT. PAYMENT FOR WORK INCLUDED IN THIS PARAGRAPH WILL BE MADE UNDER THE APPROPRIATE BID ITEMS UNDER THE PROPOSAL, AND NO ADDITIONAL COMPENSATION WILL BE CONSIDERED.
8. EXISTING UTILITIES CROSSING THE WATER MAIN ARE TO REMAIN IN SERVICE AND IN PLACE. IF RELOCATED FOR THE CONTRACTOR'S CONVENIENCE, INTERRUPTION OF SERVICE SHALL BE FOR A MINIMUM PERIOD OF TIME AND SHALL BE DONE AT THE CONTRACTOR'S EXPENSE AND ONLY WITH THE APPROVAL OF THE BOARD OF WATER SUPPLY.
9. ANY COST INCURRED BY GASCO, HECO, OR HICO BY THIS PROJECT SHALL BE PAID BY THE BOARD OF WATER SUPPLY THROUGH THE CONTRACTOR. PAYMENT SHALL BE ONLY FOR THE ACTUAL COST AS SHOWN ON THE UTILITY COMPANY'S INVOICE. NO PAYMENT WILL BE MADE FOR PROFIT, TAX, OVERHEAD, AND BOND COST.
10. IF THE CONTRACTOR ELECTS NOT TO EXPOSE AND VERIFY ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES AT CROSSINGS PRIOR TO PIPELINE EXCAVATION, HE FORFEITS HIS RIGHTS FOR CLAIMS FOR COMPENSATION CAUSED BY ANY CONFLICTS WITH EXISTING UTILITIES AND STRUCTURES.
11. ALL A.C. AND CONCRETE PAVEMENT TO BE TRENCHED (FOR PIPELINE OR ANY WATER SYSTEM INSTALLATION) SHALL BE "SAW-CUT" TO THE REQUIRED WIDTH PRIOR TO REPAVING.
12. PAYMENT FOR RESTORATION OF DRIVEWAYS, CURBS AND GUTTERS WILL NOT BE MADE DIRECTLY BUT SHALL BE INCLUDED IN THE UNIT PRICES BID IN THE VARIOUS ITEMS OF THE BID.
13. RESTORATION OF PAVEMENT SHALL BE IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS AND DONE WITH EQUIVALENT TO OR BETTER QUALITY MATERIALS.
14. UNLESS OTHERWISE SPECIFIED, CONNECTIONS TO EXISTING WATER MAINS AND CHLORINATION OF NEW MAINS SHALL BE DONE BY THE CONTRACTOR, WITH THE BOARD OF WATER SUPPLY'S INSPECTOR COORDINATING THE WORK. FOR DETAILS, CONTACT THE BWS PLANNING AND ENGINEERING DIVISION, ENGINEERING BRANCH, CONSTRUCTION SECTION.
15. WHEREVER CONNECTIONS TO EXISTING MAINS ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING MAINS PRIOR TO EXCAVATION OF MAIN TRENCH. THE REMAINING EXCAVATION FOR THE CONNECTION SHALL BE EXCAVATED WHEN THE CONTRACTOR IS READY TO MAKE THE CONNECTION.

- ~~16. THE BRIDGE DECKS FOR TEMPORARY BRIDGE INSTALLATIONS SHALL BE FLUSH WITH ADJOINING PAVEMENT OR SIDEWALK. NO BUMPS OR ELEVATED BRIDGE DECKS WILL BE ALLOWED.~~
17. ALL WATER MAIN TRENCHES SHALL BE BACKFILLED AS CALLED FOR UNDER PART III, SECTION 1.2.2, TRENCH BACKFILL, OF THE "WATER SYSTEM STANDARDS", DATED 1985. COMPACTION OF TRENCH BACKFILL SHALL MEET APPLICABLE REQUIREMENTS OF "THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER 1986, OF THE COUNTIES OF THE STATE OF HAWAII.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF CHLORINATED WATER TO SAFEGUARD PUBLIC HEALTH AND ENVIRONMENT IN ACCORDANCE WITH APPLICABLE DEPARTMENT OF HEALTH REQUIREMENTS.
19. SHOULD MAJOR TREE ROOTS 2" AND GREATER BE ENCOUNTERED DURING CONSTRUCTION, THESE ROOTS SHALL BE CUT AND SEALED WITH ASPHALTIC PAINT.
20. DURING NON-WORKING HOURS, THE TRENCHES ON CITY STREETS SHALL BE COVERED WITH NON-SKID STEEL PLATES AND ALL LANES MAINTAINED OPEN FOR TRAFFIC.
21. UNLESS OTHERWISE SPECIFIED, ALL ABANDONED LINES SHALL BE CUT AND PLUGGED WITH CLASS DWS 2000 CONCRETE. PAYMENT FOR CUTTING AND PLUGGING WILL NOT BE MADE DIRECTLY BUT WILL BE INCIDENTAL TO THE VARIOUS ITEMS OF THE PROPOSAL. THE CONTRACTOR SHALL VERIFY THE SIZE AND TYPE OF LINE TO BE PLUGGED.
22. ALL SALVAGE MATERIALS SHALL BE CLEANED, REPAINTED AND DELIVERED TO THE KALIHI BWS CORPORATION YARD.
23. ALL WATER MAINS AND APPURTENANCES INCLUDING SERVICE LATERALS AND SERVICE CONNECTIONS SHALL BE SUBJECTED TO A HYDROSTATIC TEST PRESSURE OF 150 PSI BY THE CONTRACTOR IN THE PRESENCE OF THE BOARD OF WATER SUPPLY INSPECTOR.
- ~~24. ALL LATERALS (1" TO 2 1/2") SHALL BE REPLACED OR RECONNECTED WITH EITHER COPPER OR PLASTIC TUBING.~~
- ~~25. THE CONTRACTOR SHALL FURNISH AND INSTALL DIELECTRIC COUPLINGS FOR ALL SERVICE LATERAL CONNECTIONS. PAYMENTS FOR DIELECTRIC COUPLINGS WILL NOT BE MADE DIRECTLY, BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS ITEMS IN THE PROPOSAL.~~
- ~~26. PAYMENT FOR SERVICE LATERALS AND SERVICE CONNECTIONS SHALL BE MADE AT THE UNIT PRICE BID IN THE PROPOSAL. PAYMENT SHALL INCLUDE TAPS INTO MAINS, RECONNECTIONS TO EXISTING SERVICES, TRANSFER OF METERS, AND INSTALLING PIPE LATERALS, FITTINGS, BALL CORPS, BALL STOPS, GLOBE VALVES, METER SPLICES, BRASS PIPES, GAPS AND ALL APPURTENANCES, AS REQUIRED, IN PLACE COMPLETE. PAYMENT FOR METER BOXES, INCLUSIVE OF G.I. FRAMES AND COVERS AND TYPE "A" VALVES, BOXES SHALL BE MADE AT THE RESPECTIVE UNIT PRICE BID IN THE BID.~~
- ~~27. DEMOLISH AND BACKFILL ALL ABANDONED MANHOLES, VALVE BOXES AND METER BOXES. SALVAGE ALL CAST IRON FRAMES AND COVERS.~~
28. AFTER INSTALLATION OF TAPPING SLEEVE AND TAPPING VALVE AND PRIOR TO TAPPING THE EXISTING WATER MAIN, THE ASSEMBLY SHALL BE PRESSURE TESTED AT 150 PSI ON BOTH SIDES OF THE VALVE AND IN ACCORDANCE WITH THE WATER SYSTEM STANDARDS, DATED 1985.
- ~~29. THE NEW WATER MAIN SHALL BE COMPLETED IN PHASES AS SHOWN ON THE PLANS. THE CONTRACTOR SHALL COMPLETE EACH PHASE INCLUDING INSTALLATION AND TESTING OF THE WATER MAIN, TRANSFER OF SERVICES AND FINAL PAVING OF THE STREET PRIOR TO BEGINNING THE NEXT PHASE. HOWEVER, THE CONTRACTOR MAY COMMENCE WORK ON THE NEXT PHASE UPON SATISFACTORY PROGRESS OF ALL REMAINING WORK ON THE PREVIOUS PHASE AS APPROVED IN WRITING BY BWS.~~
- ~~30. THE CONTRACTOR SHALL INSTALL THE FIRE HYDRANT REFLECTIVE MARKERS. THE CONTRACTOR SHALL NOTIFY THE NEAREST FIRE DEPARTMENT BATTALION CHIEF FOR THE INSTALLATION OR RELOCATION OF FIRE HYDRANT REFLECTIVE MARKERS. PAYMENT FOR INSTALLATION OF REFLECTIVE HYDRANT MARKERS SHALL BE MADE AT THE RESPECTIVE UNIT PRICE IN THE BID.~~
31. MECHANICAL JOINT GLANDS SHALL BE "STRAIGHT-SIDED" AND POLYGON IN SHAPE AS DESCRIBED IN AWWA C111 AND SHALL BE APPLICABLE TO BOTH CAST IRON AND DUCTILE IRON GLANDS OR AN APPROVED EQUAL ON A JOB TO JOB BASIS.
32. ALL AIR RELIEF VALVES SHALL HAVE A MINIMUM WORKING PRESSURE RANGE OF 0 TO 150 PSI.

33. ALL PVC FITTINGS SHALL CONFORM TO ASSOCIATION (AWWA) C-907. THE USE OF SCREWS ON PVC FITTINGS IS NOT APPROVED. UPON FITTING INSTALLATION, THE CONTRACTOR SHALL OBTAIN APPROVAL BY THE BOARD OF WATER SUPPLY THAT ALL PVC FITTINGS CONFORM TO AWWA C-907.
34. PIPE CUSHION SHALL BE OF HIGH RESISTANCE TO IMPACT. CONTRACTOR SHALL SUBMIT A SOIL RESISTANT CUSHION MATERIAL HAS A MINIMUM OF 5,000 OHM-CM. REMAINDER OF THE CUSHION AND BACKFILL MATERIAL SHALL BE AS SPECIFIED IN VOLUME 1 OF THE WATER SYSTEM STANDARDS. SUBSTANCES ABOVE REGULATORY ACTS ARE LIMITED TO LEAD, ASBESTOS, MERCURY, STRONTIUM, AND POLYCHLORINATED BIPHENYLS.
35. ALL SECTIONS OF THE WATER MAIN REPAIRS SHALL BE DUCTILE IRON PIPE AND FITTINGS.
36. ALL POLYVINYL CHLORIDE (PVC) PIPE SHALL BE ACCOMPLISHED ONLY BY THE USE OF ELBOWS AND COUPLINGS. DEFLECTION AROUND CURVES SHALL BE ACCOMPLISHED ONLY BY THE USE OF PVC DEFLECTION COUPLINGS.
37. CLEANING SHALL BE BY THE USE OF "PIG" PIPELINE AND RUN COMPLETELY THROUGH THE PIPELINE AND ALL BRANCH LINES FOR FIRE HYDRANT SERVICE. LATERALS IS NOT REQUIRED. USED TO SWAB PIPING CLEAN AS EACH SECTION IS INSTALLED. EACH "PIG" SHALL CONSIST OF POLYURETHANE FOAM WITH A DENSITY OF 1.5 LBS PER CUBIC FOOT AND A VINYL-COATED NOSE. THE "PIG" SHALL BE EQUAL TO 1 1/2 TO 1 3/4 TIMES THE LENGTH OF THE PIPE BEING INSTALLED. THE "PIG" SHALL BE 1 1/2 TO 2 TIMES ITS DIAMETER. THE "PIG" SHALL BE SUBMERGED IN A CHLORINE BLEACH SOLUTION IN 5 GALLONS OF PIPELINE SHALL BE CONSIDERED INCIDENTAL TO THE NEW PIPELINE.
38. BALL CORPS AND BALL STOPS SHALL BE USED IN CONFORMANCE WITH THE BOARD OF WATER SUPPLY CORPORATION STOPS AND STOPCOCKS.
- ~~39. PIPE ALTERNATIVES:

 - A. DUCTILE IRON PIPES SHALL BE USED WITH POLYETHYLENE WRAP.
 - B. POLYVINYL CHLORIDE (PVC) PIPE SHALL BE USED FOR ALL VALVES, CAST IRON PIPES, DOUBLE WRAPPED WITH POLYETHYLENE WRAP. POLYVINYL CHLORIDE PIPES WILL BE USED FOR ALL INSTALLATION OF PVC PIPE AS SPECIFIED AS BID ON BY THE BOARD OF WATER SUPPLY. ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL CONSIDERATIONS INCIDENTAL TO THE PROPOSAL FOR PVC PIPE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. TAPPING WIRE SHALL BE INSTALLED ON THE PIPELINE.~~

~~PAYMENT FOR POLYETHYLENE WRAP SHALL BE MADE AT THE UNIT PRICE BID FOR EACH PIPE, VALVE AND FITTING.~~

~~DOUBLE POLYETHYLENE WRAP SHALL BE USED FOR ALL 12" AND 16" DIAMETER PIPES.~~

~~GLASS 150 OR 200 FOR DIAMETERS GREATER THAN 12" AND 16" RESPECTIVELY.~~

NOTES:

JOB No. 2182/03

- 33. ALL PVC FITTINGS SHALL CONFORM TO AMERICAN WATER WORKS ASSOCIATION (AWWA) C-907. THE USE OF HUB CLAMPS AND SET SCREWS ON PVC FITTINGS IS NOT APPROVED. PRIOR TO THE PVC FITTING INSTALLATION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE BOARD OF WATER SUPPLY, THE MANUFACTURER'S CERTIFICATION THAT ALL PVC FITTINGS CONFORM IN ALL RESPECTS TO AWWA C-907.
- 34. PIPE CUSHION SHALL BE OF HIGH RESISTIVITY MATERIAL. THE CONTRACTOR SHALL SUBMIT A SOIL CERTIFICATION THAT HIGH RESISTANT CUSHION MATERIAL HAS A RESISTIVITY GREATER THAN 5,000 OHM-CM. REMAINDER OF THE BACKFILL MATERIAL SHALL BE AS SPECIFIED IN VOLUME 1 OF THE WATER SYSTEM STANDARDS. PIPE CUSHION AND BACKFILL MATERIAL SHALL CONTAIN NO HAZARDOUS SUBSTANCES ABOVE REGULATORY ACTION LEVELS INCLUDING BUT NOT LIMITED TO LEAD, ASBESTOS, MERCURY, CHROMIUM, CADMIUM, ZINC, STRONTIUM, AND POLYCHLORINATED BIPHENYLS (PCB).
- 35. ALL SECTIONS OF THE WATER MAIN REQUIRING REINFORCED CONCRETE JACKETING SHALL BE DUCTILE IRON PIPE WITH DUCTILE IRON FITTINGS.
- 36. ALL POLYVINYL CHLORIDE (PVC) PIPE DEFLECTIONS SHALL BE ACCOMPLISHED ONLY BY THE USE OF SPECIAL PVC DEFLECTION COUPLINGS. DEFLECTION AROUND CURVES SHALL BE ACCOMPLISHED ONLY BY THE USE OF PVC DEFLECTION COUPLINGS.
- 37. CLEANING SHALL BE BY THE USE OF "PIGS" INTRODUCED INTO THE PIPELINE AND RUN COMPLETELY THROUGH ALL INSTALLED PIPELINES AND ALL BRANCH LINES FOR FIRE HYDRANTS. "PIGGING" OF SERVICE LATERALS IS NOT REQUIRED. BARE FOAM "PIGS" SHALL BE USED TO SWAB PIPING CLEAN AS EACH LENGTH OF THE PIPELINE IS INSTALLED. EACH "PIG" SHALL CONSIST OF A CYLINDRICAL PIECE OF POLYURETHANE FOAM WITH A DENSITY OF 3-7 POUNDS PER CUBIC FOOT AND A VINYL-COATED NOSE. OUTSIDE DIAMETER OF THE "PIG" SHALL BE EQUAL TO 1/2 TO 1 1/2 TIMES THE INSIDE DIAMETER OF THE PIPE BEING INSTALLED. THE LENGTH OF THE "PIG" SHALL BE 1 1/2 TO 2 TIMES ITS DIAMETER. PRIOR TO USE, THE "PIG" SHALL BE SUBMERGED IN A CHLORINE SOLUTION OF 1 OZ. OF 5% CHLORINE BLEACH IN 5 GALLONS OF WATER. "PIGGING" OF THE PIPELINE SHALL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE NEW PIPELINE.
- 38. BALL CORPS AND BALL STOPS SHALL BE INSTALLED IN UEU OF THE CORPORATION STOPS AND STOPCOCKS, RESPECTIVELY.

~~39. PIPE ALTERNATIVES:~~

- ~~A. DUCTILE IRON PIPES SHALL BE CLASS 52, DOUBLE WRAPPED WITH POLYETHYLENE.~~
- ~~B. POLYVINYL CHLORIDE (PVC) PIPES SHALL BE CLASS 150. ALL VALVES, CAST IRON PIPES AND FITTINGS SHALL BE DOUBLE WRAPPED WITH POLYETHYLENE. NO BENDING OF POLYVINYL CHLORIDE PIPES WILL BE PERMITTED. THE INSTALLATION OF PVC PIPE ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID ON BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS, NOT SPECIFIED IN THE PLANS AND SPECIFICATIONS. PAYMENT FOR ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID IN THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COPPER TONING WIRE SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF THE PIPELINE.~~

~~PAYMENT FOR POLYETHYLENE WRAP SHALL BE INCIDENTAL TO THE UNIT PRICE BID FOR DI PIPE, VALVES AND FITTINGS.~~

~~DOUBLE POLYETHYLENE WRAP SHALL NOT BE LESS THAN 16 MILS.~~

~~CLASS 150 OR 200 FOR DIAMETERS 12" AND SMALLER
CLASS 150 FOR DIAMETERS GREATER THAN 12"~~

~~FOR EXTERNAL CORROSION CONTROL WHEN REQUIRED:~~

~~39. PIPE ALTERNATIVES:~~

- ~~A. DUCTILE IRON PIPES SHALL BE CLASS 52. ALL DUCTILE IRON PIPES, FITTINGS, AND VALVES SHALL HAVE BONDED COATING WITH AN EXTERNAL CORROSION CONTROL SYSTEM APPLIED. POLYVINYL CHLORIDE (PVC) PIPES USED TO ELECTRICALLY ISOLATE THE SYSTEM SHALL BE CLASS 150. NO BENDING OF PVC PIPES WILL BE PERMITTED. COPPER TONING WIRE SHALL BE INSTALLED ALONG ALL PVC PORTIONS OF THE PIPELINE.~~
- ~~B. POLYVINYL CHLORIDE (PVC) PIPES SHALL BE CLASS 150. ALL VALVES, CAST IRON PIPES AND FITTINGS SHALL BE DOUBLE WRAPPED WITH POLYETHYLENE. NO BENDING OF POLYVINYL CHLORIDE PIPES WILL BE PERMITTED. THE INSTALLATION OF PVC PIPE ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID ON BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS, NOT SPECIFIED IN THE PLANS AND SPECIFICATIONS. PAYMENT FOR ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID IN THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COPPER TONING WIRE SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF THE PIPELINE.~~

~~FOR BOTH ALTERNATIVES, PAYMENT FOR THE FURNISHING AND INSTALLATION OF THE EXTERNAL CORROSION CONTROL SYSTEM WILL BE MADE AT THE UNIT PRICE BID, OR LUMP SUM BID, WHICHEVER IS SPECIFIED, FOR THE ITEM OF WHICH THE EXTERNAL CORROSION CONTROL IS A PART.~~

~~DOUBLE POLYETHYLENE WRAP SHALL NOT BE LESS THAN 16 MILS.~~

~~CLASS 150 OR 200 FOR DIAMETERS 12" AND SMALLER
CLASS 150 FOR DIAMETERS GREATER THAN 12"~~

~~FOR CONCRETE CYLINDER PIPE ALTERNATIVE:~~

~~39. PIPE ALTERNATIVES:~~

- ~~A. DUCTILE IRON PIPES SHALL BE CLASS 52. ALL DUCTILE IRON WITH POLYETHYLENE.~~
- ~~B. POLYVINYL CHLORIDE (PVC) PIPES SHALL BE CLASS 150. ALL VALVES, CAST IRON PIPES AND FITTINGS SHALL BE DOUBLE WRAPPED WITH POLYETHYLENE. NO BENDING OF POLYVINYL CHLORIDE PIPES WILL BE PERMITTED. THE INSTALLATION OF PVC PIPE ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID ON BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS, NOT SPECIFIED IN THE PLANS AND SPECIFICATIONS. PAYMENT FOR ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID IN THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COPPER TONING WIRE SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF THE PIPELINE.~~
- ~~C. CONCRETE CYLINDER PIPES SHALL BE CLASS 150 AND SHALL BE MANUFACTURED AFTER ALL UNDERGROUND STRUCTURES AND UTILITIES ARE EXPOSED AND VERIFIED.~~

~~PAYMENT FOR POLYETHYLENE WRAP SHALL BE INCIDENTAL TO THE UNIT PRICE BID FOR DI PIPE, VALVES AND FITTINGS.~~

~~DOUBLE POLYETHYLENE WRAP SHALL NOT BE LESS THAN 16 MILS.~~

~~CLASS 150 OR 200 FOR DIAMETERS 12" AND SMALLER
CLASS 150 FOR DIAMETERS GREATER THAN 12"~~

REVISED JANUARY 1997

FINAL

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01/22/98

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Prepared by:



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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature _____

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 98-158B
24 INCH AND 16 INCH TRANSMISSION MAINS
ALONG KAMEHAMEHA HIGHWAY AND LUMIAINA STREET
WATER NOTES

APPROVED: _____ DATE: _____

CHIEF, PLANNING AND ENGINEERING DIVISION

DRAWN BY: DAD | CHECKED: HAA | DESIGNED BY: TAC | FILE NO. _____

FIELD BOOK NO. _____ SCALE: AS NOTED SHEET _____ OF _____ SHEETS

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HTCO NOTES:

1. THE CONTRACTOR SHALL NOTIFY HAWAIIAN TELEPHONE COMPANY (HTCO) AT 483-8085 TWO WEEKS BEFORE STARTING EXCAVATION TO ARRANGE FOR FIELD LOCATION OF ALL EXISTING TELEPHONE CABLES AND/OR DUCT LINES.
2. THE CONTRACTOR SHALL EXCAVATE AND BACKFILL AROUND TELEPHONE CABLES IN THE PRESENCE OF HTCO ENGINEER OR HIS REPRESENTATIVE.
3. ALL EXCAVATION WITHIN TWO FEET OF TELEPHONE CABLES SHALL BE DONE BY HAND.
4. FOR RELOCATION OF ANY TELEPHONE CABLES AND/OR DUCT LINES, THE CONTRACTOR SHALL NOTIFY HTCO THIRTY (30) WORKING DAYS BEFORE STARTING WORK. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EXCAVATION AND BACKFILL, ARRANGE FOR TRAFFIC PERMITS AND RESTORE SIDEWALK, PAVEMENT OR OTHER FACILITIES.
5. THE CONTRACTOR SHALL NOTIFY HTCO IMMEDIATELY AT 611 AFTER ANY DAMAGES TO HTCO CABLES, DUCT LINES, PULLBOXES, MANHOLES, HANDHOLES, POLES AND GUYS. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL DAMAGES TO HTCO FACILITIES.
6. REPAIR WORK ON DAMAGED CABLES SHALL BE DONE BY HTCO AND ANY OTHER WORK INVOLVING EXISTING UNDERGROUND FACILITIES SHALL BE DONE BY THE CONTRACTOR IN THE PRESENCE OF HTCO ENGINEER OR HIS REPRESENTATIVE. COST FOR ALL REPAIR WORK SHALL BE BORNE BY THE CONTRACTOR.
7. PROVIDE ADEQUATE SUPPORT AND PROTECTION FOR TELEPHONE CABLES AND/OR DUCT LINES EXPOSED IN THE TRENCH. SUCH SUPPORT AND PROTECTION SHALL BE APPROVED BY HTCO INSPECTOR.
8. THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT CLEARANCE FROM HTCO RECORDS SECTION LOCATED AT 3239 UALENA STREET, 3RD FLOOR (ABY-3) TWO WEEKS PRIOR TO START OF CONSTRUCTION. HOURS OF BUSINESS ARE 7:00 A.M. TO 11:00 A.M. AND 11:30 A.M. TO 3:00 P.M. MONDAY THRU FRIDAY EXCEPT HOLIDAYS.
9. THE COSTS OF ANY TEMPORARY RELOCATION OF HTCO FACILITIES DONE FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE BORNE BY THE CONTRACTOR, UNLESS OTHERWISE NOTED.
10. SHOULD IT BECOME NECESSARY TO TEMPORARILY RELOCATE ANY HTCO FACILITIES TO ENABLE THE CONTRACTOR TO PERFORM HIS WORK IN A SAFE MANNER IN FULFILLING HIS CONTRACT OBLIGATIONS, THESE TEMPORARY RELOCATIONS WILL BE DONE BY HTCO, OR BY THE CONTRACTOR UNDER HTCO'S SUPERVISION, WITH ALL COSTS AND COORDINATION TO BE BORNE BY THE CONTRACTOR.
11. ANY WORK REQUIRED TO RELOCATE HTCO FACILITIES CONFLICTING WITH THE PROPOSED CONSTRUCTION AND THE EXISTENCE OF WHICH WERE NOT SHOWN ON THE PLANS SHALL BE BORNE BY THE CONTRACTOR.

HECO NOTES:

1. THE LOCATION OF HAWAIIAN ELECTRIC COMPANY'S (HECO) OVERHEAD AND UNDERGROUND FACILITIES SHOWN ON THE PLANS ARE FROM EXISTING RECORDS WITH VARYING DEGREES OF ACCURACY AND ARE NOT GUARANTEED AS SHOWN. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF UNDERGROUND LINES AND SHALL MAINTAIN ADEQUATE CLEARANCE WHEN OPERATING EQUIPMENT WITHIN OR UNDER ANY OVERHEAD LINES.
2. THE CONTRACTOR SHALL COMPLY WITH THE STATE OF HAWAII'S OCCUPATIONAL SAFETY AND HEALTH LAW (DOSH).
3. THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT FROM HECO'S MAPPING AND RECORDS DIVISION LOCATED AT 820 WARD AVENUE, 4TH FLOOR, TWO WEEKS PRIOR TO STARTING CONSTRUCTION. REFER TO HECO REQUEST NUMBER AT THAT TIME.
4. FOR VERIFICATION OF UNDERGROUND LINES OR FOR ASSISTANCE IN SUPPORTING AND PROTECTING THESE LINES, THE CONTRACTOR SHALL CALL HECO'S UNDERGROUND DIVISION AT 543-7345 A MINIMUM OF 72 HOURS IN ADVANCE.
5. WHEN TRENCH EXCAVATION IS ADJACENT TO OR BENEATH HECO EXISTING STRUCTURES OR FACILITIES THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE FROM POSSIBLE SLIDING AND SETTLEMENTS, AND FOR PROTECTING EXISTING STRUCTURES OR FACILITIES WITH BEAMS, STRUTS, OR UNDER-PINNING TO FULLY PROTECT THESE FROM DAMAGE.
6. FOR POLE BRACING INSTRUCTIONS, THE CONTRACTOR SHALL CALL THE HECO DISTRICT CONSTRUCTION SUPERINTENDENT (AT KOOLAUA, PHONE 261-6085) A MINIMUM OF 72 HOURS IN ADVANCE.
7. ANY WORK REQUIRED TO RELOCATE HECO FACILITIES, INCLUDING TEMPORARY RELOCATION DONE FOR THE CONVENIENCE OF THE CONTRACTOR, SHALL BE DONE BY HECO AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION, AND FOR COSTS IF APPLICABLE, UNLESS OTHERWISE NOTED.
8. SHOULD IT BECOME NECESSARY TO TEMPORARILY RELOCATE ANY HECO FACILITIES TO ENABLE THE CONTRACTOR TO PERFORM HIS WORK IN A SAFE AND EXPEDITIOUS MANNER IN FULFILLING HIS CONTRACT OBLIGATIONS, THESE TEMPORARY RELOCATIONS WILL BE DONE BY HECO, OR BY THE CONTRACTOR UNDER HECO'S SUPERVISION, WITH ALL COSTS BEING BORNE BY THE CONTRACTOR.
9. ANY UNFORESEEN CONFLICT THAT WOULD RESULT IN THE REDESIGN OR RELOCATION (EITHER TEMPORARY OR PERMANENT) OF HECO'S ELECTRICAL FACILITIES MAY BE CAUSED FOR LENGTHY DELAYS. TO AVOID SUCH DELAYS, THE CONTRACTOR MUST NOTIFY HECO OF THE CONFLICT A MINIMUM OF 30 DAYS PRIOR TO THE START OF CONSTRUCTION.
10. ANY DAMAGE TO HECO'S FACILITIES WILL BE REPORTED IMMEDIATELY TO HECO'S TROUBLE DISPATCHER AT PH. 543-7874.
11. ALL HECO OVERHEAD AND UNDERGROUND FACILITIES SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR DURING CONSTRUCTION. COSTS FOR DAMAGES TO HECO FACILITIES SHALL BE BORNE BY THE CONTRACTOR. THIS REPAIR WORK SHALL BE DONE BY HECO, OR BY THE CONTRACTOR UNDER HECO'S SUPERVISION.
12. THE CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS HECO FROM AND AGAINST ALL LOSSES, DAMAGES CLAIMS AND ACTIONS, ALL EXPENSES INCIDENTAL TO SUCH LOSSES, DAMAGES, CLAIMS OR ACTION, BASED UPON OR ARISING OUT OF DAMAGE TO PROPERTY OR INJURIES TO PERSONS, OR OTHER TORTIOUS ACTS CAUSED OR CONTRIBUTED TO BY CONTRACTOR OR ANYONE ACTING UNDER ITS DIRECTIONS OR CONTROL OR ON ITS BEHALF; PROVIDED CONTRACTOR'S INDEMNITY SHALL NOT BE APPLICABLE TO ANY LIABILITY UPON THE SOLE NEGLIGENCE OF HECO.

CONSTRUCTION NOTES WITHIN CITY RIGHT-OF-WAY

1. ALL CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986, AND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984, AS AMENDED, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU AND THE COUNTIES OF KAUAI MAUI, AND HAWAII.
2. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.
3. NO CONTRACTOR SHALL PERFORM ANY TRENCHING OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE COSTS INCURRED FOR ANY REMEDIAL ACTION BY THE CHIEF ENGINEER SHALL BE PAYABLE BY THE CONTRACTOR.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF CHAPTER 54, WATER QUALITY STANDARDS AND CHAPTER 55, WATER POLLUTION CONTROL, OF TITLE 11, ADMINISTRATIVE RULES OF THE STATE DEPARTMENT OF HEALTH.
5. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION SECTION, DIVISION OF ENGINEERING, DEPARTMENT OF PUBLIC WORKS AT 527-6311 TO ARRANGE FOR INSPECTIONAL SERVICES AND SUBMIT THREE (3) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK.

SEWER NOTES

1. ALL SEWER CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE CITY'S STANDARD SPECIFICATIONS FOR SEWER CONSTRUCTION, DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, AS AMENDED, AND THE DESIGN STANDARDS FOR WASTEWATER MANAGEMENT, VOL. 1, DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, AS AMENDED, AND THE DESIGN STANDARDS FOR WASTEWATER MANAGEMENT, VOL. 2, DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, AS AMENDED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INSPECTIONAL SERVICES AND SUBMIT FOUR SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL PAY FOR ALL INSPECTIONAL SERVICES.
2. THE CONTRACTOR SHALL NOTIFY THE DIVISION OF ENGINEERING, DEPARTMENT OF PUBLIC WORKS AT 523-4345 TO ARRANGE FOR HIS INSPECTIONAL SERVICES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INSPECTIONAL SERVICES AND SUBMIT FOUR SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS SEWER SERVICE TO ALL EXISTING FACILITIES DURING CONSTRUCTION.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING FACILITIES CAUSED DURING CONSTRUCTION. THE STATE DEPARTMENT OF HEALTH SHALL BE RESPONSIBLE FOR ALL PUBLIC WORKS SAMPLING AND ANALYZING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PUBLIC WORKS SAMPLING AND ANALYZING PROCEDURES.
5. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

GAS NOTES:

1. BHP GAS COMPANY GAS PIPELINES SHALL BE COATED AND CATHODICALLY PROTECTED. THE CONTRACTOR SHALL BE EXTREMELY CAREFUL WHEN WORKING IN THE VICINITY OF THESE GAS PIPELINES.
2. WRITTEN CLEARANCES MUST BE OBTAINED FROM BHP GAS COMPANY AT LEAST FIVE WORKING DAYS PRIOR TO THE START OF CONSTRUCTION OF THESE GAS PIPELINES. SINCE GAS LINE LOCATIONS ON THE PLANS ARE FROM EXISTING RECORDS WITH VARYING DEGREES OF ACCURACY AND ARE NOT GUARANTEED AS SHOWN, THE CONTRACTOR SHALL CALL BHP GAS COMPANY AT LEAST FIVE WORKING DAYS PRIOR TO STARTING EXCAVATION TO ARRANGE FOR FIELD LOCATION OF ALL EXISTING GAS PIPELINES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INSPECTIONAL SERVICES AND SUBMIT FOUR SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
3. THE CONTRACTOR SHALL EXCAVATE AND BACKFILL WITHIN SIX INCHES OF ALL EXISTING GAS PIPELINES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INSPECTIONAL SERVICES AND SUBMIT FOUR SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. FOR RELOCATION OF ANY GAS PIPELINES, THE CONTRACTOR SHALL NOTIFY BHP GAS COMPANY FIVE WORKING DAYS BEFORE STARTING WORK. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EXCAVATION AND BACKFILL, OBTAIN TRAFFIC PERMITS AND RESTORE SIDEWALKS, AND OTHER FACILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INSPECTIONAL SERVICES AND SUBMIT FOUR SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
5. THE CONTRACTOR SHALL NOTIFY BHP GAS COMPANY IMMEDIATELY AT 611 AFTER ANY DAMAGE HAS BEEN CAUSED TO ANY GAS PIPELINE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INSPECTIONAL SERVICES AND SUBMIT FOUR SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
6. MINIMUM VERTICAL AND HORIZONTAL CLEARANCES FOR GAS PIPELINES EXPOSED IN THE TRENCH SHALL BE 12 INCHES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INSPECTIONAL SERVICES AND SUBMIT FOUR SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
7. THE CONTRACTOR SHALL WORK IN AN ORDER TO KEEP THE UNCOVERED EXCAVATION AS SHORT A PERIOD OF TIME AS POSSIBLE.

OAHU TRANSIT SERVICES

THE CONTRACTOR SHALL NOTIFY THE DIVISION OF ENGINEERING, DEPARTMENT OF PUBLIC WORKS AT 527-6311 TO ARRANGE FOR INSPECTIONAL SERVICES AND SUBMIT THREE (3) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INSPECTIONAL SERVICES AND SUBMIT FOUR SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

APPROVED:

CHIEF, DIVISION OF PLANNING AND SERVICE CONTROL,
(FOR SEWER WORK WITHIN PUBLIC R/W AND EASEMENTS)

CHIEF, DIVISION OF ENGINEERING, DPW
(FOR CONSTRUCTION WITHIN CITY R/W ONLY)

SEWER NOTES

1. ALL SEWER CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY'S STANDARD SPECIFICATIONS, SEPT. 1986, THE DEPARTMENT OF PUBLIC WORKS DETAILS, SEPT. 1984, CURRENT CITY PRACTICES AND REVISED ORDINANCES OF HONOLULU, 1990 AS AMENDED, AND THE DESIGN STANDARDS OF THE DEPARTMENT OF WASTEWATER MANAGEMENT, VOL. 1, JULY 1993.
2. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION SECTION, DEPARTMENT OF WASTEWATER MANAGEMENT AT 527-5280 OR 523-4345 TO ARRANGE FOR INSPECTION SERVICES AND SUBMIT FOUR SETS OF APPROVED CONSTRUCTION PLANS SEVEN DAYS PRIOR TO COMMENCEMENT OF SEWER WORK. THE CONTRACTOR SHALL PAY FOR ALL INSPECTION COSTS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS SEWER SERVICE TO ALL AFFECTED AREAS DURING CONSTRUCTION.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SEWAGE SPILLS CAUSED DURING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE STATE DEPARTMENT OF HEALTH AND UTILIZE APPROPRIATE SAMPLING AND ANALYZING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PUBLIC NOTIFICATIONS AND PRESS RELEASES.
5. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXISTING BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING THE AREA. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGED UTILITIES.

GAS NOTES:

1. BHP GAS COMPANY GAS PIPELINES IN THE PROJECT AREA ARE PLASTIC COATED AND CATHODICALLY PROTECTED. THE CONTRACTOR SHALL BE EXTREMELY CAREFUL WHEN WORKING NEAR THESE GAS PIPELINES.
2. WRITTEN CLEARANCES MUST BE OBTAINED FROM BHP GAS COMPANY AT LEAST FIVE WORKING DAYS PRIOR TO STARTING EXCAVATION NEAR THESE GAS PIPELINES.

SINCE GAS LINE LOCATIONS ON FIELD MAPS ARE APPROXIMATE, THE CONTRACTOR, AFTER OBTAINING WRITTEN CLEARANCE, SHALL CALL BHP GAS COMPANY AT LEAST FIVE WORKING DAYS BEFORE STARTING EXCAVATION TO ARRANGE FOR FIELD LOCATION OF THE EXISTING GAS PIPELINES. THE TELEPHONE NUMBER IS 594-5575 DURING BUSINESS HOURS AND 526-0066 AFTER HOURS.
3. THE CONTRACTOR SHALL EXCAVATE AND BACKFILL AROUND GAS PIPELINES IN THE PRESENCE OF A BHP GAS COMPANY REPRESENTATIVE. ALL BACKFILL WITHIN SIX INCHES OF ANY GAS PIPELINE SHALL BE SELECT CUSHION MATERIAL APPROVED BY BHP GAS COMPANY.
4. FOR RELOCATION OF ANY GAS PIPELINE, THE CONTRACTOR SHALL NOTIFY BHP GAS COMPANY FIVE WORKING DAYS BEFORE STARTING WORK. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EXCAVATION AND BACKFILL, OBTAIN TRAFFIC PERMITS, AND RESTORE PAVEMENT, SIDEWALKS, AND OTHER FACILITIES. ANY RELOCATION OF GAS FACILITIES SHALL BE DONE BY BHP GAS COMPANY AND PAID FOR BY THE CONTRACTOR.
5. THE CONTRACTOR SHALL NOTIFY BHP GAS COMPANY IMMEDIATELY AFTER ANY DAMAGE HAS BEEN CAUSED TO EXISTING GAS PIPELINES, COATINGS, OR ITS CATHODIC PROTECTION DEVICES. REPAIR WORK ON SUCH DAMAGE SHALL BE DONE BY BHP GAS COMPANY AND PAID FOR BY THE CONTRACTOR.
6. MINIMUM VERTICAL AND HORIZONTAL CLEARANCE BETWEEN THE GAS PIPELINES AND OTHER PIPELINES, CONDUITS, DUCTLINES, OR OTHER FACILITIES SHALL BE 12 INCHES. ADEQUATE SUPPORT AND PROTECTION FOR GAS PIPELINES EXPOSED IN THE TRENCH SHALL BE PROVIDED BY THE CONTRACTOR AND APPROVED BY BHP GAS COMPANY.
7. THE CONTRACTOR SHALL WORK IN AN EXPEDITIOUS MANNER IN ORDER TO KEEP THE UNCOVERED GAS PIPELINES EXPOSED FOR AS SHORT A PERIOD OF TIME AS POSSIBLE.

OAHU TRANSIT SERVICES NOTE:

THE CONTRACTOR SHALL NOTIFY THE OAHU TRANSIT SERVICES, INC. (OTS), ED SNIFFEN, AT 848-4571 OR LOWELL TOM AT 848-4578 TWO WEEKS PRIOR TO BEGINNING ANY WORK, INFORMING THEM OF LOCATION, SCOPE OF WORK, PROPOSED CLOSURE OF ANY STREET OR TRAFFIC LANES, AND THE NEED TO RELOCATE ANY BUS STOP.

APPROVED:

CHIEF, DIVISION OF PLANNING AND SERVICE CONTROL, HWW
(FOR SEWER WORK WITHIN PUBLIC R/W AND EASEMENT ONLY)

DATE

CHIEF, DIVISION OF ENGINEERING, DPW
(FOR CONSTRUCTION WITHIN CITY R/W ONLY)

DATE

Prepared by:



GMP
ASSOCIATES, INC.
Engineers/Architects

381 BISHOP STREET, 8TH FLOOR
HONOLULU, HAWAII 96813
TEL: 533-2121
FAX: 533-2089

T-4

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

TRAFFIC NOTES FOR WORK ON CITY AND COUNTY STREETS

1. A PERMIT SHALL BE OBTAINED FROM THE DEPARTMENT OF TRANSPORTATION SERVICES BEFORE WORK ON ANY PORTION OF A PUBLIC STREET OR HIGHWAY MAY BEGIN.
2. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS AND OTHER PROTECTIVE FACILITIES, WHICH SHALL CONFORM WITH THE "HAWAII ADMINISTRATION RULES GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS" ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U. S. FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI- TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS."
3. WORK ON ANY CITY STREET AREA MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:30 A.M. TO 3:30 P.M. MONDAY THROUGH FRIDAY, UNLESS OTHERWISE PERMITTED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.
4. DURING WORKING HOURS, THE CONTRACTOR SHALL PROVIDE TWO LANES FOR THROUGH TRAFFIC ON STREETS TOO NARROW TO MAKE THIS PRACTICABLE. THE CONTRACTOR MAY WORK IN ONE HALF OF THE ROADWAY, KEEPING ONE LANE OPEN TO TRAFFIC AND ALTERNATING THE FLOW OF TRAFFIC. DURING NON-WORKING HOURS, ALL TRENCHES SHALL BE COVERED WITH A SAFE NON-SKID BRIDGING, MATERIAL AND ALL LANES SHALL BE OPEN TO TRAFFIC.
5. AS REQUIRED BY THE DEPARTMENT OF TRANSPORTATION SERVICES, THE CONTRACTOR SHALL PROVIDE OFF-DUTY POLICE OFFICERS TO CONTROL THE FLOW OF TRAFFIC.
6. WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL BE MAINTAINED IN PASSABLE CONDITION OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEWISE BE PROVIDED.
7. DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTY USING THESE RIGHTS-OF-WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY.
8. CONTRACTOR SHALL REFERENCE TO THE APPROVAL OF THE DEPARTMENT OF TRANSPORTATION SERVICES, ALL EXISTING TRAFFIC SIGNS, POST AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS DISTURBED BY HIS ACTIVITIES. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF TRANSPORTATION SERVICES AT 523-4029 ONE (1) WEEK PRIOR TO ANY WORK TO BE DONE ON SIGNS, POSTS AND PAVEMENT MARKINGS.
9. NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN STREET RIGHTS-OF-WAY EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.
10. BOARD OF WATER SUPPLY SHALL ENSURE THAT THE CONTRACTOR INSTALLS THE CONSTRUCTION TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE MUTCD AND HAWAII ADMINISTRATION RULES AS SPECIFIED IN TRAFFIC NOTE NO. 2.

ELECTRICAL AND MAINTENANCE SERVICES DIVISION NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL AND MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING ANY WORK ON THE STREET LIGHTING SYSTEM (PHONE: 527-5002)
2. THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL AND MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING ANY WORK ON THE TRAFFIC SIGNAL SYSTEM (PHONE: 523-4589)
3. THE STREET LIGHTING AND TRAFFIC SIGNAL SYSTEMS SHALL BE KEPT OPERATIONAL DURING CONSTRUCTION. ANY RELOCATION OR CHANGEOVER REQUIRED SHALL BE APPROVED BY THE ELECTRICAL AND MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, AND PERFORMED AND PAID FOR BY THE CONTRACTOR.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO EXISTING STREET LIGHTING AND TRAFFIC SIGNAL FACILITIES, INCLUDING THE TRAFFIC SIGNAL INTERCONNECT SYSTEM, AND ANY AND ALL DAMAGES TO THESE FACILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY AND COUNTY OF HONOLULU.

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

JOB 98-1588

24 INCH AND 16 INCH TRANSMISSION MAINS
ALONG KAMEHAMEHA HIGHWAY AND LUMAINA STREET

UTILITY NOTES

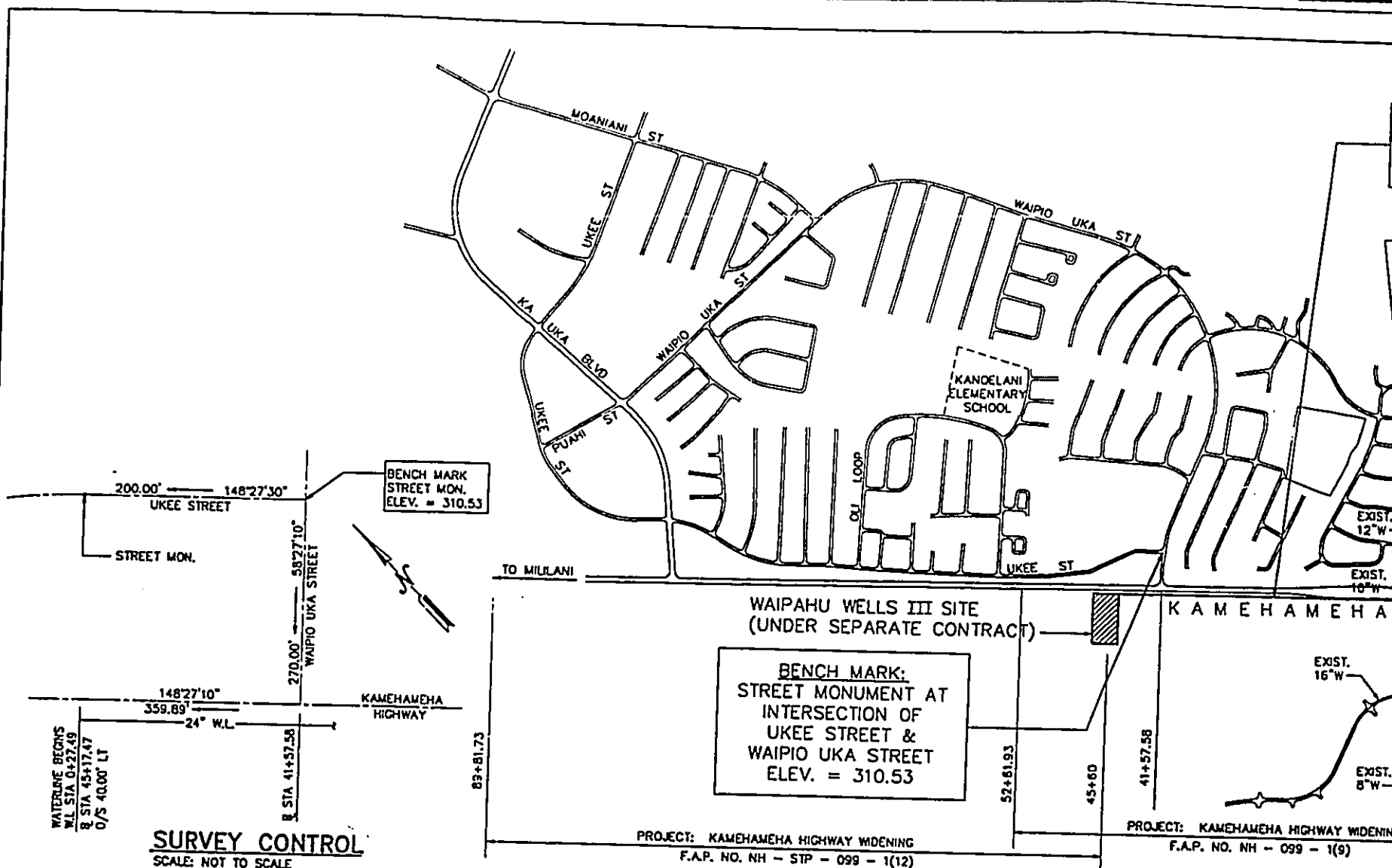
APPROVED: _____ DATE: _____

CHIEF, PLANNING AND ENGINEERING DIVISION

DESIGNED BY: DAD CHECKED BY: TAC FILE NO. _____

SCALE: AS NOTED SHEET _____ OF _____ SHEETS

2380K049 12/29/97 16:42 FINAL



SURVEY CONTROL
SCALE: NOT TO SCALE

PROJECT: KAMEHAMEHA HIGHWAY WIDENING
F.A.P. NO. NH - STP - 099 - 1(12)

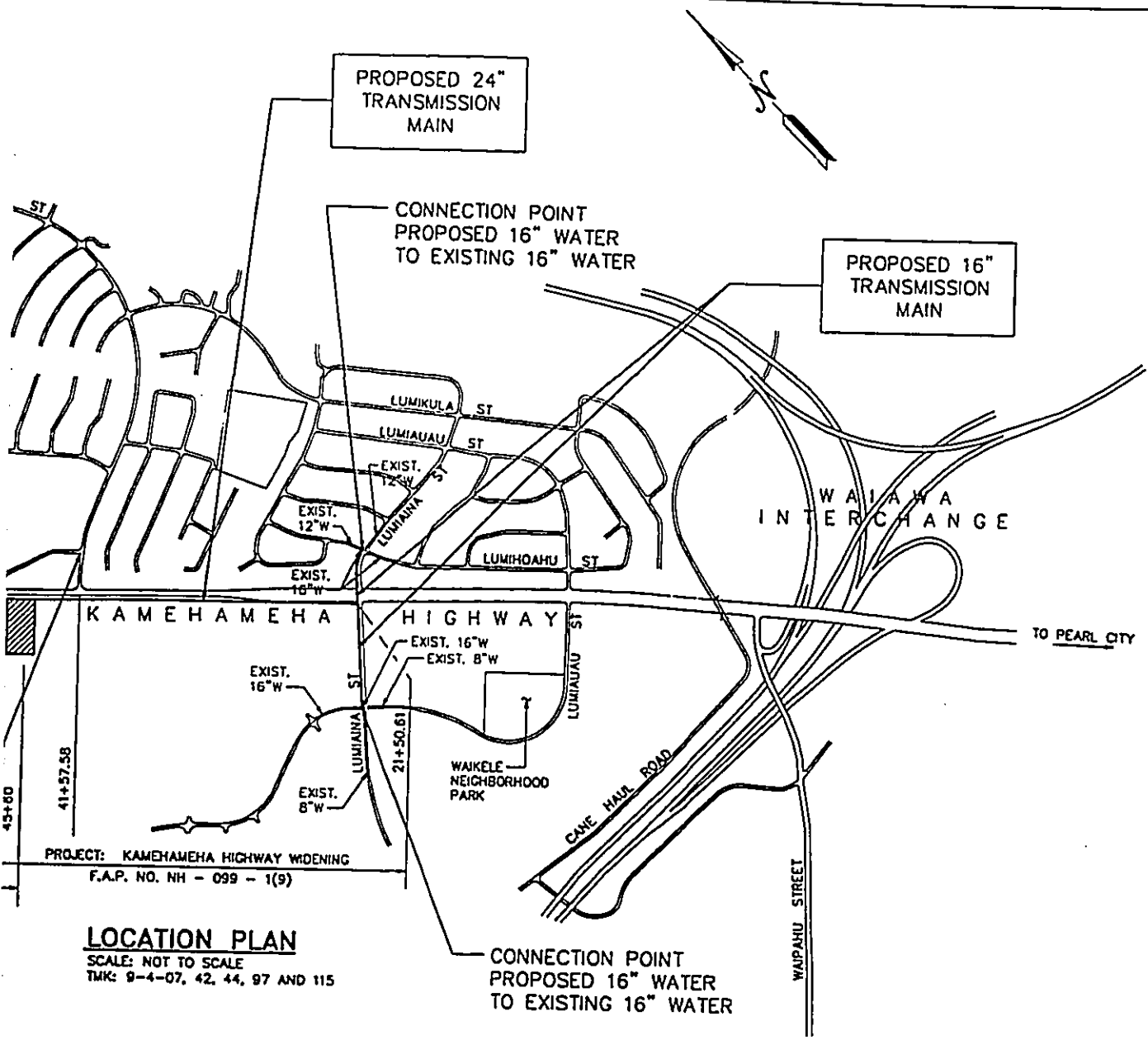
PROJECT: KAMEHAMEHA HIGHWAY WIDENING
F.A.P. NO. NH - 099 - 1(9)

LOCATION PLAN
SCALE: NOT TO SCALE
TMK: 9-4-07, 42, 44, 97 AND 115

LEGEND

NEW 24" TRANSMISSION MAIN	—————	EXISTING 36" STORM DRAIN	—E/D36"—	EXISTING OVERHEAD UTILITY LINES	—U _{OH} —
NEW 24" BCGV W/ MANHOLE	□	EXISTING 24" STORM DRAIN	—E/D24"—	EXISTING POWER POLES	PP
NEW EDGE OF PAVEMENT	—————	EXISTING STORM DRAIN INLET	□	EXISTING GUY ANCHOR	—
KAMEHAMEHA HWY. BASELINE	—0+00—	EXISTING STORM DRAIN MANHOLE	OSDMH	EXISTING 6" GAS	—E/G6"—
EXISTING RIGHT-OF-WAY	-----	EXISTING 12" SEWER	—E/S12"—	EXISTING SIGNAL CABLE	—E/SC—
EXISTING EDGE OF PAVEMENT	—————	EXISTING SEWER MANHOLE	○	EXISTING TELEPHONE POLES	TP
EXISTING FLOW LINES	-----	EXISTING ELECTRICAL LINES	—E/ELEC—	EXISTING TELEPHONE BOX	□ TEL. BOX
EXISTING CURB	—————	EXISTING HECO BOX	□ HECO	EXISTING TELEPHONE MANHOLE	□ HTCO MH
EXISTING INDEX CONTOURS	---310---	EXISTING TRAFFIC SIGNAL BOX	□ TSB	EXISTING 12" WATER	—E/W12"—
EXISTING CONTOURS	---305---	EXISTING STREET LIGHT BOX	□ SLB	EXISTING 16" WATER	—E/W16"—
EXISTING TREES	⊙ *	EXISTING CATV BOX	□ CATV	EXISTING WATER MANHOLE	○ WMH
EXISTING WALLS	— 7 —	EXISTING STREET LIGHT	⊙	ABANDONED 36" STORM DRAIN	---E/D36" (ABAND.)---
EXISTING 84" STORM DRAIN	—E/D84"—	EXISTING STREET LIGHT	⊙		

Job No. 2107/03



PROJECT: KAMEHAMEHA HIGHWAY WIDENING
 F.A.P. NO. NH - 099 - 1(9)

LOCATION PLAN
 SCALE: NOT TO SCALE
 TMK: 9-4-07, 42, 44, 97 AND 115

APPROVED:

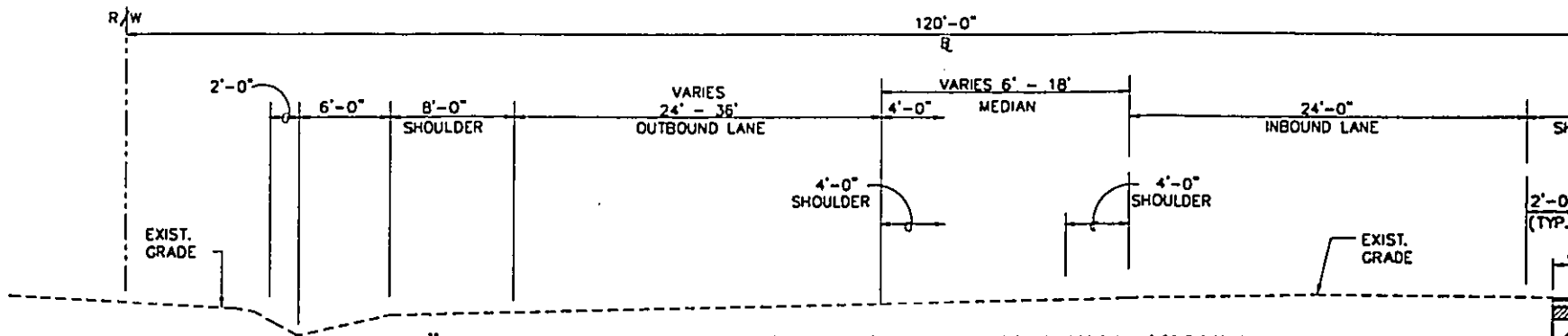
 CHIEF, DIVISION OF ENGINEERING, DPW
 (FOR CONSTRUCTION WITHIN CITY R/W ONLY) DATE

 CHIEF, DIVISION OF PLANNING AND SERVICE CONTROL, WHM
 (FOR SEWER WORK WITHIN PUBLIC R/W & EASEMENT ONLY) DATE

- UOH —
- PP →
- E/G6" —
- E/SC —
- TP →
- TEL BOX
- HTCO
- MH
- E/W12" —
- E/W16" —
- WMH
- E/D36" (ABAND.) —

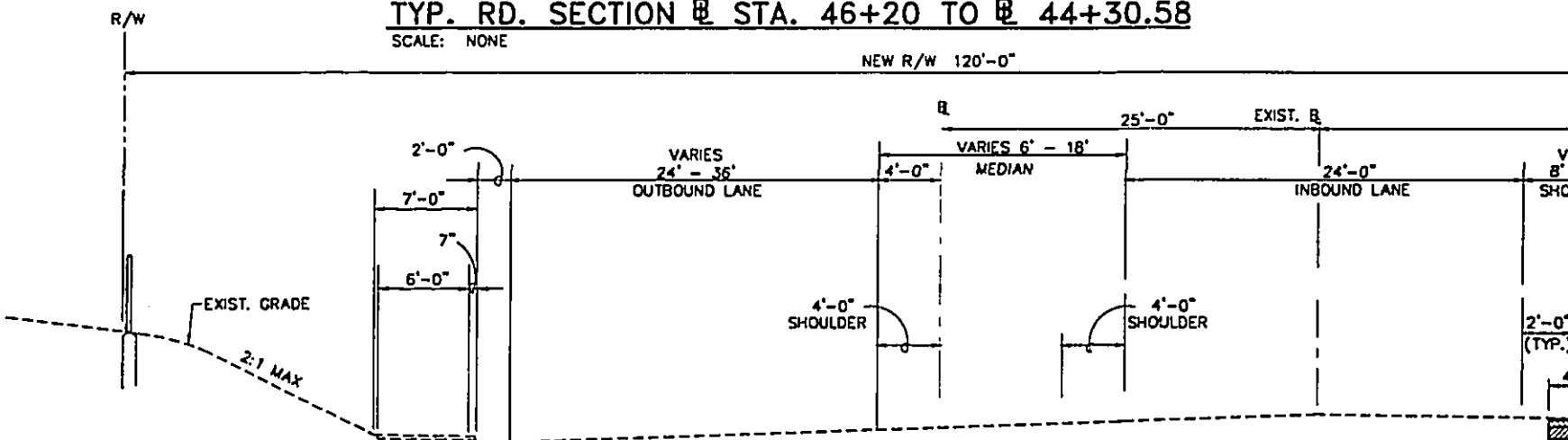
Prepared by: GMP ASSOCIATES, INC. ENGINEERS/PLANNERS 1010 KALANIANA'OHU BLVD., SUITE 1000 HONOLULU, HAWAII 96813 TEL: 531-2222	BOARD OF WATER SUPPLY CITY AND COUNTY OF HONOLULU JOB 98-158B 24 INCH AND 16 INCH TRANSMISSION MAINS ALONG KAMEHAMEHA HIGHWAY AND LUMIAINA STREET LOCATION PLAN AND LEGEND	
	APPROVED: _____ DATE: _____ CHIEF, PLANNING AND ENGINEERING DIVISION	
T-5 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. _____ Signature	APPROVED BY: DAD CHECKED BY: TAC OK'D BY: TAC FILE NO: _____ REG. BOOK NO. SCALE: AS NOTED SHEET _____ OF _____ SHEETS	DATE: _____ CHIEF, DIVISION OF PLANNING AND SERVICE CONTROL, WHM (FOR SEWER WORK WITHIN PUBLIC R/W & EASEMENT ONLY)

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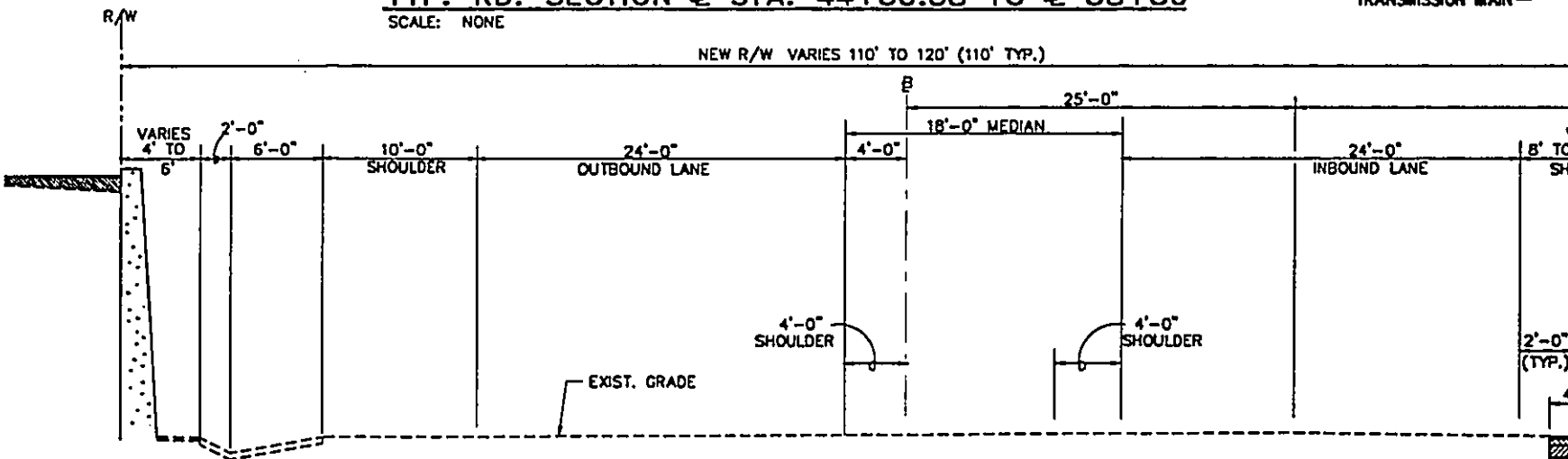
24" TRANSMISSION MAIN ALONG KAMEHAMEHA HIGHWAY
TYP. RD. SECTION @ STA. 46+20 TO @ 44+30.58

SCALE: NONE



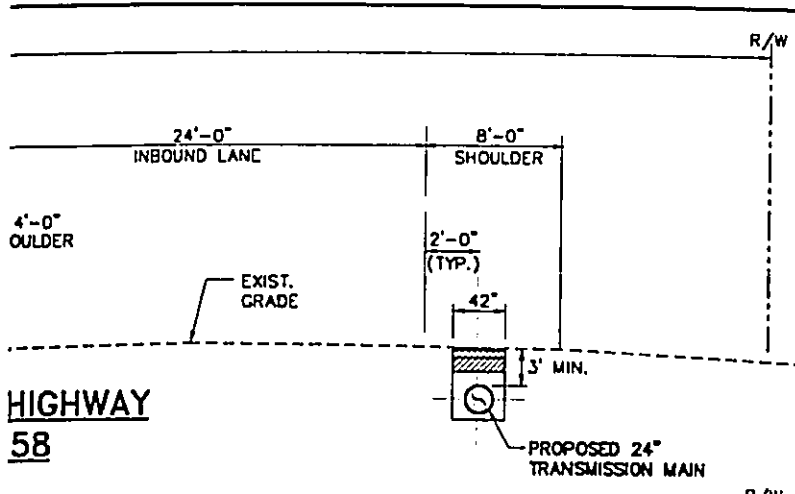
24" TRANSMISSION MAIN ALONG KAMEHAMEHA HIGHWAY
TYP. RD. SECTION @ STA. 44+30.58 TO @ 38+50

SCALE: NONE

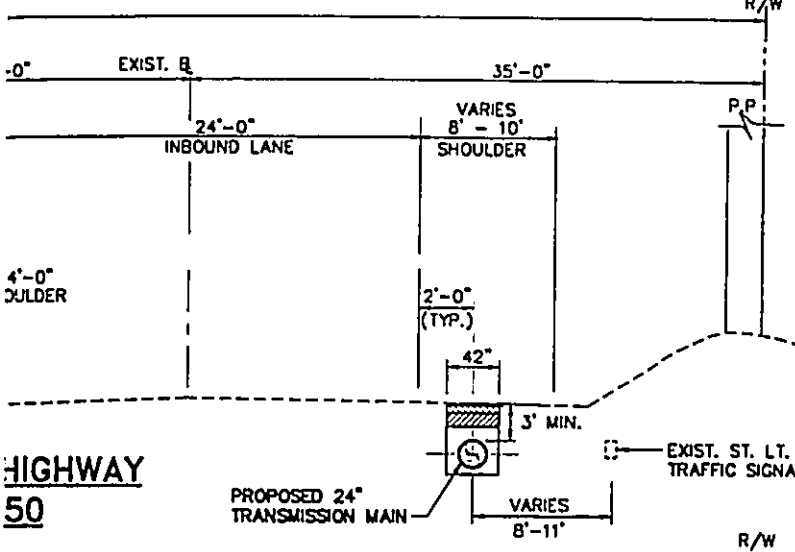


24" TRANSMISSION MAIN ALONG KAMEHAMEHA HIGHWAY
TYP. RD. SECTION STA. 38+50 TO 32+30±

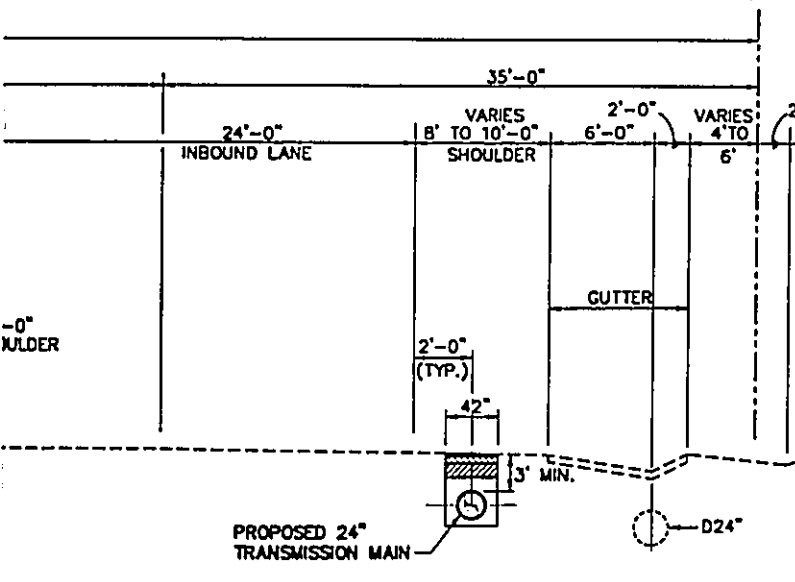
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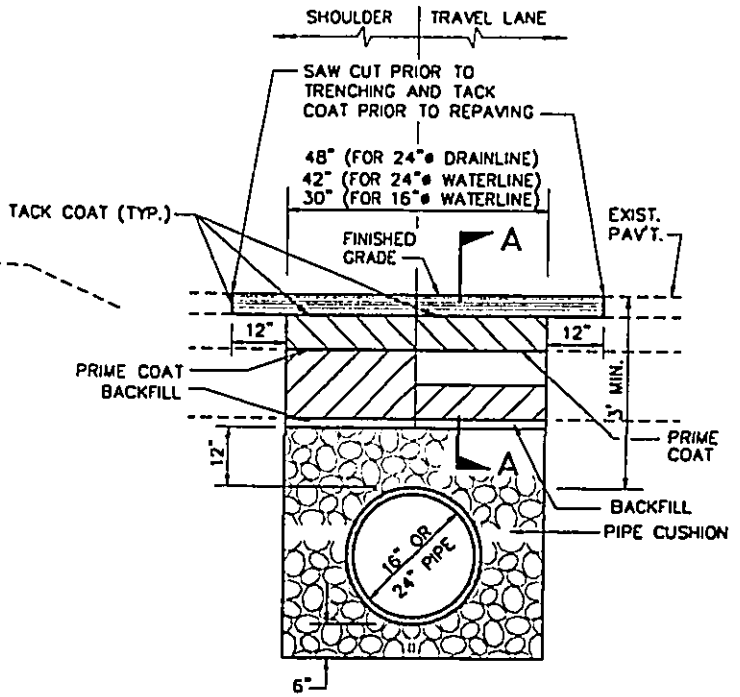
HIGHWAY 58



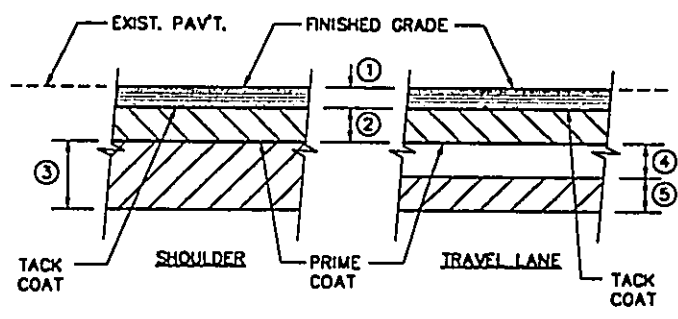
HIGHWAY 50



HA HIGHWAY



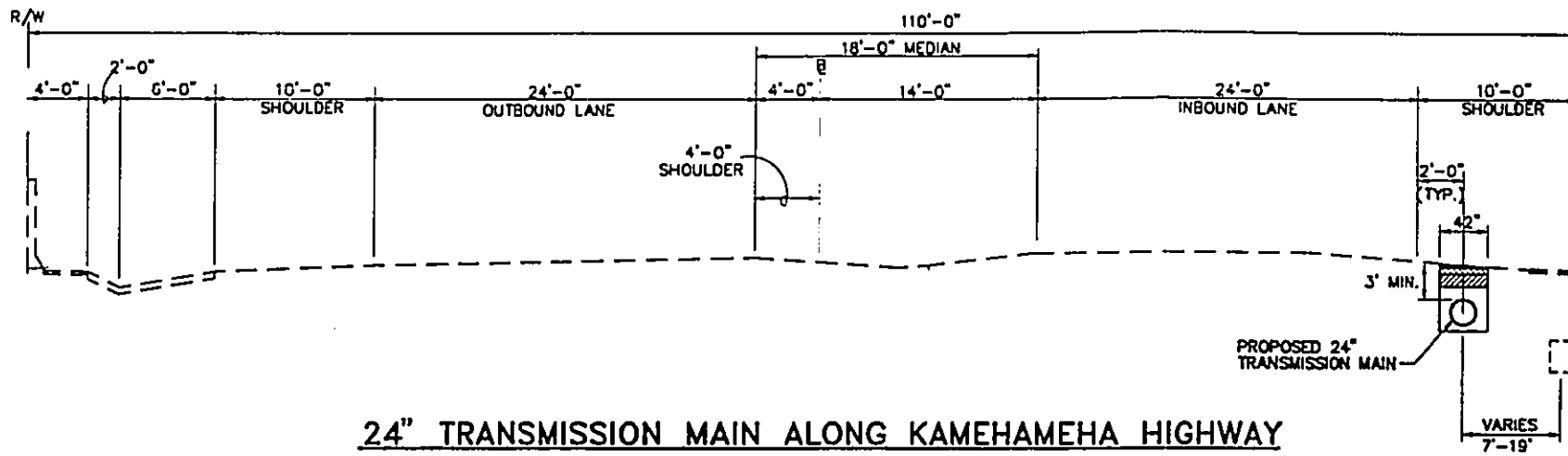
**TRENCH REPAVING DETAIL
KAMEHAMEHA HIGHWAY
AND LUMIAINA STREET
(WITHIN STATE R/W)**



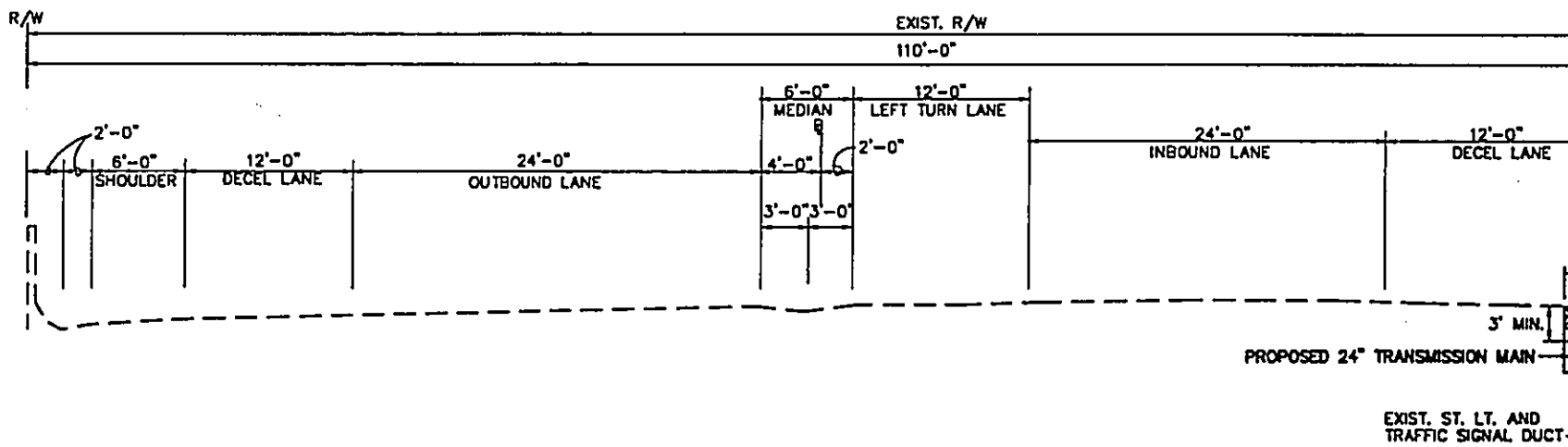
- ① 4 1/2" A.C. PAVEMENT - STATE MIX. NO. IV
- ② 6 1/2" ASPHALT CONCRETE BASE
- ③ 12" AGGREGATE SUBBASE
- ④ 7" UNTREATED PERMEABLE BASE
- ⑤ 6" AGGREGATE SUBBASE

SECTION 'A-A'

Prepared by: GAP ASSOCIATES, INC. Engineers/Architects 641 KONO STREET, 1100 HONOLULU, HAWAII 96813 TEL: 851-8111 FAX: 538-2000	THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. Signature _____	BOARD OF WATER SUPPLY CITY AND COUNTY OF HONOLULU JOB 98-158B 24 INCH AND 16 INCH TRANSMISSION MAINS ALONG KAMEHAMEHA HIGHWAY AND LUMIAINA STREET TYPICAL WATER SECTIONS - 1	
		APPROVED: _____ CHIEF, PLANNING AND ENGINEERING DIVISION	DATE: _____
C-1		DRAWN BY: DAD CHECKED BY: TAC FILE NO: _____ FIELD BOOK NO. _____ SCALE: AS NOTED SHEET _____ OF _____ SHEETS	



24" TRANSMISSION MAIN ALONG KAMEHAMEHA HIGHWAY
TYP. EXIST. RD. SECTION
STA. 32+30 TO 21+32.61
 SCALE: NTS

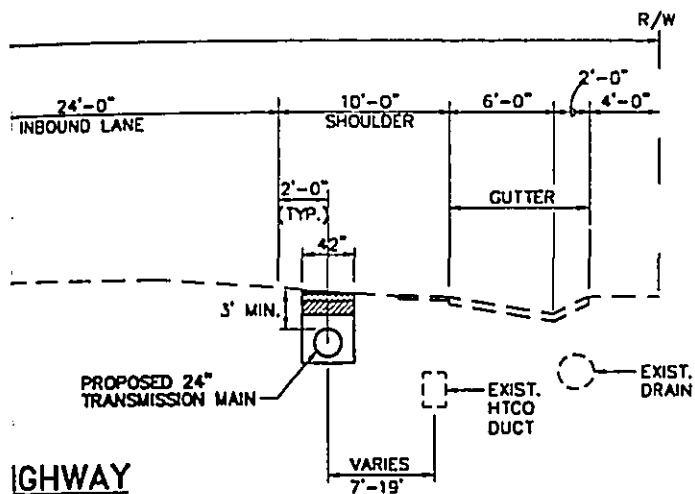


24" TRANSMISSION MAIN ALONG KAMEHAMEHA HIGHWAY
TYPICAL EXIST. ROAD SECTION WITH DECELERATION LANE
 SCALE: NTS

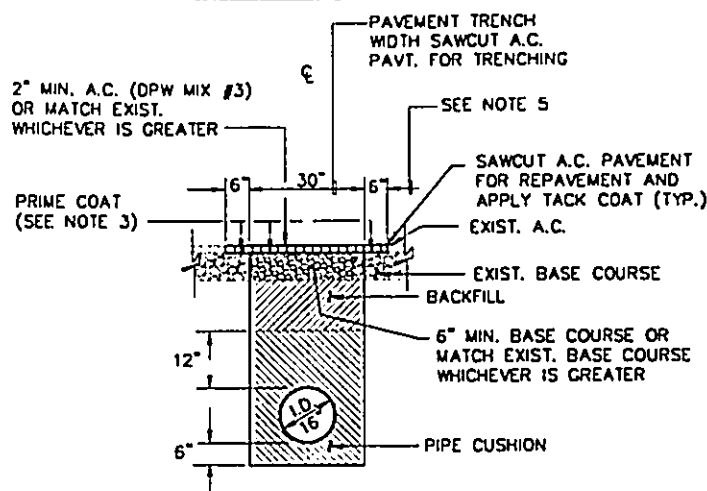
APPROVED:

CHIEF DIVISION OF ENGINEERING, DPW
 (FOR CONSTRUCTION WITHIN CITY R/W ONLY)

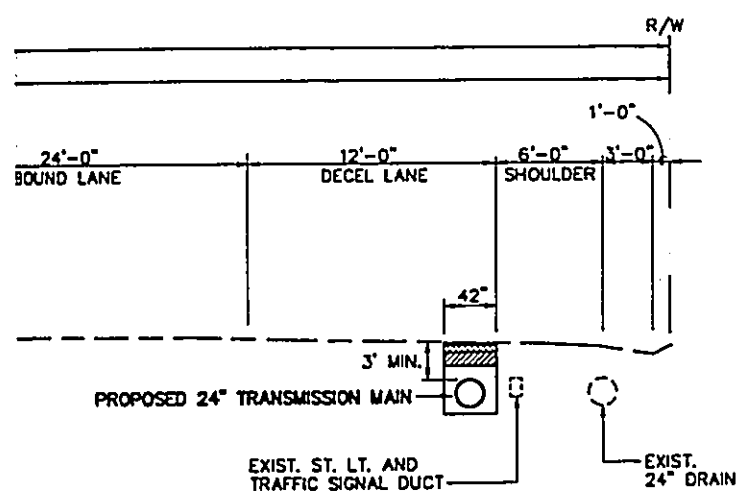
Job No. 2380703



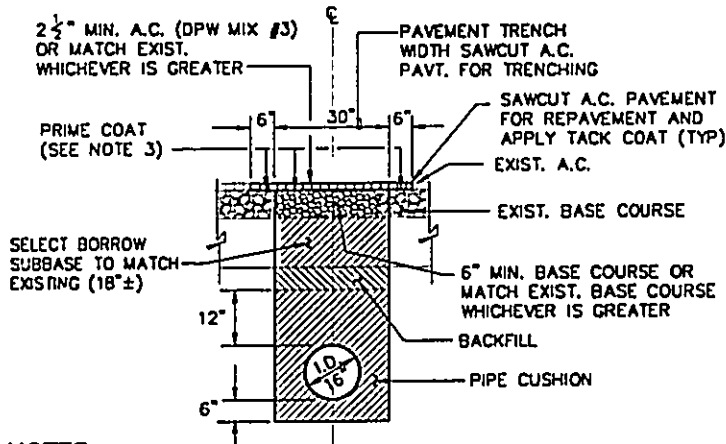
IGHWAY



**TYPICAL TRENCH SECTION
ALONG LUMIAINA ST. (EAST)
(CITY ROADWAY)**
SCALE: NTS



WAY
LANE



NOTES:

1. NEW CONSTRUCTION SHALL BE EQUAL OR BETTER THAN EXIST. IN THICKNESS AND IN QUALITY.
2. PAVEMENT THICKNESS SHALL BE AS INDICATED OR SHALL MATCH THE EXISTING PAVEMENT THICKNESS, WHICHEVER IS GREATER.
3. IF PRIME COAT IS AVAILABLE, USE PRIME COAT.
4. THE FOLLOWING REQUIREMENTS SHALL APPLY WHEN PRIME COAT IS NOT AVAILABLE:
 - A. FOR ROAD GRADES 0% TO 7.99% PRIME COAT IS NOT REQUIRED. IF PRIME COAT IS AVAILABLE, USE PRIME COAT. USE 6" MINIMUM BASE COURSE OR MATCH EXISTING, WHICHEVER IS GREATER
 - B. FOR ROAD GRADES 8% TO 11.99% AND SUPERELEVATED AREAS, USE 4" MINIMUM ATB.
 - C. FOR ROAD GRADES EXCEEDING 12% USE CONCRETE PAVEMENT.
5. REMOVE AND RECONSTRUCT A. C. PAVEMENT TO EDGE OF EXISTING GUTTER IF LESS THAN 2'-0"

**TYPICAL TRENCH SECTION
ALONG LUMIAINA ST. (WEST)
(CITY ROADWAY)**
SCALE: NTS

FINAL 13:17 02/04/98 2380F573

APPROVED:

CHIEF DIVISION OF ENGINEERING, DPW
(FOR CONSTRUCTION WITHIN CITY R/W ONLY)

DATE

Prepared by:



341 KONOHE STREET, #1301
HONOLULU, HAWAII 96813
TEL: 531-2311
FAX: 538-3399

C-2

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature

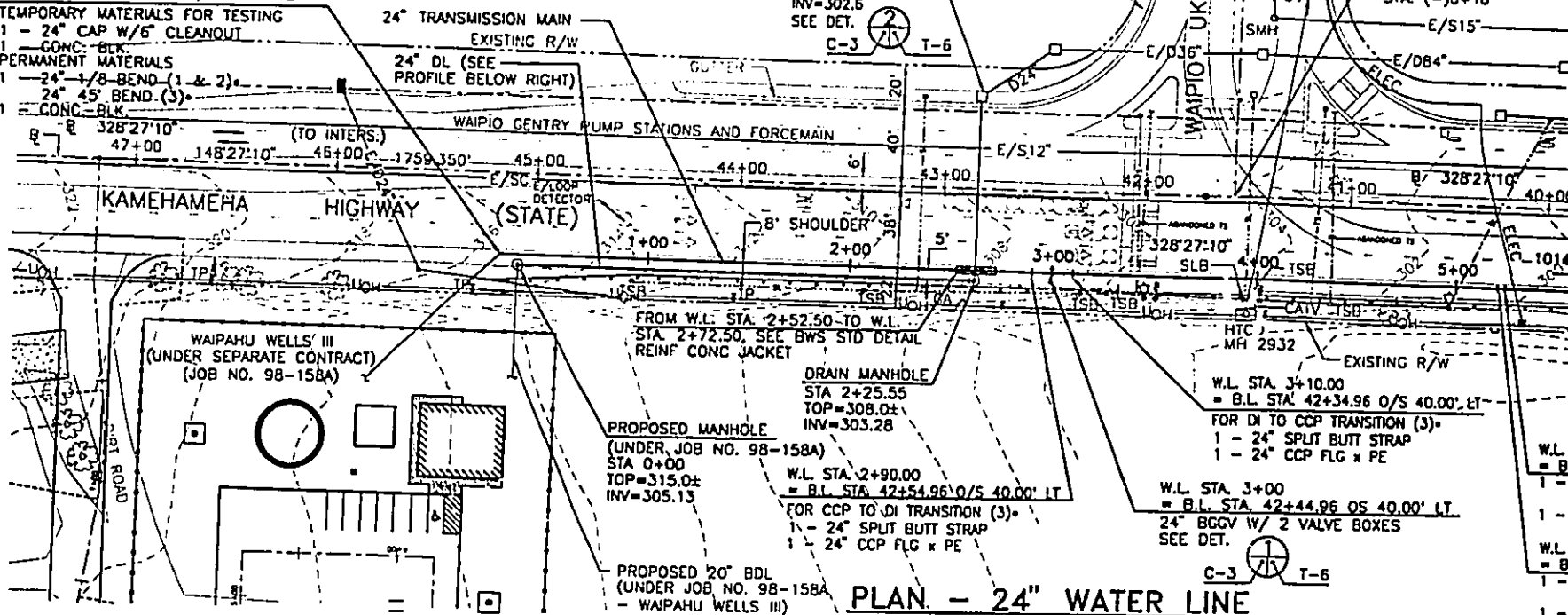
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 98-1588
24 INCH AND 16 INCH TRANSMISSION MAINS
ALONG KAMEHAMEHA HIGHWAY AND LUMIAINA STREET
TYPICAL WATER SECTIONS - 2

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION
DRAWN BY: B5 ENGINEER: MAA CHECKED BY: TAC FILE NO: _____
FIELD BODY NO: _____ SCALE: AS NOTED SHEET _____ OF _____ SHEETS

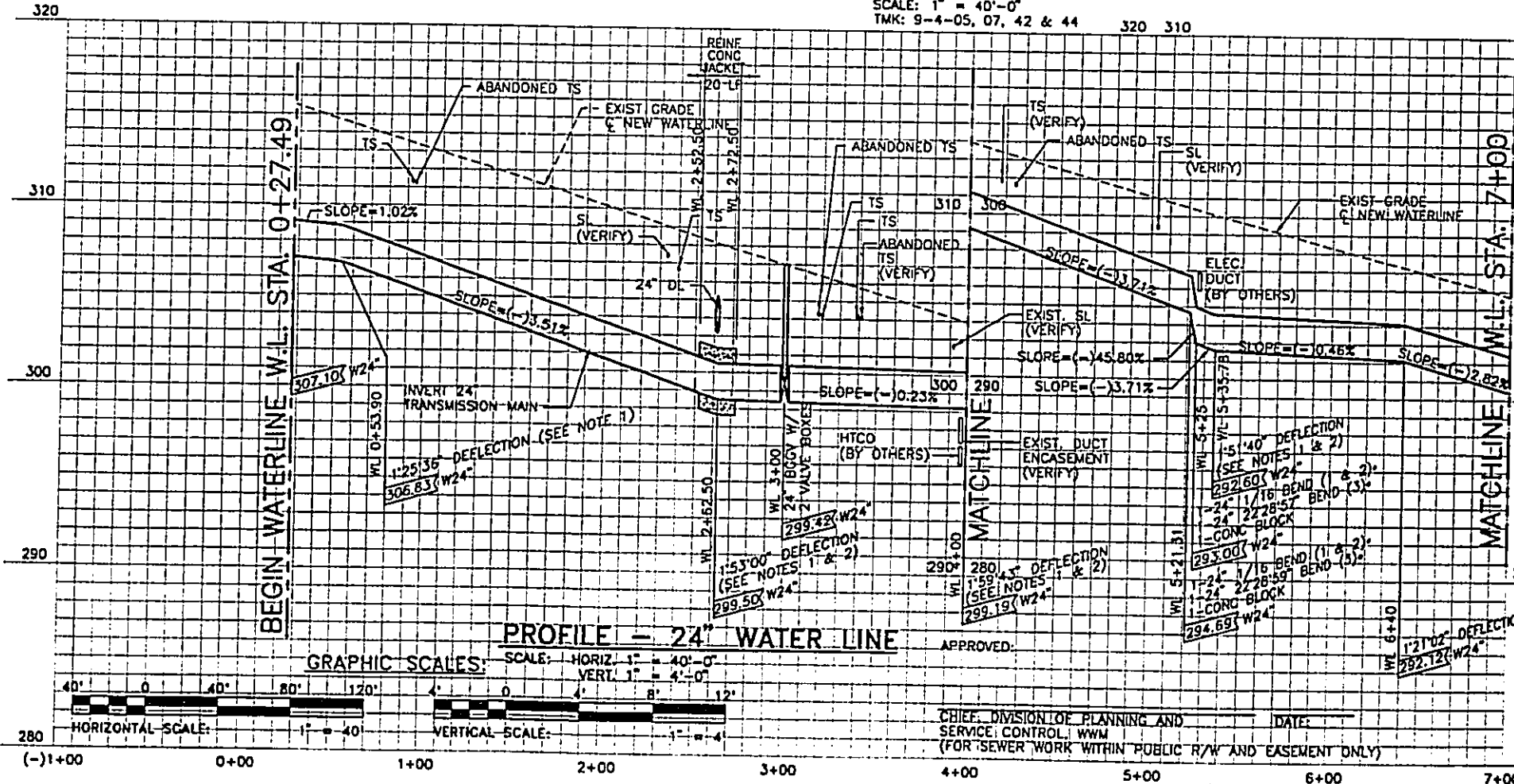
BEGIN 24" DI TRANSMISSION MAIN
 END 24" DI TW (JOB NO. 98-158A - WAIPAHU WELLS III)
 W.L. STA. 0+27.49
 = B.L. STA. 45+17.47 O/S 40.00' LT

TEMPORARY MATERIALS FOR TESTING
 1 - 24" CAP W/6" CLEANOUT
 1 - CONC. BLK
 PERMANENT MATERIALS
 1 - 24" 1/8" BEND (1 & 2)
 1 - 24" 45" BEND (3)
 1 - CONC. BLK



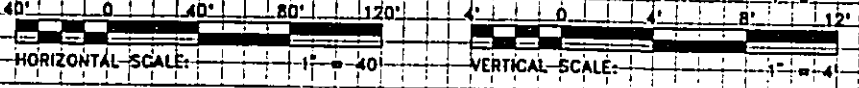
PLAN - 24" WATER LINE

SCALE: 1" = 40'-0"
 TMK: 9-4-05, 07, 42 & 44



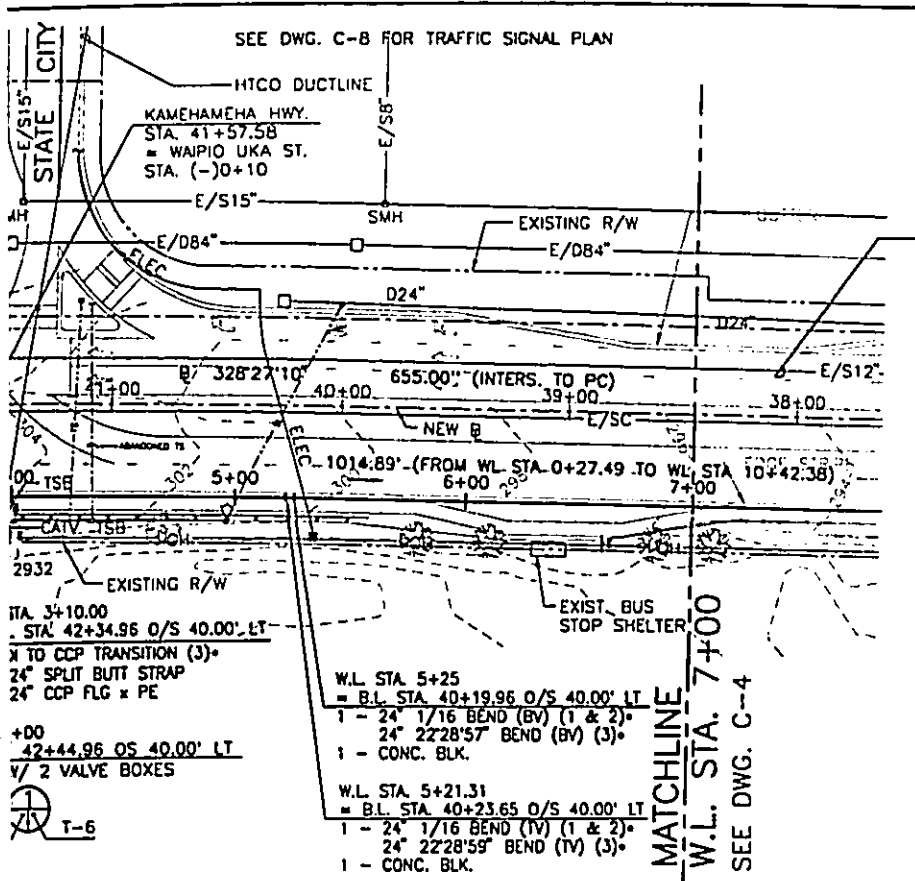
PROFILE - 24" WATER LINE

GRAPHIC SCALES: SCALE: HORIZ. 1" = 40'-0"
 VERT. 1" = 4'-0"



APPROVED: _____
 CHIEF, DIVISION OF PLANNING AND SERVICE CONTROL, WWM
 (FOR SEWER WORK WITHIN PUBLIC R/W AND EASEMENT ONLY)
 DATE: _____

JOB NO. 2380700



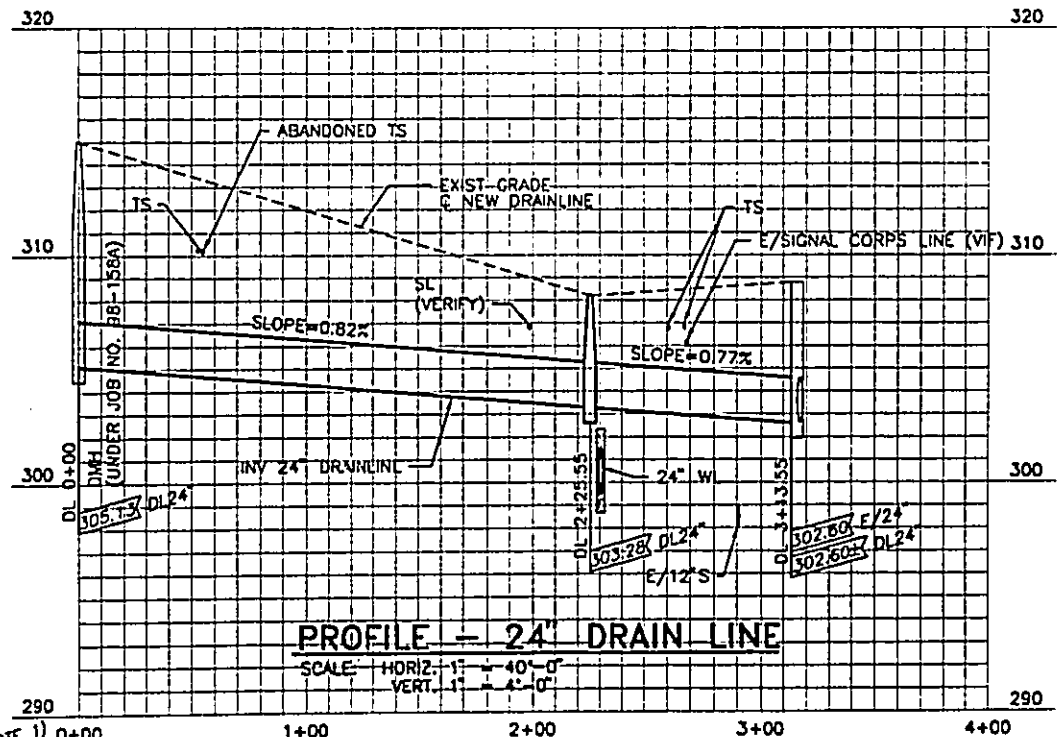
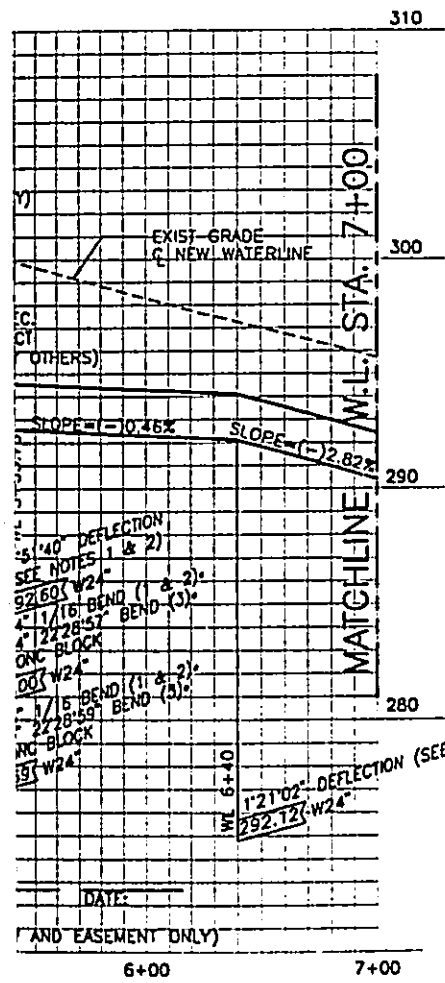
(TO BE USED AS BACK-UP TO THE MILILANI EFFLUENT DISPOSAL LINE)

* PIPE ALTERNATIVES

- (1) DUCTILE IRON
- (2) PVC
- (3) CONCRETE CYLINDER

NOTE:

1. IF THE CONTRACTOR ELECTS TO USE PVC PIPE, HE/SHE SHALL REDESIGN WATERLINE ALIGNMENT AND PROFILES WITHOUT DEFLECTIONS.
2. MAXIMUM DEFLECTION FOR CONCRETE CYLINDER PIPE (CCP) SHALL BE 1'30"00". IF THE CONTRACTOR ELECTS TO USE CCP, HE/SHE SHALL REDESIGN WATERLINE ALIGNMENT AND PROFILES.



PROFILE - 24" DRAIN LINE
SCALE: HORIZ. 1" = 40'-0"
VERT. 1" = 4'-0"

Prepared by:
GMP
ASSOCIATES, INC.
Engineers & Architects
841 KUMU STREET, SUITE 2100
HONOLULU, HAWAII 96813
TEL: 841-1111
FAX: 538-2200

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature _____

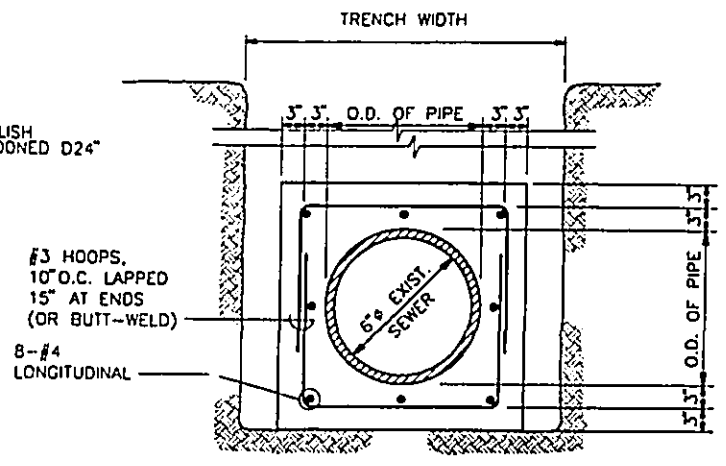
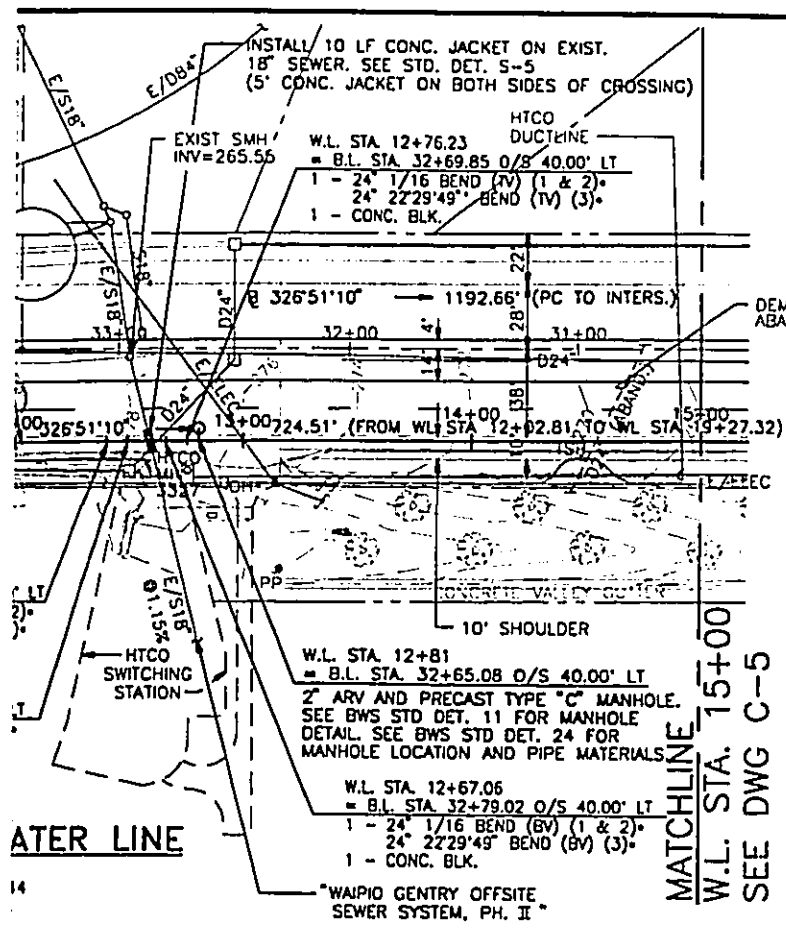
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
JOB 98-1588
24 INCH AND 16 INCH TRANSMISSION MAINS
ALONG KAMEHAMEHA HIGHWAY AND LUMIAINA STREET
PLAN AND PROFILE
24" W.L. STA. 0+00 TO 7+00
24" DRAINLINE STA 0+00 TO 3+13.55

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

DRAWN BY: MOE ENGINEER UAA CHECKED BY: TAC FILE NO. _____
FIELD BOOK NO. _____ SCALE: AS NOTED SHEET _____ OF _____ SHEETS

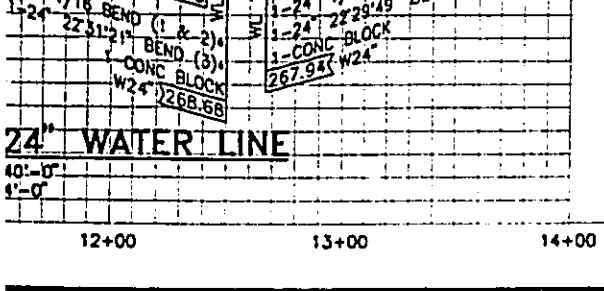
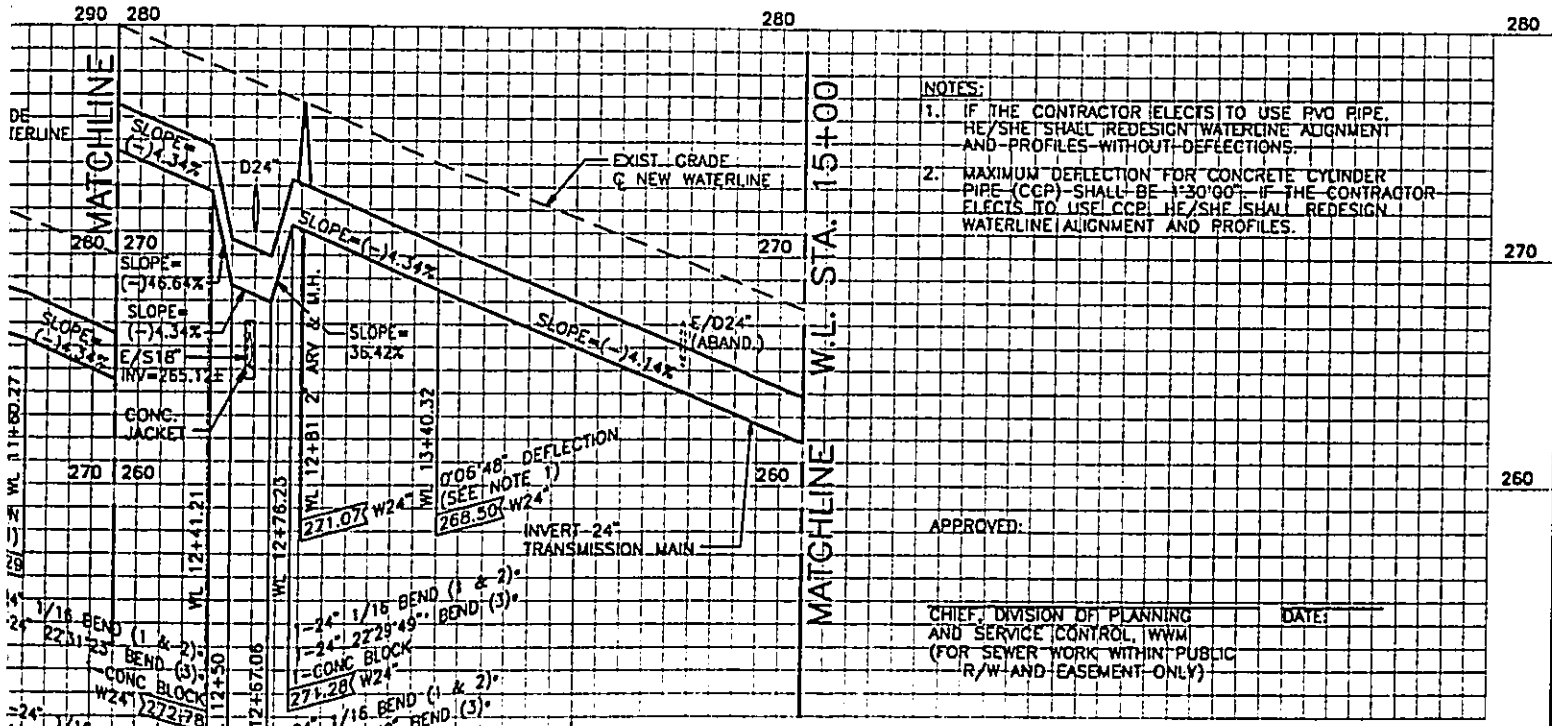
23807579 01/29/98 14:16 FINAL

JOB NO. 21827/03



DETAIL OF SEWER LINE CONCRETE JACKET

- * PIPE ALTERNATIVES
- (1) DUCTILE IRON
 - (2) PVC
 - (3) CONCRETE CYLINDER



Prepared by:

ASSOCIATES, INC.
Engineers/Architects

441 KONO STREET, SUITE 2100
HONOLULU, HAWAII 96813
TEL: 833-2211
FAX: 833-2200

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

C-4

Signature _____

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB 98-158B

24 INCH AND 16 INCH TRANSMISSION MAINS
ALONG KAMEHAMEHA HIGHWAY AND LUMIAINA STREET

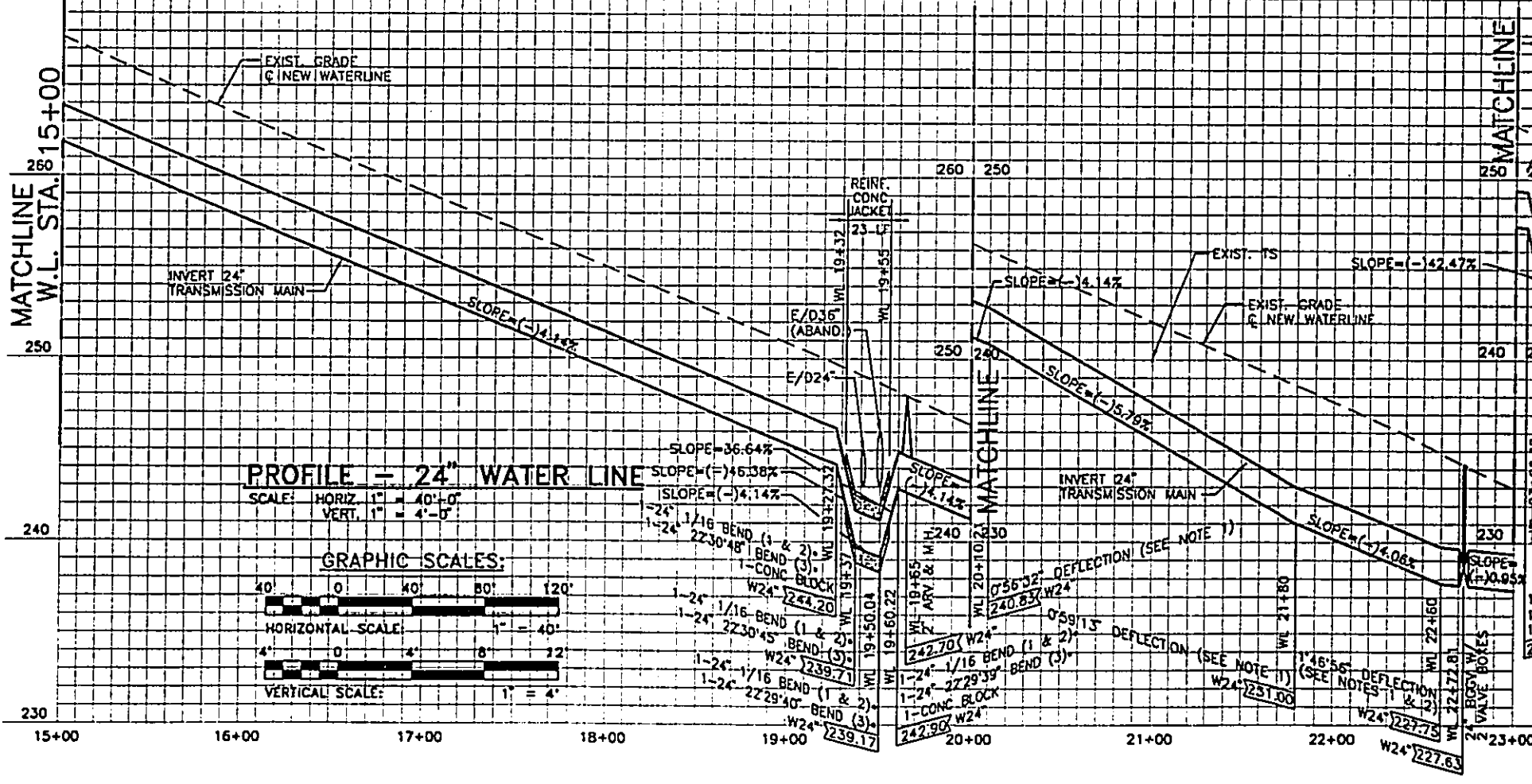
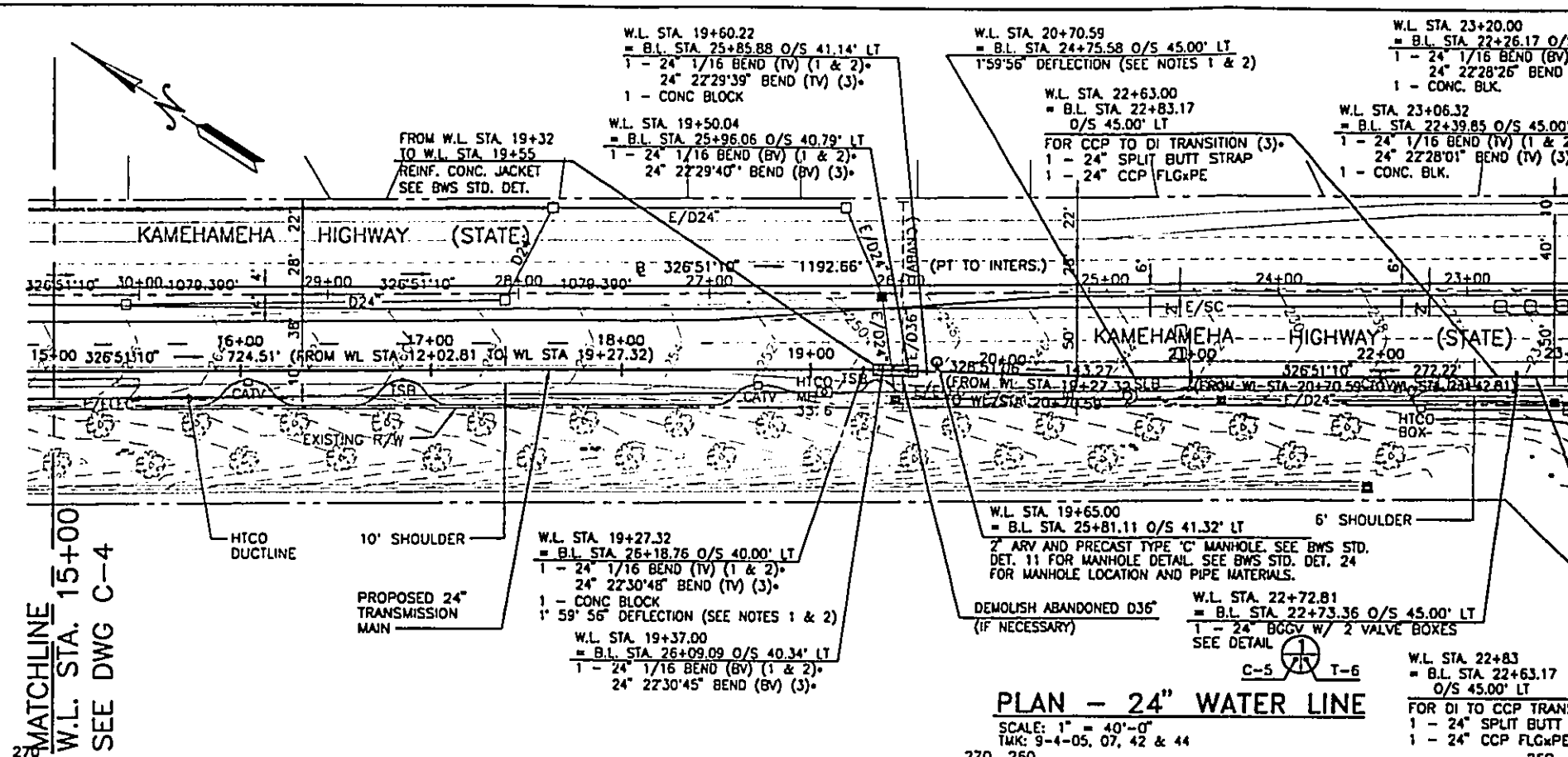
PLAN & PROFILE
24" W.L. STA 7+00 TO 15+00

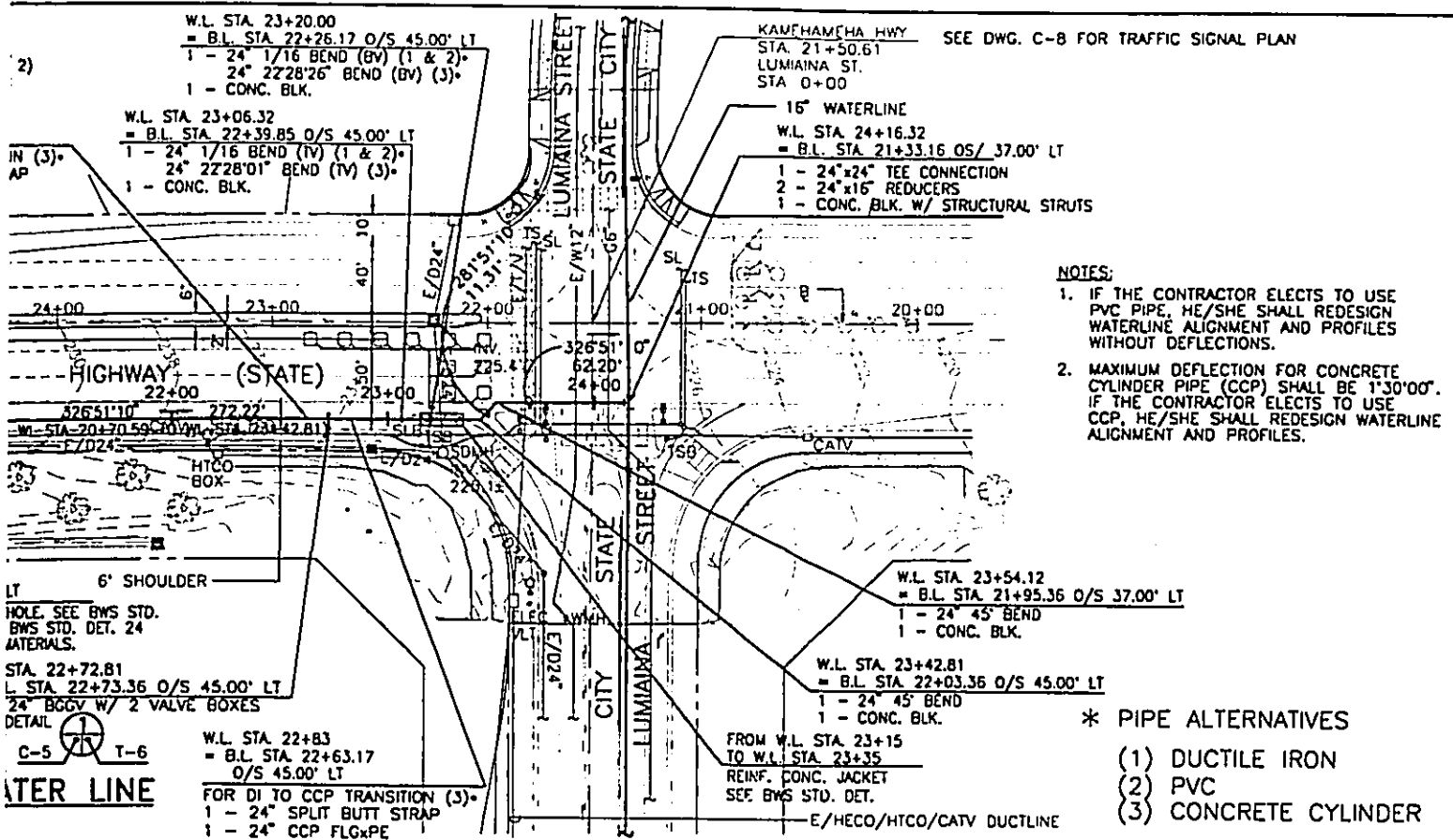
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DRAWN BY: NPP/JOE (ENGINEER/TT,MAA) CHECKED BY: EMS FILE NO. _____

SCALE: AS NOTED SHEET _____ OF _____ SHEETS

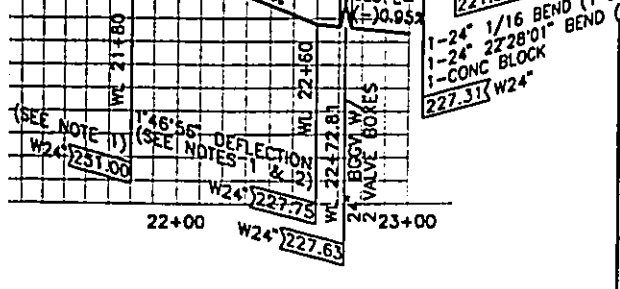
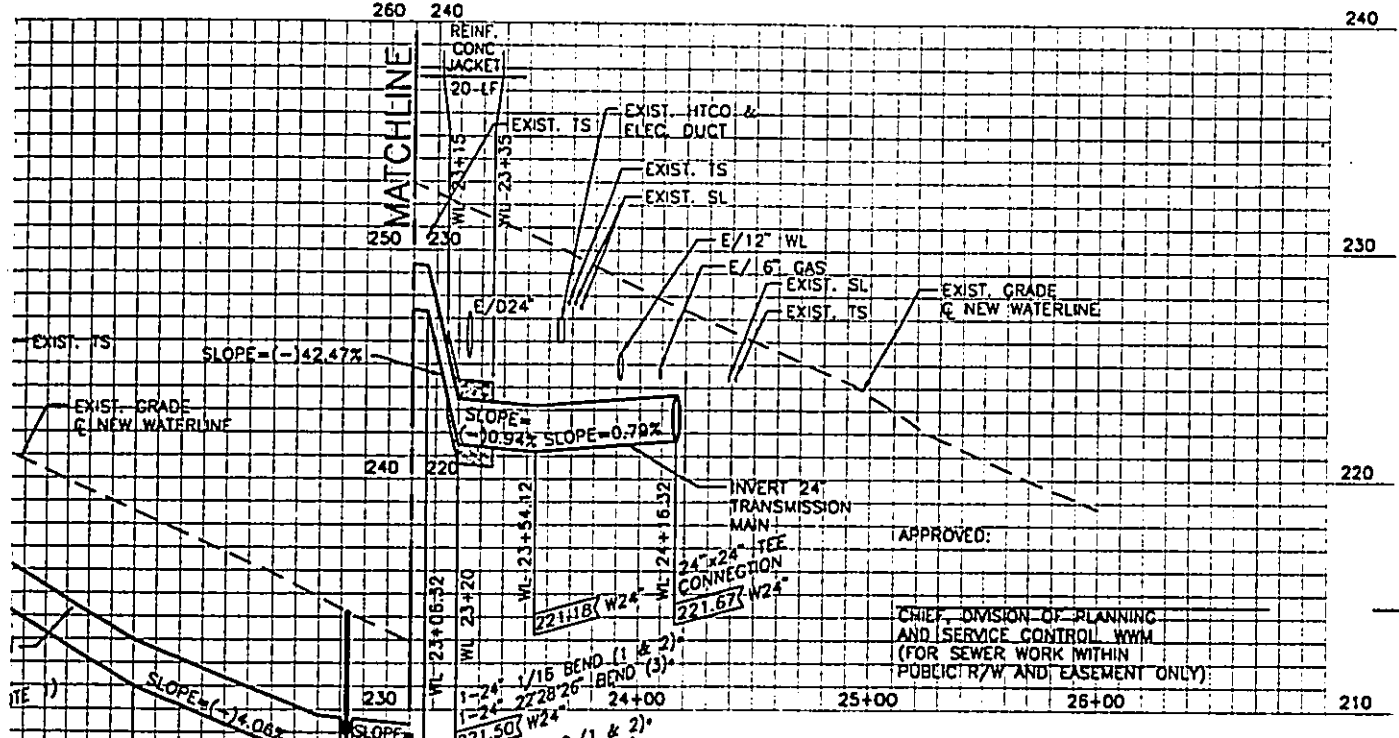
23807680 01/29/98 10:41 FINAL





- NOTES:**
1. IF THE CONTRACTOR ELECTS TO USE PVC PIPE, HE/SHE SHALL REDESIGN WATERLINE ALIGNMENT AND PROFILES WITHOUT DEFLECTIONS.
 2. MAXIMUM DEFLECTION FOR CONCRETE CYLINDER PIPE (CCP) SHALL BE 1'30\"/>

- * PIPE ALTERNATIVES**
- (1) DUCTILE IRON
 - (2) PVC
 - (3) CONCRETE CYLINDER



Prepared by:

ASSOCIATES, INC.
Engineers/Architects
341 BISHOP STREET, 21ST FLOOR
HONOLULU, HAWAII 96813
TEL: 531-2211
FAX: 531-2288

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

C-5

Signature _____

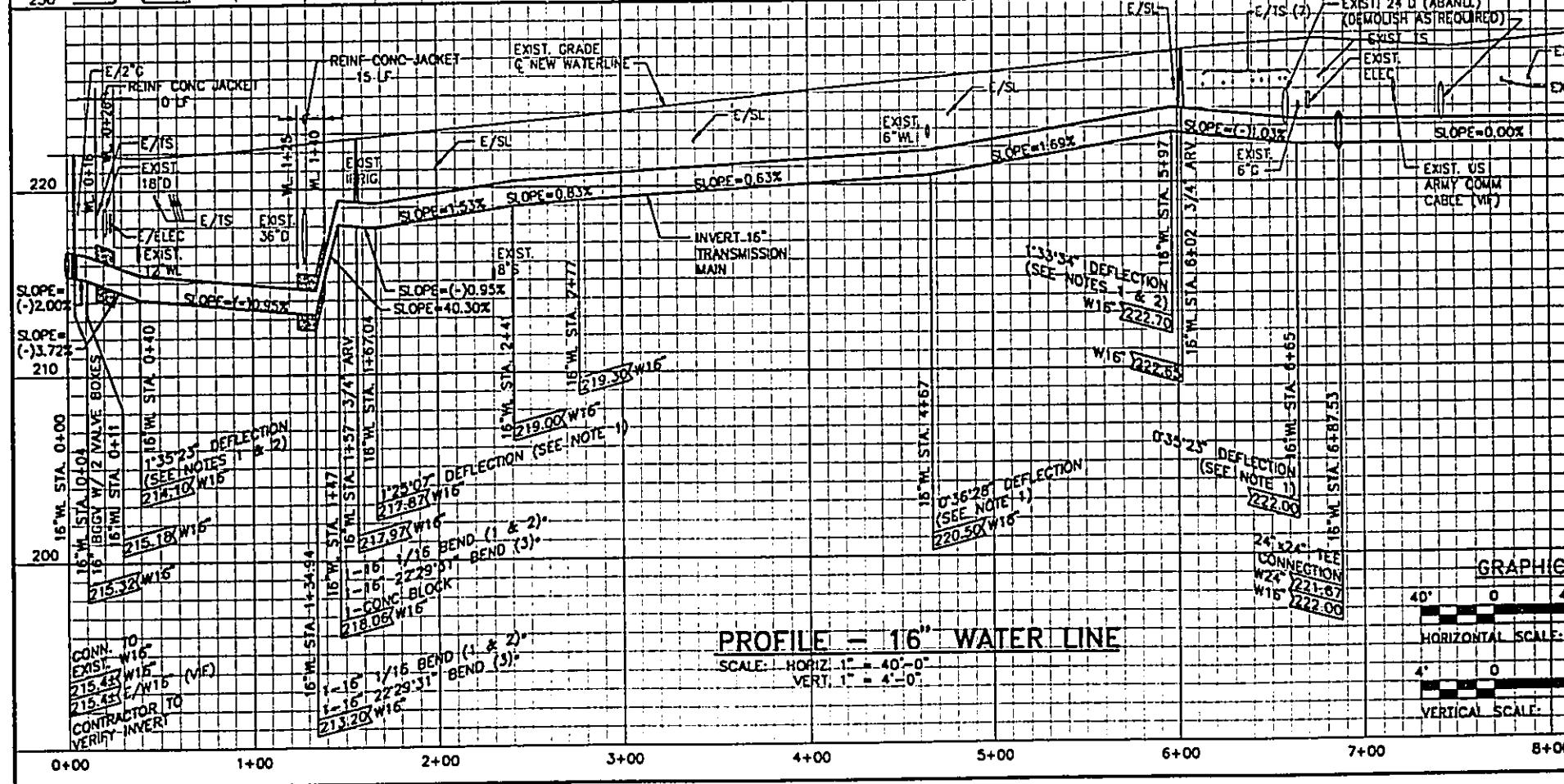
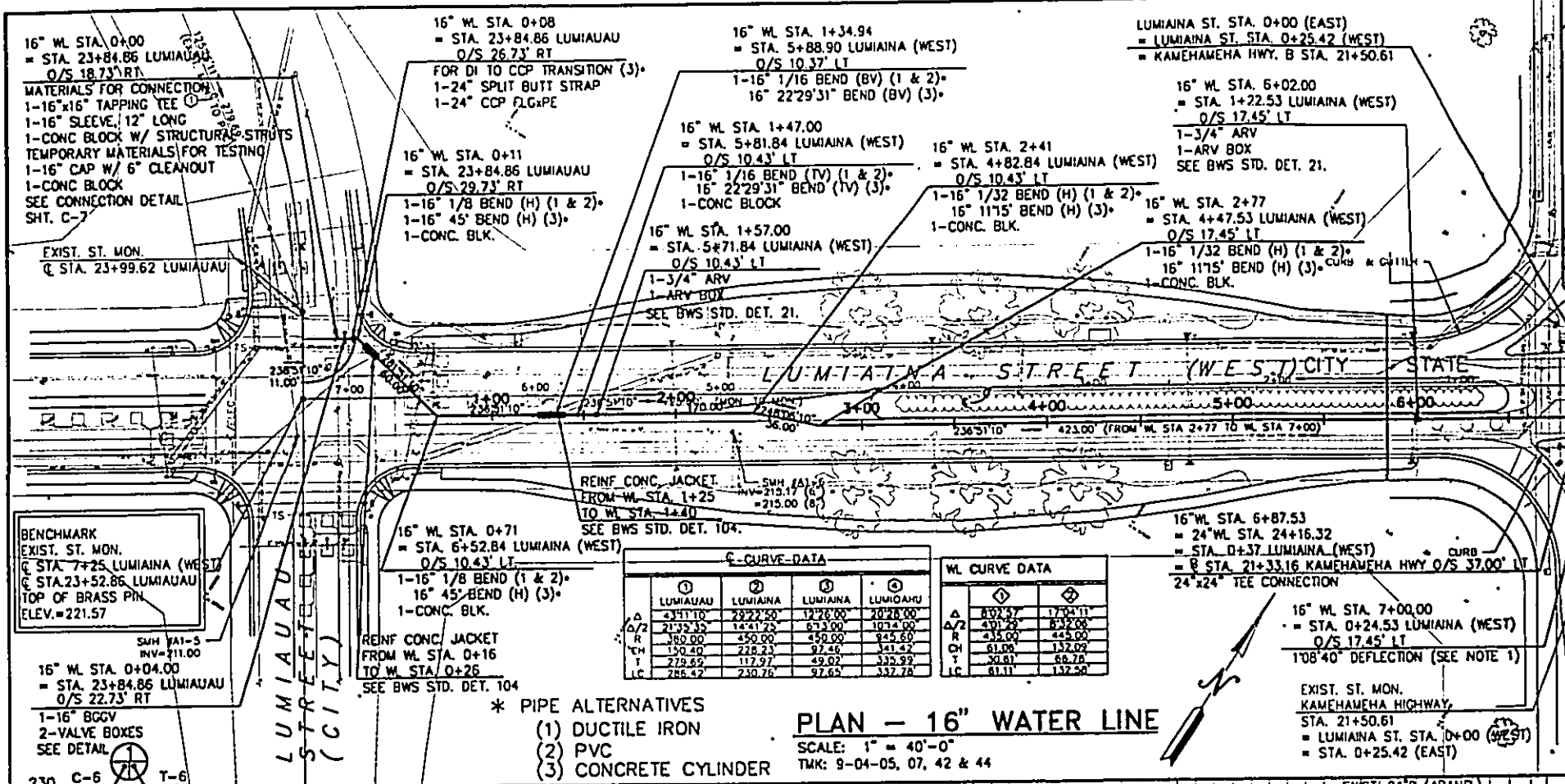
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

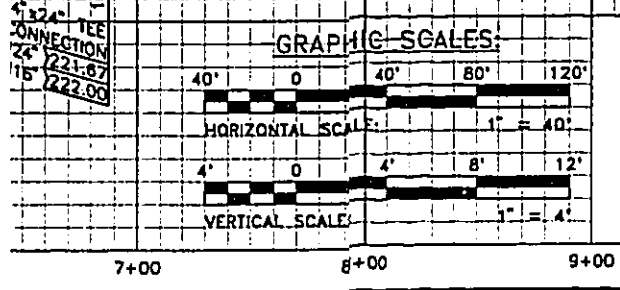
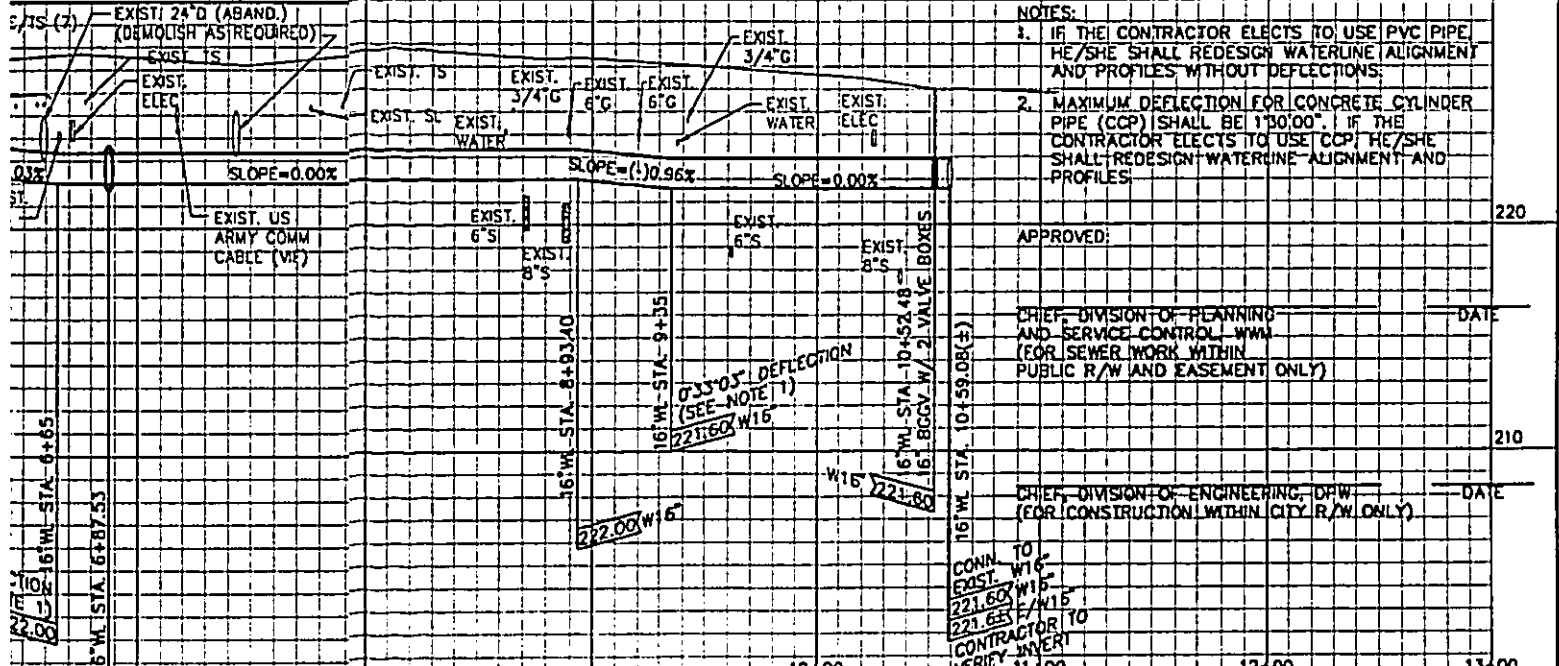
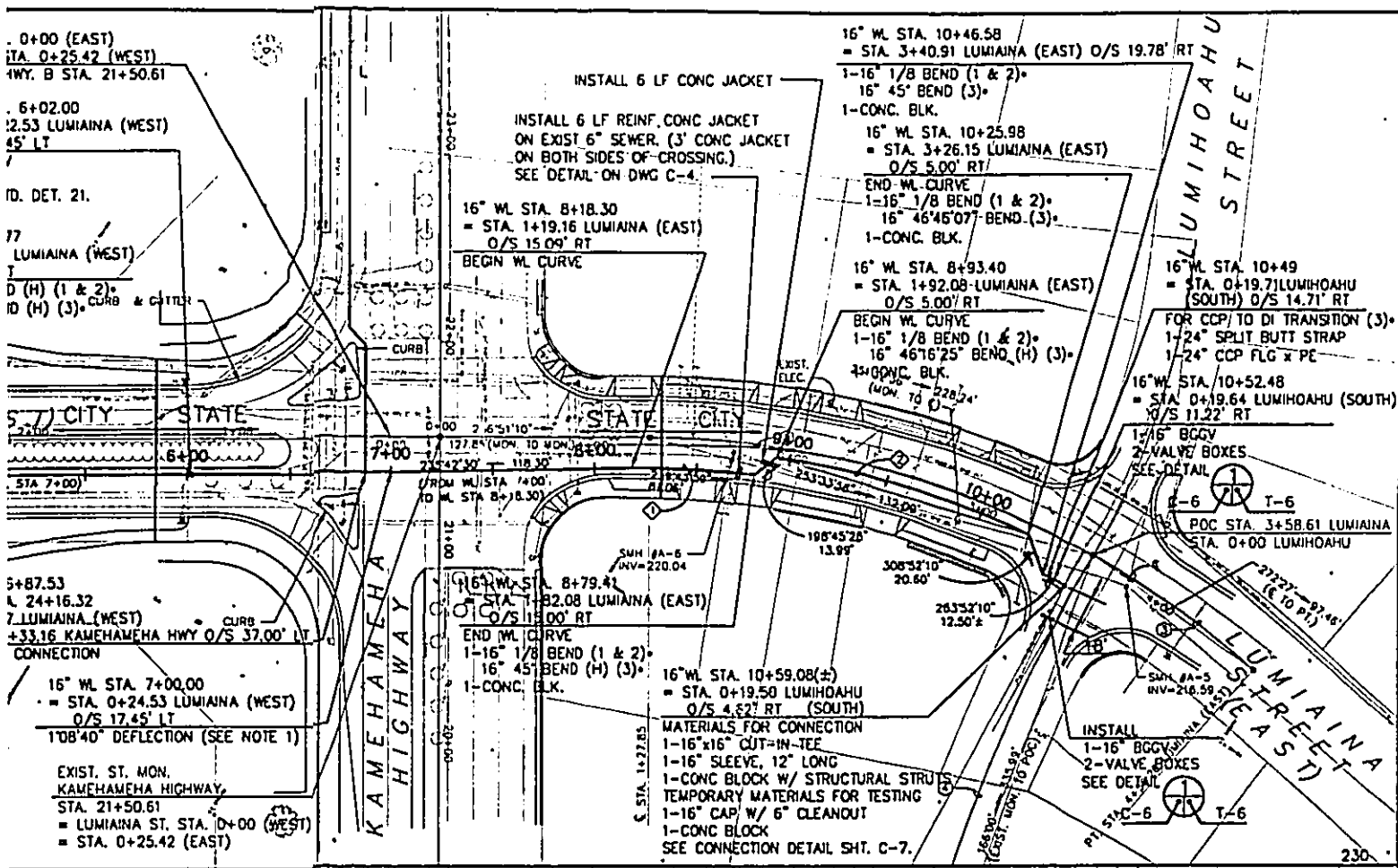
JOB 98-158B
24 INCH AND 16 INCH TRANSMISSION MAINS
ALONG KAMEHAMEHA HIGHWAY AND LUMAIINA STREET

PLAN AND PROFILE
24" W.L. STA 15+00 TO 24+16.32

APPROVED: _____ DATE: _____
CHIEF, PLANNING AND ENGINEERING DIVISION

DRAWN BY: NFP/JDC | CHECKED BY: EHS | FILE NO. _____
FIELD BOOK NO. _____ SCALE: AS NOTED | SHEET _____ OF _____ SHEETS





Prepared by:

 G.P. ASSOCIATES, INC.
 ENGINEERS/ARCHITECTS
 441 GROUP STREET, #101
 HONOLULU, HAWAII 96813
 TEL: 531-2111
 FAX: 531-2108

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature _____

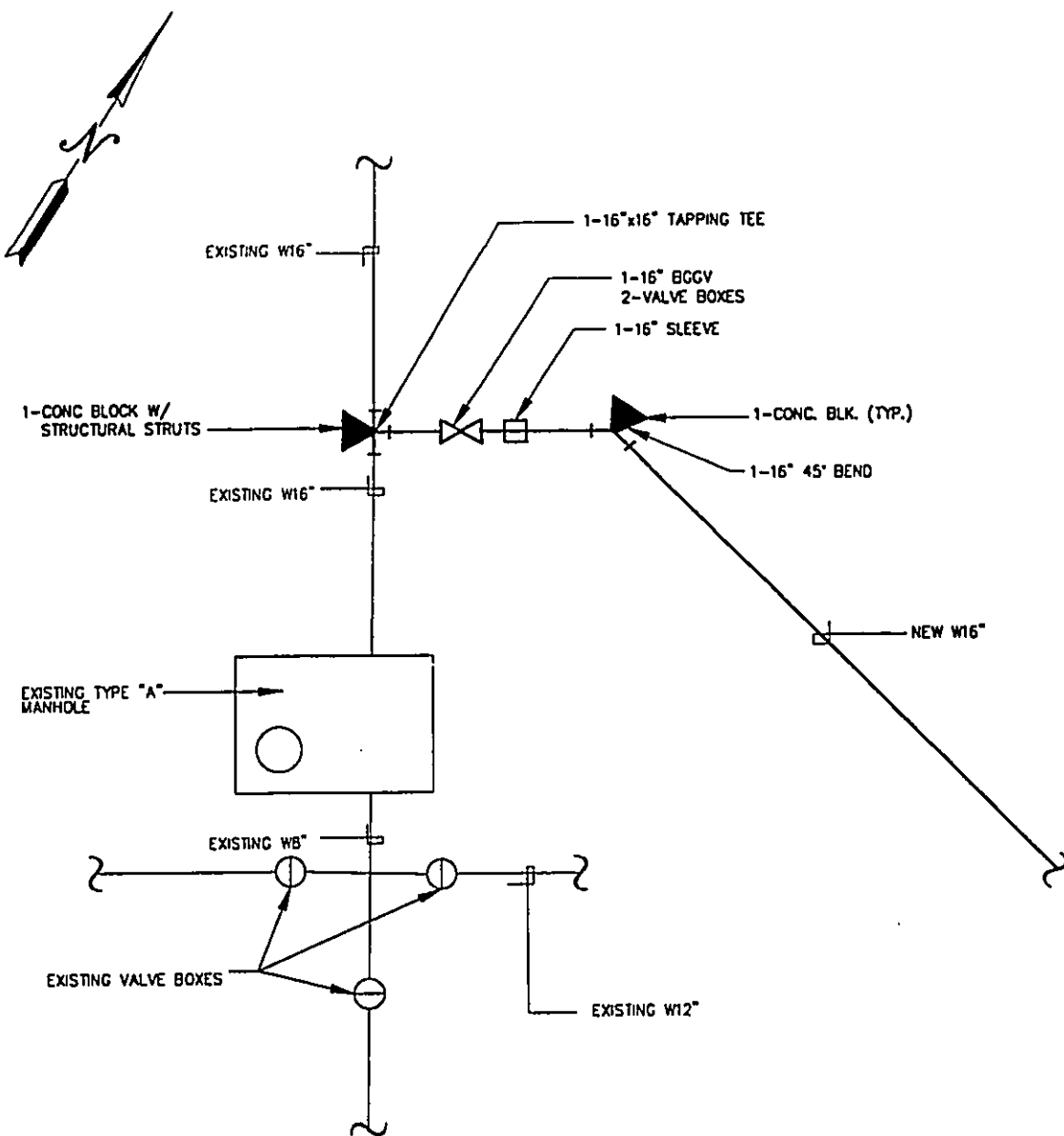
C-6

BOARD OF WATER SUPPLY
 CITY AND COUNTY OF HONOLULU
 JOB 98-158B
 24 INCH AND 16 INCH TRANSMISSION MAINS
 ALONG KAMEHAMEHA HIGHWAY AND LUMIAINA STREET
 PLAN AND PROFILE
 16" W.L. STA 0+00 TO STA 10+59.08

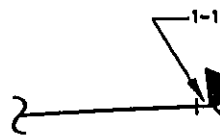
APPROVED: _____ DATE: _____
 CHIEF, PLANNING AND ENGINEERING DIVISION

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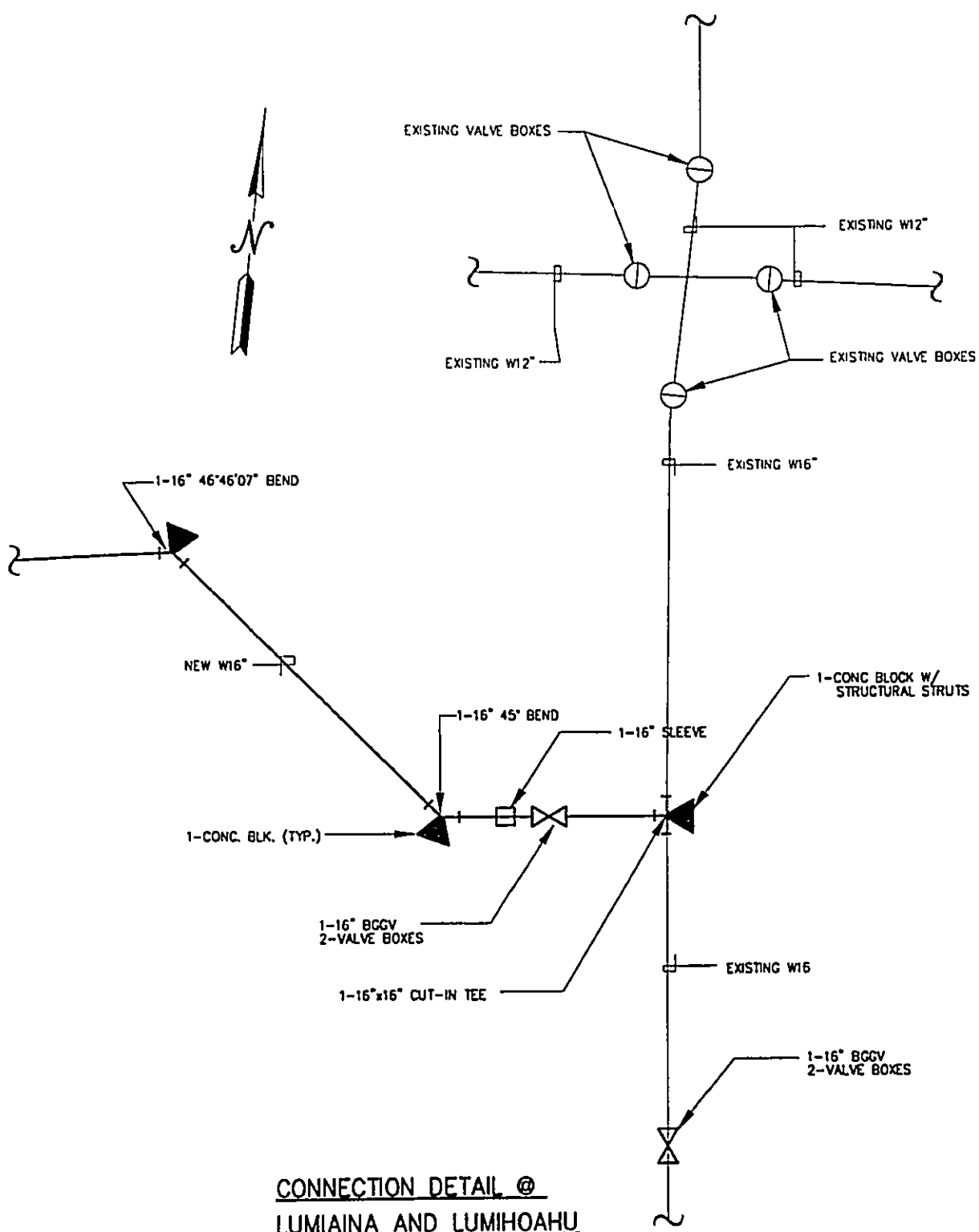
JOB NO. 2380181
 01/30/98 12:03 FINAL
 2380K181



CONNECTION DETAIL @
LUMIAINA AND LUMIAU AU
 SCALE: NONE



Job No. 2380/03



**CONNECTION DETAIL @
LUMIAINA AND LUMIHOAHU**
SCALE: NONE

Prepared by: GMP ASSOCIATES, INC. Engineers/Architects 941 KAHALA DRIVE, SUITE 2100 HONOLULU, HAWAII 96815 TEL: 832-4211 FAX: 832-4200	THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. Signature _____	BOARD OF WATER SUPPLY CITY AND COUNTY OF HONOLULU	
		JOB 98-1588 24 INCH AND 16 INCH TRANSMISSION MAINS ALONG KAMEHAMEHA HIGHWAY AND LUMIAINA STREET CONNECTION DETAILS	
C-7	APPROVED: _____ <small>CHEF, PLANNING AND ENGINEERING DIVISION</small> DATE: _____	DRAWN BY: DAD CHECKED BY: MAA FIELD BOOK NO: _____	DESIGNED BY: TAC TEL NO: _____ SCALE: AS NOTED SHEET _____ OF _____ SHEETS

2380K132 07/04/98 11:02 FINAL

APPENDIX I
AGENCY CORRESPONDENCE DURING
THE PRE-ASSESSMENT CONSULTATION PERIOD

The following agencies were contacted during the pre-assessment consultation of the draft Environmental Assessment. A (✓) indicates that a response was received from the agency.

- | | | | |
|---|--|---|--|
| | Mr. William Wong, Chief
State of Hawaii, Department of Health
Environmental Management Division
Safe Drinking Water Branch
919 Ala Moana Blvd.
Honolulu, HI 96814 | ✓ | Mr. Michael Wilson, Director
State of Hawaii
Department of Land and Natural
Resources
Office of Conservation and
Environmental Affairs
1151 Punchbowl Street, Room 131
Honolulu, HI 96813 |
| ✓ | Mr. Denis Lau, Chief
State of Hawaii, Department of Health
Environmental Management Division
Clean Water Branch
919 Ala Moana Blvd.
Honolulu, HI 96814 | ✓ | Mr. Kazu Hayashida, Director
State of Hawaii
Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, HI 96813 |
| | Mr. Patrick T. Onishi, Director
City and County of Honolulu
Department of Land Utilization
650 S. King Street, 7th Floor
Honolulu, HI 96813 | ✓ | Mr. Raymond Sato
Manager and Chief Engineer
City and County of Honolulu
Board of Water Supply
630 S. Beretania Street
Honolulu, HI 96813 |
| | Ms. Cheryl Soon, Director
City and County of Honolulu
Department of General Planning
650 S. King Street, 7th Floor
Honolulu, HI 96813 | ✓ | Mr. William Meyer
District Chief
Water Resources Division
U.S. Geological Survey
Department of the Interior
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813 |
| ✓ | Ms. Rae M. Loui, Deputy Director
State of Hawaii
Department of Land and Natural
Resources
Commision on Water Resource
Management
1151 Punchbowl Street, Room 130
Honolulu, HI 96813 | ✓ | Mr. Kenneth M. Kaneshiro
State Conservationist
U.S. Department of Agriculture
P.O. Box 50004
Honolulu, Hawaii 96850 |
| | Mr. Gary Gill, Director
Office of Environmental Quality
Control
220 S. King Street, 4th Floor
Honolulu, HI 96813 | ✓ | Mr. Gordon Matsuoka
State Public Works Engineer
Department of Accounting and General
Services
State of Hawaii
P.O. Box 119
Honolulu, Hawaii 96810 |
| ✓ | Mr. Don Hibbard, Administrator
State of Hawaii
State Historic Preservation Office
33 South King Street, 6th Floor
Honolulu, HI 96813 | | |

✓ Mr. Roy S. Oshiro, Executive Director
State of Hawaii
Department of Budget and Finance
Housing Finance and Development
Corporation
667 Queen Street, Suite 300
Honolulu, Hawaii 96813

✓ Mr. Randall K. Fujiki
Director and Building Superintendent
City and County of Honolulu
Building Department
650 South King Street, 1st Floor
Honolulu, HI 96813

✓ Mr. Kenneth Sprague
Director and Chief Engineer
City and County of Honolulu
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

✓ Mr. Charles O. Swanson, Director
City and County of Honolulu
Department of Transportation Services
650 South King Street
Honolulu, Hawaii 96813

✓ Mr. Felix Limtiaco
Director and Chief Engineer
City and County of Honolulu
Department of Wastewater Management
650 South King Street
Honolulu, Hawaii 96813

The Honorable John DeSoto
City Council
Honolulu City Council
Honolulu, Hawaii 96813

✓ The Honorable Calvin Kawamoto
Senator, Nineteenth Senatorial District
State of Hawaii
State Capitol
Honolulu, Hawaii 96813

The Honorable Roy Takumi
Representative, Thirty-Sixth
Representative District
State of Hawaii
State Capitol
Honolulu, Hawaii 96813

Waipahu Neighborhood Board No. 22
c/o Neighborhood Commission
City Hall, room 400
Honolulu, Hawaii 96813

Mr. John T. Harrison
Environmental Coordinator
University of Hawaii
Environmental Center, Crawford 317
2250 Compus Road
Honolulu, HI 96822

✓ Mr. Bill Bonnet, Manager
Hawaiian Electric Company, Inc.
Environmental Department
P.O. Box 2750
Honolulu, Hawaii 96840

✓ Ms. Esther Ueda, Executive Officer
Hawaii State Land Use Commission
335 Merchant Street, Room 104
Honolulu, Hawaii 96813

Ms. Kathleen Dadey
U.S. Army Engineer District, Honolulu
CEPOD-CO-OR
Fort Shafter, Hawaii 96858-5440

SAMPLE REQUEST FOR REVIEW LETTER
AND LIST OF AGENCIES CONTACTED



ASSOCIATES, INC.

February 6, 1996

Engineers/Architects

Mr. William Wong, Chief
State of Hawaii, Department of Health
Environmental Management Division
Safe Drinking Water Branch
919 Ala Moana Blvd.
Honolulu, HI 96814

Re: Request for Project Review
Waipahu Wells III Station

Dear Mr. Wong:

GMP Associates, Inc. is currently preparing a revised Draft Environmental Assessment (DEA) for the above subject project. We are enclosing a project description, location map, and site map to clarify the scope of this project.

The Waipahu Wells III project has been through the Environmental Review Process once before in the first quarter of 1995. However, due to some changes to the scope of work, the project must undergo the Environmental Review Process for a second time. The following specific changes have been made to the scope:

1. The 100,000-gallon overflow reservoir has been omitted from the project;
2. Approximately 2,400 feet of 24-inch transmission main along Kamehameha Highway, from Lumiaina Street to the existing 42-inch main above the H-1 freeway, has also been omitted;
3. The well system will now service the Waikele-Waipio 395' system; and
4. Approximately 1,000 feet of new 16-inch transmission main will be added along Lumiaina Street, between Lumiauau Street and Lumihohu Street. The new 16-inch main should connect the Kamehameha Highway 24-inch main from Waipahu Wells III with the existing 16-inch main at Lumiauau Street, and the existing 16-inch main at Lumihohu Street.

Please send your comments to us by February 16, 1996, to be included in the DEA. Otherwise, you will have another opportunity to comment on the project during the 30-day comment period following the publication of the DEA in the OEQC Bulletin.

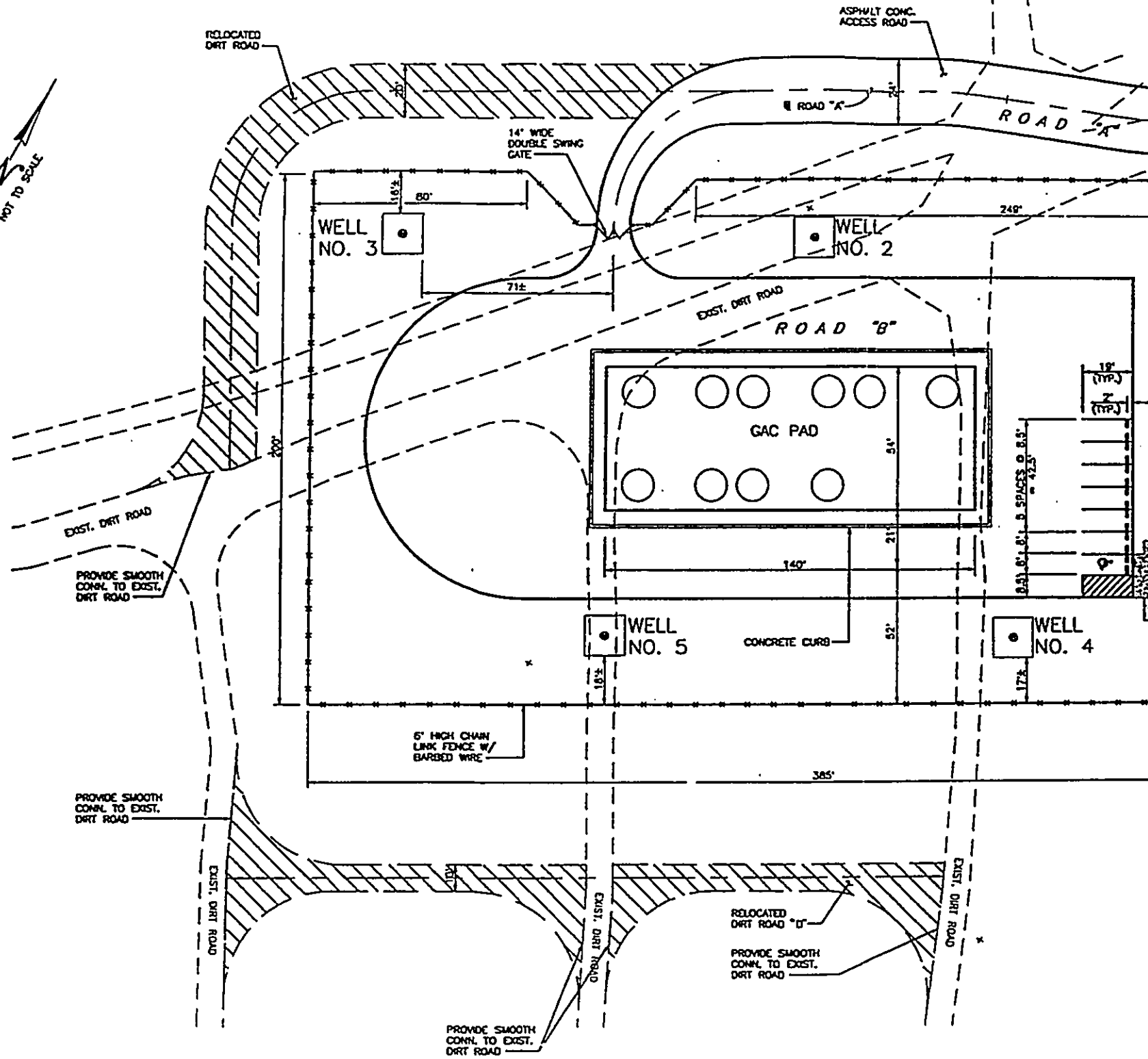
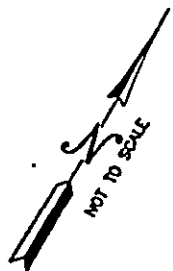
Thank you for your time and attention.

Sincerely,
GMP ASSOCIATES, INC.


Michael M. Miyahira, P.E.
Environmental Services Department

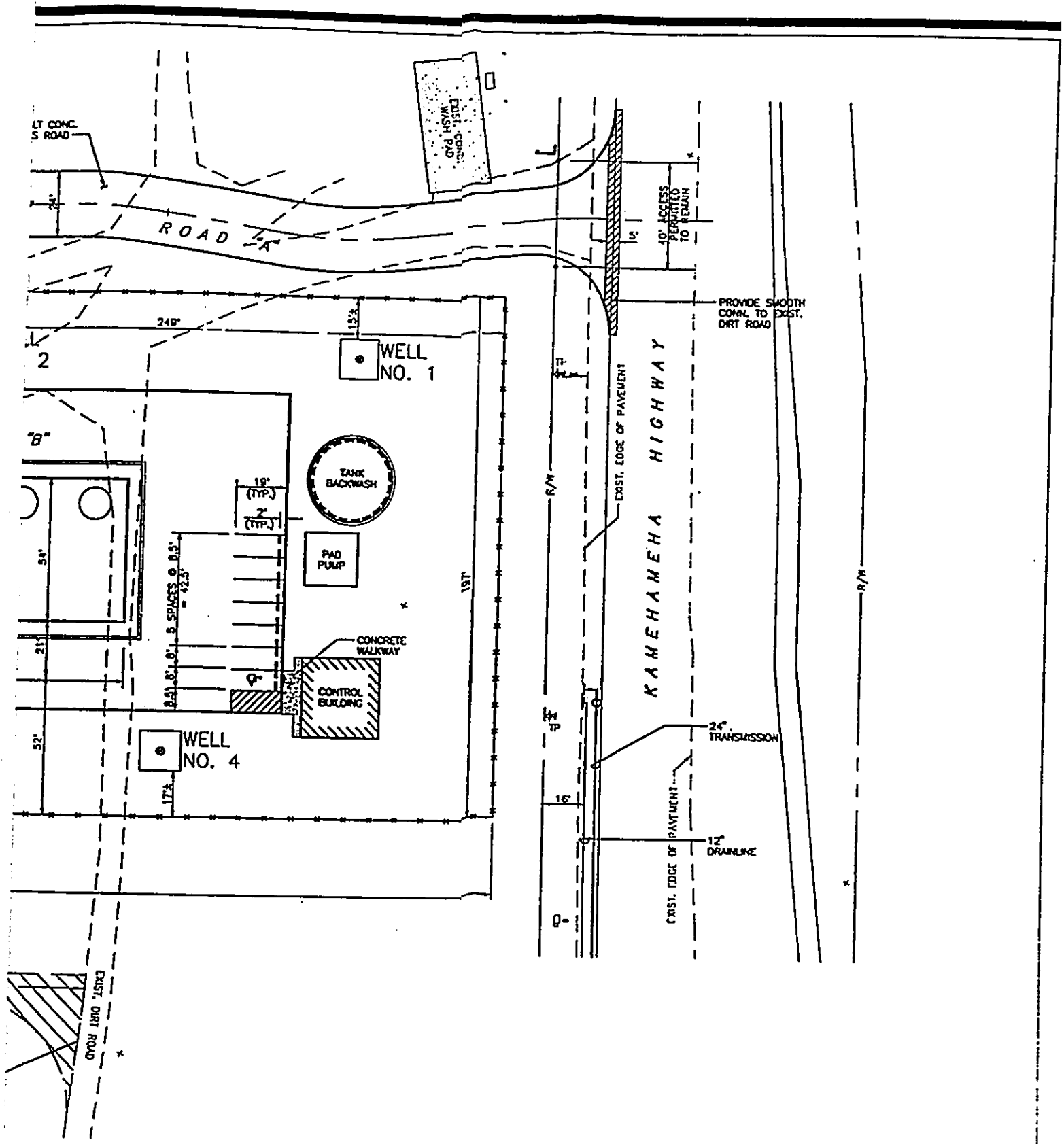
cc: OEQC

Attachments

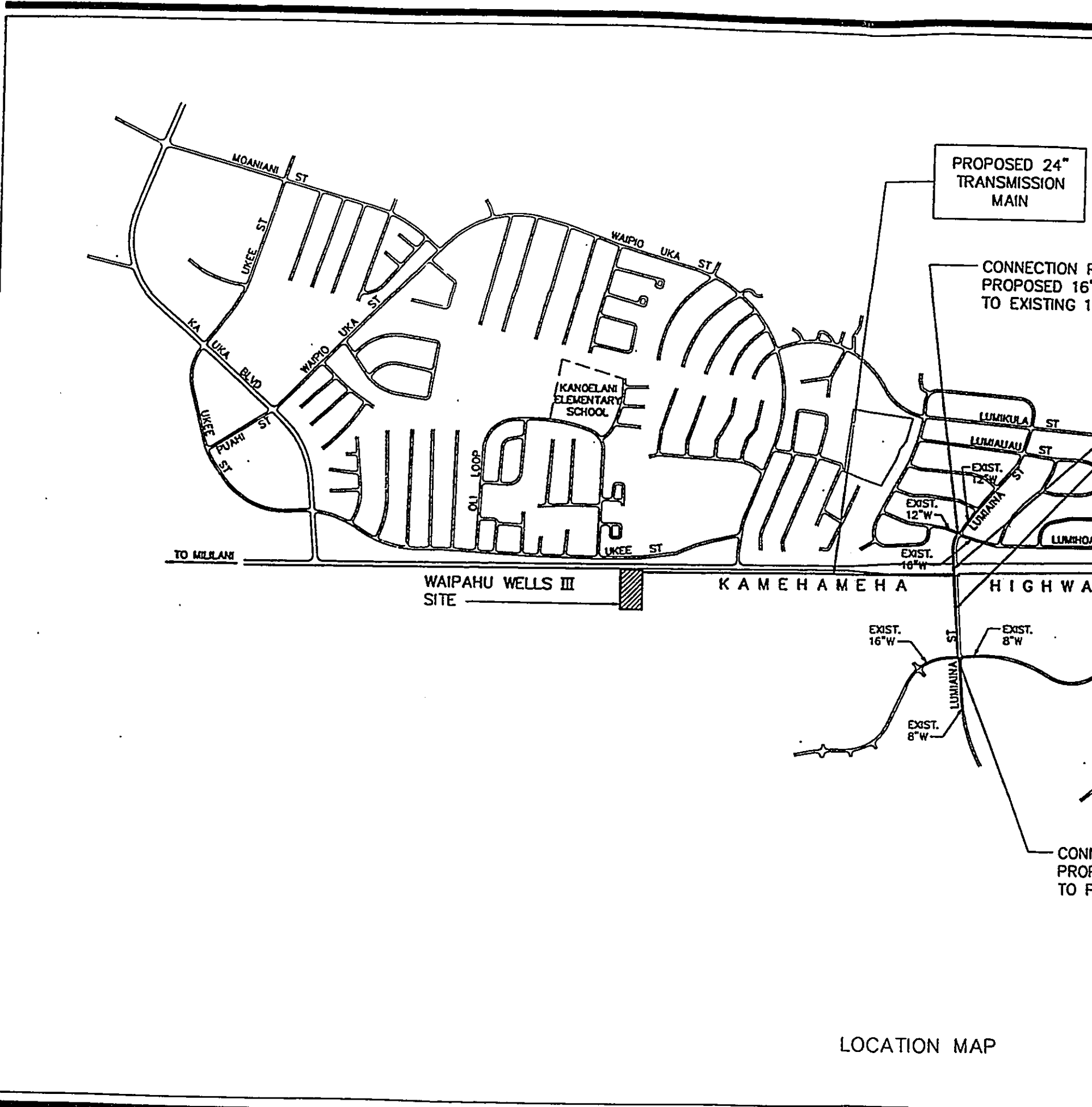


SITE PLAN

SC2380AD



SITE PLAN



PROPOSED 24"
TRANSMISSION
MAIN

CONNECTION FROM
PROPOSED 16"
TO EXISTING 16"

TO MILANI

WAIPAHU WELLS III
SITE

KAMEHAMEHA HIGHWAY

EXIST. 16"W

EXIST. 8"W

EXIST. 8"W

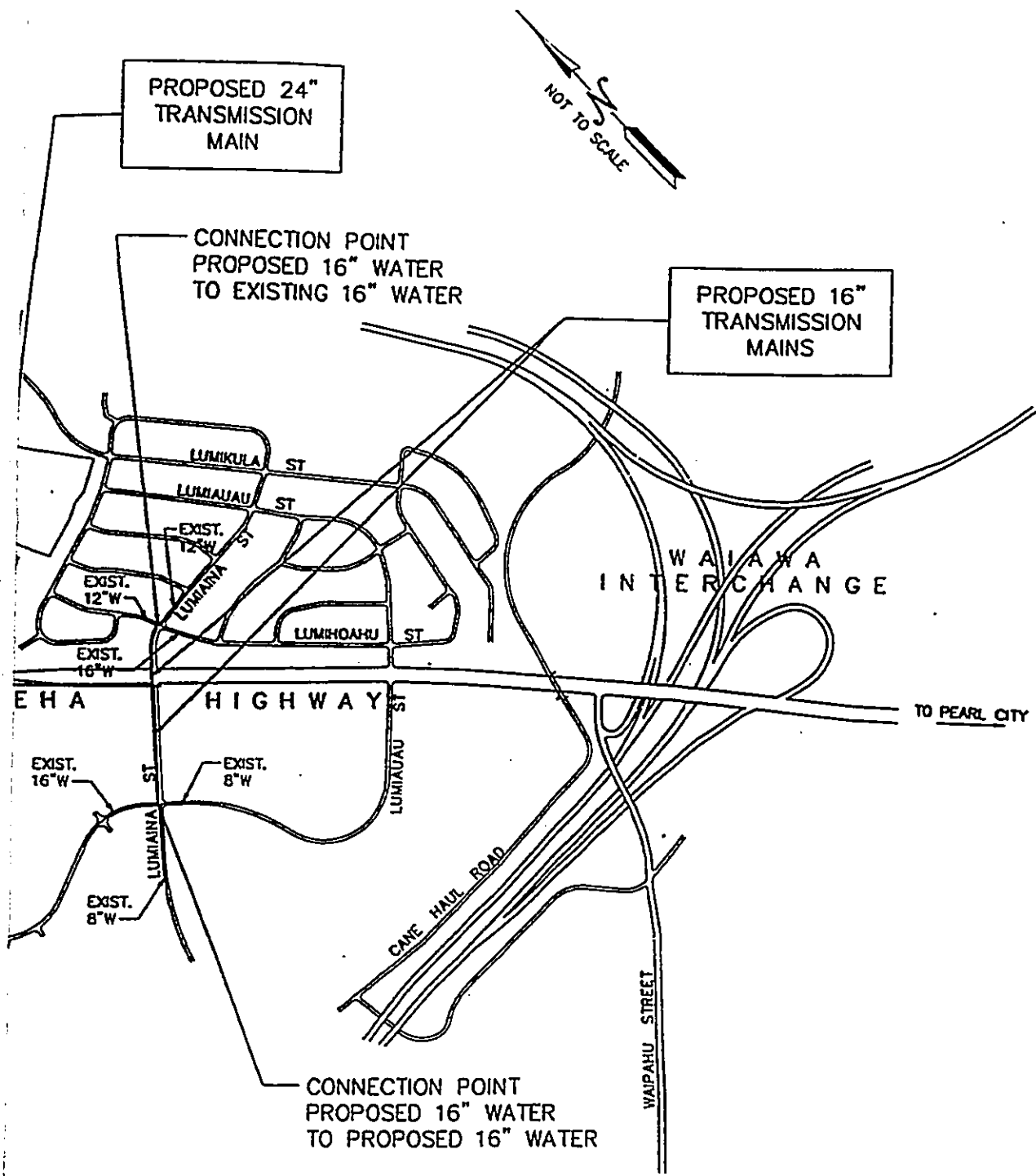
EXIST. 12"W

EXIST. 12"W

EXIST. 16"W

LOCATION MAP

SC2380AC



LOCATION MAP

INCOMING CORRESPONDENCE

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



LAWRENCE MIIKE
DIRECTOR OF HEALTH

96 MAR 8 11 09 AM '96
STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801

In reply, please refer to:

February 29, 1996

96-022/epo

Mr. Michael M. Miyahira, P.E.
Environmental Services Department
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Pre-Consultation
Waipahu Wells III Station
One (1) Mile North of the Waiawa Interchange
Oahu
TMK: 9-4-05: 74

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

Water Pollution

A National Pollutant Discharge Elimination System (NPDES) permit is required for any discharge to waters of the State including the following:

1. Storm water discharges relating to construction activities for projects equal to or greater than five acres;
2. Storm water discharges from industrial activities;
3. Construction dewatering activities;
4. Cooling water discharges less than one million gallons;
5. Ground water remediation activities; and
6. Hydrotesting water.

Any person wishing to be covered by the NPDES general permit for any of the above activities should file a Notice of Intent with the Department's Clean Water Branch at least 90 days prior to commencement of any discharge to waters of the State.

Mr. Michael M. Miyahira
February 29, 1996
Page 2

Any questions regarding this matter should be directed to
Mr. Denis Lau of the Clean Water Branch at 586-4309.

Sincerely,



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

c: CWB

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P. O. BOX 621
HONOLULU, HAWAII 96809

MICHAEL D. WILSON
CHAIRPERSON

ROBERT G. GIRALD
DAVID A. NOBRIGA
LAWRENCE H. MIKE
RICHARD H. COX
HERBERT M. RICHARDS, JR.

RAE M. LOUI, P.E.
DEPUTY

FEB 21 1996

Mr. Michael M. Miyahira, P.E.
GMP Associates, Inc.
841 Bishop St.
Honolulu, HI 96813

Dear Mr. Miyahira:

SUBJECT: DEA Waipahu Wells III Station, Response to Feb. 6, 1996 Letter

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 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 a Pump Installation Permit from the CWRM 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 CWRM would be required prior to use of this source.
- [] Groundwater withdrawals from this project may affect streamflows. This 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 diverts additional water from streams or if new or modified stream diversions are planned, the project may need to obtain a stream diversion works permit and petition to amend the interim instream flow standard for the affected stream(s).
- [] Based on the information provided, it appears that a Stream Channel Alteration Permit pursuant to Section 13-169-50, HAR will be required before the project can be implemented.
- [] Based on the information provided, it does not appear that a Stream Channel Alteration Permit pursuant to Section 13-169-50, HAR will be required before the project can be implemented.
- [] An amendment to the instream flow standard from the CWRM would be required before any streamwater is diverted.
- [] Any new development that is permitted along a stream that is not yet channelized should be based on the express condition that no streams will be channelized to prevent flooding of the development. Development in the open floodplain should not be allowed; other economic uses of the floodplain should be encouraged.

[X] OTHER:

The DHHL has earmarked 0.143 million gallons per day (mgd) to come from this well for their projects and currently has an interim water use permit for this amount from this source. The BWS has a pending water use permit application request for 3.0 mgd.

If there are any questions, please contact Roy Hardy at 587-0274.

Sincerely,

RAE M. LOUI
Deputy Director

RH:ss

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P. O. BOX 621
HONOLULU, HAWAII 96809

MICHAEL D. WILSON
CHAIRPERSON
ROBERT G. GIRALD
DAVID A. NOBRIGA
LAWRENCE H. MIKE
RICHARD H. COX
HERBERT M. RICHARDS, JR.
RAE M. LOUI, P.E.
DEPUTY

MAR 22 1996

Mr. Michael M. Miyahira
Environmental Services Department
GMP Associates, Inc.
841 Bishop St., Suite 1501
Honolulu, HI 96813

Dear Mr. Miyahira:

Request for Project Review of
Revised Draft Environmental Assessment for
Waipahu Wells III Station

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 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 a Pump Installation Permit from the CWRM 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 CWRM would be required prior to use of this source.
- [] Groundwater withdrawals from this project may affect streamflows. This 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 diverts additional water from streams or if new or modified stream diversions are planned, the project may need to obtain a stream diversion works permit and petition to amend the interim instream flow standard for the affected stream(s).
- [] Based on the information provided, it appears that a Stream Channel Alteration Permit pursuant to Section 13-169-50, HAR will be required before the project can be implemented.
- [] Based on the information provided, it does not appear that a Stream Channel Alteration Permit pursuant to Section 13-169-50, HAK will be required before the project can be implemented.
- [] An amendment to the instream flow standard from the CWRM would be required before any streamwater is diverted.
- [] Any new development that is permitted along a stream that is not yet channelized should be based on the express condition that no streams will be channelized to prevent flooding of the development. Development in the open floodplain should not be allowed; other economic uses of the floodplain should be encouraged.

[X] OTHER:

The Commission issued a well construction/pump installation permit to Honolulu Board of Water Supply (BWS) on December 29, 1993. Our records show that the well construction and pump installation work has been completed. In their application for these permits, BWS did not disclose the status of the Chapter 343 process.

A water use permit was approved for this source on October 19, 1994 for 0.144 mgd for Department of Hawaiian Homelands needs at Princess Kahanu Estates.

From the described changes in the scope of the work, it does not appear that new permits from the Commission are required.

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

Sincerely,

RAE M. LOUI
Deputy Director

ENJAMIN J. CAYLANO
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY
GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT
PROGRAM

AQUATIC RESOURCES
CONSERVATION AND
ENVIRONMENTAL AFFAIRS

CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES

FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

February 22, 1996

Michael M. Miyahira, P. E.
Environmental Engineer
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

LOG NO: 16488 ✓
DOC NO: 9602EJ25

Dear Mr. Miyahira:

SUBJECT: Revised Draft Environmental Assessment (DEA) for the
Waipahu Wells III Station
Waipi'o, 'Ewa, O'ahu
TMK: 9-4-05:074

Thank you for the opportunity to review the revised DEA for the Waipahu Wells III Station. A review of our records shows that there are no known historic sites at the revised project location. These lands were commercially cultivated for many years where it is unlikely that historic sites will be found. Therefore, we believe that this project will have "no effect" on historic sites.

Aloha,

A handwritten signature in black ink, appearing to read "Don Hibbard".

Don Hibbard, Administrator and
Historic Preservation Officer

EJ:smf

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621
HONOLULU, HAWAII 96809

MICHAEL D. WILSON
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
DEPUTY
GILBERT S. COLOMA-AGARAN

AQUACULTURE DEVELOPMENT
PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND
ENVIRONMENTAL AFFAIRS
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT
WATER RESOURCE MANAGEMENT

COPIES 15 MAR 9 45

REF: EAGMPWIII.RCOM

MAR 13 1996

LM-NV

Michael M. Miyahira P.E.
Environmental Service Department
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

SUBJECT: REVISED DRAFT ENVIRONMENTAL ASSESSMENT, WAIPAHU WELL III
STATION PROJECT, ISLAND OF OAHU, Hawaii.

We have received your transmittal and materials relevant to the subject Draft Environmental Assessment.

The information that you have forwarded to us was distributed to our divisions for their review and comments. As a result of the action, the following comments were received by our Division of Land Management:

1. Forestry and Wildlife:

"No Comments"

2. State Parks:

"No Comments"

3. Aquatic Resources:

"No Comments"

4. Boating and Ocean Recreation:

"No Comments"

5. Historic Preservation:

" A review of our records shows that there are no known historic sites at the revised project location. These lands were commercially cultivated for many years where it is unlikely that historic sites will be found. Therefore, we believe that the project will have NO EFFECT on historic sites."

The Department of Land and Natural Resources has no other comments on the proposed Waipahu Well III Station. However, we do request that the applicant, its agents, contractors, sub-contractors, obtain all applicable Federal, State and County licenses and permits prior to the commencement of the construction work.

We appreciate the opportunity to review the revised draft environment assessment for the proposed project.

Should you or your staff have any questions pertaining to this Department's comments, please feel free to contact Mr. Nicholas A. Vaccaro of the Land Division at 587-0438.

Aloha,

Michael D. Wilson
for MICHAEL D. WILSON

Attachment (s)

C: Michael H. Nekoba
Colbert M. Matsumoto
Oahu District Land Office

BENJAMIN J. CAYETANO
GOVERNOR



KAZU HAYASHIDA
DIRECTOR
DEPUTY DIRECTORS
JERRY M. MATSUDA
GLENN M. OKIMOTO

RECEIVED
STATE OF HAWAII
96 FEB 15 11:00 AM '96
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
STP 8.7224

February 13, 1996

Mr. Michael M. Miyahira
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Revised Draft Environmental Assessment (DEA)
Waipahu Wells III Station

Thank you for your letter dated February 6, 1996.

The proposed development, as revised is not anticipated to have a significant impact on our State transportation facilities.

Please coordinate the implementation of the development with our Highways Division. Plans for any construction work within the State highway right-of-way must be submitted for our review and approval.

We appreciate the opportunity to provide comments.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Kazu Hayashida".

KAZU HAYASHIDA
Director of Transportation

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843

PHONE (808) 527-6180

FAX (808) 533-2714



February 21, 1996 HHI 13 15

JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman

MAURICE H. YAMASATO, Vice Chairman

KAZU HAYASHIDA

MELISSA Y.J. LUM

FORREST C. MURPHY

KENNETH E. SPRAGUE

BARBARA KIM STANTON

RAYMOND H. SATO

Manager and Chief Engineer

Mr. Michael M. Miyahira, P.E.
Environmental Services Department
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Your Letter of February 6, 1996 Regarding the Revised Draft Environmental Assessment (DEA) for the Waipahu Wells III Station

Thank you for your letter regarding the revised DEA for the Board of Water Supply's proposed Waipahu Wells III project.

We have the following comments regarding the revisions to the DEA:

1. The 100,000 gallon overflow reservoir has been deleted from the project's scope.
2. The estimated 2,400 feet of 24-inch transmission main along Kamehameha Highway from Lumiaina Street to the existing 42-inch main above the H-1 Freeway has been deferred at this time but should be kept in the EA as a future project.
3. The Ewa/Waipahu and Honolulu district to the Waikele-Waipio 395-foot system should be included as service areas from the Waipahu Wells III project.
4. The estimated 1,000 feet of new 16-inch transmission main will be added along Lumiaina Street between Lumiauau Street and Lumihoahu Street. The EA should include the 24-inch main from Waipahu Wells II along Lumiaina Street and Paiwa Street to the 36-inch main along H-1 Freeway.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

February 9, 1996

RECEIVED
FEB 13 11 11 AM '96

Mr. Michael M. Miyahira
Environmental Services Department
GMP Associates, Inc.
841 Bishop St., Suite 501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Draft Environmental Assessment
Waipahu Wells III Station

The staff of the U.S. Geological Survey, Water Resources Division, Hawaii District, has reviewed the Draft Environmental Assessment, and we have no comments to offer at this time.

Thank you for allowing us to review the DEA.

Sincerely,

William Meyer
District Chief

Enc.



United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P. O. Box 50004
Honolulu, HI
96850-0001

30 MAR 13 11 09 41

March 11, 1996

Mr. Michael M. Miyahara, P.E.
GMP Associates, Inc.
Environmental Services Department
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Draft Environmental Assessment (DEA) - Waipahu Wells III Station,
Waipahu, Hawaii

We have reviewed the above-mentioned document and have no comments to offer at this time.
We thank you for the opportunity to review this document.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

cc:

Mr. Gary Gill, Director, Office of Environmental Quality Control, Central Pacific Plaza,
220 S. King Street, 4th Floor, Honolulu, HI 96813

The Natural Resources Conservation Service
formerly the Soil Conservation Service, works
hand-in-hand with the American people to
conserve natural resources on private lands.

AN EQUAL OPPORTUNITY EMPLOYER

BENJAMIN J. CAYETANO
GOVERNOR



SAM CALLEJO
COMPTROLLER

MARY PATRICIA WATERHOUSE
DEPUTY COMPTROLLER

STATE OF HAWAII

96 FEB 22 PM 3 03 DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 110, HONOLULU, HAWAII 96810

LETTER NO. (P) 1123.6

Kai / Alin

FEB 20 1996

GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Gentlemen:

Subject: Waipahu Wells III Station
Waipahu, Hawaii
Draft Environmental Assessment

Thank you for the opportunity to review the subject document. We have no comments to offer.

If there are any questions, please have your staff contact Mr. Ralph Yukumoto of the Planning Branch at 586-0488.

Very truly yours,

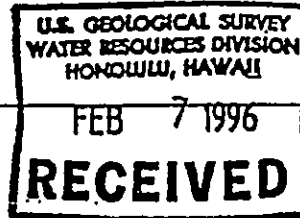
Gordon Matsuoka
GORDON MATSUOKA
State Public Works Engineer

RY:jk



ASSOCIATES, INC.

February 6, 1996



Engineers/Architects

Mr. William Meyer
District Chief
Water Resources Division
U.S. Geological Survey
Department of the Interior
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813

Re: Request for Project Review
Waipahu Wells III Station

Dear Mr. Meyer:

GMP Associates, Inc. is currently preparing a revised Draft Environmental Assessment (DEA) for the above subject project. We are enclosing a project description, location map, and site map to clarify the scope of this project.


The Waipahu Wells III project has been through the Environmental Review Process once before in the first quarter of 1995. However, due to some changes to the scope of work, the project must undergo the Environmental Review Process for a second time. The following specific changes have been made to the scope:

1. The 100,000-gallon overflow reservoir has been omitted from the project;
2. Approximately 2,400 feet of 24-inch transmission main along Kamehameha Highway, from Lumaiaina Street to the existing 42-inch main above the H-1 freeway, has also been omitted;
3. The well system will now service the Waikele-Waipio 395' system; and
4. Approximately 1,000 feet of new 16-inch transmission main will be added along Lumaiaina Street, between Lumiauau Street and Lumihoahu Street. The new 16-inch main should connect the Kamehameha Highway 24-inch main from Waipahu Wells III with the existing 16-inch main at Lumiauau Street, and the existing 16-inch main at Lumihoahu Street.

Please send your comments to us by February 16, 1996, to be included in the DEA. Otherwise, you will have another opportunity to comment on the project during the 30-day comment period following the publication of the DEA in the OEQC Bulletin.

Thank you for your time and attention.

Sincerely,
GMP ASSOCIATES, INC.



Michael M. Miyajima, P.E.
Environmental Services Department

cc: OEQC
Attachments

BENJAMIN J. CAYETANO
GOVERNOR



ROY S. OSHIRO
EXECUTIVE DIRECTOR

RECEIVED
GMP ASSOCIATES, INC.

'96 FEB 15 AM 9

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
FAX (808) 587-0600

IN REPLY REFER TO:

96:DEV/602

February 13, 1996

Mr. Michael M. Miyahira, P.E.
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Waipahu Wells III Station
Request for Project Review

The Housing Finance and Development Corporation acknowledges receipt of your February 6, 1996 letter regarding the subject project. We have reviewed the project description, location map, and site map which were enclosed with your letter and have no comment at this time.

We certainly appreciate the opportunity to comment.

Sincerely,

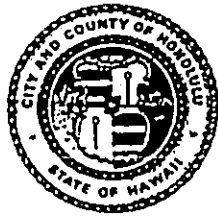
A handwritten signature in black ink, appearing to read "Roy S. Oshiro".

ROY S. OSHIRO
Executive Director



BUILDING DEPARTMENT
CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



RANDALL K. FUJIKI
DIRECTOR AND BUILDING SUPERINTENDENT

ISIDRO M. BAQUILAR
DEPUTY DIRECTOR AND BUILDING SUPERINTENDENT

PB 96-100

February 14, 1996

GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Attention: Michael M. Miyahira, P. E.

Gentlemen:

Subject: Revised Draft Environmental Assessment (DEA)
Waipahu Wells III Station

This is in response to your request to review the above subject matter.

We have no comments to offer. Thank you for the opportunity to review the document.

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

Very truly yours,

A handwritten signature in black ink, appearing to read "Randall K. Fujiki", is written over the typed name.

RANDALL K. FUJIKI
Director and Building Superintendent

cc: G. Tamashiro

JEREMY HARRIS,
MAYOR

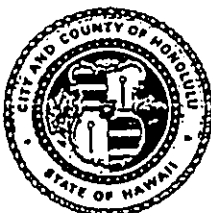
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DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 11TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4341 • FAX: (808) 527-5857

JEREMY HARRIS
MAYOR

36 Mar 7 1996 2 26



KENNETH E. SPRAGUE
DIRECTOR AND CHIEF ENGINEER

DARWIN J. HAMAMOTO
DEPUTY DIRECTOR

ENV 96-033

March 5, 1996

Mr. Michael M. Miyahira, P.E.
Environmental Services Department
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Pre-Draft Environmental Assessment (PEA)
Waipahu Wells III Station
TMK: 9-4-05:74

We have reviewed the subject PEA and have the following comments:

1. There is an existing drainline on Lumiaina Street.
2. The proposed project is located in Flood Zone "D".
3. Frontage improvements may be required.
4. The DEA should address best management practices (BMPs) for hydrotesting disinfection of lines, disposal of GAC effluent.

Should you have any questions, please contact Mr. Alex Ho,
Environmental Engineer, at 523-4150.

Very truly yours,

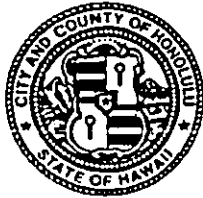

for KENNETH E. SPRAGUE
Director and Chief Engineer

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA
711 KAPIOLANI BOULEVARD, SUITE 1200
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

RECEIVED
GMP ASSOCIATES, INC.
'96 FEB 20 AM 8 38



CHARLES O. SWANSON
DIRECTOR

2/96-00667R

February 16, 1996

Mr. Michael M. Miyahira, P.E.
Environmental Services Department
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:


Subject: Waipahu Wells III Station

In response to your request for project review dated February 6, 1996, we have the following comments to offer:

1. Construction plans, including a traffic control plan, for all work within the City's right-of-way should be submitted to this department for review and approval.
2. The scheduling of this project should be coordinated with other agencies to avoid having roadwork occur on streets in close proximity at the same time.

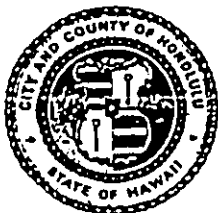
Should you have any questions regarding these comments, please contact Faith Miyamoto of the Transportation Systems Planning Division at 527-6976.

Respectfully,

for 
CHARLES O. SWANSON
Director

DEPARTMENT OF WASTEWATER MANAGEMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



JEREMY HARRIS
MAYOR

FELIX B. LIMTIACO
DIRECTOR

CHERYL K. OKUMA-SEPE
DEPUTY DIRECTOR

In reply refer to:
WCC 96-22

February 13, 1996

Mr. Michael M. Miyahira, P. E.
Environmental Services Department
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Revised Draft Environmental Assessment
Waipahu Wells III Station
TMK: 9-4-5: 74

We have no objection to the Waipahu Wells III Station and the necessary transmission mains. Please contact our department to locate existing sewers in the area during the design and construction of this project.

If you have any questions, please contact Ms. Tessa Yuen of the Service Control Branch at 523-4956.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Cheryl K. Okuma-Sepe".

A handwritten signature in cursive script, appearing to read "Felix B. Limtiaco".
FELIX B. LIMTIACO
Director

NORMAN MIZUGUCHI
PRESIDENT
MIKE MCCARTNEY
VICE PRESIDENT
ROSALYN BAKER
MAJORITY LEADER
LES IHARA, JR.
MAJORITY FLOOR LEADER
BRIAN TANIGUCHI
MAJORITY WHIP
CALVIN KAWAMOTO
MAJORITY CAUCUS LEADER
MICHAEL M. F. LIU
MINORITY LEADER

The Senate
The Eighteenth Legislature
of the
State of Hawaii
STATE CAPITOL
HONOLULU, HAWAII 96813



RECEIVED
GMP ASSOCIATES, INC.
FEB 12 11 11 AM '82

February 8, 1996

Michael M. Miyahira, P.E.
Environmental Services Department
GMP ASSOCIATES, INC.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Re: Request for Project Review
Waipahu Wells III Station

Dear Mr. Miyahira:

Thank you for your letter of February 6, 1996, and the attachments thereto.

This is to let you know that we support the project wholeheartedly, and believe that it will be beneficial to the greater Waipahu area.

Thank you again.

Sincerely,

CAL KAWAMOTO
State Senator
19th Senatorial District
(Waipahu/Pearl City)

FIRST DISTRICT
MALAMA SOLOMON
SECOND DISTRICT
RICHARD M. MATSUURA
THIRD DISTRICT
ANDREW LEVIN
FOURTH DISTRICT
ROSALYN BAKER
FIFTH DISTRICT
JOE TANAKA
SIXTH DISTRICT
AVERY CHUMBLEY
SEVENTH DISTRICT
LEHUA FERNANDES SALLING
EIGHTH DISTRICT
DONNA FL. KEDA
NINTH DISTRICT
MATT MATSUNAGA
TENTH DISTRICT
LES IHARA, JR.
ELEVENTH DISTRICT
BRIAN TANIGUCHI
TWELFTH DISTRICT
CAROL FURUKAWA
THIRTEENTH DISTRICT
ROO TAM
FOURTEENTH DISTRICT
MILTON HOLT
FIFTEENTH DISTRICT
NORMAN MIZUGUCHI
SIXTEENTH DISTRICT
REY GRALTY
SEVENTEENTH DISTRICT
DAVID IGE
EIGHTEENTH DISTRICT
RANDY IWASE
NINETEENTH DISTRICT
CALVIN KAWAMOTO
TWENTIETH DISTRICT
BRIAN KANNO
TWENTY-FIRST DISTRICT
JAMES AKI
TWENTY-SECOND DISTRICT
ROBERT BUNDA
TWENTY-THIRD DISTRICT
MIKE MCCARTNEY
TWENTY-FOURTH DISTRICT
MICHAEL M. F. LIU
TWENTY-FIFTH DISTRICT
WHITNEY T. ANDERSON
CHIEF CLERK
T. DAVID WOO, JR.



William A. Bonnet
Manager
Environmental Department

February 22, 1996

Michael M. Miyahara, P.E.
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahara:

Subject: Waipahu Wells III Station

Thank you for the opportunity to comment on your February 6, 1996 project description for the Waipahu Wells III Station project. We have reviewed the subject document and have no comments at this time on the proposed project. HECO shall reserve further comments pertaining to the protection of existing powerlines bordering the project area until construction plans are finalized. Again, thank you for the opportunity to comment on this Environmental Assessment.

Sincerely,

BENJAMIN J. CAYETANO
GOVERNOR



ESTHER UEDA
EXECUTIVE OFFICER

96 FEB 16 11:11 AM
GMP ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 587-3822

February 14, 1996

Mr. Michael M. Miyahira, P.E.
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Request for Project Review - Waipahu Wells III Station

We have reviewed the subject request for project review, and as noted in our letter dated January 6, 1995 in response to the earlier Environmental Review Process, we offer the following comments:

- 1) We confirm that the Waipahu Wells III site, as shown in the Location Map, is within the State Land Use Agricultural District.
- 2) We confirm that the proposed 24-inch transmission main is within the State Land Use Agricultural District and Urban District.
- 3) The proposed 16-inch transmission mains along Lumiaina Street is within the State Land Use Urban District.
- 4) We suggest that a map, depicting the State Land Use District Boundaries, in relation to the proposed project, be included in the draft environmental assessment.

We have no further comments to offer at this time.

If you have any questions in regards to this matter, please feel free to contact me or Leo Asuncion of my staff at 587-3822.

Sincerely,

A handwritten signature in cursive script, appearing to read "Esther Ueda".

ESTHER UEDA
Executive Officer

EU:th

APPENDIX J
AGENCY CORRESPONDENCE DURING
THE 30-DAY COMMENT PERIOD

P
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BD OF WATER SUPPLY
BENJAMIN J. CAYETANO
GOVERNOR

Dec 9 9 44 AM '97



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PE
GARY GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

236 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4186
FACSIMILE (808) 586-4186

December 5, 1997

DEC 9 2 36 PM '97

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 Waipahu Wells
III Station, Oahu

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

1. Orientation Maps

Please provide maps that show the following:

a) known or assumed groundwater flowpaths; and

b) points or regions of known contamination, points of
potential contamination (landfills, individual wastewater
disposal systems, hazardous waste sites, dry wells and
injection wells), and the likely wellhead protection area
for the proposed well.

2. Aquifer or Hydrologic Unit Status

Please provide a description of the aquifer or hydrologic
unit status including the following:

* Total authorized water use by the Commission on Water
Resource Management

* Data table presenting the following information as
appropriate

- Current water use totals, including subtotals for
individual users

- Current installed capacity including subtotals for

J

Mr. Sato
Page 2

- individual wells and/or groups of wells.
- Pending installed capacity and/or use for wells
within the aquifer

3. Contamination Analysis

Please describe the hazardous components of the spent carbon that will be removed from the water treatment unit. How will the hazardous materials be handled and disposed?

4. Determination

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

c: GMP Associates

8.0 DETERMINATION, FINDINGS AND REASONS FOR SUPPORTING DETERMINATION

8.1 SIGNIFICANCE CRITERIA

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

- (1) **Involves an irrevocable commitment to loss or destruction of any natural or cultural resources;**

The proposed project will not impact scenic views of the ocean or any ridge lines in the area. The visual character of the area will change from the current agricultural land to an improved 4-lane highway which is compatible with the surrounding land use plans and programs being implemented for the region. The highway corridor is comprised of "Prime" agricultural land which is an important resource. Development of drainage systems will follow established design standards to ensure the safe conveyance and discharge of storm runoff. In addition, the subject property is located outside of the County's Special Management Area (SMA).

As previously noted, no significant archaeological or historical sites are known to exist within the corridor. Should any archaeologically significant artifacts, bones, or other indicators of previous on-site activity be uncovered during the construction phases of development, their treatment will be conducted in strict compliance with the requirements of the Department of Land and Natural Resources.

- (2) **Curtails the range of beneficial uses of the environment;**

Although the subject property is suitable for agricultural uses, the land area adjoining the Mokulele Highway is naturally suited for transportation purposes due to its location proximate to an existing highway system. To return the site to a natural environmental condition is not practical from both an environmental and economic perspective.

- (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;**

- (8) Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions;

By planning now to address the future needs of the community and the State, improvement of the transportation system is consistent with the long term plans for Maui. No views will be obstructed or be visually incompatible with the surrounding area.

- (9) Substantially affects a rare, threatened or endangered species or its habitat;

No endangered plant or animal species are located within the highway corridor.

- (10) Detrimentially affects air or water quality or ambient noise levels;

Any possible impact to near-shore ecosystems resulting from surface runoff, will be mitigated by the establishment of on-site retention basins during the construction phases of development. After development, retention areas within the highway right-of-way will serve the same function to encourage recharge of the groundwater.

- (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.

Development of the property is compatible with the above criteria since there are not environmentally sensitive areas associated with the project and the physical character of the corridor has been previously disturbed by agricultural uses. As such, the property no longer reflects a "natural environment". Shoreline, valleys, or ridges will not be impacted by the development.

- (12) Substantially affects scenic vistas and view planes identified in county or state plans or studies;

Due to topographical characteristics of the property, views of the area to be developed are generally not significant although they are visible. The majority of the proposed project will not be visible, except from higher elevations by the general public or from persons traveling along the highway.

- (13) Requires substantial energy consumption.

The location of the proposed project is between Maui's major growth areas. This relationship will reduce travel times and energy consumption after project build out through efficiencies gained by the increased capacity of the highway. Construction of the proposed project will not require substantial energy consumption relative to other similar projects.

BOARD OF WATER SUPPLY

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



'98 MAY 11 AM 9 43

JEREMY HARRIS, Mayor

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

BROOKS H. M. YUEN, Acting
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
Waipahu Wells III Station, Waipahu, Oahu

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed
Waipahu Wells III project.

We provide the following responses 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. A map delineating the boundaries of the Waipahu and Waiawa aquifers will be added to the Final EA.
- b. Water quality test results have shown that the pesticides ethylene dibromide (EDB) and dibromochloropropane (DBCP) are present in the water. A groundwater contamination map showing the latest confirmed results of contaminated groundwater wells in the vicinity, will be included in the Final EA.

2. Aquifer or Hydrologic Unit Analysis: The Commission on Water Resource Management allocated a total of 2.684 mgd to the Waipahu Wells III station on June 5, 1996. Of this total, 2.014 mgd is allocated to the State Housing and Finance Development Corporation, 0.5 mgd is allocated to the Board of Water Supply and 0.17 mgd is allocated to the State Department of Hawaiian Home Lands. The Final EA will reflect the permitted and actual water uses within the Waipahu-Waiawa aquifer system.

3. Contamination Analysis: The activated carbon absorbs the pesticides in groundwater. The spent carbon from the GAC units is presently being landfilled in accordance with approved procedures. We are evaluating alternatives to regenerate the carbon for reuse.

4. Determination: The findings and reasons for supporting the FONSI determination will be included in Section 6, "Determination", of the Final EA.

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: Anna Lee, GMP Associates, Inc.

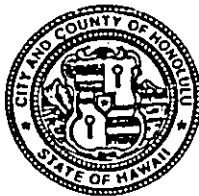
DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
BOARD OF WATER SUPPLY
150 KING STREET, 10TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4182 • FAX: (808) 523-4054

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JEREMY HARRIS
MAYOR



WILLIAM D. BALFOUR, JR.
DIRECTOR

MICHAEL T. AMI
DEPUTY DIRECTOR

December 8, 1997

Mr. Neal S. Fukumoto, P.E.
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813-3915

Dear Mr. Fukumoto:

Subject: Draft Environmental Assessment (DEA) for the Board of Water Supply (BWS) for (1) Construction and Installation of Improvements at Waipahu Wells III Station and (2) Installation of New Transmission Mains along Kamehameha Highway; along Lumiaina Street, between Kamehameha Highway and Kukula Street; and along Kukula Street, Adjoining Waipahu Wells II Station

We have reviewed the DEA for the above-described project and offer the following comments:

1. The DEA provides a thorough description and analysis of most of the "Proposed Action, Affected Environment, and Environmental Consequences..." of the action(s).
2. However, there is a near-total lack of description or illustration of the proposed transmission mains, their "Affected Environment," and the "Environmental Consequences..." of installing those mains (beyond a single line drawn along the above roadways on a single map).
3. The most significant factor, from our point of view, is the proximity of our (1) Waikele Community Park, adjoining the easterly and northerly sides of the Waipahu Wells I site, along the northerly side of Lumiaina Street, and (2) Waikele Neighborhood Park, located in the block bounded by Kamehameha Highway, Lumiaina Street, and Lumiauau Street.

DEC 11 1 02 PM '97

Mr. Neal S. Fukumoto
Page 2
December 8, 1997

After looking in several of the usual places ("Proposed Action, Affected Environment, and Environmental Consequences..."), we note that both parks are not mentioned anywhere in the text, maps, or plans in the DEA.

Our primary concerns include (1) risks to young children at the parks who might be attracted to open ditches along the path of the transmission mains; (2) traffic problems and access to the parks during installation of the transmission mains; and (3) adverse effects to trees and other landscaping along the path of the proposed mains.

We request, therefore, that the consultant or the BWS submit construction plans, etc., when they become available, showing the exact location(s), dimensions, and "Affected Environment(s)..." of the proposed transmission mains. Those plans should show or make reference to both Waialeale Community Park and Waialeale Neighborhood Park. We also request that the consultant pay special attention to the location of trees and landscaping along the northerly side of Lumiala Street and along the easterly and northerly sides of the Waipahu Wells I site.

Please call Mr. Jay Lembeck, Planner, of our Advance Planning Branch at 523-4272 if you need further assistance.

Sincerely,

W. D. Balfour, Jr.
WILLIAM D. BALFOUR, JR.
Director

WDB:ei

✓cc: Board of Water Supply

COPY

BOARD OF WATER SUPPLY

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



March 19, 1998

JEREMY HARRIS, Mayor

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

RAYMOND H. SATO
Manager and Chief Engineer

TO: WILLIAM D. BALFOUR, JR., DIRECTOR
DEPARTMENT OF PARKS AND RECREATION

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

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED WAIPAHU WELLS III STATION, TMK: 9-4-05: 074

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Waipahu Wells III project.

We provide the following responses to your concerns:

1. The description of the proposed transmission mains and the adjoining land uses will be expanded. Construction plans of the proposed transmission mains will be submitted to the Department of Parks and Recreation for review when they become available.
2. Recreational resources will be addressed in the Final EA, in particular, the Waikele Community Park and Waikele Neighborhood Park. The section will include your primary concerns on risks to park users, especially young children, traffic impacts to park access and roadway landscaping along the proposed route.

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

cc: Neal Fukumoto, GMP Associates, Inc.

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GMP ASSOCIATES, INC
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BENJAMIN J. CAYETANO
GOVERNOR



ROY S. OSHIRO
EXECUTIVE DIRECTOR

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GMP ASSOCIATES, INC.
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STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
FAX (808) 587-0600

IN REPLY REFER TO:

97:DEV/5202

December 8, 1997

*Awaiting
GMP
response*

Mr. Neal S. Fukumoto, P.E.
Project Manager
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813-3915

Dear Mr. Fukumoto:

Subject: Draft Environmental Assessment
for the Waipahu Wells III Station
Waipahu, Hawaii (TMK: 9-4-05:74)

Thank you for the opportunity to comment on the draft
environmental assessment for the subject project.

The purpose of this project is to provide 2.657 mgd of potable
water to meet the HFDC's needs for the Villages of Kapolei. As
such, HFDC is participating with the Board of Water Supply in the
cost-sharing of this project. The following are our comments
regarding the DEA:

1. Page 5-3, Paragraph 5.1.9 Traffic
Please mention how ADA requirements for temporary and
permanently relocated bus stops, sidewalk, and ramps will be
satisfied.
2. Page 5-4, Paragraph 5.1.11 Socioeconomic
Delete "90" from the first sentence. Sentence should read:
"Construction of the Waipahu Wells III Station and 24-inch
and 16-inch transmission mains is [90] expected to provide a
small number of temporary jobs for local workers."



Mr. Neal S. Fukumoto, P. E.
December 8, 1997
Page 2

3. Page 5-6, Paragraph 5.2.7 Socioeconomic
Please identify the funding amounts and the sources for this project.

If there are any questions on the above comments, please contact Neal Wu at 587-0538.

Sincerely,



ROY S. OSHIRO
Executive Director

COPY

BOARD OF WATER SUPPLY

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



March 18, 1998

JEREMY HARRIS, Mayor

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

RAYMOND H. SATO
Manager and Chief Engineer

Mr. Roy S. Oshiro, Executive Director
Housing Finance and Development Corporation
Department of Budget and Finance
State of Hawaii
677 Queen Street, Suite 300
Honolulu, Hawaii 96813

Dear Mr. Oshiro:

Subject: Draft Environmental Assessment for the Proposed Waipahu Wells III Station, Waipahu, Oahu,
TMK: 9-4-05: 74

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Waipahu Wells III Station.

We provide the following responses to your concerns:

1. Page 5-3, Paragraph 5.1.9 Traffic: The following provisions will be made to satisfy Americans with Disabilities Act (ADA) requirements:

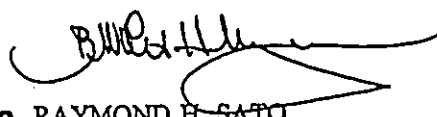
One bus stop along Kamehameha Highway, as well as a crosswalk and sidewalk ramp at the intersection of Kamehameha Highway and Lumiaina Street will be temporarily relocated during construction. The temporary relocation will be in conformance with ADA requirements. Following completion of construction activities, the bus stop, crosswalk and sidewalk ramp will be reinstalled.

2. Page 5-4; Paragraph 5.1.11 Socioeconomic will be corrected.
3. Page 5-6, Paragraph 5.2.7 Socioeconomic:

The Final EA will include the funding amounts for the proposed project. The sources of funding for this project are identified in Section 1.2 of the document.

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

Very truly yours,


FOR RAYMOND H. SATO
Manager and Chief Engineer

cc: Neal Fukumoto, GMP Associates

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GMP ASSOCIATES, INC
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BENJAMIN J. CAYETANO
GOVERNOR



ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION

P.O. Box 2359
Honolulu, HI 96804-2359
Telephone: 808-587-3822
Fax: 808-587-3827

November 7, 1997

Mr. Neal S. Fukumoto, P.E.
Project Manager
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813-3915

Dear Mr. Fukumoto:

Subject: Draft Environmental Assessment (DEA) for the
Waipahu Wells III Station, Waipahu, Hawaii,
TMK 9-4-05: 74

We have reviewed the DEA for the subject project transmitted by your letter dated November 3, 1997, and in addition to our previous comments dated February 14, 1996, on the subject project, we have the following comments to offer:

- 1) References to the "Agriculture" District/Designation on page 4-4 and Figure 4-3 should be amended to "Agricultural" District/Designation. Also on page 4-4, "Chapter 204-4.5(a)(7)" should be amended to "Section 205-4.5(a)(7)."
- 2) We suggest Figure 4-3 also include the proposed transmission mains in relation to the State land use districts.

We have no further comments to offer at this time. We appreciate the opportunity to comment on the subject DEA.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,

ESTHER UEDA
Executive Officer

EU:th

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GMP ASSOCIATES, INC
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BOARD OF WATER SUPPLY

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



January 27, 1998

JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

Ms. Esther Ueda, Executive Officer
Department of Business, Economic Development
and Tourism
Land Use Commission
State of Hawaii
P. O. Box 2359
Honolulu, Hawaii 96804-2359

Attention: Bert Saruwatari

Dear Ms. Ueda:

Subject: Your Letter of November 7, 1997 to GMP Associates, Inc. Regarding the Draft Environmental Assessment for the Proposed Waipahu Well III Station, Waipahu, Oahu, TMK: 9-4-05: 74

Thank you for your letter regarding the Draft Environmental Assessment (EA) for the proposed Waipahu Wells III Station.

We provide the following responses to your comments:

1. References in the EA will be corrected to reflect "Agricultural" District/ Designation on page 4-4 and Figure 4-3 and "Section 205-4.5 (a) (7)" on page 4-4.
2. Figure 4-3 showing state land use district boundaries will include the proposed transmission mains.

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

Very truly yours,


RAYMOND H. SATO
Manager and Chief Engineer

cc: Neal Fukumoto, GMP Associates, Inc.



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
FORT SHAFTER, HAWAII 96858-5440

November 14, 1997

Operations Branch

Mr. Neal S. Fukumoto
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813-3915

Dear Mr. Fukumoto:

Thank you for the opportunity to review the Draft Environmental Assessment for the Waipahu Wells III Station (TMK: 9-4-05:74). Based on the information provided, the proposed project will not impact waters of the United States, including wetlands, and will not require a Department of Army permit.

If you have any further questions, please contact Mr. Alan Everson of my staff at 438-9258, extension 11 and refer to File No. 980000028.

Sincerely,

A handwritten signature in cursive script, appearing to read "Linda M. Hihara-Endo".

Linda M. Hihara-Endo, Ph.D., P.E.
Acting Chief, Operations Branch

BOARD OF WATER SUPPLY

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



January 27, 1998

COPY

JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

Ms. Linda M. Hihara-Endo, Ph.D, P.E.
Operations Branch
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858-5440

Dear Dr. Hihara-Endo:

Subject: Your Letter of November 14, 1997 to GMP Associates, Inc. Regarding the Draft Environmental Assessment for the Proposed Waipahu Wells III Station, Waipahu, Oahu, Hawaii, TMK: 9-4-005: 074

Thank you for reviewing the Draft Environmental Assessment for the proposed Waipahu Wells III Station.

We acknowledge that the proposed project will not impact waters of the United States, including wetlands, and will not require a Department of the Army permit.

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

Very truly yours,


RAYMOND H. SATO
Manager and Chief Engineer

cc: Neal Fukumoto, GMP Associates, Inc.

BENJAMIN J. CAYETANO
GOVERNOR



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

November 10, 1997

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS

GLENN M. OKIMOTO
BRIAN K. MINAAI

IN REPLY REFER TO:
STP 8.8246

Mr. Neal S. Fukumoto
Project Manager
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813-3915

Dear Mr. Fukumoto:

Subject: Draft Environmental Assessment (DEA)
Waipahu Wells III Station
TMK: 9-4-05: 74

Thank you for your letter dated November 3, 1997.

The proposed development, is not anticipated to have a significant impact on our State transportation facilities.

Our comments of February 13, 1996, STP 8.7224 are still applicable. Please coordinate the implementation of the development with our Highways Division. Plans for any construction work within the State highway right-of-way must be submitted for our review and approval.

We appreciate the opportunity to provide comments.

Very truly yours,

A handwritten signature in cursive script that reads "Kazu Hayashida".

KAZU HAYASHIDA
Director of Transportation

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GMP ASSOCIATES, INC.
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BOARD OF WATER SUPPLY

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



January 27, 1998

COPY

JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

Mr. Kazu Hayashida, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Hayashida:

Subject: Your Letter of November 10, 1997 to GMP Associates, Inc. Regarding the Draft Environmental Assessment for the Board of Water Supply's Proposed Waipahu Wells III Station, Waipahu, Oahu. TMK: 9-4-05: 74

Thank you for your letter regarding the Draft Environmental Assessment for the proposed Waipahu Wells III Station.

We acknowledge that the proposed project is not anticipated to have a significant impact on State transportation facilities. Construction drawings for work within the State Highway right-of-way will be submitted for your review and approval and will be coordinated with the State Highways Division.

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

Very truly yours,


RAYMOND H. SATO
Manager and Chief Engineer

cc: Neal Fukumoto, GMP Associates, Inc.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



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

LAWRENCE MIIKE
DIRECTOR OF HEALTH

In reply, please refer to:
EMD / SDWB

November 10, 1997

Mr. Neal S. Fukumoto, P.E.
Project Manager
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813-3915

RECEIVED
GMP ASSOCIATES, INC
'97 NOV 19 AM 10 06

Dear Mr. Fukumoto:

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
FOR THE WAIPAĀHU WELLS III STATION
WAIPAĀHU, HAWAII (TMK: 9-4-05:74)

Thank you for the opportunity to review and comment on the draft environmental assessment (DEA). We have no objections to this DEA for Waipahu Wells III station. The Waipahu Wells III, state well nos. 2400-09 to -13, were granted conditional approval as drinking water source on September 11, 1995. In addition, we have the following comments to offer:

1. The September 11, 1995 conditional approval requires that all water from the Waipahu Wells III Station wells be treated by granula activated carbon.
2. Please replace Appendix A, Water Use Permits, Exhibit 1 - Well No. 2459-26 to -30, with the correct location map for well No. 2400-09 to -13.

Mr. Neal S. Fukumoto, P.E.
November 10, 1997
Page 2

If you should have any questions, please contact
Ms. Queenie Komori of the Safe Drinking Water Branch, Engineering
Section, at 586-4258.

Sincerely,



THOMAS E. ARIZUMI, P.E., Chief
Environmental Management Division

QK:la

Enclosure

BOARD OF WATER SUPPLY

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



January 28, 1998

COPY

JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

Mr. Thomas E. Arizumi, Chief
Environmental Management Division
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Arizumi:

Subject: Your Letter of November 10, 1997 to GMP Associates Inc. Regarding the Draft Environmental Assessment for the Proposed Waipahu Wells III Station, Waipahu, Oahu, TMK: 9-4-05: 74

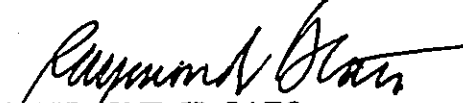
Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Waipahu Wells III Station.

We provide the following response to your concerns:

1. We acknowledge that your September 11, 1995 conditional approval requires that all water from the Waipahu Wells III Station be treated by granular activated carbon (GAC). GAC units will be installed at the proposed station for water treatment.
2. Exhibit 1, Appendix A of the Final EA will be amended to reflect the proper location map for the proposed wells.

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

Very truly yours,


RAYMOND H. SATO
Manager and Chief Engineer

cc: Neal Fukumoto, GMP Associates, Inc.



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GMP ASSOCIATES, INC
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Patricia Uyehara Wong, Esq.
Manager
Environmental Department

November 26, 1997

GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, HI 96813-3915
Attention: Mr. Neal Fukumoto, P.E.

Dear: Mr. Fukumoto

Subject: Waipahu Wells III Station

Thank you for the opportunity to comment on your October 1997 Draft EA for the Waipahu Wells III Station, as proposed by the Board of Water Supply. We have reviewed the subject document and would like to point out that the present plans call for an overhead line extension along Kamehameha Highway from Waipio Uka St. to the well site.

I suggest your staff and consultants deal directly with Bill Muench (543-5657), senior customer engineer, to coordinate HECO's continuing input on this project.

Sincerely,

cc: OEQC

B. Muench

WINNER OF THE EDISON AWARD
FOR DISTINGUISHED INDUSTRY LEADERSHIP



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BOARD OF WATER SUPPLY

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



January 27, 1998

JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

Ms. Patricia Uyehara Wong, Esq., Manager
Environmental Department
Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, Hawaii 96840-0001

Dear Ms. Wong:

Subject: Your Letter of November 26, 1997 to GMP Associates, Inc. Regarding the Draft Environmental Assessment for the Proposed Waipahu Wells III Station, Waipahu, Oahu, TMK: 9-4-05: 74

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Waipahu Wells III Station.

We will continue to coordinate the design of the proposed project with Mr. Bill Muench of the Hawaiian Electric Company. The Final EA will reflect the new overhead lines and poles that will be installed along Kamehameha Highway from Waipio Uka Street to the well station. In addition, the Final EA will note that these new lines and poles will replace existing ones.

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

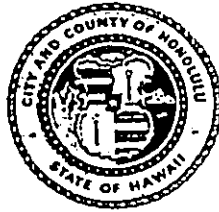
Very truly yours,


RAYMOND H. SATO
Manager and Chief Engineer

cc: Neal Fukumoto, GMP Associates, Inc.

DEPARTMENT OF WASTEWATER MANAGEMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 527-6663 • FAX: (808) 527-6675



JEREMY HARRIS
MAYOR

KENNETH E. SPRAGUE, P.E., Ph.D.

DIRECTOR

CHERYL K. OKUMA-SEPE, ESQ.
DEPUTY DIRECTOR

In reply refer to:
WCC 97-261

November 17, 1997

Mr. Neal S. Fukumoto, P. E.
Project Manager
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813-3915

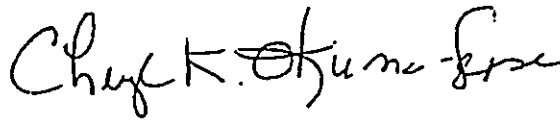
Dear Mr. Fukumoto:

Subject: **Draft Environmental Assessment for the
Waipahu Wells III Station
Waipahu, Hawaii
TMK: 9-4-05: 074**

We have no objection to the construction of the Board of Water Supply's Waipahu Wells III Station and the necessary transmission mains. Please contact our department to locate the existing sewer lines in the area during the design and construction of this project.

If you have any questions, please contact Ms. Tessa Ching of the Service Control Branch at 523-4956.

Sincerely,


KENNETH E. SPRAGUE
Director

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GMP ASSOCIATES, INC.
'97 NOV 19 AM 10 08

BOARD OF WATER SUPPLY

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



January 28, 1998

COPY

JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

TO: KENNETH E. SPRAGUE, DIRECTOR
DEPARTMENT OF WASTEWATER MANAGEMENT

FROM: *Raymond H. Sato*
RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: YOUR LETTER OF NOVEMBER 17, 1997 TO GMP ASSOCIATES, INC.
REGARDING THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE
PROPOSED WAIPAHU WELLS III STATION, WAIPAHU, OAHU,
TMK: 9-4-05: 74

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Waipahu Wells III Station.

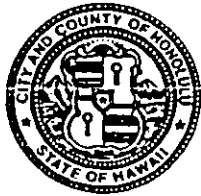
We acknowledge that you have no objections to the proposed project. We will contact your department to locate the existing sewer lines in the area during the design and construction of the project. Construction drawings will be submitted for your review and approval.

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

cc: Neal Fukumoto, GMP Associates, Inc.

PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 8TH FLOOR • HONOLULU, HAWAII 96813-3017
PHONE: (808) 523-4711 • FAX: (808) 523-4950



JEREMY HARRIS
MAYOR

PATRICK T. ONISHI
CHIEF PLANNING OFFICER

DONA L. HANAIKE
DEPUTY CHIEF PLANNING OFFICER

RR 11/97-2166

November 20, 1997

Mr. Neal S. Fukumoto P.E.
Project Manager
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

RECEIVED
GMP ASSOCIATES, INC.
'97 NOV 24 AM 8 22

Dear Mr. Fukumoto:

Draft Environmental Assessment (EA)
for the Waipahu Wells III Station
Tax Map Key (TMK) 9-4-05:74

In response to your company's request of November 3, 1997 on behalf of the City and County of Honolulu Board of Water Supply (BWS), an amendment to the Central Oahu Development Plan Public Facilities Map would be required before the proposed station is funded for construction.

*not necessarily required for BWS
only other City Dept's.*

The proposed station is located within the Waiola Sports Complex being developed by the City and County of Honolulu Department of Parks and Recreation. Your company should solicit their review comments with regards to the Station's impact upon the proposed Waiola Sports Complex.

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

Yours very truly,

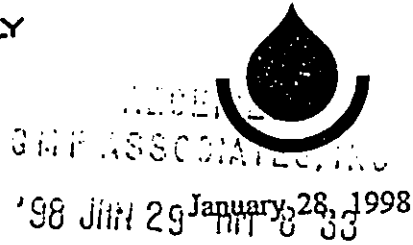
A handwritten signature in cursive script, appearing to read "Patrick T. Onishi".
PATRICK T. ONISHI
Chief Planning Officer

PTO:lh

COPY

BOARD OF WATER SUPPLY

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




JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

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

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


SUBJECT: YOUR LETTER OF NOVEMBER 20, 1997 TO GMP ASSOCIATES, INC.
REGARDING THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE
PROPOSED WAIPAHU WELLS III STATION, WAIPAHU, OAHU,
TMK: 9-4-05: 74

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Waipahu Wells III Station.

We provide the following responses to your concerns:

1. An amendment to the Central Oahu Development Plan Public Facilities map was obtained December 13, 1993.
2. The proposed well station is located adjacent to the Waiola Sports Complex which is being developed by the County's Department of Parks and Recreation. The wells were drilled in January 1995, prior to the sports complex plan. A copy of the Draft EA has been sent to the Department of Parks and Recreation for their review and comments.

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

 cc: Neal Fukumoto, GMP Associates, Inc.



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813-5249
PHONE (808) 594-1888
FAX (808) 594-1865
December 03, 1997

RECEIVED
GMP ASSOCIATES, INC.
'97 DEC 8 AM 8 24

Mr. Neal S. Fukumoto
Project Manager
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, HI 96813-3915

Subject: Draft Environmental Assessment (DEA) for the
Waipahu Wells III Station, Island of Oahu.

Dear Mr. Fukumoto:

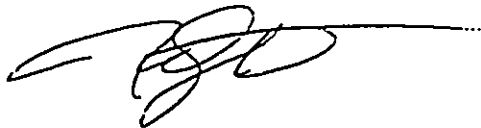
Thank you for the opportunity to review the Draft Environmental Assessment (DEA) for the Waipahu Wells III Station, Island of Oahu. The Honolulu Board of Water Supply (BWS) is proposing to develop this well to produce 2.6 mgd of potable water which is expected to meet the needs of DHHL, BWS, and the State Housing Finance and Development Corporation (HDFC). The sustainable yield of the Waipahu/Wahiawa aquifer, the source of the water for the Waipahu Well, is estimated at 119 mgd.

The Office of Hawaiian Affairs has no objections at this time to the proposed well project. Based on information contained in the DEA, the well apparently bears no significant long-term adverse impacts on adjacent areas nor upon existing flora or fauna habitats. Furthermore, no known archaeological remains exist and the proposed well will not significantly affect scenic resources. Moreover, water withdrawals will neither affect the aquifer's sustainable yield nor waterflow of nearby surface streams.

Letter to Mr. Fukumoto
December 03, 1997
Page 2

Please contact Colin Kippen (594-1938), Officer of the
Land and Natural Resources Division, or Luis A. Manrique
(594-1758), should you have any questions on this matter.

Sincerely yours,



Randall Ogata
Administrator



Colin Kippen
Officer, Land and
Natural Resources
Division

cc Trustee Aiona
Trustee Akana
Trustee Apoliona
Trustee Beamer
Trustee DeSoto
Trustee Hee
Trustee Keale
Trustee Machado
Trustee Springer

BOARD OF WATER SUPPLY

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



January 23, 1998

COPY

JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

Mr. Randall Ogata, Administrator
Office of Hawaiian Affairs
State of Hawaii
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813-5249

Dear Mr. Ogata:

Subject: Your Letter of December 3, 1997 to GMP Associates, Inc. Regarding the Draft Environmental Assessment for the Board of Water Supply's Proposed Waipahu Wells III Station, Waipahu, Oahu, TMK: 9-4-05: 74

Thank you for your letter regarding the Draft Environmental Assessment for the proposed Waipahu Wells III Station.

We acknowledge that the Office of Hawaiian Affairs has no objections to the proposed well project. The Department of Hawaiian Home Lands is participating in the construction costs to acquire water credits for Hawaiian Home land developments.

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

Very truly yours,


RAYMOND H. SATO
Manager and Chief Engineer

~~cc:~~ Neal Fukumoto, GMP Associates, Inc.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

November 10, 1997

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT
PROGRAM

AQUATIC RESOURCES
CONSERVATION AND

RESOURCES ENFORCEMENT
CONVEYANCES

FORESTRY AND WILDLIFE
HISTORIC PRESERVATION

DIVISION

LAND DIVISION

STATE PARKS

WATER AND LAND DEVELOPMENT

Neal S. Fukumoto, P. E.
Project Manager
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

LOG NO: 20467 ✓
DOC NO: 9711EJ04

Dear Mr. Fukumoto:

SUBJECT: Chapter 6E-8 Historic Preservation Review -- Draft Environmental
Assessment (DEA) for the Waipahu Wells III Station (October 1997
Revision)
Waipi'o, 'Ewa, O'ahu
TMK: 9-4-05:074

The DEA incorporates in Appendix H our earlier comments that no historic sites are known or are likely to be found at the project location and that we believe that this project will have "no effect" on historic sites.

Aloha,

Don Hibbard, Administrator
Historic Preservation Division

EJ:jk

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GMP ASSOCIATES, INC
'97 NOV 14 AM 9 31

COPY

BOARD OF WATER SUPPLY

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



January 23, 1998

JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

Mr. Don Hibbard, Administration
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:

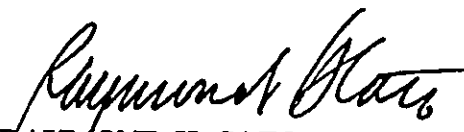
Subject: Your Letter of November 10, 1997 to GMP Associates, Inc. Regarding the Draft Environmental Assessment for the Board of Water Supply's Proposed Waipahu Wells III Station, Waipio, Ewa, Oahu, TMK: 9-4-05: 74

Thank you for reviewing the Draft Environmental Assessment for the proposed Waipahu Wells III Station.

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

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

Very truly yours,


RAYMOND H. SATO
Manager and Chief Engineer

cc: Neal Fukumoto, GMP Associates, Inc.

BENJAMIN J. CAYETANO
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96810

SAM CALLEJO
COMPTROLLER

MARY PATRICIA WATERHOUSE
DEPUTY COMPTROLLER

LETTER NO. (P) 1722.7

NOV 20 1997

Mr. Neal S. Fukumoto, P.E.
Project Manager
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813-3915

Dear Mr. Fukumoto:

Subject: Waipahu Wells III Station
Waipahu, Hawaii (TMK: 9-4-05:74)
Draft Environmental Assessment

Thank you for the opportunity to review the subject document.
We have no comments to offer.

If there are any questions, please have your staff contact
Mr. Ronald Ching of the Planning Branch at 586-0490.

Sincerely,

A handwritten signature in cursive script, appearing to read "Gordon Matsuoka".

GORDON MATSUOKA
Public Works Administrator

RC:jy

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GMP ASSOCIATES, INC.
'97 NOV 21 AM 9 35

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BOARD OF WATER SUPPLY

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



January 23, 1998

JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

Mr. Gordon Matsuoka
State Public Works Engineer
Department of Accounting and General Services
State of Hawaii
P. O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Matsuoka:

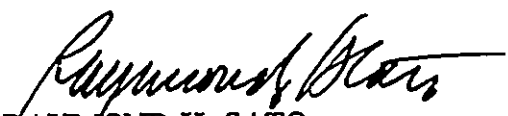
Subject: Your Letter of November 20, 1997 to GMP Associates, Inc. Regarding the Draft Environmental Assessment for the Proposed Waipahu Wells III Station, Waipahu, Oahu, TMK: 9-4-05: 74

Thank you for reviewing the Draft Environmental Assessment for the proposed Waipahu Wells III Station.

We acknowledge that you have no comments to offer at this time.

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

Very truly yours,


RAYMOND H. SATO
Manager and Chief Engineer

cc: Neal Fukumoto, GMP Associates, Inc.



United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

Our People...Our Islands...In Harmony

December 9, 1997

Mr. Neal S. Fukumoto, P.E.
Project Manager
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, HI 96813-5915

Dear Mr. Fukumoto:

Subject: Draft Environmental Assessment (DEA) - Waipahu Wells III Station,
Waipahu, Oahu, Hawaii

We have reviewed the above subject matter and have no comments to offer at this time.

Thank you for the opportunity to review this document.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

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GMP ASSOCIATES, INC.
'97 DEC 12 AM 8 44

COPY

BOARD OF WATER SUPPLY

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



January 23, 1998

JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

Mr. Kenneth M. Kaneshiro, State Conservationist
Natural Resources Conservation Service
United States Department of Agriculture
P. O. Box 50004
Honolulu, Hawaii 96850

Dear Mr. Kaneshiro:


Subject: Your Letter of December 9, 1997 to GMP Associates, Inc. Regarding the Draft Environmental Assessment for the Proposed Waipahu Wells III Station, Waipahu, Oahu, TMK: 9-4-05: 74

Thank you for reviewing the Draft Environmental Assessment for the proposed Waipahu Wells III Station.

We acknowledge that you have no comments to offer at this time.

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

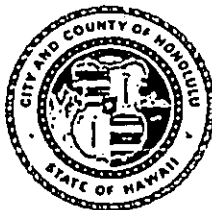
Very truly yours,


RAYMOND H. SATO
Manager and Chief Engineer

cc: Neal Fukumoto, GMP Associates, Inc.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 11TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4341 • FAX: (808) 527-5657



JEREMY HARRIS
MAYOR

JONATHAN K. SHIMADA, PhD
DIRECTOR AND CHIEF ENGINEER
ROLAND D. LIBBY, JR.
DEPUTY DIRECTOR
ENV 97-250

November 17, 1997

Mr. Neil S. Fukumoto, P.E.
Project Manager
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, HI 96813-3915

Dear Mr. Fukumoto:

Subject: Draft Environmental Assessment (DEA)
Waipahu Wells III Station
TMK: 9-4-05: 74

We have reviewed the subject DEA and have no comments to offer at this time. Should you have any questions, please contact Alex Ho, Environmental Engineer, at 523-4150.

Very truly yours,

A handwritten signature in cursive script, appearing to read "J. Shimada".

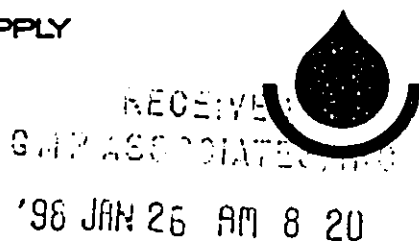
JONATHAN K. SHIMADA, PhD
Director and Chief Engineer

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GMP ASSOCIATES, INC
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BOARD OF WATER SUPPLY

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



JEREMY HARRIS, Mayor
WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

January 21, 1998

TO: JONATHAN K. SHIMADA, Ph.D., DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: *Raymond H. Sato*
RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: YOUR MEMORANDUM OF NOVEMBER 17, 1997 TO GMP ASSOCIATES, INC.
REGARDING THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE
PROPOSED WAIPAHU WELLS III STATION, WAIPAHU, OAHU,
TMK: 9-4-05: 74

Thank you for reviewing the Draft Environmental Assessment for the proposed Waipahu Wells III Station.

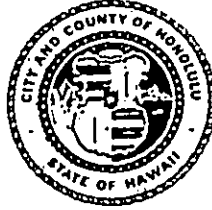
We acknowledge that you have no comments to offer at this time.

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

/s/ cc: Neal Fukumoto, GMP Associates, Inc.

BUILDING DEPARTMENT
CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



JEREMY HARRIS
MAYOR

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

PB 97-594

November 10, 1997

GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813

Attn: Neal S. Fukumoto, P.E.

Gentlemen:

Subject: Draft Environmental Assessment
for the Waipahu Wells III Station
Waipahu, Hawaii (TMK: 9-4-05:74)

We have reviewed the draft Environmental Assessment for the subject project and have no comments to offer.

Thank you for the opportunity to review the document.

Very truly yours,


FOR RANDALL K. FUJIKI
Director and Building Superintendent

RECEIVED
GMP ASSOCIATES, INC.
'97 NOV 13 1PM 10 31

COPY

BOARD OF WATER SUPPLY

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



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GMP ASSOCIATES, INC

'98 JAN 28 AM 9 58

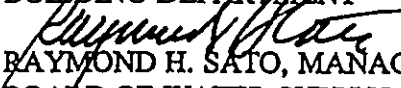
January 21, 1998

JEREMY HARRIS, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y.J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

TO: RANDALL K. FUJIKI, DIRECTOR AND BUILDING SUPERINTENDENT
BUILDING DEPARTMENT

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

SUBJECT: YOUR MEMORANDUM OF NOVEMBER 10, 1997 TO GMP ASSOCIATES, INC.
REGARDING THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE
PROPOSED WAIPAHU WELLS III STATION, WAIPAHU, OAHU,
TMK: 9-4-05: 74

Thank you for reviewing the Draft Environmental Assessment for the proposed Waipahu Wells III Station.

We acknowledge that you have no comments to offer.

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

cc: Neal Fukumoto, GMP Associates, Inc.

P.

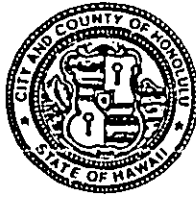
DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4414 • FAX: (808) 527-6743

973814

PE

JEREMY HARRIS
MAYOR



JAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

97-08191 (AC/SHC)
'97 EA Comments Zone 9

November 19, 1997

Mr. Neal S. Fukumoto, P.E.
GMP Associates, Inc.
841 Bishop Street, Suite 1501
Honolulu, Hawaii 96813-3915

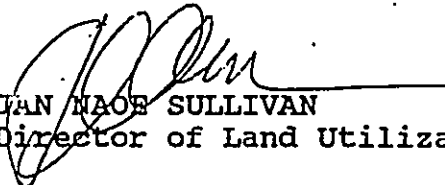
Dear Mr. Fukumoto:

Draft Environmental Assessment (EA) For
Waipahu Wells III Station
Tax Map Key: 9-4-05: 74

In response to your letter dated November 3, 1997, we have reviewed the above-referenced document and find that the proposed project is not within the Special Management Area (SMA), and therefore not subject to the provisions of Chapter 25, Revised Ordinances of Honolulu. A Special Management Area Use Permit (SMP) is not required prior to construction.

We have no further comments at this time. Thank you for the opportunity to review the Draft EA. Should you have any questions, please contact the Environmental Review Branch at 523-4077.

Very truly yours,


JAN NAOE SULLIVAN
Director of Land Utilization

JNS:am

/cc: Board of Water Supply

g:ppd\97-08191.shc

NOV 20 1 48 PM '97



COPY

BOARD OF WATER SUPPLY

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



JEREMY HARRIS, Mayor
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KAZU HAYASHIDA
MELISSA Y. J. LUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PhD
BARBARA KIM STANTON

RAYMOND H. SATO
Manager and Chief Engineer

December 12, 1997

TO: JAN SULLIVAN, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: *Raymond H. Sato*
RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: YOUR MEMORANDUM OF NOVEMBER 19, 1997 TO GMP ASSOCIATES, INC.
REGARDING THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE
PROPOSED WAIPAHU WELLS III STATION, TMK: 9-4-05: 074

Thank you for reviewing the Draft Environmental Assessment for the proposed Waipahu Wells III project.

We acknowledge that the proposed project is not within the Special Management Area.

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

ec: Neal Fukumoto, GMP Associates, Inc.