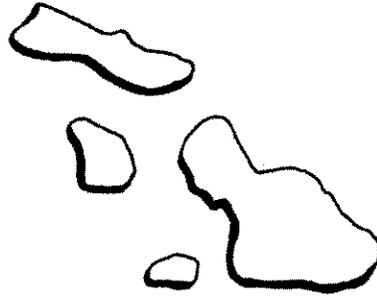
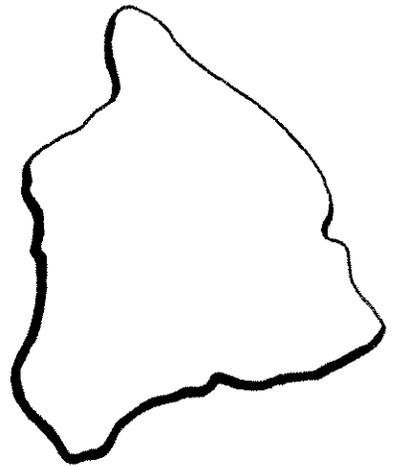


Office of Environmental Quality Control
Office of the Governor
550 Halekiauwiia Street
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Honolulu, Hawaii 96813

REVISED
ENVIRONMENTAL
IMPACT
STATEMENT



Aiea Stream
Flood Control



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VTTU PACIFIC

City & County of Honolulu
Dept. of Public Works

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

REVISED
ENVIRONMENTAL IMPACT STATEMENT
FOR THE
AIEA STREAM
FLOOD CONTROL PROJECT

Aiea, Oahu, TMK: 9-9-05

This Environmental Document is submitted
pursuant to Chapter 343, HRS

Responsible Official Wallace Miyahira Date: July 14, 1977
Wallace Miyahira
Director and Chief Engineer

Prepared by
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Honolulu, Hawaii 96813



REVISED
Environmental Impact Statement
for the
Aiea Stream Flood Control Project

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SUMMARY

Proposing Agency

Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Accepting Authority

Governor, State of Hawaii

Description of the Proposed Project

The proposed project consists of flood and erosion control improvements to Aiea Stream. A previous project (first increment) provided a rectangular concrete channel from Kamehameha Highway, near the mouth of the stream, to Moanalua Road (1,975 feet). The currently-proposed project (second increment) consists of extending this lining upstream to the vicinity of the C&H Refinery (1,430 feet). Future improvements (third and fourth increments) will extend to the end of the existing residential development in the vicinity of Kaulainahee Place (approximately 3,000 feet).

Description of the Environmental Setting

The majority of the Aiea Stream watershed has been developed in urban land uses. The banks of the second increment portion of the stream are completely occupied by residences, two schools, the Aiea Shopping Center, and the C&H Refinery. These structures are threatened at many locations by bank-overtopping and/or erosion. Aiea Stream was found to support only introduced species of stream animals, due to the lining in the downstream section and the hot water discharged by the refinery (the only source of water in the stream other than storm flow).

Probable Impacts of the Proposed Project and Mitigating Measures

The proposed improvements will have the beneficial impacts of reducing the flood potential, eliminating erosion in the stream channel, eliminating pools in which nutrient-rich water stagnates, and possibly reducing the BOD and temperature of the stream.

The project will have no effect on the present exotic stream animals, will not induce further development of the watershed, nor affect the proposed Rainbow Bay Park.

The proposed project may have the short-term adverse impact of increased turbidity during construction, but this can be reduced through the application of erosion control measures. Adjacent residents will be disturbed by construction activities. Approximately 1,430 feet of poor-quality stream habitat will be eliminated. These adverse effects are not considered to be serious enough to outweigh the benefits of the proposed project.

Alternatives to the Proposed Project

Five categories of alternatives were evaluated; no project, non-structural alternatives, partial channel lining, full channel lining alternatives, and alternative project (rectangular concrete channel) designs. The first four categories were rejected because they could not adequately meet the project goal of conveying a discharge of 3,500 cfs without causing erosion of the stream bank. Five rectangular concrete channel designs were studied in detail in a separate engineering analysis and one was recommended as the proposed project.

I. DESCRIPTION OF THE PROPOSED PROJECT

A. Location

Aiea Stream flows through the community of Aiea and discharges into the East Loch of Pearl Harbor at Aiea Bay (Figures 1 and 2). The total project involves approximately 6,400 feet of stream channel from Pearl Harbor, upstream to the vicinity of Kaulainaahee Place. The project area is divided into four increments: the first increment extends from Pearl Harbor to Moanalua Road (1,975 feet); the second increment extends from Moanalua Road to the C&H Refinery (1,430 feet); and the third and fourth increments extend from the refinery to Kaulainaahee Place (approximately 3,000 feet plus).

B. Historic Perspective

In 1969, a detailed flood control study was conducted for Aiea Stream by the Corps of Engineers (Ref. 1). In this study, it was found that a serious flood problem existed on the low-lying reach of Aiea Stream below Moanalua Road. Since its development in 1954 to 1956, the residential subdivision had been flooded numerous times. In 1965, two floods (1,650 cfs on November 15 and 1,200 cfs on December 14) caused \$164,000 in total damage and pointed to the need for flood control measures. The flooding was attributed to inadequate channel capacity, inadequate interior drainage systems in the residential subdivision, and to the clogging of the low trestle below Kamehameha Highway.

Following the recommendations of the Corps of Engineers (somewhat modified), the first increment of channel lining was completed in 1975 by the City and County of Honolulu Department of Public Works with assistance from the State. The project consisted of approximately 1,600 feet of rectangular reinforced concrete channel from approximately 150 feet below Kamehameha Highway to approximately 150 feet above Moanalua Road (Figure 2). The

channel above Kamehameha Highway has a 24-foot cross section and an average depth of 10 feet (Plate 1). The short section below Kamehameha Highway is 74 feet wide and averages 9.6 feet deep.

The Corps of Engineers study determined that flooding above Moanalua Road was not as serious as in the lower flood-plain because the steeper topography causes most of the surface runoff to sheet flow rather swiftly over the land and return to the main stream or tributary. At the time the first increment was lined, consideration was given to improving the upper increments, but construction was deferred until funding could be obtained.

The Environmental Impact Statement for the first increment project (Final EIS dated July, 1972) did not discuss the upper increments. Therefore, this Environmental Impact Statement is being prepared to cover the currently-proposed improvements to the second increment and possible future improvements to the third and fourth increments.

C. Need for Improvement

The objective of the proposed project is to convey the design storm flow along the Aiea Stream alignment into Pearl Harbor and to reduce any flooding conditions that may exist. The following deficiencies in the existing stream have been identified:

1. Inadequate Capacity

The storm water tributary area for the east basin of Aiea Stream above Moanalua Road is 1.3 square miles. Calculations made by the Corps of Engineers (Ref. 1) show that the discharge for a 50-year flood and a 100-year flood would be 2,950 cfs and 3,850 cfs, respectively. The estimated peak discharge (City and County of Honolulu Storm Drain Standard) is 3,500 cfs. This discharge has been taken as the design discharge for the proposed project.

The existing channel above Moanalua Road is unimproved except for occasional retaining walls. The channel has a curving alignment, large boulders, low rubble-wall banks, and is often clogged with vegetation (Plates 2 and 3). These factors contribute to bank overtopping along the southerly bank opposite the Aiea Shopping Center (Figure 2). Hydraulic calculations show that the existing stream has a maximum capacity of 1,200 cfs at one point in this area. It is evident that the design discharge of 3,500 cfs greatly exceeds the existing capacity of the stream (particularly below the H-1 Freeway). Should the design discharge occur, extensive damage could result.

A detailed hydraulic analysis has not yet been conducted within the third increment of Aiea Stream. However, from field inspection and observation, it is apparent that there are areas where the stream capacity may be inadequate. A resident reported flooding of his property upstream from the C&H Refinery in 1969. His observations indicated that a small bridge across the stream became clogged with debris and caused the stream to back up (Plate 4).

In the fourth increment, the stream bottom has eroded to the point where it has formed a rather deep cut. At Kaulainahee Place the cut is at least 15 feet deep with vertical sides. For this reason, the stream capacity in this area may be adequate.

2. Erosion

The entire second increment shows much evidence of bank erosion; some of the more obvious problem areas are identified on Figure 2. The worst area is immediately below the H-1 Freeway, where fill was placed adjacent to the stream bed to facilitate construction of the Aiea Shopping Center and construction of the freeway (Plate 3). These fill slopes do not have any protection against erosion caused by the stream flow. In other places where the stream banks have been protected with rock or concrete walls, the

footings of those walls have been undermined; as along the retaining wall of the shopping center, and several walls above the freeway. Erosion is usually a result of high velocities in storm flow. Due to the relatively steep slope of the stream, the approximate velocity is 19 fps within one portion of the existing stream. To minimize erosion in an unlined grassed channel, the City and County Standard recommends that the velocity of water be less than 5 fps. Poor planning in the placement of fill material and other encroachments into the stream channel has also contributed to the erosion (and flooding) problem.

The average gradient of the third and fourth increments (0.032 and 0.033 ft./ft.) is only slightly less than the average gradient of the second increment (0.038 ft./ft.), so high flow velocities can also be expected. Undermined retaining walls and bridge abutments were found in the third increment. Also, as noted above, the fourth increment has a deeply incised channel; while this reduces the flood hazard, it is evidence of rather severe erosion. One resident at the end of Kaulainae Place has attempted to halt the erosion of his property by piling shrub clippings and other garden debris against the banks. (Unfortunately, this does not stop the erosion, and only contributes to flooding when the debris is washed away and clogs the stream below.)

3. Stagnation

During most of the year, the only water in Aiea Stream is spent cooling water and other discharges from the C&H Refinery. (These discharges are described below in Chapter III.) A portion of these discharges is high in organic matter. This organic matter tends to deplete the oxygen in the water, and when it gathers in the holes and depressions in the stream bed, along with urban trash, it generates a strong hydrogen sulfide (rotten egg) odor. One particularly bad spot where this occurs is the hole scoured out below the Ulune Street culvert (Figure 2). The odor produced in this pool can be detected when crossing the bridge,

and on occasion, it can be detected below the freeway. The refinery plans to divert most of the oxygen-demanding wastes into the sewer system on July 1, 1977; however, the urban trash and nutrient-rich urban runoff water will still tend to stagnate under the existing conditions found in the second increment stream bed.

D. Project Description

The currently proposed action is the second phase of an approximate four-phase stream improvement program on the portions of Aiea Stream that are bordered by urban and residential land uses. To meet the project objectives of providing flood protection, minimizing bank erosion and preventing stagnation, several alternative channel improvements were examined (see Chapter V). It was found that full concrete lining would best meet these objectives on the second increment. The proposed lining begins at the end of the previous lining in the Aiea Shopping Center (Plate 1) and extends approximately 1,430 feet to about 300 feet upstream of Ulune Street near the C&H Refinery (Figure 2).

The new channel will be of reinforced concrete, rectangular in cross section and approximately 24 feet wide by 10 feet deep. It will closely follow the existing stream bed, but will realign some curves and raise or lower the existing invert as required to improve flow characteristics. Flow velocity in the lined channel will average approximately 30 feet per second at the design discharge of 3,500 cfs. The stream will pass under the H-1 Freeway through the existing box culvert. The new channel will be constructed so that adjoining lots will drain directly into it. The right-of-way will be fenced (chain-link) for safety and will be landscaped where appropriate. Figures 3A, 3B and 3C show the plan and profile of the proposed channel, and Figure 4 depicts three representative cross-sections of the existing and proposed channel.

The third and fourth increments will extend approximately 3,000 feet further upstream to the end of the existing residential developments on Kaulainahee Place (Figure 2). The degree and type of improvement that will be required on these increments has not been established. It does appear that some form of erosion control will be required, and the channel capacity may have to be increased at some locations. Alternatives will be developed as flood control planning for this watershed progresses.

E. Cost and Schedule

Preliminary construction cost estimates for the five alternate lined channel designs that have been developed (described in Chapter V), range from \$905,000 to \$978,000 (second increment only). The State of Hawaii has appropriated \$500,000 by Act 195/75 for plans and construction, and this project is included in the City and County of Honolulu Capital Improvement Program. Construction is scheduled to begin in 1978, and would take at least one year. The final segments remaining to be improved will be programmed in future years.

II. DESCRIPTION OF THE ENVIRONMENTAL SETTING

A. The Aiea Stream Watershed

1. Physical Characteristics

The Aiea Stream watershed is situated on the lower leeward slopes of the Koolau Mountains between Halawa Stream on the southeast and Kalauao Stream on the northwest. The watershed is approximately 4 miles long and averages $\frac{1}{2}$ mile wide; the total area is approximately 1,250 acres (1.95 mi²). The Aiea Stream watershed has two major sub-basins which join just below Moanalua Road. The west basin drains approximately 370 acres and the east basin drains 880 acres. The project area is in the lower portion of the east basin and has a tributary area of approximately 830 acres.

2. Soils

The dominant soils in the watershed are silty clays and silty clay loams of the Waipahu, Lahaina and Manana series (Ref. 2). These soils have formed on the relatively gentle lower ridges; 0% to 12% slopes for the Waipahu soils, 0% to 15% slopes for the Lahaina soils, and 0% to 25% slopes for the Manana soils. A Hanalei Silty Clay has developed in the immediate flood plain of Aiea Stream; this soil has a moderate permeability. The upper portion of the watershed is classified as rough mountainous land and rock land, having steep slopes dissected with numerous intermittent drainage channels. The erosion hazard is severe in the upper 2/3 of the watershed (rough mountainous land) and moderate (steeper slopes of Lahaina and Manana soils) to slight (Waipahu soils) in the lower portion (Refs. 2 and 3).

3. Vegetation

The vegetation of the upper portion of the Aiea Stream watershed (above 500 feet elevation) is a dense forest dominated by several species of eucalyptus (primarily robusta, with lemon-gum and others). Koa is also an important constituent of this forest, with kukui, ohia lehua, mango and guava having a lesser abundance. This forest occupies approximately 51% of the east basin watershed (36% of the total). Below the forest, on the steep rock lands along Aiea Stream, koa-haole forms a dense thicket. This introduced scrub-type plant is common on dry slopes and disturbed places. The remaining undeveloped land in the watershed (54 acres, or 4% of the total) is occupied by a grass community. Figure 5 delineates these vegetation types and tabulates their acreages in the watershed.

4. Land Use

The existing land use of the watershed is shown on Figure 5. The lower 2/3 is Urban District, and the upper 1/3 is Conservation District (Ewa Forest Reserve). Approximately 78% of the Urban District is presently developed in urban uses, predominantly single-family homes. The west basin watershed is entirely developed, with only about 4 acres of steep land remaining open. The east basin watershed is approximately 35% developed and 65% open. The open areas are the steep slopes along the stream and the Forest Reserve of the upper watershed. There is therefore no remaining land suitable for development, other than scattered single lots. For this reason, it is felt that the Aiea Stream watershed has essentially reached its full potential level of development. The population of the watershed was estimated at 16,000 persons in 1969 (Ref. 1).

B. Aiea Stream

1. Hydrology and Hydraulics

The average annual rainfall in the Aiea watershed increases with elevation from approximately 30 inches at Pearl Harbor to approximately 100 inches at the head (Ref. 3). Because the drainage basin is located at fairly low elevations (up to 1,656 feet) on the leeward slopes of the Koolau Range, it receives some protection from trade wind showers. However, the drainage basin is vulnerable to the heavy rains from "kona storms" which usually occur during the winter months.

The upper reaches of Aiea Stream carry an intermittent flow. When investigated in March (1977), the upper stream had some dry reaches and some reaches with a very low flow between small pools. At a point several hundred feet below the C&H and municipal wells (elevation 250 feet), the flow ceased on the surface, leaving only a few scattered pools from the last rainfall. This condition was found down to the main outfall from the C&H Refinery, located in the central portion of the third increment (Figure 2). The discharge from this outfall averages approximately 2.37 million gallons per day (3.7 cfs), and is the only water flowing in the lower stream except for immediately after a storm. The refinery shuts down for annual maintenance, usually in the months of November and December, during which time there are no discharges.

A hydraulic study of Aiea Stream conducted by the Corps of Engineers (Ref. 1) indicates that Aiea Stream would react very rapidly to a storm; flow would peak within an hour after the end of a heavy burst of rain, and would return to near zero within a few hours. The estimated 50-year and 100-year peak floods for the east basin are 2,950 cfs and 3,850 cfs, respectively. (Stream flow records are not kept for Aiea Stream.)

The existing stream channel in the second increment consists of large river boulders up to 3 feet in diameter. The slopes are composed of boulders and gravel in a brown silty clay matrix, except near the upstream edge of the shopping center where off-site fill has been dumped (Ref. 4). The stream banks are low at several locations, especially along the south bank opposite the shopping center where some of the rubble walls are only 3 to 4 feet high (Figure 4). The average stream gradient is relatively steep (0.038 ft./ft.), which produces high flow velocities (up to 19 feet per second at 3,500 cfs). The stream also has a curving alignment and irregular cross section which causes an inconsistent flow pattern. These factors—low banks, high velocities, and curving alignment contribute to the problems of overflow and erosion in the second increment (Figure 2).

The existing channel in the third and fourth increments is similar to the second increment except that it has a straighter alignment, and higher banks (especially near the end of the fourth increment). The potential for bank overtopping is not as evident on the third and fourth increments, although erosion is serious at several locations in the fourth increment (Figure 2).

2. Water Quality

Two aspects of the water quality of Aiea Stream will be considered here; the characteristics of the C&H Refinery discharges, and the sediment load of the stream. The characteristics of the water discharged by the refinery is essentially the quality of the water in the second increment, except for the periods of storm flow. Under storm conditions, the sediment load carried by the stream is the water quality parameter of greatest importance.

The C&H Refinery at Aiea takes in raw sugar and processes it by filtering to remove the impurities, and by boiling. There are four points in the refining process which produce effluents that are discharged

into Aiea Stream. These are: the barometric condensers, which use a flow of water to create a vacuum to draw off vapors from the boiling sugar, (85% of the total refinery discharges); the continuous boiler blow-down system, which removes minerals that collect in the boiler; the bone char filters, which are periodically back-flushed to remove collected impurities; and the supernatant from the settling tanks used in the washing of diatomaceous earth filter material. Table 1 describes the general characteristics of the effluents and identifies the outfalls through which they are discharged. Table 2 summarizes the data gathered by C&H on the discharges of the four outfalls to Aiea Stream.

Since the discharges from the refinery are monitored after being mixed, rather than at their source within the refinery process, long-term records on the contribution of each source (Table 1) to the total (Table 2) are not available. However, it is known that the bone char filter wash water is one of the main sources of BOD*, contributing approximately 120-160 lb./day. The materials primarily responsible for the high BOD are trace amounts of sugar, sugar residues, and the impurities removed from the raw sugar. The average total BOD load is 428 pounds per day, but varies greatly (121-1,136 lb./day). Another important constituent of the refinery discharges is TSS**, a major source of which is the settling tanks used to wash filter material (average 5 lb./day). The TSS is primarily made up of diatomaceous filter aid, and the dirt, grit and ash removed from the raw sugar. The TSS load from all sources averages 36 lb./day, but also varies greatly (1-192 lb./day). The pH of some of the sources is

* BOD: "Biochemical Oxygen Demand"; a 5-day test involving the measurement of the dissolved oxygen used by microorganisms in the biochemical oxidation of organic matter.

** TSS: "Total Suspended Solids"; includes settleable and colloidal solids.

TABLE 1 C & H REFINERY EFFLUENT SOURCES

SOURCE	CHARACTERISTICS		DISCHARGED VIA OUTFALL NUMBER
BAROMETRIC CONDENSER	WARM WATER, TRACE SUGAR RESIDUE		1
BOILER BLOW-DOWN	HOT WATER, MINERALS (SILICATES)		2
BONE CHAR FILTER WASH	HOT WATER, FILTER AID, SUGAR RESIDUE, IMPURITIES		1, 2, 3 (C & C SEWER AFTER 7/1/77)
SETTLING TANK DECANT	WARM WATER, FILTER AID, SUGAR RESIDUE, IMPURITIES		4 (C & C SEWER AFTER 7/1/77)

TABLE 2 C & H REFINERY DISCHARGES^a

OUTFALL	FLOW (MGD)		BOD ₅ (mg/L)		BOD ₅ (lb/day)		TSS (mg/L)		TSS (lb/day)		TEMP (°F)		pH	
	1976	Mar. 77 ^b	1976	Mar. 77	1976	Mar. 77	1976	Mar. 77	1976	Mar. 77	1976	Mar. 77	1976	Mar. 77
1	AVE	1.994	2.148	4.0	284	72	1.6	.5	27	9	106°	106°	7.2	7.3
	RANGE	.09 - 3.6	—	3 - 53	—	38 - 1057	—	0 - 5	0 - 150	—	101° - 110°	—	7.1 - 7.4	—
2	AVE	0.284	.215	26	55	47	2.6	2.0	6	4	102°	106°	7.5	8.0
	RANGE	.246 - .32	—	3 - 60	—	6 - 160	—	0 - 6	0 - 15	—	—	—	7.2 - 7.8	—
3	AVE	0.079	.067	294	41	164	4.4	4.0	3	2	100°	106°	7.3	7.3
	RANGE	.03 - .13	—	12 - 231	—	8 - 235	—	0 - 15	0 - 16	—	—	—	7.1 - 7.4	—
4	AVE	0.009	.009	778	48	58	62	47	5	4	100°	102°	7.4	7.3
	RANGE	.004 - .014	—	11 - 1119	—	1 - 121	—	6 - 255	<1 - 21	—	—	—	7.0 - 7.8	—
TOTAL INFLUENT (WELL)	AVE	2.366	2.439	15.5	428	341	2.0 ^c	.9	36	19	—	—	—	—
	RANGE	1.22 - 4.06	—	7 - 50	—	121 - 1136	—	.02 - 6	1 - 192	—	—	—	—	—
		3.4									73.4°		7.3	—

NOTES:

- a. AVERAGE AND RANGE OF MONTHLY DATA COLLECTED OVER 11 MONTHS (REFINERY SHUT-DOWN IN DECEMBER), BY REFINERY PERSONNEL, AT THE OUTFALLS.
- b. BONE CHAR FILTER WASH WATER WAS DIVERTED INTO THE CITY & COUNTY SEWER IN MARCH 16-17, 1977 TO TEST THE NPDES PERMIT COMPLIANCE MEASURES.
- c. AVERAGE CONCENTRATION FLOW-RATED FOR EACH DISCHARGE; DETERMINED MONTHLY THEN AVERAGED.

high (around 11 for the boiler blow-down), but is reduced to near neutral (7.2-7.5) by dilution before being discharged into Aiea Stream.

All of the refinery discharges are relatively hot, averaging about 106°F. Depending on the cycle of the refinery process, the discharge can range from below 100°F to around 115°F. This water cools to an average of about 81°F by the time it reaches the mouth of the stream, approximately 3/4 mile below the outfall. Measurements along the stream indicate that the water cools relatively slowly in the unlined channel of the second increment where the flow is confined and about 6 to 18 inches deep. As it spreads out in the lined channel, it is only 2 to 4 inches deep, and the cooling rate increases. When the stream first encounters tidal water, approximately 600-700 feet above its mouth, the water is around 98°F, but it cools very rapidly as it is mixed with water from Aiea (Rainbow) Bay, which averages 78°F. The overall cooling from the outfall to the mouth of the stream amounts to around 26°F on the average, so that the water entering Aiea Bay averages 81°F. The water in the upper reaches of the stream (elevation 700 feet) was 68°F when measured in March, 1977. Water drawn from the C&H well averages 73°F.

The total sediment load carried by storm flows on Aiea Stream has never been measured, but a reliable estimate can be obtained from measurements made on nearby streams. The USGS (Ref. 6) computed mean annual sediment yields of 1,100 Ton/yr/mi² on Waimalu Stream, 1,200 Ton/yr/mi² on Waikele and Kipapa Streams, and 1,590 Ton/yr/mi² on Kalihi Stream. The sediment yield of Waimalu Stream (1,100 Ton/yr/mi²) will be assumed for Aiea Stream, since the two watersheds are near each other and should therefore have similar soils and rainfall exposure. Since Waimalu Stream extends to the crest of the Koolau Range, where landslides on the very steep slopes are a significant source of erosion, the rate should be a conservative one. The annual sediment load for the east basin of Aiea Stream would therefore be approximately 1,500 tons per

year (920 cubic yards). Since the west basin has been developed for many years, it would probably not have as high of a sediment rate. Other sediment yield estimates (eg. 600 tons/year, Ref 7; 800 tons/year, Ref 3) are not as reliable as the USGS measurements, since they are either based on preliminary data, or on a general land use category method. There is insufficient data on Aiea Stream to assess the relative contribution of bank erosion in the project area to the total sediment load of the stream.

3. Aquatic Life

A brief reconnaissance of Aiea Stream was made to assess the existing aquatic habitat and to determine what species may be present. The upper portion of the stream (around elevation 700 feet) has small shallow pools connected by intermittent and ephemeral sections. Aquatic beetles and snails were found in these pools, but no fish or decapod crustaceans. The larger pools downstream, in the vicinity of the wells (elevation 250 feet), had many guppies (family Poeciliidae, also including swordtails and mollies), crayfish (Procambarus clarkii), and the tadpoles and adults of the bullfrog (Rana catesbiana), all of which are introduced species. The scattered pools above the main refinery outfall contained varying numbers of guppies and mosquito larvae. The unlined channel from the refinery outfall to the vicinity of the Aiea Shopping Center contained no fish or other macroorganisms; the water is hot and flows very swiftly in this section. A few guppies were found just upstream from the lined channel of the first increment, and their numbers increased further downstream. In the mid-portion of the first increment, 500-600 feet above Kamehameha Highway, tilapia (Tilapia mossambica) were first encountered in fairly large concentrations, swimming in water only 4 to 6 inches deep. As the stream entered the tidal waters, the tilapia increased in abundance, and were joined by other fish, which could not be identified due to the turbidity of the Pearl Harbor waters.

The water discharged by the refinery averages around 106 °F (41.1 °C) at the outfall, and cools to around 103 °F (39.4 °C) as it enters the lined channel just above Moanalua Road. Even in this hot water, the guppies are able to survive. They apparently seek cooler areas at the edge of the stream (90 °F, 32 °C), and in the vicinity of cooler water coming in from storm drains. The hottest water where these hardy fish were found in any abundance was in the shade of the Moanalua Road Crossing where the water was 102 °F (39 °C). The Tilapia were first noted in fairly large numbers in water that was around 100 °F (38 °C). Preliminary observations at the University of Hawaii (Dr. A. S. Timbol, pers. comm.) indicate that the guppies can survive up to around 40 °C (104 °F); on the other hand, the native stream animals (gobies, shrimp and prawns) have lower temperature tolerances, with limits around 34°-37° C (93°-99°F). Under natural conditions, the animals avoid these upper limits, wherever possible, as the guppies were observed to be doing by gathering in the cooler parts of the stream.

A study was recently conducted by the University of Hawaii to develop an inventory of streams, their degree of alteration, and the fauna that they support (Aiea Stream was not sampled). Ongoing research is looking into the effects of channel modification on the native stream animals. Preliminary results indicate that channel modification is detrimental to the native animals, since exotic species were dominant in all types of altered channels, and native species were entirely absent from stream segments with concrete lined inverts (Ref. 5). It is possible that the concrete lining acts as a barrier to the movement of the larvae of the native stream animals, which develop in the ocean, then return to the streams. If this is the case, Aiea Stream has a double barrier, created by the lining in the lower portion, and by the hot water discharged by the refinery. With these conditions, Aiea Stream does not provide a suitable environment for native stream animals.

4. Land Ownership

The City and County of Honolulu holds an easement on Aiea Stream, in which most of the proposed improvements will be constructed. Between Moanalua Road and the H-1 Freeway, the land on the north bank is occupied by the Aiea Shopping Center, and the parcels on the south bank are owned by a number of private individuals and the Aiea Hongwanji Mission (church and pre-school). Between the Freeway and Ulune Street is a service station on the north bank and a single residence on the south bank. Above Ulune Street, to the end of the second increment, the north bank is owned by three individuals. Both banks of the first half of the third increment are owned by the C&H Sugar Co. The remainder of the north bank, through the third and fourth increments, is owned by numerous private individuals, and the south bank is owned by the State of Hawaii (Aiea Intermediate School); see Figure 2.

III. PROBABLE IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES

The prior downstream improvements are very similar to the proposed project. The Environmental Impact Statement for this earlier project, prepared by the Department of Public Works of the City and County of Honolulu (dated July, 1972), is therefore relevant to the proposed project. The following discussion of impacts relates primarily to the recommended project design for the second increment. The impacts resulting from improvement of the third and fourth increments could be similar, depending on the specific design selected.

A. Channel Hydraulics

The proposed concrete lining will significantly improve the hydraulics of the second increment. The alignment of several curves will be improved, channel roughness will be decreased and the capacity of the channel will be increased so that the design flow of 3,500 cfs may be safely conveyed to Pearl Harbor. Velocity in the channel, at 3,500 cfs, will be approximately 30 feet per second. The new channel should have a smooth transition with the existing channel downstream, since both have the same design discharge and the same width. Because the gradients are relatively steep, and flow is super-critical, lining the second increment should have no significant effects on the flow characteristics of the third and fourth increments. A CRM inlet structure will be constructed to provide a smooth transition from the unlined to the lined channel, and to prevent erosion. Neither the total volume of runoff nor the ground water will be significantly affected; the existing stream bed is only moderately permeable, so infiltration is minimal.

B. Water Quality

The C&H Refinery has a National Pollution Discharge Elimination System (NPDES) permit, which places sanctions on the discharge of BOD (480 lb./day maximum), TSS (110 lb./day maximum), temperature (105° average, 110 ° maximum), pH (6.0 to 9.0), and floatable

solids and foam (none allowed). The NPDES permit requires compliance with these limits by July 1, 1977. The refinery will, by that date, be diverting the bone char filter wash water and the filter wash settling tank decant water (outfall number 4) into the municipal sewer system, in order to eliminate these major sources of BOD and TSS. A test conducted March 16-17, 1977, in which the char wash water was diverted, indicates that the BOD and TSS limits of the NPDES permit will be met (Table 2). However, the refinery will continue to discharge some BOD, so that if the physical conditions of the streambed are not improved, stagnation will still occur during low-flow periods.

The proposed lining will eliminate the holes in the existing streambed, where organic material collects and stagnates. The refinery effluent will be spread out across the channel, rather than being confined in a narrow stream as at present. This will provide better aeration, which could speed up the oxidation of the organic matter, thereby reducing the amount of BOD that reaches Pearl Harbor. The result of the project could therefore, be beneficial, although the magnitude cannot be predicted with confidence. The NPDES permit criteria are based on concentrations at the outfall, so they would not be affected. The refinery also has a "zone of mixing" permit which requires that the discharge of Aiea Stream not exceed 98°F in the vicinity of the mouth of the Stream. This level is not reached during normal refinery operations. The water would cool faster, with it spread out in the lined channel, but the overall result would be slight; from an average heat loss of 26°F, to a loss of around 27°F from the outfall to the mouth. The average temperature of the water entering Pearl Harbor would be around 80°F, as opposed to the 1976 average of 81°F. Neither is far from the average temperature of the Harbor waters (74°-83°F). Aiea Stream water is slightly lower in dissolved oxygen than the Harbor receiving waters, but in other parameters it does not significantly differ from the Harbor or other streams (Ref 8).

The proposed concrete lining will reduce the total sediment load of the stream by a relatively small amount. Sediment deposition does not presently occur in the second increment channel (Ref. 4), so the proposed lining will not increase the amount of sediment reaching Pearl Harbor. The sediment trap constructed at the mouth of the stream will not be affected. Since construction will be

progressing throughout the year, the rainy season cannot be avoided. It is anticipated that during the period of project construction, the waters at the stream outlet at Pearl Harbor would be temporarily discolored and turbid from siltation. Mitigation measures to remedy this situation will consist of requiring the Contractor to conform to the following regulations:

1. The Contractor shall not pollute the stream with fuel, oils, bituminous materials, calcium chloride, acids, construction wastes, wash waters or other harmful materials.
2. Surface drainage from cuts and fills and from borrow and waste disposal areas shall, if turbidity producing materials are present, be held in suitable sedimentation ponds or shall be graded to control erosion to meet acceptable limits.
3. Objectionable construction discharges shall be processed, filtered, ponded or otherwise treated prior to their discharge into a waterway or drainage system.
4. Disposal of any material, garbage, oil, grease, chemicals, trash and other similar materials on areas adjacent to streams shall be subject to the approval of the City and County Engineer.

In summarizing the above discussion of water quality, it can be stated that the proposed project will have no long-term adverse effects on the quality of water discharged into Pearl Harbor by Aiea Stream. The BOD, temperature, and sediment load of the stream could be reduced, by a small amount, from the proposed project. The current problem of trash being thrown into the stream by adjacent residents will not be eliminated, but may be reduced by the proposed chain-link fence.

C. Biological Resources

Approximately 9% of the main Aiea Stream currently has a concrete lined invert. With the proposed project, the lining will increase to 15% of the stream length. If the third and fourth increments are given concrete inverts, the proportion of lined channel will be approximately 28%. This represents a permanent loss of stream habitat, which, regardless of the degree of disturbance to which it has been subjected, is a major concern of the U. S. Fish and Wildlife Service and other agencies charged with protecting Hawaii's biological resources. However, as described in the preceding chapter, Aiea Stream does not support a significant aquatic fauna. No native fish or other native stream animals (other than insects) were found anywhere in the stream. The only aquatic organisms found were exotic species that are able to live in altered streams, including concrete lined channels. For this reason, the proposed project will have no adverse impacts on the existing aquatic organisms.

D. Health and Safety

From the human environmental standpoint, the flood control improvements should add to the social well being of the residents by providing protection from potential flooding and damages to property, and eliminating the odors produced by the stream when it stagnates.

E. Land Use

Based on the Preliminary Engineering Report, no existing dwellings will require relocation. The proposed improvements will actually create more useable

land for the abutting landowners in the area between Moanalua Road and the H-1 Freeway. There will be no remnant parcels created by the project.

The upstream end of the fourth increment, as currently envisioned, is approximately 2,500 feet downstream from the C&H and municipal wells. Protective measures will be designed, should future improvements extend to the vicinity of these wells.

A State park, Rainbow Bay Park, is proposed for the vicinity of the mouth of Aiea Stream. The channel at the park site has already been improved as part of the first increment project. The proposed improvements would have no effect on this park.

Secondary growth impacts are not anticipated from the proposed project, since the majority of suitable land in the watershed has already been developed. The project will not alter land use in the watershed.

F. Aesthetics

The appearance of the streambed will be significantly altered (compare Plates 1 and 2). The existing irregular stream channel bordered by rubble walls, dilapidated fences, and eroded banks will be replaced by a uniform rectangular concrete channel and chain-link fences. Trash accumulating in the channel would be more apparant than at present, since it is usually obscured by the dense vegetation. However, when this vegetation is removed, as during the regular maintenance effort, the visual appeal of the existing channel is greatly reduced. The construction field office and storage yard will be placed in an onobtrusive location, such as the vacant land on the north side of Kulawea Street (subject to C&H Co. approval). After completion of the project, ground cover and other low-maintenance landscaping will be planted.

G. Emissions, Solid Wastes and Noise

Noise and Airborne emissions will be caused by equipment such as tractors, trucks, cranes and air compressors during construction. Every effort will be made to create a minimum of disturbances to surrounding areas. Dust control measures will be the responsibility of the Contractor, who shall comply with all applicable State and City requirements.

All solid wastes such as construction debris and excess excavated material will be trucked away from the site for disposal at either the Waialua Sanitary Landfill or at a designated construction site needing fill material.

IV. UNAVOIDABLE ADVERSE IMPACTS

The proposed project will permanently remove approximately 1,430 feet of stream habitat. The importance of this unavoidable loss is lessened by the poor quality of the habitat.

Adjacent residents will temporarily be disturbed by the construction activities, and some property containing rock walls will be taken.

The turbidity of the stream may be increased during construction, in spite of the application of erosion control procedures.

V. ALTERNATIVES TO THE PROPOSED PROJECT

A. No Project

The "Need for Improvement" of Aiea Stream (Chapter I, C) is based upon: 1) the inadequate capacity of the existing stream to convey the design discharge of 3,500 cfs, 2) the ongoing erosion of the stream banks and undermining of retaining walls, and 3) the frequent foul odors from stagnant pools in the streambed. The "No Project" alternative would not alleviate these undesirable conditions; the potential of serious flood damage would remain, the stream banks would continue to erode (threatening adjacent structures and contributing to the siltation problem in Pearl Harbor), and the stream would continue to stagnate (although the odor may be reduced through the diversion of some of the refinery discharges). The existing channel would still require the annual maintenance expense of removing the clogging vegetation. The "No Project" alternative would save approximately \$952,000 in construction costs (a savings which would be partially offset by maintenance costs), and would retain the "natural" stream channel. In actuality, Aiea Stream (in the second increment) is not a "natural" stream; it has been altered by adjacent construction and the refinery discharges to the point where it only functions as an efficient conveyance for storm water. There is no reasonable potential for improving stream habitat as long as these conditions exist.

B. Non-Structural Alternatives

Non-structural alternatives include control of land use throughout a watershed, restricting development of flood plains, manipulating land surfaces to increase raindrop retention time (thus decreasing flood peaks), providing water storage areas (eg. reservoirs, ponds,

spreading areas), and other flood-control measures short of converting a stream into a "storm drain".

Since the Aiea Stream watershed is essentially developed to its full potential, and the flood plain is already occupied, it is obvious that land use planning measures cannot alleviate the existing problems in the second increment. Land surface treatments are likewise inapplicable, since the existing dense forest vegetation provides the best possible runoff retention for the steep slopes that characterize the majority of the undeveloped watershed. The topography of the flood plain upstream from the project area is not suited for any simple type of water storage such as a spreading basin, and a dam would be unjustifiably expensive as well as presenting a hazard to downstream land uses. The structures that are presently threatened by flooding and erosion might be removed, and a "greenway" created. However, the velocity of the stream is much too high for a grassed channel, so that severe erosion would occur without some form of channel protection. Also, the cost and social impacts of relocating people would far outweigh any advantages of retaining the stream as it is.

C. Partial Channel Lining

The feasibility of providing retaining walls at certain locations to prevent bank overtopping, and reinforcing certain curves to prevent erosion, was considered as an alternative to full channel lining. The purpose of this alternative would be to minimize the amount of construction in the streambed in order to retain its natural characteristics. In particular, the boulder strewn channel-which creates pools, riffles, and mini-falls is considered by some to provide potential habitat for native aquatic life. (It does not do so presently because of the high temperature of the refinery discharges.)

The partial channel lining alternative was evaluated on the basis of its ability to convey the design discharge of 3,500 cfs and on its ability to halt erosion of the stream banks. In order to provide sufficient capacity, a retaining wall would be constructed along the southerly bank opposite the Aiea Shopping Center. To accommodate the turbulence generated by the boulders in the streambed (which raises the water surface), this wall would have to be higher than the elevation of the adjacent lots. The wall would be provided with a deep foundation for support and to prevent its being undermined by the stream. The erosion control walls would also require deep foundations, as demonstrated by the existing retaining walls which have been undermined.

Partial lining is not considered to be a viable solution to the problems on the second increment for the following reasons:

1. The high retaining wall would not allow the adjacent lots to drain directly into the channel. "Weepholes" could not be provided because the stream would drain out. A parallel drainage system would be required to convey local runoff.
2. Some protection, either to retain the flow or to prevent erosion, would have to be constructed along both banks for the entire length of the second increment. The only "natural" characteristic that would remain would be the boulder invert, and even this would be disturbed by the excavation of the deep foundations required for the walls.
3. Vegetation would grow in the channel, so that periodic maintenance would still be required.
4. The amount of construction that would be required to make the partial lining alternative meet the project objectives for the second increment could cost as much as-perhaps more than- that required

for the proposed full channel lining. Therefore, there would be no advantage other than retention of potential aquatic habitat, the quality of which is very low.

The alternative of partial lining has been rejected for the second increment, but it could be a viable approach for the third and fourth increments, depending on the results of detailed hydraulic studies for those sections. Evidences of erosion and areas of potential bank overtopping have been identified in the third and fourth increments (Figure 2). Whether or not these are as serious as in the second increment will not be known until the planning process has progressed further.

D. Full Channel Lining Alternatives

Trapezoidal channels were evaluated but are not recommended because of the curvaceous alignment of the existing stream; trapezoidal sections are more prone to overflow along the curves. Acquisition of usable land would be required due to the wider top width. Also, trapezoidal sections are more likely to attract skateboarders.

A CRM (cement rubble masonry) lined rectangular channel was considered but is not recommended due to the higher cost of excavation required to construct the CRM gravity retaining walls for the channel. A CRM channel would require a larger cross section than a concrete channel to convey the design discharge. Acquisition of usable land would therefore, be required due to the larger cross section.

A box culvert system is not recommended because of the extremely high cost of construction. The existing runoff from the areas surrounding the project site are currently flowing directly into the Aiea Stream. Therefore, a box culvert or conduit system would require numerous grated inlets and diversion ditches to direct

surface runoff into the system, and would require continuous maintenance to prevent clogging.

The possibility of designing a channel that would satisfy hydraulic requirements and at the same time provide some aquatic habitat was considered. However, this has been determined to be impractical for Aiea Stream due to the conflict between providing holes and obstructions (a major habitat requirement) and creating a smooth flow of water (a major hydraulic requirement). Furthermore, there is presently no significant native aquatic life in Aiea Stream, and the potential for there ever being any is very low as long as the C&H Refinery discharges warm water. There is therefore, no justification for the expense of providing habitat.

E. Alternative Project Designs

Five alternative designs (A, B, C, D, and E) have been developed as variations of the basic rectangular concrete lined channel described in Chapter I, D. These alternatives differ in channel width at selected points, invert slope, degree of curvature, amount of excavation, and other hydraulic and engineering criteria. Alternate E (Figures 3A, 3B, 3C and 4) is recommended over the other designs for the following reasons (refer to the "Revised Preliminary Engineering Report for Aiea Stream Flood Control Unit II" by VTN-Pacific, October 22, 1976):

1. The alignments of all of the alternates are within the existing Aiea Stream and its sloping banks. Land acquisition will be required for all the alternates. However, the majority of the land to be acquired is located within the streambed and along its sloping banks and unusable to its owners. Based on the benefits to the adjoining landowners, after the channel is completed, the land acquisition cost will be a token amount and its impact on the project cost will be negligible.

VIII. GOVERNMENTAL POLICIES OFFSETTING ADVERSE EFFECTS

The State Public Health Regulations, Chapters 37 and 37a, in conjunction with City and County of Honolulu Construction Standards, are felt to adequately regulate the construction proposed for Aiea Stream. The resultant turbidity is not likely to be greater than that which occurs during storm runoff.

IX. RELATIONSHIP TO LAND USE POLICIES

The policy of the City and County of Honolulu General Plan (dated January 18, 1977), to require development projects to consider natural features such as flood and erosion hazards (policy 3.A.2), came too late for the lower Aiea Stream watershed; houses have already been built in the flood plain. This condition has brought about the need for the proposed flood control improvements. This past development has also limited the options for designing a flood control system in a manner that will help preserve the natural setting of the stream (policy 3.A.5); the "natural setting" of the stream has already been significantly degraded. The proposed project does have a positive relationship with the policy to "participate with State and Federal agencies in the funding and construction of flood control projects" (policy 7.B.6).

X. SUMMARY OF UNRESOLVED ISSUES

The major issue raised in the responses to the EIS Preparation Notice related to evaluating alternatives other than full channel lining. In the course of this evaluation, it was established that, due to the hydraulic requirements of the second increment, full channel lining is the most feasible design for adequately conveying the peak runoff (3,500 cfs) with minimal erosion.

The two major issues raised in the review of this EIS, relate to the short-term impacts of stream turbidity and noise generated

by the construction activities. The anticipated noise impact is treated in detail in the response to the Office of Environmental Quality Control (page B-17). The issue of erosion and sedimentation is covered in the EIS (pages 13-14, 18-19) and in the response to the University of Hawaii Environmental Center (page B-21, 22). There is apparently no disagreement over the need for the proposed project.

XI. NECESSARY APPROVALS

The proposed action will require a Department of the Army Permit for Activities in Waterways (Section 404 permit). The necessary forms and supplemental data will be submitted with the Revised EIS.

References

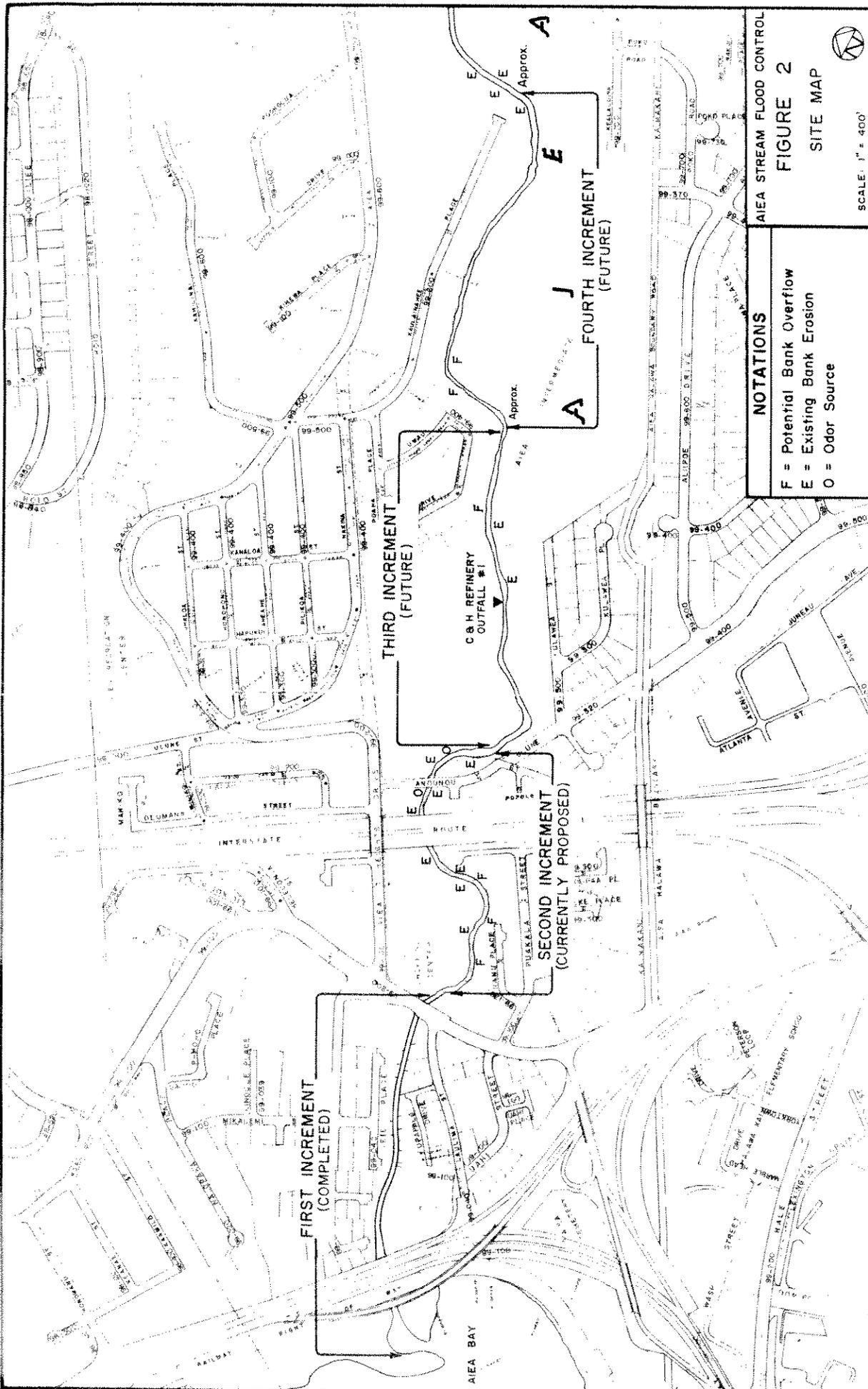
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FIGURES

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AIEA STREAM FLOOD CONTROL
FIGURE 2
 SITE MAP
 SCALE: 1" = 400'

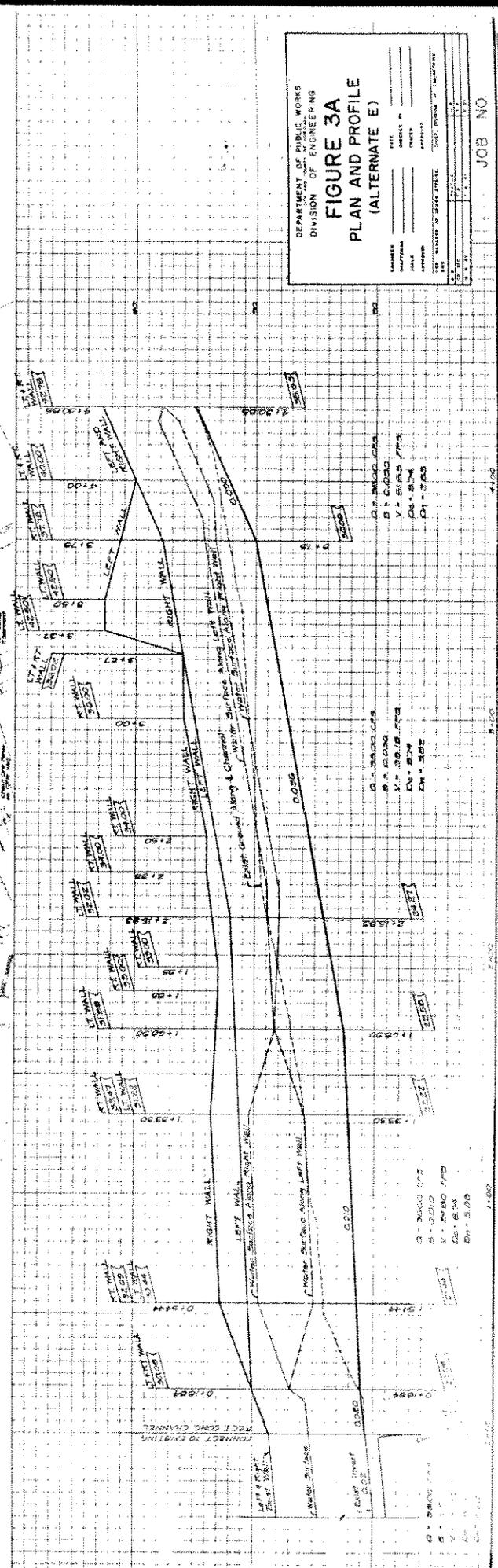
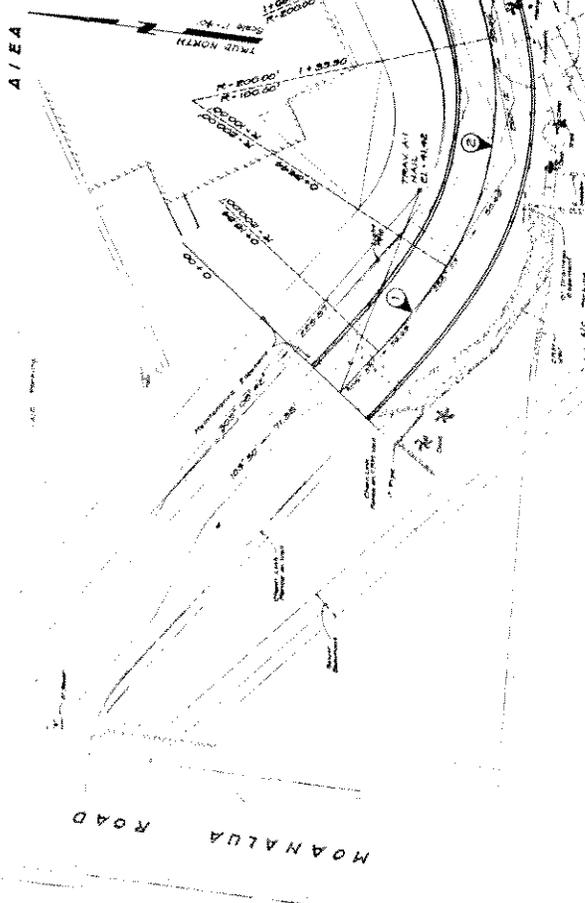
NOTATIONS	
F	Potential Bank Overflow
E	Existing Bank Erosion
O	Odor Source

AIEA SHOPPING CENTER

CURVE DATA

①	A = 107.32	A = 48.71	A = 0.00
②	Δ = 9.06	Δ = 22.50	Δ = 30.00
③	R = 400.00	R = 100.00	R = 2400.00
④	T = 17.88	T = 41.61	T = 107.50
⑤	C = 38.56	C = 76.83	C = 214.58
⑥	L = 35.00	L = 76.86	L = 20.00

MATCH LINE
STA 3+30.05
R = 8400.00'



DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

FIGURE 3A PLAN AND PROFILE (ALTERNATE E)

DATE	11/1/57
PROJECT	PROJECT
DESIGNER	DESIGNER
CHECKER	CHECKER
APPROVER	APPROVER
SCALE	SCALE
JOB NO.	JOB NO.

AIEA SHOPPING CENTER

CURVE DATA

- 1. 200.00
- 2. 250.00
- 3. 300.00
- 4. 350.00
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- 7. 500.00
- 8. 550.00
- 9. 600.00
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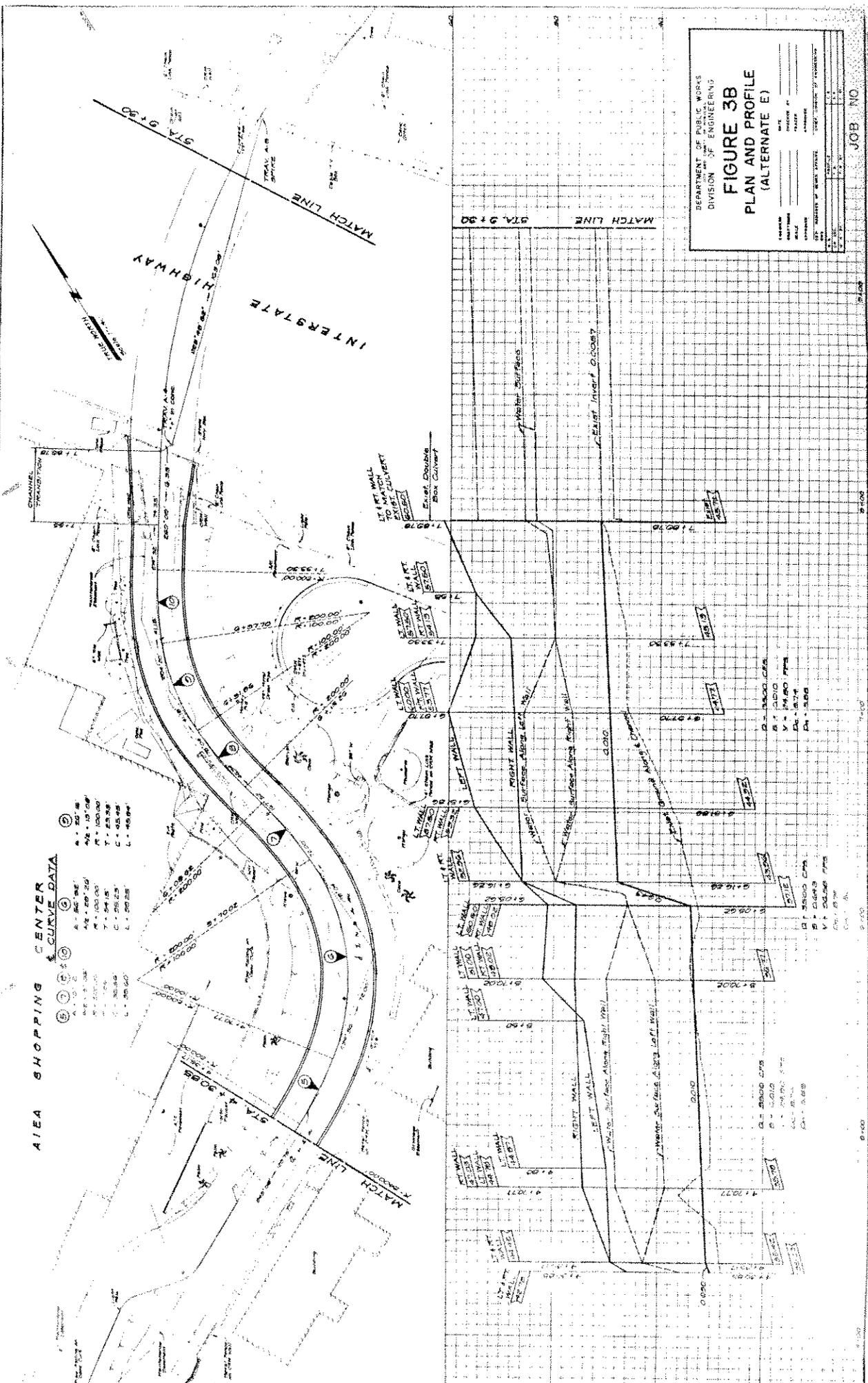


FIGURE 3B
PLAN AND PROFILE
(ALTERNATE E)

DRAWN BY	DATE	PROJECT #	ADDRESS	JOB NO.

SHEET NO. OF SHEETS

CURVE DATA

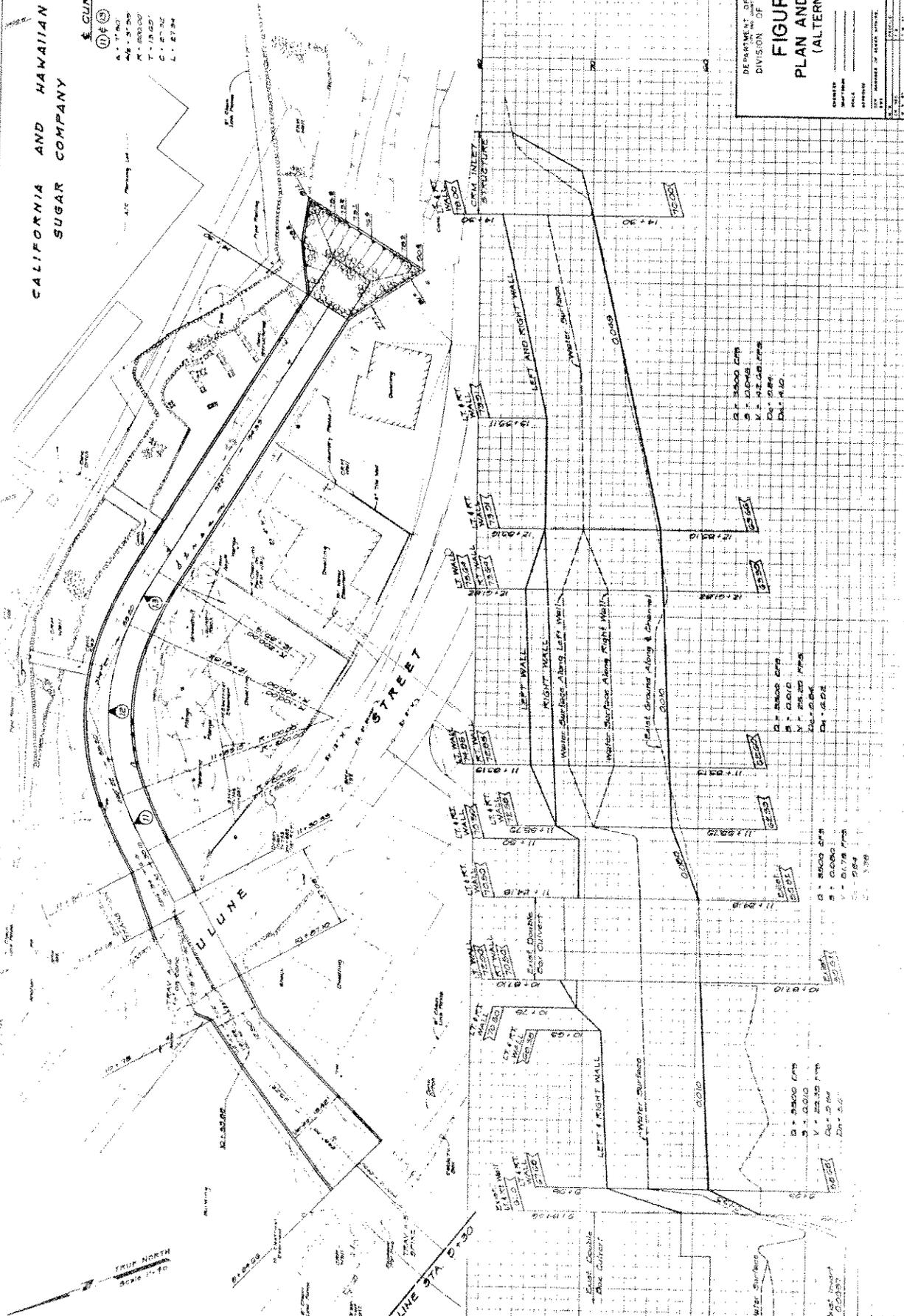
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DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

FIGURE 3C PLAN AND PROFILE (ALTERNATE E)

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PROJECT	NO.		
DATE			
BY			
CHECKED			
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JOB NO.



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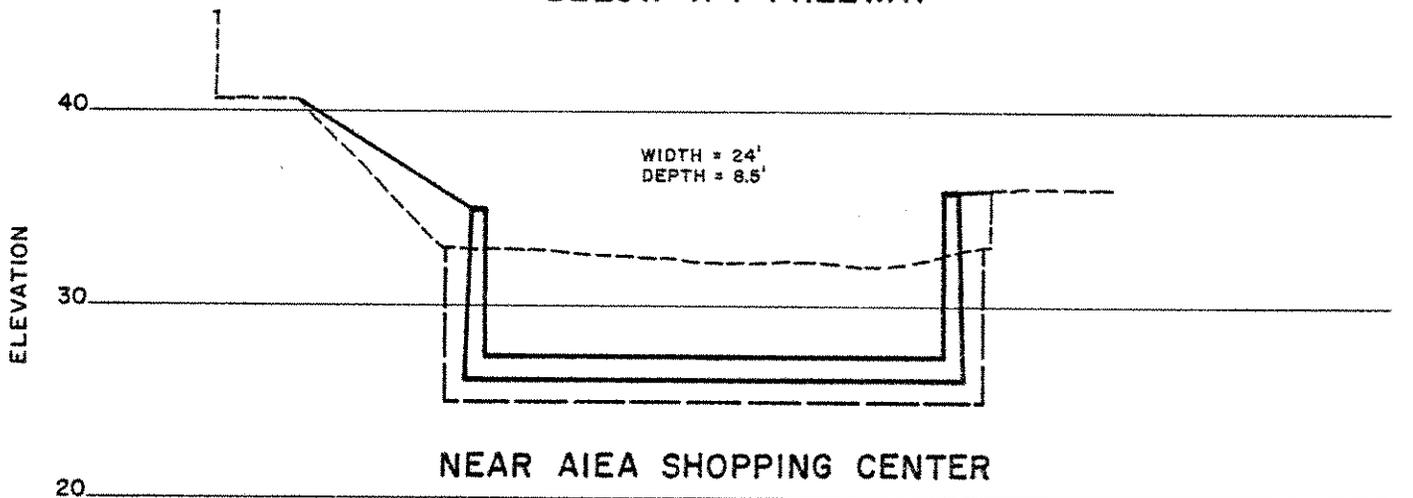
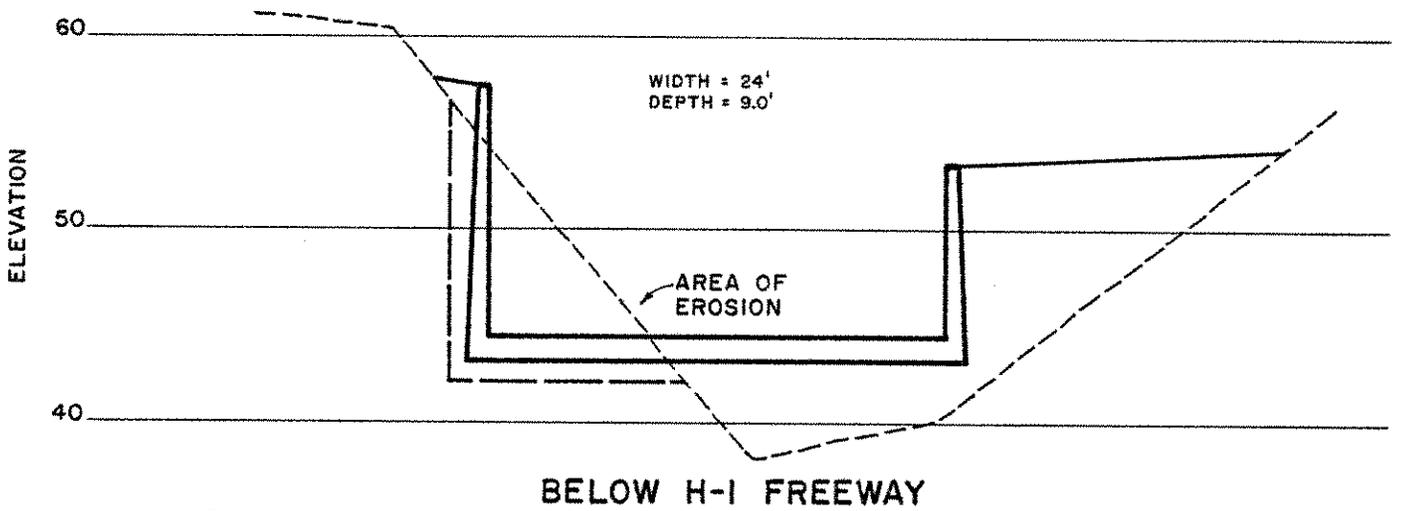
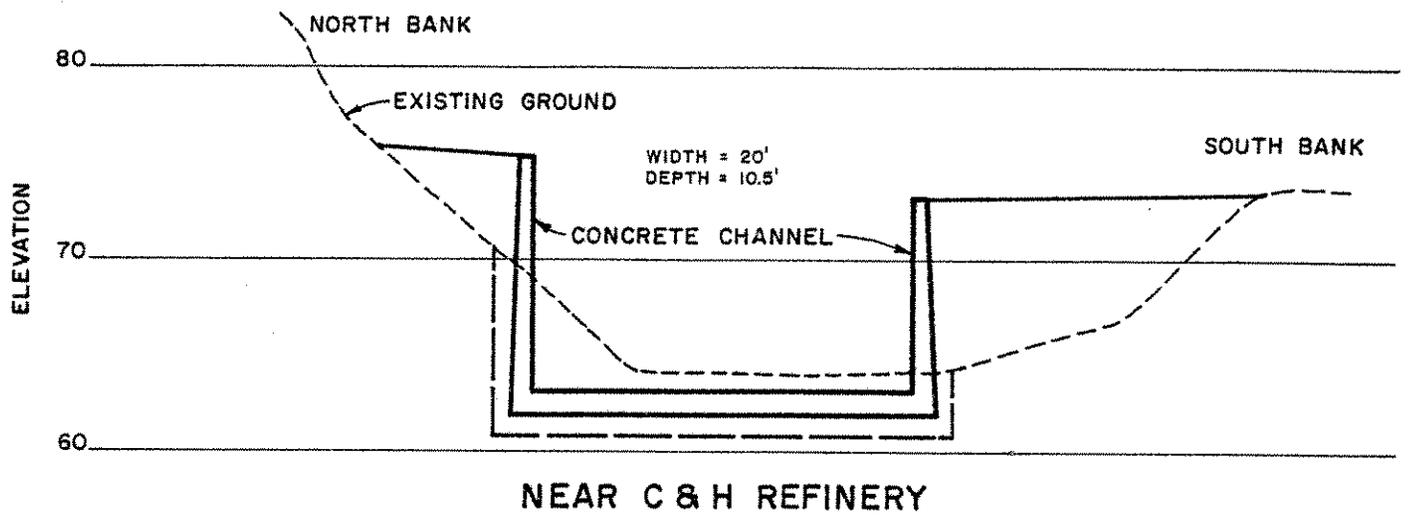
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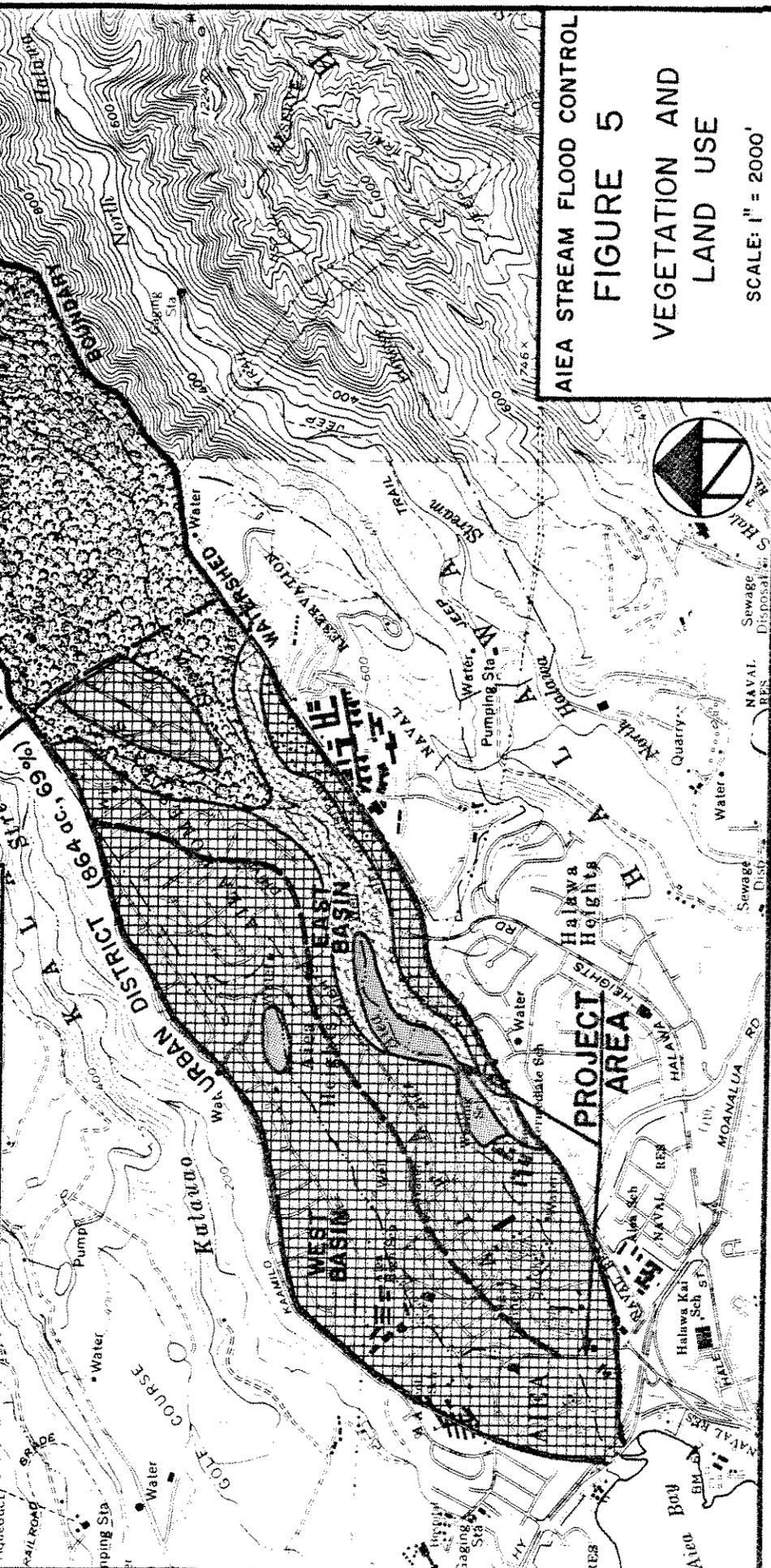
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AIEA STREAM FLOOD CONTROL
FIGURE 4
 REPRESENTATIVE
 SECTIONS
 SCALE: 1 INCH = 10 FEET

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LEGEND							
SYM.	CATEGORY	EAST BASIN		WEST BASIN		TOTAL	
		Ac.	%	Ac.	%	Ac.	%
[Grid Pattern]	URBAN DEV.	308	35	366	99	674	54
[Dotted Pattern]	FOREST	450	51			450	36
[Stippled Pattern]	KOA HAOLE	72	8			72	6
[Horizontal Lines]	GRASS	50	6	4	1	54	4
	TOTAL	880		370		1250	







PLATES



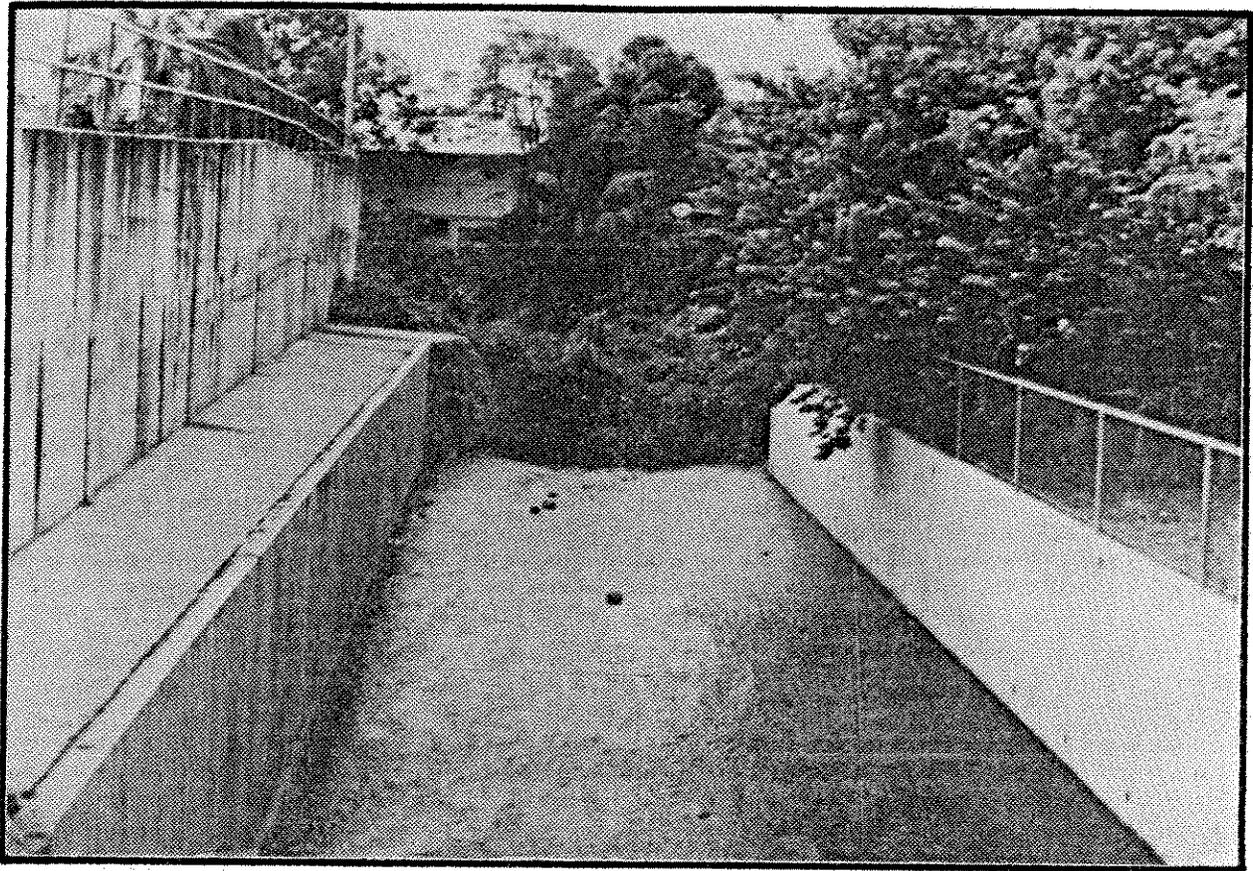


Plate 1 Existing concrete lined channel at the beginning of the proposed improvements. View upstream.

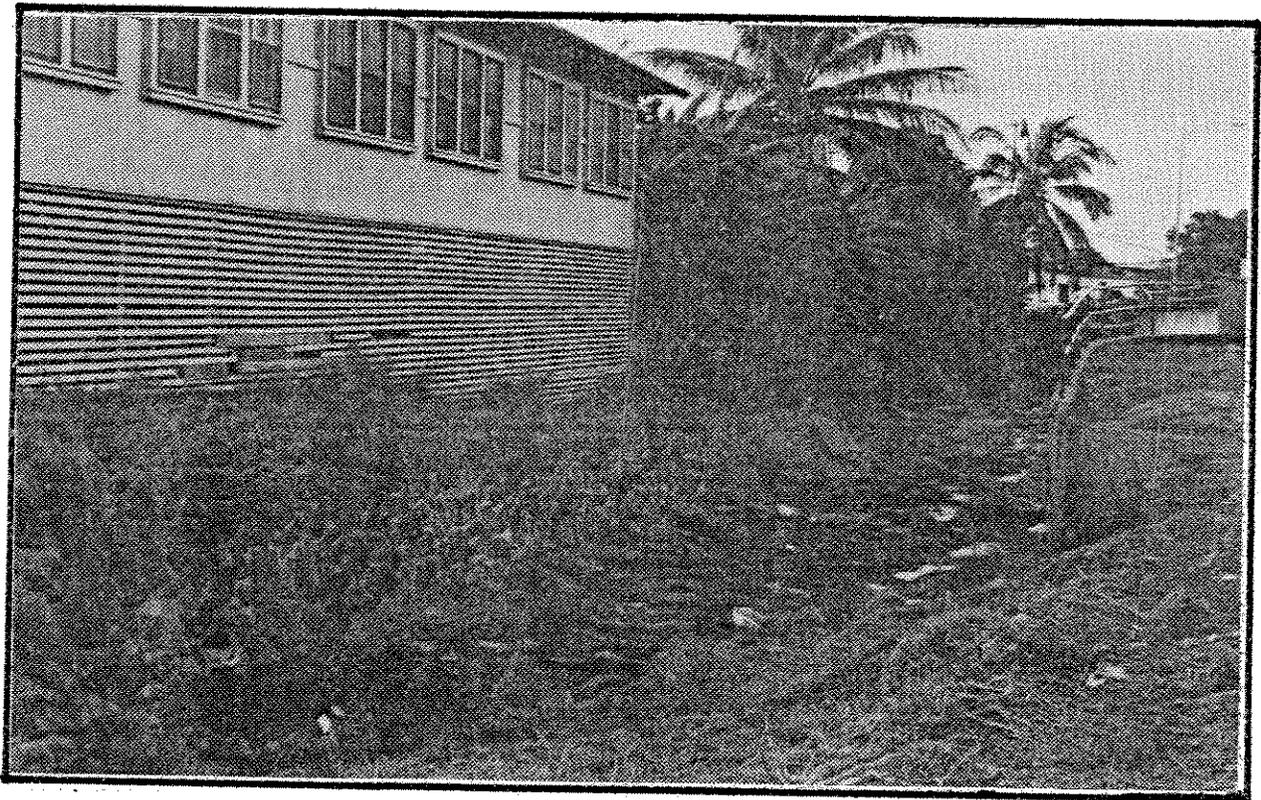


Plate 2 Typical unimproved stream channel adjacent to the private school near the Aiea Shopping Center. Note the low wall that forms the southerly bank. View downstream.





Plate 3 Example of bank erosion, downstream from the H-1 Freeway



Plate 4 Culvert crossing at the C&H Refinery, which became clogged with debris in a 1969 storm. Third Increment, view downstream.



APPENDIX A



APPENDIX A

Agencies and Organizations Consulted for the EIS

Response to
Preparation Notice

Federal Government

U. S. Army Engineer District, Honolulu	1/24/77
USDI Fish and Wildlife Service	2/10/77
USDA Soil Conservation	1/13/77
Headquarters, Fourteenth Naval District	1/17/77

State of Hawaii

Dept. of Accounting & General Service	none
Dept. of Health	2/ 4/77
Dept. Land and Natural Resources	1/27/77
Dept. of Planning and Economic Development	1/14/77
Office of Environmental Quality Control	1/21/77

City and County of Honolulu

Board of Water Supply	none
Dept. of General Planning	none
Dept. of Land Utilization	none

Others

Aiea Community Association	none
C&H Sugar Company	1/31/77
Life of the Land	none

7710542



PODED-P

RECEIVED DEPARTMENT OF THE ARMY
 DIV. OF ENGINEERING HONOLULU DISTRICT CORPS OF ENGINEERS
 BLDG. 230, FT. SHAPER DEPT. OF PUBLIC WORKS
 APO SAN FRANCISCO 96558
 JAN 27 2 38 PM '77
 JAN 27 10 27 AM '77

TO ENV U 24 January 1976
 Engg

Mr. Wallace Miyahira
 Director and Chief Engineer
 Department of Public Works
 City and County of Honolulu
 650 South King Street
 Honolulu, Hawaii 96813

Dear Mr. Miyahira:

We have reviewed the Environmental Impact Statement Preparation Notice for the Aiea Stream Flood Control Project, as requested in your letter of 20 December 1976. We previously reviewed the project environmental assessment in our letter of 8 October 1976. The following additional comments are offered for your consideration.

a. If real estate is available, it is suggested that a larger transition of the channel wall be provided along the north bank downstream of Ulune Street to minimize turbulence at the box culvert.

b. If topography is not a restraint, it is suggested that the drop structure at station 6+16.26 be moved to just downstream of the Interstate Highway to better control the flow characteristics along the reverse curves.

Thank you for the opportunity to review this document.

Sincerely yours,

for 
 KISUK CHEUNG
 Chief, Engineering Division



DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

701-12-0098

FRANK F. FASI
MAYOR

March 8, 1977

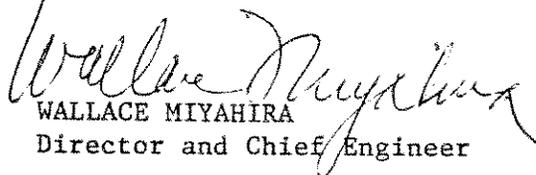
Mr. Kisuk Cheung
Chief, Engineering Division
Honolulu District
U. S. Army Corps of Engineers
Bldg. 230, Fort Shafter
APO San Francisco 96558

Dear Mr. Cheung:

SUBJECT: YOUR LETTER OF JANUARY 24, 1977, RELATING
TO THE EIS PREPARATION NOTICE FOR AIEA
STREAM FLOOD CONTROL PROJECT

Thank you for your comments on the subject EIS Preparation Notice.
Your suggestions on the design and construction plans will be considered
by our engineering consultant for this project.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer

7700 928



United States Department of the Interior

RECEIVED DIV OF ENGINEERING FISH AND WILDLIFE SERVICE RECEIVED DEPT OF PUBLIC WORKS

FEB 14 2 14 PM '77 FEB 14 9 27 AM '77
Office of Ecological Services
821 Mililani Street
Honolulu, Hawaii 96813 TO

Reference: ES

February 10, 1977

ENV W
Engy

Mr. Kazu Hayashida
Director and Chief Engineer
City and County of Honolulu
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

Dear Sir:

This provides comments on the Environmental Impact Statement Preparation Notice for the Aiea Stream Flood Control Project, dated December 20, 1976, proposing the construction of a 1430-foot concrete-lined channel between C & H refinery and Aiea Shopping Center, island of Oahu, Hawaii.

General Comments

This preparation notice reflects a general improvement over the EAR reviewed by our office on November 17, 1976. However, as mentioned previously, additional information concerning changes in stream parameters (e.g., increased velocity, volume, and temperature) resulting from the proposed project should be included in the EIS. Furthermore, a discussion should be provided which evaluates the impacts these changes would have on water quality and fishery resources in the Aiea Stream estuary and receiving waters of East Loch, Pearl Harbor.

Specific Comments

Page 5, Sec. IV.A. Natural Environment, paragraph 4. The first sentence should be expanded to include boiler blowdown, decant, and bone char filter washwater as part of C & H refinery's discharge into Aiea Stream.

Same page and paragraph, line 9, fourth sentence, should read, "Accumulated trash, as well as urban/agricultural run-off and refinery effluents, which are high in organic materials, gather in depressions in the existing streambed during this shutdown period."

Same page and paragraph, last line and continuing on the next page. Health problems, such as odors and mosquito infestations, are mentioned in the text in association with stream characteristics and the refinery's annual maintenance period when operation is shutdown, usually during the months



of November and December. According to the State Department of Health, residents have filed complaints of odors, generally during the summer months, and always when C & H refinery had been discharging into Aiea Stream. No reports are in their files concerning mosquito infestation problems. These apparent contradictions should be resolved with appropriate text changes.

Page 6, Sec. IV.A., paragraph 5. We suggest that data supporting the conclusion that Aiea Stream maintains minimal fish and aquatic life be included in the discussion.

Page 7, Sec. V.A. Potential Significant Impacts, paragraph 1. We recommend that the first sentence begin as follows: "The permanent loss of stream habitat . . ."

Same page and paragraph, last sentence. We suggest changing this sentence to read: "There would, therefore, be a chance to improve the existing aquatic habitat in Aiea Stream."

Page 9, Sec. VI.A.3. Water Pollution, paragraph 2, third sentence. See General Comments.

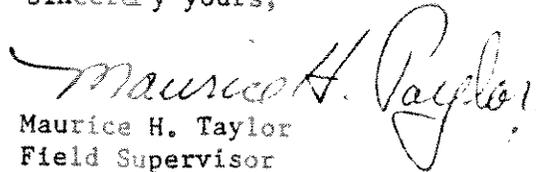
Page 9, Sec. VI.A.4. Biological Resources. See General Comments.

Page 9, Sec. VI.A.5. Special Zones. The statement should be expanded to indicate the effects the project will have on the zone of mixing permit requirements issued by State Department of Health.

Page 10, Sec. VI.B.1. Health and Safety, lines 5 and 6. See Specific Comments referring to page 5, Sec. IV.A. Natural Environment, paragraph 4, last line

We appreciate this opportunity to comment.

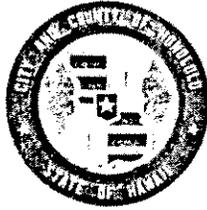
Sincerely yours,


Maurice H. Taylor
Field Supervisor

cc: ARD, AE
HA
HDF&G

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

701-12-0097

March 8, 1977

Mr. Maurice H. Taylor
Field Supervisor
Division of Ecological Services
Fish and Wildlife Service
U. S. Department of the Interior
821 Mililani Street
Honolulu, HI 96813

Dear Mr. Taylor:

SUBJECT: YOUR LETTER OF FEBRUARY 10, 1977, RELATING
TO THE EIS PREPARATION NOTICE FOR AIEA
STREAM FLOOD CONTROL PROJECT

Thank you for your comments on the subject EIS Preparation Notice.

The following are our responses to your comments:

General Comments

Major consideration will be given in the EIS to the potential effects of the proposed project on the water quality and fishery resource of the stream and the East Loch receiving waters. In this regard, we will present data on the various salient physical parameters of Aiea Stream.

Specific Comments

1. With the cooperation of Mr. Lauritzen, manager of the C&H Refinery, we will describe the physical, chemical and temporal characteristics of the various refinery discharges.
2. We concur with your suggested re-wording.
3. The reference to the nuisance of odors and mosquito infestations

Mr. Maurice H. Taylor
Page 2

was drawn from the Final EIS for the first increment of channel lining (dated July, 1972). The forthcoming EIS will draw a more detailed correlation between water quality parameters and health problems.

4. The conclusion regarding the quality of the aquatic habitat in Aiea Stream was based on the apparently poor water quality. Native stream fauna are not at all tolerant of high water temperature. These observations will be expanded in the EIS.
5. We concur that channel lining results in permanent loss of stream habitat.
6. We concur with your suggested re-wording.
7. See General Comments.
8. See General Comments and Specific Comments #4.
9. The effect of the project with regard to "zone of mixing" permit requirements will be discussed with the water quality characteristics of the Refinery discharges.
10. See General Comments.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer

7760318

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

440 Alexander Young Building, Honolulu, HI 96813

RECEIVED
DEPT OF PUBLIC WORKS
JAN 17 3 12 PM '77
January 13, 1977

TO Engng

RECEIVED
DIV. OF ENGINEERING
JAN 18 9 45 AM '77

Mr. Kazu Hayashida
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

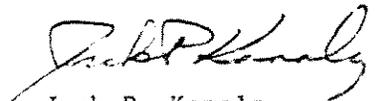
Dear Mr. Hayashida:

Subject: Aiea Stream Flood Control Project, Aiea, Oahu, TMK: 9-9-05

We have reviewed the above-mentioned document and have no comments to offer.

Thank you for the opportunity to review this document.

Sincerely,


Jack P. Kanalz
State Conservationist



7700391

HEADQUARTERS
FOURTEENTH NAVAL DISTRICT
DEPT. OF PUBLIC WORKS

BOX 110
FPO SAN FRANCISCO 96610

RECEIVED
JAN 19 3 03 PM '77
TO ENV CL
Engng
IN REPLY REFER TO:
48:09FA:sh
Ser 114
17 JAN 1977

Mr. Wallace S. Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Miyahira:

Environmental Impact Statement (EIS)
Preparation Notice for the Aiea Stream Flood Control Project

The subject EIS Preparation Notice, which was forwarded by your letter of 20 December 1976 has been reviewed for comment. The determination that an EIS must be provided to analyze all stages of the project as a whole provides an opportunity to review this project in depth.

For many years project developers have offered rationalizations such as are found under the heading of Water Pollution on page 9:

"The siltation problem in Pearl Harbor has existed for many years and will continue to exist. However, the Aiea Stream is a very minor contributor of sediment as compared with other sources (e.g. Waimalu Stream)".

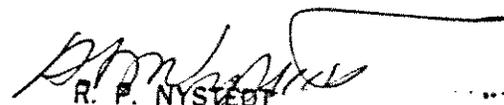
The U. S. Navy is taking vigorous steps to insure that there is a reduction of sediment from all sources, however large or small, so that siltation will continue to be effectively reduced.

The forthcoming EIS should include in Study Requirements, shown on page 7, detailed consideration of the problems of erosion and siltation. For example, on page 13 there is mention that the EIS will consider the alternative of reinforcing certain curves to prevent bank erosion but not lining the entire channel. Other alternatives might be included.

In conclusion, it is important that the question of siltation and erosion be given high priority during the preparation of the EIS, and that the analysis be given careful scrutiny in later review.

Thank you for the opportunity to review this Notice.

Sincerely,


R. P. NYSTEDT
CAPTAIN, CEC, USN
DISTRICT CIVIL ENGINEER
BY DIRECTION OF THE COMMANDANT

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

701-12-0096

March 8, 1977

Captain R. P. Nystedt
District Civil Engineer
Headquarters, Fourteenth Naval
District
Box 110
FPO San Francisco 96610

Dear Captain Nystedt:

SUBJECT: YOUR LETTER OF JANUARY 17, 1977, RELATING
TO THE EIS PREPARATION NOTICE FOR AIEA
STREAM FLOOD CONTROL PROJECT

Thank you for your comments on the subject EIS Preparation Notice.

We recognize the importance of erosion and siltation, and will thoroughly evaluate these subjects in the EIS. As you may be aware, there have been several surveys made, but there is still a paucity of data on sediment loads for Oahu streams. Although Aiea Stream has not been sampled for suspended sediment, a comparison with adjacent watersheds suggests a sediment rate of less than 1,000 tons per square mile per year, or a total yield of less than 1,800 tons per year. It is evident that some of this material is generated by the erosion of the stream banks in the project area and the proposed channel improvements will eliminate this sediment source.

Our initial analysis of various alternatives to complete channel lining has indicated that partial lining will not provide adequate flood protection. The EIS will discuss the pros and cons of these different approaches.

Very truly yours,

A handwritten signature in cursive script, reading "Wallace Miyahira".
WALLACE MIYAHIRA
Director and Chief Engineer

77 01331

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

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DIV. OF ENGINEERING
MAR 4 8 14 AM '77



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FEB 22 10 54 AM '77

STATE OF HAWAII
DEPARTMENT OF HEALTH

P.O. Box 3378
HONOLULU, HAWAII 96801

February 4, 1977

ENV
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GEORGE A. L. YUEN
DIRECTOR OF HEALTH

Audrey W. Mertz, M.D., M.P.H.
Deputy Director of Health

Henry N. Thompson, M.A.
Deputy Director of Health

James S. Kumagai, Ph.D., P.E.
Deputy Director of Health

In reply, please refer to:

File: EPHS - SS

Mr. Kazu Hayashida
Director and Chief Engineer
Department of Public Works
City & County of Honolulu
650 S. King St.
Honolulu, Hawaii 96813

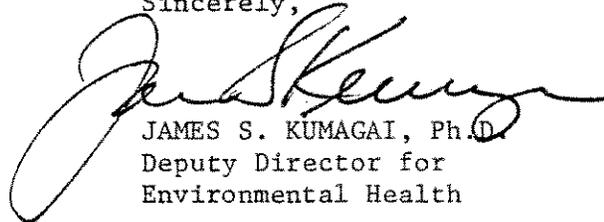
Dear Mr. Hayashida:

SUBJECT: AIEA STREAM FLOOD CONTROL

Thank you for allowing us to review and comment on the subject's proposed EIS. Please be informed that we have no comments or objections to this project at this time.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

Sincerely,


JAMES S. KUMAGAI, Ph.D.
Deputy Director for
Environmental Health

77006

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GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

JAN 27 1 18 PM '77

DIV. OF PUBLIC WORKS
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PUBLIC WORKS

JAN 31 10 49 AM '77

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621

HONOLULU, HAWAII 96809

January 27, 1977

CHRISTOPHER COBB, CHAIR
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

ENV
Engg
DIVISIONS:
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Your: 601-12-066

RECEIVED
DIVISION OF ENGINEERING
JAN 31 3 02 PM '77

Honorable Wallace Miyahira
Dept. of Public Works
650 So. King St.
Honolulu, HI 96813

Dear Sir:

We have reviewed the EIS preparation notice for the Aiea Flood Control Project.

The third and fourth increments will be located close to two existing wells, and considerations should be given to protection of the wells. The second increment should have no effect on these wells.

The project will have secondary impact on a park proposed for Aiea Bay. The notice indicates the project will reduce silting of the bay, but no quantities are given. No mention is made of trash and other pollutants entering into the bay.

Adverse effects on fisheries should be minimal since the Aiea Stream, mauka of the refinery is dry most of the year.

Very truly yours,

GORDON SOH
Program Planning Coordinator

cc: DOWALD
State Parks
Fish and Game

DEPARTMENT OF PUBLIC WORKS	
INITIAL FOR YOURS	
<input checked="" type="checkbox"/> State P. W. Engr.	Approved
<input type="checkbox"/> P. W. Secy.	Sign.
<input type="checkbox"/> Staff Comm. Br.	Info.
<input checked="" type="checkbox"/> Planning Div.	File
<input type="checkbox"/> Div. of Highw. Br.	See me
<input type="checkbox"/> Br.	Comments

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



ANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

701-12-0101

March 8, 1977

Mr. Gordon Soh
Program Planning Coordinator
Department of Land and Natural
Resources
State of Hawaii
P. O. Box 621
Honolulu, HI 96809

Dear Mr. Soh:

SUBJECT: YOUR LETTER OF JANUARY 27, 1977, RELATING
TO THE EIS PREPARATION NOTICE FOR AIEA
STREAM FLOOD CONTROL PROJECT

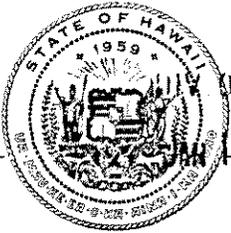
Thank you for your comments on the subject EIS Preparation Notice.

We appreciate your calling attention to the two potentially affected wells; we will insure that they are not damaged. The effect on the proposed park will be very minor, since the stream section entering Aiea Bay is already lined except for the portion below the U. S. Navy right-of-way. The EIS will discuss in detail the question of erosion/siltation and other water quality impacts. We agree that the impact to fisheries will be minimal.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer

7708373



RECEIVED DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT OF PUBLIC WORKS

GEORGE R. ARIYOSHI
Governor

HIDETO KONO
Director

FRANK SKRIVANEK
Deputy Director

Kamamalu Building, 250 South King St., Honolulu, Hawaii 96804

January 14, 1977

JAN 19 9 19 AM '77
ENV/LL
Engy

Ref. No. 2763

Mr. Kazu Hayashida
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Hayashida:

Subject: Aiea Stream Flood Control Project, Aiea, Oahu,
TMK 9-9-05, Environmental Impact Statement
Preparation Notice

We have reviewed the subject EIS Preparation Notice and have the following comments to offer at this time.

In general, the document seems to adequately assess the major environmental impacts which can be anticipated to result from the proposed full channel lining of the subject increment (Moanalua Road to C&H refinery). However, in view of the high costs, lack of visual appeal, and severe impact upon the stream environment associated with full channel lining, perhaps a more comprehensive investigation of alternative flood control measures should be made. Alternatives such as those presented in Section VIII-C of the document warrant thorough evaluation in regard to their effectiveness in meeting project objectives, as well as for their impact upon the environment.

We appreciate the opportunity to review and comment on this EIS Preparation Notice.

Sincerely,

HIDETO KONO

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



HANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

701-12-0100

March 8, 1977

Mr. Hideto Kono
Director
Department of Planning and
Economic Development
State of Hawaii
P. O. Box 2359
Honolulu, HI 96804

Dear Mr. Kono:

SUBJECT: YOUR LETTER OF JANUARY 14, 1977, RELATING
TO THE EIS PREPARATION NOTICE FOR AIEA
STREAM FLOOD CONTROL PROJECT

Thank you for your comments on the subject EIS Preparation Notice.

Our initial analysis has indicated that partial lining will not adequately provide flood protection to adjacent residences. The EIS will discuss the pros and cons of alternatives to full channel lining.

Very truly yours,

Wallace Miyahira
WALLACE MIYAHIRA
Director and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR

RECEIVED
DIV. OF ENGINEERING
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DEPT. OF PUBLIC WORKS
JAN 25 9 15 AM '77

RICHARD E. MARLAND, PH.D.
DIRECTOR

TELEPHONE NO.
548-6915

TO
STATE OF HAWAII

OFFICE OF ENVIRONMENTAL QUALITY CONTROL

OFFICE OF THE GOVERNOR

550 HALEKAUWILA ST.

ROOM 301

HONOLULU, HAWAII 96813

January 21, 1977

ENV
Eng

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu

Dear Mr. Miyahira,

SUBJECT: Environmental Impact Statement Preparation Notice
for the Aiea Stream Flood Control Project

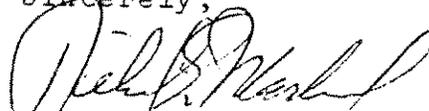
This Office has reviewed the subject EIS Preparation Notice.

We offer the following comments:

- a) The term "flashy" should be clearly defined in the EIS.
- b) Ownership of the lands involved in the project should be shown.
- c) If any cost-benefit analysis is prepared for this project, details should be provided in the EIS.
- d) Under Project Description (p.4) the sentence, "the new channel will be of reinforced concrete . . .," could be viewed as an alternative that has already been chosen. Since the purpose of an EIS is to be a decision making tool, the selection of an alternative should, of course, be made after the EIS is finalized and the information has been made available to the decision maker. Therefore, the proposed channel construction in phase II and possibly III and IV, should be evaluated along with all other reasonable alternatives. Thus the discussion of alternatives (including the potential environmental impacts of each) should include both structural and non-structural measures.
- e) We agree that the remaining increments should be viewed as one action and be addressed by a single EIS.

We trust that these comments will be useful in the preparation of the EIS. Thank you for the opportunity to review this EIS Preparation Notice. We will look forward to receiving the EIS.

Sincerely,



Richard E. Marland
Director

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

701-12-0102

March 8, 1977

Office of Environmental
Quality Control
State of Hawaii
550 Halekauwila Street
Room 301
Honolulu, HI 96813

Gentlemen:

SUBJECT: YOUR LETTER OF JANUARY 21, 1977, RELATING TO
THE EIS PREPARATION NOTICE FOR AIEA STREAM
FLOOD CONTROL PROJECT

Thank you for your comments on the subject EIS Preparation Notice.

The following is our point-by-point response:

- a) As used here, the term "flashy" refers to the rapid rise and fall of stream discharge after a rainfall. The EIS will describe other hydraulic characteristics of Aiea Stream.
- b) A land ownership map of the Aiea Stream watershed will be presented in the EIS.
- c) The "Detailed Project Report, Flood Control Improvements for Aiea Stream", prepared by the Corps of Engineers (December, 1969) determined that the first increment of improvements, from Pearl Harbor to Moanalua Road, would have a favorable cost-benefit ratio. A cost-benefit analysis is not required for City and County projects.

- d) Our initial analysis of alternatives indicates that partial lining would not provide adequate flood protection. The EIS will discuss the pros and cons of the various alternatives considered.
- e) The EIS will cover the flood protection requirements of the entire east basin of the Aiea Watershed.

Very truly yours,



WALLACE MIYAHIRA
Director and Chief Engineer



RECEIVED
 DIV. OF CALIFORNIA AND HAWAIIAN DEPT. OF PUBLIC WORKS
 SUGAR COMPANY
 FEB 1 3 47 PM '77
 P. O. BOX 308 • AIEA, HAWAII 96701

RECEIVED
 DEPT. OF PUBLIC WORKS
 FEB 1 10 35 AM '77
 TO _____
 ENVL ()
 [Signature]
 January 31, 1977

City and County of Honolulu
 Department of Public Works
 650 South King Street
 Honolulu, Hawaii 96813

Gentlemen:

SUBJECT: AIEA STREAM FLOOD CONTROL PROJECT
 TMK: 9-9-05

Your office has asked for comments on the Environmental Impact Statement Preparation Notice in conjunction with the subject Flood Control Project.

Our comments are essentially the same as those submitted to your office in our letter of October 1, 1976 for Phase II of this project. We are wholeheartedly in support of Phase III and IV of the project believing it should be given one of the highest priorities for the benefit of the Aiea community in reasons listed below.

Of primary importance, this project will give much needed flood relief protection to homes adjacent to the Aiea Stream. Although the refinery proper sits on higher ground and we have only sustained minor damage from surface waters during heavy rains, we are well aware of the damage caused by flooding to those living in lower areas next to the stream. This has affected not only employees of C and H Sugar, but many other families in the community.

Without question, this project will eliminate pockets and depressions where waters now gather and are a source of mosquito infestation.

January 31, 1977

These same pockets and depressions also collect nutrients that are responsible for odors in the community from time to time. Elimination through the boxed channel will then eliminate both mosquito infestations and sources of odors and accompanying pollution.

We further feel that the aesthetics of the stream would be improved by a sweeping boxed channel. Undergrowth, erosion, and sedimentation have marred the appearance of the stream to a degree that could hardly be called attractive or scenic.

In summary, we feel this project would be a considerable benefit to the Aiea community in flood protection, environmental improvement and elimination of mosquitoes and odors. Rest assured that your office will receive our utmost cooperation to complete this project.

Very truly yours,



H. M. Lauritzen
Manager

HML:jb

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

701-12-0099

March 8, 1977

Mr. H. M. Lauritzen
Manager
California and Hawaiian Sugar
Company
P. O. Box 308
Aiea, HI 96701

Dear Mr. Lauritzen:

SUBJECT: YOUR LETTER OF JANUARY 31, 1977, RELATING
TO THE EIS PREPARATION NOTICE FOR AIEA
STREAM FLOOD CONTROL PROJECT

Thank you for your comments in support of this project. The EIS will be covering the water quality aspects of the project in detail. Our consultant, VTN-Pacific, will therefore be contacting you for data on the physical and chemical characteristics of the Refinery discharges. Any information that you can supply will be greatly appreciated.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer

APPENDIX B

APPENDIX B. Comments and Responses to the EIS

	<u>Comment Date</u>	
<u>Federal Government</u>		
Fourteenth Naval District	6/21/77	NC
Soil Conservation Service	5/25/77	NC
US Army Corps of Engineers	6/20/77	
Us Army Support Command	5/26/77	NC
US Coast Guard	6/13/77	NC
<u>State of Hawaii Agencies</u>		
Dept. of Agriculture	6/13/77	NC
Dept. of Defense	5/24/77	NC
Dept. of Health	6/1/77	
Dept. of Land and Natural Resources	5/20/77	NC
Dept. of Social Services and Housing	5/24/77	NC
Dept. of Transportation	6/3/77	NC
Office of Environmental Quality Control	6/20/77	
<u>University of Hawaii</u>		
Environmental Center	6/24/77	
Water Resources Research Center	6/1/77	
<u>City and County of Honolulu</u>		
Board of Water Supply	6/2/77	NC
Dept. of General Planning	5/31/77	NC
Dept. of Land Utilization	6/8/77	NC
Dept. of Transportation Services	6/8/77	NC
Office of the Mayor	5/26/77	NC

NC = No comment, or comment not requiring a response.

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TO ENR/CH
 Engrg

HEADQUARTERS
 FOURTEENTH NAVAL DISTRICT
 BOX 170
 SAN FRANCISCO 96610

IN REPLY REFER TO:
 48:09F:SH:mm
 Ser 1293
 21 JUN 1977

Dr. Richard E. Marland
 Director
 Office of Environmental
 Quality Control
 550 Halekauwila Street, Room 301
 Honolulu, Hawaii 96813

Dear Dr. Marland:

Environmental Impact Statement
 for the
 Aiea Stream Flood Control Project
 Aiea, Oahu

The subject Environmental Impact Statement, which was transmitted on 16 May 1977, has been reviewed, and no further comments are to be offered at this time.

Thank you for the opportunity to review this Environmental Impact Statement.

Sincerely,

R. P. NYSTEDT
 CAPTAIN, CEC, USN
 DISTRICT CIVIL ENGINEER
 BY DIRECTION OF THE COMMANDANT

Copy to:
 Department of Public Works
 City and County of Honolulu
 Honolulu Municipal Building
 Honolulu, Hawaii 96813

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

P. O. Box 5004, Honolulu, HI 96850

May 25, 1977

Dr. Richard E. Marland
Office of Environmental
Quality Control
550 Halekauwila St., Rm. 301
Honolulu, HI 96813

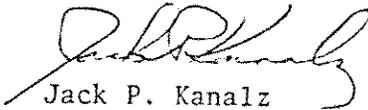
Dear Dr. Marland:

Subject: EIS - Aiea Stream Flood Control, Aiea, Oahu, TMK: 9-9-05

We have reviewed the above-mentioned EIS and have no comments to offer.

Thank you for the opportunity to review this document.

Sincerely,


Jack P. Kanalz
State Conservationist

Enclosure: EIS returned





DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY SUPPORT COMMAND, HAWAII
APO SAN FRANCISCO 96558

AFZV-FE-EE

26 MAY 1977

Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96821

Gentlemen:

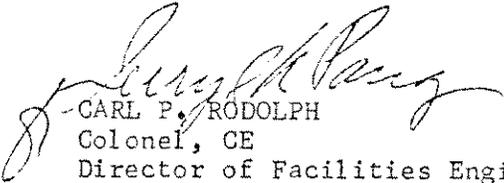
Reference is made to Environmental Impact Statement (EIS) for Aiea Stream Flood Control Project dated May 6, 1977.

The EIS has been reviewed and we have no comments. The document is returned as requested.

The opportunity to review the document is appreciated.

Sincerely yours,

1 Incl
As stated


-CARL P. RODOLPH
Colonel, CE
Director of Facilities Engineering

CF:
Dept of Public Works
City and County of Honolulu
Honolulu Muncipal Bldg
Honolulu, Hawaii 96813



DEPARTMENT OF THE ARMY
 DISTRICT, CORPS OF ENGINEERS
 REG. 230, FT. SHAFTER
 APO SAN FRANCISCO 96346
 DEPT OF PUBLIC WORKS

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20 June 1977
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Engng

Mr. Wallace Miyahira, Director
 Department of Public Works
 City and County of Honolulu
 650 S. King Street
 Honolulu, Hawaii 96813

Dear Mr. Miyahira:

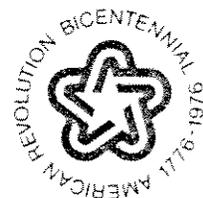
We have reviewed the Environmental Impact Statement for the Aiea Stream Flood Control Project forwarded to us by the State Office of Environmental Quality Control.

We note that Figure 4, Representative Section, indicates that there will be fill material introduced into the stream; therefore, a Department of the Army Permit under the authority of Section 404 of the Federal Water Pollution Control Act Amendments of 1972 will be required. The permit application for the project should be submitted in a timely manner to avoid unnecessary delays.

We recommend that the Environmental Impact Statement be coordinated with the US Fish and Wildlife Service and the US Environmental Protection Agency, and that methods of controlling turbidity should be given serious consideration during the development of project plans and specifications.

Sincerely yours,

F. R. Schlapak, LTC
 F. M. PENDER
 for Colonel, Corps of Engineers
 District Engineer



DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

701-12-0312

July 6, 1977

Colonel F. M. Pender
District Engineer
Honolulu District
U. S. Army Corps of Engineers
Building 230, Fort Shafter
APO San Francisco 96558

Dear Colonel Pender:

SUBJECT: YOUR LETTER OF JUNE 20, 1977 RELATING TO THE
EIS FOR THE AIEA STREAM FLOOD CONTROL PROJECT

Thank you for your comments on the subject EIS.

We are aware that a Department of the Army permit will be required for the proposed construction. The proper forms and support material will be submitted prior to construction of the project.

Both the USFWS and the EPA have been given the opportunity to comment on the EIS, but have not done so. Any person or agency wishing to monitor the proposed project may request notification when construction commences.

The project plans will require that all grading operations be performed in conformance with the applicable provisions of the Water Pollution Control and Water Quality Standards contained in the Public Health Regulations, State Department of Health on Water Pollution Control and Water Quality Standards, and that all slopes and exposed areas be grassed immediately after the grading and backfill work has been completed.

Very truly yours,

A handwritten signature in black ink, appearing to read "Wallace Miyahira".

WALLACE MIYAHIRA
Director and Chief Engineer

7704540



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Address reply to:
COMMANDER (mep)
Fourteenth Coast Guard District
577 Ala Moana
Honolulu, Hawaii 96813

JUN 15 3 36 PM '77

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JUN 15 1 22 6 PM '77
TO ENV CLP
Engg
18 JUN 1977

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Staff review of the "Environmental Impact Statement for the Aiea Stream Flood Control Project" has been completed. The Coast Guard has no objections to the proposed project being implemented nor any comments to offer at this time.

The opportunity to review and comment on this EIS is appreciated.

Sincerely,

J. V. CAFFREY
Captain, U. S. Coast Guard
Chief of Staff
Fourteenth Coast Guard District

Copy to:
COMDT(G-WEP-7)
CEQ Washington DC
OEQC Hawaii

GEORGE R. ARIYOSHI
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF AGRICULTURE
1428 SO. KING STREET
HONOLULU, HAWAII 96814

JOHN FARIAS, JR.
CHAIRMAN, BOARD OF AGRICULTURE

YUKIO KITAGAWA
DEPUTY TO THE CHAIRMAN

BOARD MEMBERS:

IRWIN M. HIGASHI
MEMBER - AT - LARGE

ERNEST F. MORGADO
MEMBER - AT - LARGE

KALFRED K. YEE
MEMBER - AT - LARGE

SHIZUTO KADOTA
HAWAII MEMBER

STEPHEN Q. L. AU
KAUAI MEMBER

FRED M. OGASAWARA
MAUI MEMBER

June 13, 1977

MEMORANDUM

To: Office of Environmental Quality Control

Subject: EIS for Aiea Stream Flood Control Project

The Department of Agriculture has no comment on the proposed project.

The subject document is herewith returned for your use.

A handwritten signature in cursive script that reads "John Farias, Jr.".

JOHN FARIAS, JR.
Chairman, Board of Agriculture

Att.

cc: Department of Public Works
C&C of Honolulu

GEORGE R. ARIYOSHI
GOVERNOR



VALENTINE A SIEFERMAN
MAJOR GENERAL
ADJUTANT GENERAL

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
FORT RUGER, HONOLULU, HAWAII 96816

HIENG

24 MAY 1977

Dr. Albert Tom, Chairman
Environmental Quality Commission
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Dr. Tom:

Aiea Stream Flood Control Project

Thank you for sending us a copy of the "Aiea Stream Flood Control" project Environmental Impact Statement. We have received the publication and have no comments to offer.

Yours truly,


WAYNE R. TOMOYASU
Captain, CE, HARNG
Contr & Engr Officer

Enclosure

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801

GEORGE A. L. YUEN
DIRECTOR OF HEALTH
Audrey W. Mertz, M.D., M.
Deputy Director of Health
Henry N. Thompson, M.
Deputy Director of Health
James S. Kumagai, Ph.D.,
Deputy Director of Health

June 1, 1977

In reply, please refer to
File: EPHS-SS

MEMORANDUM

To: Dr. Richard Marland, Director
Office of Environmental Quality Control

From: Deputy Director for Environmental Health

Subject: Aiea Stream Flood Control Project

Thank you for allowing us to review and comment on the subject EIS.

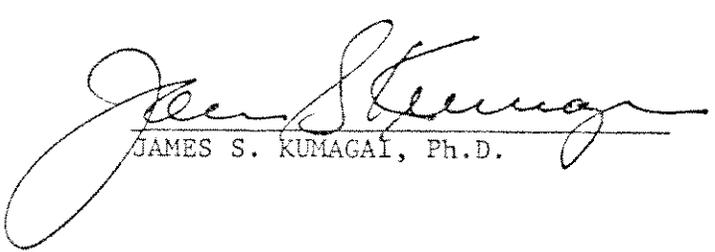
Please be advised that we are in concurrence with this project in accordance with our earlier comments to the Department of Public Works dated February 4, 1977.

The following additional comments are provided for your information. These comments should be included in the EIS.

1. Construction activities must comply with Public Health Regulations, Chapter 44B, Community Noise Control for Oahu.
 - a. An application for community noise permit must be filed and approved by the Department of Health.
 - b. Construction activities must comply with the provisions of the conditional use of permit as stated in Public Health Regulations, Chapter 44B and the conditions of the permit.
2. Traffic noise from heavy vehicles travelling to and from construction site must be minimized to not affect a residential area and must also comply with the provisions of Public Health Regulations, Chapter 44A, Vehicular Noise Control for Oahu.

Should you have any questions or concerns about this letter please do not hesitate to call us at 548-6455.

cc: Dept. of Public Works


JAMES S. KUMAGAI, Ph.D.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



HANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

701-12-0311

July 6, 1977

Dr. James S. Kumagai
Director
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

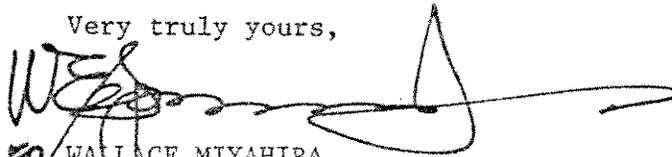
Dear Dr. Kumagai:

SUBJECT: YOUR LETTER OF JUNE 1, 1977 RELATING TO THE
EIS FOR THE AIEA STREAM FLOOD CONTROL PROJECT

Thank you for your comments on the subject EIS and your expression of support for the project.

It will be the responsibility of the Contractor to comply with the vehicular and community noise control ordinances (Public Health Regulations Chapter 44A and 44B); the proper permits will be obtained prior to construction.

Very truly yours,


FD/ WALLACE MIYAHIRA
Director and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII



CHRISTOPHER COBB, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621
HONOLULU, HAWAII 96809

May 20, 1977

DIVISIONS:
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Environmental Quality Commission
550 Halekauwila St., Rm. 301
Honolulu, Hawaii 96813

Gentlemen:

Subject: EIS for the Aiea Stream
Flood Control Project

We have nothing to add to our January 27, 1977
comments.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Gordon Soh".

GORDON SOH
Program Planning Coordinator



STATE OF HAWAII
DEPARTMENT OF SOCIAL SERVICES AND HOUSING
P. O. Box 339
Honolulu, Hawaii 96809

May 24, 1977

MEMORANDUM

TO: Environmental Quality Commission
550 Halekauwila St., Room 301
Honolulu, Hawaii 96813

FROM: Andrew I. T. Chang, Director
Department of Social Services and Housing

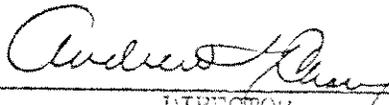
SUBJECT: Aiea Stream Flood Control Project

Subject EIS has been reviewed for effect on our department programs.

We are in favor of the proposed project as it should reduce the disaster potential for the Aiea area.

We are returning the EIS for your further usage.

Thank you for the opportunity to review and comment.



DIRECTOR

Attachment

cc: Office of Environmental Quality Control
Dept. of Public Works, City & County of Honolulu

GEORGE R. ARIYOSHI
GOVERNOR



E. ALVEY WRIGHT
DIRECTOR

DEPUTY DIRECTORS

WALLACE AOKI
RYOKICHI HIGASHIO
DOUGLAS S. SAKAMOTO
CHARLES O. SWANS

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

IN REPLY REFER TO

June 3, 1977

STP 8.4291

Mr. Donald Bremner
Environmental Quality Commission
550 Halekauwila Street
Honolulu, Hawaii 96813

Dear Mr. Bremner:

Subject: Environmental Impact Statement for
Aiea Stream Flood Control Project

Thank you very much for giving us the opportunity to review the above-captioned document. We have no comments to offer which could improve the statement.

Sincerely,

A handwritten signature in cursive script, appearing to read "E. Alvey Wright".

E. ALVEY WRIGHT
Director

7704698

GEORGE R. ARIYOSHI
GOVERNOR

RECEIVED
DIV. OF ENGINEERING
JUN 22 3 56 PM '77

RECEIVED RICHARD E. MARLAND, PH.D.
DEPT. OF PUBLIC WORKS DIRECTOR
TELEPHONE NO. 548-6915
JUN 22 10 12 AM '77

TO ENVILL
Engrg

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
OFFICE OF THE GOVERNOR
550 HALEKAUWILA ST
ROOM 301
HONOLULU, HAWAII 96813

June 20, 1977

Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu

SUBJECT: Environmental Impact Statement for Aiea Stream Flood
Control Project

Dear Mr. Miyahira:

This Office has reviewed the subject environmental impact statement. We wish to note that the EIS is a concise, well written document. We offer the following comments for your consideration:

Mitigation of construction noise should be identified. This would include the inclusion at least by reference, of the noise regulations of the Department of Health.

The proposed mitigation measures for the control of sediments that would flow into Aiea Bay should be strictly adhered to.

Please find attached a list of commentors on this EIS.

The EIS Regulations allow the accepting authority or his authorized representative to consider responses received after the fourteen day response period. This Office will exercise that option and will consider responses after the fourteen day period.

Thank you for the opportunity to review this EIS.

Sincerely,



Richard E. Marland
Director

Attachment

List of comments received on the EIS for Aiea Stream Flood Control Project, DPW-C&C

State Agencies

Comment date

*Dept. of Agriculture	6-13-77
*Dept. of Land and Natural Resources	5-20-77
Dept. of Health	6-1-77
*Dept. of Defense	5-24-77
Dept. of Social Services and Housing	5-24-77
*Dept. of Transportation	6-3-77

University of Hawaii

Water Resources Research Center	6-1-77
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Federal Agencies

*Soil Conservation Service	5-25-77
*U.S. Army - DAFE	5-26-77
*U.S. Coast Guard	6-13-77

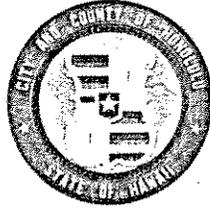
Honolulu - City and County Agencies

*Dept. of General Planning	5-31-77
*Dept. of Land Utilization	6-8-77
*Dept. of Transportation Services	6-8-77
*Board of Water Supply	6-2-77
*Dept. of Housing and Community Dev.	5-26-77

*denotes no comments

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



ANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

701-12-0313

July 6, 1977

Dr. Richard E. Marland
Director
Office of Environmental Quality Control
State of Hawaii
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Dr. Marland:

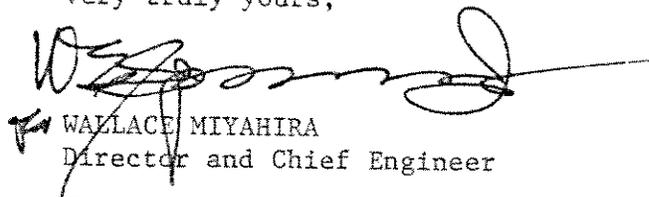
SUBJECT: YOUR LETTER OF JUNE 20, 1977 RELATING TO THE
EIS FOR THE AIEA STREAM FLOOD CONTROL PROJECT

Thank you for your review of the subject EIS.

It is anticipated that the average noise levels at the construction site (at the adjacent property lines) will range from 78 dBA to 88 dBA, depending on the phase of construction; the noisiest equipment will be earthmovers (79-85 dBA), concrete mixers (85 dBA) and trucks (91 dBA) (Bolt, Beranek and Newman, 1971). These levels will exceed the applicable standard of the Public Health Regulations Chapter 44B, "Community Noise Control for Oahu," which sets 55 dBA as the maximum allowable noise level at the property line in a residential zone. A permit from the Department of Health will therefore be required. The conditions of the permit will allow construction activities between 7:00 a.m. and 6:00 p.m., unless the noise levels exceed 95 dBA, in which case the operating hours will be reduced to 9:00 a.m. to 5:30 p.m. Construction which exceeds the allowable noise level will not be permitted on Sundays or holidays. If noise levels prove to be too disruptive at the pre-school classrooms adjacent to the stream, some form of noise barrier or special equipment mufflers may be necessary.

The project plans will require that all grading operations be performed in conformance with the applicable provisions of the Water Pollution Control and Water Quality Standards contained in the Public Health Regulations, State Department of Health on Water Pollution Control and Water Quality Standards, and that all slopes and exposed areas be grassed immediately after the grading and backfill work has been completed.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer



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RECEIVED
DEPT. OF PUBLIC WORKS

University of Hawaii at Manoa JUN 24 2 40 PM '77

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

*ENV
Energy*

Office of the Director

June 24, 1977

RE: 0225

Mr. Wallace Miyahira
Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

RE: Environmental Impact Statement
for the Aiea Stream Flood Control Project

The Environmental Center of the University of Hawaii has been assisted in the preparation of this review by Paul Ekern, Department of Agronomy and Soils and Jacquelin Miller, Environmental Center. Time and available personnel did not permit our usual broad University review, however, the following comments are offered for your consideration.

pg. 7, paragraph 2:

It would be helpful if the geomorphic processes were identified in the section on soils. Mention is made of the dominant soils in the watershed area (Waipahu, Lahaina and Manana series), and in the soils in the flood plain of Aiea Stream, however, since the flood plain is essentially totally urbanized, it no longer is able to serve its usual function as a sediment trap. An estimate of the quantity of sediment entering the Aiea Stream as compared to that exiting would be useful in arriving at relative importance of bed or bank erosion as compared to sediment derived from runoff areas.

pg. 17, paragraph 2:

A velocity of 30 feet per second in the channel is predicted for the design flow of 3,500 cfs. What provisions are proposed to restrict debris and boulders from being transported into and down the channel?

pg. 18, paragraph 3:

Mention is made of a sediment trap constructed at the mouth of the stream. What are the dimensions and configuration of this trap. What percent of the sediment transported at the design flow of 3,500 cfs. can be expected to be retained? Will the bed load material transported by the higher velocities in the stream channel eventually eliminate the effectiveness of this sediment trap?

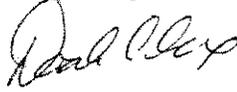
Mr. Wallace Miyahira

- 2 -

June 24, 1977

We appreciate the opportunity to comment on this EIS.

Yours truly,



Doak C. Cox
Director

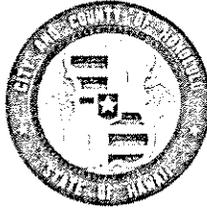
DCC:ck

cc: OEQC
Paul Ekern
Jacquelin Miller

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

701-12-0314

July 6, 1977

Dr. Doak C. Cox
Director
Environmental Center
University of Hawaii at Manoa
2550 Campus Road, Crawford 317
Honolulu, Hawaii 96822

Dear Dr. Cox:

SUBJECT: YOUR LETTER OF JUNE 24, 1977 RELATING TO THE
EIS FOR THE AIEA STREAM FLOOD CONTROL PROJECT

Thank you for your comments on the subject EIS. Our responses follow:

Geomorphic Processes. The dominant geomorphic process operating today on Oahu is erosion; this is quite obvious when one considers the highly dissected topography and coalesced valleys of the Koolau Range. The three basic geomorphic provinces of steep mountainous land, gentle uplands and alluvial deposits are represented in the Aiea watershed. The upper 2/3 of the watershed is so steep, and so actively eroding (primarily through mass wasting), that there is no opportunity for a definable soil to develop. Erosion is less severe on the more gentle slopes and uplands, allowing soils of the Lahina and Manana series to develop in place from the weathered igneous rock. In the flood plain, and on old marine terraces in the lower portion of the watershed, the eroded material is (or was) deposited as alluvium; the Waipahu and Hanalei soils developed on this transported material.

Stream Bed vs Watershed Erosion. There is no way of determining the amount of bed and bank erosion that has taken place in Aiea Stream, since the original dimensions of the channel are not known. On Kawa Stream in Kaneohe, where the original and current channel dimensions are known, it has been estimated that 40% of the total sediment yield has come from the stream channel (EIS for the Kawa Stream Flood Control Project, June 6, 1977). However, Kawa Stream is a constructed channel in earth, so would be expected to have more channel erosion than Aiea Stream, which is partially protected by boulders and retaining walls.

Debris Control. Debris structures will be placed at the inlet to the lined channel. The original plans for improvements to Aiea Stream by the Corps of Engineers called for a boulder basin in the vicinity of the sugar refinery, but this was not constructed. It will be considered for this phase of improvements.

Dr. Doak C. Cox
Page 2.

Sediment Trap. The sediment trap at the mouth of the stream is shown on Figure 2. It is a rounded basin, 200 feet wide, between the end of the concrete channel and the narrow mangrove-lined outlet to Aiea Bay. The question of "trap efficiency" for such a structure is exceedingly complex. For a theoretical answer, it would be necessary to calculate the horizontal velocity (velocity = discharge/cross-sectional area) of the water at various locations in the basin, then enter in some "turbulence factor" to determine the water's upward velocity vector. This upward velocity can be compared with the known fall velocities (in still water) of the different sediment grain sizes to find out what is the largest grain that can be held in suspension. The difficulty comes in relating the horizontal velocity to the unknown vertical velocity. A "back door" approach (suggested by Ben Jones of the USGS) is to relate the grain size distribution of a known volume of accumulated sediment to the grain size distribution of the sediment transported by the stream. The accumulated sediment should have a smaller percentage of silt and clay than is found in suspension in the stream; the difference is the amount of sediment that passes through the trap. Using this approach, it has been estimated that the Halawa Stream estuary has trapped 80% of the sediment entering it over the last 12 years (EIS for the Halawa Stream Maintenance Dredging Project, in preparation). Since the Aiea Stream sediment trap is much smaller than the Halawa Stream estuary, it would be expected to be much less efficient. Regarding the effect of the project on this efficiency, the question is somewhat irrelevant. The increased velocity in the lined channel for the design discharge will not deliver more bed load material than is presently occurring because the velocity in the unlined channel is high enough (up to 19 fps in one section) to carry virtually all of the material delivered to it; as stated in the EIS (page 18), sediment deposition is not presently occurring in the second increment channel because of the high velocity. The proposed lining will reduce the amount of material presently being eroded by these high velocities. Secondly, the effectiveness of the basin will decrease with or without the project, as it performs its designed function of trapping sediment.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer

University of Hawaii at Manoa

Water Resources Research Center

June 1, 1977

MEMORANDUM

TO: Office of Environmental Quality Control

FROM: Reginald H. F. Young *RHY*
Asst. Director, WRRC

SUBJECT: Aiea Stream Flood Control Project EIS

We have the following brief review comment on this EIS:

The cross-sectional area of the improved stream channel is only 24' x 10', thus it is considered important that some structures be installed to prevent channel clogging by debris. The EIS contains documentation of debris clogging-induced floodings but has no mention of solutions to this problem.

RHFY:jm

cc: Y. Fok
H. Gee
E. Murabayashi
Env. Center

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

701-12-0310

July 6, 1977

Dr. Reginald H. F. Young
Assistant Director
Water Resources Research Center
University of Hawaii at Manoa
2540 Dole Street
Holmes Hall, Room 283
Honolulu, Hawaii 96822

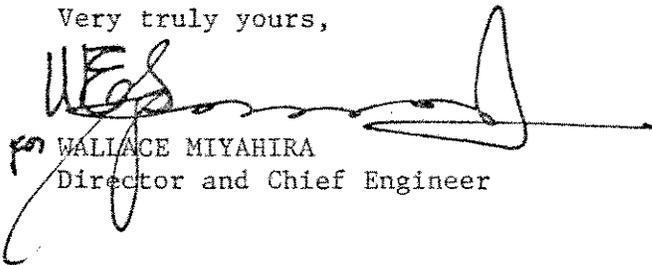
Dear Dr. Young:

SUBJECT: YOUR LETTER OF JUNE 1, 1977 RELATING TO THE
EIS FOR THE AIEA STREAM FLOOD CONTROL PROJECT

Thank you for your review of the subject EIS.

The referenced debris clogging occurred upstream from Increment II, in a section that is slated for future improvement. When Increment III is improved in the future, the problem of clogging at the small bridge will be studied. A debris trap will be placed at the inlet to the Increment II channel.

Very truly yours,


WALLACE MIYAHIRA
Director and Chief Engineer

8/15

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



ROBERT R. WAY
CHIEF PLANNING OFFICER

DGP5/77-1271 (CT)

May 31, 1977

Dr. Richard E. Marland, Director
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Dr. Marland:

Environmental Impact Statement - Aiea Stream
Flood Control, Second Increment
Comments Requested May 16, 1977

We have reviewed the EIS. The information presented seems adequate and we, therefore, have no comments.

Since we already have one copy, we are returning this to you.

Sincerely,

A handwritten signature in black ink that reads "Robert R. Way".

ROBERT R. WAY
Chief Planning Officer

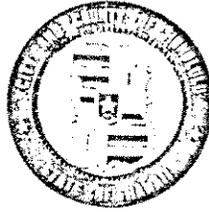
RRW:fmt

Enclosure

cc: Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

GEORGE S. MORIGUCHI
DIRECTOR

LU5/77-1789 (

EIS

June 8, 1977

Mr. Donald Bremner, Acting Chairman
Environmental Quality Commission
State of Hawaii
550 Halekauwila Street
Honolulu, Hawaii 96813

Dear Mr. Bremner:

Environmental Impact Statement
Aiea Stream Flood Control Project

We have reviewed the above and are in agreement with the objectives of the action proposed. Generally, we feel that the statement submitted provides adequate information on the affected environment.

Thank you for the opportunity to review and comment. Enclosed as you requested is the copy of the statement.

Very truly yours,

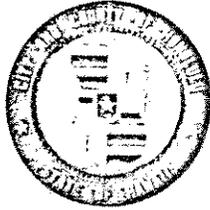

GEORGE S. MORIGUCHI
Director of Land Utilization

GSM:ey

Encl.

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

KAZU HAYASHIDA
DIRECTOR

TE5/77-2351

June 8, 1977

Environmental Quality Commission
550 Halekauwila St., Rm. 301
Honolulu, Hawaii 96813

Gentlemen:

Subject: Environmental Impact Statement -
Aiea Stream Flood Control Project

We have no comments on the subject Environmental Impact
Statement.

Very truly yours,


for KAZU HAYASHIDA
Director

cc: Dept. of Public Works

OFFICE OF THE MAYOR
CITY AND COUNTY OF HONOLULU

HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR



May 26, 1977

Environmental Quality Commission
550 Halekauwila Street, Rm. 301
Honolulu, Hawaii 96813

Gentlemen:

Re: Environmental Impact Statement
Aiea Stream Flood Control Project

We have reviewed the subject EIS and have no comment.

Per your request, we are returning the copy of the EIS forwarded to us.

Sincerely,

A handwritten signature in cursive script, appearing to read "T. Kusao".

TYRONE T. KUSAO
Acting Director

Enc.