STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES | KA 'OIHANA KUMUWAIWAI 'ĀINA
COMMISSION ON WATER RESOURCE MANAGEMENT | KE KAHUWAI PONO
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STAFF SUBMITTAL

COMMISSION ON WATER RESOURCE MANAGEMENT

January 20, 2026
Honolulu, Hawai'i

RESUBMITTAL
Approval of Stream Channel Alteration Permit Application (SCAP.6438.3),
Applicant Wasatch Arete TB Holdings
Maintain Drainage Capacity and Stream Flow for New Roadway Access within
Existing Turtle Bay Resort Property,
Landowners TB H2 Holdings, LLC and North Shore Bay Owner LLC,
'Ō'io Stream (East Main Drain), Kahuku, O'ahu
TMK Nos.: (1) 5-7-001:048, 049, and 052

APPLICANT
Wasatch Arete TB Holdings
4670 S Holladay Village Plaza, Suite 200
Salt Lake City, UT 84117

LANDOWNER
North Shore Bay Owner, LCC / Host Hotels & Resorts; and TB H2 Holdings, LLC / Host Hotels & Resorts
4747 Bethesda Ave. Ste 1300
Bethesda, MD 20814

I. SUMMARY OF REQUEST

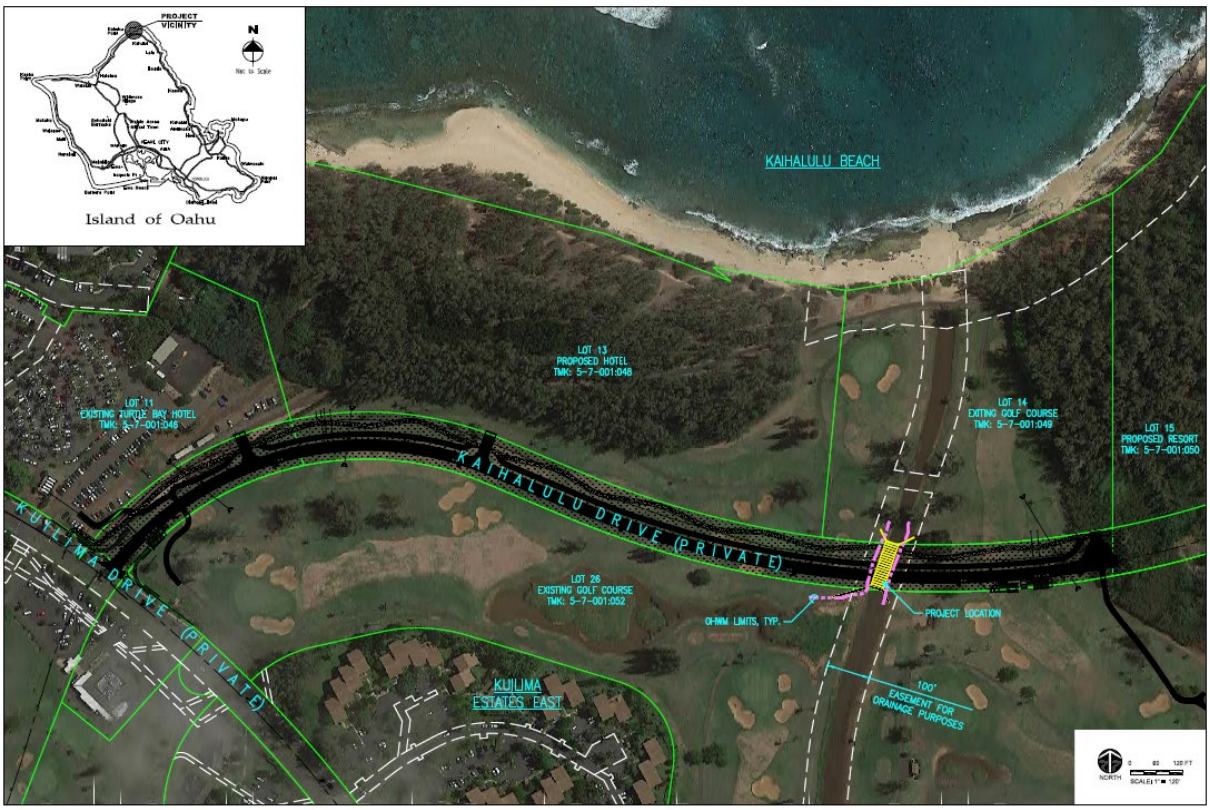
Staff requests that the Commission:

1. Approve Stream Channel Alteration Permit (SCAP.6438.3) by the Wasatch Arete TB Holdings. The Applicant proposes to construct a new Conspan culvert system (pre-cast culvert arches and wingwalls) approximately 30-feet wide by 8-feet high by 108-feet long to accommodate the crossing of a new roadway, Kaihalulu Drive, over the estuarine reach of 'Ō'io Stream (also referred to as the East Main Drain) near Kahuku on the north shore of O'ahu. This Conspan culvert system will be designed to retain a natural stream bottom and will be sized to accommodate a 100-year flood event. Concrete wing walls ranging from 30-feet to 92-feet in length will also be installed on both the upstream and downstream ends of the culverts to protect the roadway embankment from

erosion. Riprap is proposed to be placed at a depth of 3-feet at grade along the wing walls and in scour prone areas at the upstream end of the structure.

LOCATION: ʻŌʻio Stream, Kahuku, Oʻahu. See Figure 1.

Figure 1: Location, Ōʻio Stream, Kahuku, Oʻahu.



II. BACKGROUND

This project was previously approved by the Commission on May 17, 2022 and issued a Stream Channel Alteration Permit (SCAP.5860.3), but changes in land ownership resulted in project delays and the original SCAP.5860.3 expired. There are no changes to the original scope of the project, and special conditions previously approved on May 17, 2022 to address cultural consultation, aquatic resource BMPs, and endangered species protections will be retained. A copy of the May 17, 2022 submittal, which was approved as submitted, is attached as Exhibit 1.

On May 8, 2025, the Applicant, Wasatch Arete TB Holdings, filed a complete stream channel alteration permit application that is available online at https://files.hawaii.gov/dlnr/cwrm/swreview/SCAP_6438_3.pdf.

On September 16, 2025, the Commission deferred decision making until the Applicant could provide more information regarding compliance with required environmental

review procedures (i.e., Environmental Assessment) under Hawaiʻi Revised Statutes (HRS) chapter 343 given the proposed project's use within a shoreline area.

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On November 18, 2025, following discussion on various aspects of the proposed project, the Commission again deferred decision making and asked that the Applicant return to the Commission with a coherent presentation on the overall redevelopment project, the specific action being proposed, and addressing the community comments.

STREAM DESCRIPTION

The portion of ʻŌʻio Stream that will be affected by this project is located in the ahupuaʻa of ʻŌʻio. ʻŌʻio means "bonefish" in ʻōlelo Hawaiʻi. (Pukui et al. 1974: 169). The ahupuaʻa of ʻŌʻio and neighboring ʻāina were included in a study prepared by Nohopapa for Kamehameha Schools as part of the Koʻolau ʻĀina Inventory, Chapter 11. https://www.nohopapa.com/kkai

According to the Atlas of Hawaiian Watersheds and Their Aquatic Resources (2008), the ʻŌʻio Stream is a perennial stream about eight (8) miles long. The area of the watershed is 4.5 square miles with a maximum elevation of 1,680 feet. It is an unranked stream with few biota. See https://www.hawaiiwatershedatlas.com/watersheds/oahu/31005.pdf.

The National Hydrography Dataset classified the subject stream as intermittent. The Division of Aquatic Resources classified the stream as perennial. Within and downstream of the Project Area, ʻŌʻio Stream is a muliwai (a brackish water estuary, usually with a beach berm across the mouth). Measured salinity levels ranged from 5.08 ppt to 15.65 ppt. The presence of the beach berm does not preclude a hydrologic surface connection between the stream and the ocean and the berm is naturally removed by winter swells and during major storm events. Upstream of the Project Area, the gulch loses most of its stream features (e.g., bed and banks) and functions as a grassed swale through the golf course. An adjacent golf course pond/wetland was constructed between 1983 and 1988 as part of the development of the resort and surrounding golf course. The pond/wetland connects to the stream via an excavated ditch through a man-made berm. Water levels within the project area typically range between 0-feet to 2-feet.

The total drainage area is 3.9 square miles with a maximum basin elevation of 1,725 feet. The mean annual precipitation is 59.1 inches and the longest flow path is approximately 7.52 miles.

PROJECT DESCRIPTION

The proposed project is intended to maintain drainage capacity and stream flow within the ʻŌʻio Stream and to allow construction of a new private roadway within the existing Turtle Bay Resort. The Applicant proposes a new Conspan culvert system to accommodate the crossing of the new roadway. This Conspan culvert system will be designed to retain a natural stream bottom and will be sized to accommodate a 100-year flood event. It is expected to be approximately 30 feet wide with a clearance height of 8 feet. The Conspan culvert structures will be made of pre-cast concrete and will be installed in sections for a total length of approximately 108 feet along the stream. Concrete wing walls ranging from 30 feet to 92 feet in length will also be installed on both the upstream and downstream ends of the culverts to protect the roadway embankment from erosion.

Figure 2: Plan view of Conspan culvert installation.

The use of a foundation and deep foundation system will be required to support the Conspan culvert structures. A deep foundation will be accomplished by either jet grout

columns or micropiles. Both methods require installation of subgrade support columns to depths of approximately 18 feet below existing ground level. A foundation approximately 6 feet wide and 3 feet deep will then be placed upon the deep foundation. The foundation is proposed to be constructed using pre-cast concrete but may be cast-in-place depending on site characteristics and constructability issues. To protect the structure from scour, riprap is proposed to be placed at a depth of 3 feet at grade along the wing walls and in scour prone areas at the upstream end of the structure. See Figure 2: Plan view of Conspan culvert installation.

III. FINDINGS AND ANALYSIS

AGENCY REVIEW COMMENTS

City and County of Honolulu, Department of Planning and Permitting (DPP)

No comments were received from DPP on this current application, but the following comments were received on the previous application in 2022:

City and County of Honolulu, Department of Planning & Permitting: The DPP is currently reviewing the proposed project and recommend that the SCAP be conditioned on the approval of the plans by the DPP.

> CWRM Staff Response: In 2022, Commission staff concurred and was added as a special condition. However, the Applicant informed the Commission that DPP has completed its review of the infrastructure plans, which includes the proposed action described in the SCAP application. The Applicant is committed to ensuring the consistency between the approved plans and the final construction documents and will comply with all applicable permit conditions and requirements established by DPP. Staff believes that the DPP review is satisfied.

Department of Hawaiian Home Lands (DHHL)

No comments were received from DHHL on this current application, but the following comments were received on the previous application in 2022. The Commission staff concurred with the comments and added a special condition:

DHHL lands on Oʻahu comprise approximately 8,154 acres. Although none of its landholding are located in the vicinity of the project area, DHHL beneficiaries may exercise traditional and customary practices in the area of the project. Ten years has elapsed since the completion of the applicants' Cultural Impact Assessment. As a result of ever-changing conditions at the shoreline below the project area and the potential discharge of contaminants to wetlands, streams, and the ocean in the surrounding area, follow up engagement and consultation is necessary with BRE Turtle Bay Resort, LLC's Cultural Advisory Committee, the Office of Hawaiian Affairs, and other Native Hawaiian community groups whose traditional and customary rights and practices as well as nearshore marine resources are located in the surrounding area below the proposed project site. See Exhibit 2.

CWRM Staff Response: Concur with the 2022 comments and recommend retaining the special condition imposed in 2022 for the current SCAP.6438.3.

Dept. of Health (DOH), Clean Water Branch

No comments were received from DOH on this current application, but DOH provided comments on the previous application in 2022, which can be summarized as follows: 1) Based on information contained in Exhibit C of the SCAP Application, project proponent submitted a Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers (USACE), Honolulu District (POH) under the Department of the Army (DA) Nationwide Permits (NWP) #14 (Linear Transportation) under File No. POH-2021-00120. Only PCN (e-signed and dated September 16, 2021) was submitted as the Exhibit C. DA NWP verification/work authorization was not submitted; 2) The SCAP Applicant's (or project proponent) intent is to cover the project under the DA 2017 NWP #14 authorization and to be covered under DOH/CWB's conditional blanket Section 401 Water Quality Certification (WQC) File No. WQC0901.FNL.20 (issued on May 26, 2020); 3) Oio Stream is Classified as "Class 2, Inland waters" as "Stream" by DOH-CWB. Pursuant to Hawaii Administrative Rules (HAR), Title 11, Chapter 54, §11-54-3(b)(2); 4) The project proponent must ensure the compliance with that "[T]he Conspan culvert system will be designed to retain a natural stream bottom and will be sized to accommodate a 100-year flood event" statement as specified in the second paragraph of item 30 and ensures there will be no "concrete lining any section of natural streambed or bank" – bioengineering design is recommended; 5) If the project cannot be verified or work cannot be authorized under 2017 DA NWP #14 or DA NWP, an individual WQC is required; and 6) DOH/CWB recommends all Applicants who submits request for a WQC obtaining an electric signature approval from the DOH. The DOH comment letter is attached as Exhibit 3.

CWRM Staff Response: The 2021 Nationwide Permits (NWP) are now in effect, the project will be authorized under the 2021 NWP #14 instead of the 2017 NWP referenced in Mr. Chen's comments. A blanket Water Quality Certification (WQC) for the 2021 NWP has been issued so staff anticipates the project will receive coverage under the new blanket WQC. Staff believes that DOH review is satisfied.

Department of Land and Natural Resources (DLNR), Aha Moku

No comments received.

DLNR, Division of Aquatic Resources

Based on the materials provided, including the AECOS Environmental Survey dated July 7, 2021, and our internal knowledge of native aquatic ecosystems, we respectfully offer the following comments: See Exhibit 4.

Native Aquatic Species and Habitat Value
The AECOS survey documented the presence of two native aquatic species in the estuary of ʻŌʻio Stream:

- ʻOʻopu naniha (Stenogobius hawaiiensis) – endemic amphidromous goby
- ʻAmaʻama (Mugil cephalus) – native striped mullet

Both are listed as Species of Greatest Conservation Need (SGCN) in the Hawaiʻi State Wildlife Action Plan (SWAP), indicating their ecological significance and need for conservation. Their presence highlights the importance of maintaining hydrologic connectivity and water quality in this stream-estuary system.

Water Quality Observations
The AECOS report noted very high concentrations of ammonium and total nitrogen across all monitoring stations, indicating elevated nutrient levels. While total phosphorus was low, these results suggest eutrophic conditions that may negatively affect aquatic life and ecosystem health, especially if hydrology or sediment patterns are further altered.

Culvert Design and Hydraulic Concerns
The SCAP application notes a proposed 30-ft wide x 8-ft high ConSpan culvert that: "...will be designed to retain a natural stream bottom and will be sized to accommodate a 100-year flood event." (p. 39). However, based on data from the AECOS report and USGS StreamStats, the 100-year peak flow for ʻŌʻio Stream is estimated at 8,670 cfs. Based on standard open-channel hydraulics, the proposed culvert dimensions are likely insufficient to fully convey that discharge without overtopping. Key Concerns:

- The proposed culvert dimensions are unlikely to convey this volume without overtopping, especially under storm or high flow events.
- The statement in the SCAP document may be misleading if it implies full conveyance within the culvert.

Stream Connectivity and Downstream Barriers and Cumulative Effects
The proposed project involves the construction of a new stream crossing and culvert over ʻŌʻio Stream, but it does not include modifications to the existing culverts near the stream mouth. These downstream structures and may be undersized, potentially contributing to: sediment buildup, intermittent disconnection from the ocean, impaired flow conveyance, and restricted migration of native amphidromous species. While the new upstream culvert may be designed to support flow and biotic movement, its overall effectiveness will likely be limited by these downstream constraints. In addition, the introduction of new in-stream infrastructure without improving downstream connectivity may contribute to cumulative impacts on habitat quality, species movement, and overall stream health. Consideration of cumulative effects and existing barriers is critical when evaluating the ecological impacts of new infrastructure in stream systems, especially those supporting native and sensitive aquatic species.

Recommendations
To ensure effective habitat protection and compliance with DLNR's aquatic resource goals, DAR recommends:

1. Hydraulic modeling documentation showing how the culvert will accommodate the Q100 flow (with or without overtopping).
2. Clarification on whether overtopping is part of the design intent.
3. If possible, a copy of the as-built drawings or final structure dimensions be shared after construction. This would help us better understand the final conditions and how they may relate to stream flow, fish passage, and aquatic habitat.

   Applicant Response: Hydraulic modeling documentation showing how the culvert will accommodate the Q100 flow with or without overtopping. A hydraulic and scour analysis titled "Turtle Bay Resort, Kaihalulu East Roadway Extension, Proposed Crossing – East Main Drain, Study Report" prepared by River Focus and dated October 2024 (Hydraulic Analysis) is enclosed with this letter. The analysis evaluated the hydrologic and hydraulic conditions of the project under a Q100 storm event. The report concludes that the proposed Con/Span culvert (along with other proposed pipe culverts) is designed to convey the Q100 flow to the ocean outfall without overtopping the new roadway.

   Clarification on whether overtopping is part of the design intent. As noted above, overtopping of the new roadway is not part of the design intent. The system has been designed to convey the full Q100 flow without overtopping the roadway.

   If possible, a copy of the as-built drawings or final structure dimensions be shared after construction. This would help us better understand the final conditions and how they may relate to stream flow, fish passage, and aquatic habitat. A copy of the as-built drawings can be provided upon project completion. See Exhibit 5.

   CWRM Staff Response: In an email, dated July 21, 2025, DAR was forwarded a comment response letter prepared by the Applicant's consultant along with a copy of the hydraulic analysis report dated October 2024 and titled, "Turtle Bay Resort, Kaihalulu East Roadway Extension, Proposed Crossing – East Main Drain, Study Report" prepared by River Focus. In regards to "existing culverts near the stream mouth", the hydraulic analysis report indicated that, "At the coastal outlets, sand deposits from ocean currents frequently lead to clogging that is often cleaned out and maintained by the TBR staff. However, when the outlets cannot accommodate the upstream runoff, overflow occurs, resulting in channel bank overtopping and detention on the golf course and other low-lying areas east of Kuilima Drive. Runoff sheet flows through breaks in the coastline sand dunes when the golf course detention capacity and outlet capacity for East Main Drain is exceeded."

   The AECOS report, titled "Environmental surveys in ʻŌʻio Stream (East Main Drain), Turtle Bay Resort, Oʻahu" is attached as Exhibit 6. The 2024 Hydraulic Analysis report is attached as Exhibit 7. DAR responded on July 25, 2025, that

> "DAR finds the comments provided acceptable." Commission staff believes DAR's recommendations have been met.

DLNR, Engineering Division

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high-risk areas). Be advised that 44CFR, Chapter 1, Subchapter B, Part 60 reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards. The owner of the project property and/or their representative is responsible for researching the Flood Hazard Zone designation for the project. Flood zones subject to NFIP requirements are identified on FEMA' s Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA' s Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (fbat.hawaii.gov) could also be used to research flood hazard information. See Exhibit 8.

> CWRM Staff Response: The project site is in Zone VE, or areas subject to inundation by the 1 ‑ percent ‑ annual ‑ chance flood event with additional hazards due to storm induced velocity wave action, and Zone AE or areas subject to inundation by the 1 ‑ percent ‑ annual ‑ chance flood event determined by detailed methods.

DLNR, Division of Forestry and Wildlife (DOFAW)

No comments received.

DLNR, State Historic Preservation Division (SHPD)

On November 13, 2020, in response to Subdivision Application No. 2014/SUB-145 filed by the prior landowner with the City & County of Honolulu's Department of Planning and Permitting, SHPD (Project No. 2019.00055) accepted the project's Archaeological Monitoring Plan. According to SHPD's letter, "In 2014, the previous owner, Turtle Bay Resort LLC, agreed to designate more than 600 acres (out of the total 840 acres) as a conservation easement, the be called Punahoʻolapa Wildlife Preserve. The previous owner and current owner [then BRE Turtle Bay Development, LLC] each agreed, in consultation with SHPD, to prepare and implement four archaeological mitigation plans: a data recovery plan, a burial treatment plan, an archaeological monitoring plan (current document), and an archaeological preservation plan." SHPD further states that "The Archaeological Plan is well written and meets the minimum requirements of HAR §13-279-4. It is accepted. SHPD hereby notifies the DPP that construction activities for the current project shall proceed in accordance with the approved monitoring plan. The SHPD comment letter is attached as Exhibit 9.

> CWRM Staff Response: Staff believes that the SHPD review is satisfied.

DLNR, Land Division

No comments received.

DLNR, State Parks

No comments received.

Office of Hawaiian Affairs

No comments received.

US Army Corps of Engineers

No comments received.

US Fish and Wildlife Service (FWS)

While no comments were received for the this current 2025 application, FWS provided, and Commission staff concurred, with the following comments in 2022:

There is no federally designated critical habitat within the immediate vicinity of the proposed project. Our data indicate the following federally listed species may occur or transit through the vicinity of the proposed project area: the endangered Hawaiian hoary bat (Lasiurus cinereus semotus); the endangered Hawaiian petrel (Pterodroma sandwichensis), endangered Hawaiʻi distinct population segment (DPS) of band-rumped storm-petrel (Oceanodroma castro), and threatened Newell's shearwater (Puffinus auricularis newelli) (hereafter collectively referred to as Hawaiian seabirds); and the endangered Hawaiian stilt (Himantopus mexicanus knudseni), endangered Hawaiian coot (Fulica alai), endangered Hawaiian gallinule (Gallinula galeata sandvicensis), and the endangered Hawaiian duck (Anas wyvilliana) (hereafter collectively referred to as Hawaiian waterbirds). Bird species federally protected under the Migratory Bird Species Act may also occur in the proposed project area. The FWS comment letter is attached as Exhibit 10.

> CWRM Staff Response: Concur with the 2022 comments and recommend retaining the special condition imposed in 2022 for the current SCAP.6438.3.

PUBLIC COMMENTS

On September 15, 2025, Sunshine Eckstrom provided testimony. See Exhibit 11.

On October 21, 2025, Kūpaʻa Kuilima submitted testimony in opposition to the approval of the Stream Channel Alteration Permit (SCAP.6438.3) and requested to defer decision-making on this application until the following obligations are met:

1. Completion of a Ka Paʻakai Framework Analysis. There has never been a sufficient Ka Paʻakai Framework Analysis completed for this project. The LRFI and CIA prepared for the SEIS failed to adequately identify Native Hawaiian rights and traditional and customary practices in the project area. Consultation was narrowly conducted with individuals employed by the developer, not representative of the broader community of practitioners. The lack of appropriate consultation in the CIA process resulted in an incomplete picture which does not even minimally identify the scope of native rights and practices in the vicinity of the project area such as extensive subsistence fishing, limu collection, and gathering of other resources along the shoreline—all of which remain vital and ongoing. No meaningful mitigation measures have been proposed to ensure that long-term adverse impacts to these practices are avoided.

   The Commission has a legal obligation under Article XII, Section 7 of the Hawaiʻi State Constitution to consider this legal framework any time it acts to protect Native Hawaiian rights and ensure that the Ka Paʻakai Framework is applied. Without an appropriate Ka Pa'akai Framework Analysis, approval of this permit by this Commission disregards the Commission's legal obligations. Further, just because the Honolulu Department of Planning and Permitting has chosen to disregard their obligations to Article XII, Section 7, does not remove the obligation of this Commission to take it into consideration each time it acts.

2. Adequate Flood Risk Studies and Modeling. In a meeting with the Honolulu Department of Planning and Permitting, the flood risk modeling presented by the applicant in the 2013 SEIS was reviewed by subject matter experts from the University of Hawai'i and was deemed to be inadequate. As highlighted in a report prepared by Dr. Haunani Kane and Sara Kahanamoku-Meyer, the modeling fails to consider potential groundwater flooding and instead only considers a minimum scenario. This incomplete assessment creates serious gaps in understanding the risks to ʻŌʻio Stream, nearby ecosystems, and surrounding communities from flood hazard.

   Climate change has already intensified flooding events across Hawaiʻi. Without comprehensive flood risk modeling, any culvert system or stream alteration could increase risks of flooding, erosion, and damage to both ecosystems and human communities. You may view the analysis presented here: https://drive.google.com/file/d/1h_zV_a6_bxf0zUN6BA9Iiwq4-CM3ZrUc/view?usp=sharing.

   For these reasons, Kūpaʻa Kuilima urges the Commission to defer this permit application until a proper Ka Paʻakai Framework Analysis is completed and sufficient flood risk studies are conducted. These are not procedural boxes to check, but fundamental obligations to protect ʻāina, wai, and the rights of Native Hawaiians. See Exhibit 12.

CWRM Staff Response: The Ka Paʻakai analysis was conducted as part of the Ch. 343, HRS, Final Environmental Impact Statement and approved by the City and County of Honolulu, Department of Planning and Permitting in 2013. It may be reviewed at: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2013-09-08-OA-FSEIS-Turtle-Bay-Resort-Volume-3.pdf.

The Applicant prepared a hydraulic and scour analysis in 2024 which concluded that the proposed culvert is designed to convey the Q100 flow to the ocean outfall without overtopping the new roadway, as described above. There are no anticipated impacts to traditional and customary practices or the upstream/downstream migration of native macrofauna due to the project's limited impacts to the stream bed and normal streamflows.

Consistent with the previous Commission action taken on May 17, 2022, Commission staff recommends special conditions to protect endangered species, including bats, seabirds, and waterbirds, during work at the project site. Commission staff also recommends engagement and consultation throughout the project process with the Office of Hawaiian Affairs and other Native Hawaiian community groups whose traditional and customary rights and practices may be impacted.

Commission staff believes Kūpaʻa Kuilima's recommendations have been met, but recommend continued engagement and consultation with lineal descendants, cultural practitioners, the State Historic Preservation Division (SHPD), OHA, the Kuilima North Shore Strategic Planning Committee (KNSSPC), and the Oʻahu Island Burial Council (OIBC).

TRADITIONAL AND CUSTOMARY PRACTICES

1) The identity and scope of cultural, historical, or natural resources in which traditional and customary native Hawaiian rights are exercised in the area.

The Applicant stated, "A Cultural Impact Assessment (CIA) dated August 2012 was prepared in support of the 2013 FSEIS. The CIA found that the TBR property and surrounding areas contain an array of cultural resources that are currently used for traditional cultural practices, including marine food sources, medicinal plants, plants used in crafts, wood for woodcarving, and salt for various uses. Also, the land and sea are used for a variety of traditional and non-traditional sports and recreational activities such as swimming, diving, fishing, surfing, and canoeing. With respect to the current Project Area there are no significant cultural, historical and natural resources in which traditional and customary native Hawaiian rights are exercised. The closest such activities take place offshore in shallow waters approximately 500 to 700 feet to the north and east of the Project Area.

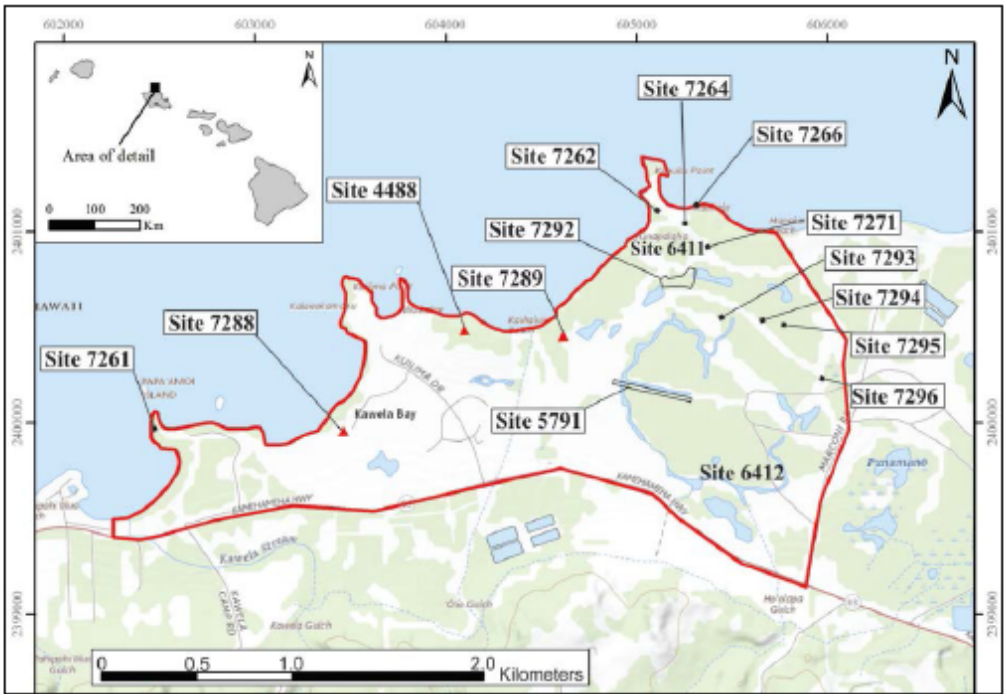
ASM Affiliates has completed the most recent archaeological work within the TBR development area and the locations of all the archaeological sites slated for preservation relative to the current Project Area are shown on Figure 3. There are no known archaeological sites within the Project Area, and ASM Affiliates has also completed an Archaeological Monitoring Plan that has been accepted by SHPD, which will be followed during project implementation. A copy of SHPD's acceptance letter for the Archaeological Monitoring Plan along with SHPD's letters accepting the other mitigation plans prepared for TBR are provided in Exhibit B (in the application)."

CWRM Staff Response: No comments were received by DLNR Aha Moku. No impacts to traditional and customary native Hawaiian rights which may be exercised in the area are anticipated due to the proposed project's limited impacts to the stream bed and normal streamflows.

Figure 3: Excerpt of SCAP application; Known archaeological sites slated for preservation/protection within TBR development area (ASM Affiliates, 2020).

*Site No.**	*Formal Type*	*Function*	*Age*
4488	Human remains	Burial	Prehistoric/early historic
5791	O. R. & L. railroad grade	Transportation	Historic
6411	Kahuku Point Archaeological Area/ Subsurface cultural deposit	Habitation/burial	Precontact
6412	Punahoʻolapa Marsh	Agriculture/resource area	Prehistoric/early historic
7261	Concrete structure	Gun position	Historic
7262	Concrete slab	Indeterminate	Historic
7264	Revetment	Storage	Historic
7266	Concrete pier blocks	Indeterminate	Historic
7271	Asphalt area	Transportation	Historic
7288	Human remains	Burial	Prehistoric
7289	Cultural deposit with human remains	Habitation/burial	Prehistoric
7292	Subsurface cultural deposit	Habitation	Prehistoric
7293	Subsurface cultural deposit	Habitation	Prehistoric
7294	Subsurface cultural deposit	Habitation	Prehistoric
7295	Subsurface cultural deposit	Habitation	Prehistoric
7296	Subsurface cultural deposit	Habitation	Prehistoric

* Site Nos. proceeded by prefix 50-80-02-



2) The extent to which those resources, including traditional and customary native Hawaiian rights, will be affected or impaired by the proposed action.

The Applicant stated, “Marine and Terrestrial Resources - No impacts to terrestrial resources are anticipated as none have been identified to occur within the Project Area. Potential impacts to near shore marine resources will be mitigated during construction through the implementation of a BMP plan that will restrict the discharge of contaminants to wetlands, streams, and the ocean. The project will also be subject to the conditions of regulatory permits and controls, such as a Department of the Army Nationwide Permit, Section 401 Water Quality

Certification, NPDES permit, State Water Quality Standards, and the City and County of Honolulu's Rules Relating to Water Quality. In the long-term, all future development will be subject to State Water Quality Standards and the City's Rules Relating to Water Quality. Moreover, the Applicant and/or its successors will be responsible for preparing a Coastal Resources Management Plan and developing an education program to be implemented with the future build out of the resort. Contemporary Use of Land and Sea - No impacts on contemporary and ancient versions of traditional activities as well as non-traditional activities or uses of the land and sea are anticipated with this project. Access to the shoreline areas and other areas used for traditional and non-traditional activities will be maintained during construction and generous shoreline setbacks provide unencumbered coastal access into the future. The Applicant will provide alternate access routes to near shore marine resources and activities should current routes be obstructed during construction."

CWRM Staff Response: There are no anticipated impacts to traditional and customary practices or upstream/downstream movement of native macrofauna due to the projects limited impacts to the stream bed and normal streamflows.

3) What feasible action, if any, could be taken by the Commission in regards to this application to reasonably protect native Hawaiian rights.

The Applicant stated, "The owners at the time the 2013 SEIS was prepared re-reinforced meaningful community relationship with the public and particularly with the range of stakeholders involved with the lands at TBR. As a result, extensive public outreach went into the preparation of the accepted SEIS. Engagement strategies included individual and small talk story sessions, group meetings, traditional public meetings, convening of a Cultural Advisory Council and the Kahuku Burial Committee, establishing a website, public notices, and ethnographic interviews. What ultimately transpired was a commitment to reduce the proposed 3,500 units to only 725 units reflecting a significantly less density and a more culturally and environmentally sensitive approach to development in the area. Hundreds of acres were also entered into a conservation easement further reflecting the collaboration between the owners, government leaders, and North Shore community groups. The Applicant shares the same commitment and desire as its predecessor to maintain a meaningful relationship with the community and stakeholders, and to ensure a more culturally and environmentally sensitive approach to development is implemented. As such, the Applicant will continue to build off previous outreach efforts and will continue to consult with the community and numerous stakeholders to implement the previously defined recommendations that will reasonably protect cultural, historical, and natural resources at TBR, including traditional and customary Native Hawaiian rights."

CWRM Staff Response: The project BMPs are feasible actions that will be employed during the project period to ensure water and stream resources mauka

and makai of the project area are not impacted to the detriment of traditional and customary practices of Native Hawaiians.

The Applicant has stated that, “Past owners have engaged with the Resort’s Cultural Advisory Committee, the Office of Hawaiian Affairs (OHA), and other Native Hawaiian community groups throughout preparation of the Turtle Bay Resort Final Supplemental Environmental Impact Statement (FSEIS). Past owners and the Applicant have continued to communicate with the Cultural Advisory Committee throughout the various stages of the project through May 2024. The Applicant initially served as the Master Design Lead and has since become the current landowner. At the time of the 2025 SCAP reapplication, the Cultural Advisory Committee is no longer active; however, the Applicant remains committed to coordinating with lineal descendants, cultural practitioners, the State Historic Preservation Division (SHPD), OHA, the Kuilima North Shore Strategic Planning Committee (KNSSPC), and the Oahu Island Burial Council (OIBC) in order to minimize potential impacts on traditional and customary rights, practices, and nearshore marine resources. The Applicant continues to coordinate with qualified archaeologists (ASM Affiliates) and biologists (AECOS, Inc) to ensure adherence to SCAP conditions and implementation of applicable best management practices (BMPs) during construction activities.”

HRS CHAPTER 343 – ENVIRONMENTAL ASSESSMENT (EA) COMPLIANCE

Under Hawaii Revised Statutes (HRS) §343-5(a), an EA shall be required for actions, as summarized in part below, that propose:

(1) use of state land or county lands, or the use of state or county funds;
(2) use within any land classified as a conservation district;
(3) use within a shoreline area;
(4) use within any historic site as designated in the National Register or Hawaii Register;
(5) use within the Waikiki area of Oʻahu;
(6) any amendments to existing county general plans where the amendment would result in designations other than agriculture, conservation, or preservation;
(7) any reclassification of any land classified as a conservation district;
(8) construction of new or the expansion or modification of existing helicopter facilities within the State, that may affect: (A) any land classified as a conservation district; (B) a shoreline area; or (C) any historic site as designated in the National Register or Hawaii Register;
(9) any (A) wastewater treatment unit, except an individual wastewater system or a wastewater treatment unit serving fewer than fifty single-family dwellings or the equivalent; (B) Waste-to-energy facility; (C) Landfill; (D) Oil refinery; or (E) Power-generating facility.

The project triggers the requirement to complete an EA because it proposes a use within a shoreline area.

Following the September 16, 2025 meeting of the Commission, Wilson Okamoto Corporation provided a letter on behalf of the Applicant providing supplemental information confirming the project's environmental review status. Exhibit 13. The letter, dated October 9, 2025, contains excerpts from the 2013 FSEIS discussing the roadway and stream channel improvements.

The Applicant states that the 2013 Final Supplemental Environmental Impact Statement (FSEIS) disclosed and analyzed roadway and stream channel improvements in detail, including the Kaihalulu East Drive extension and crossing of ʻŌʻio Stream ("East Main Drain"), and was accepted as the governing environmental review document under HRS chapter 343. Applicant further states that the current SCAP application is identical in scope and design to the previously approved permit, with no changes to project elements or mitigation measures. All environmental review and protective measures established in the 2013 FSEIS and confirmed in the 2022 SCAP approval remain applicable to the present application.

Two relevant excerpts from the 2013 FSEIS are provided below:

> B. 11. Phasing and Timing [2013 FSEIS, Volume 1, p.3-31]
>
> Implementation of the infrastructure phasing plan proposes to start with the construction of the intersection of Kaihalulu Drive (formerly known as Alpha Road) and Kamehameha Highway near Kawela Bay. Kaihalulu Drive will extend from Kamehameha Highway to the East Main Drain, providing access to Hotel site H-2. Roadway runoff will be directed to the golf course water features or channelized routing through the landscape. This segment of Kaihalulu Drive will also contain the culvert structures for the future widening of the West Main Drain. The construction of this portion of Kaihalulu Drive will coincide with the re-contouring of the Fazio Golf Course and the improvement of runoff flow to the Kuilima Drain and through the existing breaks in the sand dunes.
>
> The second segment of Kaihalulu Drive from the East Main Drain to Marconi Road will be constructed to support the Golf Course Clubhouse, Resort Residential RR-3 to RR-6, the Equestrian Center, and Community Housing CH-1. Roadway runoff also will be directed to the golf course water features or channelized routing through the landscape. This segment of Kaihalulu Drive will also contain the culvert structures for the future widening of the East Main Drain. The Golf Course Clubhouse and the recountouring of the Fazio and Palmer Golf Courses to improve the flow of runoff will be constructed concurrently and precede the construction of the second phase of Kaihalulu Drive.
>
> A.6.b. [2] East Main Drain [2013 FSEIS, Volume 1, p.5-10]
>
> Kaihalulu Drive will cross the East Main Drain below the confluence with Punahoʻolapa Ditch. A system of 4 – 32 feet x 10 feet Con-span culverts was

analyzed to convey the storm runoff under Kaihalulu Drive. The East Main Drain flows through the Fazio and Palmer Golf Courses which are maintained by the Resort, and there is little possibility of debris being carried to the Kaihalulu Drive crossing.

The proposed new Community Housing Sites (CH-1 and CH-2), new Golf Course Clubhouse, and Resort Residential Sites (RR-3a, 3b, RR-4a, 4b, RR-5 and RR-6) will drain into the existing golf course water features which can provide detention as one of the Resort's BMPs to address long-term water quality concerns relative to ocean discharges. Runoff from Resort Residential Site (RR-3) and Hotel Site (H-2, 2a) may be directed by sheet flow to the ocean with BMPs.

CWRM Staff Response: Based on the 2013 FSEIS and documentation provided by Applicant, staff believes that the requirements of HRS chapter 343 are satisfied.

The entire FSEIS, dated July 2013, can be viewed at the links below:

- 2013 FSEIS, Volume 1: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2013-09-08-OA-FSEIS-Turtle-Bay-Resort-Volume-1.pdf
- 2013 FSEIS, Volume 2: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2013-09-08-OA-FSEIS-Turtle-Bay-Resort-Volume-2.pdf
- 2013 FSEIS, Volume 3: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2013-09-08-OA-FSEIS-Turtle-Bay-Resort-Volume-3.pdf
- 2013 FSEIS, Volume 4: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2013-09-08-OA-FSEIS-Turtle-Bay-Resort-Volume-4.pdf
- 2013 FSEIS, Appendices A-E: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2013-09-08-OA-FSEIS-Turtle-Bay-Resort-Appendices-A-E.pdf
- 2013 FSEIS, Appendices F-G: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2013-09-08-OA-FSEIS-Turtle-Bay-Resort-Appendices-F-G.pdf
- 2013 FSEIS, Appendices H-M: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2013-09-08-OA-FSEIS-Turtle-Bay-Resort-Appendices-H-M.pdf

ROH CHAPTER 25 - SPECIAL MANAGEMENT AREA (SMA) COMPLIANCE

Under Revised Ordinances of Honolulu (ROH), Chapter 25, Special Management Area, the SMA is under the jurisdiction of the City and County of Honolulu, Department of Planning and Permitting. The proposed action is located within the SMA. On October 1, 1986, the Council of the City and County of Honolulu adopted Resolution 86-308 approving the SMA permit application.

CONSISTENCY WITH THE HAWAIʻI WATER PLAN

The Water Resource Protection Plan (WRPP), updated in 2019, provides an outline for the conservation, augmentation, and protection of statewide ground and surface water resources, watersheds, and natural stream environments. The legal framework of the Code for the issuance of Stream Channel Alteration Permits, as outlined in this submittal, is covered in more detail and context in the WRPP, Appendix I.

STAFF REVIEW

Review of the permit application by Commission staff is subject to the consideration of the legal authorities cited in Exhibit 20.

HAR §13-169-52(b) Based upon the findings of fact concerning an application for a stream channel alteration permit, the Commission shall either approve in whole, approve in part, approve with modifications, or reject the application for a permit.

(1) Channel alterations that would adversely affect the quantity and quality of the stream water or the stream ecology should be minimized or not be allowed.

CWRM Staff Response: Upon approval of the construction plans as proposed, the quantity and quality of stream water should not be adversely affected. The Department of Health, Clean Water Branch, provided comments regarding their permit requirements in Exhibit 3. Staff believes that DOH review is satisfied.

(2) Where instream flow standards or interim instream flow standards have been established pursuant to subchapters 3 and 4, no permit shall be granted for any channel alteration which diminishes the quantity or quality of stream water below the minimum established to support identified instream uses, as expressed in the standards.

CWRM Staff Response: HRS §174C-71 requires the Commission to protect stream channels from alteration whenever practicable to provide for fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses. The identified instream uses include fish habitat and streamflow contribution to the nearshore waters, among others. The current interim instream flow standard for this stream is an unmeasured amount and the status quo of streamflow

conditions on the effective date of this standard (1989), and as that flow may naturally vary throughout the year (HAR §13-169-49.1). The project is not anticipated to impact the status quo interim instream flow standard which was established on April 19, 1989, pursuant to HAR §13-169-49.1.

(3) The proposed channel alteration should not interfere substantially and materially with existing instream or non-instream uses or with channel alterations previously permitted.

CWRM Staff Response: The proposed work plan is limited to the project area and should not interfere with instream or non-instream uses, including existing diversions. Commission records indicate that there are no active diversions located downstream of the project area. No adverse impacts are anticipated.

IV. RECOMMENDATION

Staff recommends that the Commission:

1. Approve the Stream Channel Alteration Permit (SCAP.6438.3) Application subject to the standard conditions in Exhibit 19 and the same special conditions attached to the Commission's previous approval of SCAP.5860.3 on May 17, 2022:

    a. A copy of the DPP plan approval shall be sent to CWRM prior to issuance of the SCAP.

    b. In accordance with comments from DHHL (Exhibit 2) and Kūpaʻa Kuilima (Exhibit 12), prior, during and post engagement and consultation is required with lineal descendants, cultural practitioners, the State Historic Preservation Division (SHPD), OHA, the Kuilima North Shore Strategic Planning Committee (KNSSPC), and the Oʻahu Island Burial Council (OIBC) to minimize potential impacts to those whose traditional and customary rights and practices may be impacted.

    c. In accordance with U.S. FWS comments (Exhibit 10), the Applicant shall comply with the following conditions:

        i. To avoid and minimize impacts to the endangered Hawaiian hoary bat we recommend that you do not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15); Do not use barbed wire for fencing.

        ii. To avoid and minimize potential project impacts to seabirds we recommend that you fully shield all outdoor lights so the bulb can only be seen from below; Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in

the lighted area; Avoid nighttime construction during the seabird fledging period, September 15 through December 15.

iii. To avoid and minimize potential project impacts to Hawaiian waterbirds we recommend in areas where waterbirds are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site; If water resources are located within or adjacent to the project site, incorporate applicable best management practices regarding work in aquatic environments that include:

1. Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest).

2. If a nest or active brood is found contact the U.S. Fish and Wildlife Service within 48 hours for further guidance.

3. Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.

4. Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

Ola i ka wai,

CIARA W.K. KAHAHANE
Deputy Director

Exhibits:

1. Commission Staff Submittal, Approval of Stream Channel Alteration Permit (SCAP.5860.3) to BRE Turtle Bay Resort, LLC for its New Roadway Access Project, ʻŌʻio Stream, Kahuku, Oʻahu, TMK (1) 5-7-001:048, 049, and 052, dated May 17, 2022

2. DHHL letter, dated April 6, 2022.

3. DOH, Clean Water Branch email dated March 18, 2022.
4. DLNR, Division of Aquatic Resources letter, dated June 26, 2025.
5. Applicant Consultant, Wilson Okamoto, response to DAR letter, dated July 7, 2025.
6. AECOS, Inc. Report No. 1547C, "Environmental surveys in ʻŌʻio Stream (East Main Drain), Turtle Bay Resort, Oʻahu", dated July 7, 2021.
7. River Focus Study Report, Hydraulic and Scour Analysis, Turtle Bay Resort, Kaihalulu East Roadway Extension. Proposed Crossing – East Main Drain", dated October 2024.
8. DLNR, Engineering Division letter, dated July 3, 2025.
9. DLNR, SHPD letter, dated November 13, 2020.
10. U.S. FWS letter, dated March 21, 2022.
11. Sunshine Eckstrom email, dated September 15, 2025.
12. Kūpaʻa Kuilima letter, dated October 21, 2025.
13. Applicant Response to CWRM letter, dated October 9, 2025.
14. Jessica Kuzmier email, dated November 15, 2025
15. Kūpaʻa Kuilima testimony, submitted November 16, 2025
16. ʻAhahui o Hawaiʻi, William S. Richardson School of Law, testimony, submitted November 17, 2025
17. Kūpaʻa Kuilima testimony, submitted November 29, 2025
18. Steven and Lea Albert letter, dated November 30, 2025
19. Standard Stream Channel Alteration Permit Conditions.
20. Legal Authorities

APPROVED FOR SUBMITTAL:

RYAN K.P. KANAKAʻOLE
Acting Chairperson

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

STAFF SUBMITTAL

COMMISSION ON WATER RESOURCE MANAGEMENT

May 17, 2022
Honolulu, Hawai‘i

Approval of Stream Channel Alteration Permit Application (SCAP.5860.3)
BRE Turtle Bay Resort, LLC for its New Roadway Access Project
‘Ō‘io Stream, Kahuku, O‘ahu, TMK: (1) 5-7-001:048, 049, and 052

APPLICANT
BRE Turtle Bay Resort, LLC
57-091 Kamehameha Highway
Kahuku, HI 96731

LANDOWNER
Same

SUMMARY OF REQUEST

Commission staff is seeking approval for a Stream Channel Alteration Permit (SCAP.5860.3) by BRE Turtle Bay Resort, LLC, for their new roadway access project. The landowner proposes a new Conspan culvert (pre-cast culvert arches and wingwalls) approximately 30-feet wide by 8-feet high by 108-feet long to accommodate a new roadway across the subject stream. Concrete wing walls ranging from 30-feet to 92-feet in length will also be installed on both the upstream and downstream ends of the culverts to protect the roadway embankment from erosion. Riprap is proposed to be placed at a depth of 3-feet at grade along the wing walls and in scour prone areas at the upstream end of the structure.

BACKGROUND

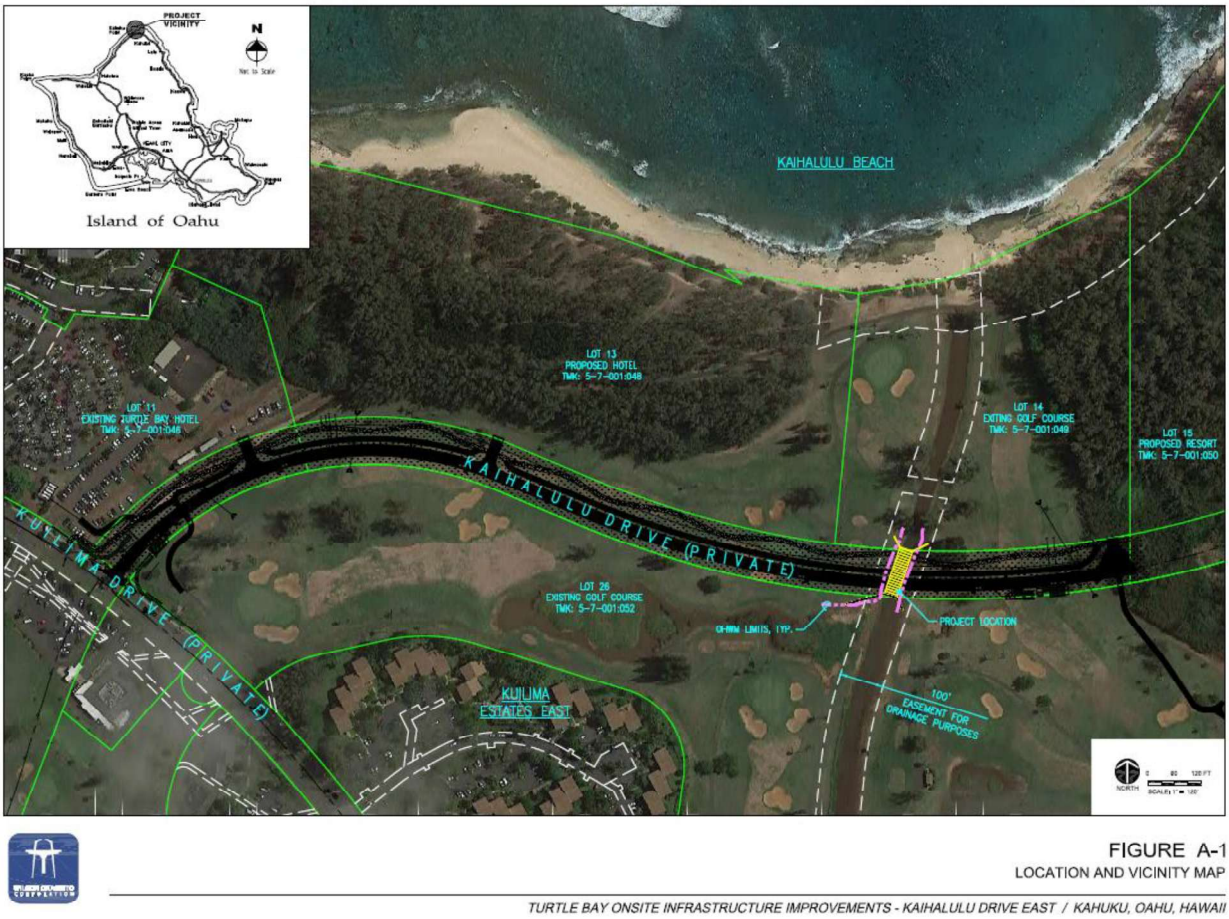
On January 27, 2022, the landowner filed a complete stream channel alteration permit application which can be viewed on the Commission website at https://files.hawaii.gov/dlnr/cwrm/swreview/SCAP_5860_3.pdf.

LOCATION: Kahuku, O‘ahu. See **Figure 1**.

Item C-2

EXHIBIT 1

Figure 1: Location, ʻŌʻio Stream, Kahuku, Oʻahu.



STREAM DESCRIPTION

According to the *Atlas of Hawaiian Watersheds and Their Aquatic Resources* (2008), the ʻŌʻio Stream is a perennial stream about eight (8) miles long. The area of the watershed is 4.5 square miles with a maximum elevation of 1,680 feet. It is an unranked stream with few biota. See https://www.hawaiiwatershedatlas.com/watersheds/oahu/31005.pdf.

The National Hydrography Dataset classified the subject stream as intermittent. The Division of Aquatic Resources classified the stream as perennial. Within and downstream of the Project Area, ʻŌʻio Stream is a *muliwai* (a brackish water estuary, usually with a beach berm across the mouth). Measured salinity levels ranged from 5.08 ppt to 15.65 ppt. The presence of the beach berm does not preclude a hydrologic surface connection between the stream and the ocean and the berm is naturally removed by winter swells and during major storm events. Upstream of the Project Area, the gulch loses most of its stream features (e.g., bed and banks) and functions as a grassed swale through the golf course. An adjacent golf course pond/wetland was constructed between 1983 and 1988 as part of the development of the resort and surrounding golf course. The pond/wetland connects to the stream via an excavated ditch through a man-made berm. Water levels within the project area typically range between 0-feet to 2-feet.

PROJECT DESCRIPTION

The landowner proposes a new Conspan culvert approximately 30-feet wide by 8-feet high by 108-feet long to accommodate a new roadway across the subject stream. Concrete wing walls ranging from 30-feet to 92-feet in length will also be installed on both the upstream and downstream ends of the culverts to protect the roadway embankment from erosion. Riprap is proposed to be placed at a depth of 3-feet at grade along the wing walls and in scour prone areas at the upstream end of the structure. See **Figure 2**.

Figure 2: Plan view of Conspan culvert installation.

AGENCY REVIEW COMMENTS

City and County of Honolulu, Department of Planning & Permitting (DPP): The DPP is currently reviewing the proposed project and recommend that the SCAP be conditioned on the approval of the plans by the DPP. See **Exhibit 1**.

CWRM Staff Response: Concur and added as a special condition.

Department of Hawaiian Home Land (DHHL): DHHL lands on Oʻahu comprise approximately 8,154 acres. Although none of its landholding are located in the vicinity of the project area, DHHL beneficiaries may exercise traditional and customary practices in the area of the project. Ten years has elapsed since the completion of the applicants' Cultural Impact Assessment. As a result of ever-changing conditions at the shoreline below the project area and the potential discharge of contaminants to wetlands, streams, and the ocean in the surrounding area, follow up engagement and consultation is necessary with BRE Turtle Bay Resort, LLC's Cultural Advisory Committee, the Office of Hawaiian Affairs, and other Native Hawaiian community groups whose traditional and customary rights and practices as well as nearshore marine resources are located in the surrounding area below the proposed project site. See **Exhibit 2**.

CWRM Staff Response: Concur and added as a special condition.

Department of Health (DOH): A summary of DOH comments are as follows: 1) Based on information contained in Exhibit C of the SCAP Application, project proponent submitted a Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers (USACE), Honolulu District (POH) under the Department of the Army (DA) Nationwide Permits (NWP) #14 (Linear Transportation) under File No. POH-2021-00120. Only PCN (e-signed and dated September 16, 2021) was submitted as the Exhibit C. DA NWP verification/work authorization was not submitted; 2) The SCAP Applicant's (or project proponent) intent is to cover the project under the DA 2017 NWP #14 authorization and to be covered under DOH/CWB's conditional blanket Section 401 Water Quality Certification (WQC) File No. WQC0901.FNL.20 (issued on May 26. 2020); 3) Oio Stream is Classified as "Class 2, Inland waters" as "Stream" by DOH-CWB. Pursuant to Hawaii Administrative Rules (HAR), Title 11, Chapter 54, §11-54-3(b)(2); 4) The project proponent must ensure the compliance with that "[T]he Conspan culvert system will be designed to retain a natural stream bottom and will be sized to accommodate a 100-year flood event" statement as specified in the second paragraph of item 30 and ensures there will be no "concrete lining any section of natural streambed or bank" – bioengineering design is recommended; 5) If the project cannot be verified or work cannot be authorized under 2017 DA NWP #14 or DA NWP, an individual WQC is required; and 6) DOH/CWB recommends all Applicants who submits request for a WQC obtaining an electric signature approval from the DOH. The DOH comment letter is attached as **Exhibit 3**.

CWRM Staff Response: The 2021 Nationwide Permits (NWP) are now in effect, the project will be authorized under the 2021 NWP #14 instead of the 2017 NWP referenced in Mr. Chen's comments. A blanket Water Quality Certification (WQC) for the 2021

NWP has been issued so staff anticipates the project will receive coverage under the new blanket WQC. Staff believes that DOH review is satisfied.

Department of Land and Natural Resources (DLNR), Aha Moku: No comments received.

DLNR, Aquatic Resources: No comments received.

DLNR, Engineering: No comments received.

DLNR, Forestry and Wildlife (DOFAW): No comments received.

DLNR, Historic Preservation (SHPD): The Archaeological Plan is well written and meets the minimum requirements of HAR §13-279-4. **It is accepted**. **SHPD hereby notifies** the DPP that construction activities for the current project shall proceed in accordance with the approved monitoring plan. The SHPD comment letter is attached as **Exhibit 4**.

CWRM Staff Response: Staff believes that SHPD review is satisfied.

DLNR, Land Division: Had no comments.

DLNR, State Parks: No comments received.

Office of Hawaiian Affairs: No comments received.

US Army Corps of Engineers: No comments received.

US Fish and Wildlife Service (FWS): There is no federally designated critical habitat within the immediate vicinity of the proposed project. Our data indicate the following federally listed species may occur or transit through the vicinity of the proposed project area: the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*); the endangered Hawaiian petrel (*Pterodroma sandwichensis*), endangered Hawaiʻi distinct population segment (DPS) of band-rumped storm-petrel (*Oceanodroma castro*), and threatened Newell's shearwater (*Puffinus auricularis newelli*) (hereafter collectively referred to as Hawaiian seabirds); and the endangered Hawaiian stilt *(Himantopus mexicanus knudseni*), endangered Hawaiian coot (*Fulica alai*), endangered Hawaiian gallinule (*Gallinula galeata sandvicensis*), and the endangered Hawaiian duck (*Anas wyvilliana*) (hereafter collectively referred to as Hawaiian waterbirds). Bird species federally protected under the Migratory Bird Species Act may also occur in the proposed project area. The FWS comment letter is attached as **Exhibit 5**.

CWRM Staff Response: HRS §174C-71, requires the Commission to protect stream channels from alteration whenever practicable to provide for fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses. Concur and added as a special condition.

PUBLIC COMMENTS

No public comments were received.

TRADITIONAL AND CUSTOMARY PRACTICES

1) The identity and scope of cultural, historical, or natural resources in which traditional and customary native Hawaiian rights are exercised in the area.

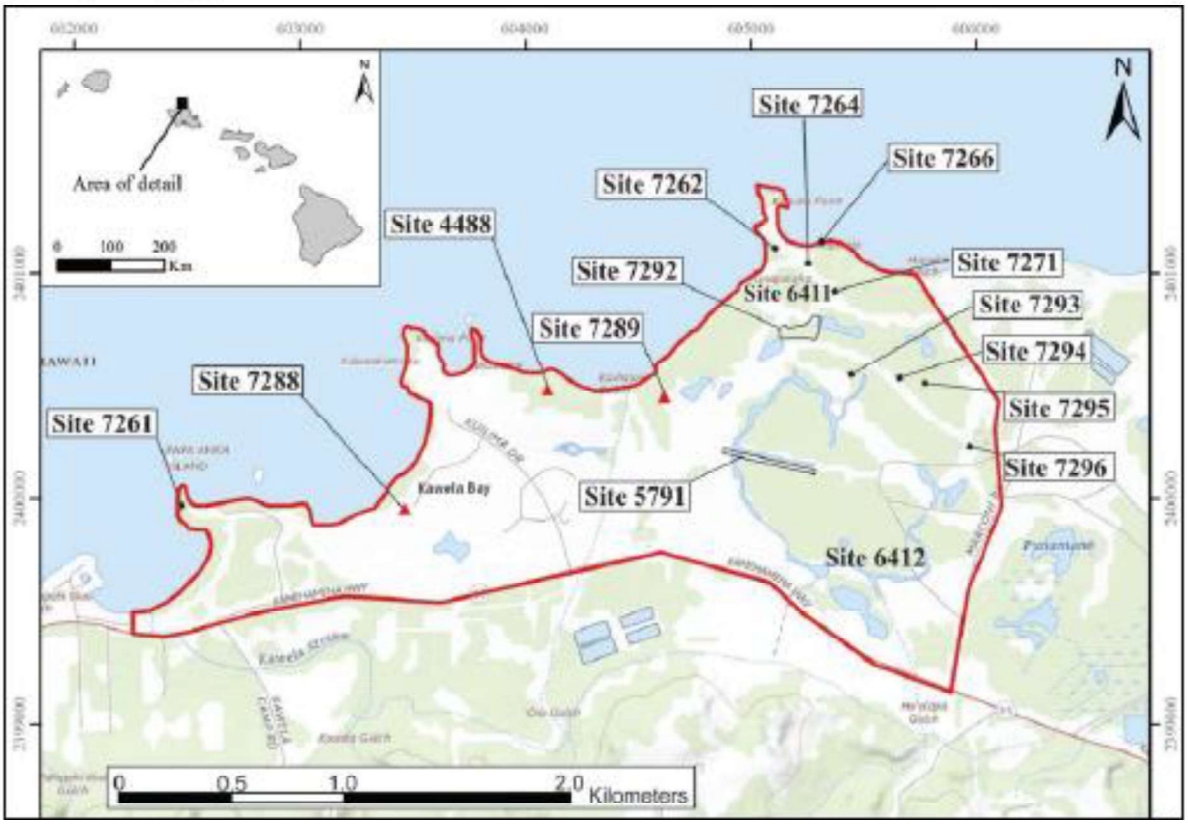
The Applicant stated "A Cultural Impact Assessment (CIA) dated August 2012 was prepared in support of the 2013 FSEIS. The CIA found that the TBR property and surrounding areas contain an array of cultural resources that are currently used for traditional cultural practices, including marine food sources, medicinal plants, plants used in crafts, wood for woodcarving, and salt for various uses. Also, the land and sea are used for a variety of traditional and non-traditional sports and recreational activities such as swimming, diving, fishing, surfing, and canoeing. With respect to the current Project Area there are no significant cultural, historical and natural resources in which traditional and customary native Hawaiian rights are exercised. The closest such activities take place offshore in shallow waters approximately 500 to 700 feet to the north and east of the Project Area. ASM Affiliates has completed the most recent archaeological work within the TBR development area and the locations of all the archaeological sites slated for preservation relative to the current Project Area are shown below (See **Figure 3**). There are no known archaeological sites within the Project Area, and ASM Affiliates has also completed an Archaeological Monitoring Plan that has been accepted by SHPD, which will be followed during project implementation. A copy of SHPD's acceptance letter for the Archaeological Monitoring Plan along with SHPD's letters accepting the other mitigation plans prepared for TBR are provided in Exhibit B."

> *CWRM Staff Response: No comments were received by DLNR Aha Moku. No comments were received from the public. There are no anticipated impacts to traditional and customary practices or the upstream/downstream migration of native macrofauna due to the project's limited impacts to the stream bed. Commission staff offers no further action as can be identified.*

Figure 3: Excerpt of SCAP application; Known archaeological sites slated for preservation/protection within TBR development area (ASM Affiliates, 2020).

Site No.*	Formal Type	Function	Age
4488	Human remains	Burial	Prehistoric/early historic
5791	O. R. & L. railroad grade	Transportation	Historic
6411	Kahuku Point Archaeological Area/ Subsurface cultural deposit	Habitation/burial	Precontact
6412	Punaho'olapa Marsh	Agriculture/resource area	Prehistoric/early historic
7261	Concrete structure	Gun position	Historic
7262	Concrete slab	Indeterminate	Historic
7264	Revetment	Storage	Historic
7266	Concrete pier blocks	Indeterminate	Historic
7271	Asphalt area	Transportation	Historic
7288	Human remains	Burial	Prehistoric
7289	Cultural deposit with human remains	Habitation/burial	Prehistoric
7292	Subsurface cultural deposit	Habitation	Prehistoric
7293	Subsurface cultural deposit	Habitation	Prehistoric
7294	Subsurface cultural deposit	Habitation	Prehistoric
7295	Subsurface cultural deposit	Habitation	Prehistoric
7296	Subsurface cultural deposit	Habitation	Prehistoric

* Site Nos. proceeded by prefix 50-80-02-



2) The extent to which those resources, including traditional and customary native Hawaiian rights, will be affected or impaired by the proposed action.

The Applicant stated, "Marine and Terrestrial Resources. No impacts to terrestrial resources are anticipated as none have been identified to occur within the Project Area. Potential impacts to near shore marine resources will be mitigated during construction through the implementation of a best management practices plan that will restrict the discharge of contaminants to wetlands, streams, and the ocean. The project will also be subject to the conditions of regulatory permits and controls, such as a Department of the Army Nationwide Permit, Section 401 Water Quality Certification, NPDES permit, State Water Quality Standards, and the City and County of Honolulu's Rules Relating to Water Quality. In the long-term, all future development will be subject to State Water Quality Standards and the City's Rules Relating to Water Quality. Moreover, the Applicant and/or its successors will be responsible for preparing a Coastal Resources Management Plan and developing an education program to be implemented with the future build out of the resort. Contemporary Use of Land and Sea. No impacts on contemporary and ancient versions of traditional activities as well as non-traditional activities or uses of the land and sea are anticipated with this project. Access to the shoreline areas and other areas used for traditional and non-traditional activities will be maintained during construction and generous shoreline setbacks provide unencumbered coastal access into the future. The Applicant will provide alternate access routes to near shore marine resources and activities should current routes be obstructed during construction."

> *CWRM Staff Response: There are no anticipated impacts to traditional and customary practices or upstream/downstream movement of native macrofauna due to the project's limited impacts to the stream bed.*

3) What feasible action, if any, could be taken by the Commission in regards to this application to reasonably protect native Hawaiian rights.

The Applicant stated, "The owners at the time the 2013 SEIS (Supplemental Environmental Impact Statement) was prepared re-reinforced meaningful community relationship with the public and particularly with the range of stakeholders involved with the lands at TBR. As a result, extensive public outreach went into the preparation of the accepted SEIS. Engagement strategies included individual and small talk story sessions, group meetings, traditional public meetings, convening of a Cultural Advisory Council and the Kahuku Burial Committee, establishing a website, public notices, and ethnographic interviews. What ultimately transpired was a commitment to reduce the proposed 3,500 units to only 725 units reflecting a significantly less density and a more culturally and environmentally sensitive approach to development in the area. Hundreds of acres were also entered into a conservation easement further reflecting the collaboration between the owners, government leaders, and North Shore community groups. The Applicant shares the same commitment and desire as its predecessor to maintain a meaningful relationship with the community and stakeholders, and to ensure a more culturally and environmentally sensitive approach to development is implemented. As such, the Applicant will continue to build off previous outreach efforts and will continue to consult with the community and numerous stakeholders to implement the previously defined recommendations

that will reasonably protect cultural, historical, and natural resources at TBR, including traditional and customary Native Hawaiian rights."

CWRM Staff Response: No further action as identified.

HRS CHAPTER 343 – ENVIRONMENTAL ASSESSMENT (EA) COMPLIANCE

Under Hawaii Revised Statutes (HRS) §343-5(a), an EA shall be required for actions, as summarized in part below, that propose:

(1) use of state land or county lands, or the use of state or county funds;
(2) use within any land classified as a conservation district;
(3) use within a shoreline area;
(4) use within any historic site as designated in the National Register or Hawaii Register;
(5) use within the Waikiki area of Oʻahu;
(6) any amendments to existing county general plans where the amendment would result in designations other than agriculture, conservation, or preservation;
(7) any reclassification of any land classified as a conservation district;
(8) construction of new or the expansion or modification of existing helicopter facilities within the State, that may affect: (A) any land classified as a conservation district; (B) a shoreline area; or (C) any historic site as designated in the National Register or Hawaii Register;
(9) any (A) wastewater treatment unit, except an individual wastewater system or a wastewater treatment unit serving fewer than fifty single-family dwellings or the equivalent; (B) Waste-to-energy facility; (C) Landfill; (D) Oil refinery; or (E) Power-generating facility.

CWRM Staff Response: The Project Area is located within the Special Management Area and a permit was approved on Nov. 1, 1986 pursuant to Chapter 25, Revised Ordinances of Honolulu. In accordance with HRS §343-5(a) due to the use within a shoreline area, a finding of no significant impact was published in the March 8, 2003 Environmental Notice.

CONSISTENCY WITH THE HAWAIʻI WATER PLAN

The Water Resource Protection Plan (WRPP), updated in 2019, provides an outline for the conservation, augmentation, and protection of statewide ground and surface water resources, watersheds, and natural stream environments. The legal framework of the Code for the issuance of Stream Channel Alteration Permits, as outlined in this submittal, is covered in more detail and context in the WRPP, Appendix I.

STAFF REVIEW

HAR §13-169-52(b) Based upon the findings of fact concerning an application for a stream channel alteration permit, the commission shall either approve in whole, approve in part, approve with modifications, or reject the application for a permit.

(1) Channel alterations that would adversely affect the quantity and quality of the stream water or the stream ecology should be minimized or not be allowed.

CWRM Staff Response: Upon approval of the construction plans as proposed, the quantity of stream water is unchanged. The Department of Health, Clean Water Branch, provided comments regarding their permit requirements in ***Exhibit 3****. Staff believes that DOH review is satisfied.*

(2) Where instream flow standards or interim instream flow standards have been established pursuant to subchapters 3 and 4, no permit shall be granted for any channel alteration which diminishes the quantity or quality of stream water below the minimum established to support identified instream uses, as expressed in the standards.

CWRM Staff Response: HRS §174C-71, requires the Commission to protect stream channels from alteration whenever practicable to provide for fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses. The current interim instream flow standard for this stream is an unmeasured amount and the status quo of streamflow conditions on the effective date of this standard (1989), and as that flow may naturally vary throughout the year (HAR §13-169-49.1). The identified instream uses include fish habitat and streamflow contribution to the nearshore waters, among others. The project is not anticipated to impact water quantity and quality below the minimum established interim instream flow standard.

(3) The proposed channel alteration should not interfere substantially and materially with existing instream or non-instream uses or with channel alterations previously permitted.

CWRM Staff Response: The proposed work plan is limited to the project area and should not interfere with instream or non-instream uses. There are no other stream diversions located on ʻŌʻio Stream.

RECOMMENDATION

That the Commission:

1. Approve a Stream Channel Alteration Permit (SCAP.5860.3) Application subject to the standard conditions in **Exhibit 6** and the special conditions below.
   a. A copy of the DPP plan approval must be sent to CWRM prior to issuance of the SCAP.
   b. Prior, during and post engagement and consultation is required with BRE Turtle Bay Resort, LLC's Cultural Advisory Committee, the Office of Hawaiian Affairs, and other Native Hawaiian community groups whose traditional and customary rights and practices may be impacted.
   c. To avoid and minimize impacts to the endangered Hawaiian hoary bat we recommend that you do not disturb, remove, or trim woody plants greater than 15 feet tall during the

bat birthing and pup rearing season (June 1 through September 15); Do not use barbed wire for fencing.

d. To avoid and minimize potential project impacts to seabirds we recommend that you fully shield all outdoor lights so the bulb can only be seen from below; Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area; Avoid nighttime construction during the seabird fledging period, September 15 through December 15.
e. To avoid and minimize potential project impacts to Hawaiian waterbirds we recommend in areas where waterbirds are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site; If water resources are located within or adjacent to the project site, incorporate applicable best management practices regarding work in aquatic environments that include:
    i. Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest).
    ii. If a nest or active brood is found contact the U.S. Fish and Wildlife Service within 48 hours for further guidance.
    iii. Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.
    iv. Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

Ola i ka wai,

M. KALEO MANUEL
Deputy Director

Exhibits:

1. City and County of Honolulu, Department of Planning and Permitting, dated March 28, 2022.
2. Department of Hawaiian Home Lands comment letter, dated April 6, 2022.
3. Department of Health comment letter via email, dated March 18, 2022.
4. State Historic Preservation comment letter, dated November 13, 2020.
5. U.S. Fish and Wildlife Service comment letter, dated March 21, 2022.
6. Standard Stream Channel Alteration Permit Conditions.
7. Legal Authorities.

APPROVED FOR SUBMITTAL:

SUZANNE D. CASE
Chairperson

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

RICK BLANGIARDI
MAYOR

DEAN UCHIDA
DIRECTOR

DAWN TAKEUCHI APUNA
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

March 28, 2022

2022/ELOG-570

Mr. M. Kaleo Manuel, Deputy Director
Commission on Water Resource Management
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

RECEIVED
COMMISSION ON WATER
RESOURCE MANAGEMENT
2022 APR -1 PM 2:27

Dear Mr. Manuel:

Stream Channel Alteration Permit Application (SCAP.5860.3)
BRE Turtle Bay Resort LLC, New Roadway Access Project
ʻŌʻio Stream (East Main Drain), Kahuku
Tax Map Key (TMK): 5-7-001: 048, 049 and 052

This is in response to your letter dated March 16, 2022 requesting the review and comments of the Department of Planning and Permitting (DPP) regarding the above-referenced Stream Channel Alteration Permit (SCAP) application.

The DPP is currently reviewing the construction plans for the proposed project. We recommend the SCAP be conditioned on the approval of the plans by the DPP.

Should you have any questions, please contact Mario Siu-Li, of our staff, at (808)768-8098.

Very truly yours,

for Dean Uchida
Director

EXHIBIT 1

DAVID Y. IGE
GOVERNOR
STATE OF HAWAII

JOSH GREEN
LT GOVERNOR
STATE OF HAWAII

WILLIAM J. AILA, JR.
CHAIRMAN
HAWAIIAN HOMES COMMISSION

TYLER I. GOMES
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

P O BOX 1879
HONOLULU HAWAII 96805

April 6, 2022

MEMORANDUM Ref.:PO-22-106

TO: Suzanne D. Case, Chairperson
Commission on Water Resource Management

COPY TO: Donald Goodman
BRE Turtle Bay Resort, LLC

FROM: William J. Aila, Jr., Chairman
Hawaiian Homes Commission

RE: Stream Channel Alteration Permit Application (SCAP.5860.3), BRE Turtle Bay Resort, LLC, New Roadway Access Project, 'Ō'io Stream (East Main Drain), Kahuku O'ahu, TMK: (1) 5-7-001:048, 049, and 052

The Department of Hawaiian Home Lands (DHHL) has reviewed SCAP No. 5860.3 'Ō'io Stream (East Main Drain), Kahuku O'ahu, TMK: (1) 5-7-001:048, 049, and 052.

We appreciate the opportunity to review this application and offer the following background and requests for action.

Background

The following points serve as context for our requests on this SCAP.

The State (and particularly the Commission on Water Resource Management [Commission]) has a duty to protect the rights of DHHL to water resources, as enumerated in the Hawaiian Homes Commission Act (HHCA) §§ 101(4), 220, 221; Hawai'i Constitution, Article XI, §§ 1 and 7 and Article XII, § 7; and Hawaii Revised Statutes (HRS) Chapter 174C, the State Water Code.

EXHIBIT 2

DHHL lands on O'ahu comprise approximately 8,154 acres. Although none of its landholdings are located in the immediate vicinity of the project area, DHHL beneficiaries may exercise traditional and customary practices in the surrounding area of the project.

DHHL understands that ten years have elapsed between the completion of the Applicant's August 2012 Cultural Impact Assessment in support of its 2013 FSEIS and its January 2022 SCAP Application submittal to the Commission. DHHL also understands that the North Shore of O'ahu and its communities are especially vulnerable to coastal erosion and flooding due to climate change and sea level rise. Such coastal hazards are leading to disproportionate impacts to frontline populations(those living near the shoreline) including Native Hawaiian communities with strong identity and place-based ties to coastal resources near the project area.

The Applicant has also articulated, in its SCAP application, their commitment to build off previous outreach efforts and continue to consult with the community and numerous stakeholders to implement recommendations that will reasonably protect cultural, historical, and natural resources at Turtle Bay Resort, including traditional and customary Native Hawaiian rights.

Because DHHL's beneficiaries may exercise traditional and customary practices in the proposed project area, DHHL has interest in this SCAP.

Requests for the applicant and Commission

Based on the above, the department offers a request regarding this SCAP: As a result of ever-changing conditions at the shoreline below the project area and the potential discharge of contaminants to wetlands, streams, and the ocean, in the surrounding area, follow up engagement and consultation is necessary, specifically with BRE Turtle Bay Resort, LLC's Cultural Advisory Committee, the Office of Hawaiian Affairs, and other Native Hawaiian community groups whose traditional and customary rights and practices as well as nearshore marine resources are located in the surrounding area below the proposed project site.

DHHL appreciates the opportunity to offer comments on this SCAP. Please contact Andrew Choy, Planning Program Manager, at andrew.h.choy@hawaii.gov for further information.

From:	Chen, Edward
To:	Alakai, Rebecca R
Cc:	Wong, Alec Y; Lum, Darryl C; CleanWaterBranch; Saito, Mona; Yoda, Kathy S; Linda.Speerstra@usace.army.mil; Chen, Edward
Subject:	Surface Water Permit Application Review: SCAP.5860.3 Oio Turtle Bay
Date:	Friday, March 18, 2022 12:38:43 PM

Good Afternoon, Ms. Alakai:

The Department of Health (DOH) Clean Water Branch (CWB) has briefly reviewed information contained in SCAP.5860.3 Application (e-signed and dated January 19, 2022) and is provide the following comments:

1. Based on information contained in Exhibit C of the SCAP Application, project proponent submitted a Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers (USACE), Honolulu District (POH) under the Department of the Army (DA) Nationwide Permits (NWP) #14 (Linear Transportation) under File No. POH-2021-00120. Only PCN (e-signed and dated September 16, 2021) was submitted as the Exhibit C. DA NWP verification/work authorization was not submitted. Please contact POH at (808) 835-4303 regarding the status of this NWP #14 verification. Pursuant to Condition 4 of File No. WQC0901.FNL.20, issued on May 26, 2020, the DOH/CWB cannot find records of receiving any e-mail (through cleanwaterbranch@doh.hawaii.gov and darryl.lum@doh.hawaii.gov) notification with the required pdf copy of issued final verification from USACE POH.
2. The SCAP Applicant's (or project proponent) intent is to cover the project under the DA 2017 NWP #14 authorization and to be covered under DOH/CWB's conditional blanket Section 401 Water Quality Certification (WQC) File No. WQC0901.FNL.20 (issued on May 26. 2020). We note that an Individual Section 401 WQC is required from the DOH/CWB if: (a) the project proponent did not receive a NWP #14 verification/work authorization before March 19, 2022 – the date 2017 NWP #14 expires; or (b) the project was not determined to be covered by POH under DOH/CWB's conditional blanket WQC by March 18, 2022 – the date WQC0901.FNL.20 expires (which is today) or (c) the project was not under construction or under contract to construct by March 19, 2022.
3. Oio Stream is Classified as "Class 2, Inland waters" as "Stream" by DOH-CWB. Pursuant to Hawaii Administrative Rules (HAR), Title 11, Chapter 54, §11-54-3(b)(2) "[T]he objective of class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation. The uses to be protected in this class of waters are all uses compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters." Per condition 3.e of WQC0901.FNL.20, the Applicant (or project proponent) shall"[E]nsure that the activities will not, after the completion of the activity, interfere or become injurious to any designated uses and/or existing uses of the receiving State water. Any such post-activity adverse impacts to the designated uses and/or existing uses of the receiving State water is a violation of HAR Chapter 11-54." The issuance of subject SCAP must ensure the compliance of objective and uses to be protected under HAR, §11-54-3(b)(2).
4. The project proponent must ensure the compliance with that "[T]he Conspan culvert system will be designed to retain a natural stream bottom and will be sized to accommodate a 100-year flood event" statement as specified in the second paragraph of item 30 and ensures

EXHIBIT 3

there will be no "concrete lining any section of natural streambed or bank" - bioengineering design is recommended.

5. If the project cannot be verified or work cannot be authorized under 2017 DA NWP #14 or DA NWP, an individual WQC is required and the "CWB Individual Section 401 WQC Form, VERSION 1.4" can be found in https://eha-cloud.doh.hawaii.gov/epermit/app/#/formversion/b01bcdfa-78eb-490e-8855-749bafeb30ae.
6. DOH/CWB recommends all Applicants who submits request for a WQC obtaining an electric signature approval from the DOH. Electronic Signature Subscriber Agreement. VERSION 3.0 and Instruction can be found in: https://eha-cloud.doh.hawaii.gov/epermit/app/#/formversion/fa666bf3-2b31-40fc-b52e-9c29c1d10d7e.

If you have any questions, please call me at (808) 586-4309.

Edward Chen
Environmental Engineer
Clean Water Branch
State of Hawaii Department of Health
Phone: (808) 586-4309

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

November 13, 2020

IN REPLY REFER TO:
Log No. 2019.00055
Doc No. 2011GC06
Archaeology

Kathy K. Sokugawa., Director
Department of Permitting and Planning
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Samantha Canon
BRE Turtle Bay Development, LLC
57-091 Kamehameha Highway
Kahuku, HI 96731
scanon@tbrdevelopment.com

Dear Ms. Sokugawa and Ms. Canon:

SUBJECT: **Chapter 6E-42Historic Preservation Review –**
Subdivision Application No. 2014/SUB-145 - Turtle Bay Resort
Archaeological Monitoring Plan
'Ōpana, Kawela, Hanakaoe, Ulupehupehu, Ō'io, Punalau, and
Kahuku Ahupua'a, Ko'olauloa District, Island of O'ahu,
TMK: (1) 5-6-003:054-062; (1) 5-7-001:013, 027-029, and 043-053; and
(1) 5-7- 006:024-030

This letter provides the State Historic Preservation Division's (SHPD's) review of the archaeological monitoring plan (AMP) titled, *Archaeological Monitoring Plan for Activities within the Turtle Bay Resort Development Area, 'Ōpana, Kawela, Hanakaoe, Ulupehupehu, Ō'io, Punalau, and Kahuku Ahupua'a, Ko'olauloa District, Island of O'ahu, TMK: (1) 5-6-003:054-062; (1) 5-7-001:013, 027-029, and 043-053; and (1) 5-7-006:024-030* (Gotay and Rechtman, December 2018).

ASM Affiliates (ASM) prepared this draft archaeological monitoring (AMP) on behalf of BRE Turtle Bay Development, LLC, in support of all proposed development activities that include subsurface disturbance within the Turtle Bay Resort development area on be. The Turtle Bay Resort property, totaling 840 acres is owned by a series of related entities, all private, including BRE Turtle Bay Development LLC (BRE), BRE Turtle Bay Resort LLC, and BRE Mauka Lands LLC. The resort property is bounded to the south by Kamehameha Highway (Hwy 83), to the east by Marconi Road, and to the west and North by the ocean.

The proposed development will expand the existing resort to include some combination of resort hotels, condo hotels, residential, commercial and recreation development on three defined, entitled and zoned oceanfront and other supporting infrastructure sites; as well as parks, shoreline setbacks, and public shoreline access points.

In 2014, the previous owner, Turtle Bay Resort LLC, agreed to designate more than 600 acres (out of the total 840 acres) as a conservation easement, to be called Punaho'olapa Wildlife Preserve. The previous owner and current owner each agreed, in consultation with SHPD, to prepare and implement four archaeological mitigation plans: a data recovery plan, a burial treatment plan, an archaeological monitoring plan (current document), and an archaeological preservation plan.

EXHIBIT 4

The burial treatment plan was submitted to the Oʻahu Island Burial Council (OIBC) which made a determination of preservation for Sites 50-80-02-4488, 50-80-02-6411, 50-80-02-7289, and the Daniel Pahu grave site and reinternment area; relocation of Site 50-80-02-7288 to the Daniel Pahu grave site; and recommended that SHPD accept the BTP. SHPD accepted the BTP in a letter dated October 12, 2018 (Log No. 2018.02260, Doc. No. 1810RKH07).

The AMP stipulates the following monitoring procedures:

- A coordination meeting shall be conducted between construction team, representatives of the project proponent and the monitoring archaeologist(s) prior to construction activities so the construction team is aware of the plan. At this time, the archaeologist shall advise the participants of the monitor's responsibilities for daily documentation of construction activities, the ability to temporarily stop construction to investigate potential cultural remains, and the documentation requirements;
- On-site monitoring shall be conducted for all project-related ground disturbing activities. One monitor is required for each piece of ground altering machinery during this project;
- The archaeological monitor has the authority to temporarily halt all activity in the area in the event of a potential historic property being identified, or to record archaeological information for cultural deposits or features;
- If non-burial historic properties are identified, documentation shall include, as appropriate, recording stratigraphy using USDA soil descriptions, GPS point collection with a receiver capable of sub meter accuracy, recordation of feature contents through excavation or sampling of features, screening of features, representative scaled profile drawings, photo documentation using a scale and north arrow, and appropriate laboratory analysis of collected samples and artifacts. Additionally, photographs and profiles of excavations shall be collected from across the project area even if no significant historic properties are encountered. Representative profiles shall be a minimum of two-meter-long sections;
- If human remains are identified, work will cease in the vicinity and the find shall be secured, and provisions outlined within the Hawaii Revised Statutes (HRS) §6E-43 and HAR §13-300-40, and any SHPD directives, shall be followed;
- Project materials will be stored temporarily with ASM and final curation facilities shall be determined in consultation with SHPD and the landowner;
- Any samples suitable for radiocarbon analysis shall be submitted for wood taxa identification prior to radiocarbon dating;
- Final curation of collected items shall be determined in consultation with the landowner and the SHPD; and
- Any deviation from these provisions shall occur only in consultation with the SHPD.

The plan is well written and meets the minimum requirements of HAR §13-279-4. **It is accepted**. Please send one hard copy of the document, clearly marked FINAL, along with a copy of this letter and a text-searchable PDF version to the Kapolei SHPD office, attention SHPD Library. Please also provide a PDF copy of the plan to Lehua.K.Soares@hawaii.gov.

SHPD hereby notifies the DPP that construction activities for the current project shall proceed in accordance with the approved monitoring plan. The permit has already been issued.

Upon completion of archaeological monitoring fieldwork, SHPD looks forward for review and acceptance a brief end of field work report within 30 days of completion of archaeological field monitoring. SHPD looks forward to reviewing an archaeological monitoring report meeting the requirements of HAR §13-279-5 within 60 days after completion of fieldwork.

Please contact Dr. Susan A. Lebo, Archaeology Branch Chief, at Susan.A.Lebo@hawaii.gov or at (808) 321-9000, for any questions regarding this letter.

Aloha,

Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Bob Rechtman, brechtman@asmaffiliates.com
Wallace Carvalho, wcarvalho@honolulu.gov
Perry Tamayo, ptamayo@honolulu.gov
Kanani Padeken, kpadeken@honolulu.gov

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850

March 21, 2022

In Reply Refer To:
2022-0022215-S7-001

Ms. Rebecca Alakai
Commission on Water Resource Management
Department of Land and Natural Resources
State of Hawai'i
P.O. Box 621
Honolulu, Hawai'i 96809

Subject: Species List for the BRE Turtle Bay Resort Stream Channel Alteration TMK: (1) 5-7-001:048, 049, and 052 Kahuku, O'ahu

Dear Ms. Alakai:

Thank you for your email of March 16, 2022, requesting a species list and guidance for the proposed construction of a new 30 ft x 8 ft x 108 ft Conspan culvert across the 'Ō'io Stream (East Main Drain), TMK: (1) 5-7-001:048, 049, and 052, on the island of O'ahu. The proposed project is located in Kahuku and consists of the installation of concrete wing walls ranging from 30 ft to 92 ft in length on both the upstream and downstream ends of the culverts to protect the roadway embankment from erosion. Riprap is proposed to be place at a depth of 3 ft at grade along the wing walls and in scour prone areas at the upstream end of the structure.

This letter has been prepared under the authority of and in accordance with provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*), as amended (ESA). Based on this authority, we offer the following comments for your consideration. We have reviewed the information you provided and pertinent information in our files, as it pertains to listed species and designated critical habitat in accordance with section 7 of the ESA. There is no federally designated critical habitat within the immediate vicinity of the proposed project. Our data indicate the following federally listed species may occur or transit through the vicinity of the proposed project area: the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*); the endangered Hawaiian petrel (*Pterodroma sandwichensis*), endangered Hawai'i distinct population segment (DPS) of band-rumped storm-petrel (*Oceanodroma castro*), and threatened Newell's shearwater (*Puffinus auricularis newelli*) (hereafter collectively referred to as Hawaiian seabirds); and the endangered Hawaiian stilt (*Himantopus mexicanus knudseni*), endangered Hawaiian coot (*Fulica alai*), endangered Hawaiian gallinule (*Gallinula galeata sandvicensis*),

EXHIBIT 5

and the endangered Hawaiian duck (*Anas wyvilliana*) (hereafter collectively referred to as Hawaiian waterbirds). Bird species federally protected under the Migratory Bird Species Act may also occur in the proposed project area.

Hawaiian hoary bat

The Hawaiian hoary bat roosts in woody vegetation across all islands and will leave their young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, June 1 through September 15, there is a risk that young bats could inadvertently be harmed or killed, since they are too young to fly or move away from disturbance. Hawaiian hoary bats forage for insects from as low as 3 feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing.

To avoid and minimize impacts to the endangered Hawaiian hoary bat we recommend you incorporate the following applicable measures into your project description:

- Do not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15).
- Do not use barbed wire for fencing.

Hawaiian seabirds

Hawaiian seabirds may traverse the project area at night during the breeding, nesting and fledging seasons (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable to light attraction.

To avoid and minimize potential project impacts to seabirds we recommend you incorporate the following measures into your project description:

- Fully shield all outdoor lights so the bulb can only be seen from below.
- Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- Avoid nighttime construction during the seabird fledging period, September 15 through December 15.

Hawaiian waterbirds

Hawaiian waterbirds are currently found in a variety of wetland habitats including freshwater marshes and ponds, coastal estuaries and ponds, artificial reservoirs, kalo or taro (*Colocasia esculenta*) lo'i or patches, irrigation ditches, sewage treatment ponds, and in the case of the Hawaiian duck, montane streams and marshlands. Hawaiian stilts may also be found wherever ephemeral or persistent standing water may occur. Threats to these species include non-native predators, habitat loss, and habitat degradation. Hawaiian ducks are also subject to threats from hybridization with introduced mallards.

To avoid and minimize potential project impacts to Hawaiian waterbirds we recommend you incorporate the following measures into your project description:

- In areas where waterbirds are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.
- If water resources are located within or adjacent to the project site, incorporate applicable best management practices regarding work in aquatic environments into the project design (see enclosure).
- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the Service within 48 hours for further guidance.
    - Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.
    - Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

We appreciate your efforts to conserve protected species. If you have questions regarding this letter, please contact Charmian Dang, Fish and Wildlife Biologist (phone: 808-792-9400, email: Charmian_Dang@fws.gov). When referring to this project, please include this reference number: 2022-0022215-S7-001.

Sincerely,

AARON NADIG

Digitally signed by AARON NADIG
Date: 2022.03.21 13:05:50 -10'00'

Island Team Manager
Oʻahu, Kauaʻi, Northwestern Hawaiian Islands, and American Samoa

STREAM CHANNEL ALTERATION PERMIT STANDARD CONDITIONS
(Revised December 15, 2020)

1. The permit application and staff submittal approved by the Commission at its meeting on the above date shall be incorporated herein by reference.
2. The project may require other agency approvals regarding wetlands, water quality, grading, stockpiling, endangered species, and floodways. The permittee shall comply with all other applicable statutes, ordinances, and regulations of the Federal, State and county governments, including, but not limited to, instream flow standards.
3. The permittee, his successors, assigns, officers, employees, contractors, agents, and representatives, shall indemnify, defend, and hold the State of Hawaii harmless from and against any claim or demand for loss, liability, or damage including claims for property damage, personal injury, or death arising out of any act or omission of the permittee or his successors, assigns, officers, employees, contractors, and agents under this permit or related to the granting of this permit.
4. The permittee shall notify the Commission, by letter, of the actual dates of project initiation and completion. The permittee shall submit a set of as-built plans and photos in pdf format of the completed work to the Commission upon completion of this project. This permit may be revoked if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. The proposed work under this stream channel alteration permit shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Commission upon showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Commission no later than three (3) months prior to the date the permit expires. If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.
5. Before proceeding with any work authorized by the Commission, the permittee shall submit one set of construction plans and specifications in PDF format to determine consistency with the conditions of the permit and the declarations set forth in the permit application.
6. The permittee shall implement site-specific, construction Best Management Practices in consultation with the DOH Clean Water Branch and other agencies as applicable, that are designed, implemented, operated, and maintained by the permittee and its contractor to properly isolate and confine activities and to contain and prevent any potential pollutant(s) discharges from adversely impacting State waters per HRS Ch. 342D Water Pollution; HAR §11-54-1 through §11-54-8 Water Quality Standards; and HAR Ch. 11-55 Water Pollution Control, Appendix C.
7. The permittee shall protect and preserve the natural character of the stream bank and stream bed to the greatest extent possible. The permittee shall plant or cover lands denuded of vegetation as quickly as possible to prevent erosion and use native plant species common to riparian environments to improve the habitat quality of the stream environment.
8. In the event that subsurface cultural remains such as artifacts, burials or deposits of shells or charcoal are encountered during excavation work, the permittee shall stop work in the area of the find and contact the Department's Historic Preservation Division immediately. Work may commence only after written concurrence by the State Historic Preservation Division.

EXHIBIT 6

LEGAL AUTHORITIES

Water as a Public Trust. The four public trust purposes are:

1. Maintenance of waters in their natural state;
2. Domestic water use of the general public, particularly drinking water;
3. The exercise of Native Hawaiian and traditional and customary rights, including appurtenant rights. Waiahole I, 94 Hawaii 97; 9 P.3d 409 (2000).
4. Reservations of water for use on Hawaiian home lands. Waiola O Molokai, Inc., 103 Hawaii 401; 83 P.3d 664 (2004).

Activities on undeveloped lands. Public Access Shoreline Hawaii v. Hawaii County Planning Commission (PASH I). 79 Hawaii 246 (1993).

HRS §174C-71 Protection of instream uses. The commission shall establish and administer a statewide instream use protection program. In carrying out this part, the commission shall cooperate with the United States government or any of its agencies, other state agencies, and the county governments and any of their agencies. In the performance of its duties the commission shall:

(2) Establish interim instream flow standards;
  (D) In considering a petition to adopt an interim instream flow standard, the commission shall weigh the importance of the present or potential instream values with the importance of the present or potential uses of water for non-instream purposes, including the economic impact of restricting such uses;
(3) Protect stream channels from alteration whenever practicable to provide for fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses;
  (A) The commission shall require persons to obtain a permit from the commission prior to undertaking a stream channel alteration; provided that routine streambed and drainageway maintenance activities and maintenance of existing facilities are exempt from obtaining a permit;
  (C) The commission shall establish guidelines for processing and considering applications for stream channel alterations consistent with section 174C-93;

HAR §13-169-2 Definitions.

"Channel alteration" means to obstruct, diminish, destroy, modify, or relocate a stream channel; to change the direction of flow of water in a stream channel; to place any material or structures in a stream channel; or to remove any material or structures from a stream channel.

"Stream channel" means a natural or artificial watercourse with a definite bed and banks which periodically or continuously contains flowing water.

HAR §13-169-49.1 Interim instream flow standard for Windward Oahu. The Interim Instream Flow Standard for all streams on Windward Oahu, as adopted by the commission on water resource management on April 19, 1989, shall be that amount of water flowing in each stream on the effective date of this standard, and as that flow may naturally vary throughout the year and from year to year without further amounts of water being diverted offstream through new or expanded diversions, and under the stream conditions existing on the effective date of the standard. (Eff. May 4, 1992).

HAR §13-169-50 Permit required. (a) Stream channels shall be protected from alteration whenever practicable to provide for fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses. No stream channel shall be altered until an application for a permit to undertake the work has been filed and a permit is issued by the commission; provided that routine streambed and drainageway maintenance activities and maintenance of existing facilities are exempt from obtaining a permit.

HAR §13-169-52 Criteria for ruling on application. (a) The commission shall act upon an application within ninety calendar days after acceptance of the application.

(b) Based upon the findings of fact concerning an application for a stream channel alteration permit, the commission shall either approve in whole, approve in part, approve with modifications, or reject the application for a permit.

(c) In reviewing an application for a permit, the commission shall cooperate with persons having direct interest in the channel alteration and be guided by the following general considerations:

(1) Channel alterations that would adversely affect the quantity and quality of the stream water or the stream ecology should be minimized or not be allowed.
(2) Where instream flow standards or interim instream flow standards have been established pursuant to subchapters 3 and 4, no permit shall be granted for any channel alteration which diminishes the quantity or quality of stream water below the minimum established to support identified instream uses, as expressed in the standards.
(3) The proposed channel alteration should not interfere substantially and materially with existing instream or non-instream uses or with channel alterations previously permitted.

(c) Notwithstanding subparagraph (b) above, the commission may approve a permit pursuant to subparagraph (a) above in those situations where it is clear that the best interest of the public will be served, as determined by the commission.

HAR §13-169-53 Term of permit. (a) Every permit approved and issued by the commission shall be for a specified period, not to exceed two years, unless otherwise specified in the permit.

DAVID Y. IGE
GOVERNOR
STATE OF HAWAII

JOSH GREEN
LT. GOVERNOR
STATE OF HAWAII

WILLIAM J. AILA, JR
CHAIRMAN
HAWAIIAN HOMES COMMISSION

TYLER I. GOMES
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P O BOX 1879
HONOLULU, HAWAII 96805

April 6, 2022

MEMORANDUM Ref.:PO-22-106

TO: Suzanne D. Case, Chairperson
Commission on Water Resource Management

COPY TO: Donald Goodman
BRE Turtle Bay Resort, LLC

FROM: William J. Aila, Jr., Chairman
Hawaiian Homes Commission

RE: Stream Channel Alteration Permit Application (SCAP.5860.3), BRE Turtle Bay Resort, LLC, New Roadway Access Project, ʻŌʻio Stream (East Main Drain), Kahuku Oʻahu, TMK: (1) 5-7-001:048, 049, and 052

The Department of Hawaiian Home Lands (DHHL) has reviewed SCAP No. 5860.3 ʻŌʻio Stream (East Main Drain), Kahuku Oʻahu, TMK: (1) 5-7-001:048, 049, and 052.

We appreciate the opportunity to review this application and offer the following background and requests for action.

Background

The following points serve as context for our requests on this SCAP.

The State (and particularly the Commission on Water Resource Management [Commission]) has a duty to protect the rights of DHHL to water resources, as enumerated in the Hawaiian Homes Commission Act (HHCA) §§ 101(4), 220, 221; Hawai'i Constitution, Article XI, §§ 1 and 7 and Article XII, § 7; and Hawaii Revised Statutes (HRS) Chapter 174C, the State Water Code.

EXHIBIT 2

DHHL lands on O'ahu comprise approximately 8,154 acres. Although none of its landholdings are located in the immediate vicinity of the project area, DHHL beneficiaries may exercise traditional and customary practices in the surrounding area of the project.

DHHL understands that ten years have elapsed between the completion of the Applicant's August 2012 Cultural Impact Assessment in support of its 2013 FSEIS and its January 2022 SCAP Application submittal to the Commission. DHHL also understands that the North Shore of O'ahu and its communities are especially vulnerable to coastal erosion and flooding due to climate change and sea level rise. Such coastal hazards are leading to disproportionate impacts to frontline populations(those living near the shoreline) including Native Hawaiian communities with strong identity and place-based ties to coastal resources near the project area.

The Applicant has also articulated, in its SCAP application, their commitment to build off previous outreach efforts and continue to consult with the community and numerous stakeholders to implement recommendations that will reasonably protect cultural, historical, and natural resources at Turtle Bay Resort, including traditional and customary Native Hawaiian rights.

Because DHHL's beneficiaries may exercise traditional and customary practices in the proposed project area, DHHL has interest in this SCAP.

Requests for the applicant and Commission

Based on the above, the department offers a request regarding this SCAP: As a result of ever-changing conditions at the shoreline below the project area and the potential discharge of contaminants to wetlands, streams, and the ocean, in the surrounding area, follow up engagement and consultation is necessary, specifically with BRE Turtle Bay Resort, LLC's Cultural Advisory Committee, the Office of Hawaiian Affairs, and other Native Hawaiian community groups whose traditional and customary rights and practices as well as nearshore marine resources are located in the surrounding area below the proposed project site.

DHHL appreciates the opportunity to offer comments on this SCAP. Please contact Andrew Choy, Planning Program Manager, at [redacted] for further information.

From:	Chen, Edward
To:	Alakai, Rebecca R
Cc:	Wong, Alec Y; Lum, Darryl C; CleanWaterBranch; Saito, Mona; Yoda, Kathy S; Linda.Speerstra[redacted] Chen, Edward
Subject:	Surface Water Permit Application Review: SCAP.5860.3 Oio Turtle Bay
Date:	Friday, March 18, 2022 12:38:43 PM

Good Afternoon, Ms. Alakai:

The Department of Health (DOH) Clean Water Branch (CWB) has briefly reviewed information contained in SCAP.5860.3 Application (e-signed and dated January 19, 2022) and is provide the following comments:

1. Based on information contained in Exhibit C of the SCAP Application, project proponent submitted a Pre-Construction Notification (PCN) to the U.S. Army Corps of Engineers (USACE), Honolulu District (POH) under the Department of the Army (DA) Nationwide Permits (NWP) #14 (Linear Transportation) under File No. POH-2021-00120. Only PCN (e-signed and dated September 16, 2021) was submitted as the Exhibit C. DA NWP verification/work authorization was not submitted. Please contact POH at (808) 835-4303 regarding the status of this NWP #14 verification. Pursuant to Condition 4 of File No. WQC0901.FNL.20, issued on May 26, 2020, the DOH/CWB cannot find records of receiving any e-mail (through cleanwaterbranch@doh.hawaii.gov and [redacted] notification with the required pdf copy of issued final verification from USACE POH.
2. The SCAP Applicant's (or project proponent) intent is to cover the project under the DA 2017 NWP #14 authorization and to be covered under DOH/CWB's conditional blanket Section 401 Water Quality Certification (WQC) File No. WQC0901.FNL.20 (issued on May 26. 2020). We note that an Individual Section 401 WQC is required from the DOH/CWB if: (a) the project proponent did not receive a NWP #14 verification/work authorization before March 19, 2022 – the date 2017 NWP #14 expires; or (b) the project was not determined to be covered by POH under DOH/CWB's conditional blanket WQC by March 18, 2022 – the date WQC0901.FNL.20 expires (which is today) or (c) the project was not under construction or under contract to construct by March 19, 2022.
3. Oio Stream is Classified as "Class 2, Inland waters" as "Stream" by DOH-CWB. Pursuant to Hawaii Administrative Rules (HAR), Title 11, Chapter 54, §11-54-3(b)(2) "[T]he objective of class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation. The uses to be protected in this class of waters are all uses compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters." Per condition 3.e of WQC0901.FNL.20, the Applicant (or project proponent) shall"[E]nsure that the activities will not, after the completion of the activity, interfere or become injurious to any designated uses and/or existing uses of the receiving State water. Any such post-activity adverse impacts to the designated uses and/or existing uses of the receiving State water is a violation of HAR Chapter 11-54." The issuance of subject SCAP must ensure the compliance of objective and uses to be protected under HAR, §11-54-3(b)(2).
4. The project proponent must ensure the compliance with that "[T]he Conspan culvert system will be designed to retain a natural stream bottom and will be sized to accommodate a 100-year flood event" statement as specified in the second paragraph of item 30 and ensures

there will be no “concrete lining any section of natural streambed or bank” - bioengineering design is recommended.

5. If the project cannot be verified or work cannot be authorized under 2017 DA NWP #14 or DA NWP, an individual WQC is required and the “CWB Individual Section 401 WQC Form, VERSION 1.4“ can be found in https://eha-cloud.doh.hawaii.gov/epermit/app/#/formversion/b01bcdfa-78eb-490e-8855-749bafeb30ae.
6. DOH/CWB recommends all Applicants who submits request for a WQC obtaining an electric signature approval from the DOH. Electronic Signature Subscriber Agreement. VERSION 3.0 and Instruction can be found in: https://eha-cloud.doh.hawaii.gov/epermit/app/#/formversion/fa666bf3-2b31-40fc-b52e-9c29c1d10d7e.

If you have any questions, please call me at [redacted]

Edward Chen
Environmental Engineer
Clean Water Branch
State of Hawaii Department of Health
Phone: [redacted]

From: Lum, Darryl C <[redacted]gov>
Sent: Thursday, March 17, 2022 1:33 PM
To: Chen, Edward <[redacted]>
Cc: Wong, Alec Y <[redacted]>; Saito, Mona <[redacted]gov>
Subject: FW: Surface Water Permit Application Review: SCAP.5860.3 Oio Turtle Bay

Hi EC,

Please help me draft a response.

Thanks,
Darryl

Darryl Lum
Clean Water Branch
State of Hawaii Department of Health
Phone: [redacted]

received this communication and/or attachments in error, please notify the sender via e-mail immediately and destroy all electronic and paper copies.

From: Saito, Mona <[redacted]gov>
Sent: Thursday, March 17, 2022 1:17 PM
To: Lum, Darryl C <[redacted]gov>
Cc: Wong, Alec Y <[redacted]gov>
Subject: FW: Surface Water Permit Application Review: SCAP.5860.3 Oio Turtle Bay

Org msg pdfd and efiled in Daily log.

From: Yoda, Kathy S <[redacted]>
Sent: Thursday, March 17, 2022 12:36 PM
To: CleanWaterBranch <cleanwaterbranch@doh.hawaii.gov>
Subject: Surface Water Permit Application Review: SCAP.5860.3 Oio Turtle Bay

The application is on our website at http://dlnr.hawaii.gov/cwrm/surfacewater/review/.

Please respond to this email request for comments to [redacted] Thank you.

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL
RESOURCES DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

Date: 06/26/2025
DAR # AR6906

MEMORANDUM

TO: Brian J. Neilson
DAR Administrator

FROM: Anthony Olegario, Aquatic Biologist

SUBJECT: SCAP.6438.3 Turtle Bay, Oio Stream

Request Submitted by: CWRM

Location of Project: ~~5-7-00 1:048, 049, and 052;~~ Turtle Bay Resort, ʻOʻio Stream (East Main Drain), Kahuku, Koʻolauloa District, Oʻahu, Hawaiʻi

Brief Description of Project:

Turtle Bay Resort proposes to construct a new road, Kaihalulu Drive ("Project"), over the estuarine reach of ʻŌʻio Stream (also known as East Main Drain) near Kahuku on the north shore of Oʻahu. The purpose of the proposed project is to maintain drainage capacity and stream flow within the ʻOlo
Stream and to allow construction of a new private roadway within the existing Turtle Bay Resort. The proposed road, Kaihalulu Drive, will run parallel and approximately 500 feet mauka of the shoreline within the existing TBR property and will provide access to various resort facilities and amenities pursuant to the master plan for the resort.

Comments:

☐ No Comments ☑ Comments Attached

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

Comments Approved: _____ Date: 07/01/2025
Brian J. Neilson
DAR Administrator

EXHIBIT 4

DAR# AR6906

Brief Description of Project

The first phase of construction will extend approximately 2,500 feet east of Kuilima Drive. Proposed facilities within Kaihalulu Drive consist of a 24-foot-wide asphalt concrete (A.C.) paved road, a 10-foot-wide concrete walkway, a 10-foot-wide A.C. paved golf cart path, underground utility lines, and landscaping.

Approximately 2,100 feet (0.4 miles) east of the proposed intersection with Kuilima Drive, the new roadway alignment will cross a downstream portion of ‘Oio Stream (East Main Drain). A new Conspan culvert system is proposed to accommodate the crossing of the new roadway. This Conspan culvert system will be designed to retain a natural stream bottom and will be sized to accommodate a 100-year flood event, It is expected to be approximately 30 feet wide with a clearance height of 8 feet. The Conspan culvert structures will be made of pre-cast concrete and will be installed in sections for a total length of approximately 108 feet along the stream. Concrete wing walls ranging from 30 feet to 92 feet in length will also be installed on both the upstream and downstream ends of the culverts to prote

A biological survey was conducted for the project, and findings were compiled in the Environmental surveys in ‘O’io Stream (East Main Drain), Turtle Bay Resort, O’ahu report from AECOS, Inc. date July 7, 2021. Biologists observed 10 species of aquatic biota from nine families. Both striped mullet or ‘ama‘ama (Mugil cephalus) and o‘opu naniha (Stenogobius hawaiiensis) are native to the Hawaiian Islands; ‘ama‘ama is indigenous and o‘opu naniha is endemic. The remainder of the observed biota comprises naturalized species, common in streams and muliwai throughout Hawai‘i. It was recommended that construction plans should incorporate BMPs to prevent degradation of the water in .O.io Stream and an adaptive monitoring approach taken to monitor effectiveness of BMPs deployed during construction and take corrective action, if needed.

DAR# AR6906

Comments

CMahalo for the opportunity to review the proposed infrastructure improvements under SCAP.6438.3 at Turtle Bay Resort, specifically the proposed construction of a new culvert and access road over ʻŌʻio Stream. Based on the materials provided, including the AECOS Environmental Survey dated July 7, 2021, and our internal knowledge of native aquatic ecosystems, we respectfully offer the following comments:

Native Aquatic Species and Habitat Value
The AECOS survey documented the presence of two native aquatic species in the estuary of ʻŌʻio Stream:

- ʻOʻopu naniha (Stenogobius hawaiiensis) – endemic amphidromous goby
- ʻAmaʻama (Mugil cephalus) – native striped mullet

Both are listed as Species of Greatest Conservation Need (SGCN) in the Hawaiʻi State Wildlife Action Plan (SWAP), indicating their ecological significance and need for conservation. Their presence highlights the importance of maintaining hydrologic connectivity and water quality in this stream-estuary system.

Water Quality Observations
The AECOS report noted very high concentrations of ammonium and total nitrogen across all monitoring stations, indicating elevated nutrient levels. While total phosphorus was low, these results suggest eutrophic conditions that may negatively affect aquatic life and ecosystem health, especially if hydrology or sediment patterns are further altered.

Culvert Design and Hydraulic Concerns
The SCAP application notes a proposed 30-ft wide × 8-ft high ConSpan culvert that:
“...will be designed to retain a natural stream bottom and will be sized to accommodate a 100-year flood event.” (p. 39)
However, based on data from the AECOS report and USGS StreamStats, the 100-year peak flow for ʻŌʻio Stream is estimated at 8,670 cfs. Based on standard open-channel hydraulics, the proposed culvert dimensions are likely insufficient to fully convey that discharge without overtopping.
Key Concerns:

- The proposed culvert dimensions are unlikely to convey this volume without overtopping, especially under storm or high flow events.
- The statement in the SCAP document may be misleading if it implies full conveyance within the culvert.

Continued on Next Page

DAR# AR6906

Comments

Stream Connectivity and Downstream Barriers and Cumulative Effects
The proposed project involves the construction of a new stream crossing and culvert over ʻŌʻio Stream, but it does not include modifications to the existing culverts near the stream mouth. These downstream structures and may be undersized, potentially contributing to: sediment buildup, intermittent disconnection from the ocean, impaired flow conveyance, and restricted migration of native amphidromous species.

While the new upstream culvert may be designed to support flow and biotic movement, its overall effectiveness will likely be limited by these downstream constraints. In addition, the introduction of new in-stream infrastructure without improving downstream connectivity may contribute to cumulative impacts on habitat quality, species movement, and overall stream health. Consideration of cumulative effects and existing barriers is critical when evaluating the ecological impacts of new infrastructure in stream systems, especially those supporting native and sensitive aquatic species.

Recommendations
To ensure effective habitat protection and compliance with DLNR's aquatic resource goals, DAR recommends:
1. Hydraulic modeling documentation showing how the culvert will accommodate the Q100 flow (with or without overtopping).
2. Clarification on whether overtopping is part of the design intent.
3. If possible, a copy of the as-built drawings or final structure dimensions be shared after construction. This would help us better understand the final conditions and how they may relate to stream flow, fish passage, and aquatic habitat.

WILSON OKAMOTO CORPORATION
INNOVATORS · PLANNERS · ENGINEERS

10393-01
July 7, 2025

Rebecca Alakai
Regulatory Section
Commission on Water Resource Management
1151 Punchbowl Street, Rm 227
Honolulu, HI 96813

Subject: **Response to Recommendations**
Turtle Bay Resort - ʻŌʻio Stream (East Main Drain)
TMK: (1) 5-7-001:048, 049, and 052
Kahuku, Koʻolauloa District, Oʻahu, Hawaiʻi
SCAP.6438.3; DAR#AR6906

Dear Ms. Alakai:

Wilson Okamoto Corporation (WOC) is the civil engineering consultant for the subject project. The purpose of this letter is to formally respond to the recommendations provided in the Department of Land and Natural Resources, Division of Aquatic Resources (DLNR) letter dated June 26, 2025 (see enclosures).

Below are the recommendations noted, along with our responses:

1. **Hydraulic modeling documentation showing how the culvert will accommodate the Q100 flow (with or without overtopping).**

   A hydraulic and scour analysis titled *"Turtle Bay Resort, Kaihalulu East Roadway Extension, Proposed Crossing – East Main Drain, Study Report"* prepared by River Focus and dated October 2024 (Hydraulic Analysis) is enclosed with this letter. The analysis evaluated the hydrologic and hydraulic conditions of the project under a Q100 storm event. The report concludes that the proposed Con/Span culvert (along with other proposed pipe culverts) is designed to convey the Q100 flow to the ocean outfall without overtopping the new roadway.

2. **Clarification on whether overtopping is part of the design intent.**

   As noted above, overtopping of the new roadway is not part of the design intent. The system has been designed to convey the full Q100 flow without overtopping the roadway.

3. **If possible, a copy of the as-built drawings or final structure dimensions be shared after construction. This would help us better understand the final conditions and how they may relate to stream flow, fish passage, and aquatic habitat.**

   A copy of the as-built drawings can be provided upon project completion.

Please feel free to contact me at (808) 946-2277 should you have any questions or require any additional information.

Sincerely,

Brett Kuamoo, P.E.

Enclosures:

- DLNR Comment Letter dated June 26, 2025
- Hydraulic Analysis dated October 2024:
  "Turtle Bay Resort, Kaihalulu East Roadway Extension, Proposed Crossing – East Main Drain, Study Report", by River Focus.

Environmental surveys in ʻŌʻio Stream (East Main Drain) Turtle Bay Resort, Oʻahu

Prepared by:

AECOS, Inc.
45-939 Kamehameha Hwy, Suite 104
Kāneʻohe, Hawaiʻi 96744-3221

July 7, 2021

EXHIBIT 6

Environmental surveys in ʻŌʻio Stream (East Main Drain) , Turtle Bay Resort, Oʻahu

July 7, 2021 *AECOS* No. 1547C

Lesley Davidson, Allen Cattell, and Susan Burr
AECOS, Inc.
45-939 Kamehameha Hwy, Suite 104
Kāneʻohe, Hawaiʻi 96744
Phone: (808) 234-7770 Email: lesley@aecos.com

Introduction

Turtle Bay Resort proposes to construct a new road, Kaihalulu Drive ("Project"), over the estuarine reach of ʻŌʻio Stream (also known as East Main Drain) near Kahuku on the north shore of Oʻahu. *AECOS*, Inc. was contracted by Wilson Okamoto Corporation to conduct environmental surveys in the Project area, depicted in Figure 1, to support permitting for the Project. We assessed federal jurisdiction of aquatic features as authorized by the Clean Water Act (CWA) and Rivers and Harbors Act (RHA), and delineated[1] jurisdictional boundaries. These jurisdictional limits are the high tide line (HTL) in ʻŌʻio Stream and the wetland boundary of the golf course pond/wetland. Site surveys included an analysis of water quality, a waterbird survey, and an assessment of aquatic biota in the stream and potential for migration of native aquatic biota through the Project area. This report details findings of these efforts.

Site Description

Turtle Bay Resort is situated on the Kahuku coastal plain, which has been developed and redeveloped since the late 1700s (Pacific Legacy, 2012). The area was once used as a large Hawaiian village, as a sheep and cattle ranch, for sugar cane cultivation, as transportation corridor (e.g., railway and highway), and as a World War II military installation. The area has been used as a resort since the early 1970s.

[1] The process of determining the line on the ground (and shown on maps) separating jurisdictional waters from upland is termed a "delineation". Although *AECOS* can "delineate" limits of jurisdictional waters, jurisdictional determination is the purview of USACE, and that agency must concur with our delineation for it to become official.

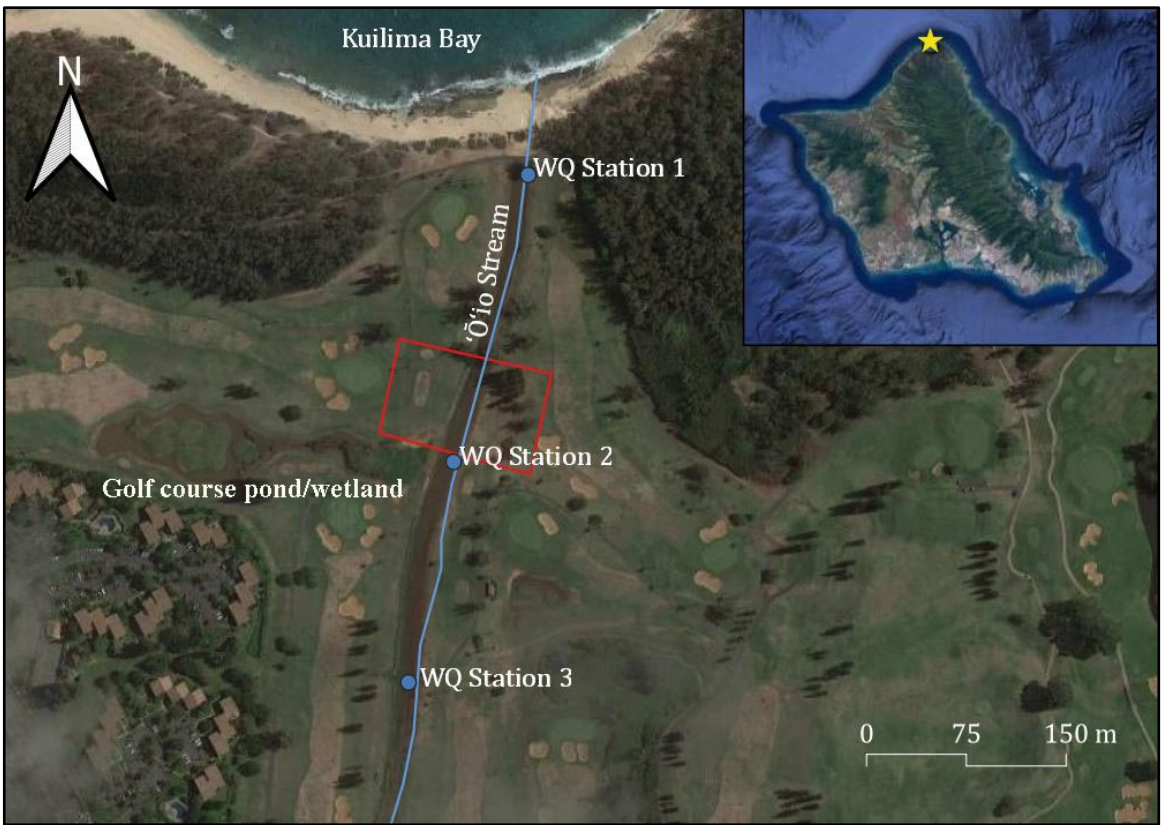


Figure 1. Project area (in red) where proposed Kaihalulu Drive will cross ‘Ō‘io Stream.

‘Ō‘io watershed (state code 31005) extends from the ridge of Ko‘olau Mountain at 512 m (1,680 ft) above sea level (ASL) across the Kahuku coastal plain and terminates at Kaihalulu Beach on Kuilima Bay (Parham et al., 2008). The watershed encompasses 11.5 km^2 (4.5 mi^2). The longest continuous length of stream channel is 13.6 km (8.4 mi). ‘Ōi‘o Stream is a second order, interrupted perennial[2] stream (HCPSU, 1990; Parham et al., 2008) with a single tributary, East ‘Ō‘io Gulch, which joins the main gulch at about 67 m (220 ft) ASL.

The Kahuku coastal plain, on which Turtle Bay Resort is built, is a fossilized limestone reef that formed some 120,000 to 125,000 years ago when sea level was higher (Stearns, 1978). Consequently, soils and rock exposures in the area are calcareous limestones and not volcanic in origin. The porous nature of the underlying limestone limits the formation of stream channels on the coastal plain because stream flow from the mountains enters underground voids in the reef formation, rather than carving a channel across the surface. Like ‘Ō‘io

[2] A perennial stream has year-round, continuous flow in at least some segments. Flow is not always continuous through the entire reach in an interrupted perennial stream.

Stream, many other streams in the region are interrupted perennial streams because channels that may have perennial flow in the upper reaches, lack continuous surface flow in the lower reaches crossing the porous coastal plain. When groundwater levels are high, the coastal plain may flood, especially after heavy rainfall. Lithified sand dunes raise the elevation just inland of the shore, which further contributes to local flooding.

Modifications on the Kahuku coastal plain have included development of a regional system of ditches to drain the land, redirect stream flow away from development, and funnel flow directly into the ocean (ONWRC and USFWS, 2011). In many instances, the ground was excavated to the depth of the basal aquifer, resulting in ditches and ponds with standing water.

On the coastal plain, in the area that would otherwise be a broad floodplain, flow from ‘Ō‘io Stream is directed between agricultural lots, underneath Kamehameha Highway, and confined in a man-made channel (East Main Drain) through the George Fazio golf course. At the *makai* end, this channel directs flow under a cart path through three, 3-ft diameter culverts and into a 20-ft wide channel that has been excavated through beachrock at the shore (Oceanit, 2012). Wave-deposited sand accumulates in front of these culverts (Figures 2 and 3) and must be mechanically cleared. The channel also accepts overflow from Punaho‘olapa Marsh (Oceanit, 2012).

Within the Project area, Ō‘io Stream is best described as a *muliwai* (a brackish water estuary, usually with a beach berm across the mouth). The presence of the beach berm does not preclude a hydrologic surface connection between Ō‘io Stream and the ocean and the berm is removed by winter swells and during major storm events.

A golf course pond/wetland, constructed between 1983 and 1988 (USGS, 1983; 1988), apparently as part of the development of the resort and golf course, connects to East Main Drain via an excavated ditch through a man-made berm (see photographs in Attachment B).

Climate and Soils

The Kahuku rain gauge (KII Kahuku 911), located 6.1 km southwest of the Project, records an average annual rainfall of 903 mm (36 in; NOAA-NCEI, 2020). U.S. Geological Survey (USGS) StreamStats estimates that the ‘Ō‘io drainage basin has a two-year peakflow of 1,610 cubic feet per second (cfs) and a 100 year peak flow of 8,670 cfs (USGS, 2017).

Figure 2. Culverts and excavated channel at mouth of ‘Ō‘io Stream on August 1, 2018 at Kaihalulu Beach (*AECOS*, 2018).

Figure 3. Mouth of ‘Ō‘io Stream on June 7, 2021 at Kaihalulu Beach. Culverts and excavated channel are buried under sand.

The National Wetlands Inventory (NWI), published by U.S. Fish and Wildlife Service (USFWS), is a geospatial dataset of surface waters and wetlands that is based primarily on historical aerial imagery (USFWS, nd-c). In this dataset, the NWI displays an intermittent stream, emergent freshwater wetland, and estuarine wetland in the excavated channel of ‘Ō‘io Stream in the Project area (NWI Codes: R4SBC, PEM1F, and E2EM1N; Figure 4). The NWI also maps the golf course pond/wetland as a semipermanently excavated pond with persistent, emergent vegetation (NWI Code: PUB/EM1Fx).

Mapped soils in the survey area (Fig. 4) are Jaucas sand, 0 to 15 percent slopes, MLRA 163 (“JaC”); Kaloko clay, 0 to 2 percent slope, MLRA 163 (“Kfa”); Pearl Harbor clay, 0 to 2 percent slopes, MLRA 163 (“Ph”; USDA-NRCS, 2020a). Both the Kaloko clay and Pearl Harbor clay are classified as hydric soils on the U.S. Dept. of Agriculture-Natural Resources Conservation Service (USDA-NRCS), National List of Hydric Soils for O‘ahu (USDA-NRCS, 2020b). Jaucas sand is classified as a nonhydric soil.

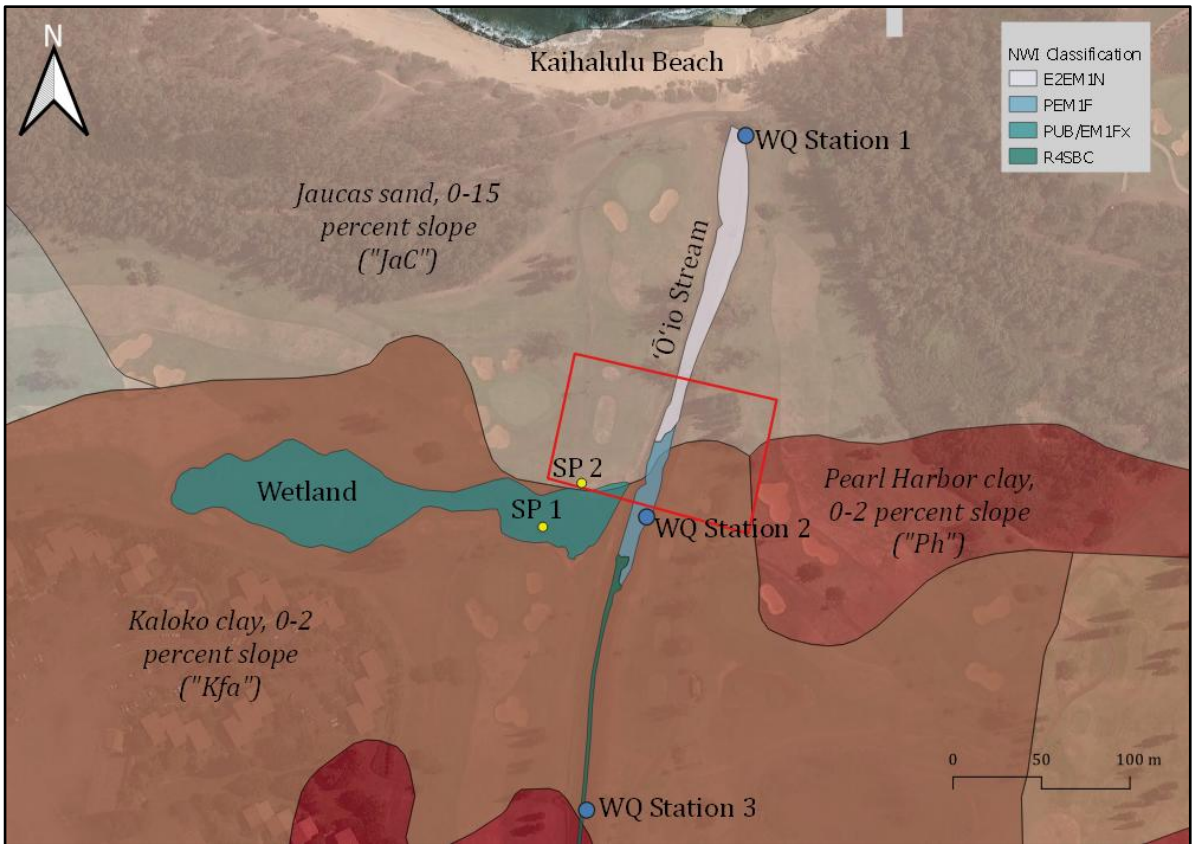


Figure 4. Mapped soils (USDA_NRCS, 2020a) and aquatic features (USFWS, nd-c) in the survey area. Project area is outlined in red.

Jurisdictional Waters

Waters of the U.S. (also called “jurisdictional waters”) are surface waters that come under federal jurisdiction as authorized by the CWA and RHA. Authority over these waters is granted to various federal agencies, including the U.S. Environmental Protection Agency (USEPA), with the U.S. Army Corps of Engineers (USACE) having permit authority for actions that impact jurisdictional waters. Jurisdictional waters include all tidal waters and a subset of streams (both perennial and intermittent), lakes, reservoirs, and wetlands.

On June 22, 2020, the Navigable Waters Protection Rule (NWPR) came into effect (USACE and USEPA, 2020), which redefined the scope of waters regulated under the CWA. As applicable to ʻŌʻio Stream and the Project site, the NWPR specifically identifies tidal waters and intermittent and perennial stream tributaries as jurisdictional waters but excludes ephemeral tributaries and wetlands without a direct hydrologic surface connection to an otherwise jurisdictional water body.

In the NWPR, a *tributary* is defined as an intermittent or perennial surface water channel (e.g., stream) that contributes surface flow to other waters of the U.S. (e.g., ocean) in a typical year. An *intermittent* stream is one that has surface water flowing continuously during certain times of the year and more than in direct response to precipitation and a *perennial* stream has surface water flowing continuously year-round. An *ephemeral* stream has surface water flowing or pooling only in direct response to precipitation. A tributary does not lose its jurisdictional status if it flows through a channelized non-jurisdictional surface water (such as a culvert) and a perennial or intermittent ditch is jurisdictional if it is a relocated tributary or is constructed in an adjacent wetland. The jurisdictional boundary of tidal waters is the mean high water (MHW, in RHA) and high tide line (HTL, in CWA), in non-tidal streams it is the ordinary high water mark (OHWM), and the jurisdictional boundary of adjacent wetlands is the wetland/upland boundary.

Wetlands are defined as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. If a wetland is present and adjacent to a jurisdictional water, CWA and RHA jurisdiction extends to the wetland/upland boundary. Adjacent wetlands means wetlands that (i) abut a jurisdictional waterbody, (ii) are inundated by flooding from a jurisdictional waterbody, (iii) are separated from a jurisdictional waterbody only by a natural berm, bank, dune, or similar natural feature; or (iv) are physically separated from a jurisdictional waterbody by an artificial dike, barrier, or similar artificial structure so long as that structure allows for a direct hydrologic connection in a typical year, such as via a culvert, flood or tide gate, pump, or similar artificial feature (USACE and USEPA, 2020).

Methods

Jurisdictional Waters

AECOS scientists reviewed literature, maps, and GIS datasets prior to our field study; sources included: U.S. Fish and Wildlife Service, National Wetlands Inventory (NWI; USFWS, 2020); U.S. Dept. of Agriculture, Natural Resource Conservation Service (USDA-NRCS) web soil survey (USDA-NRCS; 2020a); U.S. Geological Survey (USGS) StreamStats (USGS, 2017); National Oceanic and Atmospheric Administration (NOAA) Climate Data Online (NOAA-NCEI, 2020); State of Hawaii Dept. of Land and Natural Resources (HDLNR) Flood Hazard Assessment Tool (FHAT; HDLNR, n.d.); and previous surveys of the area (David and Guinther, 2012; *AECOS*, 2018).

We delineated the jurisdictional boundaries of the ʻŌʻio Stream channel and an adjacent pond/wetland feature within the general Project vicinity. The HTL in ʻŌʻio Stream channel was delineated using field observations of the general height reached by a rising tide, including a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, and tide gage information. *AECOS* scientists marked the HTL at paired locations along the stream channel (one on each bank) with flagging tape. Photographs at selected points were taken to document the HTL characteristics and to illustrate the environment (Attachment B). *AECOS* marked the geospatial locations of the HTL points using a handheld global navigation satellite system (GNSS) instrument (Trimble Geo 7X), providing, in most cases, 0.5-m accuracy in position. The resulting shapefile was processed with GPS Pathfinder, including differential correction, and exported as ArcMap shapefiles using a projected coordinate system of NAD 1983 UTM Zone 4N. A survey team from Engineer Surveyors Hawaii, Inc. recorded the locations and elevations of each flag on June 8, 2021.

To delineate the golf course pond/wetland, *AECOS* biologists followed the methods of wetland delineation described in *Corps of Engineers Wetland Delineation Manual* ("Manual"; USACE, 1987) and *Regional Supplement for Hawai'i and Pacific Islands* (USACE, 2012). Fig. 4 (above) is a map of the area around the Project site showing relevant polygons from the NWI and web soil survey. The entire Project site is within the floodway of ʻŌʻio Stream and subject to inundation by the 1% annual chance flood.

We established two wetland sampling points ("SP-1" and "SP-2"; see Fig. 4). SP-1 was located in the center of the golf course pond/wetland and SP-2 was located upslope of SP-1 in the *makai* direction. We completed a wetland

determination form at each location (Attachment A) and recorded the position with the GNSS.

The wetland status of plant species comes from the 2018 National Wetland Plant List (USACE, 2018). The National Wetland Plant List (NWPL), administered by the USACE, assigns a wetland indicator status to each species of plant on a regional basis. Table 1 provides wetland status indicators and their definitions. The wetland indicator status of each species within the plant assemblage at a SP is used to determine if a site has a “prevalence of vegetation typically adapted for life in saturated soil conditions.”

Table 1. Wetland status indicators and their definitions (from Lichvar and Gillrich, 2011).

Status indicator (CODE)	Qualitative Description
Obligate (OBL)	Almost always occurs in wetlands
Facultative wetland (FACW)	Usually occur in wetlands, but may occur in non-wetlands
Facultative (FAC)	Occur in wetlands and non-wetlands
Facultative upland (FACU)	Usually occur in non-wetlands, but may occur in wetlands
Upland (UPL)	Almost never occur in wetlands

The approach described by the Manual and Regional Supplement requires evidence of hydric soil, wetland hydrology, and hydrophytic vegetation (all three must be present) for a positive jurisdictional determination. The boundary between jurisdictional wetland and upland is established as a line outside of which at least one of the three indicators is absent.

Water Quality

AECOS biologists measured select field parameters and collected samples at three stations to characterize water quality of ‘Ō‘io Stream on June 7, 2021. One set of measurements was made and samples collected during a predicted flooding tide (0945 – 1020 hours) and one set during an ebbing tide (1420 – 1440). Tide predictions at TPT2779, Laie Bay were -0.20 ft at 05:58 am, +2.11 ft at 1:42 pm, and +0.76 ft at 7:35 pm (NOAA/NOS/CO-OPS, nd). We did not

observe any significant change in water level in ‘Ō‘io Stream channel during the course of the day, suggesting a very weak tidal response.

At each of the three stations, biologists made *in situ* field measurements for temperature, conductivity, salinity, pH, and dissolved oxygen (DO). Water samples were collected for laboratory analysis: turbidity, total suspended solids (TSS), and nutrients (ammonia [NH_4], nitrate+nitrite [NO_3+NO_2], total nitrogen [TN], and total phosphorous [TP]), and chlorophyll α. Samples were taken from just below the water surface in precleaned plastic bottles, stored on ice, and taken to the *AECOS* laboratory in Kāne‘ohe for analyses (*AECOS* Laboratory Log No. 42728). Table 2 lists analytical methods used to analyze these water samples.

Table 2. Analytical methods used for water quality analyses of ‘Ō‘io Stream on June 7, 2021.

Analysis	Method	Reference
Temperature	SM 2550 B	SM (1998)
Salinity	SM2510 B	SM (1998)
Conductivity	SM 2510 B	SM (1998)
pH	SM 4500 H+	SM (1998)
Dissolved Oxygen	SM 4500-O G	SM (1998)
Turbidity	EPA 180.1 Rev 2.0	USEPA (1993)
Total Suspended Solids	SM 2540 D	SM (1998)
Ammonia	EPA 349*	USEPA (1997a)
Nitrate + Nitrite	EPA 353.2	USEPA (1993)
Total Nitrogen	ASTM D5176-08	ASTM (2015)
Total Phosphorus	EPA 365.5 (Persulfate digestion)	USGS (2003), USEPA (1997b)
Chlorophyll α	SM 10200 H (M)	SM (1998)

Wetland Vegetation

To support the wetland delineation, biologists conducted a wandering (pedestrian) survey to identify plants within and along the margin of the wetland. Plant species were identified as they were encountered. Any plant not immediately recognized during the survey was photographed and/or a

representative feature (flower or fruit) collected for later identification at the laboratory. Conditions with respect to plant condition were adequate; plants were readily identifiable by fruits and flowers.

Plant names used herein follow *Manual of the Flowering Plants of Hawai‘i* (Wagner, Herbst, & Sohmer, 1990; Wagner & Herbst, 1999) for native and naturalized flowering plants. More recent name changes for naturalized plant species follow Imada (2019).

Aquatic Biota Survey

The aquatic biota survey consisted of making visual observations of aquatic organisms while walking adjacent to ‘Ō‘io Stream and catching by net specimens for examination. Relative abundances (e.g., rare, common, abundant) of each species were noted as the survey progressed. Identifications were aided by *Hawai‘i’s Native and Exotic Freshwater Animals* (Yamamoto and Tagawa, 2000) and nomenclature follows the *Integrated Taxonomic Information System* (ITIS, 2021).

Waterbird Survey

AECOS biologists conducted one 30-minute waterbird survey on the berm adjacent to the wetland. Following the count, biologists walked around the wetland for incidental waterbird observations. The avian phylogenetic order and nomenclature used in this report follows the 61st supplement to the AOS *Check-List of North and Middle American Birds* (Chesser et al., 2020).

Results

Jurisdictional Waters

‘Ō‘io Stream estuary

On June 7, 2021, *AECOS* scientists confirmed that ‘Ō‘io Stream has a surface connection to the Pacific Ocean (blocked only by a natural sand plug), and, therefore, considering flow regime, a jurisdictional tributary. We confirmed that the golf course pond/wetland has a surface connection to ‘Ō‘io Stream. Within the Project area, Ō‘io Stream contains standing brackish water that shows tidal rise and fall (likely groundwater exposed in the channel); therefore the jurisdictional boundary is the HTL. The jurisdictional boundary of the golf course pond/wetland is the wetland boundary.

The jurisdictional waters survey for the tidal waters of ‘Ō‘io Stream are depicted in Figure 5. Photographs to document conditions and delineated HTL are provided in Figure 6 and Attachment B. Characteristics used for the delineation include a change in vegetation, a change in bank slope, soil moisture, and salt deposits.

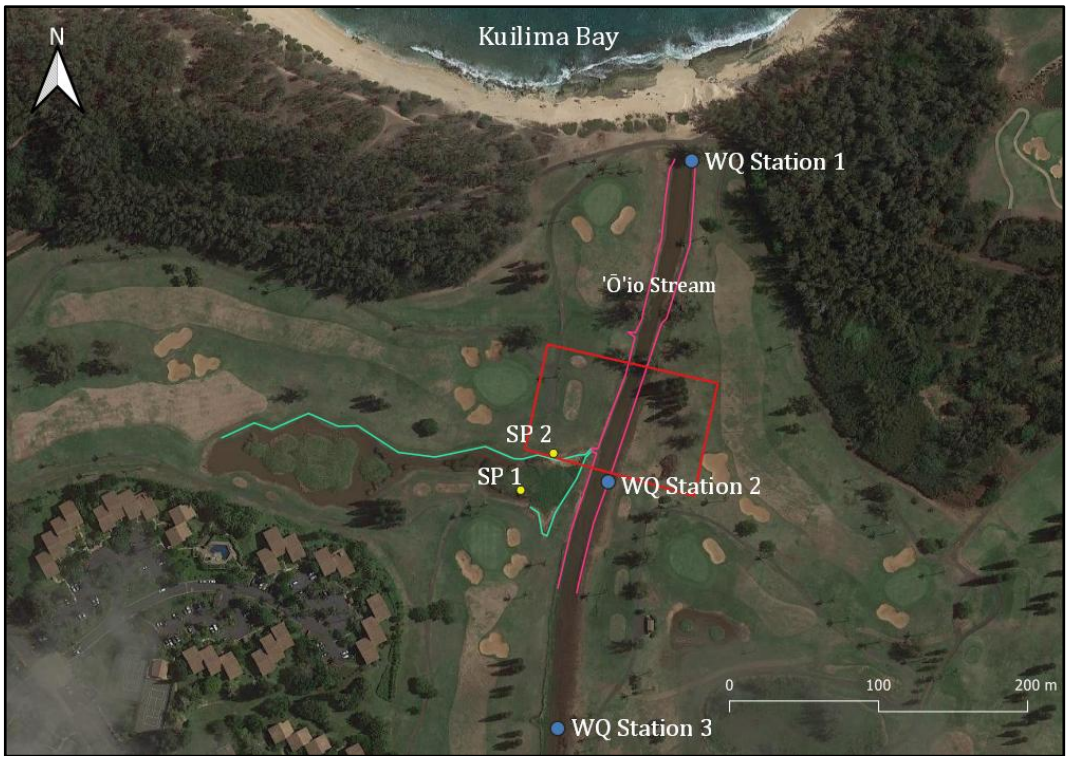


Figure 5. Delineated high tide line for the estuary of ‘Ō‘io Stream (in pink) and *makai* (north) wetland margin for an adjacent wetland (in green). Project area is outlined in red.

Wetland

Hydrophytic vegetation, hydric soil, and wetland hydrology are present at SP-1. The ground near SP-1 was dried California grass, *Urochloa mutica* (FACW), and great bulrush, *Schoenoplectus californicus* (OBL). These plants appear to have recently been sprayed with a herbicide. The soil conforms with the mapped soil type of Kaloko clay (“Kfa”), which is classified as a hydric soil (USDA-NRCS, 2020a). The upper nine inches of the soil pedon consists of a clay high in organic matter, and has redox concentrations within the pore linings and areas with a depleted matrix. The following 11 inches is gleyed soil that changed color upon exposure to air. The alpha-alpha′-Dipyridyl test, used to confirm

Figure 6. Two views of the delineated High Tide Line (in red) along the estuarine reach of ‘Ō‘io Stream.

presence of ferrous (Fe++) iron in soils, was positive, indicating reducing conditions associated with wetlands (Figure 7a). The water table was present seven inches below the surface (Figure 7b). Having satisfied all three of the requirements, we conclude that SP-1 is located within a wetland. Attachment A includes the wetland data determination form (SP-1) for the survey area.

Figure 7a (left). Soil profile of SP-1. The upper 9 in consists of a clay soil with redox features. The 11 below has a gleyed matrix that reacted to alpha-alpha′-Dipyridyl (reaction in red circle). Figure 7b (right). SP-1 located within the wetland. Water table present 7 in below surface.

Ground cover at SP-2 comprises wedelia, *Spagneticola triloba* (FAC), and Bermuda grass, *Cynodon dactylon* (FACU; Figure 8). SP-2 is close to the edge of two mapped soil types: Kaloko clay, 0 to 2 percent slope ("Kfa"), classified as hydric, and Jaucas sand, 0 to 15 percent slope ("JaC"), classified as non-hydric. The first 6 in of the soil pedon is a dark brown silty clay loam without redox features. The next lower layer (6 to 8 in) is sandy loam with redox concentrations along the pore linings. The soil pit bottom layer (8 to 18 in) consists of sand—a small portion (5%) of this matrix is depleted. None of the layers showed a positive reaction to alpha, alpha′-Dipyridyl; no indicators of wetland hydrology are present. SP-2 failed to meet two of the three requirements to be classified as a wetland location. SP-2 is outside the wetland indicated by SP-1. Attachment A includes the wetland data determination form (SP-2) for the survey area.

Wetland Vegetation

Plants identified as occurring in the wetland and near the wetland margin are listed in Table 3. We identified 23 flowering plant species from 14 families. Five of the 23 species are indigenous to the Hawaiian Islands. Of the remaining 18 species, two are considered early Polynesian introductions and 16 are naturalized species introduced to the Hawaiian Islands after 1778. The native

Figure 8. SP-2 located outside of the wetland in the Project area.

species are *kaluhā* (*Bolboschoenus maritimus*), *Cyperus polystachyos*, *ʻakulikuli* (*Sesuvium portu;lacastrtum*), *kipukai* (*Heliotropium curassavicum*), *ʻaeʻae* (*Bacopa monnieri*). These are common plants associated with coastal or coastal wetland environments on Oʻahu. The two early Polynesian introductions (canoe plants)—*honohono* (*Commelina diffusa*) and *ʻuala* (*Ipomoea batatas*)—are common plants as well.

Water Quality

Water quality results are shown in Table 4. Also included in Table 4 are the state water quality standards applicable to estuaries (HDOH, 2014). There was a notable increase in temperature at all three sampling stations between the morning and afternoon sampling events. These differences indicate little horizontal flow in the *muliwai* during daylight hours. There was also little change in salinity at Station 1, but salinity decreased at Stations 2 and 3 during the afternoon event. Dissolved oxygen saturation levels were low at all three stations during the morning sampling and somewhat higher during the

Table 3. Checklist of plants found in the wetland and margin.

Family *Species*	Common name	Status	Location	Wetland status
FLOWERING PLANTS *MONOCOTYLEDONS*				
COMMELINACEAE				
Commelina diffusa N. L. Burm.	*honohono*	**Pol**	margin	FACW
CYPERACEAE				
*Bolboschoenus maritimus p*aludosus (A. Nelson) T. Koyama	*kaluhā*	**Ind**	wetland	OBL
Cyperus gracilis R. Br.	McCoy grass	Nat	margin	FACU
Schoenoplectus californicus (C. A. Mey.) PallaR. Br.	great bulrush	Nat	wetland	OBL
Cyperus polystachyos Rottb.	---	**Ind**	margin	FACW
POACEAE				
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat	margin	FACU
Echinochloa crus-galli (L.) P. Beauv.	barnyard grass	Nat	margin	FACW
Paspalum vaginatum Sw.	seashore paspalum	Nat	margin	FACW
Urochloa mutica (Forssk.) Nguyen	California grass	Nat	wetland	FACW
TYPHACEAE				
Typha latifolia L.	common cattail	Nat	wetland	OBL
EUDICOTYLEDONS				
ACANTHACEAE				
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat	margin	FACU
AIZOACEAE				
Sesuvium portulacastrum (L.) L.	*‘akulikuli*	**Ind**	margin	FAC
APIACEAE				
Cyclospermum leptophyllum (Pers.) Sprague	fir-leaved celery	Nat	margin	FAC
ASTERACEAE (COMPOSITAE)				
Sonchus oleraceus L.	sow thistle	Nat	margin	FACU
Sphagneticola trilobata (L.) Pruski	wedelia	Nat	margin	FAC
BORAGINACEAE				
Heliotropium curassavicum (L.)	*kipukai*	**Ind**	wetland	OBL

Table 3 (continued).

Family *Species*	Common name	Status	Location	Wetland status
CLUSIACEAE				
Clusia rosea Jacq.	autograph tree	Nat	margin	FACU
CONVOLVULACEAE				
Ipomoea batatas *(L.) Lam.*	*‘uala*	**Pol**	margin	UPL
Ipomoea obscura (L.) Ker-Gawl.	---	Nat	margin	FAC
EUPHORBIACEAE				
Euphorbia hypericifolia L.	graceful spurge	Nat	margin	FACU
PLANTAGINACEAE				
Plantago lanceolata L.	nrw-lvd plantain	Nat	margin	FACU
Plantago major L.	common plantain	Nat	margin	FACU
SCROPHULARIACEAE				
Bacopa monnieri (L.) Pennell	*‘ae‘ae*	**Ind**	margin	OBL

Legend to Table 3

STATUS = distributional status for the Hawaiian Islands:

Ind = indigenous; native to Hawai‘i, but not unique to the Hawaiian Islands.

Pol = Early Polynesian introduction (before 1778); canoe plant.

Nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of the Cook Expedition in 1778, and now well-established outside of cultivation.

LOCATION:

margin – Found near the wetland margin.

wetland – Found only within the delineated wetland.

afternoon sampling. Particulate levels (chlorophyll α, turbidity and TSS) were elevated at all stations, but especially at Station 2. Ammonium and total nitrogen concentrations were very high at all stations during both morning and afternoon sampling events. Nitrate+nitrite concentrations were also high but not as high as ammonium. Interestingly, total phosphorus concentrations were low compared with total nitrogen concentrations.

Aquatic Biota

Table 5 lists aquatic animals observed in ‘Ō‘io Stream estuary on June 7, 2021, as well as those species reported in ‘Ō‘io Stream upstream from the Project area

Table 4. Water quality results for June 7, 2021 sampling event in ʻŌiʻo Stream.

Station	Time	Temp. (°C)	Conductivity (µs/cm)	Salinity (ppt)	pH (su)	DO (mg/L)	DO Sat (%)
Station 1 (AM)	0945	25.8	26100	15.65	7.39	4.16	56
Station 1 (PM)	1420	32.6	29600	15.71	7.34	4.38	65
Station 2 (AM)	0955	29.0	26700	15.08	7.63	4.71	66
Station 2 (PM)	1429	33.6	26900	13.96	7.70	5.51	84
Station 3 (AM)	1020	28.3	17600	9.96	7.40	4.30	60
Station 3 (PM)	1440	33.9	10700	5.08	6.64	4.64	68
Water Quality Standards	**---**	**(±1°)**	**---**	**(±10%)**	**(8.1 – 8.6)**	**---**	**>75%**

Station	Chlorophyll α (µg/L)	Turbidity (mg/L)	TSS (mg/L)	NH_4 (µg/L)	NO_3+NO_2 (µg/L)	TN (µg/L)	TP (µg/L)
Station 1 (AM)	6.32	14.4	15	259	117	1180	6.32
Station 1 (PM)	5.40	11.4	13	227	117	1190	5.40
Station 2 (AM)	10.6	46.0	49	284	92	1370	10.6
Station 2 (PM)	9.34	56.0	62	193	109	1310	9.34
Station 3 (AM)	3.58	31.0	35	322	169	1170	3.58
Station 3 (PM)	6.99	24.0	24	212	181	1140	6.99
Water Quality Standards	**1.50**	**1.5**	**---**	**6.0**	**8.0**	**200**	**25.0**

near Kamehameha Highway from a previous biological survey (*AECOS*, 2018). The table includes qualitative abundances for species observed in the present survey. Biologists observed 10 species of aquatic biota from nine families. Both striped mullet or *ʻamaʻama* (*Mugil cephalus*) and *oʻopu naniha* (*Stenogobius hawaiiensis*) are native to the Hawaiian Islands; *ʻamaʻama* is indigenous and *oʻopu naniha* is endemic. The remainder of the observed biota comprises naturalized species, common in streams and *muliwai* throughout Hawaiʻi.

Waterbird Survey

During the 30-minute waterbird survey, 11 Black-necked Stilt (*aeʻo* [*Himantopus mexicanus knudseni*]) and three Hawaiian endemic sub-species of the Common Gallinule (*ʻalae ʻula* [*Gallinula chloropus sandvicensis*]) were observed foraging within 30 m (100 ft) of the Project area. These two species, along with three others (*Fulica alai* [*Nycticorax nycticorax hoactili*] and *Carina moschata*) were observed during time dependent water bird counts of water and wetland features at Turtle Bay Resort undertaken during the dry and rainy

Table 5. List of aquatic species observed in ‘Ō‘io Stream and adjacent wetland on June 7, 2021.

PHYLUM, CLASS, ORDER FAMILY *Species*	Common name	Abundance	Status	ID Code
MOLLUSCA, BIVALVIA, VENEROIDA				
CORBICULIDAE				
Corbicula fluminea (O. F. Müller, 1774)	Asian flume clam	A	Nat	1
MOLLUSCA, GASTROPODA, ARCHITAENIOGLOSSA				
AMPULLARIIDAE				
Pomacea canaliculata (Lamarck, 1828)	channeled applesnail	R†	Nat	1, 2
MOLLUSCA, GASTROPODA, BASOMMATOPHORA				
PLANORBIDAE				
Planorbella duryi (Wetherby, 1879)	rams-horn snail	R†	Nat	1
MOLLUSCA, GASTROPODA, NEOTAENIOGLOSSA				
THIARIDAE				
Melanoides tuberculatus (Muller, 1774)	red-rim melania	C	Nat	1
Tarebia granifera (Lamarck, 1828)	quilted melania	C	Nat	1
ARTHROPODA, INSECTA, ODONATA				
COENAGRIONIDAE				
Ischnura ramburii (Selys, 1850)	Rambur’s forktail	O	Nat	1, 2
COENAGRIONIDAE				
Orthemis ferruginea (Fabricius, 1775)	roseate skimmer	--	Nat	2
ARTHROPODA, MALACOSTRACA, DECAPODA				
CAMBARIDAE				
Procambarus clarkii (Girard, 1852)	red swamp crayfish	--†	Nat	2
CHORDATA, ACTINOPTERYGII, TELEOSTEI				
MUGILIIDAE				
Mugil cephalus Linnaeus, 1758	*‘ama‘ama*, striped mullet	R	**Ind**	1
CHORDATA, ACTINOPTERYGII, PERCIFORMES				
GOBIDAE				
Stenogobius hawaiiensis Watson, 1991	*‘o‘opu naniha*	R	**End**	1, 2
POECILIIDAE				
Gambusia affinis (Baird and Girard, 1853)	mosquitofish	A	Nat	1, 2

Table 5 (continued).

PHYLUM, CLASS, ORDER FAMILY *Species*	Common name	Abundance	Status	ID Code
CICHLIDAE *Sarotherodon melanotheron* Rüppell, 1852	blackchin tilapia	A	Nat	1, 2
CHORDATA, AMPHIBIA, ANURA BUFONIDAE *Rhinella marina* (Linnaeus, 1758)	cane toad	--	Nat	2

Key to Table 5:

Abundance categories:
- R – Rare – only one or two individuals observed.
- O – Occasional – several individuals observed.
- C – Common – observed everywhere, although generally not in large numbers.
- A – Abundant – observed in large numbers and widely distributed.
- † Shell, carapace, or test only (not seen alive).

Status categories:
- **End** – Endemic – species found only in Hawai‘i.
- **Ind** – Indigenous – species found in Hawai‘i and elsewhere.
- Nat – Naturalized – species introduced to Hawai‘i intentionally, or accidentally.

ID Code:
- 1 – observed in present survey in Project area.
- 2 – reported from ‘Ō‘io Stream on August 16, 2018 (*AECOS*, 2018).

season of 2011 (David and Guinther, 2012). In addition, two Pacific Golden-Plover (*kōlea* [*Pluvialis fulva*]), an indigenous migratory shorebird, were observed near the Project area. *Kōlea* and three other shorebirds (*Tringa incana*, *Numenius tahitensis*, *Arenaria inerpres*) were observed in 2011 during point counts throughout Turtle Bay Resort (David and Guinther, 2012).

Discussion and Recommendations

Recommendations are partly based on U.S. Fish and Wildlife Service, Animal Avoidance and Minimization Measures (USFWS-PIFWO, nd). Implementation of the recommendations (provided below as bulleted items) by the Project contractor will minimize impacts to listed species to the maximum extent practicable.

Jurisdictional Waters

AECOS scientists delineated 74 m (243 ft) of HTL along Ōʻio Stream within the Project area and 142 m (466 ft) north and south of the Project area for a total of 300 m (984 ft; Figure 4). In addition, a length of 352 m (1155 ft) of wetland boundary on the *makai* side of the adjacent pond/wetland was delineated. The estuarine reach of ʻŌʻio Stream and adjacent wetland are likely jurisdictional up to the HTL and wetland boundary. Any work below the HTL and within the wetland may require a permit from the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act.

Water quality

Waters in the Project area are identified as Class 2 waters in State of Hawaiʻi, water quality standards (HDOH, 2014). ʻŌʻio Stream water quality is covered by state estuary criteria (HDOH, 2014) and provided here in Table 4. State criteria for temperature, salinity and pH are based on "deviations from ambient conditions"; i.e., pertain essentially to discharges that might cause deviations in the water body. Our results should be regarded as measurements of ambient conditions. Criteria for DO saturation are based upon not-to-exceed values. Criteria for turbidity, nutrients, and chlorophyll α are based on geometric means not to exceed specific criterion values. Since geometric means require a minimum of three separate sampling events per station, our single event results cannot be compared with state geometric mean criteria. Nevertheless, these criteria are useful guides for what HDOH regards as good water quality.

Temperature and salinity conditions were in accord with state water quality criteria. pH met state criteria at all stations except at Station 3 in the upper the estuary, where pH recorded is consistent with that of freshwater. DO saturation levels were below state minimum levels at all stations during both the morning and afternoon sampling events. The low DO saturation and high ammonium concentrations are indications of stagnation in the estuary, likely due to slow movement of water through the beach berm and little or no contribution from upslope stream flow.

As part of a long-term monitoring program, *AECOS* Inc. monitors the nearshore coastal waters off Turtle Bay Resort (*AECOS*, 2021) quarterly. Station "Bay" is located in Kuilima Bay, just offshore of the outlet of ʻŌʻio Stream (Figure 9). A sand berm typically forms between the outlet and the shoreline (Figs. 2 & 3), much reducing exchange between the estuary and the nearshore waters. A summary of water quality results is given in Table 6. State water quality criteria for "dry" open coastal waters are also provided in Table 6. Station Bay does not meet the state geometric mean criterion for ammonium but does meet state

Figure 9. Location of Station Bay near ‘Ō‘io Stream discharge into Kuilima Bay.

Table 6. Averaged water quality results for Station Bay for period from March 2016 through March 2021 (21 events).

	Temp. (°C)	Salinity (ppt)	pH (su)	DO Sat. (% sat)	Turbidity (ntu)	TSS (mg/L)
Mean	26.0	34.19	8.13	98	2.22*	10
Range	23.3 - 27.9	28.29 - 35.64	7.97 - 8.28	92 -108	0.97 - 16.6	3.5 - 330
Water Quality Standards	**(±1°)**	**(±10%)**	**(7.60 – 8.1)**	**(75%)**	**(0.20)**	---

	NH_4 (µg/L)	NO_3+NO_2 (µg/L)	TN (µg/L)	TP (µg/L)	Chlorophyll α (µg/L)
Geomean	10	4	109	8	0.55
Range	1 - 73	0.5 -64	73 - 266	1.5 - 28	0.25 - 1.39
Water Quality Standards	**(2.0)**	**(3.5)**	**(110)**	**(16)**	**(0.15)**

criteria for total nitrogen and total phosphorus and nearly so for nitrate+nitrite. Although the source of excess ammonium may be the East Main Drain (‘Ō‘io

Stream) or groundwater seepage, this level of ammonium can also be present in nearshore waters without influence from the land.

Station Bay water quality data for March 2016 through March 2021 were analyzed by regression analysis to determine potential correlations between salinity and the other water quality parameters to determine the coefficient of determination using R-squared values (Table 7). Turbidity showed a 64 percent correlation with changes in salinity and ammonium showed a 27 percent correlation with changes in salinity. No other correlations exceeded a 10 percent correlation with salinity distribution.

Table 7. Coefficients of determination (R-squared percent) for Station Bay water quality between March 2016 through March 2021

	Salinity	Turbidity	TSS	NH4	NO3	TN	TP	Chl. α
Salinity	1	0.641	0.001	0.271	0.075	0.082	0.062	0.001

The water quality results suggest, other than following major rain events, Ō‘io Stream does not have an influence on the nearshore coastal waters of Kuilima Bay.

- Construction plans should incorporate BMPs to prevent degradation of the water in ‘Ō‘io Stream and an adaptive monitoring approach taken to monitor effectiveness of BMPs deployed during construction and take corrective action, if needed.

Biological Resources

Aquatic Biota

Two species of fishes (*‘ama‘ama* and *‘o‘opu naniha*) identified during the survey in the estuary are fished or collected for recreation or subsistence and regulated by Hawai‘i Fishing Regulations in HAR §13-95 (HDLNR, 2014). No aquatic species protected by State of Hawai‘i Administrative Rules (HDLNR, 2014), nor federally endangered or threatened species (USFWS, 2020) were observed in Ō‘io Stream estuary. Favorable habitat to support a breeding population of any of native amphidromous stream fauna does not occur upstream from the Project area.

- Best Management Practices (BMPs) developed and employed during construction to prevent degradation of water quality in Ōʻio Stream will protect aquatic biota.

Waterbirds

In Hawaiʻi, protected waterbirds endemic to the Hawaiian Islands are Hawaiian Stilt or *aeʻo*, the Hawaiian subspecies of the Common Gallinule or *ʻalae ʻula*, Hawaiian Coot or *ʻalae keʻokeʻo* (*Fulilca alai*), and Hawaiian Duck or *kōloa* (*Anas wyvilliana*). These species are listed as endangered under the U.S. Endangered Species Act (ESA) and by the State of Hawaiʻi (HDLNR, 1998; USFWS, na-a). These waterbirds may be drawn to open grassy areas such as golf courses and standing or open water-bodies such the wetland adjacent to the Project area. Because the golf course pond and wetland fringe provide foraging and loafing habitat for Hawaiian waterbirds, construction of BMPs for waterbirds should be implemented:

- Since the wetland could provide nesting habitat for endangered waterbirds, minimal disturbance in or around this feature is required.

- If a protected Hawaiian waterbird enters the Project area, cease all work within 30 m (100 ft) of the endangered bird. Work may resume once the individual bird has left the work area on its own accord.

Other Resources of Potential Concern

Critical Habitat

No federally designated Critical Habitat occurs within the project area (USFWS, nd-b.) There is no equivalent designation under State of Hawaiʻi statute.

References

AECOS, Inc. (*AECOS).* 2018. Environmental surveys in Ōʻio Gulch for a bridge widening project, Turtle Bay Resort, Kahuku, Oʻahu. AECOS No. 1547A: 41 pp.

_____. 2021. *AECOS* Report of Analytical Results. Prep. for BRE Turtle Bay Resort LLC. AECOS No. 1119: 229 pp.

ASTM. 2015. Standard Test Method for Total Chemically Bound Nitrogen in Water by Pyrolysis and Chemiluminescence Detection. ASTM D5176-08(2015).

Chesser, R. T., S. M. Billerman, K. J. Burns, C. Cicero, J. L. Dunn, A. W. Fratter, I. J. Lovette, N. A. Mason, P. C. Rassmusen, J. V. Remsen Jr., D. F. Stotz, and K. Winker. 2020. Sixty-first Supplement to the Check-list of North American Birds. American Ornithological Society. Available online at URL: http://checklist.aou.org/taxa; last retrieved on July 2, 2021.

David, R. E. and E. Guinther. 2012. Biological surveys conducted in support of a supplemental environmental impact statement for the Turtle Bay Resort, Kahuku District, Island of Oʻahu. Prep. for: Turtle Bay Resort, LLC. 45 pp.

Giambelluca, T. W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte. 2013: Online Rainfall Atlas of Hawaiʻi. *Bull. Amer. Meteor. Soc.* 94: 313-316, doi: 10.1175/BAMS-D-11-00228.1. Online at URL: http://rainfall.geography.hawaii.edu/; last retrieved on June 16, 2021.

Hawaii Cooperative Park Service Unit. 1990. Hawaii stream assessment. A preliminary appraisal of Hawaii's stream resources. Prep. for State of Hawaii, Commission on Water Resource Management. National Park Service, Hawaii Cooperative Park Service Unit, Rept. No. R84: 294 pp.

Hawaiʻi, Department of Health (HDOH). 2014. Hawaii Administrative Rules, Title 11, Department of Health, Chapter 54, Appendix G. 110 pp.

_____. 2018. 2018 State of Hawaiʻi Water Quality Monitoring and Assessment Report: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to Sections §303(D) and §305(B), Clean Water Act (P.L. 97-117). 127 pp.

Hawaiʻi Department of Land and Natural Resources. (HDLNR). 1998. Indigenous wildlife, endangered and threatened wildlife and plants, and introduced wild birds. Department of Land and Natural Resources. State of Hawaii. Administrative Rule §13-124-1 through §13-124-10, with exhibits, dated March 02, 1998.

_____. undated (nd). Flood Hazard Assessment Tool. Available online at: http://gis.hawaiinfip.org/ FHAT/; last retrieved May 15, 2021.

Imada, C. T. 2019. Hawaiian Native and Naturalized Vascular Plants Checklist (February 2019 update). *Bishop Museum Tech. Rept*. 60. 380 pp.

Integrated Taxonomic Information System (ITIS). 2021. ITIS. Available online at URL: https://www.itis.gov/; last accessed on June 24, 2021.

Lichvar, R. W. and J. J. Gillrich. 2011. Final protocol for assigning wetland indicator status ratings during National Wetland Plant List Update. Prep. For: US Army Corps of Engineers. EDC/CRREL TN-11-1.19 pp.

National Oceanographic and Atmospheric Administration–National Centers for Environmental Information (NOAA–NCEI). 2020. Data Tools: 1981-2010 Normals. Online at URL: https://www.ncdc.noaa.gov/cdo-web/datatools/normals; last retrieved June 30, 2021.

_____, National Ocean Services, Center for Operational Oceanographic Products and Services (NOAA/NOS/CO-OPS). Undated website (nd). NOAA Tide Predictions: TPT2779 Laie Bay. Online at URL: Tide Predictions - NOAA Tides & Currents; last retrieved June 30, 2021.

Oceanit Laboratories, Inc. 2012. Ecosystem survey of nearshore marine resources and water quality along the Turtle Bay Resort shoreline, North Shore, Oʻahu, Hawaiʻi. Prep for TBR. 72 pp.

Oʻahu National Wildlife Refuge Complex and U. S. Fish and Wildlife Service (ONWRC and USFWS). 2011. James Campbell National Wildlife Refuge Comprehensive Conservation Plan. Available online at URL: https://www.fws.gov/uploadedFiles/Region_1/NWRS/Zone_1/Oahu_Complex/James_Campbell/Documents/James%20Campbell%20NWR%20CCP%20(final)%2012-01-11.pdf; last retrieved on June 30, 2021.

Pacific Legacy, Inc. 2012. Final cultural impact assessment of the Turtle Bay Resort supplemental environmental impact statement lands, District of Koʻolau Loa, Oʻahu Island, Hawaiʻi. Prep. for Lee Sichter: 129 pp.

Parham, J. E., G. R. Higashi, E. K. Lapp, D. G. K. Kuamoʻo, R. T. Nishimoto, S. Hau, J. M. Fitzsimmons, D. A. Polhemus and W. S. Devick. 2008. Atlas of Hawaiian Watersheds and their Aquatic Resources. Island of Oʻahu. Bishop Museum and Division of Aquatic Resources. 614 pp.

Standard Methods (SM). 1998. *Standard Methods for the Examination of Water and Wastewater*. 20th Edition. 1998. (Greenberg, Clesceri, and Eaton, eds.). APHA, AWWA, & WEF. 1220 pp.

Stearns, H.T. 1978. Quaternary Shorelines in the Hawaiian Islands. Bishop Museum Bulletin, Vol. 237. Bishop Museum Press, Honolulu.

U.S. Army Corps of Engineers (USACE). 1987. *Corps of Engineers Wetlands Delineation Manual*. Tech. Rept. Y-87-1. Environmental Laboratory, Dept. of the Army, Waterways Experiment Station, Vicksberg.

_____. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawai'i and Pacific Islands Region Version 2.0,* ed. J. F. Berkowitz, J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-12-5. U.S. Army Engineer Research and Development Center. Vicksberg, MS. 130 pp.

_____. 2018. National Wetland Plant List, version 3.4. Available online at URL: http://wetland-plants.usace.army.mil/nwpl_static/v34/home/home.html; last retrieved on July 2, 2021.

_____ and U.S. Environmental Protection Agency (USACE and USEPA). 2020. Department of Defense, Department of the Army, Corps of Engineers, 33 CFR Part 328, Environmental Protection Agency, 40 CFR Parts 110, 112, 116, 117, 122, 230, 232, 300, 302, and 401, The Navigable Waters Protection Rule: Definition of "Waters of the United States". *Federal Register*, 85 (77; Tuesday, April 21, 2020): 22250-22342.

U.S. Department of Agriculture–Natural Resources Conservation Service (USDA-NRCS). 2020a. Web Soil Survey, Soil Map—Island Of Oʻahu Area, Hawaiʻi. Available online at URL: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx; last retrieved June 7, 2021.

_____. 2020b. National Hydric Soils List by State. Available online at URL: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/use/?cid=nrcs142p2_053957; last retrieved June 7, 2021.

U.S. Environmental Protection Agency (USEPA). 1993. USEPA. 1993. Methods for the determination of inorganic substances in environmental samples. US EPA, Office of Research and Development, Environmental Monitoring Systems Laboratory, Cincinnati, OH. EPA/600/R-93/100.

_____. 1997a. Method 349.0 Determination of Ammonia in Estuarine and _Coastal Waters by Gas Segmented Continuous Flow Colorimetric Analysis. National Exposure Research Laboratory. Cincinnati, Ohio. 16 pp.

U.S. Environmental Protection Agency (USEPA). 1997b. Methods for determination of chemical substances in marine and estuarine matrices – 2nd edition. USEPA, Washington, DC. EPA /600/R-97/072.

U.S. Fish and Wildlife Service (USFWS). undated website (nd-a). USFWS Endangered Species. Available online at URL: https://www.fws.gov/endangered/; last retrieved on June 28,2021.

_____. Undated (nd-b). Critical Habitat Portal. Available online at URL: https://ecos.fws.gov/ecp/report/table/critical-habitat.html; last retrieved June 23, 2021.

_____. Undated (nd-c). National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Available online at URL: http://www.fws.gov/wetlands/Data/Mapper.html; last retrieved on June 27, 2021.

U.S. Geological Survey (USGS). 1983. Kahuku Quadrangle, Hawaii – Honolulu County, 7.5-minute series (topographic). Single sheet, scale 1: 24000.

U.S. Geological Survey (USGS). 1988. Kahuku Quadrangle, Hawaii – Honolulu County, 7.5-minute series (topographic). Single sheet, scale 1: 24000.

_____. 2003. Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory: evaluation of alkaline persulfate digestion as an alternative to Kjeldahl digestion for determination of total and dissolved nitrogen and phosphorus in water. Water-Resources Investigations Report 03–4174.

_____. 2017. The StreamStats program. Available online at URL: http://streamstatus.usgs.gov; last retrieved June 15, 2021.

Wagner, W. L., D. R. Herbst and S.H. Sohmer. 1990. *Manual of the Flowering Plants of Hawaiʻi: Volume I and II*. Bishop Museum Special Publication 83. University of Hawaiʻi Press. 1853 pp.

_____ and _____. 1999. *Supplement to the Manual of the flowering plants of Hawaiʻi*, pp. 1855-1918. *In:* Wagner, W.L., D.R. Herbst, and S.H. Sohmer, Manual of the flowering plants of Hawaiʻi. Revised edition. 2 vols. University of Hawaii Press and B. P. Bishop Museum.

Yamamoto, M.N. and A.W. Tagawa. 2000. *Hawaii's native and exotic freshwater animals*. Mutual Pub., Honolulu, HI.

Attachment A

Wetland Determination Data Forms

Reset Form

WETLAND DETERMINATION DATA FORM—Hawai‘i and Pacific Islands

Project/Site: Kaihalulu Road (Turtle Bay Resort) City: Kahuku Sampling Date: 06/07/2021 Time: 12:00 pm

Applicant/Owner: Wilson Okamoto Corporation State/Terr./Comm.: Hawaii Island: Oahu Sampling Point: SP-1

Investigator 1: Susan Burr Investigator 2: Lesley Davidson TMK/Parcel: 5-7-001:052

Landform: coastal plain Local relief: concave

Lat: 21.702187940 N Long: 157.991309690 W Datum: NAD 1983 (Hawa Slope (%): 3

Soil Map Unit Name: Kaloko clay, 0-2% slope, MLRA 163 NWI classification: PUB/EM1Fx*

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☐ No ☐ (If no, explain in Remarks)

Are Vegetation ☑, Soil ☑, or Hydrology ☑ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☑

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	
Hydric Soil Present?	Yes ☑	No ☐	Is the Sampled Area within a Wetland? Yes ☑ No ☐
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks: *PUB/EM1Fx - palustrine wetland with an unconsolidated bottom (pond)/excavated, semi-permanently flooded palustrine wetland with persistent emergent vegetation

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No	Select
2.		No	Select
3.		No	Select
4.		No	Select
5.		No	Select
	0	=Total Cover (sum)	
Sapling/Shrub Stratum (Plot size: 1-m radius)			
1. None		No	Select
2.		No	Select
3.		No	Select
4.		No	Select
5.		No	Select
	0	=Total Cover (sum)	
Herb Stratum (Plot size: 1-m radius)			
1. Schoenoplectus californicus (dead)	50	Yes	OBL
2. Urochloa mutica (dead)	80	Yes	FACW
3.		No	Select
4.		No	Select
5.		No	Select
6.		No	Select
7.		No	Select
8.		No	Select
	130	=Total Cover	
Woody Vine Stratum (Plot size: 10-m radius)			
1. None		No	Select
2.		No	Select
	0	=Total Cover	

Remarks: Plants in wetland margin appear to have been recently sprayed with herbicide. Live Schoenoplectus californicus plants are approximately 2 m away in standing water.

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____(A)

Total Number of Dominant Species Across All Strata: _____(B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	0
FACW species	x 2 =	0
FAC species	x 3 =	0
FACU species	x 4 =	0
UPL species	x 5 =	0
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A=

Hydrophytic Vegetation Indicators:

☑ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

☐ Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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Hawai‘i and Pacific Islands Region—Version 2.0

Modified for tablet (R.Gladstein Consulting, LLC) 12/2015

SOIL **Sampling Point:** SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 - 9	7.5YR 3/2	65	5YR 4/6	25	C	PL	Clay	very high in organic matter
			7.5YR 2.5/1	10	D	M	Select	(most material is masked)
9 - 20	Gley 2 5/1 (10BG)	100			Select	Select	Muck	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	
					Select	Select	Select	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

select
Histisols (A1)
Histic Epipedon (A2)
Black Histic (A3)
Hydrogen Sulfide (A4)
Muck Presence (A8)
Depleted Below Dark Surface (A11)
Thick Dark Surface (A12)
Sandy Gleyed Matrix (S4)

select
Sandy Redox (S5)
Dark-Surface (S7)
Loamy Gleyed Matrix (F2)
Depleted Matrix (F3)
Redox Dark Surface (F6)
Depleted Dark Surface (F7)
Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

select
Stratified Layers (A5)
Sandy Mucky Mineral (S1)
Red Parent Material (TF2)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present: Yes ☑ No ☐

Remarks:

gleyed layer (9-20 in) changed color upon exposure to air

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

select
Surface Water (A1
High Water Table (A2)
Saturation (A3)
Water Marks (B1)
Sediment Deposits (B2)
Drift Deposits (B3)
Algal Mat or Crust (B4)
Iron Deposits (B5)
Inundation Visible on Aerial Imagery (B7)
Water Stained Leaves (B9)

select
Aquatic Fauna (B13)
Tilapia Nests (B17)
Hydrogen Sulfide Odor (C1)
Oxidized Rhizospheres on Living Roots (C3)
Presence of Reduced Iron (C4)
Recent Iron Reduction in Tiled Soils (C6)
Thin Muck Surface (C7)
Fiddler Crab Burrows (C10) (Guam, CNMI, a
Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

select
Surface Soil Cracks (B6)
Sparsely Vegetated Concave Surface (B8)
Drainage Patterns (B10)
Dry-Season Water Table (C2)
Salt Deposits (C5)
Stunted or Stressed Plants (D1)
Geomorphic Position (D2)
Shallow Aquitard (D3)
FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):	
Water Table Present?	Yes ☑	No ☐	Depth (inches): 7	
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): surface	

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Standing water is 2 m away.
Apple snail shells are present in sampling plot. Wetland contains Asian flume clams, rams-horn snails, melanid snails, and mosquito fish.Positive alpha, alpha'-dipyridyl test on 9 - 20 in layer.
Some surface soil cracks in wetland, but not in sampling plot.
Salt deposits near boundary of wetland.

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Reset Form

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: Kaihalulu Road (Turtle Bay Resort) City: Kahuku Sampling Date: 06/07/2021 Time: 12:30 pm

Applicant/Owner: Wilson Okamoto Corporation State/Terr./Comm.: Hawaii Island: Oahu Sampling Point: SP-2

Investigator 1: Susan Burr Investigator 2: Lesley Davidson TMK/Parcel: 5-7-001:052

Landform: coastal plain Local relief: convex

Lat: 21.702412716 N Long: 157.991100402 W Datum: NAD 1983 (Hawa Slope (%): 3

Soil Map Unit Name: Kaloko clay, 0-2% slope, MLRA 163 NWI classification: upland

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ☐ No ☐ (If no, explain in Remarks)

Are Vegetation ☑, Soil ☑, or Hydrology ☑ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☑

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	
Hydric Soil Present?	Yes ☐	No ☑	**Is the Sampled Area**
Wetland Hydrology Present?	Yes ☐	No ☑	**within a Wetland? Yes ☐ No ☑**

Remarks:

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 10-m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None		No	Select
2.		No	Select
3.		No	Select
4.		No	Select
5.		No	Select
	0	=Total Cover (sum)	
Sapling/Shrub Stratum (Plot size: 1-m radius)			
1. None		No	Select
2.		No	Select
3.		No	Select
4.		No	Select
5.		No	Select
	0	=Total Cover (sum)	
Herb Stratum (Plot size: 1-m radius)			
1. Sphagneticola triloba	90	Yes	FAC
2. Cynodon dactylon	10	No	FACU
3.		No	Select
4.		No	Select
5.		No	Select
6.		No	Select
7.		No	Select
8.		No	Select
	100	=Total Cover	
Woody Vine Stratum (Plot size: 10-m radius)			
1. None		No	Select
2.		No	Select
	0	=Total Cover	

Plants appear to be maintained by mowing and herbicides

Remarks

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	0
FACW species	x 2 =	0
FAC species	x 3 =	0
FACU species	x 4 =	0
UPL species	x 5 =	0
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A=

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☑ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

☐ Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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Modified for tablet (R.Gladstein Consulting, LLC) 12/2015

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 - 6	7.5YR 3/3	100	none		Select	Select	Silty Clay Loam	
					Select	Select	Select	
6 - 8	10YR 5/3	80	5YR 4/4	20	C	PL	Sandy Loam	
					Select	Select	Select	
8 - 18	10YR 5/2	95	10YR 7/2	5	D	M	Sand	
					Select	Select	Select	
					Select	Select	Select	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains

[2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- select
- Histisols (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Muck Presence (A8)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Gleyed Matrix (S4)

- select
- Sandy Redox (S5)
- Dark-Surface (S7)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- select
- Stratified Layers (A5)
- Sandy Mucky Mineral (S1)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present: Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

- select
- Surface Water (A1
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Water Stained Leaves (B9)

- select
- Aquatic Fauna (B13)
- Tilapia Nests (B17)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tiled Soils (C6)
- Thin Muck Surface (C7)
- Fiddler Crab Burrows (C10) (Guam, CNMI, a
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- select
- Surface Soil Cracks (B6)
- Sparsely Vegetated Concave Surface (B8)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Salt Deposits (C5)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):
Water Table Present?	Yes ☐	No ☑	Depth (inches): >18
Saturation Present? (includes capillary fringe)	Yes ☐	No ☑	Depth (inches): >18

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Negative alpha, alpha'-dipyridyl test on all layers.

US Army Corps of Engineers

Hawai'i and Pacific Islands Region—Version 2.0
Modified for tablet (R.Gladstein Consulting, LLC) 12/2015

Attachment B

Photos of HTL and surrounding environment

1. Looking downstream to WQ Station 1 (right bank) and the *mauka* side of the culvert.

2. Looking upstream from WQ Station 2.

3. Looking across the stream from WQ Station 1.

4. Looking downstream from WQ Station 2.

5. Looking across the stream from WQ Station 2 towards the wetland adjacent to the Project area. Wetland berm indicated with red arrow.

6. Looking upstream from WQ Station 2. Wetland berm on the left bank of the stream indicated by red arrow.

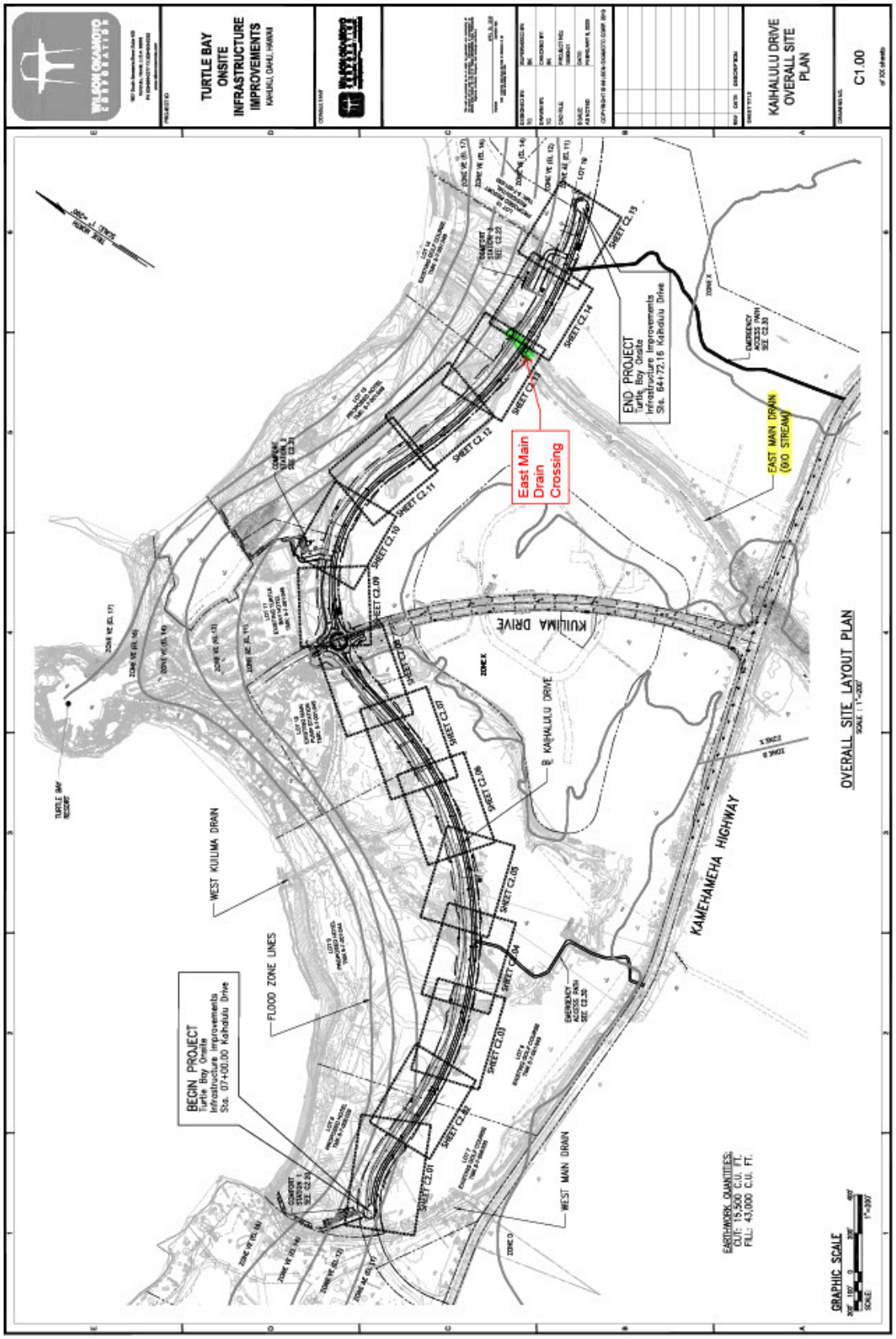
7. Looking upstream from WQ Station 3.

8. Looking across stream from WQ Station 3.

9. Looking downstream from WQ Station 3.

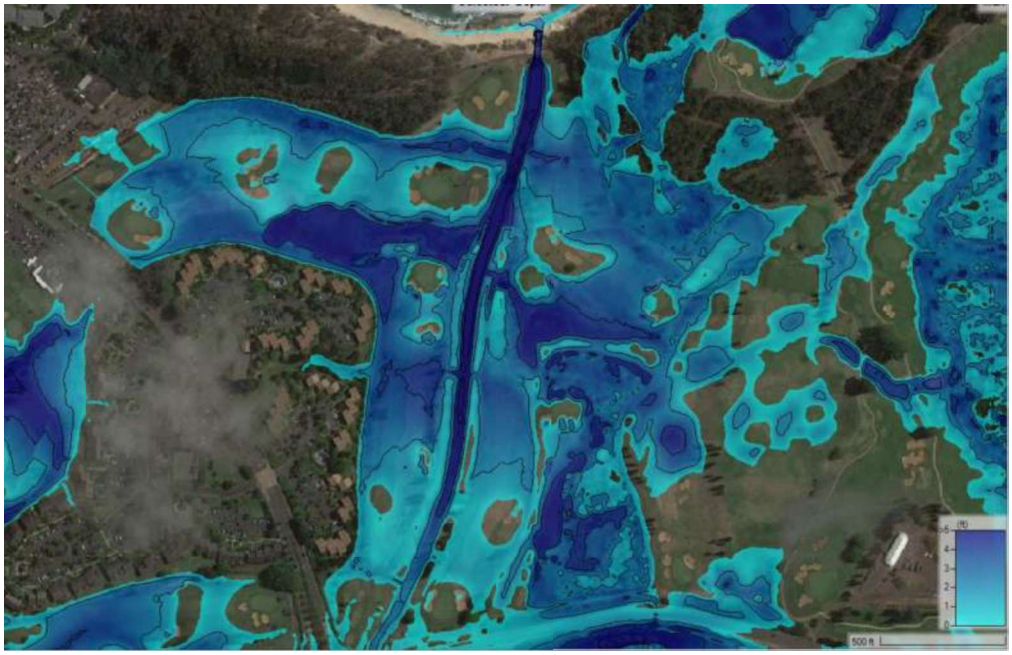
Attachment C

Survey map of Project


TURTLE BAY ONSITE INFRASTRUCTURE IMPROVEMENTS
KAHUKU, OAHU, HAWAII
KAIHALULU DRIVE OVERALL SITE PLAN
C1.00
East Main Drain Crossing
EAST MAIN DRAIN (90' STREAM)
END PROJECT
Turtle Bay Onsite Infrastructure Improvements
Sta. 64+72.16 Kaihalulu Drive
BEGIN PROJECT
Turtle Bay Onsite Infrastructure Improvements
Sta. 07+00.00 Kaihalulu Drive
FLOOD ZONE LINES
WEST KUILIMA DRAIN
WEST MAIN DRAIN
KAMEHAMEHA HIGHWAY
KUILIMA DRIVE
KAIHALULU DRIVE
OVERALL SITE LAYOUT PLAN
EARTHWORK QUANTITIES:
CUT: 15,500 C.U. FT.
FILL: 43,000 C.U. FT.
GRAPHIC SCALE

Turtle Bay Resort
Kaihalulu East Roadway Extension
Proposed Crossing – East Main Drain

Hydraulic and Scour Analysis



October
2024

Study Report

Prepared for:

WILSON OKAMOTO CORPORATION

Prepared by:

RIVER FOCUS
WATER RESOURCE CONSULTANTS

EXHIBIT 7

Turtle Bay Resort
Kaihalulu East Roadway Extension
Proposed Crossing – East Main Drain

Hydraulic and Scour Analysis

Study Report

October 2024

Prepared for

Wilson Okamoto Corporation
www.wilsonokamoto.com

Prepared by

River Focus, Inc.
www.riverfocus.com

A. Jake Gusman, P.E.
River Focus Project Manager

This work was prepared by me or under my supervision.

April 30, 2026

Signature *Expiration Date*

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1 INTRODUCTION

This study serves as an update to the original hydraulic and scour analysis and is an important component of the Kaihalulu East Roadway Extension project for the Turtle Bay Resort LLC (TBR) on the island of Oʻahu. The primary objective is to extend the project's boundaries to support the proposed roadway and crossing design over the East Main Drain, also known as ʻŌʻio Stream.

Heavy rainfall in the ʻŌʻio Stream watershed leads to flood flows that affect the downstream golf course and surrounding areas. To understand this issue better, in October 2021, River Focus conducted an initial study that was used as the starting point for the current modeling work. The original study focused on hydraulic modeling within the vicinity of the proposed roadway, including ʻŌʻio Stream and its overbanks. The initial roadway design featured a single CON/SPAN pre-engineered precast arch system for the crossing. For the updated design, the scope of work has been expanded to incorporate not only the proposed CON/SPAN bridge-culvert over the East Main Drain but also the addition of three pipe culverts to the proposed Kaihalulu Road Extension.

Furthermore, the original model geometry has been extended primarily to cover Punahoʻolapa Marsh and the additional flows that contribute to, and combine within, the study area. Figure 1-1 provides an aerial view of the project area, showing a comparison between the original study boundaries and the extended limits for the current study.

In addition to these extensions, the revised model incorporates four culverts on Kamehameha Highway to account for local drainage and also includes the Hoʻolapa Stream Bridge crossing.

1.1 Study Objectives

The primary objectives of this study are as follows:

- Conduct hydrologic modeling based on the TBR Drainage Master Plan (WOC, 2019 revised 2023) to develop 100-year hydrographs for use in the hydraulic modeling.
- Perform hydraulic modeling to calculate flood elevations and flow velocities for both existing and proposed bridges and culverts.
- Update the scour analysis to estimate potential scour for the proposed CON/SPAN bridge-culvert, considering the updated hydrology and expanded hydraulic model results.

To accomplish these objectives, the analysis integrates the flow data from various sources, including the ʻŌʻio Stream channel, localized overland flow mauka of Kamehameha Highway, and flow from the Hoʻolapa Stream channel. These data were incorporated as inflow hydrographs into the hydraulic model.

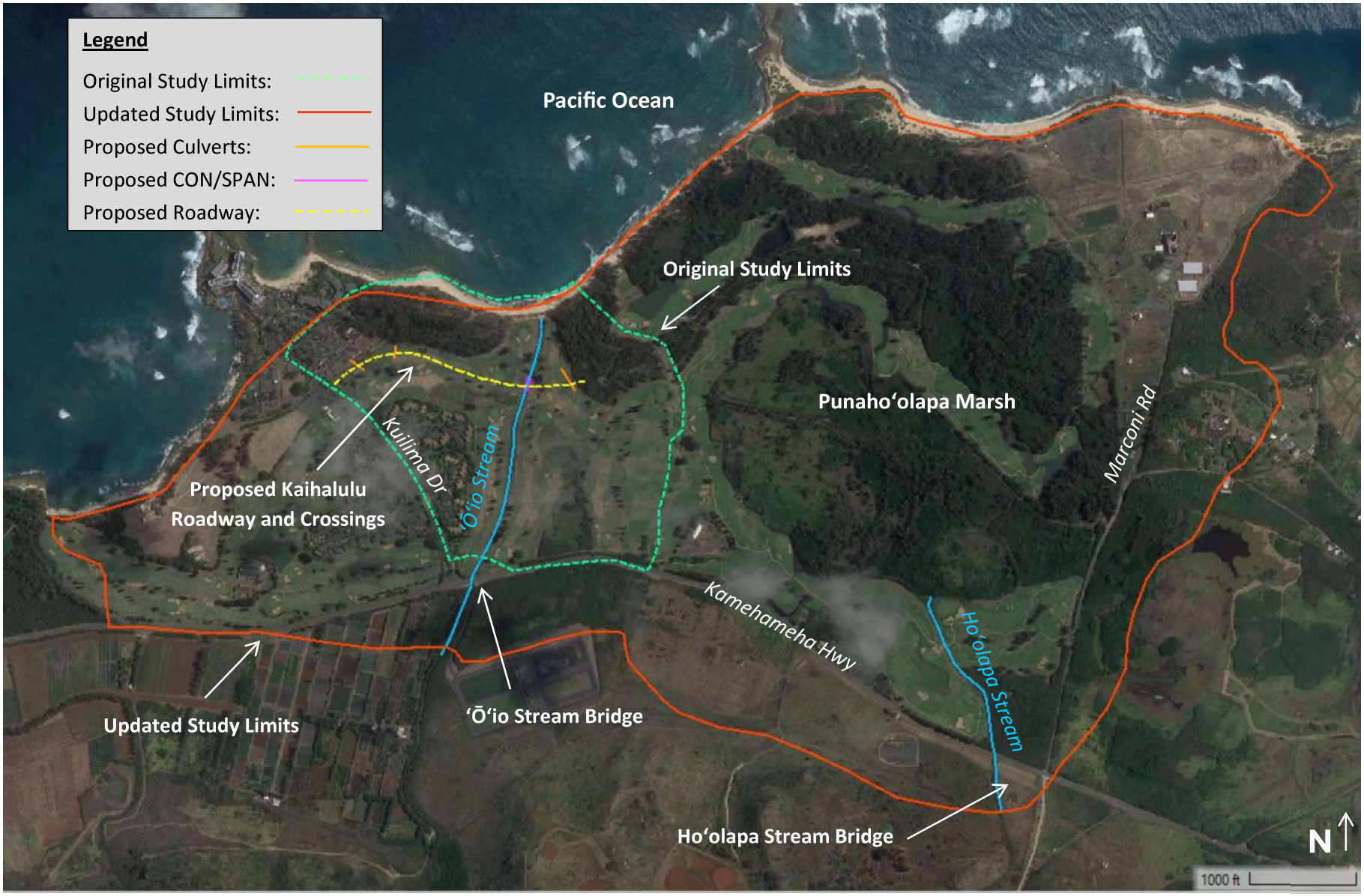

Figure 1-1. Comparison of Extended Study Boundary Limits with Original Study Limits

1.2 Study Location

Turtle Bay Resort is located on the North Shore of O'ahu, between Kawela Bay and Kahuku Point,. Figure 1-2 provides an overview of the study area, which includes the Turtle Bay Hotel, two golf courses operated as Turtle Bay Golf, as well as undeveloped land and agricultural use areas. The TBR property is approximately 13 miles east of Hale'iwa and 4 miles west of Kahuku.

'Ō'io Stream flows northward through the TBR, passing under the proposed roadway before discharging into Kuilima Bay. This portion of the stream is commonly referred to as the "East Main Drain" and stretches approximately 4 miles up to the top of the Ko'olau Mountains. Figure 1-2 provides a zoomed-in view of the Kaihalulu East Roadway location.

Figure 1-2. Kaihalulu East Roadway Location – Close-up

1.3 FEMA Flood Hazards

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Panel No: 15003C0030G dated January 19, 2011, shows that TBR is primarily located in flood hazard zones AE and VE.

Zone VE includes areas with both a 1% annual chance of flooding and additional velocity hazards associated with storm wave action. The base flood elevation for Zone VE ranges from 12 ft to 17 ft along the coastline of the resort (FEMA 2014). Zone AE is the flood insurance rate zone that is comprised of areas with a 1% annual chance of flooding where base flood elevations have been identified. The Zone AE base flood elevation at the resort is 11 ft, MSL

(FEMA, 2014). It is important to note that this Zone AE floodplain is due to coastal flooding only. The riverine flood hazard has not been mapped by FEMA.

In contrast to the FEMA coastal flooding analysis, our current study is based on riverine flooding only and does not address any coastal flood hazards.

1.4 Vertical Datum and Horizontal Projection

All elevations in this report and models are referenced to local mean sea level (LMSL or MSL). The horizontal projection/coordinate system used for this study is NAD 1983 Hawaii State Plane Zone 3 FIPS 5103 (feet).

2 HYDROLOGY

Hydrologic modeling was performed based on the TBR Drainage Master Plan (WOC, 2019; revised 2023) to develop 100-year hydrographs for use in the hydraulic modeling. The HEC-HMS (Hydrologic Modeling System, v. 4.11) software was used for hydrologic modeling, using the subbasin parameters provided in the Drainage Master Plan.

Turtle Bay Resort is primarily situated within two watershed areas: ʻŌʻio watershed and Kawela watershed. However, the proposed Kaihalulu Drive lies solely within the ʻŌʻio watershed. ʻŌʻio Stream drains the upper reaches of the ʻŌʻio watershed, conveying stormwater runoff towards TBR. Flows from ʻŌʻio Stream are directed into the East Main Drain channel at Kamehameha Highway before discharging into the ocean. Hoʻolapa Stream also drains part of the ʻŌʻio watershed, crossing under Kamehameha Highway and discharging into Punahoʻolapa Marsh (WOC 2019, revised 2023). Figure 2-1 shows the ʻŌʻio watershed boundary with the ʻŌʻio Stream and Hoʻolapa Stream , as week as the project location.

Resort Drainage System

The drainage system of the resort is divided into two subsystems, bisected by Kuilima Drive. The subsystems are identified as the West Main Drain Subsystem and the East Main Drain Subsystem. The West Main Drain Subsystem manages stormwater runoff from TBR areas west of Kuilima Drive. The East Main Drain Subsystem manages stormwater runoff from TBR areas east of Kuilima Drive. Our study focuses on the East Main Drain Subsystem within the ʻŌʻio watershed.

East Main Drain Subsystem

The East Main Drain Subsystem conveys stormwater runoff originating within TBR (east of Kuilima Drive) and from upland areas of the ʻŌʻio watershed. Currently, ʻŌʻio Stream passes through the mauka agricultural lands, with inflows from various unlined plantation ditches. The stream enters TBR under the 22-ft-long by 7-ft-high bridge (ʻŌʻio Stream Bridge), continues through the grass-lined East Main Drain channel, and discharges into the ocean through four 72-inch-diameter pipes.

Flood flows often exceed the channel capacity of ʻŌʻio Stream mauka of the bridge, leading to overtopping and sheet flow across Kamehameha Highway. The TBR golf courses receive and direct the runoff that sheet flows across Kamehameha Highway back to the East Main Drain channel. The existing golf courses were designed to accommodate runoff from a 100-year storm event and were constructed at a lower elevation than the existing developments. The golf course fairways are graded to provide routing through the golf course landscaping, directing runoff towards water features, wetland areas, and the channels (WOC, 2019; revised 2023).

At the coastal outlets, sand deposits from ocean currents frequently lead to clogging that is often cleaned out and maintained by the TBR staff. However, when the outlets cannot accommodate the upstream runoff, overflow occurs, resulting in channel bank overtopping and detention on the golf course and other low-lying areas east of Kuilima Drive. Runoff sheet flows through breaks in the coastline sand dunes when the golf course detention capacity and outlet capacity for East Main Drain is exceeded (WOC 2019, revised 2023).

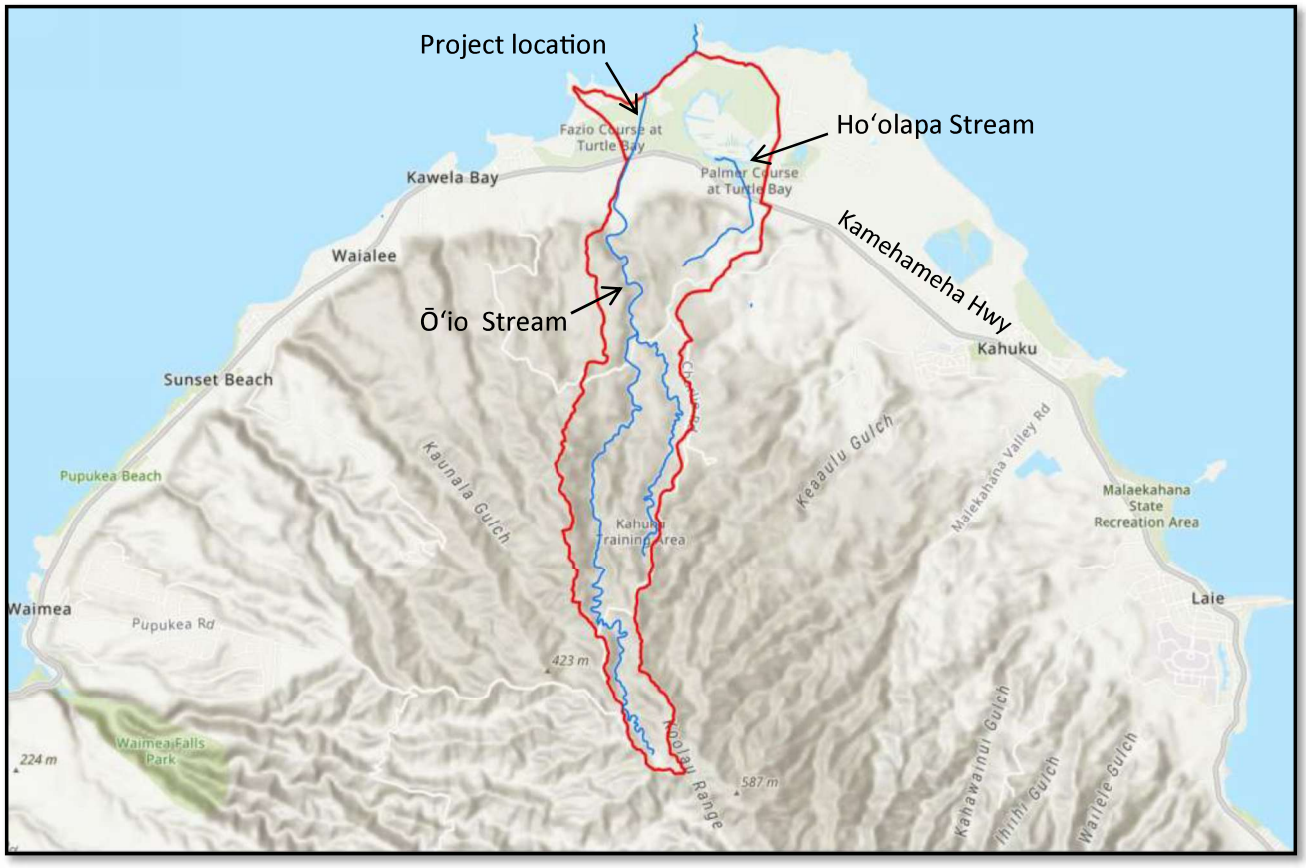

Figure 2-1. ʻŌʻio Stream Watershed, including Hoʻolapa Stream and Local Drainage Areas

2.1 Hydrologic Modeling

For the hydrologic modeling of the contributing drainage basins within the ʻŌʻio watershed at TBR, River Focus used the U.S. Army Corps of Engineers' (USACE) HEC-HMS (Hydrologic Modeling System), Version 4.11 (USACE 2023a).

Subbasin Delineation

The ʻŌʻio watershed was delineated into six subbasins in HEC-HMS to match with the subbasin delineation included in the Drainage Master Plan. The HEC-HMS schematic with the six subbasins is shown in Figure 2-2. The drainage area north of Kamehameha Highway is bisected by a ridge, splitting the area into two basins identified as E5A and E5B.

According to the Drainage Master Plan, during normal rainfall conditions, Basins E5A and E5B independently manage localized and upstream runoff. Specifically, Basin E5A outlets to the ocean via the East Main Drain, while Basin E5B retains runoff within Punahoʻolapa Marsh. A small ditch serves as a connection between East Main Drain and the marsh. During periods of heavy rainfall, this ditch serves to convey overflow from Basin E5A to Basin E5B, effectively creating a hydraulic connection between the two drainage areas.

For the modeling of four out of the six subbasins (E1, E2, E3, and E4), model parameters were adopted directly from the Drainage Master Plan. Note that the WOC study has Basins E1 and E2 included in the Basin E5A area, and Basin 3 and 4 included in the Basin E5B area. However, for purposes of the current study, the two basins were kept separate for the HEC-HMS modeling. As a result, the parameters for these two subbasins were computed separately, as described in the following sections.

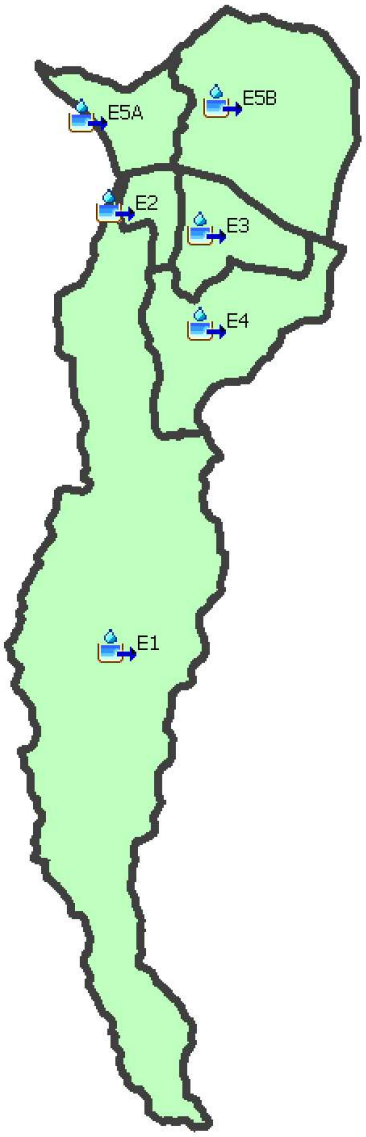

Figure 2-2. HEC-HMS Schematic of Turtle Bay Subbasins

SCS Methodology

The Drainage Master Plan used the Soil Conservation Service (SCS) method (also known as the Natural Resources Conservation Service, or NRCS, method) to determine watershed lag. The method calculates peak flow by considering various factors, including drainage basin area, potential watershed storage, and the time of concentration. The resulting values for subbasins E1, E2, E3, and E4 are detailed in the Drainage Master Plan Table B-1, for the existing conditions

100-year discharge. A summary of these values is presented in Table 2-1. To calculate the watershed lag, the time of concentration was multiplied by a factor of 0.6 (USDA-NRCS, 2010).

For the two makai basins, E5A and E5B, the land cover type National Oceanic and Atmospheric Administration (NOAA) Coastal Change Analysis Program (C-CAP) (2011) and hydrologic soil groups data (USDA-NRCS 2019) were combined. Once combined, a Curve Number (CN) was assigned based on the NRCS TR-55 table (USDA-NRCS 1986). These CN values, which correspond to different land cover and hydrologic soil groups within the watershed, are provided in Table 2-2. Subsequently, an area-weighted CN was computed, considering the total land use area for the combined soils and land cover.

Table 2-1. Computed Lag

Basin	Time of Concentration (t_c)	Lag (hours) (t_c*0.6)	Lag (min)
E1	1.417	0.850	51.0
E2	0.145	0.087	5.2
E3	0.184	0.110	6.6
E4	0.393	0.236	14.1

Table 2-2. Land Cover, Hydrologic Soil Group, and CN Values (USDA-NRCS, 1986)

Land Use/Cover Classification	Hydrologic Soil Group			
	A	B	C	D
Developed Open Space	49	69	79	84
Developed (High)	70	82	89	96
Grassland/Herbaceous	39	61	74	80
Evergreen Forest	30	55	70	77
Pasture /Hay	39	61	74	80
Scrub/Shrub	30	48	65	73
Palustrine Forested Wetland	78	78	78	78
Palustrine Scrub/Shrub Wetland	78	78	78	78
Palustrine Emergent Wetland	78	78	78	78
Bare Land	77	86	91	94
Unconsolidated Shore	77	86	91	94
Open Water	98	98	98	98

Transform and Basin Lag

The SCS Unit Hydrograph method was selected as the rainfall-runoff transformation method in the HEC-HMS model. The calculation of basin lag for the two northern subbasins, E5A and E5B, was based on the USACE relationship known as “Corps Lag.” This relationship defines lag as the duration from the start of the rainfall to the peak of the runoff hydrograph and is calculated using the following equation:

Corps Lag (hours) = 24 * $\bar{n}$ * ((L * L_c)/$s^{0.5}$)$^{0.38}$

Where:

$\bar{n}$ = the average of the Manning's *n* values of the watercourse and its tributaries

L = length of the longest watercourse (miles)

L_c = length along the longest watercourse to basin centroid (miles)

s = overall slope of drainage area between headwaters and collection point (ft per mile)

The values for the length of the longest flow path, length to the basin centroid, and basin slope were determined using ArcGIS and HEC-HMS. Additionally, the $\bar{n}$ (weighted Manning's *n*) value of 0.02 was assigned to both basins based on basin characteristics identified using terrain data, aerial imagery, and field survey photos. Based on these inputs, the computed lag (min) for the two subbasins are presented in Table 2-3.

Table 2-3. Computed Curve Number (CN) and Lag Values

Subbasin Name	Area (square mile)	Weighted CN	Computed Lag (min)
E5A	0.2	65.5	9.5
E5B	0.7	68.5	16.5

Precipitation Data

Precipitation depths for the 100-year, 24-hour duration event were adopted from the Drainage Master Plan (WOC 2019, revised 2023). For all six subbasins, the annual maximum depth is set at 13.1 inches, as per NOAA Atlas 14.

2.2 HEC-HMS Model Results

Table 2-4 provides a summary of the peak discharges computed by HEC-HMS for 100-year flood event. Additionally, the table includes the 100-year peak flows computed using the SCS method as detailed in the Drainage Master Plan, and the selected peak flows for the current hydraulic modeling.

An exception is noted for Basin E1, where a peak value of 2,720 cfs was applied instead of the computed SCS value of 4,080 cfs. The lower peak flow value was derived from a Log Pearson Type II flood-frequency analysis performed for the Kamehameha Highway ʻŌʻio Stream Bridge replacement project by River Focus in 2019. The analysis was based on 58 years of U.S. Geological Survey (USGS) stream gage data, including a long period of record from 1957 to 2017 on ʻŌʻio Stream (Station #16311000). This approach provided a more accurate representation of runoff conditions compared with the SCS method. Therefore, the River Focus 2019 result was considered the most appropriate selection for analyzing Basin E1.

Table 2-4. Comparison of HEC-HMS Computed Peak Discharges and Drainage Master Plan

Subbasin Name	Area (sq. mi.)	HEC-HMS 100-year Peak Flow (cfs)[1]	Drainage Master Plan 100-year Peak Flow (cfs)	Peak Flow for Hydraulic Modeling (cfs)
E1	2.4	4,200	2,720[2]	2,720
E2	0.1	590	410	410
E3	0.3	1,350	1,285	1,285
E4	0.5	1,870	1,710	1,710
E5A	0.2	750	N/A	750
E5B	0.7	2,120	N/A	2,120

1. Computed values were rounded based on standard USGS rounding rules—all flows from 100 cfs through 10,000 cfs are rounded to the nearest 10 cfs.
2. Computed by River Focus (2019)

3 HYDRAULIC MODEL DEVELOPMENT

River Focus developed a hydraulic model of the study area using the USACE Hydrologic Engineering Center – River Analysis System (HEC-RAS), Version 6.4.1 software (USACE, 2023b). The model was created using the best available topographic data, aerial imagery, site photos, and design plans for proposed bridges and culverts.

3.1 Hydraulic Model Data/Parameters

2-D Model Mesh

The model geometry consists of a 2-D mesh area with an average cell spacing of 30 feet. The 2-D grid extends 1,980 feet to the west of the ʻŌʻio Stream Bridge crossing and about 600 feet east of the Hoʻolapa Stream Bridge crossing on Kamehameha Highway. Towards the ocean, the 2-D mesh area extends to the makai side. On the western side of the East Main Drain channel, the 2-D mesh extends up to 3,350 feet west of Kuilima Drive, while on the eastern side, the model extends approximately 1,000 feet east of Marconi Road.

Figure 3-1 shows the boundaries of the 2-D mesh and the layout of the model geometry for the proposed conditions. The only difference between the proposed conditions geometry and the existing conditions is that the proposed conditions model incorporates the Kaihalulu East Roadway Extension and the three planned culverts and CON/SPAN structure along the roadway.

Model Terrain

The proposed terrain for the project area was merged from two primary sources: the proposed roadway design elevations and on-site survey data. In areas where survey data was unavailable, two additional sources were utilized to supplement the data. These four data sources are listed below:

1. Kaihalulu East Roadway Extension design plans (Digital Elevation Model 'DEM' provided by WOC).
2. On-site survey data collected by Control Point Surveying (provided by WOC).
3. 2007 USACE National Coastal Mapping Program (NCMP) Topobathy LiDAR: Hawaiian Islands. NOAA Digital Coast Data Access Viewer. Collected by the NOAA Office for Coastal Management (OCM) Partners on January 1, 2007 – January 27, 2007. Resolution: 6 ft (NOAA, 2007).
4. Continuously Updated Digital Elevation Model (CUDEM) – 1/9 Arc-Second Resolution Bathymetric – Topographic Tiles. Resolution: 9 ft (NOAA 2018).

These datasets were merged (in the order listed above) in HEC-RAS to create the DEM for the proposed conditions. For the existing conditions, the proposed roadway was excluded.

The on-site survey data covered most of the 2-D model mesh in the study area. In areas where the survey data did not cover the grid, the elevation data was supplemented using the USACE 2007 LiDAR and NOAA 2018 CUDEM. The 2007 LiDAR data was prioritized due to its higher resolution compared to the 2018 elevation data.

Terrain Modifications

A channel modification feature was applied in RAS Mapper to remove golf course bridge decks and eliminate high ground areas that appeared unrealistic in the terrain. These flow blockages were likely due to tree canopies or other vegetation not removed during the LiDAR data processing. In addition, the channel modification feature was applied (as needed) at culvert and pipe locations to match the invert elevations specified in plans for the proposed structures. For existing culverts along Kamehameha Highway, the modification feature was used to align the culvert invert elevations with the field measurements. In these cases, the elevation of the roadway deck was known, and the inverts of the existing culverts were determined based on field measurements of the distances from the top of the roadway to the culvert invert.

To improve the model definition, breaklines were added to the terrain at high grounds and within drainage channels. These breaklines were added to Kamehameha Highway, the proposed Kaihalulu East Roadway, Marconi Road, and Kuilima Drive. Breaklines were also used to delineate the alignment and width of ʻŌʻio Stream upstream channel (upstream of Kamehameha Highway) and downstream channel (East Main Drain Channel) within the terrain. Similarly, breaklines were added to the Hoʻolapa Stream channel to better define it within the within the terrain. Some breaklines were also added within Punahoʻolapa Marsh to delineate drainage paths.

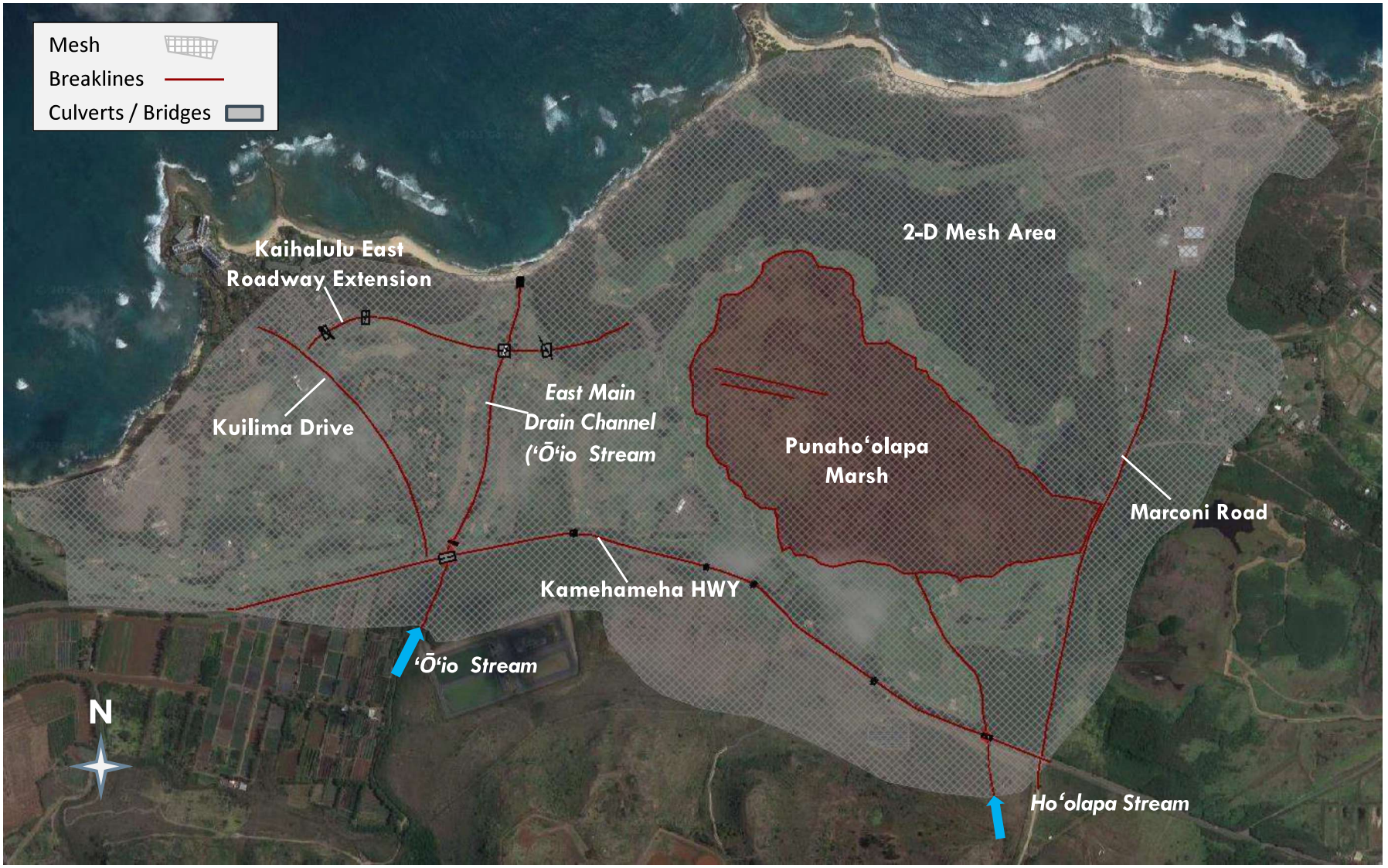

Figure 3-1. HEC-RAS 2-D Model Geometry with Proposed Kaihalulu East Roadway Extension

B1 - 118

Boundary Conditions

The model includes six (6) inflow hydrograph boundary conditions, each corresponding to flow from the six ʻŌʻio watershed subbasins, as computed by HEC-HMS. These boundary conditions were set at the following locations:

- **Subbasin E1:** Placed 660 feet mauka of the ʻŌʻio Stream Bridge crossing on Kamehameha Highway, serving as an external boundary condition.
- **Subbasin E2:** Positioned on the northeast side of the Turtle Bay Wastewater Treatment Plant, serving as an internal boundary condition.
- **Subbasin E3:** Approximately 680 feet mauka of Kamehameha Highway, located between Turtle Bay Wastewater Treatment Plant and Hoʻolapa Stream, serving as an internal boundary condition.
- **Subbasin E4:** Placed 520 feet mauka of the Hoʻolapa Stream Bridge crossing on Kamehameha Highway, serving as an external boundary condition.
- **Subbasin E5A:** Located just upstream of the CON/SPAN bridge-culvert crossing over the East Main Drain, serving as an internal boundary condition.
- **Subbasin E5B:** Placed across the Punahoʻolapa Marsh, serving as an internal boundary condition.

For the downstream boundary condition, a stage hydrograph with a known water surface elevation of 1.00 feet was used. This stage value corresponds to the Mean Higher High Water (MHHW) level, which was determined based from the nearest NOAA tidal gauge located at Haleʻiwa, Waialua Bay (Station: 1612668).

In addition to the inflow boundary and downstream boundary conditions, boundary lines were created along the eastern and western sides of the mesh to allow overland flow out of the system. These boundary conditions were set to normal depth. Figure 3-2 shows the locations of all boundary conditions within the model.

Subbasins E1, E2, E3, and E4 are all situated mauka of Kamehameha Highway. The computed HEC-HMS flow for the E1 subbasin was set as inflow to ʻŌʻio Stream channel, while E4 was set as inflow to the Hoʻolapa Stream channel. In the case of E2 and E3 subbasins, the flow lines were set to simulate overland flow from these basins mauka of Kamehameha Highway. For E5A, the flow line was placed within the East Main Drain channel, positioned just upstream of the CON/SPAN crossing. Finally, the flow for E5B was set to extend across the Punahoʻolapa Marsh.

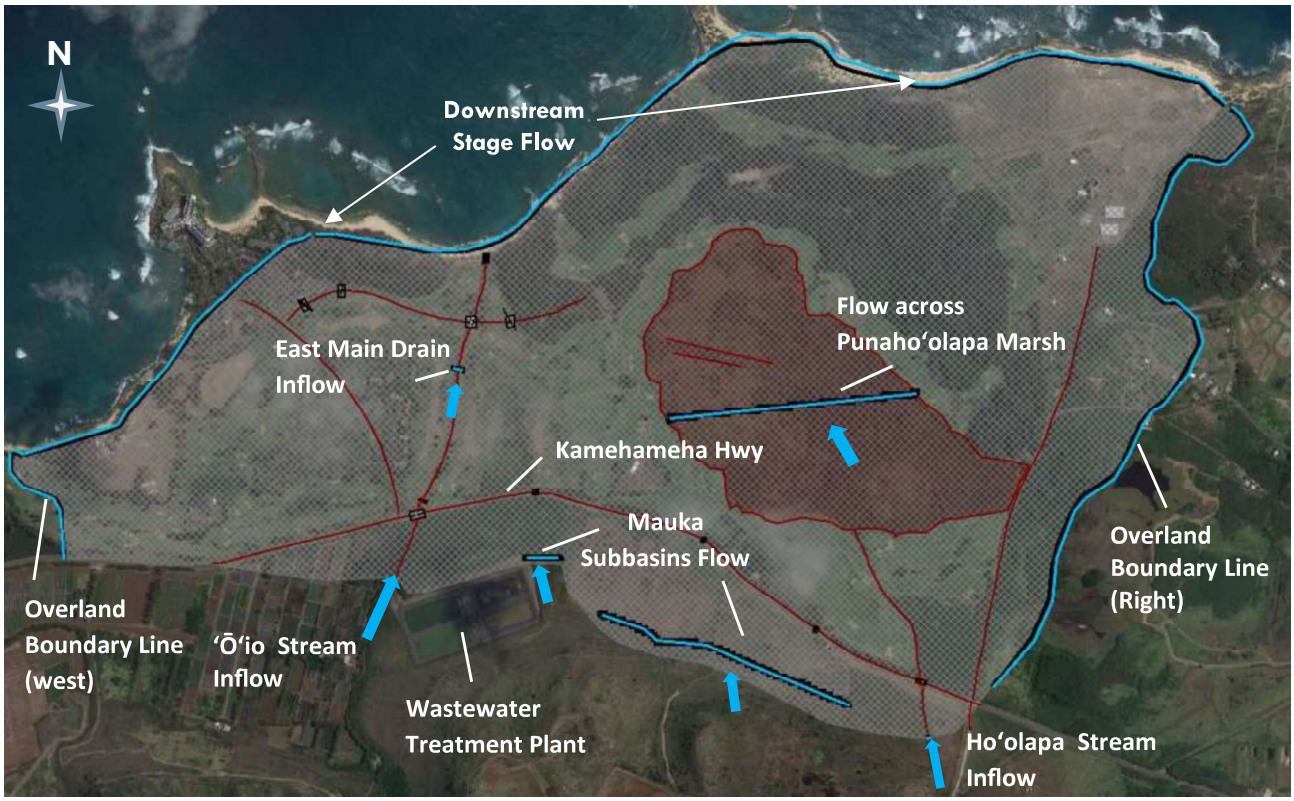

Figure 3-2. HEC-RAS 2-D Model Boundary Conditions

Manning's Roughness

The channel and overbank roughness (Manning's *n*) values used in the hydraulic simulations ranged from 0.02 to 0.10 within the 2-D model area. The selected *n* values were determined through a combination of field observations, standard engineering sources (such as Chow 1959), the City and County of Honolulu Storm Drainage Standards (2017), and engineering judgment. For the proposed culverts and pipes on Kaihalulu Rodway Extension, the Manning's *n*-values were derived from the TBR C5.11 Utility Plan & Profile and C5.12 CON/SPAN Culvert Profile (WOC, 2022).

The land cover layer was created within RAS Mapper, and user-defined polygons were drawn to align with the channels and roads as defined in the DEM. Aerial imagery was used to delineate the land use areas for the overbanks. Manning's *n* values were assigned to each specific land cover type. Table 3-1 presents the selected Manning's *n* values for the channel and overbank areas.

Table 3-1. Manning's Roughness Values - Channel and Overbanks

Manning's *n* Value	Description
0.035 – 0.040	Channels
0.013	Concrete Pipes, Culverts, Apron Protection
0.02	Road/Highway
0.02	Golf Cart Path
0.03	Golf Course Grass
0.03	Sand Traps/Beach Sand
0.03	Barren Land
0.04	Shrubs
0.045	Cultivated Land
0.07	Punahoʻolapa Marsh / Wetlands / Ponds
0.08	Developed Medium Intensity
0.10	Evergreen Forest

Hydraulic Structures

The 2-D RAS model includes 13 hydraulic structures, including bridges and culverts, modeled as SA/2D connections.

Ocean Outlet Culvert

The East Main Drain Channel discharges through four concrete pipe culverts to the ocean. The ocean outlet culvert was modeled as a group of four concrete culverts, each having a 6-foot diameter. A cross-sectional image of this model geometry is provided in Figure 3-3.

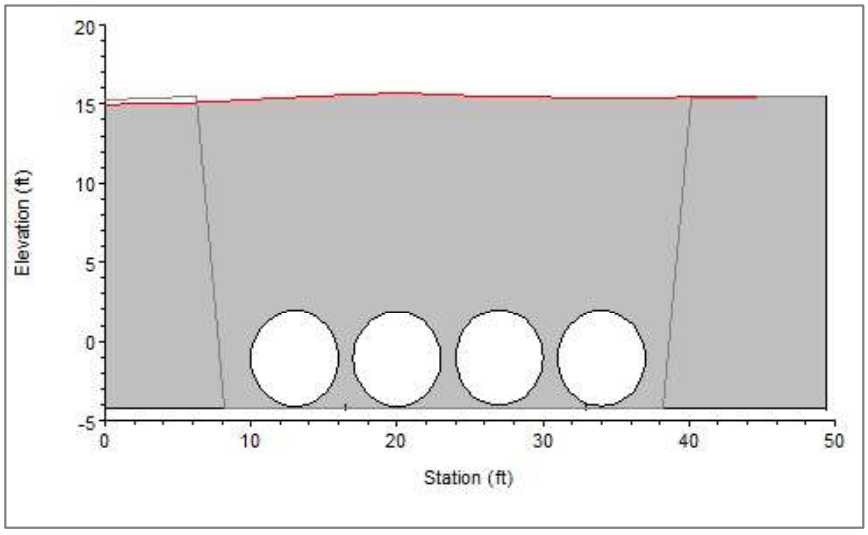

Figure 3-3. Ocean Outlet Culvert Cross Section

Proposed CON/SPAN Culvert

The East Main Drain Channel crosses the proposed Kaihalulu East Roadway through the proposed CON/SPAN concrete arch culvert. The proposed CON/SPAN culvert was modeled with a span of 28 feet and a rise of 8 feet, with an overall length of 66 feet. Figure 3-4 below shows the CON/SPAN culvert cross-section in the model geometry editor.

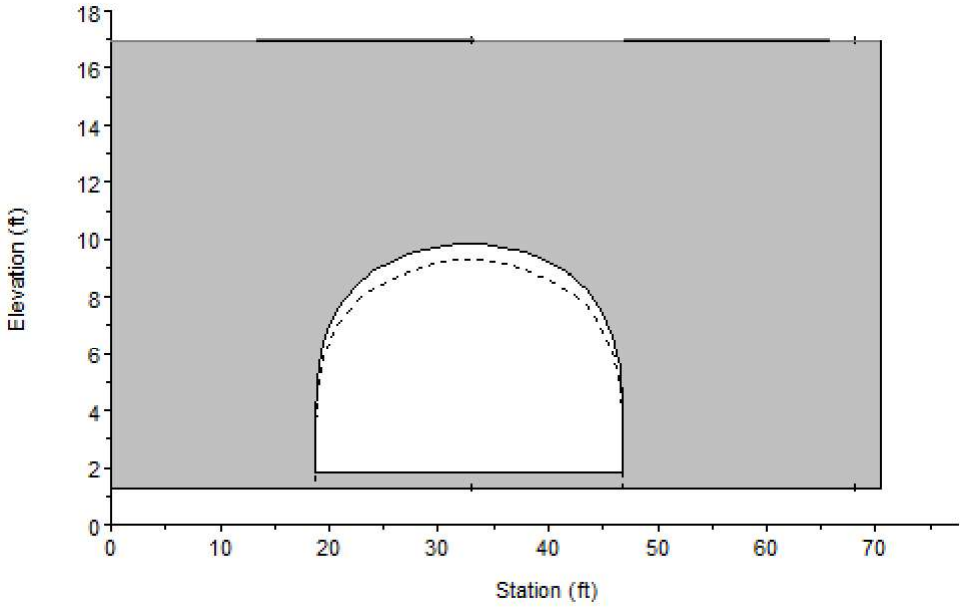

Figure 3-4. Proposed CON/SPAN Culvert Cross-Section on Kaihalulu East Roadway

Proposed Culverts on Kaihalulu East Roadway

The Kaihalulu East Roadway Extension project includes the installation of three proposed culverts. These culverts are constructed using 30-inch diameter concrete pipes, varying in lengths. Figure 3-5 shows the layout of the proposed culverts along the roadway.

Culvert #1 is comprised of two concrete pipes and facilitates local flow from makai to mauka of the roadway. On the other hand, pipe culverts #2 and 3 each consist of a single concrete pipe, passing flow from mauka to makai. Additionally, Figure 3-5 shows the CON/SPAN arch culvert crossing over the East Main Drain, and at the outlet is the four concrete pipes. Figure 3-6 through Figure 3-8 show the cross-sections for the proposed culverts #1, 2, 3, and 4.

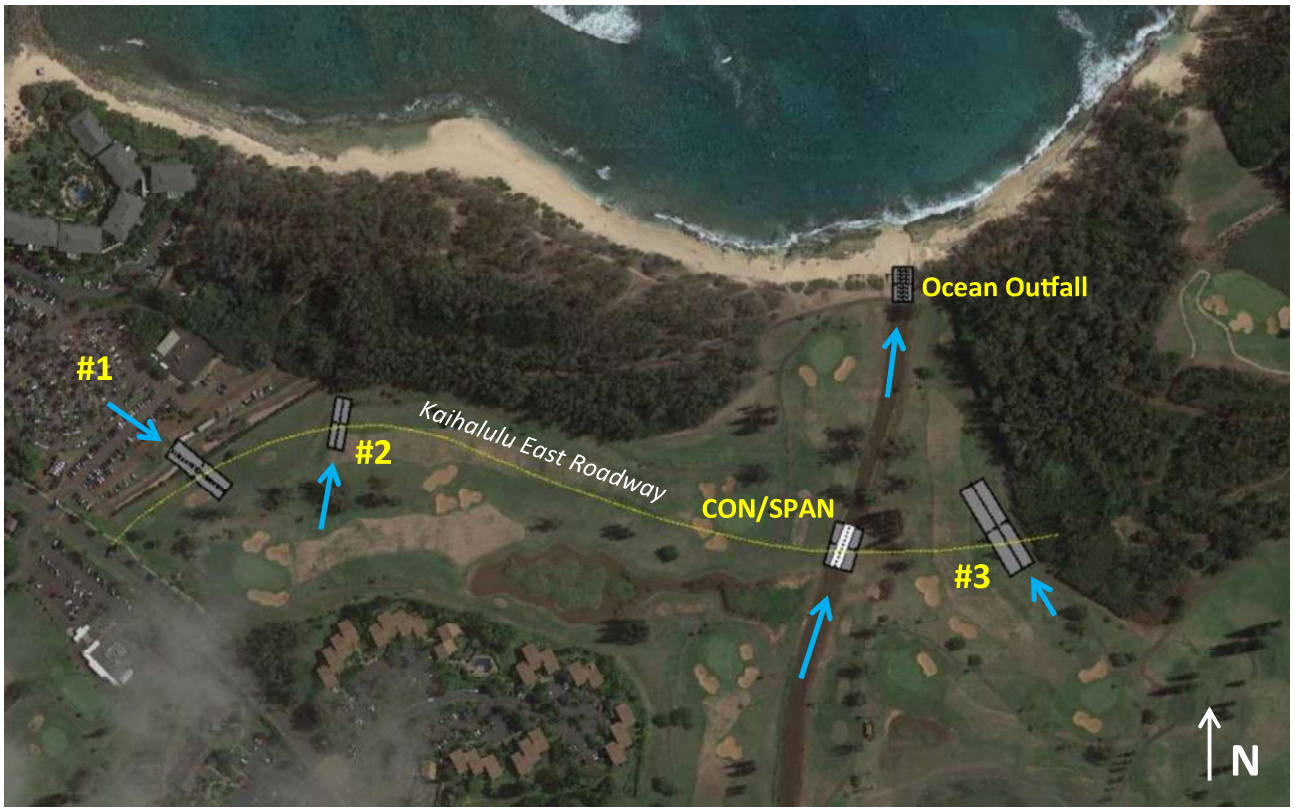

Figure 3-5. Proposed Culverts and CON/SPAN on Kaihalulu East Roadway, and Ocean Outfall

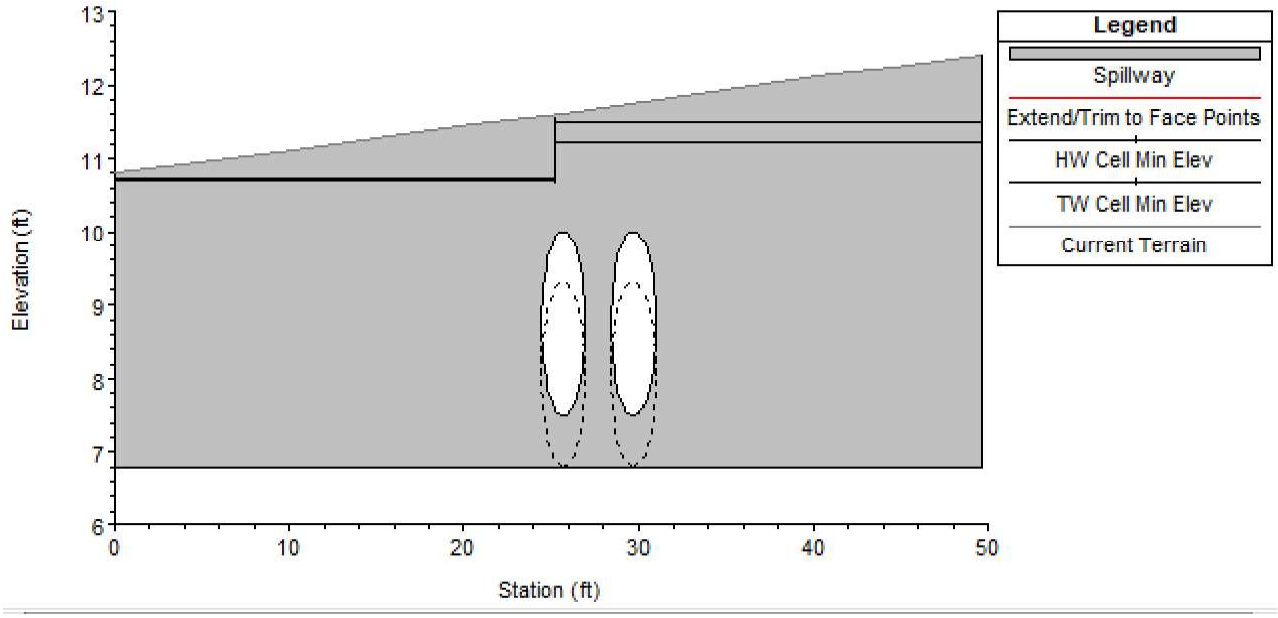

Figure 3-6. Proposed Culvert #1 Cross-Section on Kaihalulu East Roadway

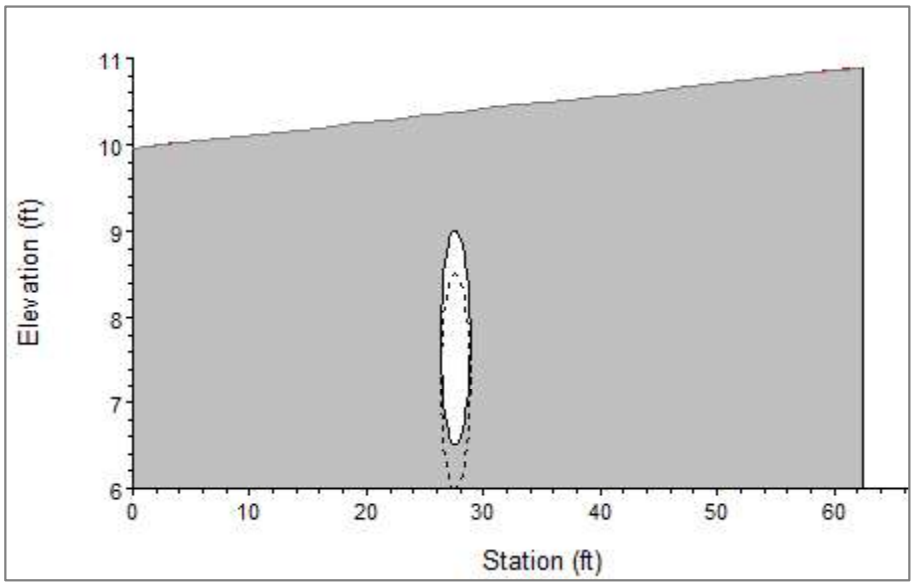

Figure 3-7. Proposed Culvert #2 Cross-Section on Kaihalulu East Roadway

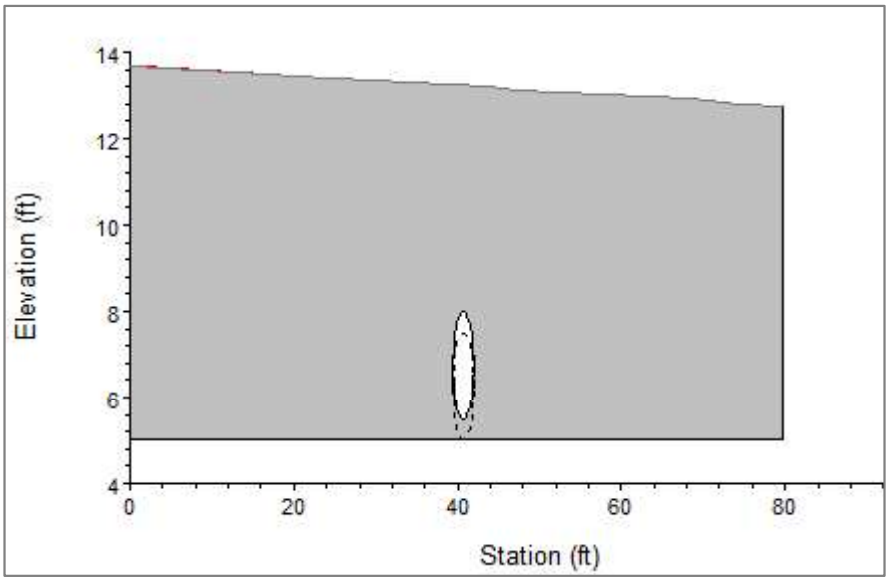

Figure 3-8. Proposed Culvert #3 Cross-Section on Kaihalulu East Roadway

Existing Culverts on Kamehameha Highway

Kamehameha Highway within the study reach has four existing culverts, including three concrete box culverts and one concrete pipe culvert. Figure 3-9 shows the layout of these culverts. The lengths of the culverts were approximated based on the roadway width and included the old plantation road culverts immediately mauka of the highway. Field measurements provided the culvert dimensions, which are detailed below:

- Box Culvert #1: Span of 8 feet span and rise of 2.8 feet.
- Box Culvert #2: Span of 4 feet span and rise of 3.5 feet.
- Box Culvert #3: Span of 6 feet and rise of 2.1 feet.
- Pipe Culvert: Diameter of 3 feet.

Refer to Figure 3-10 through Figure 3-12 for site photos of each culvert alongside their respective field measurements.

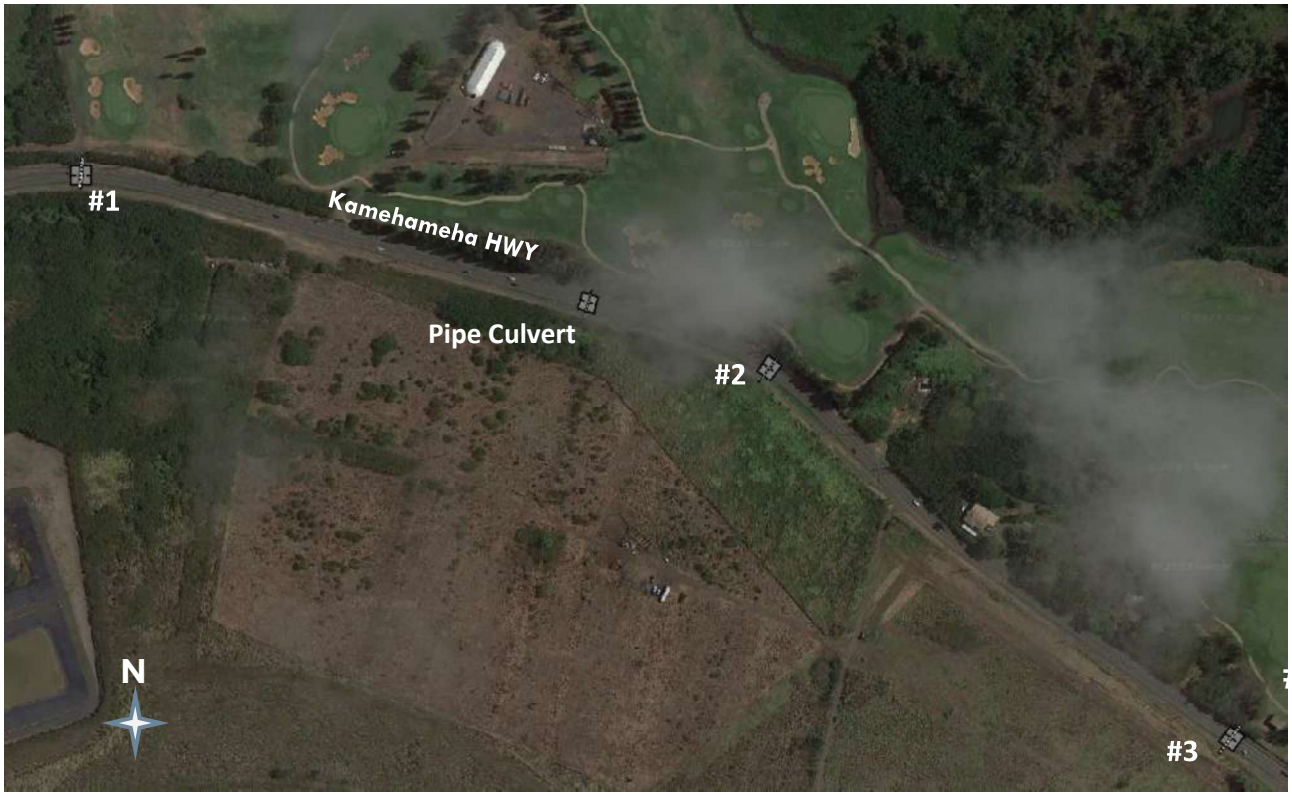

Figure 3-9. Existing Culverts on Kamehameha Highway

Figure 3-10. Existing Box Culvert#1 on Kamehameha Highway (Site Survey Photo)

Figure 3-11. Existing Box Culvert#2 on Kamehameha Highway (Site Survey Photo)

Figure 3-12. Existing Box Culvert#3 on Kamehameha Highway (Site Survey Photo)

Figure 3-13. Existing Pipe Culvert on Kamehameha Highway (Site Survey Photo)

Proposed Ōʻio Stream Bridge

The proposed Ōʻio Stream Bridge on Kamehameha Highway will serve as a replacement for both the existing bridge and the old plantation bridge. The proposed bridge is a single-span design, measuring 80 feet wide (in the direction of flow) with no piers and an opening of 49 feet. The construction of the new bridge abutments will be positioned behind the existing bridge abutments, while the original bridge abutments will remain in place.

Existing Golf Cart Crossing over Ōʻio Stream

The existing Golf Cart crossing over Ōʻio Stream is within the Turtle Bay Resort golf course area. The bridge is a single-span design with a width of 14 feet (in the direction of flow) with no piers, and an opening of 60 feet.

Proposed Hoʻolapa Stream Bridge

The proposed Hoʻolapa Stream Bridge on Kamehameha Highway will replace the existing bridge. The proposed bridge is a single-span design with a width of 42.5 feet (in the direction of flow), no piers, and an opening of 33 feet. Similar to the Ōʻio Stream Bridge, the new bridge abutments will be constructed behind the existing bridge abutments, with the original ones remaining in place.

Proposed Conditions

In the proposed conditions model geometry, thirteen hydraulic structures have been incorporated as SA/2D connections. Figure 3-14 shows the HEC-RAS 2-D mesh and its associated model features, including breaklines, boundary condition lines, and hydraulic structures, all overlaid on the proposed terrain.

Existing Conditions

The existing conditions model geometry is identical to the proposed conditions, except for the future Kamehameha Highway Extension and culverts, which have been excluded.

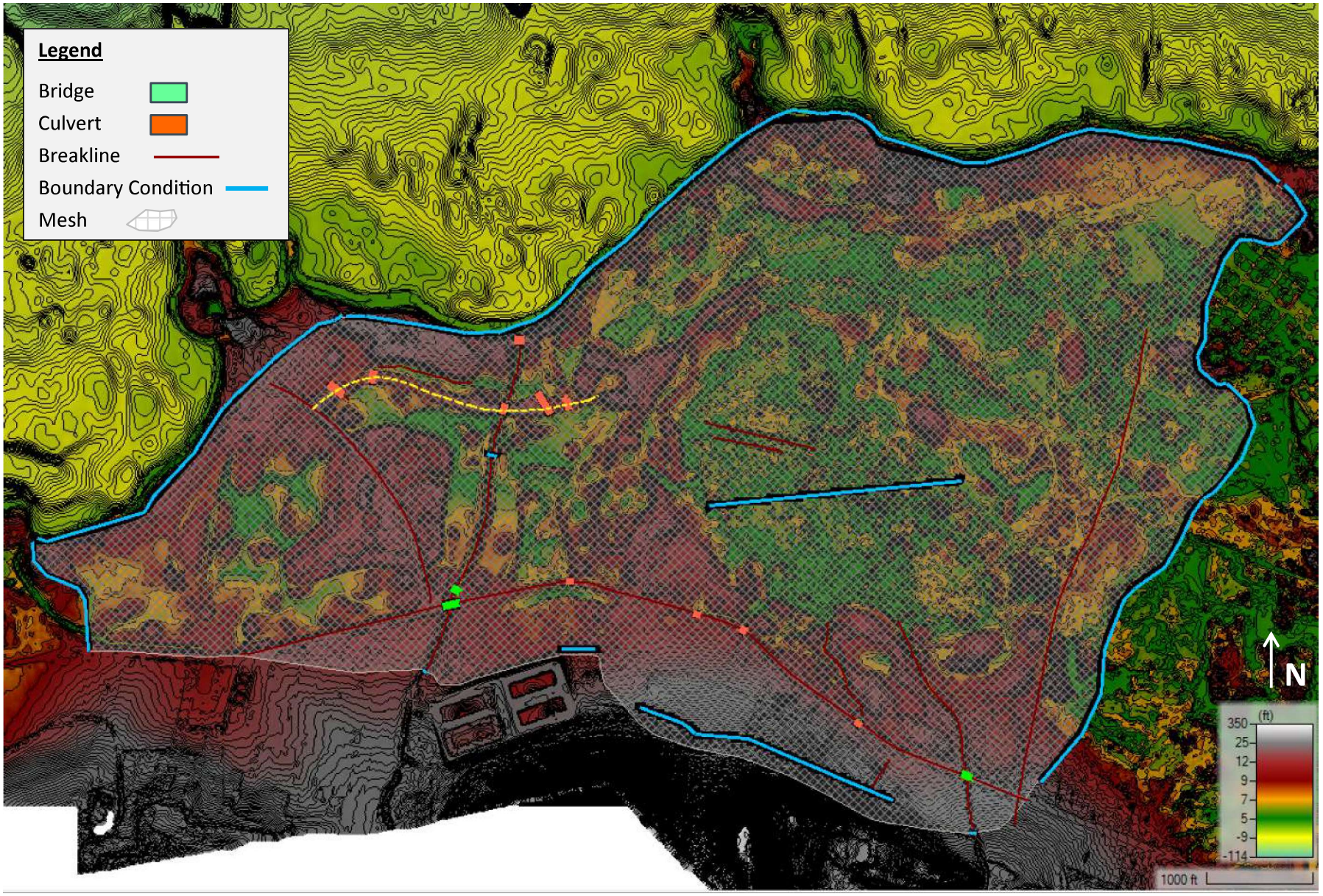

Figure 3-14. Proposed Conditions HEC-RAS Geometry Layout with Terrain

4 HYDRAULIC MODEL RESULTS

This chapter presents the HEC-RAS 2-D model results for the existing and proposed flood scenarios. The model was run to determine the water surface elevations, flood depths, and flow velocities for each condition, based on the 100-year flood hydrographs.

Flow calculations from ʻŌʻio Stream channel, localized overland flow mauka of Kamehameha Highway, and Hoʻolapa Stream channel were computed using HEC-HMS, and the resulting hydrographs were incorporated into the HEC-RAS geometries. The inflow hydrographs remained the same for both the existing and proposed scenarios.

The study focus is the East Main Drain Subsystem within the ʻŌʻio Stream watershed, as described in Chapter 2. However, model results show overflow from the East Main Drain Subsystem into the West Main Drain Subsystem. Inflow hydrographs for the West Main Drain Subsystem were not included in this study.

It is also important to note that the primary difference between the proposed conditions and existing conditions geometries is that the proposed conditions incorporate the Kaihalulu East Roadway Extension and the three planned culverts and CON/SPAN structure along the roadway.

4.1 Existing Conditions

The maximum 100-year flood results for the existing conditions are provided in Figure 4-1 (water surface elevations), Figure 4-2 (flood depths), and Figure 4-3 (flow velocities). These figures are annotated with the corresponding values for the 100-year flood event.

4.2 Proposed Conditions

The maximum 100-year flood results for the proposed conditions are provided in Figure 4-4 (water surface elevations), Figure 4-5 (flood depths), and Figure 4-6 (flow velocities). These figures are annotated with the computed values for the 100-year flood event. The results show that the future Kaihalulu East Roadway and CON/SPAN crossing are not subject to overtopping. Overall, there are only minimal differences observed between the proposed conditions and existing conditions results.

4.3 Comparison: ʻŌʻio Stream Existing vs. Proposed Conditions

In this section, the focus is on the ʻŌʻio Stream (East Main Drain) reach and overflow areas, specifically the proposed 66-foot-long CON/SPAN bridge-culvert and the three planned pipe culverts along the proposed Kaihalulu Road Extension. Figure 4-7 through Figure 4-12 present a closer look at the mapped water surfaces, depths, and velocities allowing for a detailed comparison of the existing conditions with the proposed conditions.

Table 4-1 presents a side-by-side comparison of the hydraulic parameters upstream and downstream of the proposed roadway. The results comparison shows that there are minimum differences between the existing and proposed conditions. The table shows that the water surface elevations are approximately 0.5 feet higher compared to the existing conditions upstream of the extended Kaihalulu East Roadway, whereas downstream the proposed

conditions are slightly lower, approximately 0.3 feet lower. These differences are similar for the flood depths as well. Overall, flow velocities are relatively low, ranging from 0.4 to 3.4 ft/s for the existing conditions (Figure 4-11), and 0.4 ft/s to 2.9 ft/s for the proposed conditions (Figure 4-12) in the vicinity of the future roadway.

Table 4-1. 100-year Maximum Values Upstream and Downstream of Proposed CON/SPAN

HEC-RAS Model Result	Proposed		Existing (no CON/SPAN)	
	Upstream	Downstream	Upstream	Downstream
Water Surface Elev. (ft, LMSL)	9.0	8.2	8.5	8.5
Flood Depth (ft)	8.0	7.9	7.6	8.2
Flow Velocity (ft/s)	2.9	2.6	3.4	2.4

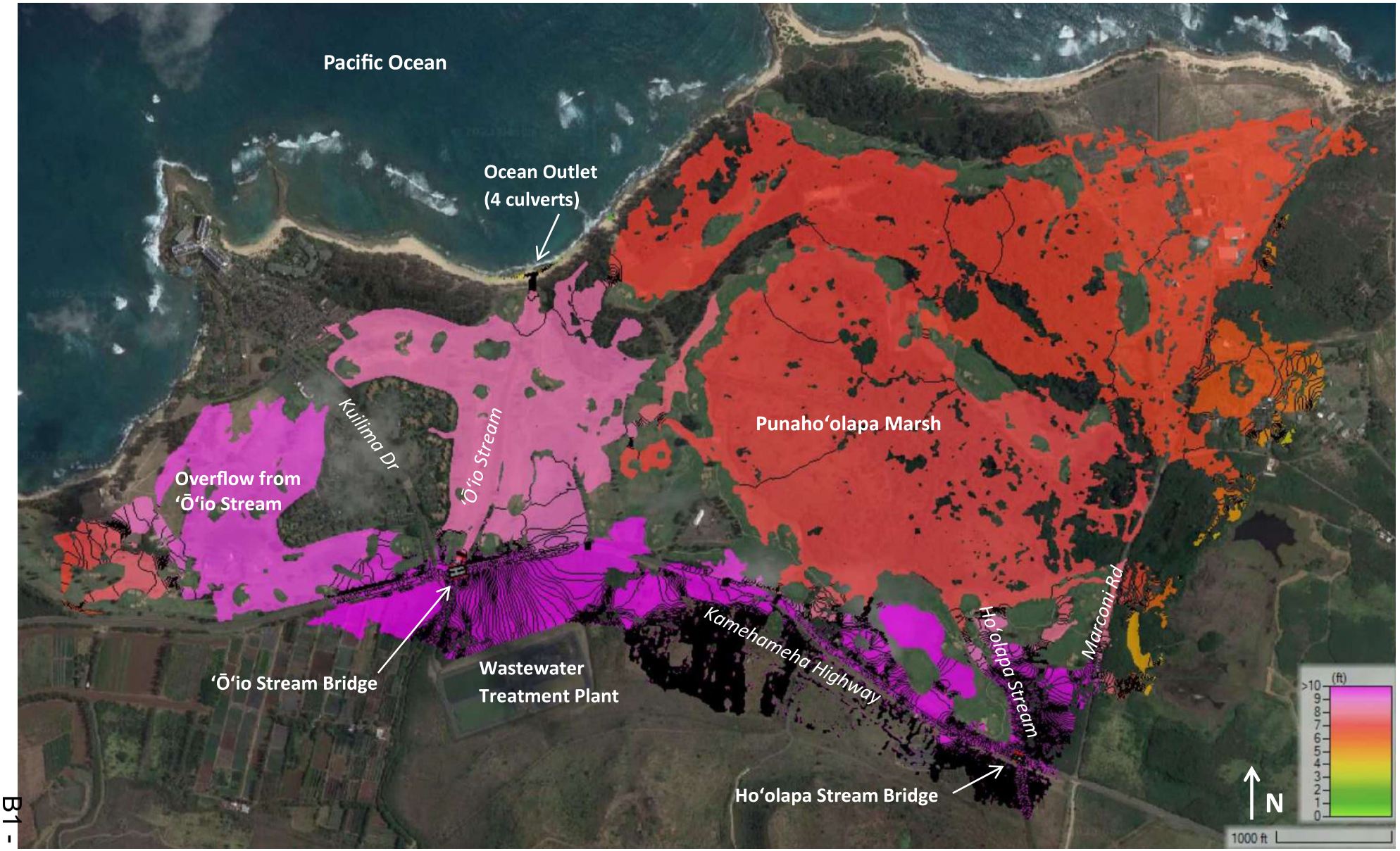

Figure 4-1. Maximum 100-year Water Surface Elevations (0.1-ft contours) – Existing Conditions

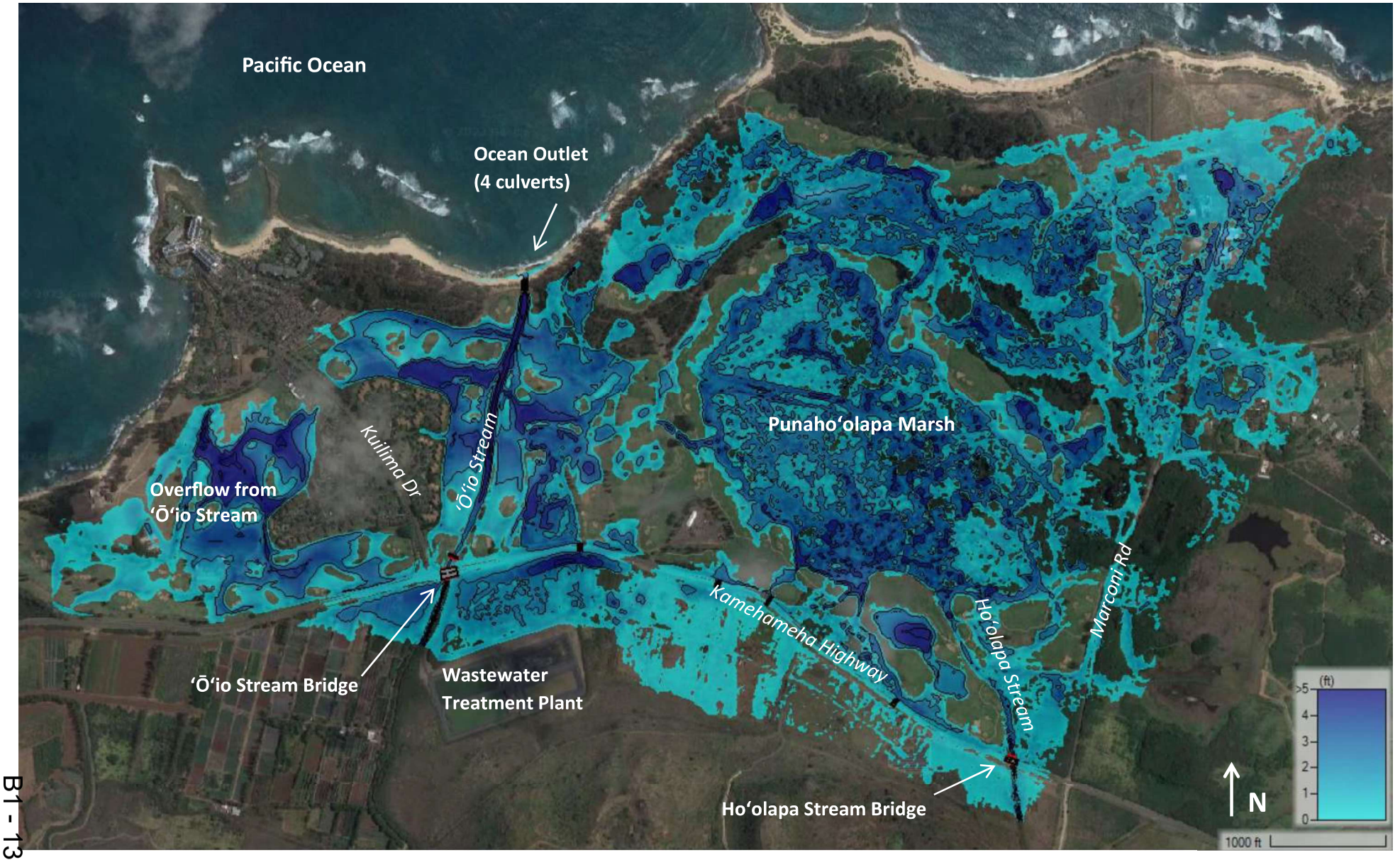

Figure 4-2. Maximum 100-year Flood Depths (2-ft contours) – Existing Conditions

B1 - 133

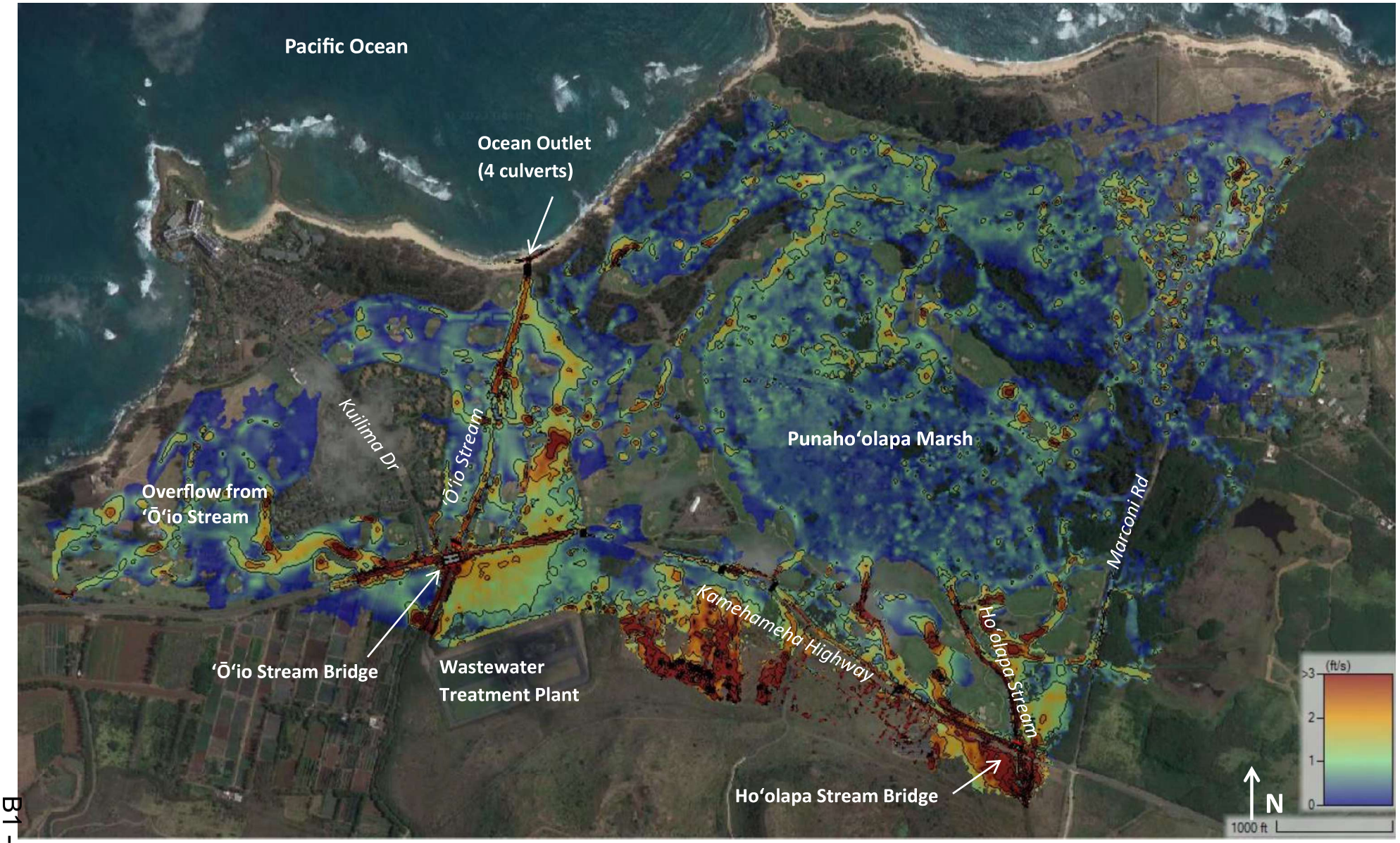

Figure 4-3. Maximum 100-year Flow Velocities (1-ft/s contours) – Existing Conditions

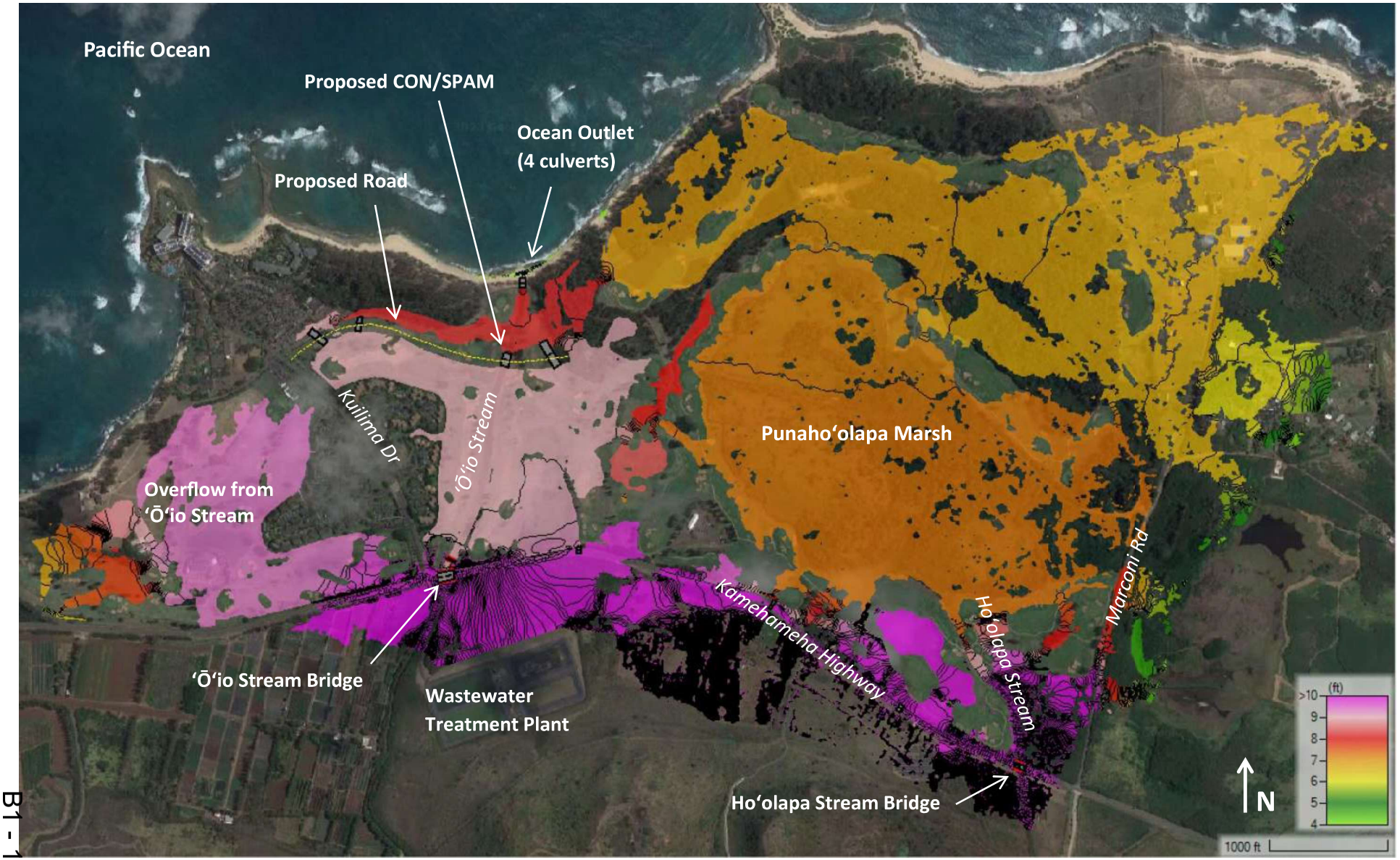

Figure 4-4. Maximum 100-year Water Surface Elevations (0.1-ft contours) – Proposed Conditions

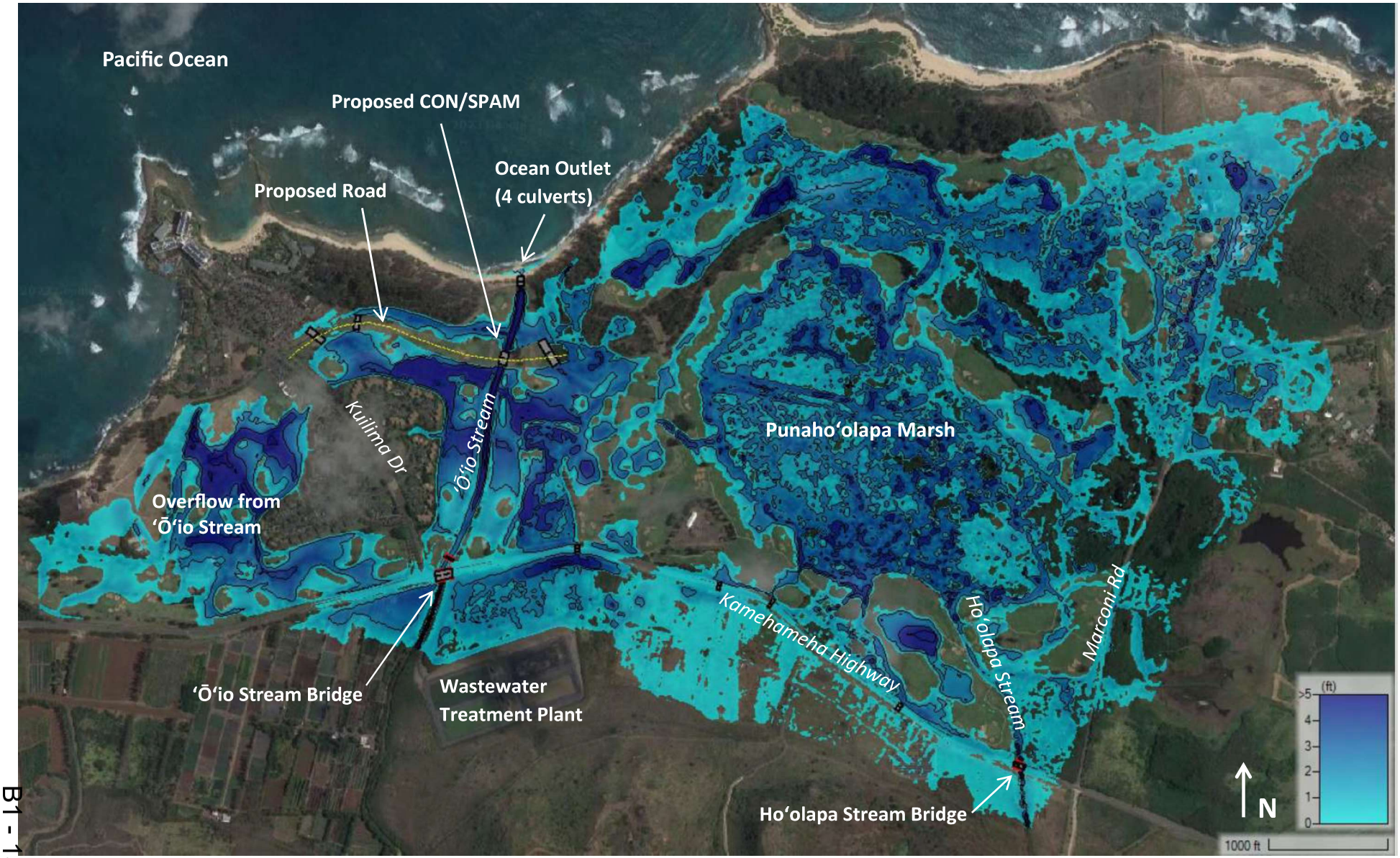

Figure 4-5. Maximum 100-year Flood Depths (2-ft contours) – Proposed Conditions

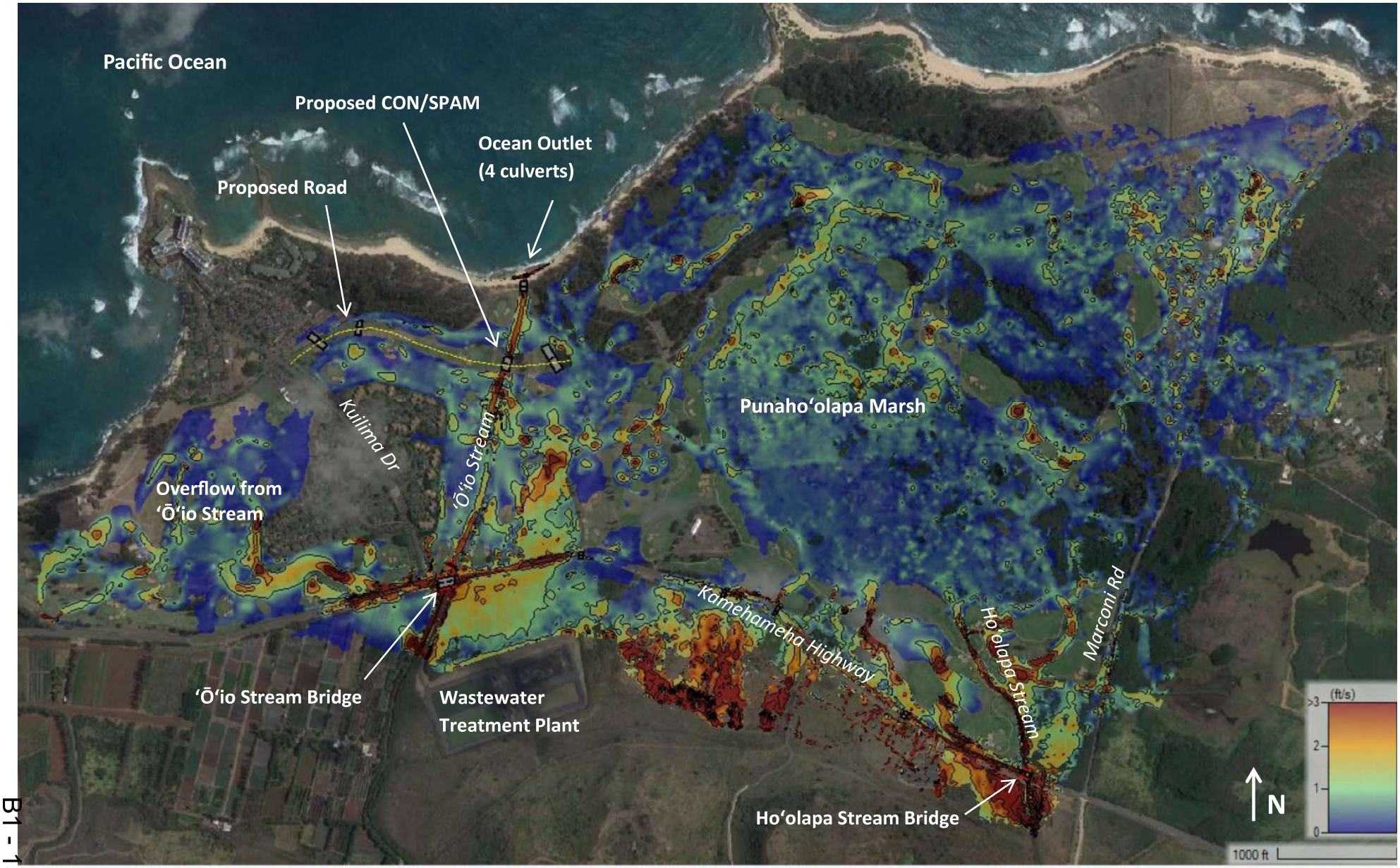

Figure 4-6. Maximum 100-year Flow Velocities (1-ft/s contours) – Proposed Conditions

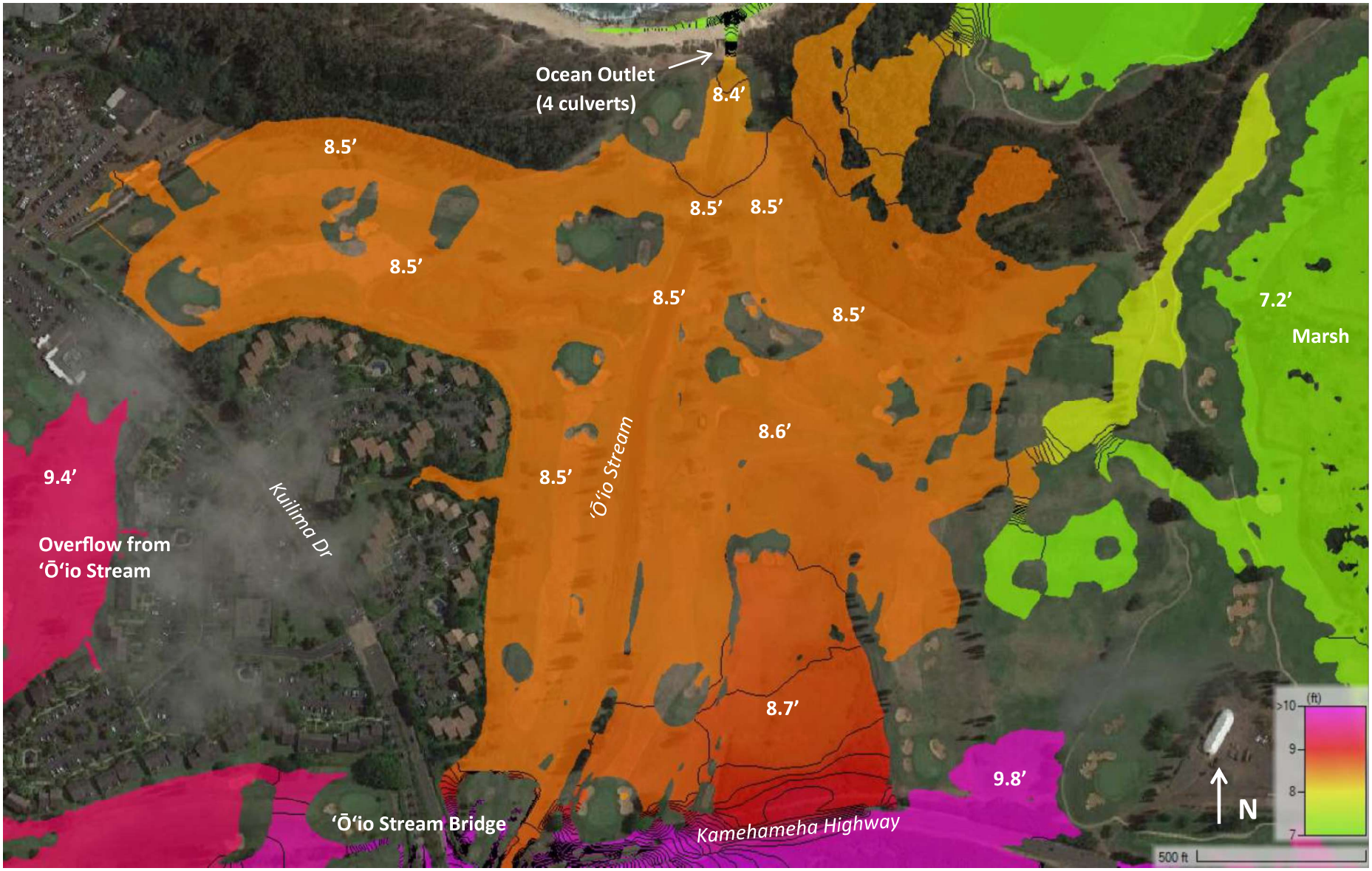

Figure 4-7. 'Ō'io Stream Maximum 100-year Water Surface Elevations (0.1-ft contours) – Existing Conditions

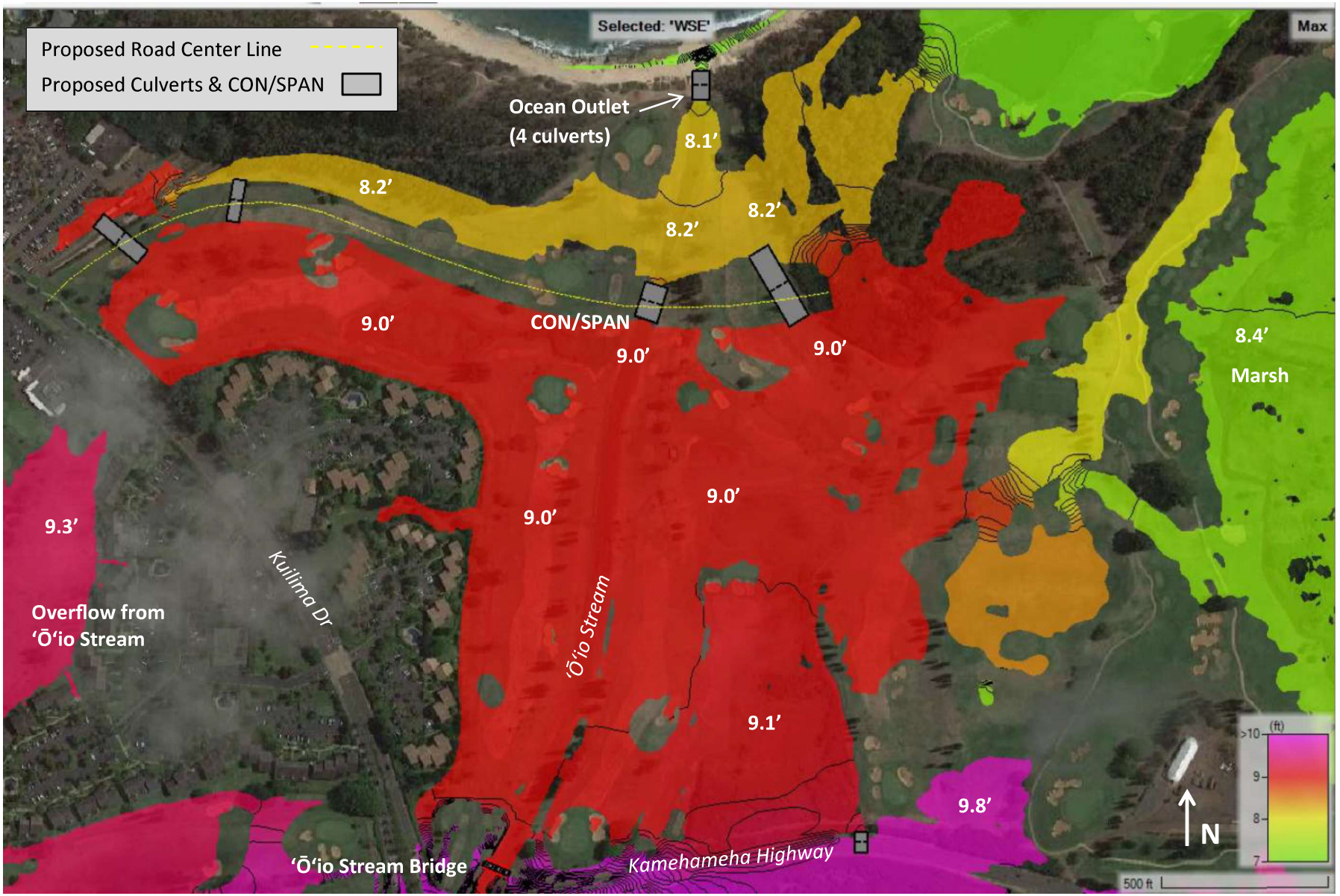

Figure 4-8. 'Ō'io Stream Maximum 100-year Water Surface Elevations (0.1-ft contours) – Proposed Conditions

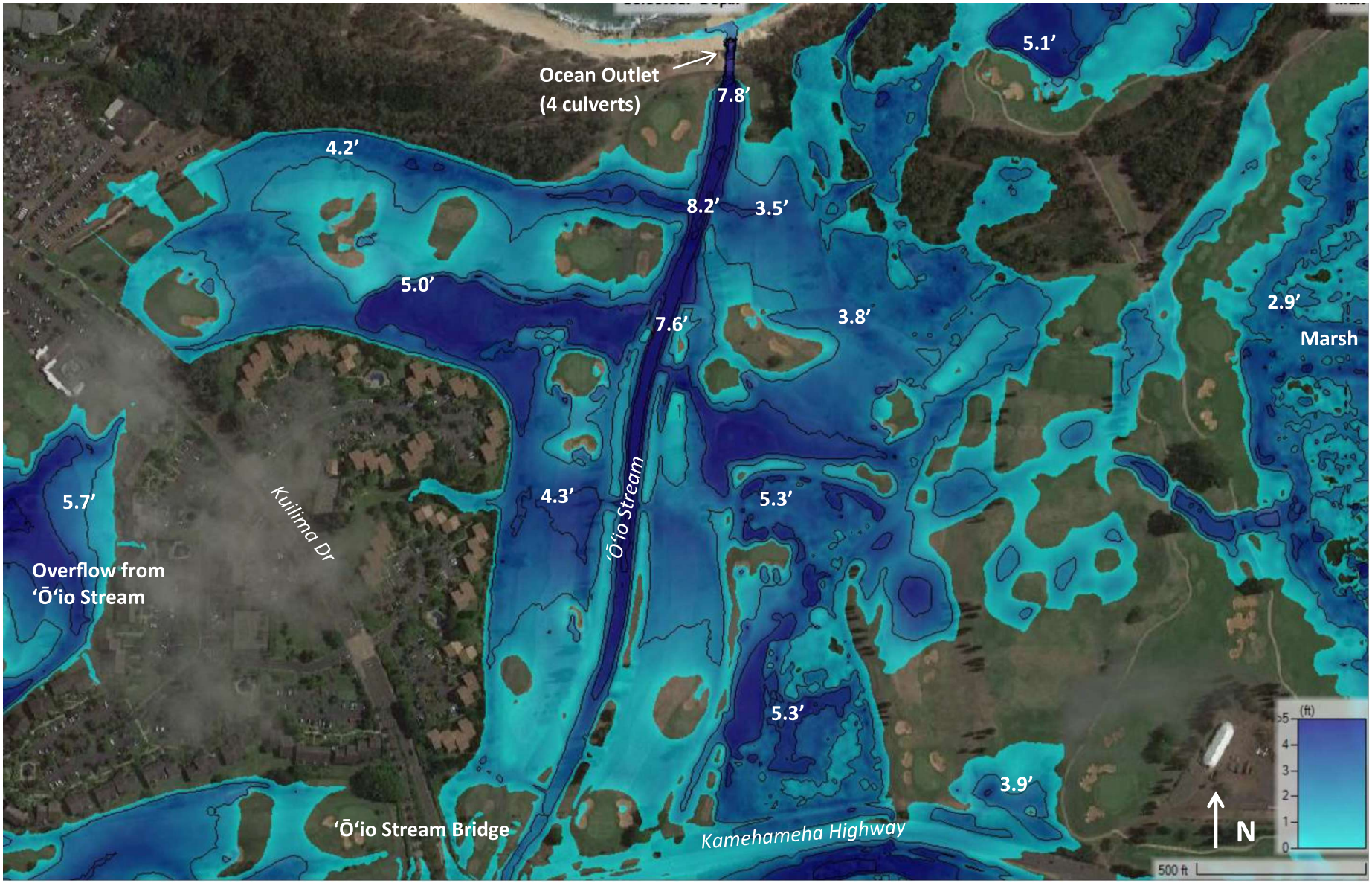

Figure 4-9. ʻŌʻio Stream Maximum 100-year Flood Depths (2-ft contours) – Existing Conditions

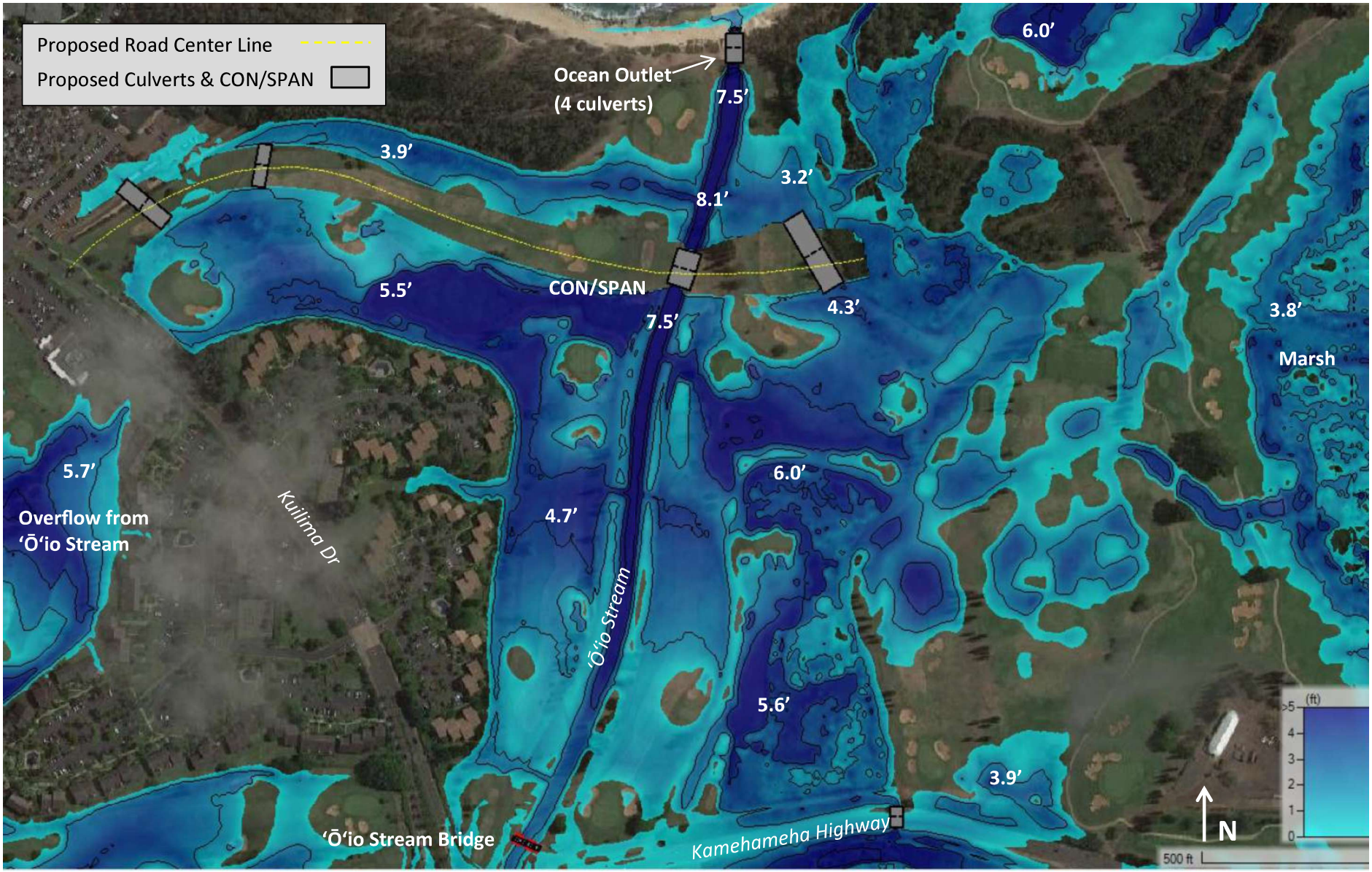

Figure 4-10. 'Ō'io Stream Maximum 100-year Flood Depths (2-ft contours) – Proposed Conditions

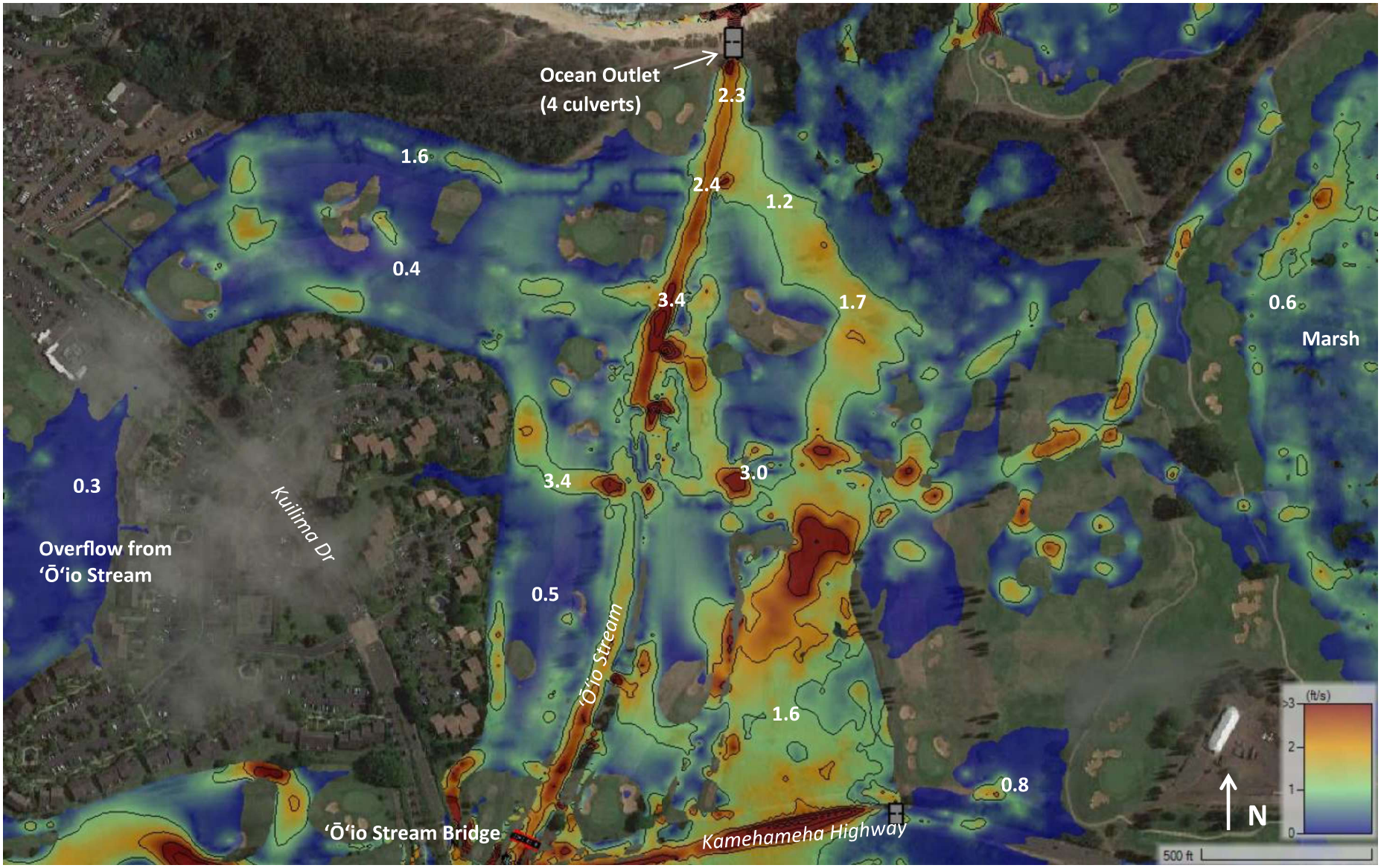

Figure 4-11. ʻŌʻio Stream Maximum 100-year Flow Velocities (1-ft/s contours) – Existing Conditions

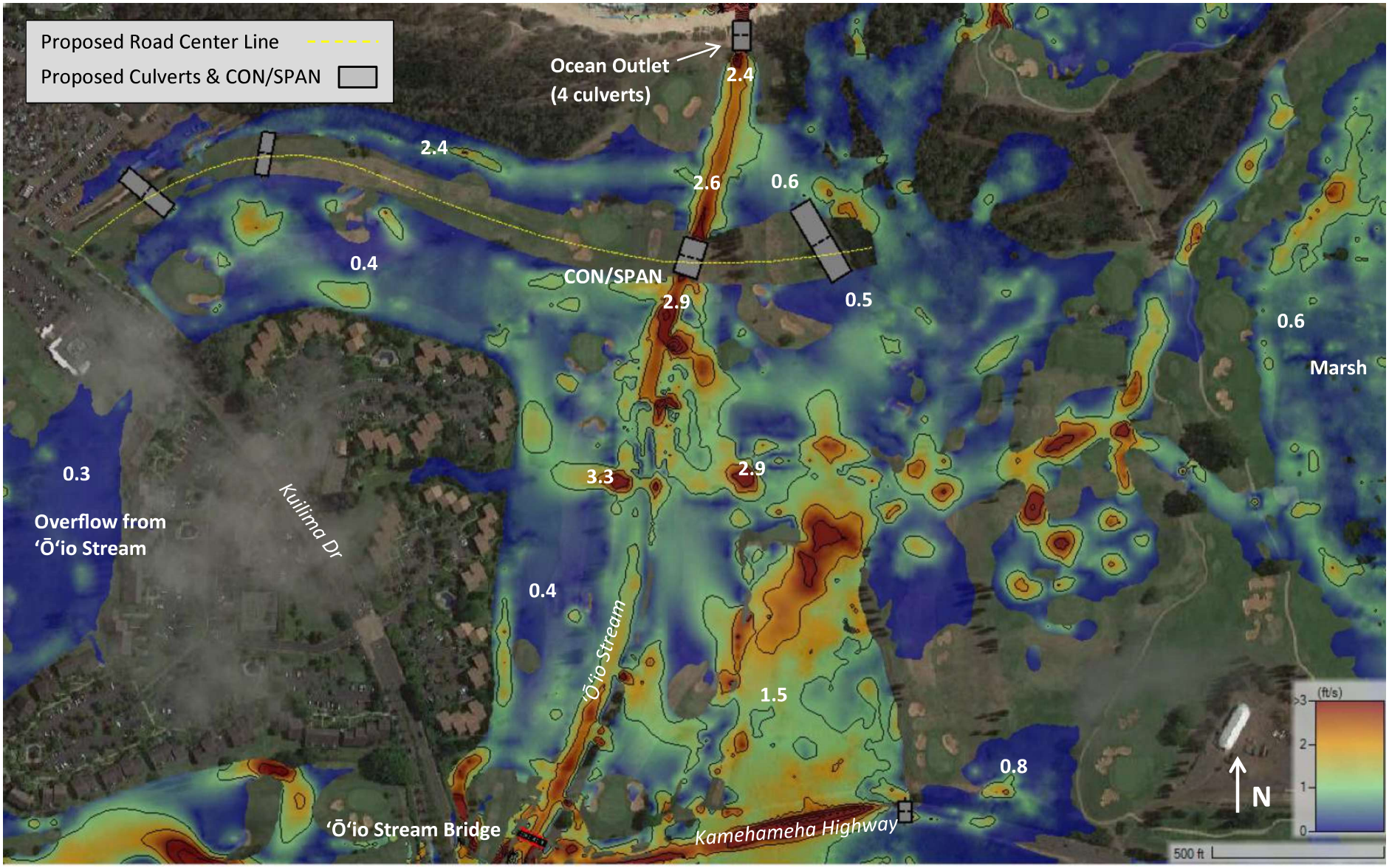

Figure 4-12. ʻŌʻio Stream Maximum 100-year Flow Velocities (1-ft/s contours) – Proposed Conditions

5 SCOUR ANALYSIS

Scour was computed for the proposed conditions based on the 100-year return period flood. Total scour at the CON/SPAN culvert crossing is determined by evaluating the combined effects of three potential scour components: 1) long-term degradation of the streambed, 2) general scour, and 3) local scour.

5.1 Streambed Gradation

Soil samples were available for the ʻŌʻio Stream near the Kamehameha Highway Bridge to determine stream gradation characteristics. Sample 1 was classified as silty sand with gravel and Sample 2 was classified as poorly graded gravel with sand. The average D_{50} (median grain size diameter) of the two samples is 0.08 mm. The streambed material is shown in Figure 5-1.

Figure 5-1. ʻŌʻio Stream Bed Material

5.2 Long-Term Degradation

Long-term degradation is associated with streambed lowering over an extended period. The time scale for long-term degradation is usually on the same order of magnitude as the life of the structure, up to 50 years or more. Based on the field reconnaissance, long-term degradation is not expected to be a significant scour component at the CON/SPAN culvert crossing.

5.3 General Scour

General scour involves lowering of the streambed across the stream at a bridge, and is typically associated with contraction of the flow, but may also result from the presence of a bend in the

stream channel. General scour is typically cyclic: during a runoff event, the bed scours during the rising limb of the hydrograph (the period of increasing discharge) and sediment is deposited during the falling limb.

Contraction Scour

Contraction scour is a form of general scour that occurs when the flow area of a stream at flood stage is reduced, either by a natural contraction or bridge. It can also occur as overbank flow is forced back into the channel by roadway embankments.

Contraction scour is separated into two basic conditions:

(1) Live-bed contraction scour: Live-bed contraction scour occurs at a bridge or natural contraction of the stream when there is a transport of bed material from the upstream reach into the contracted section. During live-bed scour, some of the bed material scoured from the contraction area may be replaced by new sediment transported into the area.

(2) Clear-water contraction scour: Clear-water contraction scour occurs when no bed material is transported from the upstream reach into the contracted area, or the bed material is transported in suspension and at a rate less than the capacity of the flow. During clear-water contraction scour, bed material scoured from the contraction area is not replaced.

During the modeled 100-year flood, the proposed conditions fall under live-bed contraction scour; the velocities in the channel are much higher than the critical velocity of the median particle size and the channel bed is mobile. The live-bed contraction scour depth was estimated to be approximately 3 ft using the Modified Laursen Equation. Full scour results are provided in Table 5-1.

Bend Scour

In a natural channel, when there is flow around a bend, scour may be concentrated near the outside of the bend where velocities and shear stresses are greatest. There may also be deposition on the inner portion of the bend at a point bar. The CON/SPAN culvert crossing is not located in a significant bend, so no bend scour would occur.

5.4 Local Scour

Local scour involves scour around bridge piers, abutments, and embankments. It is usually cyclical and is caused by the acceleration of flow and cross currents near obstructions. The CON/SPAN culvert crossing does not have a local scour component.

5.5 Total Scour

The total computed scour for the proposed CON/SPAN culvert crossing is based on contraction scour, as long-term degradation and local scour are not significant factors in the study area. The contraction scour analysis yielded a 100-year scour depth of 3.0 ft.

Based on the minimum channel elevation of 1.5 ft (MSL) through the culvert, the total estimated scour elevation is -1.5 ft (MSL) for the proposed bridge (see Table 5-1). Detailed scour calculations can be found in Appendix A.

Table 5-1. Potential Scour Depth and Elevation for Proposed Condition

Location	Contraction Scour Depth	Minimum Channel Elevation	Total Scour Elevation
Proposed CON/SPAN	3.0 ft	1.5 ft (MSL)	-1.5 ft (MSL)

Allowable Velocity Method

The USDA-NRCS (2007) provides guidance on maximum average channel velocity for stable streams from multiple sources. Their USACE (1991) source provides allowable velocity criteria for non-scouring flood control channels in the following Table 5-2.

Table 5-2. Allowable Velocity Criteria for Non-Scouring Flood Control Channels (USDA-NRCS, 2007)

Channel material	Mean channel velocity (ft/s)	(m/s)
Fine sand	2.0	0.61
Coarse sand	4.0	1.22
Fine gravel	6.0	1.83
Earth		
Sandy silt	2.0	0.61
Silt clay	3.5	1.07
Clay	6.0	1.83
Grass-lined earth (slopes <5%)		
Bermudagrass		
Sandy silt	6.0	1.83
Silt clay	8.0	2.44
Kentucky bluegrass		
Sandy silt	5.0	1.52
Silt clay	7.0	2.13
Poor rock (usually sedimentary)	10.0	3.05
Soft sandstone	8.0	2.44
Soft shale	3.5	1.07
Good rock (usually igneous or hard metamorphic)	20.0	6.08

Velocities in the channel approaching the CON/SPAN structure are low at around 2.5 ft/s. Based on the peak flow through the CON/SPAN structure (801 cfs) and the cross sectional area of the wetted parts of the CON/SPAN structure (196 ft^2), the computed velocity through the structure is 4.1 ft/s. Given the bermudagrass-like vegetation seen in the field (see Figure 5-2.), and the

proposed rock riprap at the entrance to the structure (see next section), the CON/SPAN structure should be properly protected from scour.

Figure 5-2. Mauka of Proposed CON/SPAN structure looking Downstream along Channel.

5.6 Rock Riprap Protection

Recommendations for rock riprap protection for the CON/SPAN culvert are provided below and in Figure 5-3 and Figure 5-4. Based on FHWA HEC-23 guidance, rock riprap protection is recommended to prevent scour from occurring at the base of the bottomless culvert (i.e., a CON/SPAN culvert) with flared wingwalls and to protect the culvert foundations that act as abutments (see Figure 5-3 for riprap schematic).

A conceptual riprap plan is provided in Appendix B. Riprap should have a minimum D_{50} of 9 inches, which corresponds to FHWA Standard Riprap Class II Gradation, and should be installed to a minimum depth of 1.5 feet.

Geotextile should be Rock Slope Protection (RSP) fabric as described in HEC-23 from the Federal Highway Administration (FHWA, 2009) and the geotextile filter extent should be same as the riprap extent.

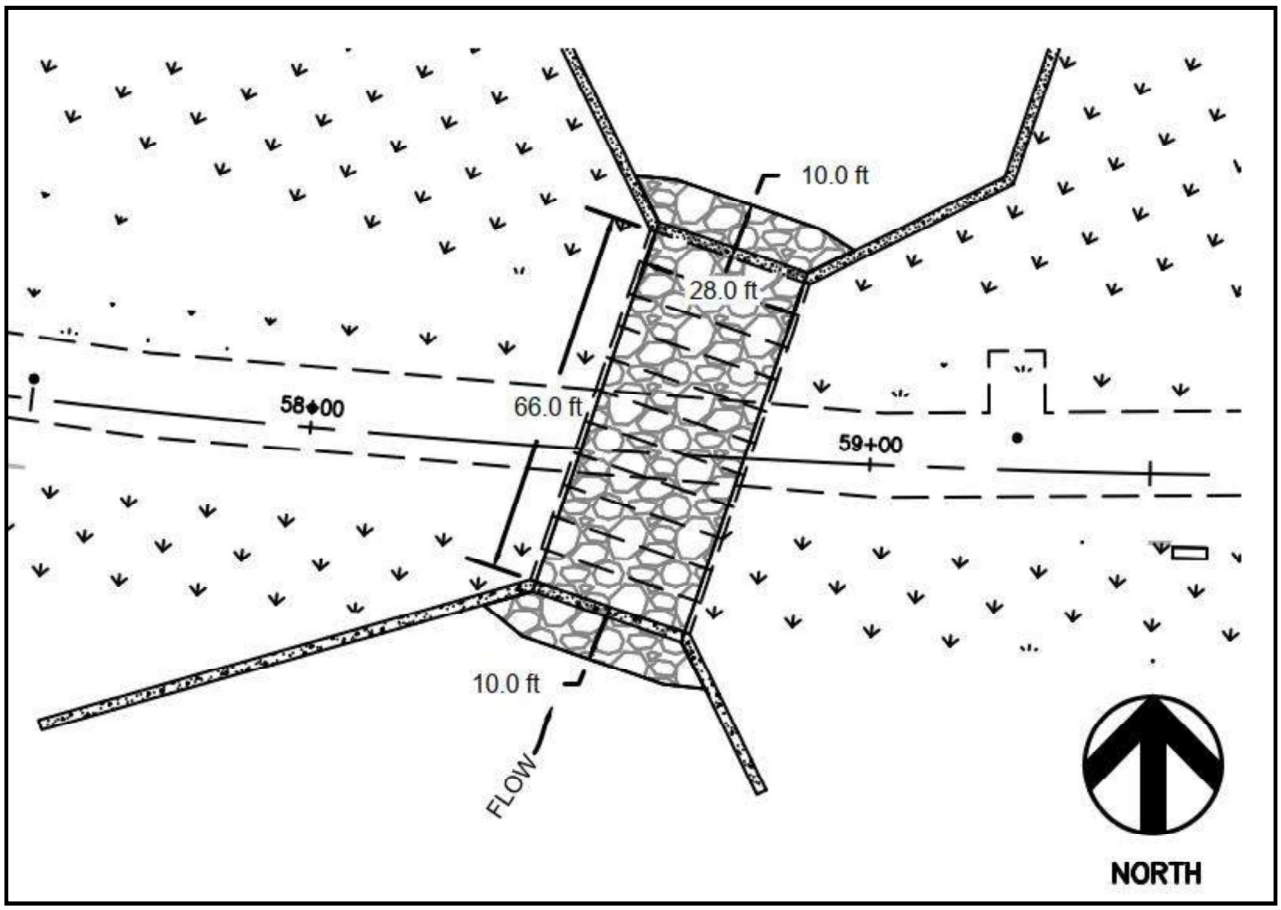

Figure 5-3. Plan View: Riprap Protection for CON/SPAN Culvert with Wingwall

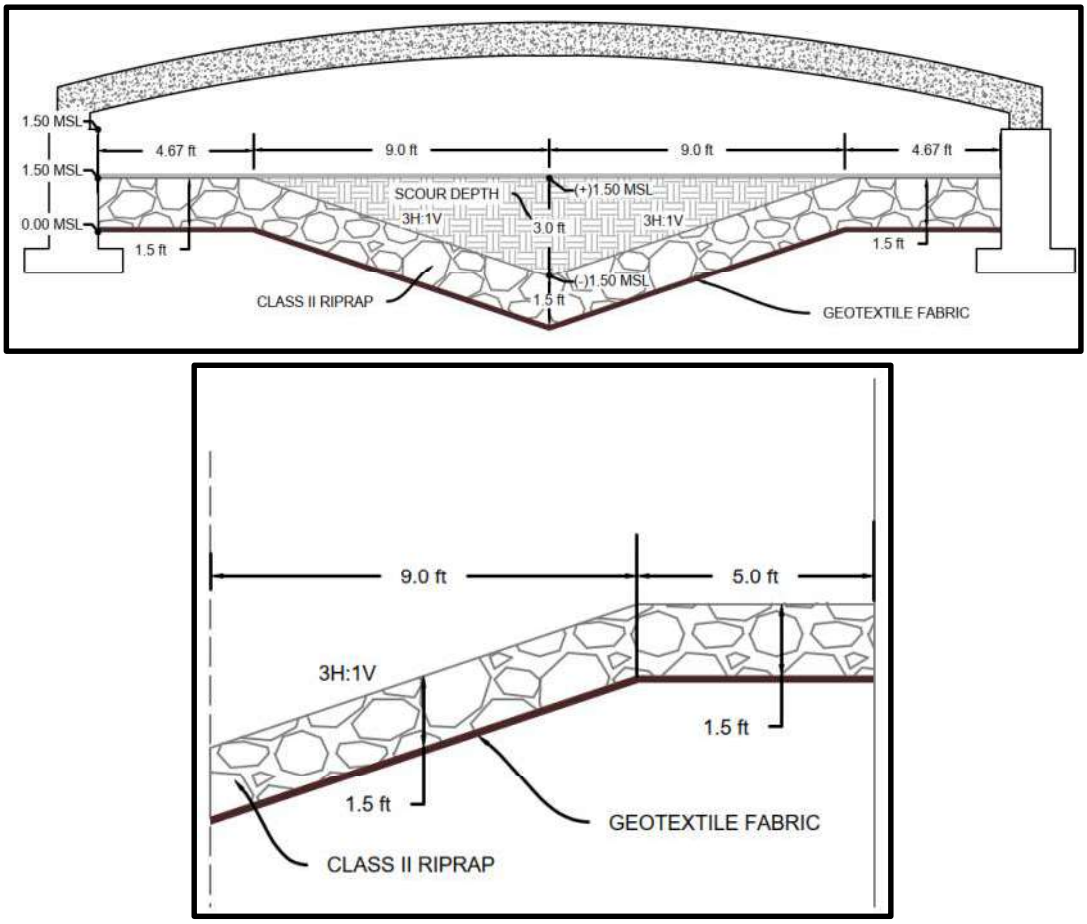

Figure 5-4. Cross Section View: Riprap Protection for CON/SPAN Culvert with Wingwall

6 REFERENCES

Chow, V.T. (1959). *Open Channel Hydraulics.* New York: McGraw-Hill Publishing Company.

City and County of Honolulu (2017). Storm Drainage Standards. Department of Planning and Permitting, Honolulu, *Hawai'i*.

FEMA (2014). *Flood Insurance Study, City and County of Honolulu, Hawaii.* Federal Emergency Management Agency, November 5, 2014.

FHWA (2012). *Hydraulic Engineering Circular No. 18: Evaluation Scour at Bridges – Fifth Edition*. USDOT, Federal Highway Administration (FHWA).

FHWA (2009). *Hydraulic Engineering Circular No. 23: Bridge Scour and Stream Instability Countermeasures: Experience, Selection, and Design Guidance – Third Edition*, Volume 2. USDOT, Federal Highway Administration (FHWA).

USACE (2023a). *HEC-HMS Hydrologic Modeling System –Version 4.11*. U.S. Army Corps of Engineers, Hydrologic Engineering Center (HEC), Davis, California.

USACE (2023b). *HEC-RAS River Analysis System – Version 6.4.1*. U.S. Army Corps of Engineers, Hydrologic Engineering Center (HEC), Davis, California.

NOAA (2007). *2007 JALBTCX Hawaii Lidar: Oahu*. Joint Airborne Lidar Bathymetry Technical Center of Expertise (JALBTCX) NOAA Digital Coast Data Access Viewer. Collected by OCM Partners on January 1, 2007 – January 27, 2007.

NOAA (2011). NOAA's Coastal Change Analysis Program (C-CAP) 2011 Regional Land Cover Data. National Oceanic and Atmospheric Administration. Office for Coastal Management (OCM). https://www.fisheries.noaa.gov/inport/item/48356

NOAA (2018). Hawaii: Continuously Updated Digital Elevation Model (CUDEM) – 1/9 Arc-Second Resolution Bathymetric – Topographic Tiles. NOAA Digital Coast Data Access Viewer. January 2, 2018.

River Focus (2019). *'Ō'io Stream Bridge – Hydrology and Existing Bridge Capacity Technical Memo.* Prepared for Wilson Okamoto Corporation by River Focus, Inc., January 2019.

River Focus (2021). *'Ō'io Stream Hydraulic and Scour Analysis. Turtle Bay Resort Kamehameha Highway Bridge over 'Ō'io Stream*. Prepared for Wilson Okamoto Corporation by River Focus, Inc., October 2021.

USDA-NRCS (1986). *Urban Hydrology for Small Watersheds TR-55.* U.S. Department of Agriculture. Natural Resources Conservation Service. Conservation Engineering Division.

USDA-NRCS (2007). *Part 654 Stream Restoration Design National Engineering Handbook. Chapter 8, Threshold Channel Design.* U.S. Department of Agriculture. Natural Resources Conservation Service.

USDA-NRCS (2010). *Part 630 Hydrology National Engineering Handbook – Chapter 15 Time of Concentration.* U.S. Department of Agriculture. Natural Resources Conservation Service. May 2010.

USDA-NRCS (2019). *Web Soil Survey.* U.S. Department of Agriculture. Natural Resources Conservation Service. https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Wilson Okamoto Corporation (2019). *Turtle Bay Resort Development Drainage Master Plan*. Prepared for Turtle Bay LLC, Kahuku, Hawaii and prepared by Wilson Okamoto Corporation, December 2019 and revised June 2023.

Wilson Okamoto Corporation (2022). *Turtle Bay Onsite Infrastructure Improvements – Kaihalulu Drive East*. Prepared for Turtle Bay LLC, Kahuku, Hawaii, prepared by Wilson Okamoto Corporation, April 2022.

7 ACKNOWLEDGMENTS

This study was performed by River Focus, Inc. for Wilson Okamoto Corporation, and the Turtle Bay Resort. The River Focus study team included A. Jake Gusman, P.E. (Project Manager), Darren Bertrand (Senior Hydrologist), Vicki Tripolitis (Senior Hydraulic Engineer), Tyler Hileman (Hydraulic Engineer), and Jess Straub (Hydraulic Engineer).

APPENDIX A

Scour Calculations:

Proposed Conditions

RIVER FOCUS
WATER RESOURCE CONSULTANTS

HEC-18 5th Edition - Scour Calculation Spreadsheet (2D)

Input Data Table

	Parameter		Entry (US)		Metric		Used In Tabs
1	Median Particle Diameter	D_{50} =	0.08	(mm)	0.08	(mm)	Fall Velocity, Critical Velocity, Clear Water Scour
2	Average depth of flow upstream of Bridge	y_1 =	4.9	(ft)	1.49	(m)	Critical Velocity, Live Bed Scour, Abutment Scour
3	Average velocity of flow upstream of Bridge	V_1 =	1.5	(ft/s)	0.47	(m/s)	Critical Velocity
4	Flow in the upstream channel	Q_1 =	780	(cfs)	22.09	(m^3/s)	Live Bed Contraction Scour, Abutment Scour
5	Flow in the contracted section	Q_2 =	866	(cfs)	24.52	(m^3/s)	Live Bed & Clear Water Contraction Scour, Abutment Scour
6	Existing depth in the contracted section before scour	y_0 =	6.6	(ft)	2.01	(m)	Live Bed & Clear Water Contraction Scour, Abutment Scour
7	Slope of energy grade line of main channel	S_1 =	0.0013	(ft/ft)	0.001	(m/m)	Live Bed Contraction Scour
8	Top width of the upstream channel	W_1 =	64	(ft)	19.51	(m)	Live Bed Contraction Scour, Abutment Scour
9	Top width of the contracted section minus pier width	W_2 =	28	(ft)	8.41	(m)	Live Bed & Clear Water Contraction Scour, Abutment Scour
10	Flow depth directly upstream of pier	$y_{1\ (pier)}$ =	n/a	(ft)	n/a	(m)	Pier Scour
11	Velocity of flow directly upstream of pier	$V_{1\ (pier)}$ =	n/a	(ft)	n/a	(m)	Pier Scour

Known or Assumed Parameters

Parameter	Units	Known Value	Used in Tabs
Gravity (g)	(m/s^2)	9.807	Fall Velocity
Density of water (ρ_w)	(kg/m^3)	1000	Fall Velocity
Density of sediment (ρ_s)	(kg/m^3)	2650	Fall Velocity
Specific weight of water (γ_w)	(kN/m^3)	9.807	Fall Velocity
Specific weight of sediment (γ_s)	(kN/m^3)	25.98855	Fall Velocity
Kinematic viscosity of water (ν_w)	(m^2/s)	1.3065E-06	Fall Velocity
Critical Velocity Parameter (K_u) - SI	($m^{1/2}/s$)	6.19	Critical Velocity
Critical Velocity Parameter (K_u) - US	($ft^{1/2}/s$)	11.17	Critical Velocity
Modified Laursen's Equation (2) (K_u) - SI	-	0.025	Clear Water Scour
Modified Laursen's Equation (2) (K_u) - SI	-	0.0077	Clear Water Scour

RIVER FOCUS
WATER RESOURCE CONSULTANTS

HEC-18 5th Edition - Scour Calculation Spreadsheet (2D)

Critical Velocity Calculation (Clear vs. Live Bed Determination)

Critical Velocity ***(V_c): The velocity above which the bed material of size D, D_{50}, etc. and smaller will be transported. Critical velocity is used as an indicator for clear-water or live-bed scour.***

→ If the mean velocity (V) of the upstream reach is equal to or less than the critical velocity (V_c) of the median diameter (D_{50}) of the bed material, then contraction and local scour will be clear-water.

→ If the mean velocity (V) of the upstream reach is greater than the critical velocity (V_c) of the median diameter (D_{50}) of the bed material, then contraction and local scour will be live-bed.

→ For channels with coarse sediments in which a critical-velocity analysis indicates that live-bed conditions prevail, HEC-18 recommends that both live-bed and clear-water contraction-scour flow depths be computed and the smaller of these values used as the estimate for contraction scour. (Note: It was assumed that sediments with a D50 greater than 2 mm were coarse sediments.)

Parameter	Metric		US	
Median Diameter of Bed Material (D_{50}):	0.1	(mm)	0.1	(mm)
Average Upstream Depth (y):	1.5	(m)	4.9	(ft)
Critical Velocity Parameter (K_u) - SI:	6.2	($m^{1/2}/s$)	11.2	($ft^{1/2}/s$)
Average Upstream Velocity (V):	0.5	(m/s)	1.5	(ft/s)
Critical Velocity (V_c):	0.3	(m/s)	**0.9**	(ft/s)

$$V_c = K_u \, y^{1/6} \, D^{1/3}$$

*Note: To determine Live Bed Scour vs Clear Scour, D in the equation above is set equal to D_{50}

Upstream V ≤ V_c: Clear Water Contraction Scour

Upstream V > V_c: Live Bed Contraction Scour

Proceed to Live Bed Contraction Scour Tab

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HEC-18 5th Edition - Scour Calculation Spreadsheet (2D)

Live Bed Contraction Scour

***Live Bed Contraction Scour*: Scour at a contraction when the bed material in the channel upstream of the bridge is moving at the flow causing bridge scour.**

Modified Laursen's Equation (1): $\frac{y_2}{y_1} = \left(\frac{Q_2}{Q_1}\right)^{6/7} \left(\frac{W_1}{W_2}\right)^{k_1}$

Average Contraction Scour Depth: $y_s = y_2 - y_o$

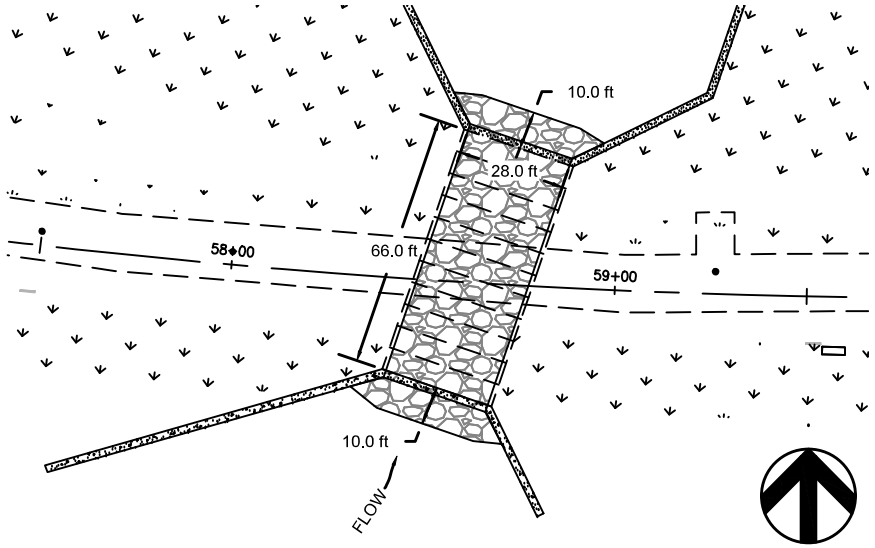
Parameter	Description	Metric Units		US Units		Notes
y_0	Existing Depth in the Contracted Section Before Scour	2.01	(m)	6.61	(ft)	*Flow area of bridge / W_2*
y_1	Average Depth in the Upstream Channel	1.49	(m)	4.90	(ft)	*Data from Chosen Upstream Profile Line*
y_2	Average Depth in the Contraction Section	2.68	(m)	9.58	(ft)	*Modified Laursen's Equation*
Q_1	Flow in the Upstream Channel Transporting Sediment	22.09	(m^3/s)	780.00	(cfs)	*Flow in the main channel upstream of the bridge, not including overbank flow.*
Q_2	Flow in the Contracted Channel	24.52	(m^3/s)	866.00	(cfs)	*Flow at the bridge section (through the bridge opening)*
W_1	Bottom Width of the Upstream Main Channel that is Transporting Bed Material	19.51	(m)	64.00	(ft)	*Can be estimated by Upstream Channel Top Width. Data from Chosen Upstream Profile Line*
W_2	Bottom width of the Contracted Section Minus Pier and Debris Width	8.41	(m)	27.58	(ft)	*Effective Bridge Width Calculated Given Bridge, Pier, and Debris Width*
S_1	Slope of EGL of Upstream Channel	0.00	(m/m)	0.00	(ft/ft)	*Data from Chosen Upstream Profile Line*
V*	Shear Velocity in the Upstream Main Channel	0.14	(m/s)	0.45	(ft/s)	*Calculated from data from Chosen Upstream Profile Line. [$V^* = (g y_1 S_1)^{0.5}$]*
ω	Fall Velocity of Bed Material based on D50	64.00	(m/s)	0.01	(ft/s)	*See Fall Velocity Tab*
V^*/ω	Ratio of Shear Velocity to Fall Velocity	0.002	-	32.024	-	*Determine Mode of Bed Transport and k_1*
k_1	Modified Laursen's Equation Exponent	0.59	-	0.69	-	*See Table 2 to the right.*

Average Live Bed Contraction Scour Depth (y_s)	**3.0**	**(ft)**
	0.7	(m)

APPENDIX B

Conceptual Riprap Plan

NOT FOR CONSTRUCTION



PLAN VIEW

RIPRAP PROTECTION FOR CON/SPAN CULVERT WITH WINGWALLS
1:50 SCALE

CONSTRUCTION NOTES:

1. GEOTEXTILE TO BE SPECIFIED BASED ON SITE-SPECIFIC SOIL CHARACTERISTICS.
2. DO NOT PUNCTURE GEOTEXTILE DURING RIPRAP PLACEMENT.

RECOMMENDED DESIGN:

RIPRAP PROTECTION WITH A MINIMUM THICKNESS OF 1.5 FT SHOULD BE PLACED AROUND THE CON/SPAN CULVERT AND THE WINGWALLS.

RIPRAP SHALL HAVE A MINIMUM D50 OF 9 INCHES, WHICH CORRESPONDS TO STANDARD CLASS II RIPRAP.

STANDARD RIPRAP GRADATION (FHWA, 2009)

RIPRAP*		D_{15}		D_{50}		D_{85}		D_{100}
CLASS	SIZE	MIN	MAX	MIN	MAX	MIN	MAX	MAX
II	9 in	5.5	7.8	8.5	10.5	11.5	14	18.0

*NOTE: NOMINAL RIPRAP CLASS BY MEDIAN PARTICLE DIAMETER, SIZE IN INCHES.

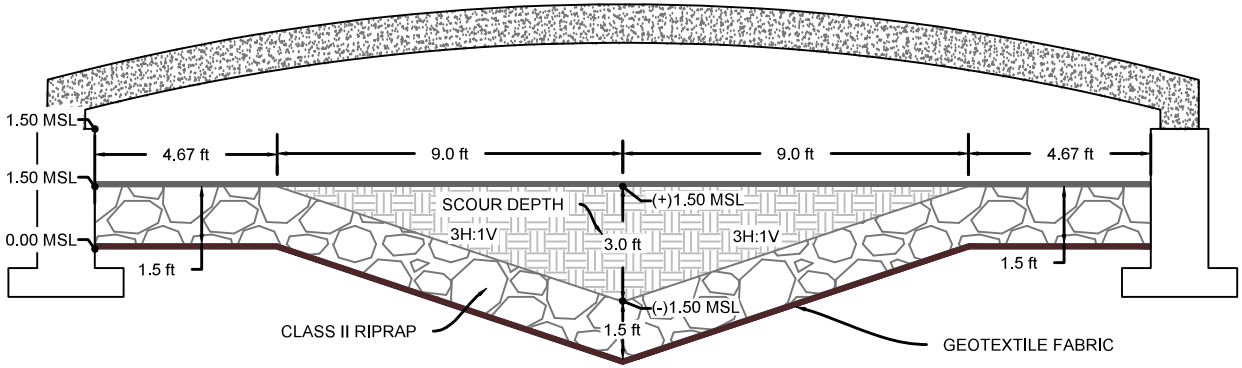
RIPRAP SIZING & LAYOUT DIMENSIONS	
DESCRIPTION	CONSPAN CULVERT
Median Riprap Size (D_{50})	9 in
Standard Riprap Class	Class II
Riprap Extent	See plan view
Minimum Riprap Thickness	1.5 ft
Geotextile Filter Extent	Same as riprap extent

UNDERWATER PLACEMENT

Yes	No
	X

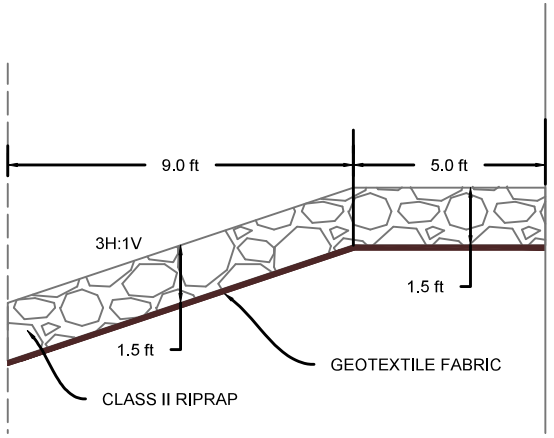
RIPRAP DESIGN EVENT (YEAR)

100	200	500
X		



CROSS SECTION VIEW

RIPRAP PROTECTION FOR CON/SPAN CULVERT
1:5 SCALE



CROSS SECTION VIEW

RIPRAP PROTECTION FOR CON/SPAN CULVERT WITH WINGWALLS, DESIGN GUIDELINE 18, HEC-23

B1 - 157

RIVER FOCUS
WATER RESOURCE CONSULTANTS

RIVER FOCUS, INC.
4630 MIRAMONTE STREET
LA MESA, CA 91941
619-212-7939

Revision No.	Description	Date
1	TBR Conceptual Riprap Plan - Appendix B	10-11-2023
2	TBR Conceptual Riprap Plan - Appendix B - Updated Hydraulics	10-11-2024
3	TBR Conceptual Riprap Plan - Appendix B - Updated Details	11-21-2024

Designed: J. GUSMAN
Drawn: J. STRAUB
Checked: J. GUSMAN
Date: 11-21-2024
Filename: X-WOC-SITE.dwg

WILSON OKAMOTO CORPORATION

TURTLE BAY RESORT
KAIHALULU EAST
ROADWAY EXSTENSION,
OAHU, HAWAII

RIPRAP PROTECTION: CON/SPAN CULVERT WITH WINGWALLS

Sheet Number: B-1

Sheet 1 of 1

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES | KA 'OIHANA KUMUWAIWAI 'ĀINA
COMMISSION ON WATER RESOURCE MANAGEMENT | KE KAHUWAI PONO
P.O. BOX 621
HONOLULU, HAWAII 96809

June 9, 2025

Ref: SCAP.6438.3

FROM: ~~TO:~~ Aha Moku
Aquatic Resources
Engineering Division
Forestry and Wildlife
State Parks

TO: ~~FROM:~~ Ciara W.K. Kahahane, Deputy Director
Commission on Water Resource Management

SUBJECT: Request for Comments, Stream Channel Alteration Permit Application (SCAP.6438.3), Wasatch Arete TB Holdings, Maintain Drainage Capacity and Stream Flow for New Roadway Access, 'Ō'io Stream (East Main Drain), Kahuku, O'ahu, TMK: (1) 5-7-001:048, 049, and 052

We would appreciate your review and comment on the subject permit application within 30 days from the date of this memo. The project proposes to maintain drainage capacity and stream flow within the 'Ō'io Stream and to allow construction of a new private roadway within the existing Turtle Bay Resort. This project was previously approved by the Commission on May 17, 2022 and issued a Stream Channel Alteration Permit (SCAP.5860.3), but changes in land ownership resulted in project delays and the original SCAP.5860.3 expired. There are no changes to the original scope of the project. The application is available on our website at https://dlnr.hawaii.gov/cwrm/surfacewater/review/. If you have any questions, contact Rebecca Alakai at [redacted] or call [redacted]

Response:

( ) We have no objections
( ) Not subject to our regulatory authority and permit
(✓) Comments attached
( ) Additional information requested
( ) Extended review period requested
( ) EA / EIS is required

Contact Person: _____ Date: Jul 3, 2025
Dina U. Lau, Acting Chief Engineer

EXHIBIT 8

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

CWRM/Ciara W.K. Kahahane

Ref: Request for Comments, Stream Channel Alteration Permit Application (SCAP.6438.3), Wasatch Arete TB Holdings, Maintain Drainage Capacity and Stream Flow for New Roadway Access, ʻŌʻio Stream (East Main Drain)
Location: Kahuku, Oʻahu
TMK(s): (1) 5-7-001:048, 049, and 052
Applicant: Wasatch Arete TB Holdings

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high-risk areas). Be advised that 44CFR, Chapter 1, Subchapter B, Part 60 reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible for researching the Flood Hazard Zone designation for the project. Flood zones subject to NFIP requirements are identified on FEMA's Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (fhat.hawaii.gov) could also be used to research flood hazard information.

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7139.
- Kauai: County of Kauai, Department of Public Works (808) 241-4849.

Signed: _____
DINA U. LAU, ACTING CHIEF ENGINEER

Date: Jul 3, 2025

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

November 13, 2020

IN REPLY REFER TO:
Log No. 2019.00055
Doc No. 2011GC06
Archaeology

Kathy K. Sokugawa., Director
Department of Permitting and Planning
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Samantha Canon
BRE Turtle Bay Development, LLC
57-091 Kamehameha Highway
Kahuku, HI 96731
[redacted]

Dear Ms. Sokugawa and Ms. Canon:

SUBJECT: **Chapter 6E-42Historic Preservation Review –**
Subdivision Application No. 2014/SUB-145 - Turtle Bay Resort
Archaeological Monitoring Plan
ʻŌpana, Kawela, Hanakaoe, Ulupehupehu, Ōʻio, Punalau, and
Kahuku Ahupuaʻa, Koʻolauloa District, Island of Oʻahu,
TMK: (1) 5-6-003:054-062; (1) 5-7-001:013, 027-029, and 043-053; and
(1) 5-7- 006:024-030

This letter provides the State Historic Preservation Division's (SHPD's) review of the archaeological monitoring plan (AMP) titled, *Archaeological Monitoring Plan for Activities within the Turtle Bay Resort Development Area, ʻŌpana, Kawela, Hanakaoe, Ulupehupehu, Ōʻio, Punalau, and Kahuku Ahupuaʻa, Koʻolauloa District, Island of Oʻahu, TMK: (1) 5-6-003:054-062; (1) 5-7-001:013, 027-029, and 043-053; and (1) 5-7-006:024-030* (Gotay and Rechtman, December 2018).

ASM Affiliates (ASM) prepared this draft archaeological monitoring (AMP) on behalf of BRE Turtle Bay Development, LLC, in support of all proposed development activities that include subsurface disturbance within the Turtle Bay Resort development area on be. The Turtle Bay Resort property, totaling 840 acres is owned by a series of related entities, all private, including BRE Turtle Bay Development LLC (BRE), BRE Turtle Bay Resort LLC, and BRE Mauka Lands LLC. The resort property is bounded to the south by Kamehameha Highway (Hwy 83), to the east by Marconi Road, and to the west and North by the ocean.

The proposed development will expand the existing resort to include some combination of resort hotels, condo hotels, residential, commercial and recreation development on three defined, entitled and zoned oceanfront and other supporting infrastructure sites; as well as parks, shoreline setbacks, and public shoreline access points.

In 2014, the previous owner, Turtle Bay Resort LLC, agreed to designate more than 600 acres (out of the total 840 acres) as a conservation easement, to be called Punahoʻolapa Wildlife Preserve. The previous owner and current owner each agreed, in consultation with SHPD, to prepare and implement four archaeological mitigation plans: a data recovery plan, a burial treatment plan, an archaeological monitoring plan (current document), and an archaeological preservation plan.

EXHIBIT 9

The burial treatment plan was submitted to the O'ahu Island Burial Council (OIBC) which made a determination of preservation for Sites 50-80-02-4488, 50-80-02-6411, 50-80-02-7289, and the Daniel Pahu grave site and reinternment area; relocation of Site 50-80-02-7288 to the Daniel Pahu grave site; and recommended that SHPD accept the BTP. SHPD accepted the BTP in a letter dated October 12, 2018 (Log No. 2018.02260, Doc. No. 1810RKH07).

The AMP stipulates the following monitoring procedures:

- A coordination meeting shall be conducted between construction team, representatives of the project proponent and the monitoring archaeologist(s) prior to construction activities so the construction team is aware of the plan. At this time, the archaeologist shall advise the participants of the monitor's responsibilities for daily documentation of construction activities, the ability to temporarily stop construction to investigate potential cultural remains, and the documentation requirements;
- On-site monitoring shall be conducted for all project-related ground disturbing activities. One monitor is required for each piece of ground altering machinery during this project;
- The archaeological monitor has the authority to temporarily halt all activity in the area in the event of a potential historic property being identified, or to record archaeological information for cultural deposits or features;
- If non-burial historic properties are identified, documentation shall include, as appropriate, recording stratigraphy using USDA soil descriptions, GPS point collection with a receiver capable of sub meter accuracy, recordation of feature contents through excavation or sampling of features, screening of features, representative scaled profile drawings, photo documentation using a scale and north arrow, and appropriate laboratory analysis of collected samples and artifacts. Additionally, photographs and profiles of excavations shall be collected from across the project area even if no significant historic properties are encountered. Representative profiles shall be a minimum of two-meter-long sections;
- If human remains are identified, work will cease in the vicinity and the find shall be secured, and provisions outlined within the Hawaii Revised Statutes (HRS) §6E-43 and HAR §13-300-40, and any SHPD directives, shall be followed;
- Project materials will be stored temporarily with ASM and final curation facilities shall be determined in consultation with SHPD and the landowner;
- Any samples suitable for radiocarbon analysis shall be submitted for wood taxa identification prior to radiocarbon dating;
- Final curation of collected items shall be determined in consultation with the landowner and the SHPD; and
- Any deviation from these provisions shall occur only in consultation with the SHPD.

The plan is well written and meets the minimum requirements of HAR §13-279-4. **It is accepted**. Please send one hard copy of the document, clearly marked FINAL, along with a copy of this letter and a text-searchable PDF version to the Kapolei SHPD office, attention SHPD Library. Please also provide a PDF copy of the plan to [redacted].

SHPD hereby notifies the DPP that construction activities for the current project shall proceed in accordance with the approved monitoring plan. The permit has already been issued.

Upon completion of archaeological monitoring fieldwork, SHPD looks forward for review and acceptance a brief end of field work report within 30 days of completion of archaeological field monitoring. SHPD looks forward to reviewing an archaeological monitoring report meeting the requirements of HAR §13-279-5 within 60 days after completion of fieldwork.

Please contact Dr. Susan A. Lebo, Archaeology Branch Chief, at [redacted] or at [redacted] for any questions regarding this letter.

Aloha,

Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Bob Rechtman, [redacted]
Wallace Carvalho, [redacted]
Perry Tamayo, [redacted]
Kanani Padeken, [redacted]

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850

March 21, 2022

In Reply Refer To:
2022-0022215-S7-001

Ms. Rebecca Alakai
Commission on Water Resource Management
Department of Land and Natural Resources
State of Hawai'i
P.O. Box 621
Honolulu, Hawai'i 96809

Subject: Species List for the BRE Turtle Bay Resort Stream Channel Alteration TMK: (1) 5-7-001:048, 049, and 052 Kahuku, O'ahu

Dear Ms. Alakai:

Thank you for your email of March 16, 2022, requesting a species list and guidance for the proposed construction of a new 30 ft x 8 ft x 108 ft Conspan culvert across the ʻŌʻio Stream (East Main Drain), TMK: (1) 5-7-001:048, 049, and 052, on the island of O'ahu. The proposed project is located in Kahuku and consists of the installation of concrete wing walls ranging from 30 ft to 92 ft in length on both the upstream and downstream ends of the culverts to protect the roadway embankment from erosion. Riprap is proposed to be place at a depth of 3 ft at grade along the wing walls and in scour prone areas at the upstream end of the structure.

This letter has been prepared under the authority of and in accordance with provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*), as amended (ESA). Based on this authority, we offer the following comments for your consideration. We have reviewed the information you provided and pertinent information in our files, as it pertains to listed species and designated critical habitat in accordance with section 7 of the ESA. There is no federally designated critical habitat within the immediate vicinity of the proposed project. Our data indicate the following federally listed species may occur or transit through the vicinity of the proposed project area: the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*); the endangered Hawaiian petrel (*Pterodroma sandwichensis*), endangered Hawai'i distinct population segment (DPS) of band-rumped storm-petrel (*Oceanodroma castro*), and threatened Newell's shearwater (*Puffinus auricularis newelli*) (hereafter collectively referred to as Hawaiian seabirds); and the endangered Hawaiian stilt *(Himantopus mexicanus knudseni*), endangered Hawaiian coot (*Fulica alai*), endangered Hawaiian gallinule (*Gallinula galeata sandvicensis*),

and the endangered Hawaiian duck (*Anas wyvilliana*) (hereafter collectively referred to as Hawaiian waterbirds). Bird species federally protected under the Migratory Bird Species Act may also occur in the proposed project area.

Hawaiian hoary bat

The Hawaiian hoary bat roosts in woody vegetation across all islands and will leave their young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, June 1 through September 15, there is a risk that young bats could inadvertently be harmed or killed, since they are too young to fly or move away from disturbance. Hawaiian hoary bats forage for insects from as low as 3 feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing.

To avoid and minimize impacts to the endangered Hawaiian hoary bat we recommend you incorporate the following applicable measures into your project description:

- Do not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15).
- Do not use barbed wire for fencing.

Hawaiian seabirds

Hawaiian seabirds may traverse the project area at night during the breeding, nesting and fledging seasons (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable to light attraction.

To avoid and minimize potential project impacts to seabirds we recommend you incorporate the following measures into your project description:

- Fully shield all outdoor lights so the bulb can only be seen from below.
- Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- Avoid nighttime construction during the seabird fledging period, September 15 through December 15.

Hawaiian waterbirds

Hawaiian waterbirds are currently found in a variety of wetland habitats including freshwater marshes and ponds, coastal estuaries and ponds, artificial reservoirs, kalo or taro (*Colocasia esculenta*) lo`i or patches, irrigation ditches, sewage treatment ponds, and in the case of the Hawaiian duck, montane streams and marshlands. Hawaiian stilts may also be found wherever ephemeral or persistent standing water may occur. Threats to these species include non-native predators, habitat loss, and habitat degradation. Hawaiian ducks are also subject to threats from hybridization with introduced mallards.

To avoid and minimize potential project impacts to Hawaiian waterbirds we recommend you incorporate the following measures into your project description:

- In areas where waterbirds are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.
- If water resources are located within or adjacent to the project site, incorporate applicable best management practices regarding work in aquatic environments into the project design (see enclosure).
- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the Service within 48 hours for further guidance.
    - Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.
    - Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

We appreciate your efforts to conserve protected species. If you have questions regarding this letter, please contact Charmian Dang, Fish and Wildlife Biologist (phone: [redacted] email: [redacted]. When referring to this project, please include this reference number: 2022-0022215-S7-001.

Sincerely,

AARON NADIG

Digitally signed by AARON NADIG
Date: 2022.03.21 13:05:50 -10'00'

Island Team Manager
O'ahu, Kaua'i, Northwestern Hawaiian Islands, and American Samoa

From: Sunshine Eckstrom
To: DLNR.CW.DLNRCWRM
Subject: [EXTERNAL] CWRM Agenda 9/16
Date: Monday, September 15, 2025 11:15:39 AM

To Whom It May Concern,

I'm writing to comment on the application Wasatch Arete TB Holdings has submitted seeking approval of a Stream Channel Alteration Permit.

You may or may not be aware, but there is large community opposition to this luxury development project. It will damage the last wild shoreline on Oahu which is some of the only habitat for native species unique to the Hawaiian islands. Monk seals, moli, yellow-faced bees and many other species of plants and animals will be irreversibly harmed by this project.

In regards specifically to this application to install a new culvert system for roadway access crossing the O'io Stream, this is a very concerning proposition. Altering streams affects ecosystems and the health of our communities. These alterations will have negative, long term effects and are purely to service the profits of a few mainland developers.

Please do not approve any alteration that would affect our precious water, land and community. Hawaii's natural resources are priceless.

Thank you,

--
Sunshine Eckstrom
Haleiwa, HI

EXHIBIT 11

Re: Stream Channel Alteration Permit Application (SCAP.6438.3)
Commission on Water Resource Management
October 21, 2025

Aloha e Chair and Commissioners,

Kūpaʻa Kuilima respectfully submits testimony in opposition to the approval of the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings for roadway access within the Turtle Bay Resort property, crossing ʻŌʻio Stream in Kahuku, Oʻahu.

We respectfully request that the Commission **defer decision-making on this permit application until the following obligations are met**:

1. Completion of a Ka Paʻakai Framework Analysis
There has never been a sufficient Ka Paʻakai Framework Analysis completed for this project. The LRFI and CIA prepared for the SEIS failed to adequately identify Native Hawaiian rights and traditional and customary practices in the project area. Consultation was narrowly conducted with individuals employed by the developer, not representative of the broader community of practitioners. The lack of appropriate consultation in the CIA process resulted in an incomplete picture which does not even minimally identify the scope of native rights and practices in the vicinity of the project area such as extensive subsistence fishing, limu collection, and gathering of other resources along the shoreline—all of which remain vital and ongoing. No meaningful mitigation measures have been proposed to ensure that long-term adverse impacts to these practices are avoided.

The Commission has a legal obligation under **Article XII, Section 7 of the Hawaiʻi State Constitution** to consider this legal framework any time it acts to protect Native Hawaiian rights and ensure that the Ka Paʻakai Framework is applied. Without an appropriate Ka Pa'akai Framework Analysis, approval of this permit by this Commission disregards the Commission's legal obligations. Further, just because the Honolulu Department of Planning and Permitting has chosen to disregard their obligations to Article XII, Section 7, does not remove the obligation of this Commission to take it into consideration each time it acts.

2. Adequate Flood Risk Studies and Modeling
In a meeting with the Honolulu Department of Planning and Permitting, the flood risk modeling presented by the applicant in the 2013 SEIS was reviewed by subject matter experts from the University of Hawai'i and was deemed to be inadequate. As highlighted in a report prepared by Dr. Haunani Kane and Sara Kahanamoku-Meyer, the modeling fails to consider potential groundwater flooding and instead only considers a minimum scenario . This incomplete assessment creates serious gaps in understanding the risks to ʻŌʻio Stream, nearby ecosystems, and surrounding communities from flood hazard.

Climate change has already intensified flooding events across Hawaiʻi. Without comprehensive flood risk modeling, any culvert system or stream alteration could increase risks of flooding, erosion, and damage to both ecosystems and human communities. You may view the analysis presented here:
https://drive.google.com/file/d/1h_zV_a6_bxf0zUN6BA9Iiwq4-CM3ZrUc/view?usp=sharing

For these reasons, Kūpa‘a Kuilima urges the Commission to **defer this permit application until a proper Ka Pa‘akai Framework Analysis is completed and sufficient flood risk studies are conducted.** These are not procedural boxes to check, but fundamental obligations to protect ‘āina, wai, and the rights of Native Hawaiians. Mahalo for your time, diligence, and commitment to upholding the kuleana of this Commission.

Me ka ha‘aha‘a,
Kūpa‘a Kuilima
Jessica dos Santos
Lillie Makaila
Melissa Ka’onohi-Camit
Ramsey Calimlim
Ida Kawailani Bluhm

WILSON OKAMOTO CORPORATION
INNOVATORS • PLANNERS • ENGINEERS

10393-29
October 9, 2025

State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management
P.O. Box 621
Honolulu, Hawai‘i 96809

Attn: Ms. Ciara W.K. Kahahane, Deputy Director
Division of Water Resource Management

Subject: Stream Channel Alteration Permit Application
Turtle Bay Resort On-Site Infrastructure Improvements
Kahuku, Oahu, Hawai‘i
Tax Map Keys (TMKs): (1) 5-7-001:048, 049, and 052

Dear Ms. Kahahane:

On behalf of Wasatch Arete TB Holdings (Applicant), Wilson Okamoto Corporation is providing this supplemental attachment to the Stream Channel Alteration Permit (SCAP) application (SCAP No. 6438.3) for the Turtle Bay Resort On-Site Infrastructure Improvements project in Kahuku, O‘ahu, Hawai‘i.

We respectfully submit this correspondence to address questions regarding compliance with Hawai‘i Revised Statutes (HRS) Chapter 343 for the SCAP associated with the Kaihalulu East Drive roadway improvements and the crossing of the East Main Drain (‘Ō‘io Stream). At the Commission on Water Resource Management (CWRM) hearing held on September 16, 2025, the Applicant was requested to provide supplemental information confirming the project’s environmental review status.

This attachment is intended to document the project’s continuous chain of environmental compliance and confirm that the current SCAP request is fully covered under the 2013 Final Supplemental Environmental Impact Statement (FSEIS) and prior regulatory approvals.

EXISTING PERMITS / DOCUMENTATION / APPROVALS

1986 SMA Permit Approval (Resolution 86-308)

In 1986, the Honolulu City Council approved a Special Management Area Permit and Shoreline Setback Variance for the Turtle Bay Resort master-planned community. This authorization

established the entitlement framework for roadway extensions, utilities, drainage improvements, and culvert/stream crossings that form the foundation of the Resort's infrastructure program.

2013 Final Supplemental Environmental Impact Statement (FSEIS)

In a letter dated October 3, 2013, the City and County of Honolulu Department of Planning and Permitting (DPP) accepted the Final Supplemental Environmental Impact Statement (FSEIS) for the Turtle Bay Resort Expansion. The FSEIS supplemented the previously approved 1985 Kuilima Resort Expansion EIS and evaluated the full scope of roadway extensions, stream crossings, drainage systems, and utility improvements associated with the Resort's Revised Master Plan. Volume 2 documented agency and community consultation. Volumes 3 and 4 included copies of all technical documents including the Cultural Impact Assessment (Volume 3, Appendix D) and the Marine Resources Impact Analysis (Volume 3, Appendix E), and the Flora and Fauna Impact Analysis (Volume 4, Appendix F). The FSEIS included engineering drawings and best management practices (BMPs) for the Turtle Bay Resort Expansion, including Kaihalulu East Drive, the ʻŌʻio Stream crossing, culverts, and stormwater systems. Collectively, the FSEIS established the governing environmental disclosure under HRS Chapter 343.

Two relevant excerpts are provided below:

B. 11. Phasing and Timing

"Implementation of the infrastructure phasing plan proposes to start with the construction of the intersection of Kaihalulu Drive (formerly known as Alpha Road) and Kamehameha Highway near Kawela Bay. Kaihalulu Drive will extend from Kamehameha Highway to the East Main Drain, providing access to Hotel site H-2. Roadway runoff will be directed to the golf course water features or channelized routing through the landscape. This segment of Kaihalulu Drive will also contain the culvert structures for the future widening of the West Main Drain. The construction of this portion of Kaihalulu Drive will coincide with the re-contouring of the Fazio Golf Course and the improvement of runoff flow to the Kuilima Drain and through the existing breaks in the sand dunes.

The second segment of Kaihalulu Drive from the East Main Drain to Marconi Road will be constructed to support the Golf Course Clubhouse, Resort Residential RR-3 to RR-6, the Equestrian Center, and Community Housing CH-1. Roadway runoff also will be directed to the golf course water features or channelized routing through the landscape. This segment of Kaihalulu Drive will also contain the culvert structures for the future widening of the East Main Drain. The Golf Course Clubhouse and the re-contouring of the Fazio and Palmer Golf Courses to improve the flow of runoff will be constructed concurrently and precede the construction of the second phase of Kaihalulu Drive."

A.6.b. [2] East Main Drain

"Kaihalulu Drive will cross the East Main Drain below the confluence with Punaho'olapa Ditch. A system of 4 – 32 feet x 10 feet Con-span culverts was analyzed to convey the storm runoff under Kaihalulu Drive. The East Main Drain flows through the Fazio and Palmer Golf Courses which are maintained by the Resort, and there is little possibility of debris being carried to the Kaihalulu Drive crossing.

The proposed new Community Housing Sites (CH-1 and CH-2), new Golf Course Clubhouse, and Resort Residential Sites (RR-3a, 3b, RR-4a, 4b, RR-5 and RR-6) will drain into the existing golf course water features which can provide detention as one of the Resort's BMPs to address long-term water quality concerns relative to ocean discharges. Runoff from Resort Residential Site (RR-3) and Hotel Site (H-2, 2a) may be directed by sheet flow to the ocean with BMPs."

As shown above, culvert structures associated with the East Main Drain were specifically disclosed in the 2013 FEIS. For ease of reference, direct links to each volume of the FSEIS are provided at the end of this correspondence.

2022 SCAP Approval (SCAP.5860.3)

On May 17, 2022, the Commission on Water Resource Management (CWRM) unanimously approved (7-0) a Stream Channel Alteration Permit for the Turtle Bay Resort On-Site Infrastructure Improvements. This approval confirmed consistency with the 2013 FSEIS and incorporated additional conditions to ensure cultural and environmental protections. Among these were consultation with the Office of Hawaiian Affairs (OHA) and the Cultural Advisory Committee, implementation of BMPs for aquatic resources including biological monitors and turbidity controls, and species protection measures for the Hawaiian hoary bat, seabirds, and waterbirds.

2025 SCAP Application (SCAP.6438.3)

The current SCAP application is identical in scope and design to the permit approved in 2022. The only change is that the previous authorization expired before construction commenced due to landownership transfer timing. No modifications have been made to the project's scope, design, or mitigation commitments. All environmental review and protective measures established in the 2013 FSEIS and confirmed in the 2022 SCAP approval remain applicable to the present application.

REGULATORY CONSISTENCY AND CHAPTER 343 COMPLIANCE

The 2013 FSEIS remains the governing environmental disclosure document for this project under HRS Chapter 343. The 2022 SCAP approval (SCAP.5860.3) confirmed the adequacy of this review, adding specific cultural, aquatic, and endangered species protections. The current SCAP application (SCAP.6438.3) is identical in scope to the 2022 approval. No new work or impacts

beyond those disclosed in the 2013 FSEIS are proposed. Accordingly, no additional environmental review is required under HRS Chapter 343.

CONCLUSION

The Turtle Bay Resort On-Site Infrastructure Improvements project demonstrates a clear and continuous chain of compliance under Hawai‘i’s environmental and permitting framework. Beginning with the 1986 SMA Permit (Resolution 86-308), which authorized roadway, utility, drainage, and culvert improvements, the project has consistently advanced under established regulatory approvals. The 2013 Final Supplemental Environmental Impact Statement (FSEIS) disclosed and analyzed roadway and stream channel improvements in detail, including the Kaihalulu East Drive extension and the crossing of the East Main Drain (‘Ō‘io Stream), and was accepted as the governing environmental review document under HRS Chapter 343. In 2022, the Commission on Water Resource Management unanimously approved SCAP.5860.3 with protective conditions addressing cultural consultation, aquatic resource BMPs, and endangered species protections. The current SCAP application (SCAP.6438.3) is identical in scope and design to that previously approved permit, with no changes to project elements or mitigation measures.

In light of this continuous chain of approvals, we respectfully request that the Commission recognize the 2013 FSEIS as the controlling environmental review for the project under HRS Chapter 343 and acknowledge that the current SCAP is identical to the application previously approved under SCAP.5860.3. Accordingly, we request that the Commission proceed with reissuance of the permit at the October 28, 2025 hearing.

We appreciate your consideration of this information. Should you have any questions, please feel free to call me or Ms. Harlee Meyers at (808) 946-2277.

Sincerely,

Keola Cheng

Keola Cheng
Director – Planning

REFERENCES:

The complete 2013 FSEIS is available through the Hawai‘i Environmental Review Program (ERP):

FSEIS_Acceptance

Volume_1

Volume_2

Volume_3

Volume_4

From: Jessica K [redacted]
Sent: Saturday, November 15, 2025 2:24 PM
To: DLNR.CW.DLNRCWRM
Subject: [EXTERNAL] I amd testifying to oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings.

Aloha, I am writing in opposition to the requested permit by Wasatch Arete TB Holdings. I have looked into the matter and believe that the flood hazard analysis is incomplete. If issued as is, the permit will authorize and lead to adverse and possibly irreversible effects on the habitat of the ʻŌʻio Stream. Additionally, the risk of flooding through groundwater must be assessed more thoroughly before any permit is issued.

As we are an island community, we must do all we can to ensure the health of the land and sea before green-lighting any commercial concerns. I believe in this case, more needs to be done to fulfill this environmental commitment, and the permit should not be granted at this time.

Mahalo for taking the time to consider my views. Jessica Kuzmier, West Hawaii Island

EXHIBIT 14

Testimony to the Commission on Water Resource Management (CWRM) *Re:* B. ACTION ITEMS 1. Stream Protection and Management Branch – Approval of Stream Channel Alteration Permit Application (SCAP.6438.3), Applicant Wasatch Arete TB Holdings, Maintain Drainage Capacity and Stream Flow for New Roadway Access within Existing Turtle Bay Resort Property, Landowners TB H2 Holdings, LLC and North Shore Bay Owner LLC, ʻŌʻio Stream (East Main Drain), Kahuku, Oʻahu, TMK Nos.: (1) 5-7- 001:048, 049, and 052

Time Stamp	Email	Name	Testimony (a)	**Testimony (b)**	Authorization to Submit
11/12/2025 20:05:36	[redacted]	Jessica dos Santos	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Paʻakai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Paʻakai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpaʻa Kuilima, and I support Kūpaʻa Kuilima's call for the Commission to defer approval of this permit until a complete Ka Paʻakai Framework Analysis and flood-risk assessment are conducted. Protecting ʻŌʻio Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.		I authorize Kūpaʻa Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.
11/12/2025 20:17:20	[redacted]	Lillie	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch	Board members, please consider community concerns! Please echo these valid concerns for	I authorize Kūpaʻa

	[redacted]		Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Pa‘akai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Pa‘akai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I stand with Kūpa‘a Kuilima, and I support Kūpa‘a Kuilima’s call for the Commission to defer approval of this permit until a complete Ka Pa‘akai Framework Analysis and flood-risk assessment are conducted. Protecting ‘Ō‘io Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.	'āina and people by rejecting or deferring until the appropriate supplemental technical studies can be completed.	Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.
11/12/2025 20:30:56	[redacted]	Frederick Smith	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community.		I authorize Kūpa‘a Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.
11/12/2025 21:17:37	[redacted]	Hyo Jung Kwon	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Pa‘akai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Pa‘akai Framework Analysis and the consultation		I authorize Kūpa‘a Kuilima to include my name and testimony in the official submission to

			completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpa‘a Kuilima, and I support Kūpa‘a Kuilima’s call for the Commission to defer approval of this permit until a complete Ka Pa‘akai Framework Analysis and flood-risk assessment are conducted. Protecting ‘Ō‘io Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.		the Commission on Water Resource Management.
11/12/2025 22:37:13	[redacted]	Vikki Pahia	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Pa‘akai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Pa‘akai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate		I authorize Kūpa‘a Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.

			groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpa‘a Kuilima, and I support Kūpa‘a Kuilima’s call for the Commission to defer approval of this permit until a complete Ka Pa‘akai Framework Analysis and flood-risk assessment are conducted. Protecting ‘Ō‘io Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.		
11/13/2025 3:26:08	[redacted]	Laura Zoller	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Pa‘akai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Pa‘akai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpa‘a Kuilima, and I support Kūpa‘a Kuilima’s call for the Commission to defer approval of this permit	I have long complained about this waterway, ‘Ō‘io, being altered. This water is vital to our ocean and provides nutrients for our ocean critters. Our birds, plants, endangered Hawai’ian Monk Seals, and Turtles, and fishermen rely on this stretch of ocean being nurtured by ‘Ō‘io so they can eat. With all the shoreline from kualoa to Haleiwa being altered because our roads are succumbing to ocean rise- this shoreline and waterway is more critical than ever. Mahalo for your	I authorize Kūpa‘a Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.

			until a complete Ka Pa‘akai Framework Analysis and flood-risk assessment are conducted. Protecting ‘Ō‘io Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.		
11/13/2025 4:42:52	[redacted]	Brittin Sciuto	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Pa‘akai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Pa‘akai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpa‘a Kuilima, and I support Kūpa‘a Kuilima’s call for the Commission to defer approval of this permit until a complete Ka Pa‘akai Framework Analysis and flood-risk assessment are conducted. Protecting ‘Ō‘io Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.		I authorize Kūpa‘a Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.
11/13/2025 4:53:28	[redacted]	Gena wEhitten	I stand with Kūpa‘a Kuilima, and I support Kūpa‘a Kuilima’s call for the Commission to defer approval of this permit until a complete	I lived at Turtle Bay for 25 years and often walked along the coast and across the stream. I have seen the stream flood several times per	I authorize Kūpa‘a Kuilima to

			Ka Paʻakai Framework Analysis and flood-risk assessment are conducted. Protecting ʻŌʻio Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.	year. I would object strongly to any road going along the coast because of the unstable bank there, likely to collapse or any road blocking access to the shoreline to the public. A safe walking and biking trail must be maintained. This is a beautiful and scared breach front.	include my name and testimony in the official submission to the Commission on Water Resource Management.
11/13/2025 6:25:56	[redacted]	Nancy Harter	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Paʻakai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Paʻakai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpaʻa Kuilima, and I support Kūpaʻa Kuilima's call for the Commission to defer approval of this permit until a complete Ka Paʻakai Framework Analysis and flood-risk assessment are conducted. Protecting ʻŌʻio Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience	The voices of the community and people must be heard and not that of commerical development. Flood risk and other environmental hazards must be fully investigated and transparently shared with the community and water rights and protection must be upheld. Flooding has taken lives in Hawaii and must be a priority over granting a permit that could harm or jeopardize the well being of the environment and community.	I authorize Kūpaʻa Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.

			in Kahuku.		
11/13/2025 7:06:45	[redacted]	Peyton Reed Nguyen	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Pa‘akai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Pa‘akai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpa‘a Kuilima, and I support Kūpa‘a Kuilima’s call for the Commission to defer approval of this permit until a complete Ka Pa‘akai Framework Analysis and flood-risk assessment are conducted. Protecting ‘Ō‘io Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.		I authorize Kūpa‘a Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.
11/13/2025 7:11:17	[redacted]	Gwen Young	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Pa‘akai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Pa‘akai Framework Analysis and the consultation	Native and migratory birds, honu, monk seals thrive in estuary areas and in particular this area. We have a kuleana to take care of the 'aina and these protected or endangered species.	I authorize Kūpa‘a Kuilima to include my name and testimony in the official submission to

			completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpa‘a Kuilima, and I support Kūpa‘a Kuilima’s call for the Commission to defer approval of this permit until a complete Ka Pa‘akai Framework Analysis and flood-risk assessment are conducted. Protecting ‘Ō‘io Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.		the Commission on Water Resource Management.
11/13/2025 10:46:10	[redacted]	Lars von Sydow	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Pa‘akai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Pa‘akai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate	Thank you for the opportunity to provide comment regarding Stream Channel Alteration Permit SCAP.6438.3, proposed by Wasatch Arete TB Holdings, affiliated with the Turtle Bay Resort ownership group. Based on the information available, the proposed activities present significant hydrologic, ecological, cultural, and cumulative risks to ‘Ō‘io Stream and the surrounding watershed. I respectfully urge the Commission on Water Resource Management (CWRM) to defer or deny this permit until the applicant provides complete, scientifically defensible analysis and demonstrates no harm to public trust resources. 1. Hydrologic Vulnerability of ‘Ō‘io Stream at This Specific Location	I authorize Kūpa‘a Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.

			groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpaʻa Kuilima, and I support Kūpaʻa Kuilima's call for the Commission to defer approval of this permit until a complete Ka Paʻakai Framework Analysis and flood-risk assessment are conducted. Protecting ʻŌʻio Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.	ʻŌʻio Stream is a highly sensitive freshwater system whose flow regime is easily altered by nearby land disturbance, grading, channel modification, and increased impervious surfaces. The location associated with SCAP.6438.3 sits within a small, low-gradient coastal drainage basin, where: Peak stormwater flows amplify quickly during rainfall events Baseflow is already limited and highly dependent on natural infiltration Sediment transport is easily disrupted by earthwork or channel modification Downstream wetlands rely on consistent freshwater input Any channel alteration, culvert installation, rerouting, or increase in runoff from resort-related development has the potential to: Intensify flash flooding Reduce aquifer recharge Destabilize streambanks Increase downstream sediment deposition Overwhelm existing drainage and wetland systems Because Turtle Bay is already a built environment with large impervious footprints (parking lots, roofs, roadways), any additional hydrologic load without detailed modeling is unacceptable. The applicant has not provided watershed-scale hydrologic modeling, storm-frequency analysis (2-, 10-, 50-, 100-year events), or sediment transport modeling to demonstrate that the stream channel alteration will not degrade flow or water quality. 2. Ecological Impacts to a Downstream-Sensitive System ʻŌʻio Stream feeds directly into low-lying wetland complexes and nearshore coastal ecosystems adjacent to Turtle Bay. These	

				ecosystems are scientifically documented as highly sensitive to turbidity, sedimentation, and changes in freshwater inflow. Potential consequences include: Elevated turbidity levels, leading to wetland degradation Sediment plumes entering coastal waters, impairing reef health Disruption of native riparian vegetation that stabilizes banks Loss of habitat for native aquatic invertebrates and stream organisms Increased nutrient loading, fueling algal blooms offshore The applicant has not provided baseline water quality data, turbidity thresholds, or post-construction monitoring plans. Without this, impacts cannot be properly evaluated or mitigated. 3. Cumulative Impacts & the Precautionary Obligation of the Public Trust This is not an isolated project. The Turtle Bay area has experienced decades of: Grading Infrastructure expansion Wetland reduction Shoreline hardening Sediment loading into nearshore waters ʻŌʻio Stream has already been incrementally stressed by upstream alterations. CWRM is constitutionally obligated to protect water as a public trust resource, especially when the applicant is a large private resort entity whose activities have cumulative impacts. Approving SCAP.6438.3 without complete analysis would: Set a precedent enabling further incremental damages Undermine long-term watershed resilience Fail to meet the State's duty under Article XI of the Hawaiʻi Constitution	

				Given the resort's development footprint and history, the burden of proof must be higher—not lower—for this applicant. 4. Cultural Resource and Traditional Practice Concerns ʻŌʻio Stream is part of the traditional hydrologic network within the ahupuaʻa of Kahuku, feeding into coastal wetlands historically used for: Gathering native plants Maintaining riparian access Supporting ʻai pono (subsistence practices) Education in ahupuaʻa resource management traditions Channel alteration threatens: Freshwater flow needed for cultural plants Hydrologic connectivity between mauka and makai Stream access and health tied to generational practices Integrity of the cultural landscape adjacent to Turtle Bay No Cultural Impact Assessment (CIA) or traditional cultural practitioners' consultation has been provided for this permit. This alone is grounds for deferral. 5. Basis for Deferral or Denial of SCAP.6438.3 CWRM must deny or defer this application because the applicant has not provided the minimum required scientific and cultural documentation: Missing or Insufficient Information No watershed hydrologic model No stormwater or baseflow analysis No sediment and erosion transport model No baseline water quality data No downstream turbidity impact analysis No cumulative impact assessment No Cultural Impact Assessment No long-term monitoring plan Without these, CWRM cannot meet its public	

				trust obligations or ensure no harm to the stream. 6. Vision for the Future of the ʻŌʻio Watershed The ʻŌʻio Stream corridor has the potential to be: A restored freshwater ecosystem A functioning natural filter for downstream wetlands A protected habitat for native species A place where ahupuaʻa values are honored A resilient buffer against flooding and climate impacts Allowing channel alteration without full scientific justification undermines this future. CWRM should require comprehensive environmental, hydrologic, and cultural review before any alteration is considered. Conclusion Given the significant risks, incomplete analysis, and public trust obligations, I respectfully urge CWRM to defer or deny SCAP.6438.3 until Wasatch Arete TB Holdings provides a complete and scientifically rigorous assessment demonstrating no harm to ʻŌʻio Stream, the surrounding wetlands, the nearshore marine environment, and the cultural resources of the community.	
11/13/2025 10:50:50	[redacted]	Harald von Sydow	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Paʻakai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Paʻakai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as	The proposed project at ʻŌʻio Stream poses substantial hydrologic, ecological, and cultural risks to the ʻŌʻio Stream corridor. This reach of ʻŌʻio Stream already experiences [existing issues: erosion, sedimentation, reduced baseflow, flooding, development pressure], and any additional disturbance must be evaluated with extreme caution to avoid cumulative degradation of the watershed. 1. Hydrologic Impacts at This Specific	I authorize Kūpaʻa Kuilima to include my name and testimony in the official submission to the Commission on Water Resource

			UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpaʻa Kuilima, and I support Kūpaʻa Kuilima's call for the Commission to defer approval of this permit until a complete Ka Paʻakai Framework Analysis and flood-risk assessment are conducted. Protecting ʻŌʻio Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.	Location The project proposes to [describe action: disturb streambank, alter channel, install culvert, increase impervious surfaces, withdraw water, etc.]. In this part of the watershed, the stream channel is [describe: narrow, shallow, braided, erosion-prone], making it highly sensitive to changes in: Peak stormwater discharge Baseflow reduction Sediment transport Surface runoff volumes At this site, even small alterations can significantly modify the hydrograph due to [steep slope, small drainage basin, proximity to wetlands, etc.]. Without watershed-scale modeling, the risk of downstream impact is high. 2. Ecological Significance of This Reach This section of ʻŌʻio Stream supports [native species present if known], riparian vegetation, and serves as a corridor between upland habitat and [downstream wetland/estuary name]. Disturbance here can cause: Sediment plumes into [downstream wetland / estuary / coastal area] Habitat fragmentation Decline in native aquatic invertebrates Changes in nutrient loads affecting nearshore fisheries Water quality in this reach directly affects [name of bay/ahupuaʻa], where increased sedimentation is known to harm coral recruitment and smother reef substrate. 3. Cultural and Public Trust Implications at This Site This section of the watershed is integral to the cultural landscape of [ahupuaʻa name], where the mauka–makai system remains culturally significant. Altering this stream may impair: Gathering of [native plants in that area] Access to the stream corridor	Management.

				Traditional hydrologic function feeding [loʻi, wetlands, estuary] Habitat tied to cultural practices Under the public trust doctrine, CWRM must protect stream flow and water quality before private development interests. 4. Basis for Deferral or Denial of This Permit Because the applicant has not provided: Hydrologic modeling specific to the ʻŌʻio watershed Sediment and erosion control analysis Water quality baseline data Cumulative impact assessment Cultural impact assessment with consultation …CWRM cannot reasonably determine that public trust resources will be protected. The absence of this data at this specific location warrants deferral or denial. 5. Vision for This Watershed ʻŌʻio Stream is one of the few remaining [describe condition: perennial/intermittent/relatively intact] freshwater systems in the area. The long-term sustainability of this watershed requires: Maintaining natural baseflow Preventing bank destabilization Restoring riparian vegetation Reducing sediment input to downstream wetlands and coastal waters Respecting cultural uses tied to this stream corridor Approving this project without full analysis undermines both ecological integrity and cultural continuity.	
11/13/2025 10:52:41	[redacted]	Helena von Sydow	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Paʻakai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Paʻakai	The proposed project presents substantial hydrologic, ecological, and cumulative risks to ʻŌʻio Stream and its associated watershed. ʻŌʻio Stream is part of a sensitive mauka–makai system where even small alterations in flow regime, sediment load, or water quality can produce disproportionate	I authorize Kūpaʻa Kuilima to include my name and testimony in the official

			Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpa‘a Kuilima, and I support Kūpa‘a Kuilima’s call for the Commission to defer approval of this permit until a complete Ka Pa‘akai Framework Analysis and flood-risk assessment are conducted. Protecting ‘Ō‘io Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.	impacts downstream. Because this watershed supports native riparian vegetation, groundwater recharge, wetlands, and nearshore fisheries, any disturbance must be evaluated with the highest level of precaution. 1. Hydrologic Concerns Available information suggests that the project may alter surface flow pathways, increase impervious surfaces, and modify the natural hydrograph of the stream. Changes to peak flow, baseflow, or stormwater runoff volumes can: Increase flash-flood intensity Reduce infiltration and aquifer recharge Accelerate erosion of streambanks Transport sediment and pollutants into downstream wetlands and coastal waters Hydrologic models repeatedly show that once a natural stream system is disrupted, especially in small watersheds, baseline conditions cannot easily be restored. Without comprehensive watershed modeling (including stormwater capacity, baseflow analysis, and sediment transport modeling), the risks are unacceptable. 2. Water Quality and Ecological Impacts ‘Ō‘io Stream supports native aquatic invertebrates, riparian plant species, and wetland ecosystems that rely on consistent, high-quality freshwater input. Disturbances can result in: Elevated turbidity and sedimentation Introduction of nutrients, contaminants, and hydrocarbons from construction and runoff Habitat fragmentation and loss of connectivity Declines in native species populations Freshwater inputs from this stream also influence the health of the downstream estuary and reef ecosystems. Increased sedimentation has been scientifically linked to coral stress, algal overgrowth, and reduced recruitment of native fish. Without thorough	submission to the Commission on Water Resource Management.

				environmental baseline data and continuous monitoring, impacts cannot be properly evaluated or mitigated. 3. Cumulative Impacts and Precedent CWRM is mandated to protect public trust waters. In this watershed, cumulative stressors already include runoff from nearby development, invasive species pressure, and sediment loading into nearshore areas. Any additional disturbance compounds these existing issues. Approving a permit without robust cumulative impact analysis conflicts with the precautionary principle and the State's trust obligations. 4. Cultural and Public Trust Resources at Risk Beyond ecology, ʻŌʻio Stream is part of a traditional Hawaiian watershed system where water flow and quality support gathering practices, riparian access, and cultural resource integrity. Altered hydrology or degraded water quality can impair: Traditional gathering and subsistence uses Wetland maintenance Native plant habitats The functioning of cultural landscapes tied to the stream These cultural uses are recognized under Article XI of the Hawaiʻi Constitution and fall under public trust protections. Any project with the potential to interfere with these rights warrants heightened scrutiny. 5. Basis for Deferral or Denial Given the absence of comprehensive hydrologic modeling, environmental baseline data, cumulative impact assessment, and cultural impact analysis, it is scientifically and regulatorily prudent for CWRM to defer or deny the permit until the applicant can demonstrate: No reduction in baseflow No increase in peak stormwater discharge No increase in sediment or pollutant loading	

				No negative impact to native species or wetlands No impairment of cultural practices or public trust uses Without this data, the Commission cannot reasonably conclude that the stream will be protected. 6. Future Vision for the Watershed Long-term resilience of the ʻŌʻio watershed depends on maintaining natural flow regimes, minimizing disturbance, restoring riparian vegetation, and supporting community stewardship. Future generations deserve a stream system that functions as a healthy, connected ecological corridor—not one compromised by insufficiently studied development. For these reasons, I strongly urge CWRM to defer or deny this permit until the applicant provides scientifically sound, culturally informed, watershed-wide analysis that meets both environmental and public trust standards.	
11/14/2025 13:30:35	[redacted]	Deborah Carter	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Paʻakai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Paʻakai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any	Concern about habitat and erosion, the plan needs to be vetted out better. Healthy banks and soil are critical for preventing erosion and absorbing floodwaters. A more detailed analysis is needed.	I authorize Kūpaʻa Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.

			culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpa‘a Kuilima, and I support Kūpa‘a Kuilima’s call for the Commission to defer approval of this permit until a complete Ka Pa‘akai Framework Analysis and flood-risk assessment are conducted. Protecting ‘Ō‘io Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.		
11/14/2025 14:48:27	[redacted]	Bella Brandes	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Pa‘akai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Pa‘akai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpa‘a Kuilima, and I support Kūpa‘a Kuilima’s call for the Commission to defer approval of this permit until a complete Ka Pa‘akai Framework Analysis and flood-risk assessment are	This project affects me and my community that call this ahupua'a home. I have grown up in these waters and I don't want to see outside developers destroying ecosystems by installing these culverts. The community of Kahuku and the greater North Shore relies on the health of this watershed and we need to protect it.	I authorize Kūpa‘a Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.

			conducted. Protecting ʻŌʻio Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.		
11/15/2025 7:47:41	[redacted]	Malia Murphey	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Paʻakai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Paʻakai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpaʻa Kuilima, and I support Kūpaʻa Kuilima's call for the Commission to defer approval of this permit until a complete Ka Paʻakai Framework Analysis and flood-risk assessment are conducted. Protecting ʻŌʻio Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.	I lived in Kuilima East for over 20 years up—from the time I was in 6th grade until last year they got kicked out right in the same time they started prepping for construction—and ʻŌʻio Stream was quite literally my backyard. This stream has always been our pathway to the ocean. It's where we learned, from a young age, that every stream connects to the sea, and that what happens mauka always affects what happens makai. This place shaped who we are. It taught us to fish, to observe the natural cycles of the seasons, and to understand our relationship with the land and water. Even though I am not Hawaiian by blood, this is my home, and I take my kuleana seriously. The culture, the practices, and the values tied to this place were passed down to us through lived experience. This area is where we gathered food to survive because, as a family of six, we couldn't afford school lunches or eating out. ʻŌʻio Stream and the adjacent coastline provided for us. It taught us how to feed ourselves, how to work together, and how to respect what we depend on. All my brothers learned to fish in this stream before moving on to the grounds near the Keiki Pond and along the last truly protected stretch of coastline. It has stayed untouched for a reason. Allowing construction or continued unauthorized impacts in this area directly threatens our ability—and the ability of future generations—to practice these traditions, to access clean water, and to maintain our	I authorize Kūpaʻa Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.

				cultural connection to the watershed. The proposed development and any unpermitted actions are not just land use issues; they are threats to cultural practices, food access, ecological health, and community identity. Those making or approving these decisions often do not understand what it means to grow up depending on this place. They have not had to put themselves in the shoes of families who rely on these resources to eat, learn, and live in balance with the land. Protecting ʻŌʻio Stream is not optional—it is essential. For these reasons, I respectfully and firmly ask CWRM to defer or deny this permit. The risks to the watershed, the community, and to long-standing cultural practices are too great. The future of this place depends on the choices made now. We owe it to the next generation to keep ʻŌʻio Stream and this coastline intact, healthy, and free from harmful, illegal, or irresponsible development.	
11/15/2025 15:09:40	[redacted]	Sunshine Eckstrom	I oppose the Stream Channel Alteration Permit (SCAP.6438.3) requested by Wasatch Arete TB Holdings., I urge the Commission to defer decision-making until full compliance with Article XII, Section 7 regarding Ka Paʻakai Framework Analysis are conducted, as the existing SEIS is very thin in Ka Paʻakai Framework Analysis and the consultation completed almost exclusively includes employees being paid by the developer., I believe the existing flood hazard analysis and flooding scenarios modeled are incomplete, as UH Mānoa experts have stated that the low and intermediate low scenarios used for sea level rise projections are obsolete. These flood-risk studies only include sea level rise/storm surge and do not contemplate groundwater flooding, which is a critical	In regards to this application to install a new culvert system for roadway access crossing the O'io Stream, this is a very concerning proposition. Altering streams affects ecosystems and the health of our communities. These alterations will have negative, long term effects and are purely to service the profits of a few mainland developers. This luxury development project will damage the last wild shoreline on Oahu which is some of the only habitat for native species unique to the Hawaiian islands. Monk seals, moli, yellow-faced bees and many other species of plants and animals will be irreversibly harmed	I authorize Kūpaʻa Kuilima to include my name and testimony in the official submission to the Commission on Water Resource Management.

			component and should be required before any culvert or stream alteration is approved., I am concerned about the cumulative impacts of resort-related stream modifications on ecosystems and the well-being of the community., I stand with Kūpaʻa Kuilima, and I support Kūpaʻa Kuilimaʼs call for the Commission to defer approval of this permit until a complete Ka Paʻakai Framework Analysis and flood-risk assessment are conducted. Protecting ʻŌʻio Stream is critical to maintaining the health of our ecosystems, cultural practices, and community resilience in Kahuku.	by this project. Please do not approve any alteration that would affect our precious water, land and community. Hawaii's natural resources are priceless.	

TESTIMONY BEFORE THE HAWAIʻI COMMISSION ON WATER RESOURCE MANAGEMENT
Re: Opposition to Arete Application for Construction of Concrete Culvert in ʻŌʻio Stream

Aloha e Honorable Chair and Commissioners,

Mahalo for the opportunity to provide testimony regarding the pending application to construct a concrete culvert across ʻŌʻio Stream. ʻAhahui o Hawaiʻi respectfully **opposes** this application due to significant deficiencies in the project's supporting materials, its failure to meet the standards of the Commission's public trust duties, and the substantial risks it poses to the ecosystems and Native Hawaiian cultural practices that depend on this resource.

1. Incomplete and Outdated Flood-Risk Assessment

The applicant relies on a flood-risk assessment that is both outdated and incomplete. Climate change has already altered rainfall intensity, storm frequency, and watershed behavior throughout Hawaiʻi, and these shifts continue to accelerate. Any assessment that does not incorporate current climate projections, revise hydrologic modeling, or account for impacts to downstream and upstream communities is inadequate for evaluating a project of this nature.

The culvert's proposed design does not demonstrate resilience against increased stormwater volume, debris flow, or backflow effects that could result from more frequent high-intensity rainfall events. Approving new hard infrastructure in a stream without updated modeling exposes nearby residents, properties, and the ecosystem to preventable hazards.

2. Insufficient Paʻakai Framework Analysis

Under the **Paʻakai** framework, agencies must identify:
(1) the cultural, historical, and traditional practices associated with the area;
(2) how the proposed action may adversely affect those practices; and
(3) what feasible protective measures will be taken to prevent or mitigate harm.

The applicant's submission falls far short of these requirements. The analysis neither meaningfully identifies the traditional and customary practices carried out in and along ʻŌʻio Stream—such as shoreline and stream fishing, gathering, subsistence uses, and other practices connected to the maintenance of ʻŌʻio stream's health—nor assesses how construction, sediment disruption, and hydrologic alteration will interfere with these practices. Most critically, the application proposes no enforceable mitigation measures that could preserve the integrity of these cultural resources. This is incompatible with the State's constitutional obligations to protect Native Hawaiian rights and public trust resources.

3. Impacts to Ecosystems and Native Hawaiian Cultural Practices

ʻŌʻio Stream supports a sensitive freshwater ecosystem, including native ʻoʻopu, ʻōpae, and other amphidromous species whose lifecycles depend on unobstructed mauka-to-makai flow. The introduction of a concrete culvert risks restricting stream connectivity, altering sediment transport, degrading water quality, and creating velocity barriers that impede native species migration.

These ecological impacts also have direct cultural consequences. Healthy streams are foundational to Native Hawaiian practices, subsistence gathering, and the perpetuation of ʻike kupuna tied to watershed stewardship and the functioning of ahupuaʻa systems. Any infrastructure that diminishes the biological integrity of the stream also undermines the cultural life embedded within it.

4. Alternatives and the Precautionary Principle

Given the lack of complete information, the Commission must apply the precautionary principle inherent in the public trust doctrine. Until comprehensive, current, and culturally informed analysis is provided, approval would be premature and inconsistent with the Commission's duty to protect water resources for present and future generations.

Conclusion

For these reasons—an outdated flood-risk assessment, an inadequate Paʻakai analysis, and unacceptable impacts to ecosystem function and cultural practice—ʻAhahui o Hawaiʻi respectfully requests that the Commission **deny the application** or, at minimum, require the applicant to conduct a complete, updated, and culturally grounded evaluation before any further consideration.

Mahalo for your time, your stewardship, and your commitment to protecting Hawaiʻi's precious wai resources.

OFFICIAL TESTIMONY OF KŪPAʻA KUILIMA

November 29th, 2025

Before the Commission on Water Resource Management (CWRM)
RE: SCAP.6438.3 - Wasatch Areté TB Holdings
Proposed Stream Channel Alteration Permit for a New Concrete Culvert Across ʻŌʻio Stream, Kahuku

Aloha Chair Chang and Honorable Commissioners,

Kūpaʻa Kuilima submits this testimony in strong opposition to approving Stream Channel Alteration Permit SCAP.6438.3. The Commission's decision to defer the permit at the November meeting was both appropriate and necessary, and we mahalo you for recognizing many of the same concerns that our community has been raising. This project simply cannot be evaluated responsibly without a complete Ka Paʻakai Framework Analysis, updated environmental and hydrologic data, and a transparent explanation of the broader development this culvert is intended to support.

Below, we highlight the major deficiencies that must be addressed before the Commission can lawfully or ethically consider approval.

I. Ka Paʻakai Framework Analysis Has Not Been Completed

The Ka Paʻakai Framework Analysis for this project has not yet been completed. The existing Cultural Impact Assessment (2012) and SEIS (2013) were improperly accepted by the Department of Planning and Permitting in 2022 as fulfilling Ka Paʻakai. The current DPP Director has chosen not to revisit or overturn that determination, leaving the department open to legal challenge. Regardless of the DPP's position, this Commission has its own legal obligation to determine whether the documents provided by the applicant meet the threshold of fulfilling Ka Paʻakai Framework Analysis.

To date, the applicant has not been able to identify which document, or combination of documents, fulfills Ka Paʻakai. If they are referring to the CIA (2012) and SEIS (2013), then these two documents clearly do not meet the three-part framework. These documents fail to adequately answer the three core questions required under Ka Paʻakai:

1) What traditional and customary Native Hawaiian rights and practices exist in the vicinity of the proposed action?
2) What impacts would the proposed action have on those practices? And,
3) How does the applicant intend to mitigate those impacts?

At the November 2025 meeting, Areté representatives seemed to imply that the Turtle Bay Cultural Advisory Committee was consulted as a part of Ka Paʻakai for this project. But that committee did not exist until 2021 and was disbanded in 2025. If the CIA is supposed to be the document demonstrating Ka Paʻakai compliance, that committee did not exist during the supposed consultation process.

Additionally, proper consultation under the Ka Paʻakai Framework requires far more than the applicant has shown. It includes signed disclosures of consent from consultees, transcripts of interviews, opportunities for practitioners to review and correct those transcripts, and ultimately, the publication of a complete report. None

of this has been provided to the Commission. The applicant has not produced evidence demonstrating that they completed these steps.

Substantively, the existing CIA (2012) and SEIS (2013) also do not satisfy Ka Paʻakai, firstly because it does not answer the three-part framework for analysis mentioned above. And additionally, much of the consultation in the CIA (2012) relied on paid employees of the then-developer, which undermines the validity of the process.

As people of this place, we know who the cultursl practitioners are who should be consulted. There are today native practitioners who engage in hula, limu picking, shoreline and subsistence fishing. including casting, throw net, lay net, and diving, lei making, gathering coastal resources such as paʻakai, collecting lāʻau lapaʻau, and recreate,ʻauʻau kai in these places. These practices will be directly affected by alterations to ʻŌʻio Stream. If Areté had completed a Ka Paʻakai Framework Analysis, then their project team should be able to show evidence of the completed analysis. At the very least they should be able to clearly explain how each of these practices may be impacted and what measures they intend to take to mitigate those impacts. Based on the responses given by the Areté team at the November 2025 CWRM meeting, it appears they are unable to provide this information and that is because an adequate Ka Paʻakai Framework Analysis has not been completed.

II. Outdated Flood and Sea Level Rise Modeling

In a meeting with the Honolulu Department of Planning and Permitting, the flood risk modeling presented by the applicant in the SEIS (2013) was reviewed by subject-matter experts from the University of Hawaiʻi and found to be inadequate. As highlighted in the report prepared by Dr. Haunani Kāne and Sara Kahanamoku-Meyer, the analysis failed to incorporate potential **groundwater flooding**, one of the most critical and well-documented drivers of backshore inundation. Instead, the applicant relied on a minimal scenario that does not represent present or projected flood risk. This incomplete assessment leaves significant gaps in understanding how flooding may impact ʻŌʻio Stream, surrounding ecosystems, and nearby communities. This analysis is publicly viewable here:
https://drive.google.com/file/d/1h_zV_a6_bxf0zUN6BA9Iiwq4-CM3ZrUc/view?usp=sharing

Climate change has already intensified flooding events across Hawaiʻi. Without comprehensive and current flood risk modeling—including groundwater emergence, passive flooding, and sea level rise dynamics—any culvert, stream crossing, or channel alteration risks increasing flooding, erosion, and damage to both ecosystems and community infrastructure.

Compounding these deficiencies, the flood and sea level rise analysis submitted by the applicant does **not incorporate the most recent State of Hawaiʻi–endorsed modeling updates**, including the **2025 passive flooding model release** and the updated guidance provided through the State's 2022 Hawaiʻi Sea Level Rise Vulnerability and Adaptation Report. These updated models—now required for State and County planning—include refined passive flooding layers, backshore inundation projections, and the Sea Level Rise Exposure Area (SLR-XA), all of which are directly relevant to the project area.

State guidance is explicit: planners and applicants must evaluate a minimum of **4 feet of sea level rise**, and up to **6 feet for low-tolerance-for-risk infrastructure**, such as culverts. NOAA's updated 4–8 foot passive flooding scenarios, PacIOOS layers, and revised SLR-XA projections were released in support of these requirements.

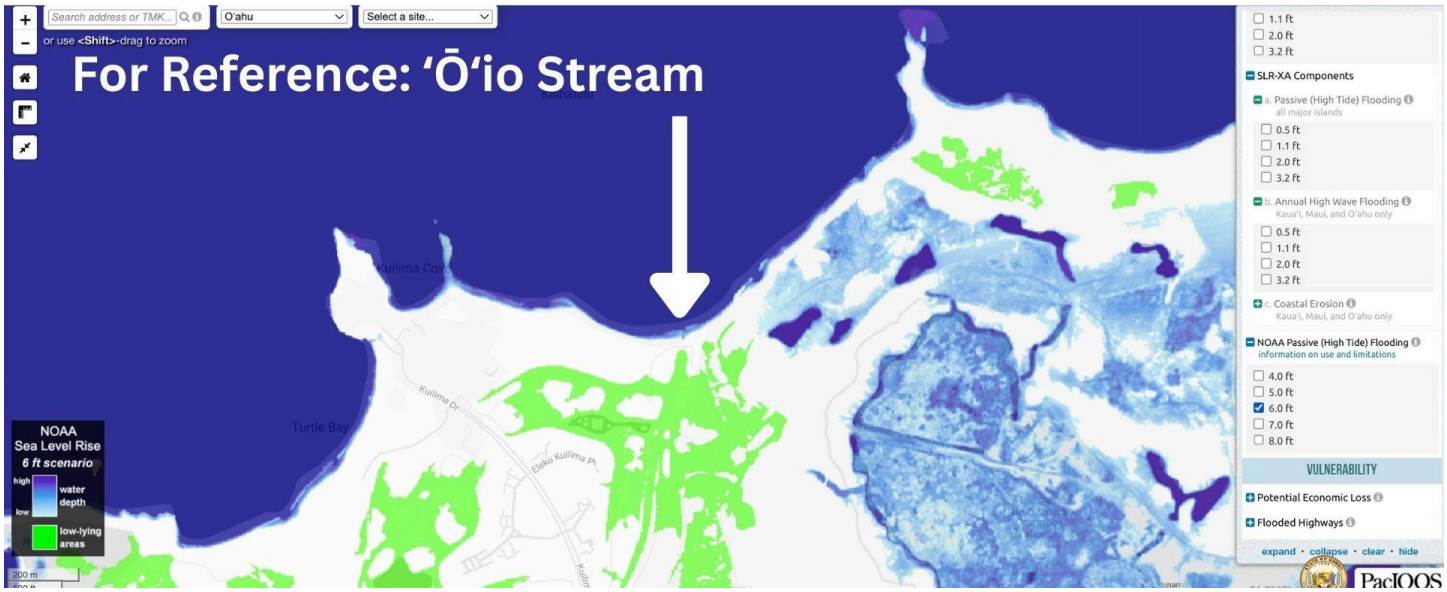
However, the applicant's analysis relies instead on **older "low" and "intermediate-low" scenarios** that UH researchers have already deemed obsolete. By failing to incorporate the newly released 2025 data, the applicant's modeling does not reflect current exposure conditions, projected flooding pathways, or the State's

required planning thresholds. As a result, the analysis cannot be considered aligned with best available science and cannot support responsible decision-making.

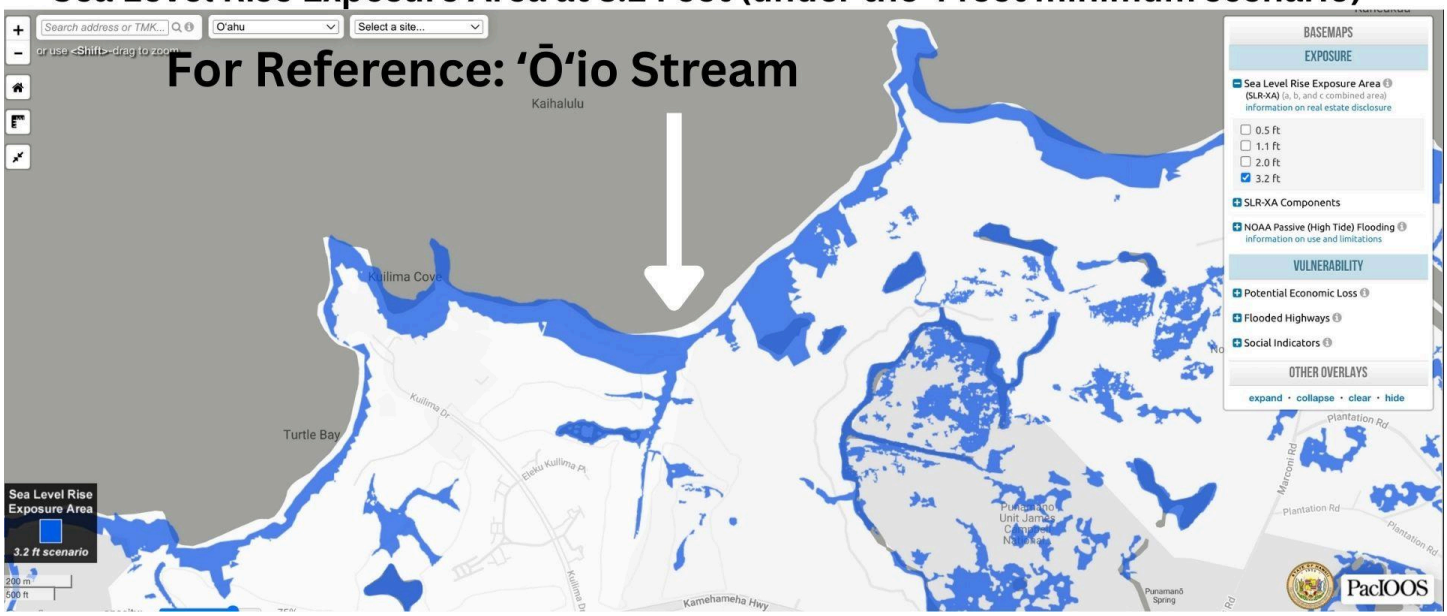
Given the accelerating pace of sea level rise and recent statewide updates to coastal hazard modeling, approving a culvert based on outdated or incomplete data would expose both the Commission and the public to unnecessary and preventable risk.

Passive High Tide Flooding at 6 Feet

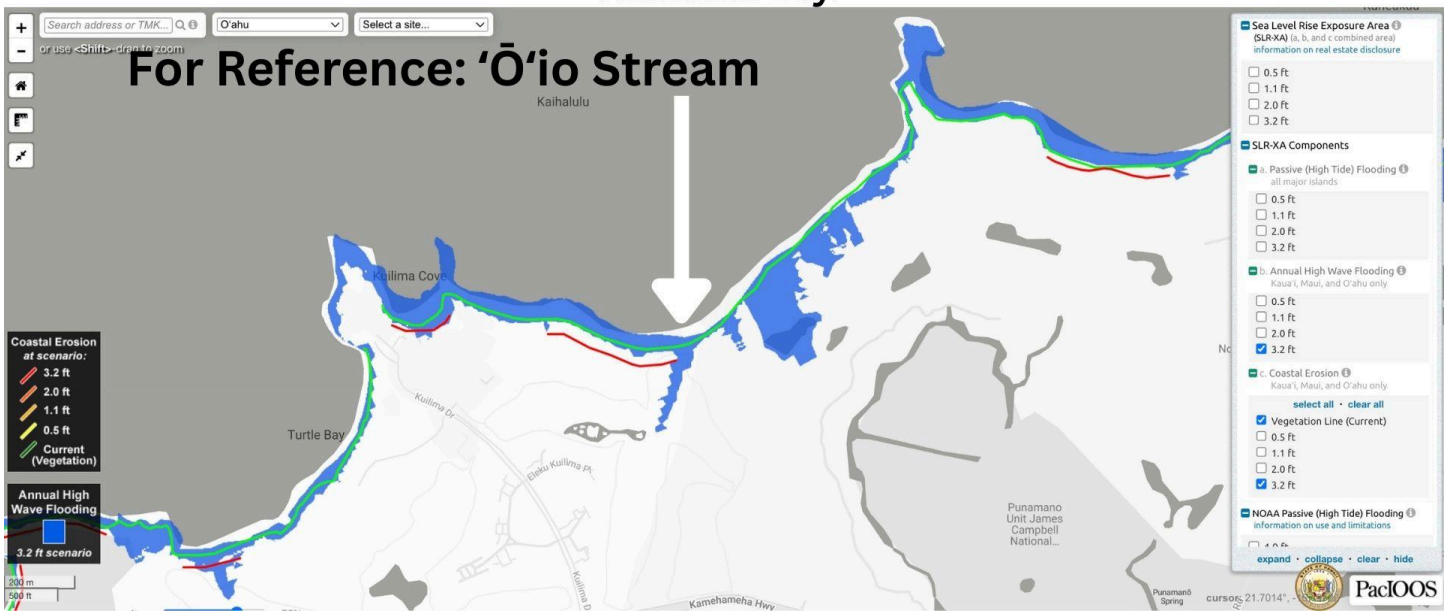
NOAA passive flooding layers from 4–8 ft — showing what high-tide flooding could look like in future conditions



Sea Level Rise Exposure Area at 3.2 Feet (under the 4 feet minimum scenario)



Annual High Wave Flooding at 3.2 Feet (under the 4 feet minimum scenario) at Kaihalulu Bay.



III. No Explanation of the Larger Development Plan

Throughout the November 2025 meeting, Commissioners repeatedly asked the applicant to explain what broader project the culvert is intended to serve. The applicant was unable to provide an adequate answer. A culvert is not a standalone structure; it is part of a larger development plan involving roadways, buildout, and alterations to hydrology and shoreline processes. CWRM cannot properly evaluate a single component of a

larger project when the larger project has not been adequately disclosed, which would be considered segmentation.

IV. Public Trust Responsibilities and Agency Precedent

Approving a permit based on decade-old documents and outdated science would set a dangerous precedent. Such action would undermine the Public Trust Doctrine, weaken protections for Native Hawaiian rights under Article XII, Section 7, and erode public confidence in CWRM's ability to steward Hawaiʻi's water resources responsibly. The Commission's duty is to present and future generations. An incomplete and outdated record cannot satisfy that duty. Legally, the Commission should demand that the applicant provide updated supplemental technical studies and environmental disclosure documents in order to make an informed decision and fulfill the intent of the law.

VI. Request

For these reasons, Kūpaʻa Kuilima respectfully urges the Commission to require a complete and updated Ka Paʻakai Framework Analysis, including independent cultural consultation, identification of traditional and customary practices, analysis of impacts, and proposed mitigation supported by documentation and interview transcripts. We also request that the Commission require updated hydrologic, flood, and sea level rise modeling that incorporates groundwater inundation, the SLR-XA, NOAA's 4–8 ft scenarios, and cumulative watershed impacts, consistent with the State's 2022 and 2025 guidance. Finally, we ask that the Commission continue to defer this permit until all the above required information is provided and reviewed.

Conclusion

‘Ō‘io Stream is a living cultural and ecological resource. The decisions made here will shape the health of the stream, the shoreline, and the surrounding community for generations. The applicant has not met the legal, scientific, or cultural thresholds necessary for approval. We urge the Commission to maintain its stance and defer action until the required analyses and studies are properly completed. Mahalo nui for your time, diligence, and commitment to the protection of Hawai‘i’s water resources and cultural heritage.

Kūpa‘a Kuilima

Jessica dos Santos
Lillie Makaila
Melissa Ka’onohi-Camit
Ramsey Calimlim
Ida Kawailani Bluhm

November 30, 2025

SUBJECT: Testimony Opposing SCAP 6438 3-Proposed Culvert Across "O"io Stream

We are Steven G. Albert and Lea E. Albert,

We have been residents of the North Shore, specifically Sunset Beach for over 50 years,, and we are members of the Sunset Beach Community Association. We are writing in strong opposition to Stream Channel Alteration Permit **SCAP. 6438.3** for a new culvert across 'O"io Stream. I ask that the Commission defer this permit for the following reasons:

1. **No Ka Pa'akai Framework Analysis Report or Document has been completed.** The applicant has not identified all native rights and traditional Practices on-going in the vicinity of the project area or explained how impacts will be avoided or mitigated.

2. **The flood and sea level rise modeling is outdated and inadequate.** Experts have found the applicant's analysis does not include groundwater flooding or the State's most recent 2022-2025 projections, which are essential for sfe planning and design.

3. **The applicant has not included the full development this culvert will support.** A culvert is not a standalone structure, and the Commission cannot evaluate cumulative impacts without knowing the broader project.

Given these major data gaps, approving the permit now would not meet the Commission's responsibilities under the public fund doctrine. **Please require the applicant to complete the K Pa'akai Framework Analysis and submit current hydrologic and climate modeling before any consideration of approval.** Mahalo for your time and for protecting our streams, communities, and cultural resources.

Sincerely,

Steven G. Albert Lea E. Albert

Steven G. Albert Lea E. Albert

EXHIBIT 18

STREAM CHANNEL ALTERATION PERMIT STANDARD CONDITIONS
(Revised December 15, 2020)

1. The permit application and staff submittal approved by the Commission at its meeting on the above date shall be incorporated herein by reference.
2. The project may require other agency approvals regarding wetlands, water quality, grading, stockpiling, endangered species, and floodways. The permittee shall comply with all other applicable statutes, ordinances, and regulations of the Federal, State and county governments, including, but not limited to, instream flow standards.
3. The permittee, his successors, assigns, officers, employees, contractors, agents, and representatives, shall indemnify, defend, and hold the State of Hawaii harmless from and against any claim or demand for loss, liability, or damage including claims for property damage, personal injury, or death arising out of any act or omission of the permittee or his successors, assigns, officers, employees, contractors, and agents under this permit or related to the granting of this permit.
4. The permittee shall notify the Commission, by letter, of the actual dates of project initiation and completion. The permittee shall submit a set of as-built plans and photos in pdf format of the completed work to the Commission upon completion of this project. This permit may be revoked if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. The proposed work under this stream channel alteration permit shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Commission upon showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Commission no later than three (3) months prior to the date the permit expires. If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.
5. Before proceeding with any work authorized by the Commission, the permittee shall submit one set of construction plans and specifications in PDF format to determine consistency with the conditions of the permit and the declarations set forth in the permit application.
6. The permittee shall implement site-specific, construction Best Management Practices in consultation with the DOH Clean Water Branch and other agencies as applicable, that are designed, implemented, operated, and maintained by the permittee and its contractor to properly isolate and confine activities and to contain and prevent any potential pollutant(s) discharges from adversely impacting State waters per HRS Ch. 342D Water Pollution; HAR §11-54-1 through §11-54-8 Water Quality Standards; and HAR Ch. 11-55 Water Pollution Control, Appendix C.
7. The permittee shall protect and preserve the natural character of the stream bank and stream bed to the greatest extent possible. The permittee shall plant or cover lands denuded of vegetation as quickly as possible to prevent erosion and use native plant species common to riparian environments to improve the habitat quality of the stream environment.
8. In the event that subsurface cultural remains such as artifacts, burials or deposits of shells or charcoal are encountered during excavation work, the permittee shall stop work in the area of the find and contact the Department’s Historic Preservation Division immediately. Work may commence only after written concurrence by the State Historic Preservation Division.

LEGAL AUTHORITIES

Water as a Public Trust. The four public trust purposes are:

1. Maintenance of waters in their natural state;
2. Domestic water use of the general public, particularly drinking water;
3. The exercise of Native Hawaiian and traditional and customary rights, including appurtenant rights. Waiahole I, 94 Hawaii 97; 9 P.3d 409 (2000).
4. Reservations of water for use on Hawaiian home lands. Waiola O Molokai, Inc., 103 Hawaii 401; 83 P.3d 664 (2004).

Activities on undeveloped lands. Public Access Shoreline Hawaii v. Hawaii County Planning Commission (PASH I). 79 Hawaii 246 (1993).

HRS §174C-71 Protection of instream uses. The commission shall establish and administer a statewide instream use protection program. In carrying out this part, the commission shall cooperate with the United States government or any of its agencies, other state agencies, and the county governments and any of their agencies. In the performance of its duties the commission shall:

(2) Establish interim instream flow standards;
  (D) In considering a petition to adopt an interim instream flow standard, the commission shall weigh the importance of the present or potential instream values with the importance of the present or potential uses of water for non-instream purposes, including the economic impact of restricting such uses;
(3) Protect stream channels from alteration whenever practicable to provide for fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses;
  (A) The commission shall require persons to obtain a permit from the commission prior to undertaking a stream channel alteration; provided that routine streambed and drainageway maintenance activities and maintenance of existing facilities are exempt from obtaining a permit;
  (C) The commission shall establish guidelines for processing and considering applications for stream channel alterations consistent with section 174C-93;

HAR §13-169-2 Definitions.

"Channel alteration" means to obstruct, diminish, destroy, modify, or relocate a stream channel; to change the direction of flow of water in a stream channel; to place any material or structures in a stream channel; or to remove any material or structures from a stream channel.

"Stream channel" means a natural or artificial watercourse with a definite bed and banks which periodically or continuously contains flowing water.

§13-169-49.1 Interim instream flow standard for Windward Oahu. The Interim Instream Flow Standard for all streams on Windward Oahu, as adopted by the commission on

water resource management on April 19, 1989, shall be that amount of water flowing in each stream on the effective date of this standard.

HAR §13-169-50 Permit required. (a) Stream channels shall be protected from alteration whenever practicable to provide for fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses. No stream channel shall be altered until an application for a permit to undertake the work has been filed and a permit is issued by the commission; provided that routine streambed and drainageway maintenance activities and maintenance of existing facilities are exempt from obtaining a permit.

HAR §13-169-52 Criteria for ruling on application. (a) The commission shall act upon an application within ninety calendar days after acceptance of the application.

(b) Based upon the findings of fact concerning an application for a stream channel alteration permit, the commission shall either approve in whole, approve in part, approve with modifications, or reject the application for a permit.

(c) In reviewing an application for a permit, the commission shall cooperate with persons having direct interest in the channel alteration and be guided by the following general considerations:

(1) Channel alterations that would adversely affect the quantity and quality of the stream water or the stream ecology should be minimized or not be allowed.
(2) Where instream flow standards or interim instream flow standards have been established pursuant to subchapters 3 and 4, no permit shall be granted for any channel alteration which diminishes the quantity or quality of stream water below the minimum established to support identified instream uses, as expressed in the standards.
(3) The proposed channel alteration should not interfere substantially and materially with existing instream or non-instream uses or with channel alterations previously permitted.

(c) Notwithstanding subparagraph (b) above, the commission may approve a permit pursuant to subparagraph (a) above in those situations where it is clear that the best interest of the public will be served, as determined by the commission.

HAR §13-169-53 Term of permit. (a) Every permit approved and issued by the commission shall be for a specified period, not to exceed two years, unless otherwise specified in the permit.