STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
Honolulu, Hawaii

REF:OCCL:DH

CDUA KA-3472

Acceptance Date: July 10, 2008
180-Day Exp. Date: January 6, 2008

November 14, 2008

Board of Land and
Natural Resources
State of Hawaii
Honolulu, Hawaii

REGARDING:	Conservation District Use Application (CDUA) KA-3472 for Proposed Jess Jackson and Barbara Banke Single Family Residence (SFR)
APPLICANT:	Ben Welborn, Landmark Consulting Services, Inc., P.O. Box 915, Hanalei, Hawaii 96714, 808-828-6332
LANDOWNER:	Jess Jackson & Barbara Banke, 1045 Alexander Mountain Road, Geyserville, California, 95441
LOCATION:	Haena, Island of Kauai
TMK:	(4) 5-9-005:028
AREA OF PARCEL/ USE:	2.46 Acres or 107,290 Square Feet 4,958 Square Feet
SUBZONE:	Limited

PRIOR CDUA PERMIT: KA-2894

On October 1, 1998, the Chairperson of the Board of Land and Natural Resources (BLNR) approved a departmental permit for the reconstruction of an existing fence on the subject parcel; subject to twelve terms and conditions (**Exhibit 1**).

DESCRIPTION OF AREA/CURRENT USE:

The proposed project is located on a vacant 2.46 acre subject parcel TMK: (4) 5-9-005:028, in Haena, Island of Kauai. Access to the parcel is provided by Kuhio Highway. The subject parcel is bounded on the south by Kuhio Highway, to the north by the ocean, and to the east and west by private landowners. The parcel is located in the State Land Use (SLU) Conservation District, Limited subzone (**Exhibits 2 & 3**).

PROPOSED PROJECT:

The applicants, Jess Jackson and Barbara Banke, propose to construct a SFR in Haena, Island of Kauai, pursuant to Section 13-5-23, Hawaii Administrative Rules (HAR), L-6, SINGLE FAMILY RESIDENCES, D-1, "a single family residence in a floodplain or coastal high hazard area that conforms to applicable county regulations regarding the National Flood Insurance Program and single family residential standards as outlined in this chapter."

The applicant originally proposed a 4,958 square foot SFR but have revised the plans to construct a 4,974 square foot elevated SFR; includes 3,897 square feet of interior living space (four (4) bedrooms, four (4) 1/2 bathrooms, kitchen, study, laundry, kitchen, living/dining room, and dining/family room); 584 square feet of screened lanai; approximately 493 square feet of exterior lanais, access stairwells; and a dumbwaiter. The SFR's architecture is of a plantation design and will be painted in earth tone colors.

Existing landscaping will soften the visual impact of the proposed structure from the adjacent property owners, and the roadway. Landscaping consists of groundcovers, ornamental shrubs, and various trees (Indian almond, ironwoods, Alexandria laurel, Java plum, coconut palms, Hala trees, beach naupaka, panax, mock orange, areca palms) which are compatible with the soils and climate of the area. Consideration will be given to the use of native plants for additional landscaping. Also requested is approval to carry on periodic pruning and maintenance of the existing ironwood trees.

Also proposed is a vehicular gate with gate columns and flanking rock walls. The existing permitted fencing (under CDUA Permit KA-2897) will be replaced with a new six foot chain link fence. All fencing will be setback a minimum of 40 feet from the Certified Shoreline (**Exhibit 4**).

The topography of the subject parcel rises abruptly along its seaward edge to the top of an old sand dune; the certified shoreline is situated near the crest of the dune formation which ranges approximately 20 to 27 feet above Mean Sea Level (MSL). The parcel slopes downward to the lowest elevation of 15'6" above MSL. The SFR footprint is located approximately 15 to 20 feet above MSL; the higher elevation is located near the sea.

Introduced birds (Japanese white-eye, red crested cardinal, common myna, wild jungle fowl) were observed on the subject parcel. The applicant notes there are no rare or endangered native plants and/or animals present on the subject parcel.

The applicant notes an Archaeological Inventory Survey of the subject property was conducted; a new single historic site was identified and inventoried as State Inventory of Historic Properties 50-30-02-4018; a cultural layer (two fire pits and imu), no burial sites. The survey report concluded the possibility of additional features (including burials) may be present in the subsurface deposits of the property. A program of Archeological Monitoring and further Data Recovery was recommended for the site. The Historic Preservation Division (HPD) reviewed the Inventory Survey Report and recommended: 1) additional Data Recovery; 2) preparation and approval of a Data Recovery and Archeological Monitoring Plan; and 3) a qualified archeologist shall monitor all ground disturbing activities. There are no historic or archeological sites listed on the State or Federal Registers for the subject parcel.

Utilities, such as, electrical, water, refuse collection, telephone, cable, and natural gas services are available to the property. Wastewater will be treated by an individual wastewater system septic tank.

The proposed SFR will meet the required minimum setback of fifteen feet on the side yards.

The SFR is located in the State Land Use (SLU) Conservation District, Limited subzone, and in a coastal high hazard area. On Flood Insurance Rate Map (FIRM) Panel 15000-20030-E (dated September 16, 2005), the subject parcel is located within Flood Zone VE 30, which is designated as a coastal flood area with a velocity hazard due to its potential susceptibility to 100-year inundation by tsunami; Base Flood Elevations (BFE) have been determined at thirty (30) feet above mean sea level (MSL).

The existing grade of the subject parcel is approximately 15 feet above MSL, thus the finished floor height of the building will be approximately 30 feet above MSL in order to comply with federal flood standards. This would allow the applicant to construct the enclosed living areas, and overlying roof structure of the SFR within a fifteen (15) foot building height envelope above the minimum MSL floor elevation as required by flood elevations. Therefore, the SFR will have a maximum height limit of thirty (30) feet to meet Federal and County flood regulations.

Therefore, the applicant is requesting a variance of five feet from the maximum height limit of twenty-five (25) feet, pursuant to HAR, Chapter 13-5, Section 13-5-41(a), SINGLE FAMILY RESIDENCES; STANDARDS, which notes "the maximum height of the building shall not exceed twenty-five feet, measured from the highest point of the roof structure, down to the lower of the existing or finished grade at the lowest corner of the building." Staff notes the request for a five foot variance is to meet Federal and County flood regulations, pursuant to HAR, Chapter 13-5, Section 13-5-41(a). Similar variances have been granted for single-family residences in Haena.

AGENCY COMMENTS:

The CDUA was referred for review and comment to the DLNR – Division of Forestry and Wildlife (DOFAW), Historic Preservation Division (HPD), Engineering Division, Kauai District Land Office (KDLO), Commission on Water Resource Management (CWRM), Division of Conservation and Resources Enforcement (DOCARE), State Parks Division (SPD), Office of

Conservation and Coastal Lands (OCCL), Kauai County Planning Department, County of Kauai Council Services, Office of Hawaiian Affairs (OHA), Department of Health (DOH), Office of Environmental Quality Control (OEQC), Hanalei Haena Community Association, the Princeville Public Library, as well as comments from the OCCL. The following comments were received:

State Parks Division
No Comment.

Engineering Division
According to the Flood Insurance Rate Map (FIRM) the project site is located in Zone VE; the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal regulations whenever development(s) within a Special Flood Hazard Area is undertaken. For questions about local flood ordinances please contact the County of Kauai, Department of Public Works, NFIP coordinator.

Applicant Response: we understand the SFR, in both its design and construction, must comply with NFIP rules and regulations, 44CFR, and County of Kauai flood zone ordinance. Construction drawings for a building permit will be submitted to the County of Kauai, Department of Public Works for review to verify the project's compliance with both the Federal and County standards.

Division of Forestry and Wildlife
No Comment.

Kauai District Land Office
No Comment.

Commission on Water Resource Management
No Comment.

Historic Preservation Division
HPD notes that an Archeological Inventory Survey (AIS) identified one significant historic site 50-30-02-4018. To mitigate any adverse effects the following is recommended: 1) Archeological Data Recovery is recommended around archeological trenches 4 and 5 prior to construction; 2) an approved data recovery plan shall be submitted to the HPD; 3) a qualified archeologist shall be onsite to monitor all subsurface disturbances; 4) prior to construction an approved archeological monitoring plan shall be submitted to HPD; and 5) a draft monitoring report shall be submitted 180 days after the completion of fieldwork for review and approval to the HPD.

Applicant Response: an Archaeological Data Recovery plan for Site 50-60-02-4018 was prepared, submitted, and approved by the State HPD. No historic properties were found. In the event historic resources, including human skeletal remains (iwi kupuna), are identified during construction activities, all work will cease and HPD shall be contacted. Construction work in the vicinity of the find may resume when the human remains have been properly treated and HPD gives its approval; the OHA will also be notified. A Cultural Impact Assessment (CIA) was prepared; it found that adequate access to and along the beach and coastal resources will be

maintained. The proposed project will not hinder Native Hawaiian cultural and/or gathering practices.

Office of Hawaiian Affairs

OHA notes the sandy topography may yield additional Native Hawaiian cultural sites, including burials. We rely on the assurances of the applicant that should iwi or Native Hawaiian cultural deposits be found during ground disturbance, work will cease, and the appropriate agencies will be contacted pursuant to applicable law. We appreciate that an archeologist will monitor all ground-disturbing activities related to the project. Lastly, OHA recommends that applicant use native vegetation in its landscaping plan to further the traditional Hawaiian concept of malama aina and creates a more Hawaiian sense of place.

Applicant Response: a qualified archeologist shall be on site to monitor the all ground disturbing activities, and shall follow the guidelines of the Archeological Monitoring Plan (to be approved by the HPD) prior to the commencement of ground disturbance. Should iwi kupuna or other cultural artifacts be exposed during construction, all work shall stop in the immediate vicinity and the HPD shall be contacted for mitigation protocol. The OHA and the Kauai-Niihau Burial Council will also be notified. Consideration will be given to the use of native landscaping on the subject parcel. However, the parcel is already predominately landscaped with groundcovers, ornamental shrubs, various trees such as hala, and beach naupaka.

Department of Health

The subject parcel is located in the Critical Wastewater Disposal Area (CWDA); an area where no new cesspools will be allowed. DOH notes an individual wastewater system (IWS) is allowable on the property as long as it serves no more than five bedrooms or bedroom like rooms. The IWS should not be constructed within 1,000 feet of the potable well and shall be down-gradient of the well if possible. All wastewater plans must meet the department's rules, HAR, Chapter 11-62 "Wastewater Systems." We reserve the right to review the detailed wastewater plans for conformance to applicable rules. Please review all standard comments on the website:www.hawaii.gov/health/emvironmental/env-planning/landuse.htnl.

Applicant Response: an approved IWS plan will be submitted for review and approval together with building plans following the issuance of a CDUP. The Applicant is aware of the subject property's proximity to a public, domestic water well, will try to follow the DOH's requirements to situate the IWS more than 1,000 feet from the public well.

Hanalei-Haena Community Association

The Hanelei-Haena Community Association had the following concerns regarding: 1) fencing, 2) the proposed SFR in relation to the shoreline setback; 3) Certified Shoreline; 4) shoreline hardening; 4) ironwood pruning and maintenance; 5) shoreline lateral access; 6) the beachfront providing critical habitat for the endangered Hawaiian monk seal; 7) two proposed SFR's; 8) a proposed 40-foot shoreline setback; 8) required additional archaeological data recovery work/investigative excavation and Data Recovery Plan; 9) adequate CIA regarding adequate access to and along the beach/coastline; 10) commercial uses; 11) possible significant impacts (primary, secondary, cumulative); 12) Individual Wastewater System (IWS); and 13) proposed gates.

Applicant Response: we understand all fencing must be setback a minimum of 40-feet from the certified shoreline. On September 30, 2008, EKNA provided supplementary analysis that challenges the validity of using only the beach toe as an accurate Shoreline Change Reference Feature. The reference to a proper definition of the 'shoreline' is noted. It is acknowledged the Certified Shoreline is not synonymous with the 'vegetation line', but rather that the Certified Shoreline is established by the highest seasonal wash of the waves as evidenced by debris lines, natural vegetation and other site-specific factors. The Certified Shoreline will establish a point of beginning for the proposed residential shoreline setback of 100-feet. We are not proposing to harden or otherwise fix the shoreline.

Tree pruning of the ironwoods will be carried out by a licensed and insured professional arborist to selectively thin the ironwoods in an effort to manage their height, improve their overall appearance and minimize breakage or up-rooting of the trees during heavy wind storms. The ironwoods help to stabilize the shoreline and thereby mitigate the erosive effects of seasonal high surf, in this way the ironwoods serve an important function and the Applicant does not wish to jeopardize their health. The OCCL and the Board of Land and Natural Resources (BLNR) will make a determination regarding request and will define the extent to which the existing ironwoods can be pruned and maintained. The Final EA will make reference to the important beach area fronting the project which provides critical habitat for the endangered Hawaiian monk seal. The proposed home will be sufficiently setback from the shoreline so as not to place the adjacent beach habitat at risk.

When the AIS was prepared in 2007, the Kauai Shoreline Setback and Coastal Protection Ordinance # 863 was not yet adopted; the proposed SFR location is 100 feet from the Certified Shoreline. Prior to construction, additional archaeological data recovery work and investigative excavation will occur on the project parcel. Included in the Final EA is an Archaeological Data Recovery Plan and an accompanying letter of approval from HPD (dated September 9, 2008).

The Applicant believes adequate access to and along the beach/coastline is maintained, the proposed actions will not hinder native Hawaiian cultural practices, nor will it inhibit access to coastal resources. The Applicant does not intend to conduct commercial uses on the subject property. The DEA concludes that there will be no significant impacts (primary, secondary or cumulative). The Applicant's proposal for a 100-foot setback provides a conservative buffer between the proposed residential development and the coastal resources. An approved IWS plan will be submitted for review and approval together with building plans following the issuance of a CDUP. The Applicant is aware of the subject property's proximity to a public, domestic water well, will try to follow the DOH's requirements to situate the IWS more than 1,000 feet from the public well. The Applicant feels that the scale of the proposed gates neither massive nor imposing and that the gates are compatible with the residential character of the property.

<u>County of Kauai Planning Department</u>

Kauai County Planning department notes the application is exempt from obtaining an SMA permit; all county building permits will be necessary.

We requested a review of the Historical Shoreline Erosion Study prepared by EKNA by the University of Hawaii Sea Grant Program Coastal Processes and Hazards Specialist, Jim O'Connell. His analysis suggests that the procedure used by the EKNA in the erosion rate analysis and the proposed setback distance from the 'shoreline' needed additional scrutiny.

We note the procedure is not entirely consistent with that required by County of Kauai Shoreline Setbacks and Coastal Protection Ordinance #863, and of the Hawaii Coastal Hazard Mitigation Guidebook (referenced in the Ordinance). The procedure was not consistent with what DLNR requested in their April 22, 2008 letter to the consultant which requested of the consultant, 'in calculating the shoreline setback for this parcel to utilize the new published shoreline erosion data for Kauai generated by the University of Hawaii, Coastal Geology Group or adopting an approach similar to the new Kauai County shoreline setback ordinance...'. The approach uses the 'beach toe', not the vegetation line, in calculating the erosion rate used to base the shoreline setback on. Finally, we suggest a setback of 129 feet, which is consistent with the application of Ordinance # 863 (**Exhibit 5**).

University of Hawaii Sea Grant Program Coastal Processes and Hazards Specialist
Although the consultant acknowledged and cited the recommended technique to calculate the average 'annual coastal erosion rate' as required in Ordinance #863, and as outlined in the 'Hawaii Coastal Hazard Mitigation Guidebook,' additional information and data is required for the 'coastal erosion study' as outlined in the Ordinance (see Section 8-27.1 Definitions).

The annual coastal erosion rate calculated for the applicant's property by the consultant and by the University of Hawaii, School of Ocean and Earth Science and Technology (SOEST) do not agree. The larger of the erosion rates between the beach toe erosion rate and the vegetation erosion rate should be used to determine the setback distance. However, the consultant used the vegetation line changes and stated the 'beach toe' fluctuations are statistically unreliable due to extreme episodic and seasonal variability associated with winter surf.

Both the vegetation line and the beach-toe have exhibited variability in movement through time; the beach toe exhibits greater variability. This relationship is typical of most ocean-facing beaches. Most researchers and technical specialists in this field use a shoreline reference feature (mean high water line, wet/dry interface, beach toe) that is located seaward of the dune toe or seaward dune vegetation line to calculate a shoreline change rate. The use of the 'beach toe' in calculating shoreline change rates for Hawaii has been extensively peer reviewed in scientific journals, and has been accepted among technical specialists in shoreline change analysis as a valid technique to determine shoreline change.

An 'uncertainty range' associated with the data generated and presented by consultant (for both the beach toe and the vegetation line) would be useful, as well as an elaboration on their methodology. Were rectified aerial photographs or orthophotographs used in determining the shoreline, i.e. what is the resolution of the source material? Additionally, has any artificial (human-induced) manipulation of the beach or dune (or adjacent areas) occurred in the past? This information would be useful in assessing the causes and magnitude of shoreline fluctuations. Many shoreline areas have had landscaping such that the movement of the vegetation line may not accurately reflect shoreline change.

Additional comments were made regarding: 1) the use of a 50-year life expectancy versus 70-year life-expectancy for a building; 2) use of the vegetation line as opposed to the beach toe; 3) use of only 5 of the 7 shoreline data; 4) the significant difference in the calculated erosion rates for the 'beach toe'; 5) use of a shorter versus longer time series of documented shoreline changes; 6) use of the vegetation line erosion rate setback calculation versus the beach toe erosion data setback calculations.

The 'coastal erosion hazard zone' may be too narrow and the setback line too far makai. Erosion is occurring and will continue to do so at the subject parcel. Considering the primary purposes of Ordinance #863 of protecting life, property and coastal resources the Director needs to determine whether using the higher of the two erosion rates generated by the consultant is appropriate and reflective of shoreline changes at the site (**Exhibit 6**).

Office of Conservation and Coastal Lands

The OCCL observed a few technical observations and discrepancies with EKNA's Historical Shoreline Erosion Study. Both the *beach toe* and the *vegetation line* changes were analyzed; the County Ordinance and the Guidebook recommends that the *larger of the erosion rates between the two* should be used in the calculation of the set-back. In this case, the beach toe erosion rate was the larger of the two, yet the vegetation erosion rate was used by the consultant to determine the setback distance.

The 'beach toe' in calculating shoreline change rates for Hawaii has been extensively peer reviewed in scientific journals, and has thus been accepted among technical specialists in shoreline change analysis as a valid technique to determine shoreline change. The OCCL requires the submission of change rates for both the beach toe and the vegetation line for private erosion studies but will utilize the larger of the two for setback calculations.

In the updated shoreline change analysis, only 5 of the 7 shorelines appear to have been used from the previous (1950-1988 study). If this is correct, the reason for dropping 2 shorelines from the analysis and not using the 7 total shorelines (as stated) needs clarification.

Although the 'vegetation line' was used to calculate the setback rather than the higher erosion rates of the two reference features there is a significant difference in the calculated erosion rates for this property (transect #127: see attached UH SOEST diagram) between the consultant's rate for the 'beach toe' at -0.76feet/year, and the UH's erosion rate for the 'beach toe' at -1.27 feet/year (+/-0.16 feet/year).

The OCCL recommends the use of the beach toe change rate for setback purposes. In addition since the UH shoreline data appears to be based on a larger data set, is more statistically robust, and includes an evaluation of uncertainty, the OCCL will defer to the UH data for shoreline setback calculations. Using the method recommended in the guidebook and recently adopted in ordinance by the Kauai County, we note the calculated setback is 130 feet (**Exhibit 7**).

Applicant Response: The most substantive comments regard the 100-foot shoreline setback proposed by the applicant and the underlying Historical Erosion Study prepared by EKNA. A

supplementary letter dated 9/30/08 from the President of EKNA, Elaine Tamaye, responds to the comments and concerns regarding their calculation of an annual coastal erosion rate and the proposal for a 100-foot shoreline setback.

In response to a determination of the shoreline setback for the subject property, it is our understanding since the property is located in the Conservation District, an appropriate shoreline setback for the proposed residence will be determined by the BLNR upon the CDUA and DEA review. Under this assumption, we interpret that a "Shoreline Setback Determination" (as prescribed by the recently adopted County of Kauai Shoreline Setback and Coastal Protection Ordinance # 863 is not required for Conservation District lands (under the State's jurisdiction). We note the County's shoreline setback recommendation to the OCCL (dated August 20, 2008) was provided within the 6-month timeframe from the current Shoreline Certification (dated February 20, 2008).

We note that EKNA opines the vegetation line provides a more accurate and reliable marker of shoreline change than does the "beach toe," based on their opinion of the dynamic seasonal and episodic variability of the beach toe fronting the property, which is associated with frequent high surf events throughout the winter months.

EKNA responds to the Hanalei-Haena Community Association comments that the beach toe line is an even worse indicator of long-term shoreline change than the vegetation line because of short-term seasonal variability of the beach compared to a more stable vegetation line.

EKNA also makes reference to the Hawaii Coastal Hazard Mitigation Guidebook which states, "one disadvantage of using the beach toe or water line is that it may be subject to large seasonal changes for beaches that have large seasonal change in wave energy". The Guidebook recommends that "the analysis of historical shoreline erosion rates be based on both the vegetation line and the water line or beach toe." The County of Kauai Ordinance # 863 for "Shoreline Setback and Coastal Protection" states the "method resulting in the larger erosion rate (SCRF/toe of beach versus vegetation line) shall be used to establish the erosion rate, unless there is clear evidence to indicate another method is a more accurate representation of historic shoreline change."

Since the beach toe fronting their property is subject to large seasonal (and episodic) fluctuations, it is therefore an unreliable Shoreline Change Reference Feature in determining an annual erosion rate upon which to establish an appropriate shoreline setback for the proposed residence. Statistical uncertainty of the beach toe is further compounded by the limitations of the photographic data set used in the historical analysis.

EKNA Services, Inc. submits that the beach toe is not a reliable Shoreline Change Reference Feature in the area of the subject parcel.

ENKA Historical Shoreline Erosion Study dropped 2 of the 7 photo data sets associated with the beach toe and vegetation line fronting the Jackson/Banke parcel. Doing so resulted in a larger annual erosion rate for the beach toe/water line and a smaller annual accretion rate for the

vegetation line. Therefore, the historical erosion rates calculated for the subject property by not including the data from the 2 photos are more conservative, leading to greater setbacks.

EKNA challenges the accuracy of the UH data set that was used in determining the UH beach toe annualized erosion rate of -1.27 feet per year. The UH study relies upon data from a 1927 T-sheet (included with the EKNA analysis), which is a paper survey map (as opposed to an aerial photograph) that was prepared by the US Coast and Geodetic Survey dated June-July 1927. The T-sheet is at a scale of 1:20,000 and is not of the same quality as the high-resolution aerial photography that forms the basis of ENKA's historical erosion rate calculations.

EKNA suggests that the 1927 T-sheet "should not have been included in the analysis of shoreline change..." (due to the T-sheet's) inherent lack of resolution in locating the shoreline." Reliance upon the 1927 T-sheet subjects the erosion rate calculations of the UH study to statistical inaccuracies and interpretive error.

EKNA recommends that the shoreline setback for this reach of coastline and the proposed Jackson/Banke residence be based upon an equally weighted average of the adjusted historical annual erosion rates using both the beach toe and the vegetation line. Further, ENKA opines that the data set used in the EKNA Historical Erosion Analysis is more statistically defensible than the UH data set due to the 1927 T-sheet included with the UH study.

Based upon the foregoing, EKNA calculates and recommends the shoreline setback for the proposed Jackson/Banke residence as follows:

- *Beach Toe/Waterline – Annual Erosion Rate = 1.00 ft/year*
- *Vegetation Line – Annual Erosion Rate = 0.26 ft/year*
- *Average Annual Erosion Rate (Beach Toe & Vegetation Line) = (1.00 + 0.26)/2 = 0.63 ft/year.*
- *Applying the Guidebook Formula - 0.63 ft/year X 70 years = 44.1 feet + 40 foot buffer = 84.1 feet.*

*Applying the guidelines of Ordinance # 863, the proposed 100-foot setback (based upon the calculated lot depth) still conservatively exceeds the 84 feet derived by applying a weighted average to the EKNA erosion study (**Exhibit 8**).*

Office of Conservation and Coastal Lands Response: notes the setback in the FEA is unchanged from the DEA and the comments regarding the use of the toe versus the vegetation line are valid. The consultant is proposing a 100 foot setback based on the average lot depth, which is the larger of the erosion based setback. The coastal engineer proposes the use of a weighted average for both the vegetation line and the toe and calculates 84 ft setback using this methodology. The use of a weighted average for using erosion rate data is **unprecedented** in Hawaii and it is not clear this is statistically valid. **The use of the toe is an industry standard in Hawaii and a statistically robust method of tracking the shoreline.**

The use of vegetation is of concern: 1) the vegetation line shows a widely different rate than the beach toe thus indicating it is not representative of the same long-term trends as the shoreline which may be due to artificial growth, and is subject to human-induced alterations; 2) how was

the report able to locate the "vegetation line;"it is under a thick tree canopy and cannot be seen readily using traditional aerial photography (**Exhibit 9**).

The coastal engineer states the EKNA data is more statistically defensible than the University of Hawaii at Manoa data. There is no support for this statement or any justification for such a statement. If this is the position of the engineer a statistical analysis will need to be provided in support.

The consultant argues the use of the 1927 "T-Sheet" does not provide the same resolution as the aerial photography and therefore should not be used. The OCCL believes the use of the USCGS topographic sheets are statistically valid indicators of the shoreline and provide adequate resolution to discern a SFR position. The UH Coastal geology website elaborates on this point and provided the rational for the use of the T-sheets (http://www.soest.hawaii.edu/asp/coasts/index.asp).

Why did EKNA drop 2 of the 7 historical aerial photos in the erosion analysis. There is no explanation why the 2 photos sets were dropped, other than for "quality control purposes," and how this affects the statistical validity of the data set.

The University of Hawaii Manoa, Department of Geology and Geophysics, Chair Professor Chip Fletcher was contacted on October 29, 2008, regarding the validity of the T-sheets.

He confirmed that the use of the T-sheet is statistically valid. They double-checked this particular case and found that there is no reason to move or otherwise re-adjust their T-sheet shoreline. Dr. Fletcher reports that T-sheets are a nationally accepted source of historical shoreline data used by many research groups and promoted by NOAA, the U.S.G.S., FEMA, and the National Academy of Sciences. To NOT use T-sheets would be heavily criticized by peer scientists and probably result in an inability to publish their research findings. The use of T-sheets is recommended by a National Academy of Sciences study ("Managing Coastal Erosion" http://www.nap.edu/openbook.php?record_id=1446) because of their high value in extending a time-series of historical shorelines. The U.S. Geological Survey and FEMA uses T-sheets in their national studies of coastal erosion, and have funded research by the UH team (and other collaborators across the U.S.) to employ T-sheets. Dr. Fletcher's group have published peer-reviewed studies, and given numerous talks at research conferences using T-sheets in coastal erosion studies.

The T-sheets used by the UH team are provided to them by the NOAA Coastal Services Center (from Mr. Mike Rink) in digital/scanned form as a Georectified image. The UH team further corrects the map by matching it to rocky shoreline features that have not changed since the map was drafted. Tests of the map after this process may result in rejecting the T-sheet if it cannot be easily made to fit reference features in the area. The T-sheet at Haena gave a good fit to local rocky features that have not changed over time.

The UH research methodology uses a regression procedure ("weighted least squares") that employs error bars on each data point. A data point is a past shoreline location. Based on environmental observations on Kauai beaches, and commercial remote sensing software

calculations, 7 separate sources of error are quantified for shoreline positions taken from T-sheets and aerial photographs. Dr. Fletcher stated that their research team is recognized for their careful attention to quantifying sources of error and that this is a prime objective in many of their publications. These sources of error form weights on each data point. The regression procedure recognizes these weights and incorporates them in modeling the trend. The slope of the regression line is the trend (rate of shoreline change). Because all shoreline locations have errors, and are weighted, no single point unduly influences the resulting rate of change.

Dr. Fletcher also quotes a section in the National Academy Press book on Managing Coastal Erosion. In the section titled "Historical Shoreline Change Method", the study says "all rectifiable NOS T-sheets should be utilized in a long-term analysis of historical shoreline changes," which is also stated elsewhere in the book.

In reference to the criticism of using the toe: the toe is the only true reflector of beach processes. When it migrates mauka or makai it is because of actual sand volume changes (beach geomorphology) not because of incidental water level changes (wave run-up). It is: 1) relatively stable, more stable than a wet-dry line, or any feature on the beach. And a better indicator than vegetation which can naturally grow in directions not related to beach changes, and can be landscaped. Any uncertainties about the toe are captured in their error process. They account for tide changes in the toe and seasonal changes in the toe.

In examining the beach at the Jackson Banke property, Dr. Fletcher reports that other statistical methods they use reveal that the vegetation line has been relatively stable, the toe shows fairly strong erosion, and the rate of erosion appears to be decreasing through the 20th century up to present. In Dr. Fletchers opinion, this suggests the beach is narrowing, most likely due to an interruption in the sand supply. The appearance of beach rock in recent time has slowed the rate of beach recession, somewhat stabilizing the toe. The appearance of beach rock is typical of chronically eroding beaches. In his opinion the beach has a sand deficiency and the vegetation line is only stable because it has been artificially vegetated at some point in the past. A former sand dune appears to have been flattened by previous landscaping. It is possible that the slower erosion rate will persist for some time. The beach will continue to narrow; the slope of the land under the vegetation line will steepen and develop a scarp.

In Dr. Fletcher's opinion the consultants proposed setback of 100 feet represents a significant advancement over previous coastal development discussions and is a reasonable compromise. However, he would like to see a deed restriction that any future erosional threats to structures on this property would be mitigated by removal of threatened structures and no engineering steps taken that could potentially threaten the environment or public access.

ANALYSIS:

Following review and acceptance for processing, the applicant was notified, by letter dated July 10, 2008 that:

1. The proposed use is an identified land use (L-6, SINGLE FAMILY RESIDENCES, D-1) within the Limited Subzone of the Conservation District,

according to Section 13-5-23, Hawaii Administrative Rules (HAR); please be advised, however, that this finding does not constitute approval of the proposal;

2. Pursuant to Section 13-5-40(a), HAR, a public hearing will not be required; and

3. In conformance with Chapter 343, (HRS), as amended, and Chapter 11-200, HAR, a finding of no significant impact (FONSI) to the environment is anticipated for the proposed project. The draft environmental assessment (DEA) for the project will be submitted to OEQC to be published in the April 23, 2008 issue of the Environmental Notice.

Staff notes the Draft Environmental Assessment (DEA) was published in the OEQC Environmental Notice on August 8, 2008. The FONSI was published in the OEQC's Environmental Notice on October 23, 2008. Staff notes the FEA can be challenged until November 23, 2008, thus CDUA approval is subject to a 9-day waiting period.

13-5-30 CRITERIA:

The following discussion evaluates the merits of the proposed land use by applying the criteria established in Section 13-5-30 HAR.

1) *The proposed use is consistent with the purpose of the Conservation District.*

The objective of the Conservation District is to conserve, protect and preserve the important natural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety and welfare.

Staff is of the opinion that the proposed action will increase structural density on a vacant parcel. The Haena area has been slowly developing with residential structures due to the 1967 court ordered subdivision and the subsequent BLNR policy of allowing one house per lot. The action is consistent with the existing uses and with the purpose of the Conservation District in this location. The area's natural resources will be preserved and potential impacts will be minimized, with mitigation measures.

2) *The proposed land use is consistent with the objectives of the Subzone of the land on which the use will occur.*

The objective of the Limited subzone is to limit uses where natural conditions suggest constraints on human activities.

Staff notes the proposed SFR is an identified land use within the Limited subzone, which is restrictive in nature regarding land use development. However, Staff notes that the proposed project has met the restrictive criteria and that adequate mitigation measures have been taken to the protected natural resources of the coastal area. The proposed SFR will need to obtain the BLNR's approval for a variance from the maximum height limit and the minimum side yard setbacks, in order to mitigate potential flooding and erosion.

In addition, the applicant will be required to sign and file an indemnity statement due to the potential coastal hazards attendant to the site.

3) *The proposed land use complies with the provisions and guidelines contained in Chapter 205A, HRS entitled "Coastal Zone Management", where applicable.*

The Kauai County Planning Department notes the proposed project lies within the Special Management Area (SMA) and construction of a SFR's is exempt from the County's SMA Regulations via letter dated August 20, 2008.

4) *The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region.*

Staff notes that the proposed project will not have any adverse impact to existing natural resources within the surrounding area, community or region, provided that adequate mitigation measures are implemented. The site is currently landscaped; however the applicant is proposing additional landscaping with the construction of fencing. Staff notes that the proposed project and accessory fence will not detract from the rural character of the area, which is developed with residential structures.

5) *The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels.*

Staff is of the opinion the proposed SFR will fit into the locality and surrounding areas since the area is currently developed with single-family residences.

6) *The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable.*

Staff notes the applicant has taken the appropriate steps to mitigate any potential impacts, and to maximize and enhance the natural beauty and open space characteristics of the subject parcel. The proposed project is intended to blend in visually with the surrounding area.

7) *Subdivision of land will not be utilized to increase the intensity of land uses in the Conservation District.*

The proposed project does not involve subdivision of Conservation District land.

8) *The proposed land use will not be materially detrimental to the public health, safety and welfare.*

The proposed action will not be materially detrimental to the public health, safety and welfare. Staff concurs with the applicant.

DISCUSSION:

Staff reiterates that the Board of Land Natural Resources (BLNR) 1981 policy that allows single-family residential use in the partitioned area located in the Limited subzone known as the "Haena Hui Subdivision." Haena Hui is different than other areas within the Conservation District due to its unique history.

In 1967, the Kauai Courts approved the Haena Hui Subdivision. This was done without the consent of the BLNR. The BLNR considered this issue in 1980 and determined that the individuals involved acted in good faith by applying to and following the dictates of the courts in the matter, albeit the oversight of the BLNR's requirements to first obtain a permit for subdivision. Following this chain of events, the BLNR adopted a policy that residential lots within Haena Hui subdivision (save for certain lots with poor developmental qualities, such as some beach lots) would qualify for one residential structure, subject to some special and standard conditions, which are herein incorporated.

Notwithstanding this policy, and notwithstanding a change in the policy by the BLNR, the BLNR still retains its discretionary authority over all matters with respect to land use within the Conservation District

The proposed use is an identified land use, pursuant to Section 13-5-23, Hawaii Administrative Rules (HAR), L-6, SINGLE FAMILY RESIDENCES, D-1." The applicant proposes to construct a 4,974 square foot elevated SFR, which includes 3,897 square feet of interior living space (four (4) bedrooms, four (4) 1/2 bathrooms, kitchen, study, laundry, kitchen, living/dining room, and dining/family room), and 584 square feet of screened lanai, approximately 493 square feet of exterior lanais, access stairwells, and a dumbwaiter. Staff notes the proposed SFR is still less than the maximum allowable size for a residence on a lot of one acre or more in the Conservation District, which is 5,000 square feet.

The applicant proposes to site the SFR 100 feet back from the Certified Shoreline and supports the rationale by calculating the average annual erosion rate for the subject parcel and using the "vegetation line" as the Shoreline Reference Feature. They discredit using the beach toes as statistically unreliable due to the extreme episodic and seasonal variability associated with the high winter surf.

EKNA Services provided additional analysis which challenges the statistical validity of the University of Hawaii study which the County, State, and community association found their recommendations. EKNA proposed that the shoreline setback for the proposed SFR be based on an equally weighted average of the adjusted historical annual erosion rates for both the beach toe and vegetation line; coming up with a weighted average figure of 84.1 feet. The applicant contends the proposed 100 foot setback still conservatively exceeds the 84.1 feet.

Staff notes what is at the heart of this matter is what is the BLNR's policy regarding using the toe as the industry standard in the State of Hawaii?

The OCCL notes using the toe is a statistically robust method of tracking the shoreline as validated by the University of Hawaii at Manoa, Department of Geology and Geophysics.

However, the coastal engineer proposes using the weighted average of the vegetation line and the toe. Staff notes that the use of a weighted average for using erosion rate data is **unprecedented** in Hawaii, and it is not clear that this is statistically valid method of computation.

Staff notes that the use of vegetation is of concern: 1) the vegetation line shows a widely different rate than the beach toe thus indicating it is not representative of the same long-term trends as the shoreline - this may be due to artificial growth and is subject to human-induced alterations (i.e. vegetation planting, sprinklers to encourage growth); 2) the "vegetation line" is under a thick tree canopy and cannot be seen readily using traditional aerial photography.

Should the standard be upheld, the BLNR would direct the landowner to setback the proposed SFR 130 feet from the Certified Shoreline. Staff notes: 1) according to Exhibit 4 it does not appear the subject parcel size would restrict this movement; 2) the Minimum Setback will still be met; 3) the SFR will be closer to Kuhio Highway; and 4) the SFR configuration will not be changed.

Staff recommends to the BLNR that a condition be assigned that any and all fencing and rock walls will be setback a minimum of 40 feet from the Certified Shoreline.

Staff also recommends to the BLNR that the HPD conditions be added to the permit if approved: 1) Archeological Data Recovery is recommended around archeological trenches 4 and 5 (prior to construction); 2) an approved data recovery plan shall be submitted to the HPD; 3) a qualified archeologists shall be onsite to monitor all subsurface disturbances; 4) prior to construction an approved archeological monitoring shall be submitted to HPD; and 5) a draft monitoring report shall be submitted 180 days after the completion of fieldwork for review and approval to the HPD.

The applicant will preserve the natural beauty and open space characteristics of the subject parcel around the SFR with appropriate building design and landscaping, thus staff is of the opinion that the proposed SFR will not result in substantial adverse impacts to natural resources. Staff notes that the site is currently landscaped; however the applicant is proposing additional landscaping with the construction of fencing. The OCCL recommends to the Board of Land and Natural Resources that the applicant will utilize native vegetation for landscaping purposes.

Staff requests that the BLNR approve the applicants request for a variance of five feet from the maximum height limit of twenty-five (25) feet, pursuant to HAR, Chapter 13-5, Section 13-5-41(a), SINGLE FAMILY RESIDENCES; STANDARDS, which notes "the maximum height of the building shall not exceed twenty-five feet, measured from the highest point of the roof structure, down to the lower of the existing or finished grade at the lowest corner of the building." Staff recommends the BLNR approve the request for a five foot variance to meet Federal and County flood regulations, pursuant to HAR, Chapter 13-5, Section 13-5-41(a). Similar variances have been granted for single-family residences in Haena.

Staff comments that there is significant potential for fugitive dust to be generated during the proposed action, and may impact nearby residents. It is recommended that a dust control management plan be developed which identifies and addresses those activities that have a

potential to generate fugitive dust. In addition, construction activities must comply with provisions of HAR, Section 11-60.1-33 on Fugitive Dust.

Staff notes the contractor should provide adequate means to control dust from road areas and during the various phases of construction activities, including by not limited to: 1) planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing material transfer points and on-site vehicular traffic routes, and locating potentially dusty equipment in areas of the least impact; 2) providing an adequate water source at the site prior to start-up of construction activities; 3) landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase; 4) controlling of dust from shoulders, project entrances, and access roads; 5) and providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities.

Staff notes the FONSI was published in the OEQC's Environmental Notice on October 23, 2008. The FEA can be challenged until November 23, 2008; 9 days after the Board of Land and Natural Resources meeting. Staff recommends to the Board of Land and Natural Resources that a condition be inserted that approval of CDUA KA-3472 is subject to full compliance with HRS, Chapter 343.

Therefore, staff recommends the following:

RECOMMENDATION:

That the Board of Land and Natural Resources APPROVE CDUA KA-3472 for the proposed Jess Jackson and Barbara Banke Single Family Residence, located in Haena District, Island of Kauai, subject to the following terms and conditions:

1. The applicant shall comply with all applicable statutes, ordinances, rules, and regulations of the federal, State and county governments, and the applicable parts of Section 13-5-42, HAR;

2. The applicant, its successors and assigns, shall indemnify and hold the State of Hawaii harmless from and against any loss, liability, claim or demand for property damage, personal injury or death arising out of any act or omission of the applicant, its successors, assigns, officers, employees, contractors and agents under this permit or relating to or connected with the granting of this permit;

3. The applicant shall comply with all applicable Department of Health administrative rules. Particular attention should be paid to Hawaii Administrative Rules (HAR), Section 11-60.1-33, "Fugitive Dust" and to Chapter 11-46, "Community Noise Control," and Chapter 11-54 National Pollutant Discharge Elimination System;

4. Before proceeding with any work authorized by the Board, the applicant shall submit four copies of the construction plans and specifications to the Chairperson or his authorized representative for approval for consistency with the conditions of the permit and the declarations set forth in the permit application. Three copies will be returned to the

applicant. Plan approval by the Chairperson does not constitute approval required from other agencies;

5. Any work or construction to be done on the land shall be initiated within one and a half years of the approval of such use, in accordance with construction plans that have been approved by the Department; further, all work and construction must be completed within three and a half years of the approval;

6. That the landowner will located the proposed Single Family Residence 130 feet from the Certified Shoreline;

7. That any and all fencing and rock walls will be setback a minimum of 40 feet from the Certified Shoreline to allow for lateral public access;

8. That the applicant will adhere to the following Historic Preservation Division conditions: 1) Archeological Data Recovery is recommended around archeological trenches 4 and 5 - prior to construction; 2) an approved data recovery plan shall be submitted to the HPD; 3) a qualified archeologists shall be onsite to monitor all subsurface disturbances; 4) prior to construction an approved archeological monitoring shall be submitted to HPD; and 5) a draft monitoring report shall be submitted 180 days after the completion of fieldwork for review and approval to the HPD;

9. That the Single Family Dwelling shall not be used for rentals or any other commercial purposes unless approved by the Board of Land and Natural Resources; and

10. That the applicant will utilize native vegetation for landscaping purposes;

11. The applicant shall notify the Office of Conservation and Coastal Lands in writing prior to the initiation, and upon completion, of the project;

12. Where any interference, nuisance, or harm may be caused, or hazard established by the use, the applicant shall be required to take measures to minimize or eliminate the interference, nuisance, harm, or hazard;

13. The applicant will use Best Management Practices for the proposed project;

14. The applicant will give preference towards using native plants for the remaining landscape work, and that prior to any construction the applicant will submit a landscape plan for the Office of Conservation and Coastal Land's approval;

15. The applicant understands and agrees that this permit does not convey any vested rights or exclusive privilege;

16. In issuing this permit, the Department and Board have relied on the information and data that the applicant has provided in connection with this permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete or

inaccurate, this permit may be modified, suspended or revoked, in whole or in part, and/or the Department may, in addition, institute appropriate legal proceedings;

17. In the event that unrecorded historic remains (i.e., artifacts, or human skeletal remains) are inadvertently uncovered during construction or operations, all work shall cease in the vicinity and the applicant shall immediately contact the State Historic Preservation Division;

18. The applicant shall provide documentation (i.e. book/page document number) that this approval has been placed in recordable form as a part of the deed instrument, prior to submission for approval of subsequent construction plans;

14. That the applicant shall execute a waiver and indemnity prior to construction plan approval that is satisfactory to the Department;

15. That the Board approve the request for a five foot Maximum Height Limit variance to meet Federal and County flood regulations, and a five foot variance from the minimum side yard setbacks to accommodate long-term erosion hazards;

16. That the approval of CDUA KA-3472 is subject to full compliance with HRS, Chapter 343;

17. That the approval of CDUA KA-3472 is subject to a 9-day waiting period until November 23, 2008 should there be a challenge the FONSI pursuant to Chapter 343, HRS;

18. Other terms and conditions as may be prescribed by the Chairperson; and

19. That failure to comply with any of these conditions may render this Conservation District Use Permit null and void.

Respectfully Submitted,

Dawn T. Hegger
Senior Staff Planner

By: _____
Laura H. Thielen, Chairperson
Board of Land and Natural Resources

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

OCT - 5 1998

Ref.:PB:THE

File No.: CDUA KA-2897

Mr. Larry Smith
P.O. Box 1680
Hanalei, Hawaii 96714

Dear Mr. Smith,

I am pleased to inform you that on October 1, 1998, the Chairperson of the Department of Land and Natural Resources approved your Conservation District Use Application for reconstruction of the existing fence at Haena, Kauai (TMK [4]5-9-05:28), subject to the following conditions:

1. The applicant shall comply with all applicable statutes, ordinances, rules, regulations, and conditions of the federal, State and County governments, including the standard conditions established in Section 13-5-42, Hawaii Administrative Rules;

2. The applicant shall comply with all applicable County administrative rules relating to the shoreline setback;

3. All mitigation measures set forth during the application process for this project are hereby incorporated as conditions of approval;

4. The fence shall not be located seaward of the top of the slope descending to the beach.

5. Prior to any ground disturbing activity, the applicant shall contact the State Historic Preservation Division (SHPD) to determine if there are historic/cultural concerns regarding the project. If historic/cultural remains such as archaeological artifacts, charcoal deposits or human burials are found during construction, the applicant shall stop work in the area, and immediately contact the SHPD and/or the Kauai District Archaeologist to determine the appropriate action.

6. The applicant shall make a reasonable effort to relocate the neighbor's existing fence that separates the subject Lot 34 and the adjoining Lot 35 back onto Lot 35;

7. The applicant shall notify the Department when the project is initiated and shall submit photographs of the work, referencing this permit by file number (KA-2897), when the project is completed;

EXHIBIT 1

8. Project-related work on the land shall be initiated within one (1) year from the date of this approval, and all project work must be completed within three (3) years of the approval;

9. That in issuing this permit, the Department has relied on the information and data that the permittee has provided in connection with this permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete or inaccurate, this permit may be modified, suspended or revoked, in whole or in part, and/or the Department may, in addition, institute appropriate legal proceedings;

10. The applicant, its successors and assigns, shall indemnify and hold the State of Hawaii harmless from and against any loss, liability, claim or demand for property damage, personal injury or death arising out of any act or omission of the applicant, its successors, assigns, officers, employees, contractors and agents under this permit or relating to or connected with the granting of this permit;

11. That failure to comply with any of these conditions may render this Conservation District Use Permit null and void; and

12. Other terms and conditions as prescribed by the Chairperson.

Please acknowledge receipt of this approval, with the above noted conditions, in the space provided below. Please sign two copies, retain one copy, and return the other copy within thirty days.

Should you have any questions regarding these conditions, please contact Tom Eisen of our Planning Branch at (808) 587-0386.

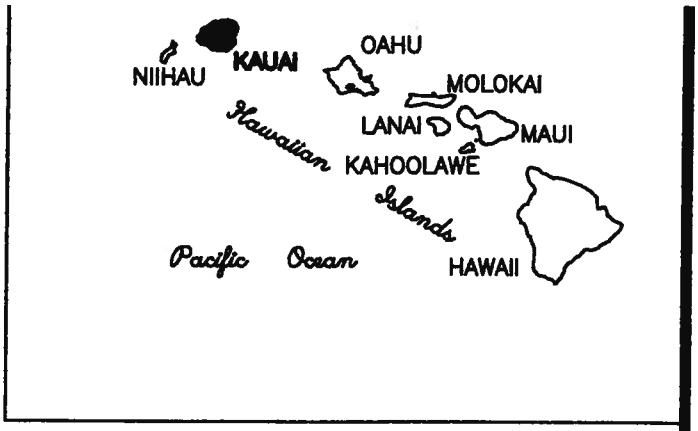
Sincerely,

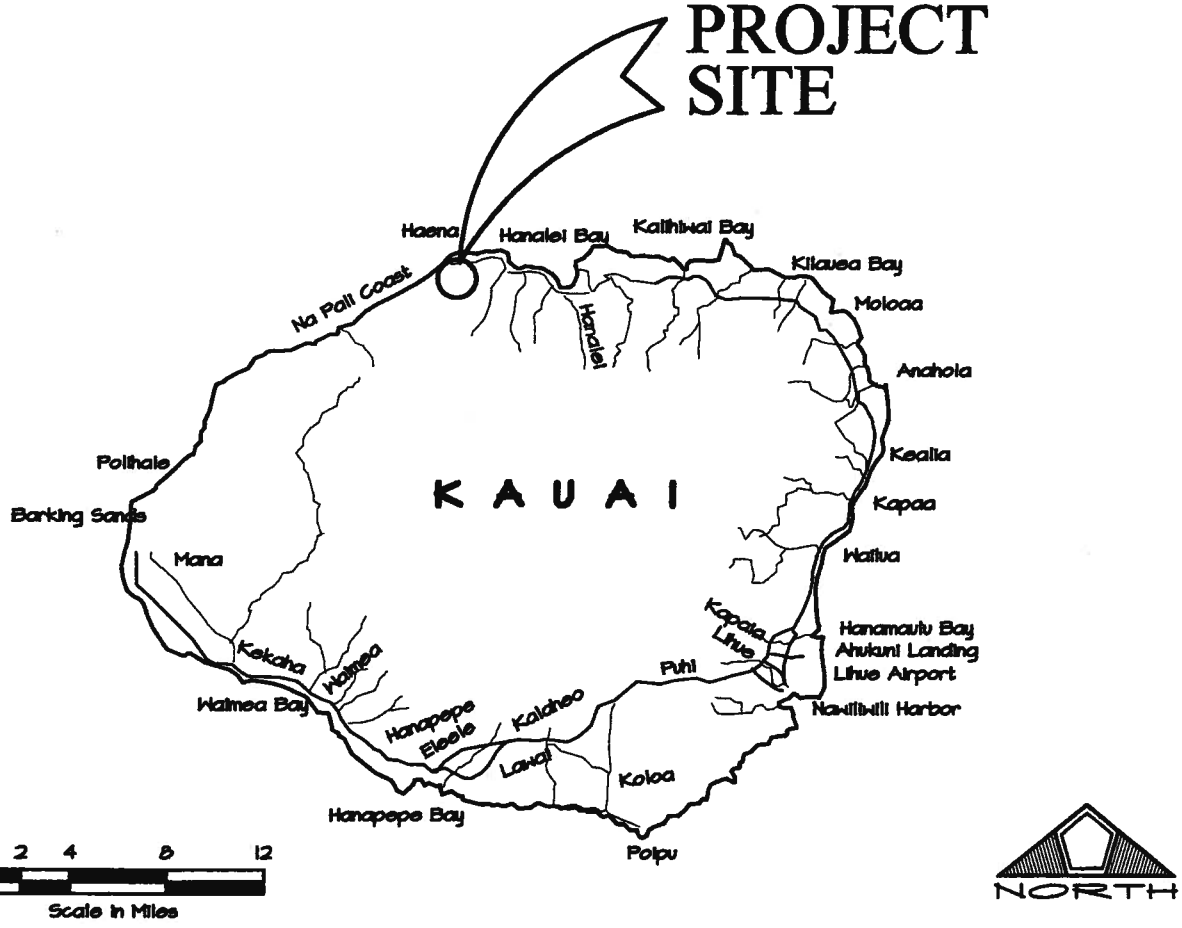
DEAN Y. UCHIDA, Administrator
Land Division

Receipt acknowledged:

_____
Applicant's Signature and Date

cc: Chairperson's office
Kauai Board member
KDLO/SHPD
County of Kauai Planning Department
Catherine Bartmess
Mary M. Cooke

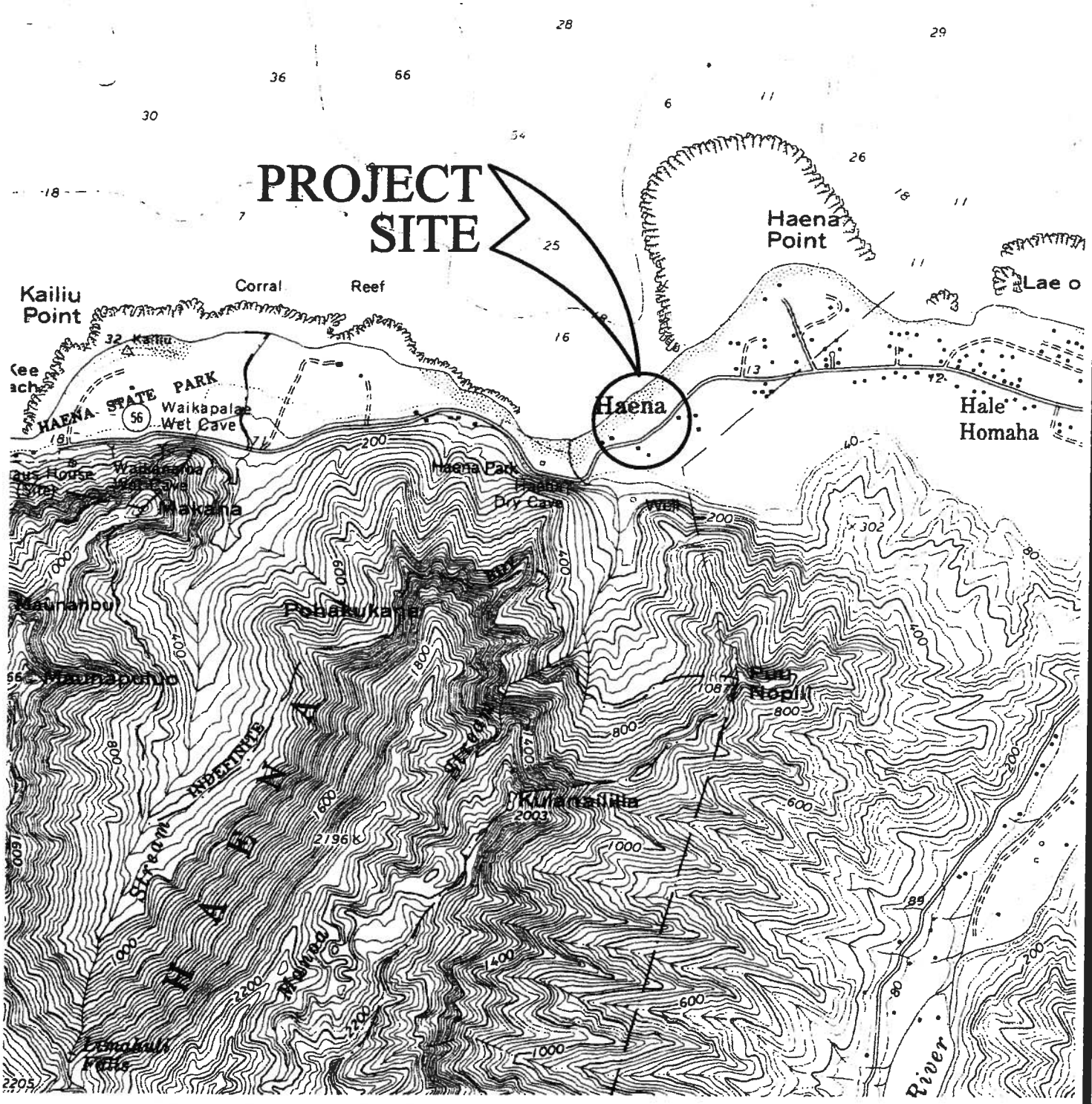




VICINITY MAP

JACKSON / BANKE SINGLE FAMILY RESIDENCE
T.M.K. (4) 5-9-05:028
HAENA, KAUAI, HAWAII

EXHIBIT 2

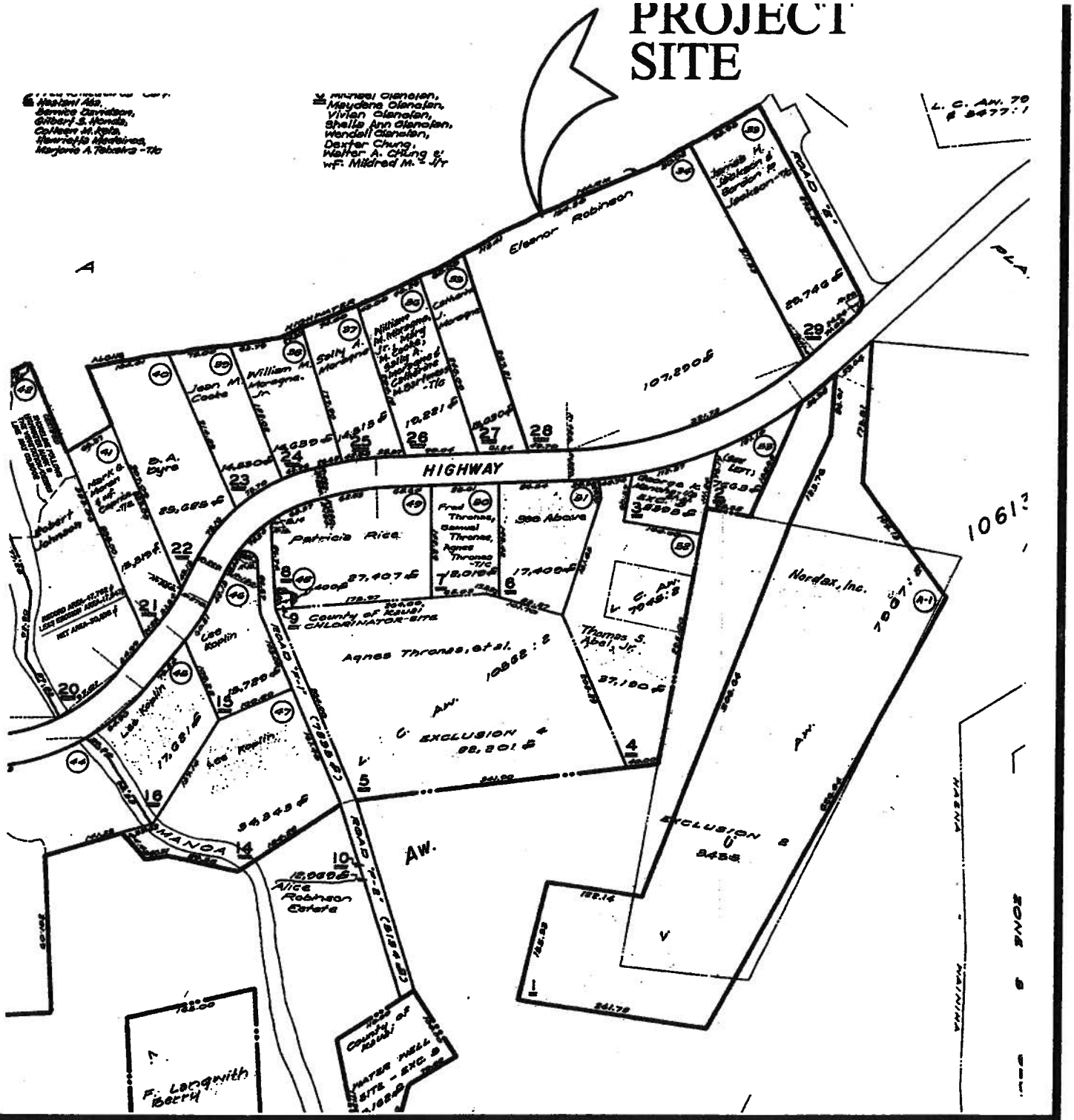


LOCATION MAP

JACKSON / BANKE SINGLE FAMILY RESIDENCE
T.M.K. (4) 5-9-05:028
HAENA, KAUAI, HAWAII

NORTH

EXHIBIT 2



TAX MAP (4) 5-9 -05:28

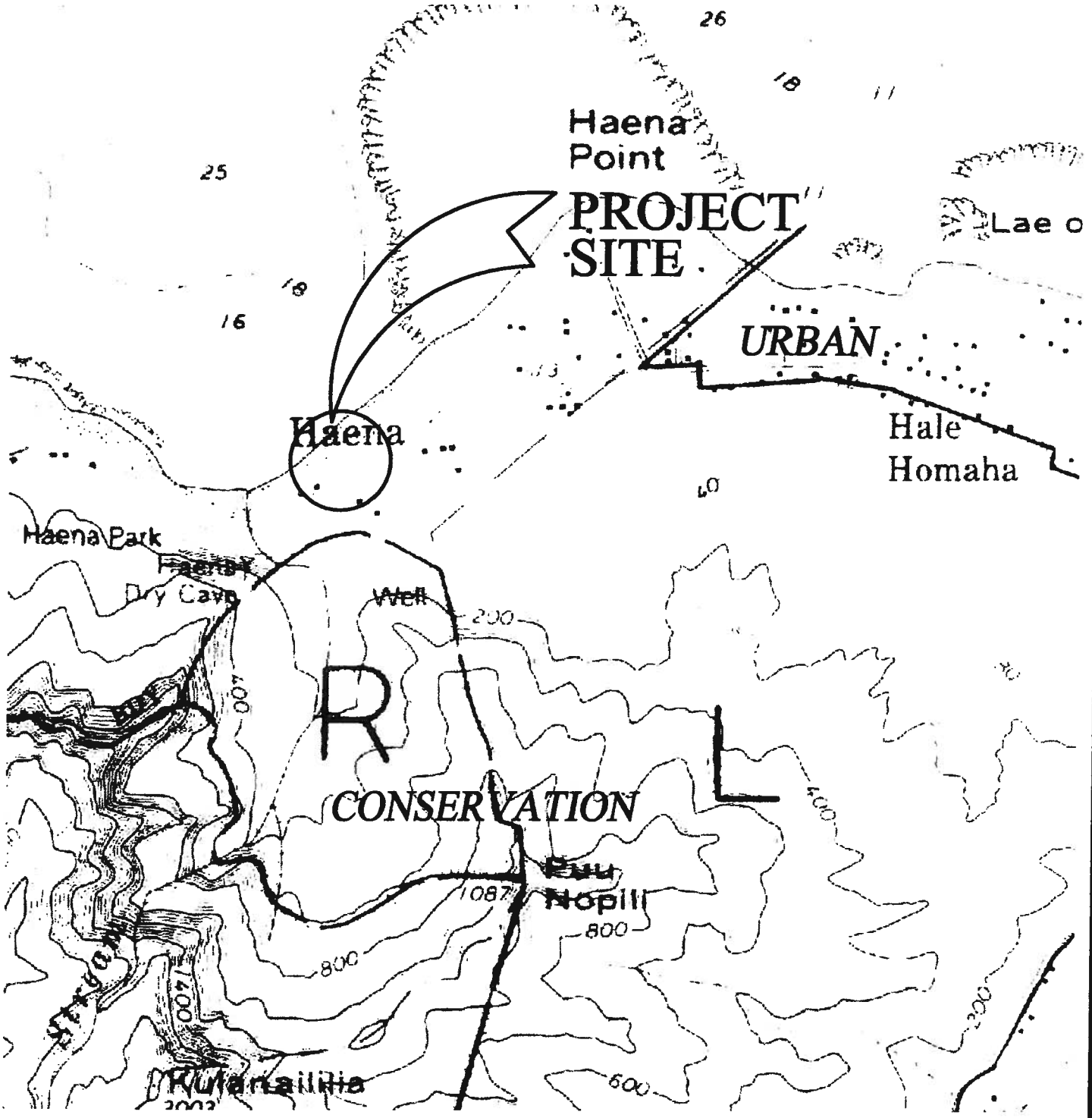
JACKSON / BANKE SINGLE FAMILY RESIDENCE

T.M.K. (4) 5-9-05:028

HANA, KAUAI, HAWAII

NORTH

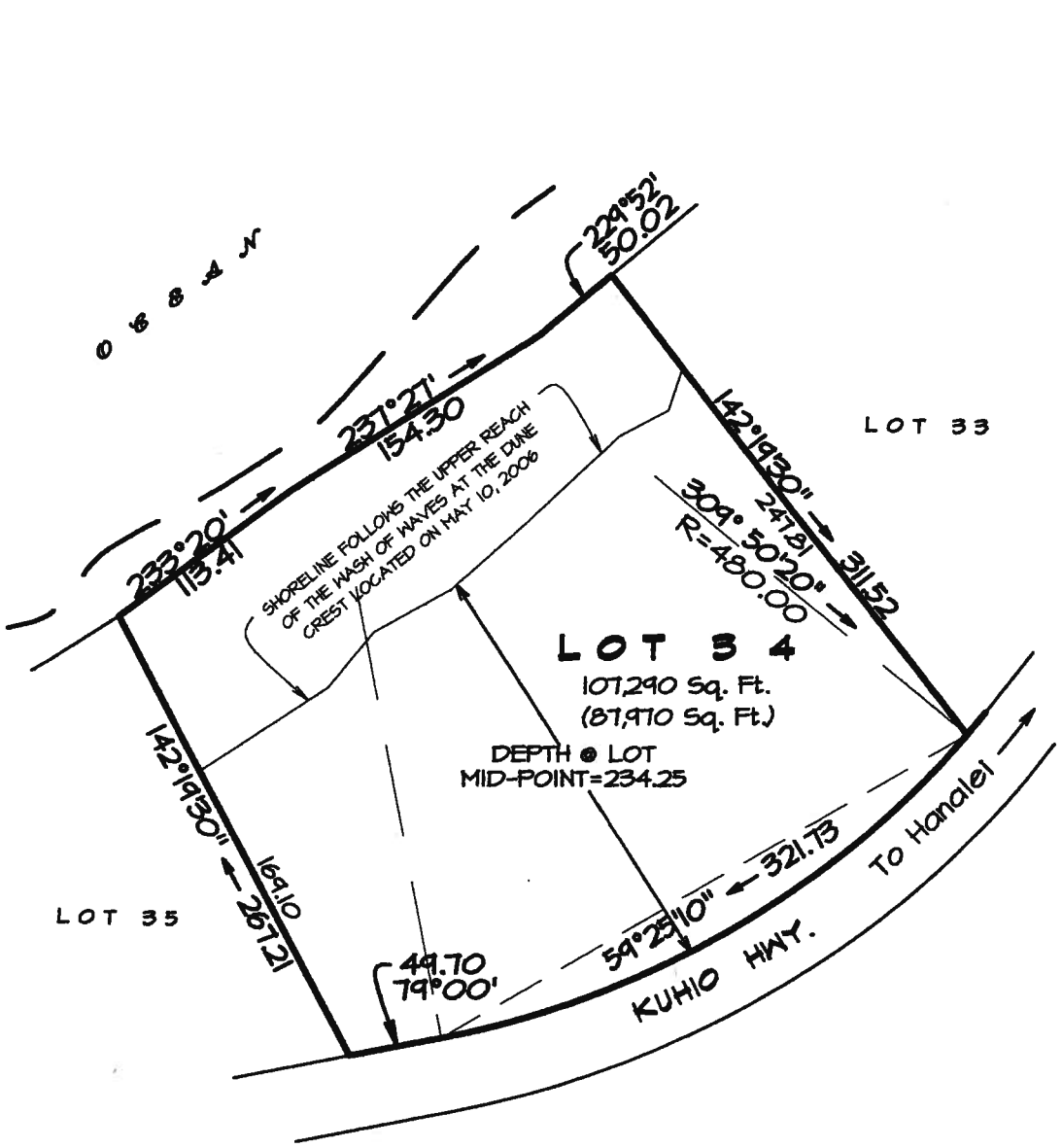
EXHIBIT 3



STATE CONSERVATION DISTRICT SUBZONE MAP

JACKSON / BANKE SINGLE FAMILY RESIDENCE
T.M.K. (4) 5-9-05:028
HAENA, KAUA'I, HAWAI'I

EXHIBIT 2



AVERAGE LOT DEPTH = (169.10+234.25+247.81)/3 = 217.05

100 0 100

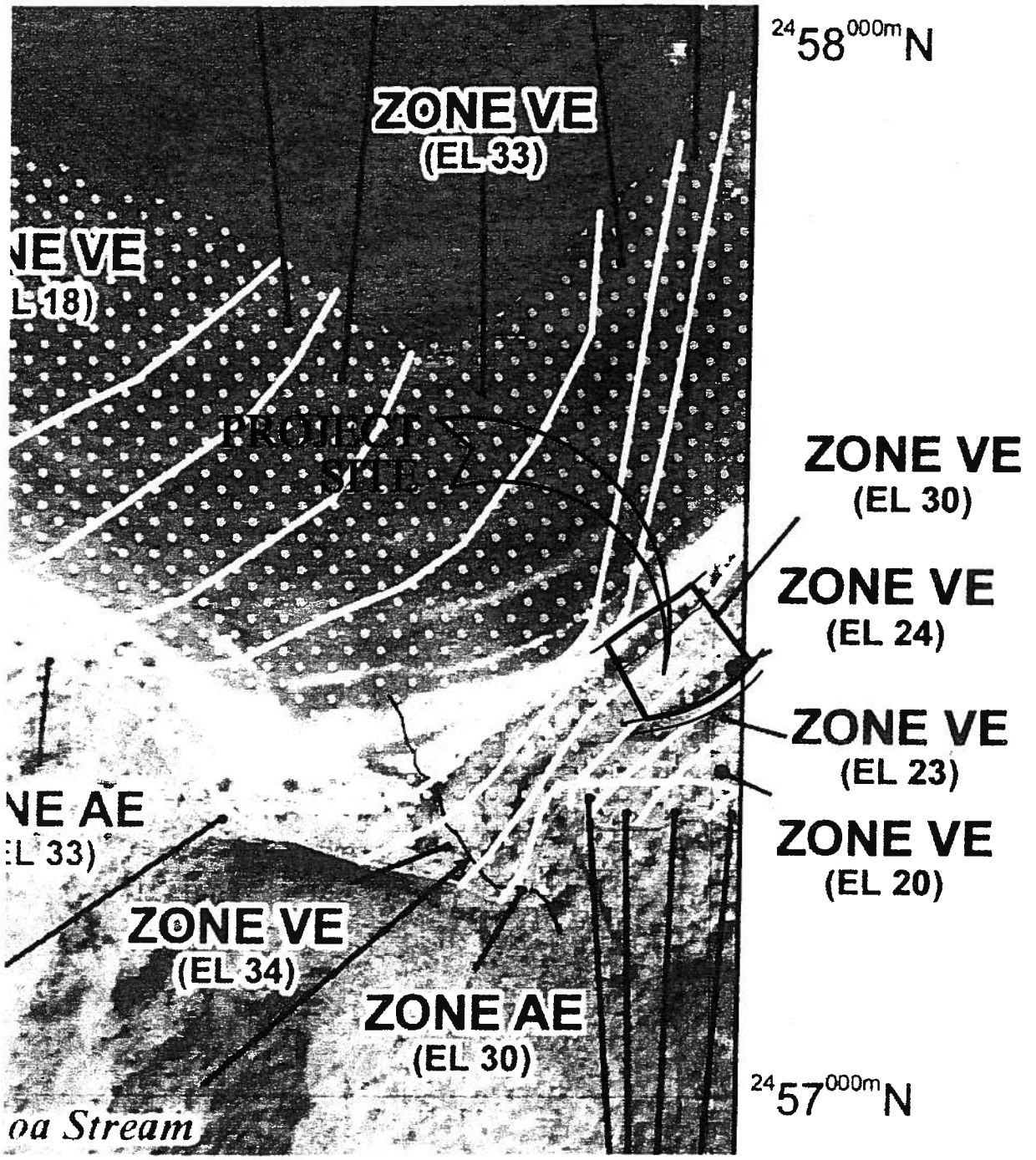
Graphic Scale In Feet

AVERAGE LOT DEPTH CALCULATION

EXHIBIT 4

JACKSON / BANKE SINGLE FAMILY RESIDENCE
T.M.K. (4) 5-9-05:028
HANA, KAUAI, HAWAII

Wagner Engineering Services, Inc.
P.O. Box 851 Hanalei, HI 96714 (808) 826-7256



SUBJECT PARCEL LIES WITHIN FLOOD ZONE VE 24, VE 30, AND VE 34, COASTAL HIGH HAZARD AREA SUSCEPTIBLE TO TSUNAMI INUNDATION PER FIRM MAP # 1500020030 E DATED SEPTEMBER 16, 2005

NORTH

FLOOD ZONE MAP

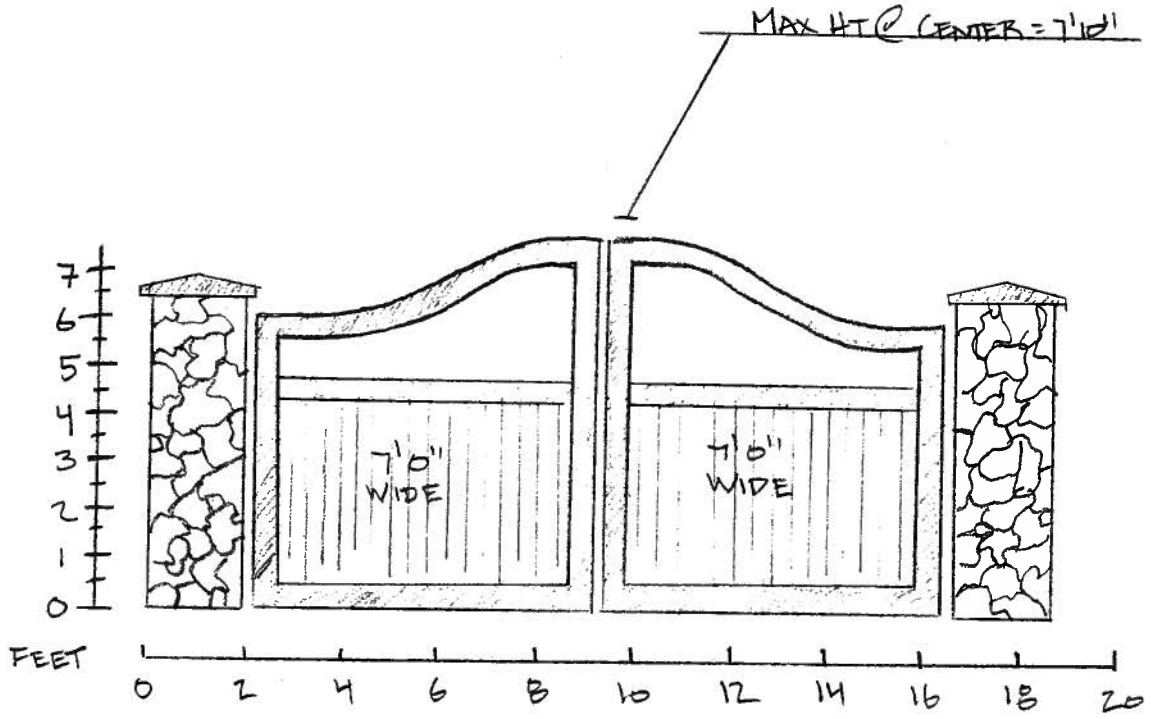
JACKSON / BANKE SINGLE FAMILY RESIDENCE
T.M.K. (4) 5-9-05:028
HAENA, KAUA'I, HAWAI'I

500 0 500
Graphic Scale In Feet

EXHIBIT 7

EXHIBIT 4

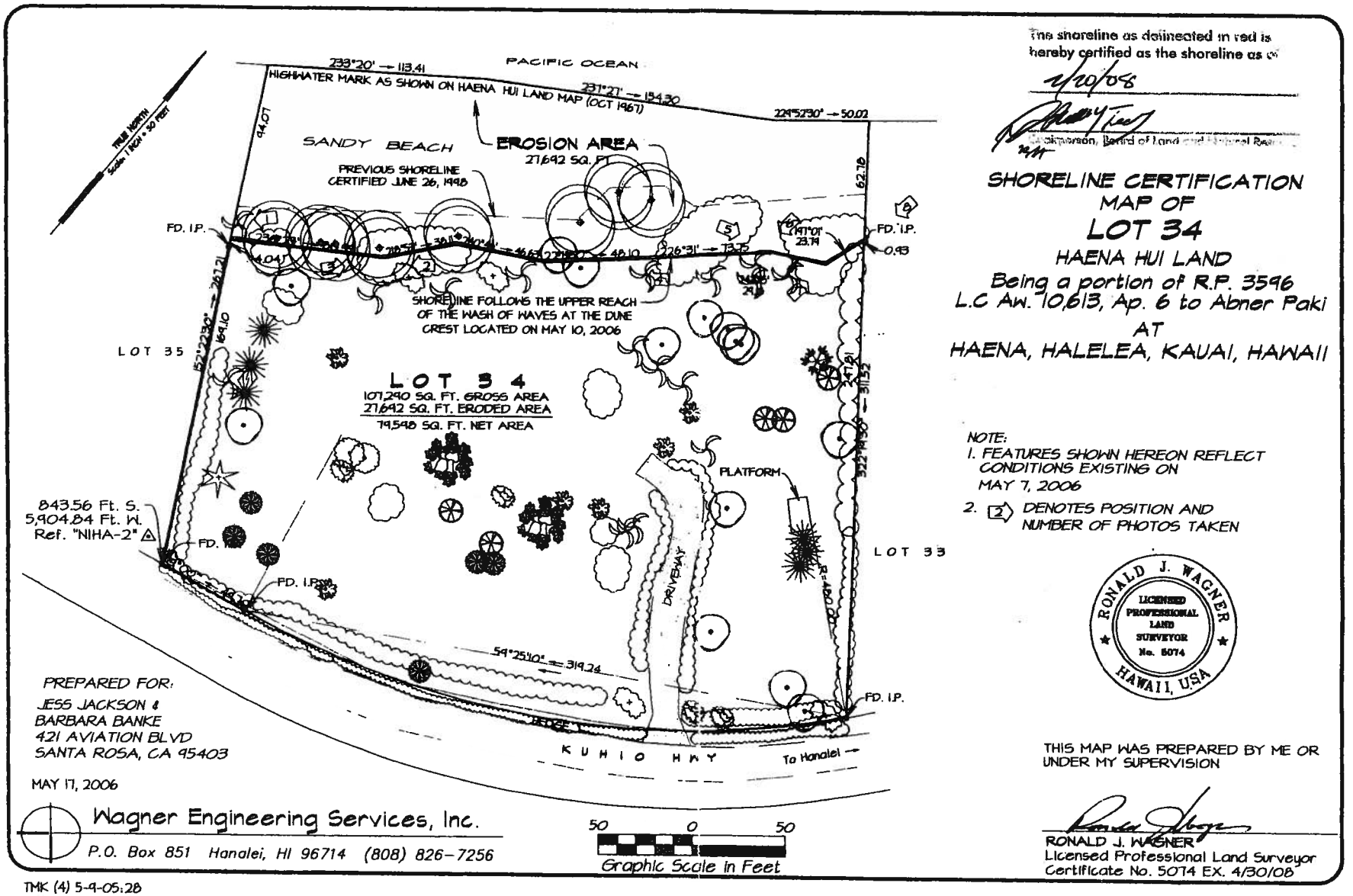
Vehicular Gate Representation
Jackson/Banke Residence



NOTE: Design and exact dimensions are approximate

Jackson/Banke Single Family Residence
TMK (4) 5-9-05: 028
Haena, Kauai, Hawaii

EXHIBIT 4



The shoreline as delineated in red is hereby certified as the shoreline as of

2/20/08

Chairperson, Board of Land and Natural Resources

SHORELINE CERTIFICATION MAP OF LOT 34

HAENA HUI LAND

Being a portion of R.P. 3596
L.C Aw. 10,613, Ap. 6 to Abner Paki

AT

HAENA, HALELEA, KAUAI, HAWAII

NOTE:
1. FEATURES SHOWN HEREON REFLECT CONDITIONS EXISTING ON MAY 7, 2006
2. [2] DENOTES POSITION AND NUMBER OF PHOTOS TAKEN

RONALD J. WAGNER
LICENSED PROFESSIONAL LAND SURVEYOR
No. 5074
HAWAII, USA

THIS MAP WAS PREPARED BY ME OR UNDER MY SUPERVISION

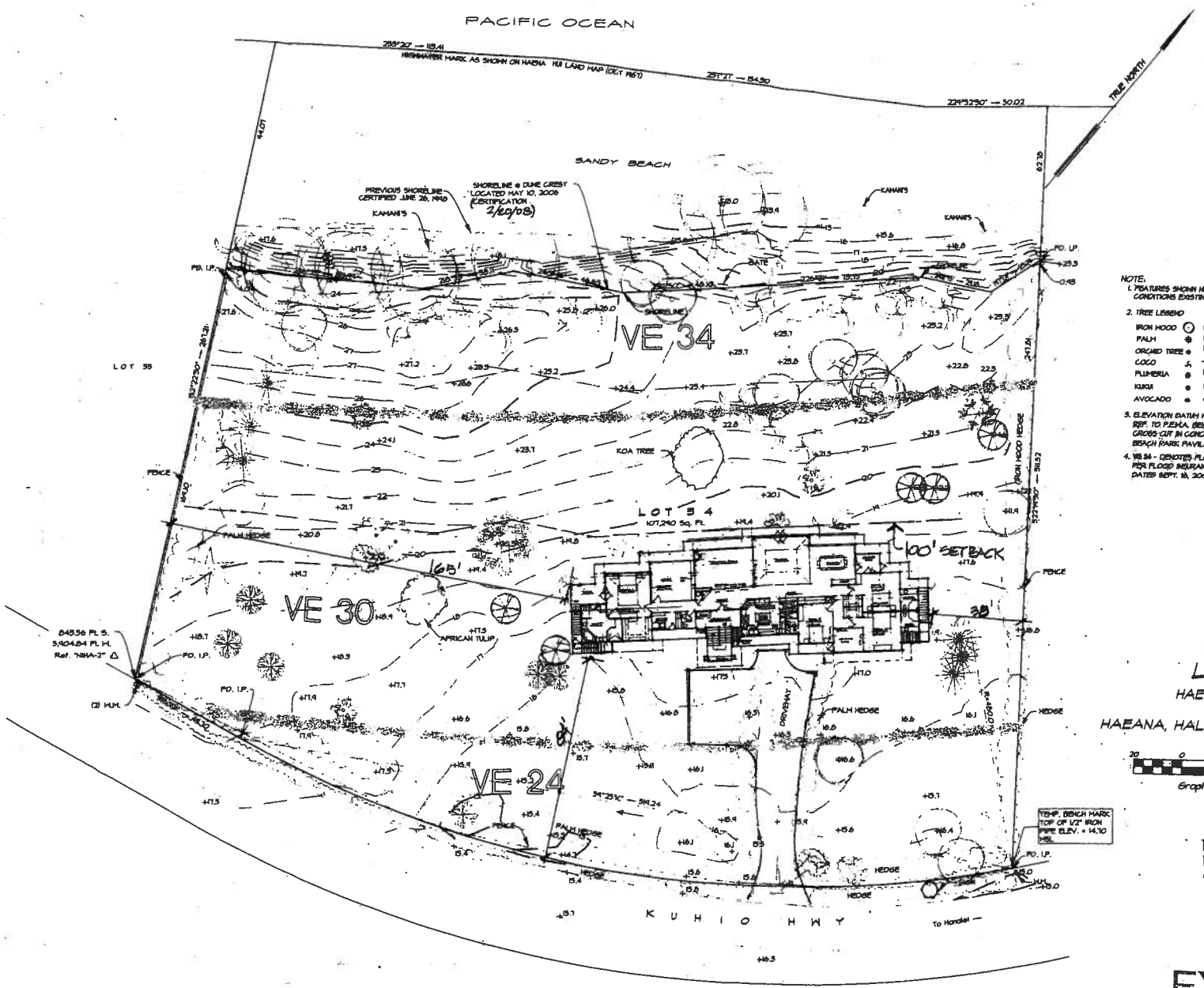
RONALD J. WAGNER
Licensed Professional Land Surveyor
Certificate No. 5074 EX. 4/30/08

PROJECT NUMBER 4239

REDUCED – NOT TO SCALE

SHORELINE CERTIFICATION MAP – CERTIFIED 2/20/2008
JACKSON/BANKE SINGLE FAMILY RESIDENCE
T.M.K. (4) 5-9-05: 028
HAENA, KAUAI, HAWAII

EXHIBIT 4



SITE PLAN

JACKSON/BANKE
SINGLE FAMILY RESIDENCE
HAENA, KAUAI, HAWAII
T.M.K. (4th) 5-9-05:028

NOTE:
1. FEATURES SHOWN HEREON REFLECT CONDITIONS EXISTING ON APRIL 10, 2006
2. TREE LEGEND

IRON WOOD	○	BREAD FRUIT	⊛
PALM	✱	MANGO	⊙
ORCHID TREE	●	KAMANI	⊙
COCO	⅄	JAVA PLUM	○
PLUMERIA	✱	NONI	✱
KUKUI	●	RUBBER	▯
AVOCADO	●	CITRUS	●↓

3. ELEVATION DATUM MEAN SEA LEVEL (MSL) REF. TO P.E.H.A. BENCH MARK RH 53, CROSS CUT IN CONC. SLAB, S.E. CORNER HAENA BEACH PARK PAVILION ELEV.=16.41
4. VE 34 - DENOTES FLOOD ZONE AND BASE FLOOD ELEVATION PER FLOOD INSURANCE RATE MAP (FIRM) PANEL #15000C0090 E DATED SEPT. 16, 2009

LOT 34
HAENA HUI LAND
AT
HAENA, HALELEA, KAUAI, HAWAII

20 0 20 60
Graphic Scale in Feet

BASE MAP & TOPO DATA BY WAGNER ENGINEERING SERVICES, INC.

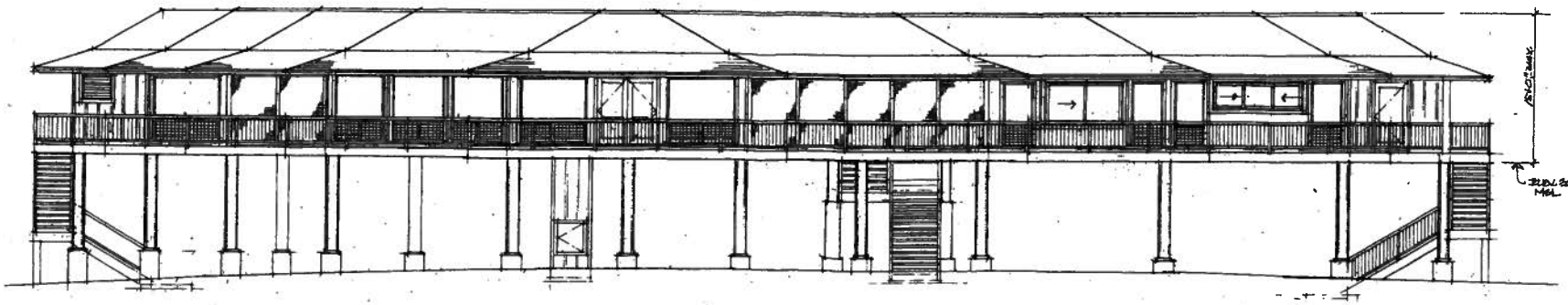
TIMOTHY M. BRADLEY REGISTERED PROFESSIONAL ARCHITECT No. 5124 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
Timothy M. Bradley

TIM BRADLEY, ARCHITECT
INNOVATIVE ISLAND ARCHITECTURE
P. O. BOX 797, KAPAA, KAUAI, HI 96746
Phone: (808) 821-9727 FAX: (808) 821-9726

EXHIBIT 4

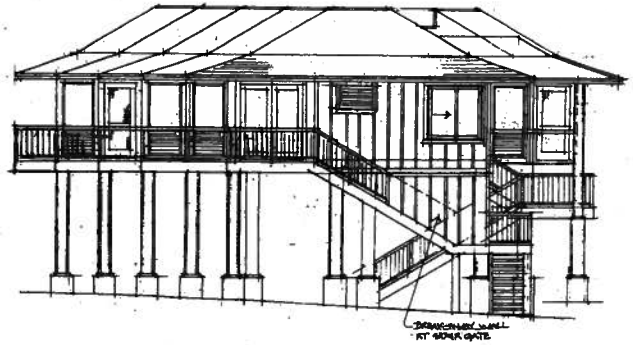
EXHIBIT 4



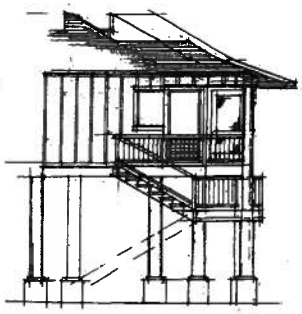
NORTHWEST ELEVATION (REAR, HAENA-GREEN)

GRAPHIC SCALE IN FEET

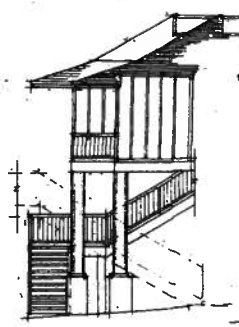
0 5 10 20



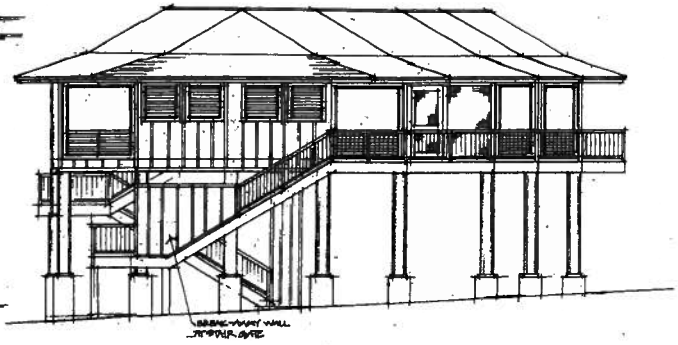
SOUTHWEST ELEVATION (LEFT SIDE)



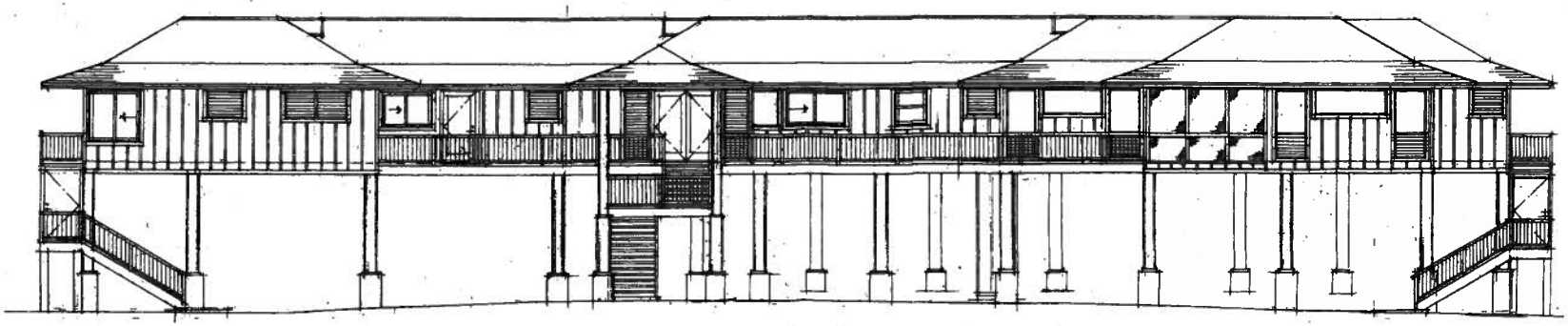
RIGHT SIDE AT ENTRY



LEFT SIDE AT ENTRY



NORTHEAST ELEVATION (RIGHT SIDE)



SOUTHEAST ELEVATION (FRONT, HIGHWAY SIDE)

TIM BRADLEY, ARCHITECT
INNOVATIVE ISLAND ARCHITECTURE
P. O. BOX 797, KAPAA, KAUAI, HI 96746
Phone: (808) 821-9727 FAX: (808) 821-9726

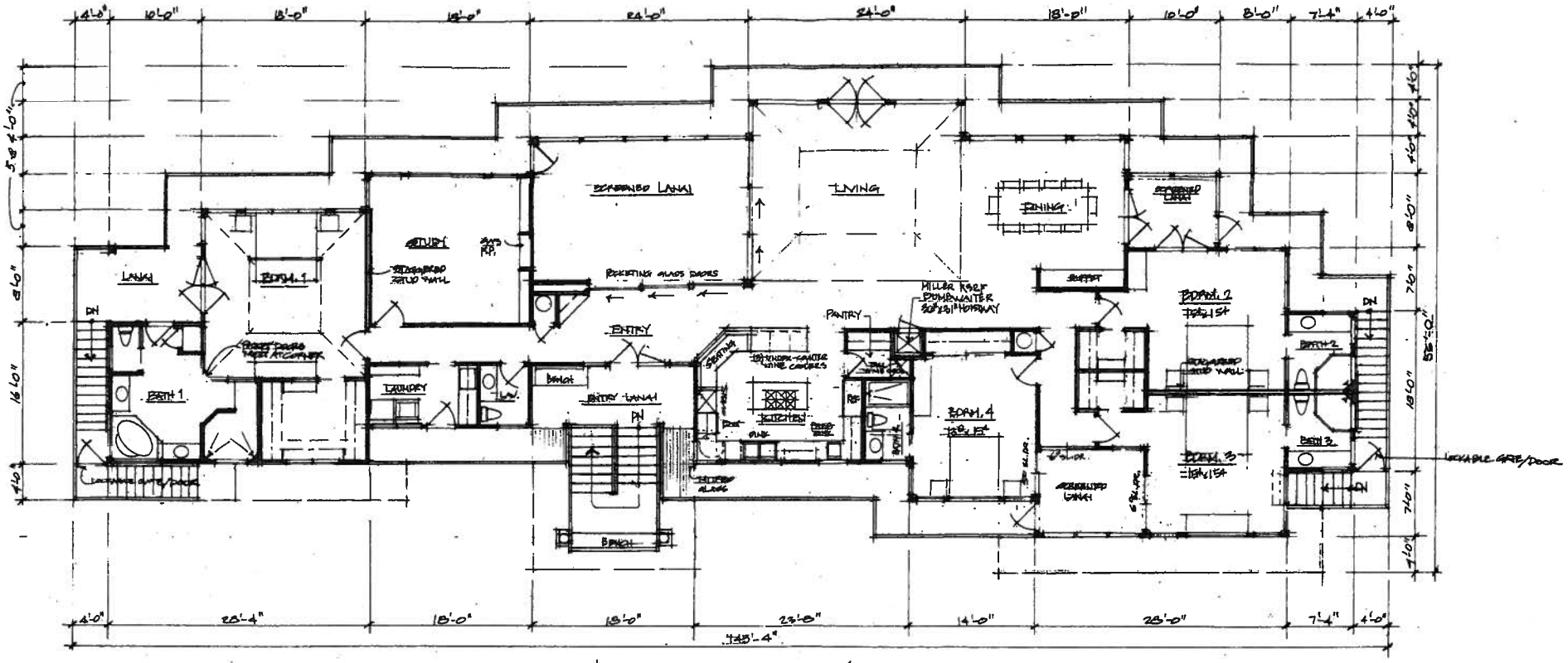
Proposed New Residence for:
Jess Jackson & Barbara Banke
Kuhio Highway, Haena, Kauai, Hawaii
Tax Map Key #(4th) 5-9-05: 28, Lot 34

DATE	REV.	ISSUED FOR

JOB NO.

DRAWING NUMBER 5

SHEET 5 OF 5



GRAPHIC SCALE IN FEET

0 10 20 40

NORTH

FLOOR PLAN

3,897 SQ.FT. INTERIOR
584 SQ.FT. SCREENED LANAIS
378 SQ.FT. LANAI, PORCH & STAIR
4,859 SQ.FT. TOTAL

TIM BRADLEY, ARCHITECT
INNOVATIVE ISLAND ARCHITECTURE
P. O. BOX 797, KAPAA, KAUAI, HI 96746
Phone: (808) 821-9727 FAX: (808) 821-9726

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION. SUPERVISION OF CONSTRUCTION AS DEFINED IN SECTION 1.2(h) OF THE RULES AND REGULATIONS OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND SURVEYORS OF THE STATE OF HAWAII.

TIMOTHY M. BRADLEY REGISTERED PROFESSIONAL ARCHITECT No. 5124 HAWAII, U.S.A.

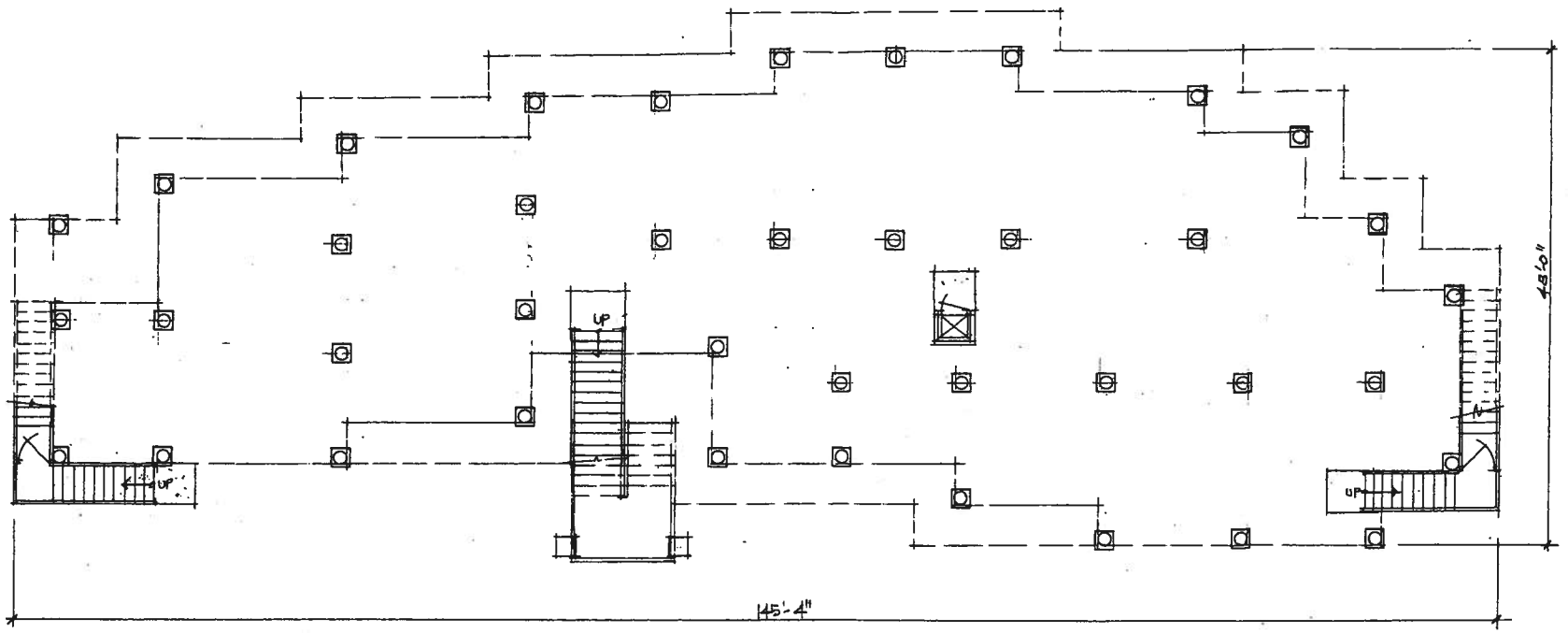
Timothy M. Bradley 9/29/08

Proposed New Residence for:

Jess Jackson & Barbara Banke

Kuhio Highway, Haena, Kauai, Hawaii
Tax Map Key #(4th) 5-9-05: 28, Lot 34

EXHIBIT 4



GRAPHIC SCALE IN FEET

0 10 20 40

NORTH

GROUND LEVEL PLAN

1115 SQ.FT. (STAIRS, LANDING SLABS & PUMPWATER)

TIM BRADLEY, ARCHITECT
INNOVATIVE ISLAND ARCHITECTURE
P. O. BOX 797, KAPAA, KAUAI, HI 96746
Phone: (808) 821-9727 FAX: (808) 821-9726

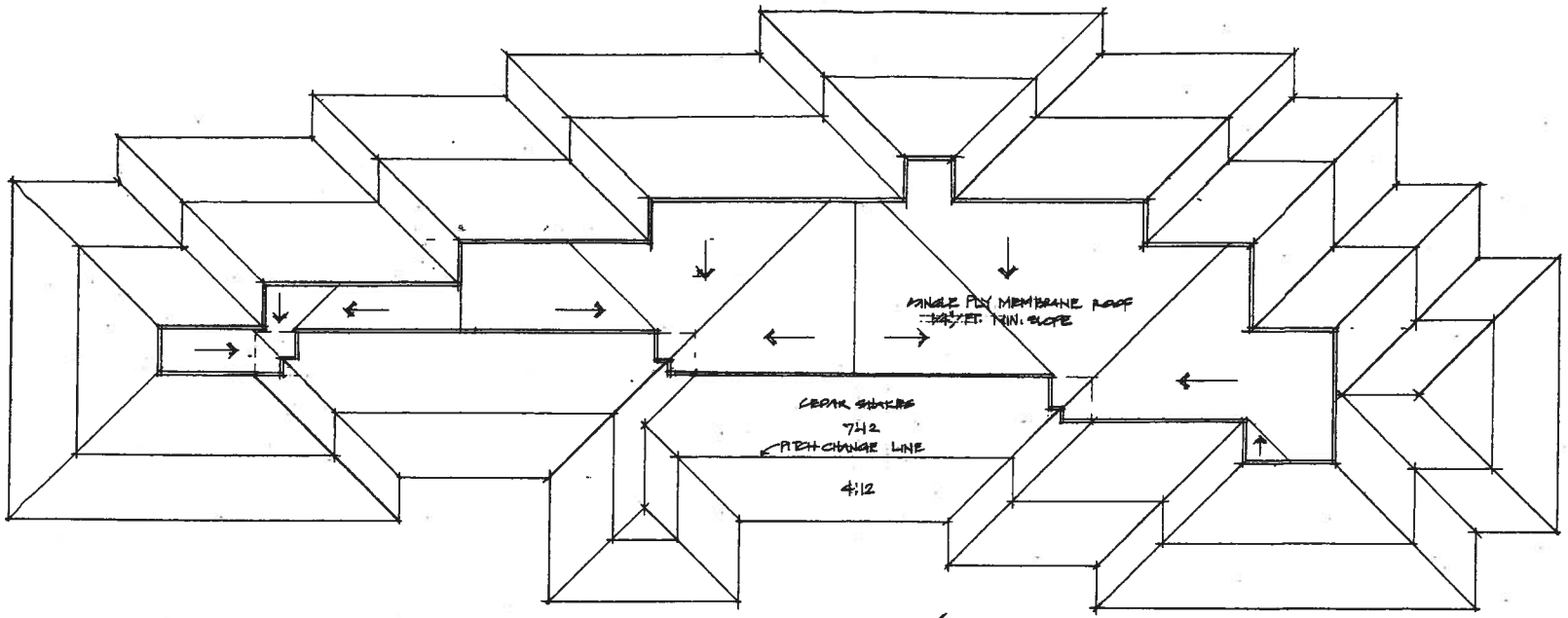
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION. (SUPERVISION OF CONSTRUCTION AS DEFINED IN SECTION 13(h) OF THE RULES AND REGULATIONS OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND SURVEYORS OF THE STATE OF HAWAII.)

TIMOTHY M. BRADLEY REGISTERED PROFESSIONAL ARCHITECT No. 3124 HAWAII, U.S.A.

Timothy M. Bradley 9/30/08

Proposed New Residence for:
Jess Jackson & Barbara Banke
Kuhio Highway, Haena, Kauai, Hawaii
Tax Map Key #(4th) 5-9-05: 28, Lot 34

EXHIBIT 4



ROOF PLAN

TIM BRADLEY, ARCHITECT
INNOVATIVE ISLAND ARCHITECTURE
P. O. BOX 797, KAPAA, KAUAI, HI 96746
Phone: (808) 821-9727 FAX: (808) 821-9726

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION. (SUPERVISION OF CONSTRUCTION AS DEFINED IN SECTION 1.2(h) OF THE RULES AND REGULATIONS OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND SURVEYORS OF THE STATE OF HAWAII.)

TIMOTHY M. BRADLEY REGISTERED PROFESSIONAL ARCHITECT No. 5124 HAWAII, U.S.A.

Timothy M. Bradley 9/29/06

Proposed New Residence for:
Jess Jackson & Barbara Banke
Kuhio Highway, Haena, Kauai, Hawaii
Tax Map Key #(4th) 5-9-05: 28, Lot 34

EXHIBIT 4

Open Lawn & Existing Vegetation

Open Lawn & Existing Vegetation

Mountain View Looking Southwest

Shoreline Interface

View of Subject Parcel From Beach

Ironwoods at Shoreline Interface

Entrance to Parcel Along Kuhio Highway

Existing Landscape Screening Along Kuhio Highway

View of Parcel Looking Westward

SITE PHOTOS

Jackson/Banke Single Family Residence
TMK (4) 5-9-05: 028
Haena, Kauai, Hawaii

EXHIBIT 4

BILL "KAIPO" ASING
MAYOR

GARY K. HEU
ADMINISTRATIVE ASSISTANT

IAN K. COSTA
DIRECTOR OF PLANNING

IMAIKALANI P. AIU
DEPUTY DIRECTOR OF PLANNING

COUNTY OF KAUA'I
PLANNING DEPARTMENT
4444 RICE STREET
KAPULE BUILDING, SUITE A473
LIHU'E, KAUA'I, HAWAI'I 96766-1326
TEL (808) 241-6677 **FAX** (808) 241-6699

August 20, 2008

Samuel J. Lemmo, Administrator
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, HI 96809

Subject: Conservation District Use Applicant and
Draft Environmental Assessment
CDUA KA-3472
Jackson / Banke Single Family Residence
TMK 5-9-005:023-027
Kuhio Highway, Haena, Kauai, Hawaii

Dear Mr. Lemmo:

Thank you for forwarding the above referenced Conservation District Use Application and Environmental Assessment dated April 3, 2008. We received it and your accompanying cover letter requesting comments on July 10, 2008.

Kauai County Planning Department has reviewed the CDUA and accompanying draft EA and offers the following comments.

SMA Permit
Upon departmental review it has been determined that the application is exempt from obtaining an SMA permit. However, all other requisite County of Kauai building permits will be necessary.

Shoreline Change Data Review and Setback Provisions
Due to the importance of the application of Kauai County Ordinance #863: Shoreline Setback and Coastal Protection Ordinance, and the technical nature of interpreting the procedure for generating the necessary shoreline change data and its application in determining an appropriate setback distance, we requested a review of the Historical Shoreline Erosion Study prepared by

EXHIBIT 5

EKNA Services, Inc. provided in Appendix 3, and the subsequent proposed shoreline setback determination as outlined in Section VII. F: Shoreline (p. 4), and shown on Exhibit 8. The review was conducted by Jim O'Connell, University of Hawaii Sea Grant Program Coastal Processes & Hazards Specialist, who is now stationed on Kauai to assist Kauai County and Kauai Island residents by providing unbiased technical coastal processes and shoreline information and analyses.

The result of his analysis, which is attached, suggests that the procedure used by the consultant in the erosion rate analysis and, thus, the proposed setback distance from the 'shoreline' needs additional scrutiny. The procedure is not entirely consistent with that required by Ordinance #863, and as outlined in Hawaii Coastal Hazard Mitigation Guidebook referenced in the Ordinance.

In addition, the procedure is not consistent with what was requested by DLNR in their April 22, 2008 letter to the consultant (see first page, second side in Appendix 5). In that letter DLNR requested of the consultant, 'in calculating the shoreline setback for this parcel to utilize the new published shoreline erosion data for Kauai generated by the University of Hawaii, Coastal Geology Group (web site cited), or adopting an approach similar to the new Kauai County shoreline setback ordinance…'. That approach uses the 'beach toe', not the vegetation line, in calculating the erosion rate used to base the shoreline setback on.

We would suggest a setback of 129 feet, which is consistent with the application of our Ordinance 863.

Thank you for the opportunity to comment on this application.

If you have any questions please feel free to CZM planner Lisa Ellen Smith of our staff at 241-6677.

Sincerely,

IAN K. COSTA, Director
Kauai County Planning Department

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF:OCCL:DH

FILE NO: CDUA KA-3472

Acceptance Date: July 10, 2008
180-Day Exp. Date: January 6, 2009

SEP 24 2008

Ben Welborn
Landmark Consulting Services, Inc.
P.O. Box 915
Hanalei, Hawaii 96714

Dear Mr. Welborn,

SUBJECT: Conservation District Use Application (CDUA) KA-3472 for the Jess Jackson and Barbara Banke proposed Single Family Residence (SFR) located in the Haena District, Island of Kauai, Subject Parcel TMK: (4) 5-9-005:028

This letter is regarding the processing of CDUA KA-3472. The public and agency comment period on your application has closed. Attached to this letter are copies of the comments received by the Office of Conservation and Coastal Lands (OCCL) regarding your CDUA. Please send copies of your responses to the questions raised in these letters directly to the authoring agency as well as to the OCCL.

The OCCL also notes there is concern regarding EKNA Services, Inc., (June 2008) Historical Shoreline Erosion Study for the Jackson/Banke subject parcel TMK: (4) 5-9-05: 028. OCCL saff notes there are a few technical observations and discrepancies that have been identified by the OCCL staff.

According to the EKNA study, the average lot depth as measured by the consultant is 217 feet; the proposed coastal erosion rate, based on movement of the *vegetation line* and including a safety/design buffer, is – 0.26feet/year; and, the calculated minimum shoreline setback was calculated as 58.2 feet.

The OCCL staff have identified a few problems with the EKNA calculation of the setback:

1. Both the *beach toe* (the 'shoreline change reference feature') and the *vegetation line* changes were analyzed by the consultant as recommended in the Coastal Hazard Mitigation Guidebook (Guidebook). Both the County Ordinance and the Guidebook recommends that the ***larger of the erosion rates between the two***

EXHIBIT 5

should be used in the calculation of the set-back. The beach toe erosion rate was the larger of the two, yet the vegetation erosion rate was used by the consultant to determine the setback distance;

2. In addition, the use of the 'beach toe' in calculating shoreline change rates for Hawaii has been extensively peer reviewed in scientific journals, and has thus been accepted among technical specialists in shoreline change analysis as a valid technique to determine shoreline change. The UH team has conducted extensive monitoring of the beach toe: seasonal beach profiles on 30 beaches on Kauai have been captured over the past several years by University of Hawaii, SOEST, to assist in calculating an uncertainty range (an important statistic associated with shoreline change data) for the shoreline change data. The OCCL requires the submission of change rates for both the beach toe and the vegetation line for private erosion studies but will utilize the larger of the two for setback calculations;

3. In the updated shoreline change analysis, only 5 of the 7 shorelines appear to have been used from the previous (1950-1988 study). If this is correct, the reason for dropping 2 shorelines from the analysis and not using the 7 total shorelines (as stated in Appendix 3, p.1) needs clarification.

4. Although the 'vegetation line' was used to calculate the setback rather than the higher erosion rates of the two reference features, importantly, there is a significant difference in the calculated erosion rates for this property (transect #127: see attached UH SOEST diagram) between the consultant's rate for the 'beach toe' at -0.76feet/year, and the UH's erosion rate for the 'beach toe' at -1.27 feet/year (+/-0.16 feet/year).

5. The OCCL recommends the use of the beach toe change rate for setback purposes. In addition since the UH shoreline data appears to be based on a larger data set, is more statistically robust and includes an evaluation of uncertainty the OCCL will defer to the UH data for shoreline setback calculations. Using this method recommend in the guidebook and recently adopted in ordinance by the Kauai County the calculated setback is as follows:

CALCULATION	RESULT
UH shoreline erosion rate (mean of Transects 126-130)	-1.29 ft/yr
-1.29 ft/yr X 70 years	90 ft
90 ft + 40 storm and safety buffer	130 ft

Since 130 ft is the larger of the calculated and the "preset" setback in accordance with Kauai County Ordinance the OCCL recommends a 130 foot setback.

The OCCL notes to please submit six paper copies of the Final EA (FEA) to us by October 6, 2008, so it can be submitted for the October 23, 2008 Environmental Notice. Also include an

Office of Environmental Quality Control (OEQC) Publication Form for the Final EA, and if the project summary has changed a new summary on diskette. We also request that you include the entire CDUA with the Final EA on a compact disk for your submittal.

If no response is received, we will assume there are no comments. Should you have questions, please call Dawn Hegger of our Office of Conservation and Coastal Lands staff at 587-0380.

Sincerely,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

c: KDLO
County of Kauai Planning Department
Haena – Hanalei Community Association

UNIVERSITY OF HAWAI'I

Sea Grant College Program on Kauai
P.O. Box 141, Lihue, HI 96766
Telephone: (808) 241-4921
Jim.OConnell@hawaii.edu

August 18, 2008

Mike Laureta, SMA Planner
Lisa Ellen Smith, CZM Planner
Kauai County Planning Department
4444 Rice Street, suite A473
Lihue, HI 96766

RE: Analysis of Shoreline Change and Set-back Requirements: Jackson/Banke Property
TMK: (4) 5-9-005:028), Haena, Kauai

Dear Mike & Lisa:

At your request, I have reviewed the 'Historical Shoreline Erosion Study' for the Jackson/Banke property (TMK (4) 5-9-05: 028), prepared by EKNA Services, Inc., dated June 2008, contained in the Conservation District Use Application Draft EA, submitted by Landmark Consulting Services. The erosion study is Appendix 3, and the shoreline and set-back lines are shown as Exhibit 8. The setback calculations are in Part 1: Section VII(F) 'Shoreline'.

EKNA Inc Shoreline Change Analysis for this Property

Based on Appendix 3 in the submitted report, EKNA obtained recent aerial photographs for this coastal reach and updated an existing shoreline change data base and study known as the 'Kauai Shoreline Erosion Management Study, 1990'. The applicant's property spans 350 linear feet of shore. The shorelines used in their updated analysis span between 1950 and 2002 (52 years), and the analysis included 8 shorelines.

The calculated annual coastal erosion rate, average lot depth and the suggested setback are described in Part 1; Section VII; F: Shoreline. The average lot depth as measured by the consultant is 217ft; the proposed coastal erosion rate, based on movement of the *vegetation line* and including a safety/design buffer, is –0.26ft/yr; and, the calculated minimum shoreline setback was calculated as 58.2ft.

Because the average lot depth is 217 feet and the building footprint is <5,000sf, the shoreline setback proposed by the consultant is 100ft (based on Table 2, Sec 8-27.3 in the Ordinance).

My Analysis

The consultant acknowledged and cited the recommended technique to calculate the average 'annual coastal erosion rate' as required in Ordinance #863, 'Shoreline Setback and Coastal Protection Ordinance' and outlined in the 'Hawaii Coastal Hazard Mitigation

EXHIBIT 6

Guidebook' (the Guidebook). However, additional information and data required for a '*coastal erosion study*' as outlined in the Ordinance (sec. 8-27.1 Definitions) is needed.

In addition, importantly, the annual coastal erosion rate calculated for the applicant's property by the consultant and an annual coastal erosion rate calculated by the University of Hawaii, SOEST (Fletcher, et al) do not agree (see attached Figures of shoreline data histograms from UH SOEST).

The additional necessary information regarding the appropriate erosion rate to apply in the setback determination, as well as the differences in erosion rates are outlined below:

1. Both the *beach toe* (the 'shoreline change reference feature') and the *vegetation line* changes were analyzed by the consultant as required by the Ordinance and recommended in the Guidebook. Both require that the ***larger of the erosion rates between the two*** should be used in the calculation of the set-back. The beach toe erosion rate was the larger of the two, yet the vegetation erosion rate was used by the consultant to determine the setback distance. However, the Ordinance further states that the larger erosion rate shall be used '...unless there is clear evidence to indicate that another method is a more accurate representation of historic shoreline change'.

The consultant used the vegetation line changes stating that the 'beach toe' fluctuations are statistically unreliable due to extreme episodic and seasonal variability associated with winter surf (p. 5).

Both the vegetation line and the beach-toe have exhibited variability in movement through time, although the beach toe exhibits greater variability. This relationship is typical of most ocean-facing beaches. Most researchers and technical specialists in this field use a shoreline reference feature that is located seaward of the dune toe or seaward dune vegetation line, e.g. mean high water line; wet/dry interface; or beach toe to calculate a shoreline change rate.

In addition, the use of the 'beach toe' in calculating shoreline change rates for Hawaii has been extensively peer reviewed in scientific journals, and has thus been accepted among technical specialists in shoreline change analysis as a valid technique to determine shoreline change. The UH team has conducted extensive monitoring of the beach toe: seasonal beach profiles on 30 beaches on Kauai have been captured over the past several years by University of Hawaii, SOEST, to assist in calculating an uncertainty range (an important statistic associated with shoreline change data) for the shoreline change data.

An 'uncertainty range' associated with the data generated and presented by consultant (for both the beach toe and the vegetation line) would be useful, as well as an elaboration on their methodology. Were rectified aerial photographs or orthophotographs used in determining the shoreline, i.e. what is the resolution of the source material? Additionally, has any artificial (human-induced) manipulation of the beach or dune (or adjacent areas) occurred in the past? This information would be useful in assessing the causes and magnitude of shoreline fluctuations. Many shoreline areas have had landscaping such that the movement of the vegetation line may not accurately reflect shoreline change.

2. A 50-year life expectancy was used to calculate the minimum 'erosion zone' in Appendix 3, but appropriately the 70-year life-expectancy for a building, as required by Ordinance #863 and outlined in the Guidebook, was used in Section VII(F): Description of Parcel - Shoreline (pgs 5 & 6).

   However, the more important issue is using the 'vegetation line' as opposed to the 'beach toe'. Both the consultant's and UH SOEST's calculated 'beach toe' erosion rate would suggest that the proposed 100' setback based on vegetation line movement may be too narrow (see #4 below).

3. In the updated shoreline change analysis, only 5 of the 7 shorelines appear to have been used from the previous (1950-1988 study). If this is correct, the reason for dropping 2 shorelines from the analysis and not using the 7 total shorelines (as stated in Appendix 3, p.1) needs clarification.

4. Although the 'vegetation line' was used to calculate the setback rather than the higher erosion rates of the two reference features, importantly, there is a significant difference in the calculated erosion rates for this property (transect #127: see attached UH SOEST diagram) between the consultant's rate for the 'beach toe' at -0.76ft/yr, and the UH's erosion rate for the 'beach toe' at -1.27ft/yr (+/-0.16ft/yr).

5. A longer time series of documented shoreline change more accurately reflects shoreline rates of change, providing that human-induced alterations have not biased natural fluctuations. The.UH SOEST shoreline change data include a time series of 9 shorelines spanning 81 years, while the consultant's data span 52 years.

<u>Utilizing the Consultant's Vegetation Line Erosion Rate: Setback Calculation</u>
Utilizing the vegetation line movement the consultant arrived at an erosion zone of 18.2 feet, plus 40 additional feet for a safety design buffer (to compensate for potential errors and relative sea level rise) to arrive at his minimum erosion zone of 58.2 feet. Utilizing Table #2 in the Ordinance, the consultant plotted the 100 foot 'minimum' coastal erosion hazard zone (Exhibit 8).

<u>Utilizing UH SOEST's Beach Toe Erosion Data: Setback Calculation</u>
Utilizing the 'beach toe' movement, as required in the Ordinance and recommended in the Guidebook (p. 64: Figure 4.4), the setback or coastal erosion hazard zone would be 157 feet utilizing the recommended method in the Guidebook, and 129 feet based on the required methodology in Ordinance #863 (Table #2).

Thus, the 'coastal erosion hazard zone' may be too narrow and the setback line to far makai, unless the Director determines that the alternative method of using the vegetation line is more appropriate or representative of historic shoreline changes for this particular lot than the shoreline change reference feature - the 'beach toe'.

Conclusion

There is always uncertainty in predicting future shoreline changes. In addition, more than likely erosion rates will accelerate in the future due to climate change and associated relative sea level rise, and human activities, such as armoring beach sediment sources.

Erosion is occurring at the subject property and will more than likely continue to do so. Considering the primary purposes of Ordinance #863 of protecting life, property and coastal resources, the Director needs to determine whether using the higher of the two erosion rates – the University of Hawaii, SOEST's rate of -1.27ft/yr based on movement of the shoreline change reference feature – the beach toe, or the lower rates of -0.76ft/yr or –0.2ft/yr for the 'beach toe' and 'vegetation line', respectively, generated by the consultant, is most appropriate and reflective of shoreline changes at the site.

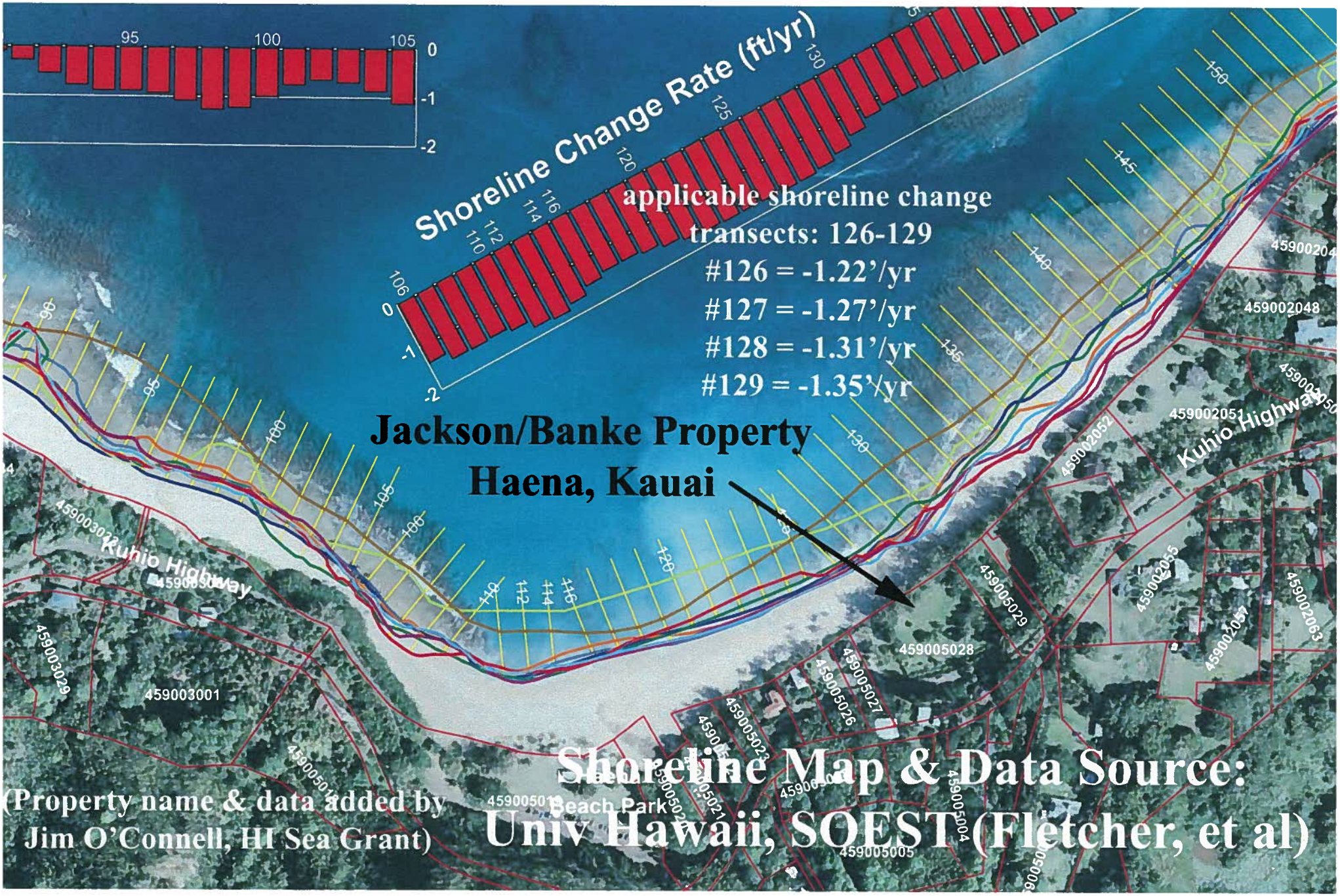
I hope this analysis is helpful to the Planning Department and the Director in recommending an appropriate 'coastal erosion hazard zone', and helpful to the property owner in protecting site occupants, property and valuable coastal resources.

If I can be of further assistance, feel free to contact me at (808) 241-4921 or Jim.OConnell@hawaii.edu.

Sincerely,

Jim O'Connell

Jim O'Connell, Coastal Processes & Hazards Specialist
University of Hawaii Sea Grant Program on Kauai


Shoreline Change Rate (ft/yr)
applicable shoreline change transects: 126-129
#126 = -1.22'/yr
#127 = -1.27'/yr
#128 = -1.31'/yr
#129 = -1.35'/yr
Jackson/Banke Property
Haena, Kauai
Kuhio Highway
Kuhio Highway
459003029
459003001
459005028
459005029
459005027
459005026
459005023
459002048
459002051
459002052
459002055
459002057
459002063
Shoreline Map & Data Source:
Univ Hawaii, SOEST (Fletcher, et al)
(Property name & data added by
Jim O'Connell, HI Sea Grant)

LANDMARK
CONSULTING

October 1, 2008

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

2008 OCT -9 A 8:26

DEPT OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Re: Conservation District Use Application (CDUA) KA-3472
Proposed Jackson/Banke Single Family Residence (SFR)
TMK (4) 5-9-05: 028
Haena, Kauai, Hawaii

Dear Mr. Lemmo,

This correspondence is in response to your letter dated September 24, 2008 regarding the above referenced CDUA KA-3472 for the proposed Jackson/Banke residence, which is proposed on a coastal lot in Haena.

Included herewith are revised floor plans and a revised site plan for the proposed residence. Note that the floor plans and site plans have been altered from those which were originally submitted with the CDUA and Draft EA. The revised floor plans, like the original, proposes development of a 4-bedroom, 4 ½-bath residence. The original floor plans had an aggregate "Development Area" of 4,958 square feet whereas the revised floor plans have an aggregate Development Area of 4,974 square feet. The Applicant is asking that the Board of Land and Natural Resources (BLNR) consider and approve the revised plans and site plan. Copies of the revised plans will be submitted with the Final Environmental Assessment (FEA).

The most substantive comments on the Draft EA regard the 100-foot shoreline setback proposed by the Applicant and the underlying Historical Erosion Study prepared by EKNA Services, Inc. The EKNA Study was included as Appendix #3 of the CDUA and Draft EA. Attached hereto is a supplementary letter from Elaine Tamaye, President of EKNA Services, Inc., dated September 30th, 2008 which responds to the comments and concerns raised by the County of Kauai Planning Department, the Hanalei-Haena Community Association and the Office of Conservation and Coastal Lands regarding EKNA's calculation of an Annual Coastal Erosion Rate and the Applicant's corresponding proposal for a 100-foot shoreline setback.

1. In determining an Annual Coastal Erosion Rate and an appropriate shoreline setback for the subject property EKNA opines that the vegetation line provides a more accurate and reliable marker of shoreline change than does the "beach toe". EKNA bases its opinion on the dynamic seasonal and episodic variability of the beach toe fronting the property, which is associated with frequent high surf events throughout the winter months. In responding to comments from the Hanalei-Haena Community

EXHIBIT 7

Landmark Consulting Services Inc., P.O. Box 915, Hanalei HI. 96714. phone: 808.828.6332 fax: 808.828.6242 email: welhorn@aloha.net

Association, EKNA states, *"the beach toe line is an even worse indicator of long-term shoreline change that the vegetation line because of short-term seasonal variability of the beach compared to a more stable vegetation line."* EKNA also makes reference to the Hawaii Coastal Hazard Mitigation Guidebook[i] ("Guidebook"), which states *"One disadvantage of using the beach toe or water line is that it may be subject to large seasonal changes for beaches that have large seasonal change in wave energy"*. The Guidebook goes on to recommend *"the analysis of historical shoreline erosion rates be based on both the vegetation line and the water line or beach toe."* Similarly, the recently adopted County of Kauai Ordinance No. 863 for "Shoreline Setback and Coastal Protection"[ii] states that the *"method resulting in the larger erosion rate (SCRF/toe of beach vs. vegetation line) shall be used to establish the erosion rate unless there is clear evidence to indicate another method is a more accurate representation of historic shoreline change."* The Applicant submits that since the beach toe fronting their property is subject to large seasonal (and episodic) fluctuations, it is therefore an unreliable Shoreline Change Reference Feature in determining an annual erosion rate upon which to establish an appropriate shoreline setback for the proposed residence. The statistical uncertainty of the beach toe is further compounded by the limitations of the photographic data set used in the historical analysis.

2. For the reasons stated, EKNA Services, Inc. submits that the beach toe is not a reliable Shoreline Change Reference Feature in the area of the subject parcel.

3. The ENKA Historical Shoreline Erosion Study dropped 2 of the 7 photo data sets associated with the beach toe and vegetation line fronting the Jackson/Banke parcel. Doing so resulted in a larger annual erosion rate for the beach toe/water line and a smaller annual accretion rate for the vegetation line. Therefore, the historical erosion rates calculated for the subject property by not including the data from the 2 photos are more conservative, leading to greater setbacks.

4. EKNA challenges the accuracy of the UH data set that was used in determining the UH beach toe annualized erosion rate of -1.27 feet per year. The UH study relies upon data from a 1927 T-sheet (included with the EKNA analysis), which is a paper survey map (as opposed to an aerial photograph) that was prepared by the US Coast and Geodetic Survey dated June-July 1927. The T-sheet is at a scale of 1:20,000 and is not of the same quality as the high-resolution aerial photography that forms the basis of ENKA's historical erosion rate calculations. EKNA suggests that the 1927 T-sheet *"should not have be included in the analysis of shoreline change..." (due to the T-sheet's) inherent lack of resolution in locating the shoreline."* Reliance upon the 1927 T-sheet subjects the erosion rate calculations of the UH study to statistical inaccuracies and interpretive error.

5. EKNA recommends that the shoreline setback for this reach of coastline and the proposed Jackson/Banke residence be based upon an equally weighted average of the adjusted historical annual erosion rates using both the beach toe and the vegetation line. Further, ENKA opines that the data set used in the EKNA Historical Erosion

Analysis is more statistically defensible than the UH data set due to the 1927 T-sheet included with the UH study. Based upon the foregoing, EKNA calculates and recommends the shoreline setback for the proposed Jackson/Banke residence as follows:

- Beach Toe/Waterline – Annual Erosion Rate = 1.00 ft/year
- Vegetation Line – Annual Erosion Rate = 0.26 ft/year
- Average Annual Erosion Rate (Beach Toe & Vegetation Line) = (1.00 + 0.26)/2 = 0.63 ft/year.
- Applying the Guidebook Formula - 0.63 ft/year X 70 years = 44.1 feet + 40 foot buffer = 84.1 feet.
- Applying the guidelines of Ordinance 863, the proposed 100-foot setback (based upon the calculated lot depth) still conservatively exceeds the 84 feet derived by applying a weighted average to the EKNA erosion study.

In summary, the Applicant proposes a 100-foot setback.

As per your request, six copies of the Final EA will be submitted for publication in the October 23, 2008 OEQC Environmental Notice. The submittal of the Final EA will be made prior to October 6, 2008.

Thank you for your consideration of our input on these matters.

Sincerely,

Ben Welborn

C: Jess Jackson & Barbara Banke

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[i] Hawaii Coastal Hazard Mitigation Guidebook, by Dennis Hwang, prepared for the Office of Conservation and Coastal Lands, Coastal Zone Management Program, UH Sea Grant College Program, and NOAA, January 2005.

[ii] Ordinance 863, A Bill for an Ordinance establishing a new Article 27, Chapter 8, Kauai County Code 1987, relating to Shoreline Setback and Coastal Protection, effective January 25, 2008.

EKNA Services, Inc.

CN 2644-01R#

September 30, 2008

Landmark Consulting Services, Inc.
P.O. Box 915
Hanalei, Hawaii 96714

Attn: Mr. Ben Welborn

Subject: Analysis of Shoreline Change and Setback
Jackson/Banke Property TMK:(4)5-9-05:028, Hanalei, Kauai
CDUA KA-3472

Gentlemen:

This letter responds to the comments from the Kauai County Planning Department (letter dated August 20, 2008), the Hanalei-Haena Community Association (letter dated September 4, 2008), and the State Office of Conservation and Coastal Lands (letter dated September 24, 2008) relating to the Draft Environmental Assessment and Conservation District Use Application (CDUA) for the subject property. As requested, my responses are directed towards the comments related to historical shoreline erosion and shoreline setback determination, based on the results of the study conducted by EKNA Services, Inc. (EKNA), described in my letter dated May 5, 2008.

Kauai County Planning Department (Planning Dept.) and State Office of Conservation and Coastal Lands (OCCL):

The Planning Department requested a review by Jim O'Connell of the University of Hawaii Sea Grant Program, and as a result, suggested a setback of 129 feet which they considered to be consistent with their Ordinance 863[1]. The Department of Land and Natural Resources OCCL's letter echoes the same comments contained in the Planning Department's letter. Following are my responses to comments by Mr. O'Connell and the OCCL:

1. The beach toe rate of erosion should be used instead of the vegetation line.

For this Haena coastline, the beach exhibits very large seasonal fluctuations. Both the Ordinance

[1]Ordinance 863, A Bill for an Ordinance establishing a new Article 27, Chapter 8, Kauai County Code 1987, relating to Shoreline Setback and Coastal Protection, effective January 25, 2008.

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and the Hawaii Coastal Hazard Mitigation Guidebook[2] (Guidebook) acknowledge that the use of the beach toe may not be an accurate representation of historic shoreline change. From the Guidebook: *"One disadvantage of using the beach toe or water line is that it may be subject to large seasonal changes for beaches that have large seasonal change in wave energy....It is recommended that the analysis of historical shoreline erosion rates be based on both the vegetation line and water line or beach toe."* Ordinance 863 requires mapping of both the Shoreline Change Reference Feature (SCRF) and the vegetation line, and states that *"The method resulting in the larger erosion rate (SCRF/toe of beach vs. vegetation line) shall be used to establish the erosion rate unless there is clear evidence to indicate another method is a more accurate representation of historic shoreline change."*

For this Haena shoreline, the winter storm events can cause significant erosion of the beach, while the summer wave climate can substantially restore the beach width. The dynamic seasonal beach width fluctuations are significant enough to mask the long term changes to the vegetation along the subject property. Therefore, a historical analysis based solely on the highly variable beach toe is not a reliable indicator of shoreline erosion at this location.

2. A 50-year expectancy was used to calculate the minimum "erosion zone" in EKNA's letter report.

The reason for recommending a minimum erosion zone is to take into account the very large short-term fluctuations in shoreline changes for shorelines that are not uniformly erosionary or accretionary. As reflected in Figure 2 of our letter report, the maximum short-term cycle was about 34 feet. Therefore, this plus the erosion zone for a 50-year life of 13 feet yields a recommended minimum setback of 47 feet. If this value were larger than the setback determined using the Guidebook or the Ordinance, then it would be prudent to use the larger value.

3. In the updated shoreline change analysis, only 5 of the 7 shorelines appear to have been used from the previous (1950-1988 study).

For quality control purposes, the shoreline change analysis for the subject property did not use data from a 1960 (month unknown) and a March 1988 aerial photo. A review of the results from the Kauai Shoreline Erosion Management Study indicates that deleting the data from these two photographs would have yielded a larger annual erosion rate for the water line, and a smaller annual accretion rate for the vegetation line for the Section 4 reach, which includes the subject property. Therefore, the rates calculated for the subject property by not including the data from the 2 photos are more conservative.

4. There is a significant difference in EKNA's calculated erosion rate (-0.76 ft/yr) for the beach toe and the UH SOEST's erosion rate (-1.27 ft/yr).

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[2] "Hawaii Coastal Hazard Mitigation Guidebook", by Dennis Hwang, prepared for the Office of Conservation and Coastal Lands, Coastal Zone Management Program, UH Sea Grant College Program, and NOAA, January 2005.

A major factor for the difference in the calculated erosion rates is the difference in the data sets used for the two studies. The UH SOEST's study includes data from a 1927 T-sheet, which is a paper survey map prepared by the US Coast and Geodetic Survey dated June-July 1927 at a scale of 1:20,000. According to the UH SOEST erosion map, this 1927 T-sheet "beach toe" line is much farther seaward than the other shorelines, resulting in biasing the shoreline erosion towards a larger rate. The T-sheet data is not of the same quality as high resolution aerial photography, and should not have been included in the analysis of shoreline change. Attached is a copy of a portion of the T-sheet survey map for the vicinity of Haena, which reflects the inherent lack of resolution in locating the shoreline.

5. A longer time series of documented shoreline change more accurately reflects shoreline rates of change.

Although the UH SOEST shoreline change data is for a time span of 81 years (versus 52 years for EKNA's study), the 1927 T-sheet does not provide the same quality of data as the aerial photography. The earliest aerial photo used in the UH SOEST study is dated November 1950, which is the same photo used in EKNA's data set. The most recent aerial photo used in the UH SOEST study is a January 2008 photo, which is not included in EKNA's data set. According to the UH SOEST erosion map, the location of the January 2008 shoreline is approximately at the same location as the October 1963 shoreline fronting the subject property. Therefore, if the 1927 T-sheet is not included in their erosion calculation, then it can be expected that the erosion rate at the subject property would be much less than 1.27 ft/yr, and possibly comparable to EKNA's calculated erosion rate of 0.76 ft/yr for the beach toe.

Hanalei-Haena Community Association (Association):

The Association accuses EKNA of *"rejecting sound science and instead relying upon an unsound, out-of-date policy in regard to the erosion study performed on this parcel, with the apparent objective of manipulating and minimizing the required setback. The use of the vegetation line rather than the beach toe resulted in a default depth-based setback being proposed, rather than a setback based on the erosion rate. The net effect may be an insufficient setback and the location of the large proposed house being farther seaward than the erosion rates would require."*

As already discussed in responses above to the Planning Department's comments, erosion rates were calculated for both the beach toe and vegetation line. Both the Ordinance and the Guidebook acknowledge the usefulness of both as indicators of shoreline change. EKNA was not requested to calculate a proposed setback for this property. However, based on the large seasonal variability of the beach at this location, it is EKNA's opinion that the vegetation line is a more suitable indicator of the long-term rate of shoreline change on this Haena coastline rather than the beach toe line. The Association's letter states "The high winter surf in Haena makes vegetation especially inappropriate for use as an indicator (of the shoreline) in Haena." In this case, the beach toe line is an even worse indicator of long-term shoreline change than the vegetation line because of the short-term seasonal variability of the beach compared to the more stable vegetation line.

EKNA's recommendations:

EKNA recommends that a conservative approach in the calculation of the setback would be to use an average erosion rate based on the adjusted annual erosion rate for the vegetation line (0.26 ft/yr) and the adjusted rate for the beach toe line (1.0 ft/yr):

(0.26 + 1.0)/2 = 0.63 ft/yr average annual erosion rate

The setback according to the Ordinance (Table 2) = 0.63 x 70 years + 40 ft buffer = 84.1 feet. According to Table 1, 100 feet is the minimum setback distance for the lot based on the average lot depth, therefore the setback should be 100 feet.

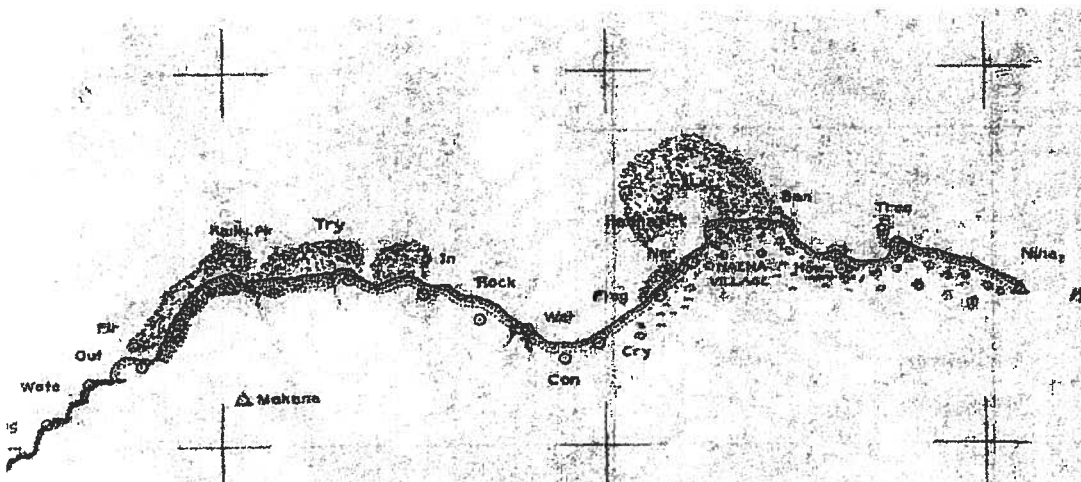
Please do not hesitate to contact me if you have any questions concerning the above.

Very truly yours,

EKNA Services, Inc.

Elaine E. Tamaye
President

enc: T-sheet for Haena



U. S. COAST AND GEODETIC SURVEY
Register No. 4302

STATE HAWAIIAN IS.
GENERAL LOCALITY KAUAI-N.W. COAST
LOCALITY MAKAHA PT. TO WAINIHA BAY
Surveyed by G.A. Nelson
Chief of Party F.G. Engle
Date June-July 1927
Scale 1:20,000

Inked by G.A.N.
Lettered by G.A.N.

Examined and [illegible]
A.J. Geronimo
Chief, Section of Field Records
L.O. Colvocoresses
Chief, Section of Field Work
Recommended for approval
L.O. Colvocoresses
Chief, Division of Charts
G.G. Rude
Chief, Division of Hydrography and Topography

EXHIBIT 9

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