



## Letter Attachments





#### 4.6 AIR QUALITY

Air quality refers to the presence or absence of pollutants in the atmosphere. It is the combined result of the natural conditions (i.e., dust from wind erosion) and emissions from a variety of pollution sources (i.e., automobiles, power generating facilities). B.D. Neal & Associates prepared an air quality study to: 1) describe existing air quality in the area; 2) assess the potential short- and long-term direct and indirect air quality impacts that could result from Honua'ula; and 3) recommend measures to mitigate potential air quality impacts where possible and appropriate. Key findings and recommendations of air quality study are summarized below. Appendix O contains the full study.

B.D. Neal & Associates also prepared an air quality study specifically for the widening of Pi'ilani Highway from Kilohana Drive to Wailea Iki Drive. Appendix R contains the complete Pi'ilani Highway Widening Project Final EA. Appendix E of the Final EA contains the complete air quality study for the widening of Pi'ilani Highway.

The present air quality in the vicinity of Honua'ula, the area of the widening of Pi'ilani Highway, Wailea Ike Drive and Wailea Alanui Drive intersection, and the off-site wells, waterline, storage tank and the wastewater transmission line alignment for possible connection to the Makena Resort WWRF (off-site water and wastewater infrastructure) is believed to be relatively good, except for periodic impacts from volcanic emissions (vog) and possibly occasional localized impacts from traffic congestion and local agricultural sources.

Regional and local climate, together with the amount and type of human activity, generally dictate the air quality of a given location. The climate in the vicinity of Honua'ula, the area of the widening of Pi'ilani Highway, the Wailea Ike Drive and Wailea Alanui Drive intersection, and the areas of the off-site water and wastewater infrastructure is very much affected by its the elevation near sea level and by nearby mountains. Haleakala shelters the area from the northeast trade winds, and local winds (such as land/sea breezes and upslope/downslope winds) affect the wind flow in the area much of the time. Temperatures in the area are generally very consistent and warm with average daily temperatures ranging from about 63°F to 86°F.

Both Federal and State standards have been established to maintain ambient air quality. At the present time, seven parameters are regulated: 1) particulate matter, 2) sulfur dioxide, 3) hydrogen sulfide, 4) nitrogen dioxide, 5) carbon monoxide, 6) ozone and 7) lead. Hawaii air quality standards are comparable to the national standards except those for nitrogen dioxide and carbon monoxide, which are more stringent than the national standards.

#### **POTENTIAL IMPACTS AND MITIGATION MEASURES**

Creation of Honua'ula, the widening of Pi'ilani Highway, the Wailea Ike Drive and Wailea Alanui Drive intersection improvements, and the areas of the off-site water and

wastewater infrastructure may result in short- and long-term impacts on air quality, either directly or indirectly, as a consequence of construction and equipment use. However, it is anticipated that no State or Federal air quality standards will be violated during or after the construction. After build-out, air quality in the vicinity of Honua'ula, the widened Pi'ilani Highway, the Wailea Alanui Drive intersection, and the off-site water and wastewater infrastructure primarily will be affected by vehicular emissions associated with additional traffic.

**Short-term Impacts** – Short-term impacts from fugitive dust will likely occur during construction. Construction will include earthmoving activity, excavating, trenching, and filling. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from disruption of traffic, and from workers' vehicles may also affect air quality during construction.

**Dust Control Plans** for both Honua'ula and the widening of Pi'ilani Highway will be implemented during all construction phases. All construction activities, including construction of the Wailea Iki Drive and Wailea Alanui Drive intersection improvements and the off-site water and wastewater infrastructure will comply with the provisions of Chapter 11-60.1-33, HAR on fugitive dust. Measures to control dust during construction may include:

- Planning phases of construction to minimize the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of least impact;
- Watering active work areas and any temporary unpaved work roads daily;
- Landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase;
- Minimizing dust from shoulders and access roads;
- Providing adequate dust control measures during weekends, after hours and before daily start-up of construction activities;
- Controlling dust from debris being hauled away;
- Using wind screens and/or limiting the area of disturbance at any given time;
- Covering dirt-hauling trucks traveling on roadways;
- Preventing trucks from tracking dirt onto paved roadway by routine road cleaning and/or tire washing;
- Establishing landscaping early in the construction schedule, and
- Monitoring dust at the Property boundary during the construction period as a means to evaluate the effectiveness of the dust control program, and adjusting the program if necessary.

In accordance with County of Maui Ordinance No. 3554 (Condition 15), during construction of Honua'ula all dust control will use non-potable water or effluent, which may be obtained from the Kihai WWRF when available.

**Long-term Impacts** – After construction, use of Honua'ula, the widened Pi'ilani Highway, and the improved Wailea Iki Drive and Wailea Alanui Drive intersection will result in increased motor vehicles in these areas coming to and from Honua'ula will result in a long-term increase in air pollution emissions in the area. Motor vehicles with gasoline-powered engines are significant sources of carbon monoxide. They also emit nitrogen oxides and other contaminants.

To assess the impact of emissions from these vehicles, a computerized air quality modeling study was undertaken to: 1) provide estimates of air pollution emissions from traffic within the area of the widened Pi'ilani Highway from Kilohana Drive to Wailea Iki Drive; and 2) estimate current assess ambient concentrations of carbon monoxide at roadway intersections in the area of the widened Pi'ilani Highway and the vicinity of Honua'ula after build out and to predict future levels both with and without Honua'ula.

Based on the results of the analysis of the potential long-term effects of the widening of Pi'ilani Highway, the air quality study concludes that the widening of Pi'ilani Highway would likely have an overall positive impact on air quality of the area. This is due to the fact that emissions from vehicles are a function of vehicle speed, and improved traffic flow will also provide for less time queued at intersections and less idle emissions.

While the widening of Pi'ilani Highway is expected to have an overall positive impact on air quality of the area, at specific locations, such as at intersections, the widened highway will tend to concentrate more traffic, and thus may cause an increase in carbon monoxide concentrations at specific locations. Therefore, some specific locations may experience higher carbon monoxide concentrations compared to without the project, but concentrations are expected to remain well within State and Federal standards and overall emissions are expected to decrease for the region as a whole.

Based on the results of the analysis of ambient concentrations of carbon monoxide prepared specifically for Honua'ula, even during worst-case conditions, model results indicated that present one-hour and eight-hour carbon monoxide concentrations at study intersections are well within both State and Federal ambient air quality standards. In the year 2022 without Honua'ula, worst-case carbon monoxide concentrations were predicted to increase at some locations study intersections in the area, but concentrations should remain well within State and Federal standards. With Honua'ula in the year 2022, worst-case carbon monoxide concentrations at study intersections were estimated to increase by about 10 to 20 percent compared to the without-Honua'ula case, but worst-case concentrations should still remain within both State and Federal standards.

The air quality study concludes that implementing mitigation measures for traffic-related air quality impacts are unnecessary and unwarranted.

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While a specific air quality study was not prepared for the Wailea Ike Drive and Wailea Alanui Drive intersection improvements, long-term impacts are not expected to be significant as the improvements will accommodate anticipated future traffic while providing similar vehicle flow and queuing times at the intersection as compared to exiting conditions.

Long-term air quality impacts are not expected to be significant from the off-site water and wastewater infrastructure, as after these facilities are created there will be very little to no vehicle emissions associated with on-going operations.

**Electrical Demand and Solid Waste Disposal** – The Honua'ula air quality study concludes that significant long-term impacts on air quality are unlikely due to indirect emissions associated with the community's electrical power and solid waste disposal requirements. Nevertheless, Honua'ula will incorporate energy conservation strategies (see Section 4.8.6 (Electrical System)) and recycling programs (see Section 4.8.5 (Solid Waste)) to further reduce any associated impacts and conserve resources.

# ATTACHMENT ALTERNATIVES

### 6.7 130-ACRE NATIVE PLANT PRESERVATION AREA

Several comments on the Draft EIS requested that the EIS include an alternative discussing a Native Plant Preservation Area of 130 acres. County of Maui Ordinance No. 3554 Condition 27 states, in part, that the Native Plant Preservation Area "shall not be less than 18 acres and shall not exceed 130 acres." County of Maui Ordinance No. 3554 also includes a map showing the location of the Native Plant Preservation Area within the portion of the Property south of latitude 20°40'15.00"N. This map shows a Native Plant Preservation Area of 18 acres.

As discussed in Section 3.6 (Botanical Resources), in conformance with County of Maui Ordinance No. 3554 Condition 27, to protect and conserve an area that contains the highest density of representative native plant species within Honua'ula, Honua'ula Partners, LLC will dedicate in perpetuity a conservation easement titled "Native Plant Preservation Area." As shown on Figure 1 and Figure 12, the Native Plant Preservation Area encompasses a contiguous 40-acre area within the southern portion of the Property. Section 3.6 (Botanical Resources) and Section 3.7 (Wildlife Resources) detail additional on-site measures to protect native plants also discusses off-site measures that that Honua'ula Partners, LLC will undertake to protect and enhance native plants and habitat for the Blackburn's sphinx moth<sup>2</sup>, including:

- Acquiring a perpetual conservation easement of approximately 224-acres on a currently unprotected portion of property owned by Ulupalakua Ranch adjacent to the eastern boundary of the State of Hawaii Kanaio Natural Area Reserve; and
- Funding and implementing the continuation and expansion of restoration efforts within the Auwahi Forest Restoration Project area, just north of the Kanaio Natural Area Reserve, including fencing of approximately 130 acres, ungulate removal, and plant restoration activities.

It is important to note that no Federal or State of Hawai'i listed threatened or endangered plant species have been identified on the Honua'ula Property<sup>3</sup>. The Property is not located within or immediately adjacent to critical habitat or recovery management units designated by the U.S. Fish and Wildlife Service (USFWS) and until recently there have been no efforts by any Federal, State, or local government agency, or non-governmental conservation organizations to acquire or protect any portion of the Honua'ula Property. The non-native tree tobacco (*Nicotiana glauca*) has been found at various locations throughout the Property and often appears quickly following grading, mowing, or related land disturbances. While insignificant as an introduced weedy plant species, it is a recognized host plant for the Federally-listed endangered Blackburn's sphinx moth

<sup>2</sup> The on- and off-site mitigation measures and areas are subject to the approval of the Habitat Conservation Plan by USFWS and DLNR.

<sup>3</sup> While no Federal or State of Hawai'i listed threatened or endangered plant species have been identified, five individual plants of the candidate endangered species, *awikiwiki* (*Canavalia pubescens*), have been documented within the Property.

(*Manduca blackburni*) (for information on the Blackburn's sphinx moth see Section 3.7 (Wildlife Resources)).

Chapter 19.90A, MCC (Kihei-Makena Project District 9 (Wailea 670)), sets forth Honua'ula's purpose and intent; land use sub-districts, including allowable densities and acreage; general standards of development; and specifications for each sub-district. Chapter 19.90A, MCC also includes an adopted conceptual land use map for Honua'ula that graphically shows Honua'ula's land use sub-districts, golf course, circulation, and other elements. This map does not show a Native Plant Preservation Area of any size.

The Conceptual Master Plan shown in Figure 1 is in conformance with the requirements of Chapter 19.90A, MCC regarding Honua'ula's purpose and intent, land use sub-districts, allowable densities, and other elements, such as the provision of a golf course. It is also in conformance with the map provided with County of Maui Ordinance No. 3554 regarding the general size and location of the Native Plant Preservation Area.

Providing a Native Plant Preservation Area of 130 acres would result in significant changes to the Conceptual Master Plan (Figure 1), resulting in conflicts with several provisions of Chapter 19.90A, MCC. A Native Plant Preservation Area of 130 acres would necessitate shifting a significant number of single-family and multi-family homes to the northern section of the Property, thereby increasing density in this area. It would also significantly change the golf course layout or possibly make a golf course altogether infeasible. Simply reducing the number of homes or not providing a golf course could make Honua'ula economically unfeasible in light of the significant on and off-site improvements required as conditions of County of Maui Ordinance No. 3554. Reducing the number of homes and/or not providing a golf course would also dramatically decrease the economic benefits of Honua'ula, such as property tax revenues to the County, total gross tax revenues to the State, and impact fees paid to the County and State by Honua'ula Partners LLC.

To elaborate on how a Native Plant Preservation Area of 130 acres would be in conflict with the provisions of Chapter 19.90A, MCC, the following examples are provided:

- Section 19.90A.010, MCC states: "The purpose and intent of Kihei-Makena project district 9 (Wailea 670) ... is to establish permissible land uses and appropriate standards of development for a residential community consisting of single-family and multifamily dwellings complemented with village mixed uses, all integrated with an eighteen-hole golf course and other recreational amenities."
  - Section 19.90A.010(B)(3), MCC states: "Integrate the golf course and recreational amenities with the different uses comprising the project."
- A Native Plant Preservation Area of 130 acres would significantly impact the ability to integrate Honua'ula's single and multifamily homes with an 18-hole golf course and other recreational amenities, as shifting nearly all of the residential uses to the

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northern section of the Property would require most of the area to be used for residential uses, or if integrated with a golf course, require significantly higher density residential configurations.

- Section 19.90A.020(A), MCC sets forth maximum allowable densities and acreage for each sub-district. The single-family sub-district is limited to an average density of 2.5 units per acre or less and approximately 40 percent of Honua'ula's total dwelling units are required to be single-family. The multi-family sub-district is limited to an average density of 10 units per acre or less and approximately 60 percent of Honua'ula's total dwelling units are required to be multi-family.

Shifting nearly all the single-family and multi-family homes to the northern section of the Property would require: 1) significantly higher density residential configurations in the northern section to provide the same amount of workforce and market priced homes; or 2) significantly less homes to comply with the density requirements of Section 19.90A.020(A), MCC. Reducing the total number of homes would make Honua'ula economically unfeasible in light of the significant on and off-site improvements required as conditions of County of Maui Ordinance No. 3554.

- Section 19.90A.020(B), MCC requires that 450 affordable homes shall be provided within the Honua'ula Property.

Shifting nearly all single-family and multi-family homes (affordable and market priced) would require significantly higher density residential design or a reduction in the total number of homes. Since 450 affordable homes are required, any reduction in the number of homes would result in less market priced homes. Reducing the number of market priced homes would make Honua'ula economically unfeasible in light of the significant on and off-site improvements required as conditions of County of Maui Ordinance No. 3554.

In addition, some Maui Meadows residents have expressed concerns about the density of affordable multi-family homes adjacent to the Maui Meadows boundary. On the Conceptual Master Plan included with the Draft EIS it was necessary to include multifamily homes in this area to accommodate the initial Native Plant Preservation Area. Providing a larger 130-acre Native Plant Preservation Area would necessitate increasing the number and density of units in the northern section of the Property thus adding to the concerns of some Maui Meadows residents.

- Section 19.90A.020(D), MCC references a conceptual land use map that "is adopted and is made a part of this section." The map graphically shows Honua'ula's land use sub districts, golf course, circulation, and other elements.

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The conceptual land use map adopted as part of Section 19.90A.020(D) has already been modified to accommodate the initial Native Plant Preservation Area and other conditions required under County of Maui Ordinance No. 3554. The Planning Department reviewed the changes necessary to implement the initial Native Plant Preservation Area and other conditions which included changes to sub-district configurations and densities, circulation design, and golf course layout. Increasing the Native Plant Preservation Area to 130 acres would require additional changes in sub-district configurations and densities, circulation design, golf course layout, and other critical design considerations. A significantly revised conceptual land use map incorporating a 130-acre Native Plant Preservation area would be inconsistent with the conceptual land use map referenced in Section 19.90A.020(D).

- Section 19.90A.030(A)(1), MCC requires: "Existing natural drainageways shall remain as open spaces and their hardening shall be discouraged, provided that landscaping, walkways, bikeways, roadways, fences, drainage, and minor recreational and other structures, which do not either detract from the natural environment or adversely affect drainageways and improvements, shall be permitted."

Shifting nearly all single-family and multi-family homes to the northern section of the Property would impact the ability to retain the natural drainage ways, buffer zones, and slope areas in their natural condition. Grading for home site pads would be drastically increased as a result of greater densities. This would have aesthetic impacts and, more importantly, create greater concentrations of run-off within the property. Increases in density would result in increased non-permeable areas and create the need for increased detention basin area.

- Section 19.90A.030(A)(2), MCC states: "The drainage master plan shall incorporate the golf course and open spaces as areas for stormwater retention and desilting basins."

Increasing density in the northern section of the Property will impact the ability to create a golf course and a drainage plan required under Section 19.90A.030(A)(2), MCC. In all Honua'ula planning and engineering studies the golf course has been a critical element of the drainage design. If the golf course layout is significantly altered in its design, or becomes infeasible, the ability to use the golf course for drainage will be significantly impacted.

- Section 19.90A.030(A)(3) requires: "Grading of the project site shall be encouraged to retain the existing rolling topography and natural drainage ways."

Shifting nearly all single-family and multi-family homes to the northern section of the Property would dramatically increase grading of the Property, as significantly

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more grading would be necessary to create home site pads with the increased density.

County of Maui Ordinance No. 3554 contains conditions requiring Honua'ula to provide a private water system (Condition 1) and a private wastewater system (Condition 17). Significantly reducing the number of homes within Honua'ula to accommodate a 130-acre Native Plant Preservation Area could make providing these systems infeasible as the cost to build and operate these systems may not be supportable with less homes. In addition, Condition 17 also requires reclaimed water from the private wastewater system to be used for irrigation. A reduced number of homes would result in less output of reclaimed water from the private wastewater system, thereby possibly necessitating more non-potable well water for irrigation. Alternatively, if the same amount of homes were provided at increased densities, with a 130-acre Native Plant Preservation Area there would be less area available to dispose of the reclaimed water. Condition 17 prohibits injection wells.

County of Maui Ordinance No. 3554 requires Honua'ula to pay specific development fees, including:

- Traffic improvement fees of \$5,000 per residential unit, payable to the County of Maui (Condition 3);
- Park assessment fees, currently at \$17,240 per residential unit, payable to the County of Maui (Condition 11); and
- School impact fees, currently at \$5,560 per single family unit and \$3,000 per multifamily unit, payable to the State (Condition 22).

Together, these fees are at least \$25,240 per residential unit and total over \$29 million. Any reduction in the number of units will result in a corresponding decrease in fees paid to the State and the County. County property tax revenues would also decrease with less homes or diminished property values resulting from higher density homes. State tax revenues, estimated on a per capita basis, would also decrease with fewer homes.

County of Maui Ordinance No. 3554 also requires Honua'ula Partners, LLC to:

- Widen Piilani Highway from Kilohana Drive to Wailea Ike Drive from two to four lanes<sup>4</sup>. The widening project is estimated to cost approximately \$26 million;
- Pay not less than \$5 million to the County for the development of the South Maui Community Park in-lieu of dedicating a Little League Field within Honua'ula (Condition 10);

<sup>4</sup> Cost to be shared by Honua'ula Partners, LLC, A&B Wailea LLC, Keaka LLC, and ATC Makana Holdings; however County of Maui Ordinance No. 3554 Condition 2a requires the widening of Piilani Highway to be completed before any construction on the Honua'ula Property, with the exception of grading; therefore Honua'ula Partners, LLC may be required to pay the total amount if the other entities are not able to contribute before construction of Honua'ula begins.

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- Contribute \$550,000 to the County for the development of the new Kfhei District Police Station in South Maui (Condition 24); and
- Provide the County two acres of land with direct access to the Pi'ilani Highway extension for the development of a fire station (Condition 24).

Reducing the number of homes within Honua'ula or not providing a golf course could make Honua'ula economically unfeasible in light of these significant fees that must be paid, in addition to overall on-site construction costs of Honua'ula.

In summary, the alternative with a 130-acre Native Plant Preservation Area would:

- Conflict with provisions of Chapter 19.90A, MCC;
- Conflict with several conditions of approval required under County of Maui Ordinance No. 3554
- Necessitate shifting a significant number of single-family and multi-family homes to the northern section of the Property, thereby increasing density in this area and requiring significant changes to the Conceptual Master Plan;
- Significantly change the golf course layout or possibly make a golf course altogether infeasible;
- Impact the ability to use the golf course for drainage as required under Section 19.90A.030(A)(2), MCC;
- Significantly increase grading of the Property to create home site pads required for the increased density;
- Impact the ability to use reclaimed water for irrigation;
- Decrease the economic benefits of Honua'ula, such as property tax revenues to the County, total gross tax revenues to the State, and impact fees paid by Honua'ula Partners LLC; and
- Make Honua'ula economically unfeasible in light of the significant on and off-site improvements required as conditions of County of Maui Ordinance No. 3554;

Honua'ula's on-site 40-acre Native Plant Preservation Area will protect and conserve the area of the Property that contains the highest density of representative native plant species. It also will allow for conformance with the requirements of Chapter 19.90A, MCC and the conditions of County of Maui Ordinance No. 3554. Combined, Honua'ula's on-site 40-acre Native Plant Preservation Area and proposed off-site mitigation measures discussed in Section 3.6 (Botanical Resources) and Section 3.7 (Wildlife Resources) provide approximately 394 acres of native dry shrublands for the perpetual protection and propagation of native dryland plants—a substantially greater area for native plant protection and Blackburn's sphinx moth habitat than would be provided solely by a 130-acre Native Plant Preservation area on the Honua'ula Property.



#### 4.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Aki Sinoto Consulting, LLC, completed a revised archaeological inventory survey for the Property in 2008. The resulting archaeological inventory survey report, dated March 2010, was included as an appendix to the Draft EIS (Sinoto 2010). Revisions to the archaeological inventory survey report were completed in 2012 (Sinoto 2012). Findings of the archaeological inventory survey report, as revised in 2012 (Sinoto 2012), are summarized below. Appendix I contains the complete archaeological inventory survey report dated March 2012.

The area surveyed includes the Property, the area of the Pi'ilani Highway extension ROW that traverses the Property (both the portion owned by the State and the portion owned by 'Ulupalakua Ranch), and the area of the Maui Electric substation. The revised archaeological inventory survey report incorporates the results of two previous surveys together with the results of additional fieldwork. In April 2000, Sinoto & Pantaleo conducted an archaeological inventory within the 190-acre southern third of the Property (Sinoto & Pantaleo, 2000). Subsequently, in 2001, Sinoto & Pantaleo conducted an inventory survey of the northern two-thirds of the Property (Sinoto & Pantaleo, 2001). Multiple field sessions were conducted between August 2003 and June 2008 to supplement the two initial surveys. Additional field work was conducted in February 2012. ~~Findings of the survey work are summarized below. Appendix I contains the complete archaeological inventory survey.~~

Previous to the archaeological work commencing in 2000, four other archaeological surveys were conducted within the Property; one for the proposed Pi'ilani Highway extension project (Walton, 1972); two for the previously proposed Wailea 670 development (Hammatt, 1979; Kennedy, 1988), and one for a cinder haul road paralleling the southern boundary (Sinoto & Pantaleo, 1993).

In March 2010 the archaeological inventory survey report incorporating all previous surveys and included as an appendix to the Draft EIS (Sinoto 2010) was submitted to the State Historic Preservation Division (SHPD) for review.

On June 22, 2010 the Maui Planning Commission held a meeting to discuss the Draft EIS. At this meeting Lucienne De Naie, testifying on behalf of Maui Tomorrow, and Clare Apana, testifying on behalf of Maui Cultural Lands, stated that they thought the archaeological inventory survey report in the Draft EIS was inadequate that there are more archaeological sites on the Property than were recorded in the archaeological inventory survey report. Clare Apana also provided to the Commission a copy of a letter from Daniel Kanahale addressed to SHPD explaining what he considered were the inadequacies of the archaeological inventory survey. In their comments on the Draft EIS the Maui Planning Commission directed Honua'ula Partners, LLC's representative Charlie Jencks to: "Work with people that have provided comments regarding the archaeology of the site to clarify findings".

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**Archaeological and Historic Resources**

Maui Cultural Lands and other community members at Maui Community College on November 17, 2011. Maui Cultural Lands members and other community members present at the November 17, 2011 meeting included: Daniel Kanahela, Janet Six, 'Ekolu Lindsey, Lucienne De Naité, Jocelyn Costa, and Clifford Omellas. Others present at the meeting included Stanley Solamillo, a cultural resource planner with the Maui Planning Department, and Tanya Lee Greig, the director of Cultural Surveys Hawaii's Maui office.

As a result of the November 17, 2011 meeting, the archaeological inventory survey report was further revised to: 1) recommend preservation of a section of a post-contact agricultural wall documented in the archaeological inventory survey but not previously recommended for preservation; 2) add descriptive narrative information for two post-contact agricultural walls; and 3) revise pertinent map figures in the report. Archaeologist Aki Sinoto submitted the further revised archaeological inventory survey report to SHPD in March 2012. Since the SHPD Maui archaeologist had recently resigned, copies of the revised archaeological inventory survey report were transmitted to SHPD's main office in Kapolei and to Dr. Theresa Donham, the interim SHPD chief of archaeology in Hilo. In April 2012, Dr. Donham notified archaeologist Aki Sinoto that the report was forwarded to the SHPD Maui office for review due to the hiring of replacement personnel. As of May 2012, SHPD has not completed its review of the revised (March 2012) archaeological inventory survey. Appendix I contains the complete archaeological inventory survey report dated March 2012.

In addition to the revised archaeological inventory survey for the Property (Sinoto 2012), Aki Sinoto Consulting, LLC, completed archaeological surveys for the areas of: 1) the wastewater transmission line alignment for possible connection to the Makena Resort WWRF; and 2) the off-site wells, waterline, and storage tank. Figure 2 shows the locations of these utility areas. Appendix I contains the complete archaeological inventory surveys.

Regarding the Pi'ilani Highway widening area from Kilohana Drive to Wailea Iike Drive and the area of the Wailea Iike Drive and Wailea Alanui Drive intersection improvements, the State Historic Preservation Division has determined that an archaeological inventory survey of these areas is not required given that the work will be within the existing highway right-of-way or adjacent to previously disturbed land; however archaeological monitoring plans will be prepared and a qualified archaeological monitor will be present during all ground altering disturbances. For more information on the widening of Pi'ilani Highway see Section 4.4 (Roadways and Traffic) and Appendix R, which contains the complete Pi'ilani Highway Widening Project Final EA. Appendix G of the Final EA contains the SHPD letter regarding the need for archaeological monitoring plan for the Wailea Alanui Drive widening area. For more information on the Wailea Iike Drive and Pi'ilani Highway widening area, see Section 4.4 (Roadways and Traffic) and Appendix S, which contains the complete Wailea Iike Drive and Wailea Alanui Drive intersection improvements Final EA. Appendix G of the Final EA contains the SHPD letter regarding the need for archaeological monitoring plan for the Wailea Iike Drive and Wailea Alanui Drive intersection improvements.

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**Archaeological and Historic Resources**

In response to the Maui Planning Commission's directive, on August 26, 2010 Honua'ula Partners, LLC's representative Charlie Jencks, consultant archaeologist Aki Sinoto, and consultant cultural advisor Kimokeo Kapahulehua participated in a site visit of the Honua'ula Property with several community members and SHPD staff. SHPD staff present were archaeologist Morgan Davis and cultural historian Hinano Rodrigues. Community members present included: Lucienne de Naité, Daniel Kanahela, Janet Six, Elle Cochran, U'ilani Kapu, Ke'eumoku Kapu, Lee Altenberg, and 'Ekolu Lindsey. Some of the community members had previously: 1) presented testimony, or were present, at the Maui Planning Commission meeting on June 22, 2010 at which the Honua'ula Draft EIS was discussed; 2) submitted information to SHPD claiming that they had found archaeological sites on the Property that had not been included in the archaeological inventory survey dated March 2010 included in the Draft EIS; and 3) submitted written comments on the Draft EIS expressing concerns regarding archaeological sites on the Property.

Subsequent to the site visit, SHPD issued a letter dated September 8, 2010 stating that no significant unrecorded sites were noted at that time (i.e. during the August 26, 2010 site visit). The letter also provides SHPD's review of the archaeological inventory survey (dated March 2010) and requested revisions, including: 1) editorial changes; 2) that the total number of survey man-hours and the spacing of survey transects be noted; and 3) a large plan map of the survey area with sites and features plotted be included. In addition, the SHPD letter states: "This report presents a comprehensive summary of past archaeological work in this area and nicely incorporates previous surveys in the discussion of current findings."

In response to SHPD's September 8, 2010 letter commenting on the archaeological inventory survey (dated March 2010), archaeologist Aki Sinoto: 1) revised the archaeological inventory survey report to address SHPD's concerns; and 2) submitted the revised archaeological inventory survey report to SHPD in April 2011.

In July and August of 2011, Daniel Kanahela of Maui Cultural Lands submitted letters to Honua'ula Partners, LLC's representative Charlie Jencks and SHPD providing additional comments on the archaeological inventory survey (dated March 2010) that was included in the Draft EIS. Honua'ula Partners, LLC's representative Charlie Jencks, consultant archaeologist Aki Sinoto, and consultant cultural advisor Kimokeo Kapahulehua responded to these letters in writing. In the summer of 2011 Maui Cultural Lands members also made a presentation to SHPD regarding their inspections of the Property.

In response to the concerns Maui Cultural Lands members expressed to SHPD in the summer of 2011, on September 23, 2011 archaeologist Aki Sinoto and cultural advisor Kimokeo Kapahulehua met with SHPD archaeologist Morgan Davis and SHPD cultural historian Hinano Rodrigues at SHPD's Maui office. Subsequently, as recommended by SHPD, Honua'ula Partners, LLC's representative Charlie Jencks, consultant archaeologist Aki Sinoto, and consultant cultural advisor Kimokeo Kapahulehua met with members of

habitation and agriculture, although scattered permanent habitation extended as far as a half-mile inland in certain localities (Schilt 1988). The presence of earlier permanent settlements on the coast has been recently discovered as well (Donham 1986 and Fredericksen 1999).

As the archaeological knowledge base has progressively grown, traditionally held perceptions that the region was marginal and sparsely occupied until the latter phases of the prehistoric period have been changing. Similarly, the interpretation that the "intermediate" zone between the coastal areas and the forested upland zones was barren, used only during transit between the two loci, and lacked any consequential occupation, has also recently come into question. Recent studies of the intermediate zone (Cosser et al. 1993 & 1997, Sinoto & Pantaleo 2008) highlight: 1) the importance of the intermediate zone in specific areas of the region; and 2) a range of site types representing various activities in the intermediate zone.

#### **Identified Sites**

A total of 40 archaeological sites comprised of 60 component features have been recorded within the Property. No burials or human remains have been found. The recorded site types include: small enclosures, modified overhang shelters, modified outcrop platforms and terraces, steppingstone trail segments, long walls, and multiple feature complexes. The majority of the sites/features appear to primarily represent prehistoric-period semi-permanent and temporary habitation functions associated with marginal intermediate inland-zone agricultural pursuits and/or mauka-makai transits between coastal and inland permanent habitation zones. A few sites, such as a complex of meandering free-standing walls, may represent historic period activities, most likely associated with ranching.

Only one site was recorded in the northern two-thirds of the Property. Although there is evidence that the area had previously undergone extensive disturbances, the scarcity of archaeological sites is remarkable especially when compared to the southern third of the Property, which contains 97.5 percent of the recorded sites. A large wall, trending east to west, demarks a physical division between the northern two-thirds of the Property and the southern third. The southern portion of the Property consists of large areas of a'a flows with intermittent pahoe-hoe flow ridges. Due to the rough terrain, it appears that earlier historic ranching activities attempted to keep cattle out of this southern area and did not encroach south of the large wall until a later phase of ranching activities.

The presence of a steppingstone trail in the a'a flows (in the southern third of the Property) and small, isolated features support the argument that this mid-elevation zone was primarily used for temporary transit stops during travel between the coast and inland areas. Based on results of previous research in the region, the dispersed, isolated occurrence of small, crudely constructed, structural features; such as C-shapes, modified outcrops and overhang shelters; can be indicative of temporary habitation. These feature types are well-represented in the neighboring areas and have been interpreted as

#### **Settlement Patterns**

The earliest prehistoric settlement on Maui is postulated to have occurred between A.D. 300-600 along the windward regions where abundant rainfall and fertile soil supported crop cultivation and human populations (Kirch 1985, Cordy and Athens 1988, Gosser et al. 1997). Population expansion into the drier, leeward areas of Kihei, Wailea, and Mākena, likely took place by A.D. 1000-1200 (Cordy 1974, Kirch 1985) although localized areas of earlier permanent occupation appear to have been present (Gosser et al. 1997).

The Honua'ula Property is located along the southwestern slopes of Haleakala, within the *moku* (traditional district) of Honua'ula (currently subsumed into the Makawao District) and includes portions of three *ahupua'a*: Paeahu in the north, Palauea in the middle, and Keaouhu in the south.

The inhabitants of Honua'ula *moku* subsisted mainly on fish and sweet potatoes, a common diet of those who lived in the dry leeward areas of Maui (Barrere 1975). The early French navigator La Perouse noted, while anchored at Keone'o'io Bay that "This part of the coast was altogether destitute of running water. The inhabitants had no drinking water but a brackish water obtained from shallow wells" (La Perouse 1798). Due to the lack of running water, agricultural production in leeward Maui was limited to dryland taro in the upland areas in pockets of moist soil where rainfall was greater, while sweet potatoes were grown at the lower elevations (Handy 1940).

The general pattern of occupation within the Honua'ula *moku* suggested by previous archaeological research consists of seasonal settlements occurring along the coastal areas to exploit marine resources, while permanent settlements occupied the upland areas to utilize forest products and cultivate agricultural resources. Between these settlements was an arid area used for cultivating sweet potatoes and for transit on mauka-makai trails. Upland populations exchanged taro, bananas, and sweet potatoes with the coastal populations for ocean resources (Handy 1940).

Chapman and Kirch (1979) proposed that a pattern of transience existed between coastal and inland areas. Inhabitants of the upland agricultural region may have utilized the coastal shelters as temporary or seasonal bases for expanding the range of resource exploitation. Trails linked these permanent upland habitation areas to coastal areas. Temporary habitation sites, located along trails linking upland and coastal settlements were used by travelers from upland residences to the coast to gather seasonal marine resources.

The late prehistoric/early historic settlement was characterized by permanent habitation along the coast and limited agricultural expansion into harsher, more ecologically marginal regions (Kirch 1977). Sites over a quarter-mile inland were used for temporary

however, archaeological monitoring plans will be prepared and a qualified archaeological monitor will be present during all ground altering disturbances.

**POTENTIAL IMPACTS AND MITIGATION MEASURES**

The archaeological inventory survey recommends placement of the recorded sites on the Property into three categories: *in situ* preservation, data recovery, and no further work. Permanent *in situ* preservation is recommended for 15 16 sites. Data recovery is recommended for 18 sites. No further work is recommended for seven six sites which correspond to those sites which were evaluated to be no longer significant (NLS). Table 3 presents a summary of the significance and treatment for all 40 sites.

Fourteen Fifteen of the 15 16 sites recommended for permanent *in situ* preservation are in the southern portion of the Property. Eleven of these are within the Native Plant Preservation Area (4) and the Native Plant Conservation Areas (7), areas that will not be graded or disturbed so that existing native vegetation can be conserved and protected dedicated in perpetuity to the conservation of native Hawaiian plants and significant cultural sites (see Section 3.6 (Botanical Resources)). The three four remaining sites recommended for permanent *in situ* preservation in the southern portion of the Property that are not in the Native Plant Preservation Area or the Native Plant Conservation Areas will be preserved as isolates in historic preservation easements. The single site in the northern two-thirds of the Property recommended for permanent preservation will be preserved *in situ* within an existing gulch, which will remain as an open area.

In addition to the 15 16 sites recommended for permanent *in situ* preservation, there are opportunities to retain additional sites designated for data recovery within the approximately 143 acres of the Native Plant Conservation Areas. There are further opportunities to retain sites within golf course areas not requiring grading. In addition, the Native Plant Conservation Areas will enhance the natural setting in which archaeological and cultural preservation is implemented.

In compliance with County of Maui Ordinance No. 3554 (Condition 26), Honua'ula Partners, LLC, will provide an archaeological preservation/mitigation plan, pursuant to Chapter 6E, HRS, to the State Historic Preservation Division (SHPD) and the Office of Hawaiian Affairs (OHA) for approval, prior to Project District Phase II approval. In accordance with SHPD requirements, Honua'ula Partners, LLC, will also provide a data recovery plan to SHPD for review and approval.

temporary habitation sites, most with intermediate to late prehistoric period origins. The frequency of platform features as well as two multiple feature complexes—composed of more substantial structural features in terms of variety, size, numbers, and construction—suggest more intensive, if not permanent, occupation in the area. Further work, especially age determinations for specific sites, is needed to clarify the nature of these sites.

Of the 40 total sites recorded, 33 34 are considered to be significant based on at least one Hawai'i Register criterion: the potential to yield information. Several of the six sites—such as the multiple feature complexes, steppingstone trail segments, and the long walls—are considered significant based on multiple criteria. Seven six sites are considered no longer significant. For resources to be significant they must possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet one or more of the following criteria:

- Criterion A** – specifies association with events or broad patterns important to the prehistory or history of a region, island, or Hawaii in general;
- Criterion B** – reflects association with persons important to the prehistory or history of a region, island, or Hawaii in general;
- Criterion C** – applies to sites that reflect architectural achievements or are excellent examples of a specific type of site;
- Criterion D** – specifies that the site has yielded or has the potential to yield information significant to the understanding of traditional culture, prehistory, history, and/or foreign influences on traditional culture and history of a region, island, or Hawaii in general; and
- Criterion E** – applies to sites or places perceived by the contemporary community as having traditional cultural value.

**Off-Property Areas**

No surface structural remains or any other features indicative of prehistoric period or traditional Hawaiian cultural activities were encountered in the areas of: 1) the wastewater transmission line alignment for possible connection to the Mākena Resort WWRF; and 2) the off-site wells, waterline, and storage tank.

The Pi'ilani Highway widening area from Kilohana Drive to Wailea Iike Drive is within the existing highway ROW or adjacent to previously disturbed land. The area of the Wailea Iike Drive and Wailea Alanui Drive intersection improvements is also within an area of previously disturbed land. The State Historic Preservation Division has determined that archaeological inventory surveys of the areas of the Pi'ilani Highway widening and the Wailea Iike Drive and Wailea Alanui Drive intersection improvements are not required;

Aki Sinoto Consulting, LLC and Hana Pono, LLC prepared a CRPP (see Section 4.2 Cultural Resources and Appendix J) in compliance with County of Maui Ordinance No. 3554 (Condition 13 and Condition 26). The CRPP also serves as the archaeological preservation/mitigation plan discussed above and sets forth (among other things) selection criteria for sites to be preserved and short- and long-term preservation measures, including buffer zones and interpretative signs, as appropriate for each site to be preserved. The CRPP was prepared in consultation with interested and concerned parties, cultural advisors, Nā Kūpuna O Maui, the Maui County Cultural Resources Commission, the Maui/Lānaʻi Island Burial Council, the DLNR Nā Ala Hele, SHPD, OHA, and various knowledgeable individuals. In compliance with County of Maui Ordinance No. 3554 (Condition 13) the CRPP ~~will be~~ has been submitted to SHPD and OHA on March 18, 2010 for review and recommendations. Upon receipt of comments and recommendations from SHPD and OHA, the CRPP will be provided to the Maui County Cultural Resources Commission for review and adoption before Project District Phase II approval.

The CRPP includes short-term and long-term preservation measures for each of the 15 sites slated for *in situ* preservation. While the CRPP provides specific preservation measures for each site, summaries of general short- and long-term preservation measures are provided below.

**Short-Term Preservation Measures** – The identification and implementation of appropriate short-term or interim site protection measures, including an SHPD approved archaeological monitoring plan, ensure that, during construction, inadvertent damage or other adverse impacts do not befall sites slated to be preserved. These include:

- Prior to construction commencement a meeting shall be held to inform all pertinent parties regarding the locations and buffer zones for all sites slated for preservation in or near areas of potential effect and the authority of the archaeological monitor to temporarily halt work in the vicinity of any inadvertent findings;
- The erection of temporary construction fencing (orange plastic) or other visible markings defining no-encroachment buffer zones around the perimeter of sensitive areas;
- The installation of protective supports or covers to better protect the integrity of fragile or delicate features, if warranted;
- Regular monitoring of preservation sites and construction activities; and
- Ensuring transition to permanent preservation measures following completion of construction.

**Long-Term Preservation Measures** – The identification and implementation of long-term or permanent site protection measures provide for the continued protection of archaeological and cultural resources. The two typical categories of long-term preservation are passive and active preservation, as described below:

Table 1. Archaeological Sites: Significance and Treatment

No.	*SHHP#	Type	Features	Period	Significance	Treatment
1	200	wall	1	historic?	C,D	Preservation
2	201	complex	5	traditional?	A,D	Preservation
3	204	platform	2	traditional?	D	Preservation
4	205	mod OH	1	traditional?	D	Preservation
5	3156	C-shape	1	traditional?	NLS	No further work
6	3157	wall	1	historic?	NLS	No further work
7	3158	wall	1	historic?	NLS	No further work
8	4945	U-shape	1	traditional?	D	Data Recovery
9	4946	C-shape	1	traditional?	D	Data Recovery
10	4947	mod OH	1	traditional?	D	Data Recovery
11	4948	open area	1	historic?	D	Data Recovery
12	4949	mod OH	2	traditional?	D	Data Recovery
13	4950	C-shape	1	traditional?	D	Data Recovery
14	4951	SS trail	1	traditional?	C,D,E	Preservation
15	4952	platform	1	traditional?	D	Preservation
16	4953	walls	3	historic?	NLS D	No further work Preservation
17	4954	C-shape	1	traditional?	D	Data Recovery
18	4955	mod OH	1	traditional?	D	Data Recovery
19	4956	mod OH	2	traditional?	D	Data Recovery
20	4957	complex	6	traditional?	A,D	Preservation
21	4958	enclosures	2	traditional?	D	Data Recovery
22	4959	SS trail/pits	3	traditional?	C,D,E	Preservation
23	4960	platform	1	traditional?	D	Data Recovery
24	4961	wall seg.	1	historic?	NLS	No further work
**29	**5109	OH	1	traditional	D	Preservation
25	5110	lava blister	1	traditional?	D	Data Recovery
26	5111	platform	1	traditional?	D	Preservation
27	5112	platform	1	traditional?	D	Preservation
28	6794 #A	cluster	2	traditional?	D	Data Recovery
29	6795 #A	C-shape	1	traditional?	D	Data Recovery
31	6796 #A	platform	1	traditional?	D	Data Recovery
32	6797 #A	trail	1	traditional?	D	Preservation
33	6798 #A	cluster	2	traditional?	D	Preservation
34	6799 #A	OH	1	traditional?	D	Data Recovery
35	6800 #A	platform	1	traditional?	D	Preservation
36	6801 #A	lava tube	1	traditional?	D	Preservation
37	6802 #A	wall	1	historic?	NLS	No further work
38	6803 #A	mod outcrop	1	traditional?	D	Data Recovery
39	6804 #A	OH	1	traditional?	D	Data Recovery
40	6805 #A	walls	2	historic?	NLS	No further work

\*State Inventory of Historic Places Numbers (Preceded by 50-50-14)

\*\*Only site in the northern section

**Attachment**  
**Archaeological and Historic Resources**

- **Passive Preservation** – Sites in this category do not undergo any interpretive development, occur in areas that can be avoided by development, and are left as is. This category is sometimes referred to as “data banking.” Most sites in this category are not intended to be permanently preserved, but are anticipated to undergo data recovery procedures in the future, presumably when improved data gathering techniques and refined analysis technologies are available or on large tracts of land where development is intended to take place in incremental phases; and
- **Active Preservation** – Sites in this category are chosen for their interpretive potential. Their selection may be based on aesthetic, academic, or cultural representation values. Different levels of interpretive development may be undertaken, including: stabilization, partial or complete restoration, and/or reconstruction. Signs may be involved, and details regarding access and protocols need to be worked out.

**Off-Property Areas**

The AIS reports for the off-site water and wastewater infrastructure areas recommend that in view of the negative results, no further pre-construction archaeological procedures are warranted. However, archaeological monitoring of construction-related ground disturbing activities is recommended. When water and wastewater system plans are finalized, archaeological monitoring plans will be prepared and submitted to SHPD for review and approval before commencement of any construction activities. The limited width of the water and wastewater transmission line corridors will facilitate avoidance of any inadvertent discoveries that warrant preservation.

The Pi'ilani Highway widening area from Kilohana Drive to Wailea Ike Drive is within the existing highway ROW or adjacent to previously disturbed land. The area of the Wailea Ike Drive and Wailea Alanui Drive intersection improvements is also within an area of previously disturbed land. The State Historic Preservation Division has determined that archaeological inventory surveys of the areas of the Pi'ilani Highway widening and the Wailea Ike Drive and Wailea Alanui Drive intersection improvements are not required; however archaeological monitoring plans will be prepared and a qualified archaeological monitor will be present during all ground altering disturbances. For more information on the widening of Pi'ilani Highway see Section 4.4 (Roadways and Traffic) and Appendix R, which contains the complete Pi'ilani Highway Widening Project Final EA. Appendix G of the Final EA contains the SHPD letter regarding the need for archaeological monitoring plan for the Pi'ilani Highway widening area. For more information on the Wailea Ike Drive and Wailea Alanui Drive intersection improvements see Section 4.4 (Roadways and Traffic) and Appendix S, which contains the complete Wailea Ike Drive and Wailea Alanui Drive Intersection Improvements Final EA. Appendix G of the Final EA contains the SHPD letter regarding the need for archaeological monitoring plan for the Wailea Ike Drive and Wailea Alanui Drive intersection improvements.

**Attachment**  
**Archaeological and Historic Resources**

**Inadvertent Finds**

In addition to the protections to be instituted through the CRPP, Honua'ula Partners, LLC and its contractors will comply with all State and County laws and rules regarding the preservation of archaeological and historic sites. Should historic sites such as walls, platforms, pavements and mounds, or remains such as artifacts, burials, concentrations of shell or charcoal be inadvertently encountered during the construction activities, work will cease immediately in the immediate vicinity of the find and the find will be protected. The contractor shall immediately contact SHPD, which will assess the significance of the find and recommend appropriate mitigation measures, if necessary.

Attachment  
Botanical Resources

### 3.6 BOTANICAL RESOURCES

Several botanical reconnaissance surveys of the Property have been conducted since 1988 (Char and Linney 1988; Char 1993, 2004; SWCA 2006; and Altenberg 2007) and SWCA conducted a comprehensive botanical survey of the Property in 2008 (SWCA 2010a). In all, 146 plant species have been identified within the Property, 26 of which are native; 14 of these native species are endemic to the Hawaiian Islands. The remaining 120 species are introduced non-native species.

None of the surveys identified any Federal or State of Hawai'i listed threatened or endangered plant species on the Property. However, five individual plants of the candidate endangered species, *awikiwiki* (*Canavalia pubescens*), have been documented by SWCA (2010a) within the Property. The Property is not located within or immediately adjacent to critical habitat or recovery management units designated by the U.S. Fish and Wildlife Service (USFWS). There until recently there have been no efforts by any Federal, State, or local government agency, or non-governmental conservation organizations have been undertaken to acquire and or protect any portion of the Honua'ula Property. The a few non-native tree tobacco (*Nicotiana glauca*) has been found at various locations widely scattered throughout the Property, and this opportunistic weedy species often appears quickly following grading, mowing, or related land disturbances. While insignificant as an introduced weedy plant species, it The species is a recognized host plant for the Federally-listed endangered Blackburn's sphinx moth (*Manduca blackburni*) (for information on the Blackburn's sphinx moth see Section 3.7 (Wildlife Resources)). However, the plant is not considered as a "primary constituent element" of critical habitat by the US Fish and Wildlife Service for the moth.

SWCA completed the most recent botanical survey of the Honua'ula Property in 2008 (SWCA 2010a), which included the area of the Pihlani' Highway extension ROW that traverses the Property (both the portion owned by the State and the portion owned by Ulupalakua Ranch), and the area of the Maui Electric substation. To address concerns regarding native plants, SWCA conducted a thorough quantitative assessment of site vegetation to obtain the best possible understanding of vegetation types and plant species present within the Property. Spatially explicit information on the composition and structure of plant communities at Honua'ula was obtained to meet three key study objectives: 1) identify the location(s) of rare plants; 2) develop conservation and management recommendations; and 3) provide support for long-term monitoring and ecological research. Key findings of the SWCA survey are presented below. Appendix E contains the complete survey.

SWCA also completed a botanical surveys of the areas of: 1) the alternative wastewater transmission line alignments for possible connection to the Makena Resort WWRF, which is located approximately one mile south of Honua'ula; 2) the off-site wells, waterline, and storage tank; 3) the Pihlani' Highway widening area which extends from Kilo'hana Drive to Wailea Iike Drive; and 4) the Wailea Iike Drive and Wailea Alanui Drive intersection

# ATTACHMENT BOTANICAL RESOURCES

## Attachment Botanical Resources

improvement area. The survey did not observe any Federal or State of Hawaii-listed threatened, endangered, or candidate plant species on any of the alignments

No Federal or State of Hawaii-listed threatened, endangered, or candidate plant species were observed during the survey of the alternative wastewater transmission line alignments; however the non-native tree tobacco (*Nicotiana glauca*) was also observed (SWCA 2009). Since the botanical survey of the areas of the wastewater transmission line alignments was conducted, a decision has been made regarding which alignment to use based upon potential construction impacts, costs, and permitting considerations. For more information on the selected wastewater alignment for possible connection to the Mākena Resort WWRF see Section 4.8.2 (Wastewater System) and Figure 2. Appendix E contains the complete botanical survey of the alternative wastewater transmission line alignments.

No Federal or State of Hawaii-listed threatened, endangered, or candidate plant species were observed during the survey of the areas of the off-site wells, waterline, and storage tank (SWCA 2010d). Eighty percent of the plant species observed during the survey are introduced to the Hawaiian Islands. Most of the native plants observed during the survey are commonly found throughout Maui and the main Hawaiian Islands. Of the native plants in the survey area, only *wiliwili* has a limited distribution throughout the Hawaiian Islands. For more information on the off-site wells, storage tank, and waterline see Section 4.8.1 (Water System) and Figure 2. Appendix E contains the complete botanical survey of the areas of the off-site wells, storage tank, and waterline.

No Federal or State of Hawaii-listed threatened, endangered, or candidate plant species were observed during the survey of the Pi'ilani Highway widening area (SWCA 2009c). In addition, no rare native plant species were found. A total of 88 plant species were recorded, of which, three species are native. Two indigenous species, *'ilima* (*Sida fallax*) and *uhaloa* (*Waltheria indica*), were common along both sides of the highway. The third indigenous species, *milo* (*Thespesia populnea*), was only found at one location adjacent to a homeowner's backyard. For more information on the widening of Pi'ilani Highway see Section 4.4 (Roadways and Traffic) and Appendix R, which contains the complete Pi'ilani Highway Widening Project Final EA. Appendix C of the Final EA contains the complete botanical survey of the Pi'ilani Highway widening area.

No Federal or State of Hawaii-listed threatened, endangered, or candidate species were observed during the survey of the Waialea Iike Drive and Waialea Alanui Drive intersection improvement area (SWCA 2009b). In addition, no rare native plant species were found. A total of 49 plant species were recorded, of which, only glossy nightshade (*Solanum americanum*) is native to, but, common in the Hawaiian Islands. For more information on the Waialea Iike Drive and Waialea Alanui Drive intersection improvements see Section 4.4 (Roadways and Traffic) and Appendix S, which contains the complete Waialea Iike Drive and Waialea Alanui Drive Intersection Improvements Final EA. Appendix B of the Final EA contains the complete botanical survey of the Waialea Iike Drive and Waialea Alanui Drive intersection improvement area.

## Attachment Botanical Resources

### Vegetation Types

Within the Honua'ula Property SWCA (2010a) identified three distinct vegetation types:

**Kiawe-Buffergrass Grassland** – About 75 percent of the northern portion of the Property consists of kiawe-buffergrass grasslands. There is scattered evidence of kiawe logging activities in this area. In addition to buffelgrass, guinea grass (*Panicum maximum*), natal reedtop (*Rhynchelytrum repens*), and sour grass (*Digitaria insularis*) are also scattered throughout the northern portion of the Property. Other plants found in this area include the invasive *koa haole* (*Leucaena leucocephala*), lantana (*Lantana camara*), partridge pea (*Chamaecrista nictitans*) and cow pea (*Macroptilium lathyroides*). The area has been disturbed throughout by numerous jeep trails and unrestricted grazing by axis deer (*Axis axis*). Some open areas that appeared to be heavily grazed were devoid of buffelgrass, but contained the native shrubs *'ilima* and hoary abutilon, and the introduced golden crown beard (*Verbesina enceloides*).

**Gulch Vegetation** – The vast expanse of kiawe-buffergrass in the northern three quarters of the Property is bisected from east to west by several gulches. These intermittent gulches vary in depth and are characterized by patches of exposed bedrock. The gulches are shaded by their steep walls providing relatively cool and moist conditions. Three species of ferns including maiden hair fern (*Adiantum raddianum*), sword fern (*Nephrolepis multiflora*), and the endemic *'iwa'iwa* fern (*Doryopteris decipiens*) were found in the shaded rocky outcrops and crevices within the gulches. Native *piii* grass (*Heteropogon contortus*) was found in more open and sunny locations. Other species found within the gulches included tree tobacco (*Nicotiana glauca*), *wiliwili*, lantana, partridge pea, golden crownbeard, *'ilima*, hoary abutilon, *koa haole*, indigo (*Indigofera suffruticosa*), *uhaloa* (*Waltheria indica*) and lion's ear (*Leonotis nepetifolia*).

**Mixed Kiawe-Wiliwili Shrubland** – The mixed kiawe-wiliwili shrubland vegetation area is limited to the southern 'a'a lava flow in the southern quarter of the Property. This 'a'a lava flow comprises approximately 170-acres. Scattered groves of large-stature *wiliwili* (*Erythrina sandwicensis*) and kiawe trees co-dominated the upper story. Native shrubs, such as *'ilima* and *maiapilo*, and the native vine *'ānunu* (*Sicyos pachycarpus*), were represented in the understory. Introduced shrubs (e.g., *koa haole*, lantana, wild basil, and tree tobacco), and introduced grasses (e.g., guinea grass, natal reedtop) and introduced vines and herbaceous species (e.g., bush bean, vining solanum, burbush, and golden crownbeard) dominate the ground vegetation. Lantana found throughout the mixed kiawe-wiliwili shrubland showed signs of dieback. Although abundant, the guinea grass found on the site was grazed to stubble, probably by axis deer.

### Native Species

All of the native plant species reported on the Property (Char and Linney 1988; Char 1993, 2004; SWCA 2006; Altenberg 2007, and SWCA 2010a) are known to occur



biocontrol. The effort was very successful in mitigating the threat caused by the Erythrina gall wasp.

#### POTENTIAL IMPACTS AND MITIGATION MEASURES

Honua'ula will not impact any Federal or State of Hawaii'i listed threatened or endangered plant species, as none were identified on the Property. In addition, the possible sewer line connection to the Mākena Resort WWRF, the off-site wells, waterline, and storage tank, the widening of Pi'ilani Highway, and the Waialea Iki Drive and Waialea Alanui Drive intersection improvements will not impact any Federal or State of Hawaii'i listed threatened or endangered plant species, as none were identified on during any of the alternative transmission line alignments surveys of these areas.

County of Maui Ordinance No. 3554 Condition 27 requires the establishment of a Native Plant Preservation Area on the Property south of latitude 20°40'15.00"N that shall not be less than 18 acres and shall not exceed 130 acres, excluding any portions that the State Department of Land and Natural Resources, the United States Fish and Wildlife Service, and the United States Corps of Engineers find do not merit preservation.

In their letter addressed to William Spence, Director of the County of Maui Planning Department dated February 15, 2012, the DLNR stated:

With regard to Condition 27, we note that the ordinance refers to "preservation". Statutory provisions for the preservation of natural resources are provided in Chapter 195, Hawaii Revised Statutes, through the establishment of the Natural Area Reserve System. At this time, the Subject Area is not designated a Natural Area Reserve. Chapter 195 provides a process by which a natural Area reserve may be established.

DLNR also stated: "Mitigation for a project as part of an HCP [Habitat Conservation Plan] may, in principle, be conducted off site if all other requirements are met and if the HCP is approved."

In their letter commenting on the Honua'ula Draft Environmental Impact Statement (EIS) dated July 2, 2010, the USFWS stated: "...we recommend that the conservation easement or Native Plant Preservation Area include a contiguous area of roughly 130 acres (56 hectares) which would encompass the majority of the mixed use remnant kiawe-wiliwili shrubland." USFWS also stated that the Conservation & Stewardship plan (see below and Appendix F):

...has identified numerous proposed mitigation measures and an interest in cooperating with funding off-site conservation projects to offset the loss of habitat within the proposed project footprint. Your Final EIS should also include a description of these off-site conservation projects. In order to fully address this aspect of the project in your Final EIS, we suggest that a 130-acre (56 hectare) Native Plant Preservation Area, located within the southern portion of the property,

elsewhere on Maui and the main Hawaiian Islands. Only the unique leaf form of Rock's *nehē* (*Lipochaeta rockii*) appears to be limited to the Property; however, it is not recognized as a separate subspecies or variety (Wagner et al. 1999; Herbst, personal communication). One native species, *āwīkīwīki* (*Canavalia pubescens*), is considered to be a candidate endangered species by USFWS. Five *āwīkīwīki* vines were found within the Property (SWCA 2010a). Currently, the species appears to be limited to five populations on the Island of Maui, which altogether total a little over 200 between 360 and 500 individuals (USFWS 2009, 2010). The USFWS has chosen not to pursue immediate issuance of a proposed listing rule for *āwīkīwīki* in lieu of higher priority listing actions, which include other candidate species with lower listing priority numbers (USFWS 2009, 2010). As of October 2011, the USFWS had not changed the status of *āwīkīwīki* from candidate endangered species (USFWS 2011). Continued status monitoring will be conducted as new information becomes available.

Other native species found on the Property include: *pua kaila* (*Argemone glauca*), *alena* (*Boerhavia repens*), *malapilo* shrubs (*Capparis sandwicheana*), *'a'ali'i* shrubs (*Dodonaea viscosa*), *'iwa'iwa* ferns (*Doryopteris decipiens*), *pili* grass (*Heteropogon contortus*), Hawaiian moon flower vines (*Ipomoea tuboides*), *wīlīwīlī* trees (*Erythrina sandwicensis*), *naio* trees (*Myoporum sandwicense*), *kolomona* trees shrubs (*Senna gaudichaudii*), *hoay* abutilon shrubs (*Abutilon incanum*), *koali* *awahia* vines (*Ipomoea indica*), *ilima* (*Sida fallax*), *popolo* (*Solanum americanum*), *'ilīe'e* (*Plumbago zeylanica*), *'uhaloa* (*Waltheria indica*), and *'ānunu* vines (*Sicyos hispidus*, *S. pachycarpus*).

The highest concentration of native plants occurs in the southern quarter of the Property, which is the area containing the approximately 170-acre 'a'ā lava flow and the *kiawe-wīlīwīlī* shrubland vegetation type. The remnant native vegetation in the mixed *kiawe-wīlīwīlī* shrubland represents a highly degraded lowland dry shrubland in which *wīlīwīlī* trees are a natural component (SWCA 2010a). Far from being pristine, this dry shrubland has been degraded by human activities including unrestricted grazing by feral ungulates, periodic cattle grazing, and invasion by invasive plant species, road cutting, *kiawe* logging, and World War II military training maneuvers (SWCA 2010a). Until surveys by SWCA (2006) and Altenberg (2007), there had been no recognition of the mixed *kiawe-wīlīwīlī* shrubland as an area worthy of special recognition.

*Wīlīwīlī* (*Erythrina sandwicensis*) was the most common native tree species in the southern 'a'ā lava flow area. SWCA (2010a) mapped 2,476 individual trees distributed throughout the *kiawe-wīlīwīlī* shrubland in groves of various sizes. The largest groves tended to be located in the eastern portion of the *kiawe-wīlīwīlī* shrubland. Most *wīlīwīlī* trees showed some form of damage, primarily from the Erythrina gall wasp (*Quadrastichus erythrinae* Krom) and the seed eating bruchid beetle (*Speularius impressithorax* Pe). Although *wīlīwīlī* is not a Federal or State of Hawaii listed endangered species, severe damage caused by the Erythrina gall wasp has led to uncertainty about the survival of these trees throughout the State. Thus agency resource managers believe it is prudent to protect remaining trees wherever they naturally occur. However, a parasitic wasp species (*Eurytoma erythrinae*) was released in 2008 by the State Department Of Agriculture as a

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*be incorporated into the preferred alternative. Alternatively, your discussion of the project alternatives (Section 6.0) in your Final EIS should thoroughly address any reasons conservation of the entire southern area was not included selected [sic] as the preferred alternative.*

Based on the presence of the non-native tree tobacco (*Nicotiana glauca*) and native host plants for the endangered Blackburn's sphinx moth, the USFWS also expressed concern that "habitat loss within the project site could adversely impact Blackburn's sphinx moth populations within this region of Maui."

In their letter dated May 10, 2010 the United States Army Corps of Engineers stated:

*The Corps Regulatory Program does not have the legal authority or expertise to comment or make recommendations as to the appropriateness of areas of a parcel for preservation or for use as mitigation, for a particular project, for Maui Planning Commission use.*

Since June of 2010 Honua'ula Partners, LLC has met with DLNR and USFWS on many occasions to reach agreement regarding satisfaction of Condition 27. As a result of these meetings, Honua'ula Partners, LLC proposes both on- and off-site measures to protect and enhance native plants and habitat for the Blackburn's sphinx moth (*Manduca blackburni*) as discussed below (also see Figure 1, Figure 12, and Figure 12a).

**On-Site Native Plant Preservation Area and Native Plant Conservation Areas**

**Native Plant Preservation Area** — To protect and conserve an area that contains the highest density of representative native plant species within Honua'ula, including the five individual 'āwīkīwī plants and numerous individual *nehe* plants found on the Property, Honua'ula Partners, LLC will dedicate in perpetuity a conservation easement titled "Native Plant Preservation Area." This in compliance with Condition 27 this area will be dedicated to the conservation of native Hawaiian plants and significant cultural sites (see Section 4.1 (Archaeological and Historical Resources) and Section 4.2 (Cultural Resources) for information on archaeological and cultural resources). The Native Plant Preservation Area will be actively managed in accordance with the Conservation and Stewardship Plan (see below and Appendix F). Management actions will include removal and exclusion of ungulates (deer, cattle, goats, and pigs), removal and control of noxious invasive weeds and plants, and propagation of native plants from seeds collected on the Property.

As shown on Figure 1 and Figure 12, the proposed Native Plant Preservation Area is within the portion of the property south of latitude 20°40'15.00"N as required by Condition 27. It encompasses a contiguous 22 40-acre area within the *kiawe-wīwīwī* shrubland to protect the portion of the remnant native lowland dry shrubland plant community with the highest densities of selected endemic/native plants having high conservation priority. The proposed size and location of the Native Plant Preservation Area are based, in part, upon a vegetation density analysis employed by SWCA (2010a) to

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aid in defining areas where preservation could be most effective. The size and location of the Native Plant Preservation Area are also based upon scientific research that suggests even small restoration efforts consisting of a few hectares can help provide habitat for native species and can subsequently serve as urgently-needed sources of propagules (Cabin et al. 2000b, Cabin, et al. 2002a). This is reinforced by numerous sources of information on successful propagation of native plants specifically for landscaping (e.g., TNC 1997, Tamimi 1999, Friday 2000, Wong 2003, Bornhorst and Rauch 2003, Lilieeng-Rosenberger and Chapin 2005, CTAHR 2006). The research shows that even small preserves consisting of individual trees are being deemed as appropriate and feasible by USFWS and DLNR when managed in combination with regional preserve areas, such as at La'i'opua on Hawai'i Island (Leonard Bisel Associates, LLC and Geometrician Associates 2008.)

In addition, the Native Plant Preservation Area must be considered in the context of the significant conservation efforts already in existence in South Maui. As previously noted, the remnant native vegetation found on the Property represents a highly degraded lowland dry shrubland, and until recently there have been no efforts by any Federal, State, or local government agency, or non-governmental conservation organizations to acquire and or protect any portion of the Property (SWCA 2010b). Instead, government conservation efforts for native dry forest ecosystems on Maui have focused on better examples of relatively intact ecosystems, such as the 'Auwahi 1 restoration area (10 acres) and Pu'u o Kali (236 acres) Forest Reserves and the Kanai'o (876 acres) and 'Ahihi-Kina'u (1,238 acres) Natural Area Reserves (SWCA 2010b). In addition, in 2009 over 12,000 11,000 acres in South Maui were recently donated to the Maui Coastal Land Trust—the state's largest conservation easement—representing a significant area of dry forest habitat that will be forever protected. These existing conservation efforts protect substantial habitats that are more intact host higher diversity of known native host plants for the Blackburn's sphinx moth than those found in Honua'ula, and contain a greater diversity of native plant species than Honua'ula.

~~When considered together with the other conservation measures identified for plants and wildlife (SWCA 2010a, 2010c), including an additional 121 36 acres of lands at Honua'ula where existing native plants are to be protected, enhanced, and propagated, the 22 40-acre Native Plant Preservation Area will make an important, valuable, and appropriate contribution to the long-term viability of remnant mixed *kiawe-wīwīwī* shrubland associations in southeastern Maui. These conservation measures are subject to concurrence by the State DLNR, the USFWS, and the United States Corps of Engineers. The provision of the Native Plant Preservation Area easement is in conformance with County of Maui Ordinance No. 3554 Condition 27.~~

The scope of the Native Plant Preservation Area easement will be set forth in an agreement between Honua'ula Partners, LLC and the County of Maui (in conformance with County of Maui Ordinance No. 3554 Conditions 27a – 27d) that will include:

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**Table 1. Honua'ula Native Plant Areas**

Preservation & Conservation Designation	Approximate Area	Management Objective
Native Plant Preservation Area	22 acres	Easement protected in perpetuity and managed exclusively for preservation of the existing native <i>withiif</i> shrubland association
Native Plant Conservation Areas	23 acres	Ungraded conservation areas in which existing native plants will be protected and managed as natural areas
Naturalized Landscape (Existing and Enhanced)	53 acres	Areas for conservation of existing native vegetation
Natural Gulches	28 acres	Natural drainage gulches will be left undisturbed and existing native vegetation will remain intact
Out-planting Areas for Native Plants	17 acres	Areas dedicated to the propagation of native plants
<b>TOTAL AREA</b>	<b>143 acres</b>	<b>Native Plant Areas</b>

**Native Plant Conservation Areas** – In addition to the Native Plant Preservation Area, Native Plant Conservation Areas will be located throughout the Property including adjacent to both the golf course and the Native Plant Preservation Area. The areas will include:

- All the existing natural gulches throughout the Property (28 acres);
- Ungraded conservation areas (eight acres) in which existing native plants will be protected and that will be managed as natural areas; and
- Areas containing naturalized landscape in which existing native vegetation will be conserved or enhanced through propagation of native species from seeds collected on the Property.

Combined these areas will add an additional conservation area of at least 36 acres in which existing native plants will be protected. Management strategies employed for these Plant Conservation Areas will be in accordance with the Conservation and Stewardship Plan.

**Additional On-site Mitigation Measures** – To further protect native species on-site, Honua'ula Partners, LLC will:

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- A commitment from Honua'ula Partners, LLC to protect for the perpetual protection and preserve preservation of the Native Plant Preservation Area for the protection of native Hawaiian dry shrubland plants and significant cultural sites worthy of preservation, restoration, and interpretation for public education and enrichment consistent with a Conservation Plan (see below) approved by the State DLNR, the United States Geological Survey, and the USFWS and with a Cultural Resource Preservation Plan (see Section 4.1 (Archaeological and Historic Resources) and Section 4.2 (Cultural Resources) for information on archaeological and cultural resources), which includes the management and maintenance of the Native Plant Preservation Area (Condition 27a);
- Confining use of the Native Plant Preservation Area to activities consistent with the purpose and intent of the Native Plant Preservation Area (Condition 27b);
- Prohibiting development in the Native Plant Preservation Area other than erecting fences, enhancing and interpretive trails, and constructing structures for the maintenance needed for the area, in accordance with the Conservation/Preservation Plans (Condition 27c). Interpretive trails will be minimal in size, and shall not consist of imported materials or hardened surfaces; care will be taken to minimize impacts to native plants during establishment of trails; and
- That title to the Native Plant Preservation Area will be held by Honua'ula Partners, LLC, its successors and permitted assigns, or conveyed to a land trust that holds other conservation easements. Access to the Native Plant Preservation Area will be permitted pursuant to an established schedule to organizations on Maui dedicated to the preservation of native plants to help restore and perpetuate native species, and to engage in needed research activities. These organizations may enter the Native Plant Preservation Area at reasonable times for cultural and education purposes only (Condition 27d).

In addition to the Native Plant Preservation Area, Honua'ula Partners, LLC will also provide additional areas for the protection of native plants (Figure 12). Altogether, 143 acres are proposed for the preservation, conservation, propagation, and management of native plant species at Honua'ula. Included in this area is the 22-acre Native Plant Preservation Area, which will contain the highest density of native and indigenous plants found at Honua'ula. The Native Plant Preservation Area and an additional 23 acres of Native Plant Conservation Areas within the *kiawe withiif* shrubland will remain ungraded and protected. Further areas specifically designated for native plants include approximately: 1) 53 acres of existing or enhanced natural landscape which may be graded but will be replanted with native dry shrubland species; 2) 28 acres of natural gulch areas; and 3) 17 acres for planting and propagation of native plants. Table 2 identifies conservation sub-areas and the elements unique to each. Combined, these areas will: 1) provide protection for native plants; 2) ensure the long-term genetic viability and survival of the native dry shrubland species; and 3) enhance long-term population growth.

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- Conserve as many of the *wiliiwi* trees as possible outside the Native Plant Preservation Area;
- Fence the entire perimeter of the Property, and other areas as appropriate, to exclude feral ungulates from the *kiawe-wiliiwi* shrubland. A fence has already been erected, however fencing requirements will be reviewed and updated (for example, to include stronger deer fencing) as establishment of the Native Plant Preservation Area and site construction begins (this is consistent with County of Maui Ordinance No. 3554 Condition 7);
- Implement an ungulate management plan to ensure that goats, deer, pigs, and stray cattle are removed in a humane manner from the Native Plant Preservation Area and the Native Plant Conservation Areas (this is consistent with County of Maui Ordinance No. 3554 Condition 7);
- Employ a Natural Resources Manager to help develop and implement specific conservation programs to ensure the protection of native plants and animals within the Native Plant Preservation Area and other Native Plant Conservation Areas throughout the Property. The Natural Resources Manager will also be responsible for ensuring the success of the off-site mitigation program;
- Implement a program to control and eradicate invasive grasses, weeds, and other non-native plants from the Native Plant Preservation Area with the exception of the non-native tree tobacco (*Nicotiana glauca*), which is a recognized host plant for the endangered Blackburn's sphinx moth (*Manduca blackburni*) (for information on the Blackburn's sphinx moth see Section 3.7 (Wildlife Resources));
- Implement a native plant propagation program for landscaping with plants and seeds naturally occurring on the Property. All plants native to the geographic area will be considered as potential species for use in landscaping;
- Implement a seed predator control program to control rats, mice, and other seed predators;
- Implement a fire control program to help protect the Native Plant Preservation Area and the Native Plant Conservation Areas and ensure the success of plant propagation and conservation efforts;
- Implement an education and outreach program open to the public and sponsor service groups to assist with implementation of the management programs in the Native Plant Preservation Area and other Native Plant Conservation Areas;
- Apply for additional program support offered by the State of Hawai'i (Natural Area Partnership Program and Hawai'i Forest Stewardship Program) and USFWS to promote sound management of the natural resources within Honua'ula;
- Submit copies of all SWCA reports prepared for Honua'ula, along with the report titled "Remnant *Wiliiwi* Forest Habitat at Wailea 670, Maui, Hawaii" (Altenberg 2007), to DLNR, USFWS, U.S. Geological Survey, and U.S. Army Corps of Engineers for review and comment in compliance with County of Maui Ordinance No. 3554 Condition 27. These reports were submitted to the above agencies on March 22, 2010;
- Continue long-term vegetation monitoring during wet and dry seasons to evaluate the health of native plants and to support the development of the Conservation and

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- Stewardship Plan for the Native Plant Preservation Area and other Native Plant Conservation Areas (see below); and
- Prepare a multi-species Finalize its draft Habitat Conservation Plan (to include the candidate endangered *awikiwika*) under in collaboration with USFWS and DLNR in accordance with Section 10(a)(1)(B) of the Endangered Species Act and in collaboration with DLNR and USFWS Chapter 195D, HRS, Section 3.7 (Wildlife Resources) below contains additional information regarding the Habitat Conservation Plan.

**Off-Site Mitigation Areas**

For off-site mitigation, Honua'ula Partners, LLC will:

1. Acquire a perpetual conservation easement of approximately 224-acres on a currently unprotected portion of property owned by Ulupalakua Ranch adjacent to the eastern boundary of the State of Hawai'i Kanaio Natural Area Reserve; and
2. Fund and implement the continuation and expansion of restoration efforts within the Auwahi Forest Restoration Project area, just north of the Kanaio Natural Area Reserve, including fencing of approximately 130 acres, ungulate removal, and plant restoration activities.

Figure 12a shows the proposed locations of the on- and off-site mitigation areas. The on- and off-site mitigation measures and areas are subject to the approval of the Habitat Conservation Plan by USFWS and DLNR.

The Kanaio and Auwahi areas have been pinpointed by USFWS, USGS, Medeiros, Loope, and Chimera (1993), VanGelder and Conant (1998), Price et al (2007), and The Nature Conservancy to be of high value for Blackburn's sphinx moth habitat and native dryland forest and shrubland species including wiliwili and a number of threatened and endangered species. While it may be debated that there are additional areas in Southeast Maui with geology, slope, rainfall, and plant species composition similar to the Honua'ula Property, such areas are either already protected or simply not available for acquisition from their owners.

**Kanaio Natural Area Reserve Conservation Easement** – The proposed approximately 224-acre perpetual conservation easement adjacent to the eastern boundary of the Kanaio Natural Area Reserve harbors 171 species of plants, 40 percent of which are native to the Hawaiian Islands (19 indigenous species and 49 endemic species). In comparison, Honua'ula harbors 146 species of plants, of which 27 percent were native (26 indigenous species, and 14 endemic species).

This area, which contains native dry land habitat, is considered to be particularly high quality habitat for the Blackburn's sphinx moth, due in large part to the presence of many native host plants for both adult and juvenile life stages of the Blackburn's sphinx moth.

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2. Creation and protection of a higher number species of native host plants than currently exists on the Property.

The on- and off-site mitigation areas together provide approximately 394 acres of native dry shrublands for the perpetual protection and propagation of native dryland plants, including wiliwili. Through the perpetual protection and enhancement of these areas, a stable core habitat area will be secured for the moth, providing net benefit to this covered species, as well as a large number of additional native dryland species. To implement the on- and off-site mitigation measures Honua'ula Partners, LLC, will finalize its draft Habitat Conservation Plan (HCP). (See Section 3.7 (Wildlife Resources)). The on- and off-site mitigation measures and areas are subject to the approval of the Habitat Conservation Plan by USFWS and DLNR. Section 3.7 (Wildlife Resources) below contains additional information regarding the Habitat Conservation Plan.

**Honua'ula Conservation and Stewardship Plan**

To ensure the long-term conservation and stewardship of native plants within Honua'ula, and in conformance with County of Maui Ordinance No. 3554 Condition 27a, SWCA prepared the *Honua'ula Conservation and Stewardship Plan* (2010b). The plan incorporates findings, conclusions, and recommendations from previous botanical surveys, wildlife surveys, and biological assessments of the Property and recommends proactive stewardship actions to manage the Native Plant Preservation Area and other Native Plant Conservation Areas.

The *Honua'ula Conservation and Stewardship Plan* also includes discussion of Hawaiian dry forest ecosystems and their status, an evaluation of the remnant coastal dry shrubland community at Honua'ula, an inventory of dry forest restoration efforts underway statewide (reserves and preserves), and an evaluation of lessons learned that are applicable to the Honua'ula Native Plant Preservation Area and other Native Plant Conservation Areas.

In summary, the remnant native vegetation in the Honua'ula mixed *kiawe-wiliwili* shrubland represents a highly degraded lowland dry shrubland. Current conservation efforts for native dry forest ecosystems have been focused on better examples of relatively intact ecosystems such as the Pu'u o Kali, Auwahi, and Kula Forest Reserves and the Kanaio and 'Ahihi-Kina'u Natural Area Reserves. These projects and other conservation efforts in Hawai'i indicate that even small restoration efforts consisting of a few hectares, and in some cases individual trees, can help provide habitat for rare native dry forest species and can subsequently serve as urgently-needed sources of propagules.

With the lessons learned from other resource protection programs, the overall goal of the *Honua'ula Conservation and Stewardship Plan* is to ~~conserve the native plant resources of~~ protect native plants and animals within Honua'ula. The secondary goals are to cooperate with researchers in furthering the science of native plant propagation, and provide education and outreach opportunities, ~~and enhance the natural beauty of Honua'ula.~~ To

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As part of Honua'ula Partners, LLC's conservation efforts, the eight-foot unguulate fence that currently exists along the eastern and southern border of the approximately 224-acre area will be extended along the remaining borders of the parcel, and unguulates will be removed from the enclosure. A 10-foot wide fire break will be established along the inside perimeter of the fence to minimize the risk of fires started outside the parcel from entering the mitigation area. In addition, a cross fencing plan for adjacent ranch land is being developed in coordination with Ulupalakua Ranch. Cross fencing will be designed to facilitate cattle grazing in such a pattern to enhance fire control immediately adjacent to the protected area. The fence and fire breaks will be maintained in perpetuity.

**Auwahi Forest Restoration** – At the Auwahi Forest Restoration Project, Honua'ula Partners, LLC will fund and implement a 15-year restoration program covering an area of approximately 130-acres. This will include: a) fencing of, and unguulate removal from, approximately 130 acres of Blackburn's sphinx moth conservation area; and b) dry forest restoration to benefit the Blackburn's sphinx moth, and native dry shrubland plant species. Restoration activities will include removal of invasive weeds and propagation and out-planting of native species, including many native host plants for both adult and juvenile life stages of the Blackburn's sphinx moth.

While an eight foot fence already exists around the entire 184-acre Auwahi Forest Restoration Project, some cattle grazing continues in most of the area within the enclosure. As part of the program funded and implemented by Honua'ula Partners, LLC, cattle fences will be moved or installed and cattle will be removed from restoration areas.

Restoration efforts at the Auwahi Forest Restoration Project started in 1997 have been very successful, with 28 native species naturally reproducing after only 10 years of restoration efforts. The mitigation program implemented by Honua'ula Partners, LLC will build on this success, and will include mechanical and chemical removal of invasive plant species and enhancement of the native vegetation through propagation. A 10-foot wide fire break will be established along the inside perimeter of the fence, and the cross-fencing plan described above will benefit the Auwahi mitigation area as well as the Kanaio conservation easement area. Honua'ula Partners, LLC will establish an endowment to ensure that fences, firebreaks, and restored areas will be maintained in perpetuity.

**Net Conservation Benefit**

The proposed on- and off-site measures to protect native plants and Blackburn's sphinx moth habitat proposed by Honua'ula Partners, LLC provide a net conservation benefit (as required under Chapter 195D, HRS) through:

1. The protection and propagation of additional native host plants for both larval and adult Blackburn's sphinx moth (including the native host species 'aia (*Nothocestrum spp.*) and halapepe (*Pleomele spp.*)); and

achieve these goals the *Honua'ula Conservation and Stewardship Plan* sets forth management objectives, which are summarized below (SWCA 2010b). Many of these management objectives mirror the recommendations contained in the botanical survey (SWCA 2010a). Appendix F contains the complete *Honua'ula Conservation and Stewardship Plan*.

- **Management Objective 2: Fund and Hire a Natural Resources Manager**  
A Natural Resources Manager will implement the goals and objectives of the *Honua'ula Conservation and Stewardship Plan*, which includes the *Ungulate Management Plan*. The Natural Resources Manager will be responsible for implementing the management objectives, including conducting public outreach, supporting plant propagation efforts and scientific research, and controlling and eradicating invasive plant species. The Natural Resources Manager will also work cooperatively with government and non-governmental conservation agencies including the Maui Invasive Species Council, Leeward Haleakala Watershed Alliance, DLNR, and other organizations. The Natural Resources Manager will also be responsible for ensuring the success of the off-site mitigation program.

- **Management Objective 3: Eliminate Browsing, Grazing, and Trampling By Feral Ungulates**  
The perimeter of the Property has already been fenced to exclude feral ungulates from the *kiawe-wilwil* shrubland; however, the fencing is porous. In accordance with DLNR stipulations, the existing fence will be replaced with an ungulate proof fence to exclude non-native deer, goats, and cattle from damaging native plants. The fence is expected to be made of rust resistant, galvanized steel materials and will be approximately eight feet high with a mesh size of no more than six inches. Ungulates trapped within fenced areas will be removed from the Property in a humane manner. A detailed description of the fencing is contained in the *Ungulate Management Plan* which is appended to the *Honua'ula Conservation and Stewardship Plan*;

- **Management Objective 4: Remove and Manage Noxious Invasive Plants**  
Honua'ula Partners, LLC will implement a program to control and eradicate invasive grasses, weeds, and other non-native plants from the Native Plant Preservation Area with the exception of the non-native tree tobacco (*Nicotiana glauca*), which is a recognized host plant for the endangered Blackburn's sphinx moth. In addition, the Natural Resources Manager will establish a protocol for avoiding the introduction of new invasive plants or the spread of existing plants. The Natural Resources Manager will also collaborate with the landscape designers for the golf course and the residential areas to ensure that the ornamental plants being used for landscaping are not likely to become invasive within the Native Plant Preservation Area or the Native Plant Conservation Areas;

- **Management Objective 5: Protect and Augment All Native Plants Within the Native Plant Preservation Area**

In addition to building features or physical barriers (stone walls, fences, etc) to protect the Native Plant Preservation Area, Honua'ula Partners, LLC will augment existing native populations by seeding, out-planting nursery grown native plants, or transplanting native plants from un-protected areas on the Property. The Natural Resources Manager will implement a program to relocate scattered rare native plants occurring outside of the Native Plant Preservation Area (e.g. *ne/le*) to appropriate areas within the boundaries of the Native Plant Preservation Area. The Natural Resources Manager will be responsible for improving habitat conditions, as needed, to augment the health of plants in the Native Plant Preservation Area and other Native Plant Conservation Areas;

- **Management Objective 6: Create a Plant Propagation Effort**  
The Natural Resources Manager will work with native plant propagators in the community to facilitate a native plant propagation program. Selective seeds and cuttings will be collected from native plants found within Honua'ula to be stored outside the natural environment (i.e. seed banks) for use in plantings within the Property, as well as at protected areas such as Pu'u O Kali or the off-site mitigation areas. The success of this effort depends largely on the availability of fresh, viable seeds;

- **Management Objective 7: Attempt Propagation and Out-planting of Native Host Plants for the Blackburn Sphinx Moth**  
Despite its importance to the endangered Blackburn's sphinx moth, the non-native tree tobacco (a Blackburn's sphinx moth host plant) is not an ideal species to maintain within the Native Plant Preservation Area because it is a high risk invasive species, due to its prolific seed production, environmental versatility, and toxicity to humans and cattle;

Because the intent of the Native Plant Preservation Area is to protect valuable native plant species, consideration is being given to propagating 'aiea (*Nothocestrum latifolium*) (a Blackburn's sphinx moth host native plant) in this area to replace the non-native tree tobacco. The ultimate outcome of this effort is unknown because the Property is at a lower elevation and drier climate than the elevation where native 'aiea usually grows. If 'aiea becomes established within the Native Plant Preservation Area and is used by the Blackburn sphinx moth, then non-native tobacco trees ~~will~~ may be removed. Removal of non-native tree tobacco will only occur in the season when Blackburn sphinx moths are underground. Precautions will be taken to ensure pupae are not harmed;

- **Management Objective 8: Protect Native Plants and Animals Against Wild Fires**  
Honua'ula Partners, LLC will implement a fire control program to help protect the Native Plant Preservation Area and Native Plant Conservation Areas to insure the

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success of plant propagation and conservation efforts. This program will include the creation of a fire break immediately outside of the perimeter of the Native Plant Preservation Area. The golf course, which will abut portions of the Native Plant Preservation Area and other Native Plant Conservation Areas, will also act as a fire break to protect native plants. In addition, non-native grasses which augment fuel biomass, will be controlled from inside of the areas. The Natural Resources Manager will develop and finalize the fire control plan in coordination with resource agencies and fire department officials;

- **Management Objective 9: Remove and Manage Non-Native Seed Predators**  
The Natural Resources Manager will design and implement a predator control program for rats, mice, and other predators within the Native Plant Preservation Area and the Native Plant Conservation Areas that prey on native plant seeds and seedlings. This program may include the use of bait stations, as well as traps. The program will be developed through coordination with USDA Animal Damage Control and DLNR staff. State DOH BMPs will be implemented;

- **Management Objective 10: Develop and Implement a Scientific Monitoring Program**  
The Natural Resources Manager will work with the USFWS, DLNR, and others as appropriate to conduct a detailed scientific inventory and monitoring program. The purpose of the monitoring will be to: 1) establish an accurate baseline to evaluate the efficacy of management activities; 2) determine if the goals of the *Honua'ula Conservation and Stewardship Plan* are being achieved; and 3) identify impending threats to the Native Plant Preservation Area. This program will monitor annual survival rates, natural reproduction, signs of herbivory, abundance of invasive species, and accurately map native species, as appropriate;

- **Management Objective 11: Utilize Appropriate Native Plant Landscaping in Areas Outside the Native Plant Preservation Area and Native Plant Conservation Areas**  
Honua'ula Partners, LLC will landscape common areas with native plant species to the maximum extent practicable. Preference will be given to xeric species (i.e. plants that require minimal irrigation and are tolerant of dry conditions); however, all plants native to the geographic area should be considered as potential species for use in landscaping. Honua'ula Partners, LLC will also conserve as many of the *wilowili* trees as possible outside of the Native Plant Preservation Area and the Native Plant Conservation Areas;

- **Management Objective 12: Manage the Native Plant Preservation Area With the Cooperation of Stakeholders**  
Honua'ula Partners, LLC will attempt to involve a wide range of stakeholders in the management of the Native Plant Preservation Area. The Natural Resources Manager will work with the University of Hawai'i, Maui Invasive Species Council, Leeward Haleakala Watershed Alliance, State DLNR, and others, as appropriate, to

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conduct detailed scientific inventories and monitoring programs to develop an accurate baseline and ongoing monitoring to evaluate the efficacy of management activities and identify imminent threats to the Native Plant Preservation Area. Honua'ula Partners, LLC will make an effort to continually disseminate useful information to all stakeholders;

- **Management Objective 13: Develop a Public Education and Outreach Program**  
Honua'ula Partners, LLC will implement an education and outreach program open to the local community and the general public. This program will be coordinated by the Natural Resources Manager and will involve: 1) sponsoring service trips to assist with management activities; 2) field trips for island students; and 3) developing interpretive signs to encourage public cooperation and discourage trespassing through the Native Plant Preservation Area and other Native Plant Conservation Areas; and

- **Management Objective 14: Incorporate Adaptive Management Principals**  
To accommodate for uncertainty inherent in natural systems, Honua'ula Partners, LLC will adopt an active adaptive management approach. With this approach, information gathered during the monitoring program will influence and improve future management practices. According to USFWS policy, adaptive management is defined as a formal, structured approach to dealing with uncertainty in natural resources management, using the experience of management and the results of research as an on-going feedback loop for continuous improvement. Adaptive approaches to management recognize that the answers to all management questions are not known and that the information necessary to formulate answers is often unavailable. Adaptive management also includes, by definition, a commitment to change management practices when determined appropriate.

**Honua'ula Landscape Master Plan**

To ensure a cohesive and visually unified landscape throughout Honua'ula, PBR Hawaii and Associates, Inc. prepared the Honua'ula Landscape Master Plan. The Landscape Master Plan establishes an overall landscape concept and establishes principles to guide the design and implementation of landscape planting within Honua'ula. Key concepts and objectives of the Landscape Master Plan are summarized below. Appendix G contains the complete plan.

The design proposals contained in the Honua'ula Landscape Master Plan are driven by the *Honua'ula Conservation and Stewardship Plan* (SWCA 2010b), which recommends proactive stewardship actions to manage and propagate native plants within Honua'ula. Similarly, the Landscape Master Plan strives to create a naturalized landscape palette, using native plants, which require minimal irrigation and will, after establishment, require minimal maintenance. Consistent with the Maui County Planting Plan, the Honua'ula

## Attachment Botanical Resources

Landscape Master Plan is responsive to the botanical resources of the area and the need to limit the use of water for irrigation.

The goals of the Landscape Master Plan are to:

- Create an informal, naturalistic community-wide landscape that will allow buildings and other improvements to rest graciously upon the land; in this sense, the landscape will dominate the scene;
- Create a memorable experience at Honua'ula by designing landscapes that respect the site's natural and cultural resources, and embrace this unique Hawaiian landscape;
- Preserve, enhance, and protect native landscape and habitat areas by using native plants, whenever possible, to make seamless transitions between the natural landscape and introduced landscapes;
- Concentrate ornamental landscapes around key amenity areas of the Golf Clubhouse, mixed use village areas, and select higher density residential neighborhoods;
- Rehabilitate existing degraded landscapes and restore all disturbed areas affected by grading and construction for infrastructure and community development; and
- Use plants and irrigation techniques that are sensitive to water conservation.

The Honua'ula Landscape Master Plan draws inspiration from the geographical characteristics and native vegetation found on-site and in the area:

- **Native Plant Palette** – Honua'ula's primary plant palette will reflect the area's mixed *Kiawe-wilivili* shrubland vegetation. The vegetation will consist mainly of native drought-tolerant plants, which will be planted in a manner that will mimic how these plants would grow in their natural state. All planting areas will be irrigated using non-potable water.
- **Lava Flows** – Lava stone found on-site will be incorporated into the landscape as a thematic element. On-site rocks and boulders will be used for grade transitions and will also be incorporated as landscape features.
- **Lava Rock Walls** – Dry stack rock walls similar to the existing historic and ranch era walls found on-site will be incorporated into the landscape as both a functional and aesthetic design element. These walls will be incorporated throughout Honua'ula, becoming an important identity element of the Honua'ula landscape.
- **Gulches** – As much as possible, gulches will remain natural. Transition areas between gulches and built areas will incorporate boulders found on-site with native plantings.

The Honua'ula Landscape Master Plan identifies 13 key landscape areas or components that combine to create the framework for the overall landscape concept. Below is a listing of these areas along with the key design features of each:

## Attachment Botanical Resources

- **Entries/Gateways** – Define entries and gateways with boulders, rock walls, signs, canopy trees and/or vertical palms, specimen trees, native plants, and subtle lighting;
- **Roadways** – The landscape treatment along roadways and trails will consist primarily of informal clusters of native plants;
- **Pi'ilani Highway Extension** – With the exception of a few strategically located view corridors, most of the Pi'ilani Highway extension within Honua'ula will be planted with informal clusters of native and/or ornamental plants to create a dense buffer between the highway and adjacent uses;
- **Golf Course** – Native vegetation will be planted in informal clusters to transition from golf course landscaping to open spaces;
- **Clubhouse** – A combination of native plants, at the periphery or in low impact areas, and ornamental landscaping, close to the club buildings and in high impact areas, will create a varied yet naturalistic landscape;
- **Native Plant Preservation Area and Native Plant Conservation Areas** – Protection of existing native plants will be the primary objective for these areas;
- **'A'a Lava Flows** – Lava and rocks will surround native plant clusters propagated from the site;
- **Grass Lands** – Native shrub vegetation will be used to landscape the area;
- **Maui Meadows Landscape Buffer** – A mixture of medium-sized canopy trees, large native shrubs, and small trees will function as a landscape buffer. In addition, portions of the buffer could be utilized for community parks and gardens;
- **Utility Buffers** – Canopy trees and dense understory plantings will surround water tanks and utility features to create a dense visual screen;
- **Gulches** – Re-established native plants will provide natural landscape treatment;
- **Parks** – Landscape will include turf grass, canopy trees, and native shrubs and groundcovers; and
- **Village** – Within the higher density village mixed use areas, a more ornamental landscape is appropriate, using canopy trees and shrub massing to mitigate the visual and micro-climate impacts of buildings.



Attachment  
Consultation

8.1 INDIVIDUALS AND ORGANIZATIONS CONSULTED WITH PRIOR TO THE EIS  
PROCESS

In the course of planning Honua'ula, since 2001, Honua'ula representatives have met with concerned individuals, community organizations, private groups, and government agencies, which include (Note: \* Title/position at time of meeting):

State of Hawai'i

- Land Use Commission
  - Anthony Ching, Executive Officer\*
  - Full Commission
- Department of Education
  - Heidi Meeker, Land Use Planner
- Department of Health
  - Herbert Matsubayashi, Chief, District Environmental Health Division\*
- Department of Land and Natural Resources
  - Betsy Gagne, Natural Area Reserve System
  - John Cummings, Branch Manager, Maui DOFAW
  - Fern Duvall, Wildlife Biologist, DOFAW
  - Paula Hartzell, Conservation Initiative Coordinator, DOFAW
  - Charles Ice, Staff, CWRM
  - Ane Bakutis, formerly with Plant Extinction Prevention Program (DLNR)
  - Talia Portner, Plant Extinction Prevention Program (DLNR)
- Department of Transportation
  - Brian Minai, Director\*
  - Jadine Urasaki, Deputy Director\*
  - Brennon Morioka, Director\*
- Office of Hawaiian Affairs
  - Boyd Mossman, Trustee\*
  - Kai Markell, Director of Native Rights, Land, and Culture
  - Jerome Yasuhara, Compliance Specialist
- University of Hawai'i
  - Dr. Creighton Litton, Assistant Professor of Forest Ecology
  - Dr. Jonathan Price, Assistant Professor of Geography & Environmental Studies
  - Dr. Cliff Morden, Associate Professor of Botany

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**Federal**

- U.S. Fish and Wildlife Service
  - James Kwon, Botanist
  - Lorena Wada, Biologist
  - Bill Standley, Fish and Wildlife Biologist
  - Mike Richardson, Entomologist
- U.S. Geological Survey
  - Dr. Art Medeiros, Research Biologist
- U.S. Army Corps of Engineers
  - George Young, Chief, Regulatory Branch
  - Robert Deroche, Project Manager, Regulatory Branch
- U.S. Army
  - Stephen Mosher, Wildlife Biologist (Contractor)

**County of Maui**

- Mayor Kimo Apana\*
- Mayor Alan Arakawa\*
- Mayor Charmaine Tavares\*\_
- Department of Planning
  - John Minn, Director\*
  - Michael Foley, Director\*
  - Jeffrey Hunt, Director\*
  - Clayton Yoshida, Deputy Director\*
  - Colleen Suyama, Deputy Director\*
  - Ann Cua, Senior Planner\*
- Department of Fire and Public Safety
  - Carl Kaupololo, Chief\*
  - Jeffrey Murray, Chief
  - Neal Bai, Deputy Chief\*
  - Robert Shimada, Deputy Chief
- Department of Housing and Human Concerns
  - Alice Lee, Director\*
- Department of Parks and Recreation
  - Tamara Horcajo, Director\*
  - Floyd Miyazono, Director\*

**Attachment  
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- Glenn Correa, Director‡
- Pat Matsui, Deputy Director\*
- Police Department
  - Tom Phillips, Chief\*\_
- Department of Public Works
  - Gilbert Agaran, Director\*
  - Milton Arakawa, Director\*\_
  - Michael Miyamoto, Deputy Director\*
- Department of Water Supply
  - Jeffrey Eng, Director\*
  - George Tengan, Director\*

**Private Organizations & Individuals**

- Maui Electric Company, Ltd.
  - Edward Reinhardt, President
  - Neil Shinyama, Engineering Manager
- Kihei Community Association
  - David Fraser, President
  - David Maxwell, President
  - Planning and Development Committee
  - Full membership
- Wailea Community Association
  - William Overton, Director
  - Bud Pikrone, Director
  - Phillip Johnson
  - Board of Directors
  - Full membership
- Diamond Resort
  - Kyoko Kimura, General Manager
- 'Ekolu Homeowners Association
  - Ronald Beckett
  - Board of Directors
- Makena Homeowners Association
  - Tim Farrington, President
  - Board of Directors

**Attachment  
Consultation**

- o Full membership
- o Maui Meadows Homeowners Association
  - o Ron Sturtz
  - o Madge Schafer
  - o Board of Directors
  - o Full membership
- Maui Meadows Neighborhood Association
  - o Dorothy Hughes
  - o Board of Directors
  - o Full membership
- Maui Tomorrow
  - o Ron Sturtz
  - o Irene Bowie
  - o Board of Directors
  - o Membership
- Sierra Club
  - o Rob Parsons
  - o Membership
- Haleakalā Ranch
  - o Buzz Stituka, President\*
  - o Don Young, President
  - o Scott Meidell, Manager
- 'Ulupalakua Ranch
  - o Pardee Erdman, President
  - o Sumner Erdman, VP
  - o James Gomes, Manager
- Housing for Local People
  - o Mr. Stan Franco
  - o Board members
- Maui Junior Golf
  - o Eric Miyajima
- Nā Kūpuna O Maui,
  - o Patty Nishiyama

**Attachment  
Consultation**

- Maui Contractors Association
  - o Jackie Haraguchi, Executive Director
  - o Tom Cook, President
  - o Full membership
- Hawai'i Carpenters Union
  - o William Kamai
  - o Steven Suyat
  - o Ivan Lei
- International Longshoreman Workers
  - o Willi Kennison
  - o Steven West
  - o Jason Medeiros
- Bernice Pauahi Bishop Museum
  - o Dr. Rob Preston, Department of Entomology
  - o Dr. Derral Herbst, Department of Botany (Retired)
- The Nature Conservancy
  - o Dr. Sam Gon
- Maui Coastal Land Trust
  - o Dale Bonar
- Contractors
  - o Maya LeGrande, Botanist/owner, LeGrande Biological Surveys
  - o Hina Kneubuhi, Botanist, LeGrande Biological Surveys
  - o Ronald Walker, former DLNR wildlife biologist
  - o Reggie David, wildlife biologist
- Community Members
  - o Shannie Akau
  - o John Armstrong
  - o Peggy Aviles
  - o Michelle Bruce
  - o John Buist
  - o Kolyne Cabanas
  - o Laverne Carvalho
  - o Donna Clayton
  - o Danny Collier
  - o Steve Cordova
  - o Dave Cullup
  - o Mike Diaz
  - o Dustin Dipersia
  - o Joe Evans
  - o Ted Fritzen
  - o Ken Gift
  - o Chad Goodfellow
  - o Daniel & Claudia Goodfellow
  - o Steve Goodfellow
  - o Lucia Gouveia
  - o Tia Hanchett
  - o Mike Harrell

**Attachment  
Consultation**

- o Arline Harris
- o Chris Haynes
- o Fred Hollenbeck
- o Michele Hough
- o Tamio Iwado
- o Mike Jackman
- o Erik Jorgensen
- o Rob Judge
- o Kristi Kapahulehua
- o Howard S. Kihune
- o Karen Kuwashima
- o Blanca Lafolette
- o Mark La Turner
- o Corie Leal
- o Bob & Kay Lloyd
- o Craig Lohmeyer
- o Adam Lynch
- o Todd MacFarlane
- o Todd MacFarlane, Jr.
- o Dave Mackwell
- o Paul MacLaughlin
- o John Maloney
- o John Martinsen
- o Mary Lou Masako
- o Dennis McCarthy
- o Bo McKuin
- o Jerry McLain
- o Jerry McLain III
- o Melina Mindoro
- o Dayna Morreira
- o Mel Nakoa
- o Steven Newhouse
- o Kelly O'Kief
- o Steve Owendale
- o Wilson Padilla

**Attachment  
Consultation**

- State of Hawai'i**
- Department of Business, Economic Development & Tourism (DBEDT)
  - DBEDT – Office of Planning
  - DBEDT – Strategic Industries Division
  - Department of Education
  - Department of Health
  - Office of Environmental Quality Control
  - Department of Land & Natural Resources
  - DLNR – State Historic Preservation Division
  - Department of Transportation
  - Office of Hawaiian Affairs
  - University of Hawai'i Environmental Center
- Federal**
- U.S. Army Engineer Division
  - U.S. Fish and Wildlife Service
- Maui County**
- County Council
  - Department of Planning
  - Department of Fire Control
  - Department of Housing & Human Concerns
  - Department of Parks & Recreation
  - Police Department
  - Department of Public Works
  - Department of Environmental Management
  - Department of Water Supply

**Private Organizations & Individuals**

- Hawaiian Telcom
- Maui Electric Company, Ltd.
- Maui News
- Maui Meadows Neighborhood Association
  - o Madge Schaefer
- Wailea Community Association
- Save Makena.org
  - o Angie Hoffman
  - o Elle Cochran

**8.2 INDIVIDUALS AND ORGANIZATIONS CONSULTED DURING THE EIS PROCESS**

Various Federal, State, and County agencies, as well as organizations and members within the community, were consulted with or provided comments on the EA/EISPN which aided in preparation of the Draft EIS (see Chapter 11, EA/EISPN Comments and Responses). ~~THE DRAFT EIS WILL BE DISTRIBUTED TO THE FOLLOWING AGENCIES, ORGANIZATIONS, AND INDIVIDUALS. COMMENT LETTERS RECEIVED ON THIS DRAFT EIS AND RESPONSES WILL BE INCLUDED IN THE FINAL EIS.~~

**Attachment  
Consultation**

- Maui Unite!
  - Elle Cochran
  - Gordon Cockett
- Maui Cultural Lands
  - Clare Apana
- Maui Tomorrow Foundation
  - Irene Bowie
- Sierra Club Maui Group
  - Lucienne de Naie
- Community Members
  - Angie Hofmann
  - Claire Jordan
  - Clare Apana
  - Dale Deneweth
  - Daniel Kanahale
  - Dick Mayer
  - George Harker
  - Gordon Cockett
  - Joe Fell-McDonald
  - Johnny Be
  - Joycynn Costa
  - Karrie Silva
  - Katie Romanchuk
  - Keegan House
  - Ken Rose
  - Lee Altenberg
  - Lucienne de Naie
  - Madeleine Migenes
  - Mark Hyde
  - Michael Howden
  - Michael & Barbara Gach
  - Robert Wirthner
  - Robin Knox
  - Sally Raisbeck
  - Scott Heller
  - Steve Lefleur
  - Teri Leonard
  - Todd Wilson
  - Wayne Bachman

**Attachment  
Consultation**

**EIS Consulted Parties**

Title 11, Chapter 200, HAR, §11-200-15, Consultation Prior to Filing a Draft EIS, states:  
"Upon publication of a preparation notice in the periodic bulletin, agencies, groups, or individuals shall have a period of thirty days from the initial issue date in which to request to become a consulted party and to make written comments regarding the environmental effects of the proposed action."

The following organizations and individuals requested to become a consulted party:

- Maui County Council
  - Wayne Nishiki
- Maui Cultural Lands
  - Clare Apana
- Maui Unite!
  - Elle Cochran
- Maui Tomorrow Foundation
  - Irene Bowie
- Save Mākena
  - Angie Hoffman
- Sierra Club Maui Group
  - Lucienne de Naie
- Community Members
  - Angie Hofmann
  - Claire Jordan
  - Clare Apana
  - Dale Deneweth
  - Daniel Kanahale
  - George Harker
  - Joe Fell-McDonald
  - Johnny Be
  - Joycynn Costa
  - Karrie Silva
  - Katie Romanchuk
  - Keegan House
  - Ken Rose

**Attachment  
Consultation**

- o Lucienne de Naie
- o Mark Hyde
- o Michael Howden
- o Michael & Barbara Gach
- o Robert Wintner
- o Robin Knox
- o Scott Heller
- o Steve Lefleur
- o Teri Leonard
- o Todd Wilson

**8-3 FURTHER CONSULTATION**

Following the distribution of the Draft EIS, additional consultation was sought prior to the preparation and distribution of the Final EIS. Based on input gathered at these consultation meetings, the Draft EIS was refined to the plans presented in the Final EIS.

Some key issues that have surfaced from the consultation include: archaeological sites on the Property, size of the Native Plant Preservation Area, and off-site improvements. Below is a list of consulted agencies and individuals.

**State of Hawai'i**

- Department of Land & Natural Resources
- DLNR – Division of Forestry and Wildlife
- DLNR – State Historic Preservation Division
- Office of Hawaiian Affairs

**Federal**

- U.S. Fish and Wildlife Service

**Maui County**

- County Council
- Planning Commission
- Planning Department
- Urban Design Review Board

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Consultation**

**Private Organizations & Individuals**

- Maui Unite!
  - o Elle Cochran
- Maui Cultural Lands
  - o Daniel Kanahele
- Sierra Club Maui Group
  - o Lucienne de Naie
- Community Members
  - o Angie Hofmann
  - o Claire Jordan
  - o Ke'eaumoku Kapu
  - o U'ilani Kapu
  - o Lee Altenberg
  - o Janet Six
  - o Ekolu Lindsey

#### 4.2 CULTURAL RESOURCES

Hana Pono, LLC prepared a cultural impact assessment for the Honua'ula Property to identify traditional customary practices within the Property and in the vicinity of the Property. The cultural impact assessment was conducted in accordance with the OEQC Guidelines for Assessing Cultural Impacts and includes archival research and interviews with people knowledgeable of Honua'ula and the surrounding area. Findings of the cultural impact assessment and other relevant information are summarized below. Appendix K contains the complete cultural impact assessment.

Hana Pono, LLC also prepared a cultural impact assessment specifically for the widening of Pi'ilani Highway. The cultural impact assessment concluded that no current gathering practices or access concerns occur within the Pi'ilani Highway widening area. For more information on the widening of Pi'ilani Highway see Section 4.4 (Roadways and Traffic) and Appendix R, which contains the complete Pi'ilani Highway Widening Project Final EA. Appendix H of the Final EA contains the cultural impact assessment specifically for the widening of Pi'ilani Highway.

While a specific cultural impact assessment was not prepared for the Wailea Iike Drive and Wailea Alanui Drive intersection improvement area, in a letter dated March 9, 2011 Hana Pono, LLC concluded that the intersection improvements are not expected to impact any cultural resources, access concerns or current gathering practices, as none are known to exist in the area.

In addition, Hana Pono, LLC, completed a review of Honua'ula's off-site water and wastewater infrastructure areas and determined that there are no known cultural resources, access concerns, or current gathering practices occurring in these areas. Figure 2 shows the locations of these off-site water and wastewater infrastructure areas.

##### 1.1.1 Honua'ula Moku

The Honua'ula moku was one of 12 ancient districts of Maui Island. The literal meaning of the name is "red earth" or "red land," which may have been in reference to the distinctive red dust of Haleakala (Handy et al. 1991). There are a number of alternative explanations for the name. In the cultural impact assessment, Tau'a and Kapahulehua (2009) state that the name connotes sacred earth based on the sacredness of the color red. Sterling (1998), in *Sites of Maui*, includes the following account, by Formander, of the chief, Mo'ikeha, who brought back companions from his voyage to Tahiti:

*His canoes were equipped forthwith under the superintendence of Kamahualele, his astrologer and seer (Kilokilo), and with a goodly company of chiefs, retainers, and relatives, they set sail for Hawaii... The legends differ somewhat to the names of the followers of Mo'ikeha, but they all agree that a number of places in the Hawaiian group were named after such or such*

## ATTACHMENT CULTURAL RESOURCES

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Cultural Resources

companions of Mo'ikeha, who were permitted to land here and there as the fleet coasted along the island shores, and who succeeded in establishing themselves where they landed. Thus were named the district of Honua'ula on Maui.

Two traditional Hawaiian sayings regarding Honua'ula recorded by Mary Kawena Pūku'i (1983) in *'Ōlelo No'ēau, Hawaiian Proverbs and Poetical Sayings* speak of the wind of the region and describe the character of the inhabitants as given below:

*Honua'ula, e paluku 'ia ana na kīhi po'ohiwi e na 'āle o ka Moa'e*  
Honua'ula whose shoulders are pummeled by the Moa'e wind

(A poetical expression for a person being buffeted by the wind. Honua'ula, Maui, is a windy place.)

*Honua'ula kua la'ola'o*

Callous-backed Honua'ula

(Said of the people of Honua'ula, Maui, who were hard workers. The loads they carried often caused callouses on their backs.)

There are many historical accounts that specifically mention Honua'ula moku in story, chant and oral tradition. One of the earliest accounts that describe the first inhabitants of Honua'ula came from genealogical chant. Between 1100 and 1400 A.D., chants recorded the long voyage of Chief Mo'ikeha from Tahiti to Hawai'i and describe how his travels gradually appropriated the rule over lands in Hawai'i through intermarriage, battles and ritual sacrifices. In his inaugural sail, Chief Mo'ikeha first landed on Hawai'i Island and then on to Maui, where he sailed around the Kaupō coastline until he arrived at the place known today as Honua'ula.

In the years following the Mahele in 1848, various configurations of the 12 moku (districts) were implemented and revised. In 1901 and 1932, the current district divisions were established, with Honua'ula incorporated into Makawao. Of these boundary modifications, R. D. King, in Sterling (1998), stated:

*Since the advent of legislative government, or from about 1846, many modifications have been made of the ancient district boundaries and there are many instances where other names have been substituted for the old district names. Some of these changes were made for political reasons and others for convenience, but the principal changes in boundaries were caused by movements in population reflecting new uses of the land areas. These new district boundaries did not always conform to the ahupua'a boundary and there are examples today of an ahupua'a being situated in more than one district where no such condition existed in ancient times*

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The traditional Honua'ula moku, located between Kula to the north and Kahikinui to the east and south, included the following 19 known ahupua'a from north to east: Paeahu, Palauaea, Keauhou, Kalihi, Waipao, Papa anui, Ka'eo, Maluaka, Mo'oiki, Mo'oloa, Mo'omuku, Onau, Kanahena, Kualapa, Kalihi, Papaka-kai, Kaunuaehane, Kalo'i, and Kanalo. The traditional Honua'ula moku crossed several environmental zones that spanned across 18.5 miles of coastline and reached the summit of Haleakalā.

Human settlement of the Honua'ula moku dates back to pre-historic times and continues today. The Honua'ula moku was a fishing and farming region from the beginning of its occupancy in early Hawai'i. Its shores were rich with an abundance of marine life, which included deep and shoreline fishing of squid, octopus, crab, and shell fish, and an abundance of various seaweeds. The sweet potato or 'uala was the important agricultural crop of the Honua'ula region and together with the marine resources comprised the staple food of its inhabitants. Handy and Handy (1972) describe the Honua'ula region thus:

*On the south coast of East Maui, from Kula to 'Ulupalakua, a consistently dry and lava-strewn country, Mākena and Keone'ō'io were notable for good fishing; this brought many people to live by the shore and inland. There were some patches of upland taro, not irrigated; but this was a notable area for sweet potato, which, combined with the fishing, must have supported a sizable population although it cannot be counted as one of the chief centers.*

As explained in Section 4.1 above, previous archaeological research suggests a pattern of transience existed between coastal and inland areas (Chapman and Kirch 1979). Inhabitants of the upland agricultural region may have utilized coastal areas as seasonal bases for expanding the range of resource exploitation. Temporary habitation sites, located along trails linking upland and coastal settlements were used by travelers from upland residences to the coast to gather marine resources. Upland populations exchanged taro, bananas, and sweet potatoes with the coastal populations for ocean resources (Handy 1940).

Kiha-Pi'ilani who reigned in the last half of the 15<sup>th</sup> century connected the entire island with a network of trails to aide his people in their travels and give the king quick access to all parts of his kingdom. The original trails still exist today from Keone'ō'io to Nu'u. The trails do not intersect the Honua'ula Property; however branching trails extend from the Pi'ilani trail in the Honua'ula moku.

During the time of Kamehameha the Great, large quantities of sandalwood were harvested from mauka areas (Kula, Makawao, and Haleakalā) and loaded at Mākena. Kamehameha's invasion of Maui occupied all the shores of Honua'ula to defeat the Maui king Kalanikupule (Sterling 1998). Afterwards, the fishponds of Kalepolepo and Kō'ie'ie were rebuilt. Since Honua'ula did not possess rich waterways from mountain to ocean, sweet potato, sugar cane, and ranching were key activities of the region. The maka'aimana (common people) worked the land under the direction of the *Konohiki* and occasionally



## Attachment Cultural Resources

the *ali'i* would drop by enroute to Kaupō, where most of the activities of the chiefs took place.

In post-contact times, Mākena Landing became the second busiest port after Lahaina since cattle and agricultural products from the mauka lands were brought here to load, and the port received goods for residents throughout Central Maui. By the 1800's, traditional settlement patterns underwent major changes throughout the region and the entire island with: 1) the advent of cattle and commercial agricultural enterprises; 2) the introduction of the western concept of private ownership of land; and 3) the development of cart paths, roadways, and harbors.

Following the overthrow of the Hawaiian monarchy, Handy (1940) reported the following changes in the area due to cattle ranching:

*In Honuauia, as in Kaupo and Kahikinui, the forest zone was much lower and rain more abundant before the introduction of cattle. The usual forest-zone plants were cultivated in the lower upland above the inhabited area. Despite two recent (geologically speaking) lava flows which erupted from fissures below the crater and only a few miles inland and which covered many square miles of land, the eastern and coastal portion of Honuauia was thickly populated by Hawaiian planters until recent years. A few houses are still standing at Kanaloa where the upper road (travelling eastward) ends but only two are now occupied. A number of Hawaiian families whose men are employed at Ulupalakua Ranch have homes near the ranch house. Above these native homes a little dry taro is cultivated. Formerly, there was much dry taro in the forest zone.*

Ranching has been blamed for many of the district's environmental problems. Cattle and goats stripped the land of its native flora while destroying ancient Hawaiian temples and other traditional Hawaiian remains

### 1.1.2 Ahupua'a within the Honua'ula Property

The Honua'ula Property includes portions of three ahupua'a: Paeahu, Palauaea, and Keaouhou from north to south. Most of the northern two-thirds of the Property is within a section of Paeahu ahupua'a. Roughly half of the width of Palauaea ahupua'a is within the Honua'ula Property, with the remainder extending north. The entire width of Palauaea ahupua'a is within the Honua'ula Property, primarily within the southern third of the Property. A proportion of the width of Keaouhou ahupua'a extends from within the southern third of the Property and continues further south.

**Paeahu Ahupua'a** – The Paeahu ahupua'a is significant for many reasons. Literal translation of the name is a "row of heaps" (Puku'i et al. 1974), the heaps refer to *ahu* (a stone mound). Paeahu holds multiple meanings, all having to do with the concept of *ahu*.

## Attachment Cultural Resources

The area is significant for its connection to Kealaikahiki, the pathway to Tahiti and the voyaging of Hawaiian ancestors. Paeahu signifies a place of embarking on a journey or disembarking after a journey. To this day, Paeahu ahupua'a is connected with *wa'a*, the outrigger canoe, and the voyages of Hawaiian people. Traditionally, when fishing or on a sea voyage, but within sight of shore, reference points on land were used to determine the off-shore location or maintain a certain course. This worked much like lining up a set of lights to enter a harbor channel today. Natural landmarks were used, but often, *ahu* or stone mounds were constructed for this purpose. *Ahu* were used to guide travelers on land as well.

The Paeahu ahupua'a was part of the lands assigned to Moses Kekaiwa, the eldest son of Kekua'oa, a powerful governor of O'ahu. However, in 1842, it was included with other Honua'ula moku lands that were reclaimed by the government (Barrere 1975). The commutation of lands to the government, in lieu of cash tax payments, was a common practice among the chiefs.

At the time of the Mahele, nine kuleana Land Commission Awards (LCA) in Paeahu ranged in size from 0.22 to 11.68 acres and consisted of shoreline parcels, houselots, and agricultural lands. Banana, dryland taro, and sweet potato were listed as the cultivated crops (Stocker et al. 1992). One of the kuleana awards, LCA 10665 to Piopio, appears to have been located close to, but beyond the northern boundary of the current Property area, probably within the existing Maui Meadows subdivision. The locations of the other LCAs, with the exception of 5220 to Koukaina, located at the coast, are unknown. Most likely, the other parcels were located mauka of the current Property area in the inland agricultural zone. Following 1850, portions of Paeahu ahupua'a were sold to foreign businessmen and large acreages changed owners often, until in 1864 when 4,445 acres were sold to James McKee, the founder of Rose Ranch in 'Ulupalakua. Much of the lands passed through McKee to 'Ulupalakua Ranch and Alexander and Baldwin, Ltd. (Kleiger et al. 1992).

**Palauaea Ahupua'a** – The Palauaea ahupua'a is a large land section. Literally, the name means "lazy" (Puku'i et al. 1974). One of the oral traditions passed down about this area refers to laziness. The ahupua'a, comprising about 2,130 acres (LCA 11216) was awarded to Chiefess Miriam Kekauonohi during the Mahele of 1854, and the current Property area includes a portion of this LCA. Upon her death in 1851, the land passed to her husband, Ha'alelea. In 1862, most of the ahupua'a was sold to James McKee through public auction. A total of 14 LCAs and 11 Royal Patent Grants to commoners are listed for Palauaea ahupua'a. Four are described as Irish potato plots and three others as houselots. The remaining awards are not described as to land use. Map locations of kuleana are unavailable. However, the narrative descriptions of two of the houselots place them at the coast. The others likely consisted of agricultural lots located in the wetter uplands.

**Keaouhou Ahupua'a** – The Keaouhou ahupua'a is a large land division of which only a small section lies within the Property. The name literally means "the new era" or "the new

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current" (Puku'i et al. 1974). It is connected to the currents that flow around and between the islands, Nā Kai Ewalu, and the channels that carried the ancestors to and from their destinations.

In 1852, LCA 6713 (RP 8213) was awarded to Ho'omanawanui, a member of the *ali'i* class whose father, Kalelele, was a member of King's (Kamehameha III) court, which included the entire *ahupua'a* of Keaouhou 1. The award covered an area of 853 acres. In 1856, Ho'omanawanui and her husband Hikiau II sold Keaouhou 1 to James McKee for \$1,000. Eleven commoner awards are listed for all of Keaouhou (1 and 2) *ahupua'a*. Although their locations are unknown, based on the descriptions given in the award documents, most appear to be Irish and sweet potato lands or houselots. The potato lands probably were further inland (above the 1200-foot elevation) of the current Property area, while the houselots were most likely located closer to the coast.

### 1.1.3 Oral History Interviews

Informant interviews with eight local residents were conducted in January 2008 by Keli'i Tau'a and Kimokeo Kapahulehua of Hana Pono LLC as part of the cultural impact assessment. Kimokeo Kapahulehua conducted an additional interview in March 2009. The complete transcript for each interview is appended to the cultural impact assessment provided in Appendix K.

- Douglas "Butch" Wayne Akina was born in 1943. He is the youngest of eight siblings from the Akina family of Kihei. He currently resides on Maui and has owned and operated a variety of small businesses including school/tourist bus, fishing, airplane, roofer, cesspool extraction, and fishing net companies. He learned of traditions and practices of the families of the land, and was a fisherman in his youth;
- Marie Doreen "MD" Alborano was born in 1935 in Kihei. Raised from infancy in Kihei, she grew up working on the family's 56-acre farm near the existing Welakahao Road. She was a student of renowned hula teacher Auntie Emma Sharpe;
- Edward Quai Ying Chang, Jr. was born in 1982 at Wailuku. He moved to Mākena when he was four or five years old. His ancestors have lived in Mākena since 1883 when his great grandfather John Kukahiko bought the lands from Mākena Surf to Mākena Landing. Mr. Chang has a degree in Biological Science with a minor in Plant Pathology;
- Stanley Ahana Chock was born at Honolulu in 1933 and moved to Kula shortly after he was born. He was raised by his mother's sister, Hattie Kanoho, in Pulehu'iki at Kula and also spent most of his childhood in Kahakuloa;
- Eugene C. "Herman" Clark, Sr. is of Hawaiian ancestry and lived on Maui since 1935. He lived in the Kihei region on what is now known as Kenolio Road. He is knowledgeable of the Honua'ula area and is currently practicing the art of reflexology;

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- Jimmy Gomes was born in Pu'unene in 1948. He has been employed by the 'Uluupalakua Ranch for the last six years and is currently the Operations Manager. Aside from his employment activities, he has visited the lands owned by the Ranch for the past 50 years;
- Kevin Mahealani Kai'okamaile was born in Keokea. He was raised in the Honua'ula region where his family has resided for at least seven generations. He took an interest in botany at a young age and was able to learn from noted local botanists;
- Ramsdon Arthur Kahawenui Piltz was born at Wailuku in 1939. He was raised on Maui until moving to Dayton, Ohio where he studied Business Management. He returned to Maui in 1993 to start working for his father's business, Piltz Electric. Mr. Piltz is part of the 130-member Kukahiko family which has roots in the Mākena Landing area. He also served on the Maui Planning Commission and is currently serving on the State LUC; and
- Mildred Ann Wietecha is a lifelong resident of Kihei. Her mother was Violet Thomson of the Thomson Ranch in Kula. She is related to Douglas "Butch" Wayne Akina of Akina Bus Service.

### Summary of the Oral History Interviews

Each of the individuals interviewed had something to contribute about life in the Honua'ula District and the surrounding areas. The three most knowledgeable individuals regarding the region were Edward Chang Jr., Kevin Kai'okamaile, and Ransom Piltz. These three individuals, all related to the Kukahiko family of Mākena, grew up in different time frames, lived separate lifestyles, but all three speak the same language about the land and the ocean of the Honua'ula region. Mr. Eugene Clark interestingly spoke of the relationship between the upland farmers and the coastal fishermen, a traditional pattern of life that continued over centuries in the Honua'ula region.

The concerns raised by the oral interviews were more general in nature, and no cultural concerns were raised that related specifically to the Honua'ula property. These concerns included impact on coastal fishing, the rising property taxes that make it difficult if not near impossible for Hawaiian families to maintain any coastal property in the region, shoreline access in developed areas, gated communities, the loss of traditional Hawaiian place names, the potential loss of good grazing land for cattle, the desecration of Hawaiian culture, and the desire to keep new development out of the region. None of the interviewees shared any proprietary knowledge about specific traditional cultural resources or associated practices within the boundaries of the Property.

### POTENTIAL IMPACTS AND MITIGATION MEASURES

The cultural impact assessment report recommends that representative existing cultural sites be incorporated into Honua'ula and native plants be kept intact as much as possible to retain the unique identity of the area. The cultural impact assessment report also

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recommends that the *ala i ke kai* (pathway to the ocean) and the *ala i ke kula* (pathway to the uplands) be recognized as part of the law decreeing that one should respect Hawai'i's gathering rights (passage to fishing at the ocean and streams or gathering native plants in the mountain). However, based on consultation with interviewees, the cultural impact assessment report concludes that there are no known gathering practices or access concerns.

To preserve cultural resources within Honua'ula, Aki Sinoto Consulting, LLC and Hana Pono, LLC prepared a CRPP in compliance with County of Maui Ordinance No. 3554 (Condition 13). The CRPP seeks to:

- Define cultural parameters that will guide the preservation of archaeological remains and the interpretation of archaeological data;
- Document settlement patterns and timelines for the sites;
- Consult with traditional/cultural practitioners with ties to the Honua'ula region and other interested parties;
- Foster a more traditional and cultural land use perspective for the project site; and
- Ensure long-term consistency and integrity toward preservation efforts within the Property and in the Honua'ula region.

Appendix J contains the complete CRPP.

The CRPP incorporates the findings of the cultural impact assessment report and the Archaeological Inventory Survey. Recommendations of the CRPP regarding archaeological resources are summarized above in Section 4.1. Although archaeological resources comprise part of cultural resources and are more readily identified, quantified, and evaluated, other aspects of cultural resources are sometimes not as apparent and not as easily identified and evaluated. This is especially true of non-material regional resources, such as place names and specialized protocols, since the expertise is only found in persons with intimate or long-term knowledge of the subject region or particular locality.

During the initial planning stages of Honua'ula, several on-site tours and discussions involving archaeological and cultural components were held with various members of the community. An informational presentation was given to the Maui Cultural Resources Commission. Specific input was also sought from key individuals and the Native Hawaiian organization, Nā Kūpuna O Maui, and a number of valuable recommendations resulted from discussions with an in-house cultural group<sup>2</sup>. Public input was also sought prior to preparation of the CRPP through publication of public notices in the *Honolulu Advertiser*, the *Maui News* and OHAs' Newsletter, *ka Wai Ola*. Nā Kūpuna O Maui, under the leadership of Mrs. Patty Nishiyama and their regional representative Mr. Kimokeo

<sup>2</sup> The in-house cultural group included: Kimokeo Kapahulehua, Clifford Naeole, Hokulani Holt Padilla, Keli'i Tau'a, members of Nā Kūpuna O Maui, Lisa Rotunno-Hazuka, Aki Sinoto, and Charlie Jencks.

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Kapahulehua, retains the primary role in consulting with the landowner and in interacting with other Hawaiian organizations regarding matters related to cultural preservation, protocols, and practices.

The elements of the CRPP for which community input, especially from Native Hawaiian groups, was sought, include:

- The mode of preservation, passive or active, recommended for specific sites;
- The nature of access to religious, ceremonial, and confirmed burial sites;
- The determination of appropriate traditional protocols and practices;
- The size and types of buffer zones and appropriate protective barriers;
- The need for any stabilization or restoration;
- Whether signs are appropriate and if so, the type, design, and content of the sign;
- The types of native flora to be used for landscaping or barriers; and
- The establishment of educational and community stewardship programs;

Based on the community input received, the CRPP:

- Includes recommendations regarding the mode of preservation—passive or active—for specific sites;
- Notes that at this time, there are no known or identified religious, ceremonial, or burial sites on the Property; however, conditional access for lineal and cultural descendants will be provided if any such sites are identified later;
- Recommends that Nā Kūpuna O Maui, in consultation with other cultural experts, address appropriate protocols and practices throughout the planning and development periods and thereafter;
- Includes recommendations regarding the size and type of buffer areas for specific archaeological sites;
- Concludes that the long rock wall that demarcates the southern third of the Property (Site 200) requires repair and stabilization where deer have caused damage and where sections have been breached;
- Provides sample text for interpretive signs; the material and method of mounting signs will be finalized during subsequent planning phases;
- Recommends that native plants found on the Property should be used for archaeological buffer areas, and suitable plants include: *'a'ali'i* (*Dodonaea viscosa*), *'āwīkīwīkī* (*Canavalia galeata*), *'ilima* (*Sida fallax*), *kolomana* (*Senna surrattensis*), *maiapilo* (*Capparis sandwicheana*), *ma'o* (*Abutilon grandifolium*), and *naio* (*Myoporum sandwicense*); and
- Notes that the nature and implementation of community stewardship and educational programs is currently under consideration by Nā Kūpuna O Maui, Honua'ula Partners, LLC, and other pertinent parties and will be finalized as additional input is received and planning progresses.

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Cultural Resources**

In addition to community input received for the specific points noted above, much information regarding traditional place names, protocols, practices, as well as glimpses of daily life were gained from oral interviews conducted in conjunction with both the CRPP and the cultural impact study. Starting from mythology and legends that include references to places in the region, there are well-known stories and folklore recounted for generations by the inhabitants. The compilation of not only this conventional folklore, but the recording of individual stories and experiences of area *kupuna* are invaluable resources that aid in interpreting the unique aspects of the region. The CRPP contains a compilation of not only texts and translations of several *mele* and *oli*, both traditional and contemporary, but also audio recordings of these on a compact disc.

In compliance with County of Maui Ordinance No. 3554 (Condition 13) the CRPP will be has been submitted to SHPD and OHA on March 18, 2010 for review and recommendations. Upon receipt of comments and recommendations from SHPD and OHA, the CRPP will be provided to the Maui County Cultural Resources Commission for review and adoption before Project District Phase II approval.

# ATTACHMENT CUMULATIVE AND SECONDARY IMPACTS

**Attachment  
Cumulative and Secondary Impacts**

	Planned/Committed (Continued)	
Hokulani Golf Villas	182	58
Honua'ula	560	840
Kai Ani Village	0	99
Kai Mālu Wailea Master	0	150
Kalama Heights Ph. 2	0	36
Kalama Hills	12	0
Kanani Wailea	38	0
Ke Aii'a Ocean Villas	14	144
Kenolio Leilani Affordable Homes	7	0
Kihana Nursery	1	0
Kiheti Hanalei Condominiums	0	4
Kilohana Waena	31	0
Liloa Village	65	0
Mākena Condos	0	436
Māhaka Mākena Residences	13	0
Maui Beach Place	0	3
Maui Lūi Timeshare	0	388
MF-21 Subdivision	5	0
Nani Loa Condos	0	64
Nāupaka Courtyard	0	78
One Palaua Bay PD 8	15	0
Papa'anui Mākena Place	7	0
Paradise Ridge Estates	0	32
Sunset Estates	25	0
Wailea Baccarat (Renalissance)	0	193
Wailea MF-10	10	36
Wailea MF-11 Lots	12	0
Wailea MF-19 Lots	9	0
Wailea SF-11 Lots	16	0
Wailea SF-8	60	0
Wailea Villas (MF-4) (Papali)	25	0
Waiakea Village Apartments	0	18
<b>Sub-Total</b>	<b>1,205</b>	<b>2,550</b>
<b>Planned/Designated</b>		
Hale Pama Condos	0	6
ʻIwa ʻIke Mākena Lots	4	0
Kaiwahine Lots	47	0
Kalani Mākena Condos	0	4
Kaʻonoʻulu Condos	0	166
Ke Kani Kai Mākena Lots	2	0
Kenolio Makai Lots	18	0
Kiheti Kaiwahine Res. A&B	600	0
Mākena Lots	669	0
Ohukai Village	768	160
One Wailea Dev.	20	0
<b>Sub-Total</b>	<b>2,128</b>	<b>336</b>

**Attachment  
Cumulative and Secondary Impacts**

**7.2 CUMULATIVE AND SECONDARY IMPACTS**

Cumulative and secondary impacts are impacts that may result from other reasonably foreseeable actions within the area, regardless of who initiates the action. Table 7 lists recently completed and proposed South Maui development projects, as compiled by the County of Maui Department of Planning, Long Range Planning Division. As defined by the Long Range Planning Division, projects are divided among the following categories:

- **Recently Completed Projects** include those where the subdivision process is complete, total build-out of the project has been reached or nearly reached, and real property is being actively marketed;
- **Planned/Committed Projects** have the appropriate conforming Community Plan and zoning entitlements, are approved agricultural subdivisions, are approved 201G/H, I-RS projects (i.e. affordable housing projects which may be granted certain exemptions from State and County land use regulations), or are Department of Hawaiian Home Lands (DHHL) projects (which are exempt from State and County land use regulations);
- **Planned/Designated Projects** have urban or rural Community Plan designations but not the conforming zoning entitlements to proceed; and
- **Proposed Projects** are currently lacking urban or rural Community Plan designations.

**Table 87. South Maui Development Projects**

Projects	Unit Types			Time Share and Hotel
	Single Family	Multi-Family	Time Share and Hotel	
<b>Recently Completed</b>				
Ho'olei Wailea MF-9	0	120	0	0
Honu Ala Hele	62	0	0	0
Kai Mākeni	0	112	0	0
Kamali'i Alayna Estates	92	0	0	0
Kiheti Kauhale	23	0	0	0
Kilohana Hema	20	0	0	0
Kilohana Mauka	73	0	0	0
Landy Apartments	0	18	0	0
Moana Estates	90	0	0	0
Wailea Beach Villas	0	105	0	0
<b>Sub-Total</b>	<b>360</b>	<b>355</b>	<b>0</b>	<b>0</b>
<b>Planned/Committed</b>				
Alahele Homes	48	0	0	0
Bluffs at Wailea	12	0	0	0
Chambers Apartments	0	18	0	0
Cove Beach Villas	0	32	0	0
Garcia Mākena Residences	10	0	0	0
Grand Wailea Resort Expansion	0	0	0	310
Hale Mahaolu Ehiku	0	114	0	0
Ho'onani Homes	28	0	0	0

**Attachment  
Cumulative and Secondary Impacts**

review and approval of State and County decision-making bodies, which will need to weigh the merits of each project at the time the approvals are requested. Therefore, proposed projects in the State Agricultural or Conservation Districts, without the appropriate community plan designation, and without property zoning, are much more speculative than projects with the appropriate underlying entitlements.

Furthermore, a multi-stage land use approval and permitting process exists in Hawai'i, such that there are many approvals of a project at various levels of government and at different points in time. At each step, decision-makers involved in the process evaluate a project in the context of the existing regional conditions, including infrastructure capacity and other factors. Because it is not possible to know which proposed projects may proceed, at what time, and in what form, it is appropriate to evaluate the impact of an individual project at each step in the decision-making process in context with all other projects that have preceded it. This comprises the existing cumulative conditions at the time. This is a rational, logical approach that allows each project to be evaluated in sequence with others that have preceded it (i.e. in context of the existing cumulative conditions at the time). Because of the multi-stage land use approval process, along with additional environmental permit regulations, there are sufficient safeguards in place to address and mitigate for cumulative impacts when proposed projects apply for approvals.

Finally, the capacity of infrastructure systems (such as roadways and wastewater treatment facilities) are constraints to unlimited development, and large-scale projects increasingly are required to provide regional solutions to add capacity proportionate with their impacts or to build private systems (as Honua'ula will) that do not or do burden State and County facilities. The availability of water is also a critical factor in determining whether a project can proceed and may be a limiting factor with respect to a specific project moving forward, especially in the Kīhei region with its restricted water resources. Thus, for all of the foregoing reasons, an overly broad approach of simply adding up the total units of all proposed projects and then concluding that the total amount of proposed development will have significant cumulative impacts, is too simplistic, unrealistic, and unreasonably alarmist.

Honua'ula will be part of the overall change and growth of the region. Cumulative and secondary impacts resulting from proposed projects are likely to include increased population and greater demands on public infrastructure systems and services. However, the population of the Kīhei-Mākena region is projected to grow and the needs of a growing population relating to traffic, infrastructure, public services, and other issues will need to be addressed regardless if some or all of these projects are built. The challenge is to manage growth in a predictable and acceptable manner.

In the case of Honua'ula, the "Project District 9" designation of Property on the Kīhei-Mākena Community Plan has been in place since 1992. In the mid-1990s the Kīhei-Mākena Community Plan was subject to an extensive community-based revision and update. The County Council and the Mayor adopted the plan (Ordinance No. 2641), which became effective on March 6, 1998. The updated Kīhei-Mākena Community Plan

**Attachment  
Cumulative and Secondary Impacts**

Proposed			
Ka'omo'ūlu Village	1,522	895	0
Kama'ole Heights	0	98	24
Kama'ole Mauka Village	364	0	0
Kama'ole Village	1,216	400	0
Kulanihāko'i Residences	0	231	0
Maui Palisades	300	0	0
Ohukai Village	70	56	0
Waiakoa Homes A&B	1,700	0	0
Waiohuli Village	616	512	0
<b>Sub-Total</b>	<b>5,788</b>	<b>2,192</b>	<b>24</b>
<b>Total</b>	<b>9,121</b>	<b>5,078</b>	<b>927</b>

Source: County of Maui Department of Planning, Long Range Planning Division (2009)  
([http://co.maui.hi.us/documents/Planning/Long%20Range%20Division/GIS%20Maps/D](http://co.maui.hi.us/documents/Planning/Long%20Range%20Division/GIS%20Maps/D%20Proj200907_SouthMaui_WM.PDF)

In addition, to proceed projects listed as Planned/Committed Projects, Planned/Designated Projects, or Proposed Projects may also need: 1) a State Land Use District Boundary Amendment, to designate the property to the appropriate State Land Use District (for example a property could have the necessary County Community Plan and/or zoning designation, but still be in the State Agricultural District, and thus require a reclassification to the State Urban District); 2) compliance with Chapter 343, HRS regarding preparing an EA or EIS; and 3) one or more County approvals, such as a SMA Use Permit, Project District Phase 1, 2 or 3 approval, subdivision approval or other approval.

In considering cumulative impacts, the above designations are important distinctions regarding when and if a proposed project may proceed. It is unknown whether all proposed projects will proceed or be built as currently proposed, as desired product types change over time and project developers are constantly assessing project feasibility. For several of the listed projects there has been no movement toward development, in some cases for many years. The feasibility of a project proceeding is based on many factors, including the State Land Use District classification, the Community Plan and zoning designations, other necessary approvals, overall economic conditions, the demand for the proposed product, and the willingness of a landowner or developer to risk the capital required for development.

In addition to the category distinctions utilized for the list of projects above, however, there are other important considerations that must also be taken into account when evaluating cumulative impacts. Some listed projects may be proceeding only with their preliminary or first phases or only have some of their required approvals. Other listed projects are currently within the State Agricultural or Conservation Districts, do not have the appropriate community plan designation, or proper zoning, and thus to proceed may require: 1) a State Land Use District Boundary Amendment at the State level; 2) a community plan amendment at the County level; and/or 3) a change in zoning approval at the County level. These approvals could take many years to obtain and are subject to

**Attachment  
Cumulative and Secondary Impacts**

maintained the Project District 9 designation for the Property. It also reaffirmed the vision—through a community-based process—that Project District 9 should be a residential community complemented with commercial uses and integrated with golf courses and other recreational amenities. Thus, the primary uses envisioned for Honua'ula have been well thought out, considered, and anticipated for nearly 20 years.

In addition, during the County Council hearings for the Honua'ula Change in Zoning and Project District Phase I approval in 2008, the County Council heard extensive testimony from both the public and experts in various fields of study. In response to concerns raised at the hearings, the Council included comprehensive conditions as part of the Change in Zoning Ordinance (County of Maui Ordinance No. 3554) approval. These conditions reflect a range of concerns and ensure that any impacts of Honua'ula are mitigated and addressed in context with regional impacts and demands, including impacts related to traffic and demands related to infrastructure systems such as water and wastewater. Prior to the County Council hearings in 2008, the Council's Land Use Committee had held extensive public meetings over the course of 2006 and 2007 to consider Honua'ula, including an estimated ten public hearings where public testimony was heard. These meetings/hearings provided significant opportunity for the consideration of public questions and concerns prior to the Council's consideration and approval of the Project District Phase I application.

One of the conditions imposed by the Council as part of Honua'ula's Change in Zoning Ordinance (County of Maui Ordinance No. 3554, Condition 5) requires Honua'ula Partners, LLC to provide workforce affordable homes in compliance with Chapter 2.96, MCC, with 250 of these required workforce affordable homes to be provided off-site at the Ka'ono'ulu Light Industrial Subdivision (TMK (2) 3-9-01: 16). The Ka'ono'ulu Light Industrial Subdivision is within the State Urban District and is within the County of Maui Light Industrial zoning district. Multifamily homes are a permitted use within the State Urban District and County Light Industrial zone.

Providing workforce affordable homes at the Ka'ono'ulu Light Industrial Subdivision does not trigger the need for an environmental assessment or environmental impact statement under Chapter 343, HRS. However, impacts related to the use of the property for urban uses and uses permitted under the property's Light Industrial zoning have previously been examined as part of the property's State Land Use District Boundary Amendment, County Change in Zoning, and County Subdivision approvals. No rare, threatened, or endangered plant species are expected to be impacted, as none were found during a botanical inventory survey of the property. An archaeological inventory survey and a related preservation plan have been prepared to address impacts to archaeological resources and, based on their approval of these documents, the State Historic Preservation Division has determined that no historic properties will be affected. As part of the subdivision process for the Ka'ono'ulu Light Industrial Subdivision, the County of Maui Department of Public Works reviewed and approved improvements necessary for the subdivision, including provisions for water, sewage disposal, electrical and communications lines, drainage and flood control, and connection with Pi'ilani Highway, including widening and traffic signal

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Cumulative and Secondary Impacts**

improvements. The State DOT has also reviewed and approved the connection with Pi'ilani Highway, including widening and traffic signal improvements. Further, the construction of the improvements required for the subdivision has been guaranteed with a bond of over \$22 million.

Regional traffic growth, including from the Ka'ono'ulu Light Industrial Subdivision, is being taken into account as part of DOT's Long Range Land Transportation Plan (LRLTP), which is currently being updated in consideration of known proposed developments in the region and will serve as a guide for the development of major surface transportation facilities and programs to be implemented in the future.

Because Chapter 2.96, MCC, requires the workforce affordable homes to be offered to Maui residents, the affordable homes will result in a redistribution of the existing Maui population as opposed to an incremental increase. As a result, there will be no impacts related to increased population, such as an overall increase in the need for State and County services. In addition to the workforce affordable homes, Honua'ula Partners, LLC will also provide a minimum two-acre park within Ka'ono'ulu Light Industrial Subdivision to meet the recreational needs of the workforce affordable home residents.

Impacts to schools will be addressed by Honua'ula Partners, LLC's compliance with County of Maui Ordinance No. 3554, Condition 22, which requires Honua'ula Partners, LLC to pay DOE at least \$3,000 per dwelling unit upon issuance of each building permit to be used, to the extent possible, for schools serving the Kihei-Makena Community Plan area; provided that, should the State pass legislation imposing school impact fees that apply to Kihei-Makena Project District 9, Honua'ula Partners, LLC will from that point forward comply with the State requirements, or contribute \$3,000 per dwelling unit, whichever is greater.

Of all the projects currently proposed within South Maui, Honua'ula stands out as contributing its fair share and more to address cumulative and secondary impacts. For example, Honua'ula will address the regional need for:

- **Traffic Improvements, by:**
  - Upgrading Pi'ilani Highway to four lanes from Kiloohana Drive to Wailea Ike Drive;
  - Modifying the Wailea Alanui/Wailea Ike Drive intersection to add a signalized double right-turn movement from northbound to eastbound turning traffic and provide two left-turn lanes for southbound traffic from Wailea Ike Drive;
  - Signalizing the Pi'ilani Highway/Okolani Drive/Mikioi Place intersection and providing an exclusive left-turn lane on Okolani Drive;
  - Modifying the Pi'ilani Highway/Kiloohana Drive/Mapu Place intersection to provide an exclusive left-turn lane, and the southbound Pi'ilani Highway approach to provide an exclusive right-turn lane into Mapu Place; and

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- o Providing a contribution of \$5,000 per unit (totaling \$5.75 million) to the County for traffic improvements.
- **Workforce Housing**, by providing a significant amount of workforce housing in accordance with Chapter 2.96, MCC (the "Residential Workforce Housing Policy");
- **Parks**, by providing a contribution of \$5 million to the County for the development of the South Maui Community Park and an in-lieu cash contribution to satisfy the park assessment requirements under Section 18.16.320, MCC (currently set at \$17,240 per residential unit) in addition to providing parks within Honua'ula that are open to the public but privately maintained;
- **Schools**, by paying at least \$3,000 per dwelling unit (totaling over \$3.45 million) to DOE for schools serving the Kīhei-Mākena Community Plan area;
- **A Fire Station**, by providing two acres of land to the County of Maui for the development of a fire station; and
- **A Police Station**, by providing a contribution of \$550,000 to the County for the development of a police station in South Maui.

In addition, Honua'ula will not rely upon or burden any public infrastructure facilities and will instead develop, maintain, and operate its own private water and wastewater systems (or partner with other private providers, in the case of wastewater treatment facilities). All infrastructure will be constructed concurrently with development and will be completed before the issuance of any certificate of occupancy, thus ensuring that necessary facilities and services are in place before residents move in.

Further, the substantial tax revenues from Honua'ula are expected to be well in excess of the costs incurred by the State and County, thereby contributing to the overall State and County tax base (see Section 4.9.5, Economy) and, in turn, the provision of public infrastructure and facilities concurrent with growth.

Regarding cumulative impacts of traffic, the TIAR prepared for Honua'ula (see Section 4.4 and Appendix L) accounted for increased traffic due to additional projects in the Wailea and Mākena region. Traffic on Pī'ilani Highway and other roads is expected to increase even if Honua'ula is not built. As stated above Honua'ula will be part of the regional traffic solution by: 1) upgrading Pī'ilani Highway to four lanes from Kilohana Drive to Wailea Ike Drive; 2) modifying the Wailea Alanui/Wailea Ike Drive intersection to add a signalized double right-turn movement from northbound to eastbound turning traffic and provide two left-turn lanes for southbound traffic from Wailea Ike Drive; 3) signalizing the Pī'ilani Highway/Okolani Drive/Mikioli Place intersection and providing an exclusive left-turn lane on Okolani Drive; 4) modifying the Pī'ilani Highway/Kilohana Drive/Mapu Place intersection to provide an exclusive left-turn lane, and the southbound Pī'ilani Highway approach to provide an exclusive right-turn lane into Mapu Place; and 5) providing a contribution of \$5,000 per unit (totaling \$575 million) to the County for traffic improvements.

**Attachment**  
**Cumulative and Secondary Impacts**

Honua'ula is also part of the new "smart growth" planning paradigm that provides an alternative to conventional suburban sprawl, with stores and services as an integral part of the community. This design will help to minimize car trips onto Pī'ilani Highway, since many establishments providing for residents' day-to-day needs will be within walking and biking distance. Therefore, unlike in a conventional subdivision, Honua'ula is designed to be a community with services and facilities to enable residents to meet many of their daily needs without using their cars; thus minimizing trips to outside areas and reducing congestion.

In mitigating cumulative impacts to human and environmental health, Honua'ula is committed to limiting energy consumption and reducing solid waste. Honua'ula Partners, LLC will design and construct energy systems for all residential units to meet all applicable ENERGY STAR requirements established by the EPA in effect at the time of construction. All homes (single-family and multifamily) will be equipped with a primary hot water system at least as energy efficient as a conventional solar panel hot water system and other energy-saving concepts and devices will be encouraged in the design of Honua'ula. Design standards will specify low-impact lighting and encourage energy-efficient building design and site development practices. Honua'ula will also implement strategies from the County of Maui Integrated Solid Waste Management Plan (2009) for diverting solid waste from landfills by providing options for recycling, such as collection systems and bin spaces and promoting sound recycling practices among residents, guests, and construction and maintenance personnel. Green waste, particularly from the golf course, may be processed on-site and reused.

Honua'ula will make an important and valuable contribution to the long-term viability, preservation, and conservation of native plants in southeastern Maui. Honua'ula's on-site Native Plant Preservation Area, combined with other on-site Native Plant Conservation Areas within Honua'ula (see Figure 12 and Section 3.6 (Botanical Resources)), will provide a total of approximately 443 76 acres for the protection, enhancement, and propagation of native plants of the mixed *kiawe-wilivilii* shrubland associations in southeastern Maui. These areas will: 1) provide protection for native plants; 2) ensure the long-term genetic viability and survival of the native dry shrubland species; and 3) enhance long-term native plant population growth. In addition, Honua'ula Partners, LLC will implement significant off-site measures to protect native plants and Blackburn's sphinx moth habitat and provide a net conservation benefit. Combined, Honua'ula's on-site 40-acre Native Plant Preservation Area and off-site mitigation measures discussed in Section 3.6 (Botanical Resources) provide 394 acres of native dry shrublands for the perpetual protection and propagation of native dryland plants.

Existing scientific research suggests even small restoration efforts consisting of a few hectares can help provide habitat for native species and can subsequently serve as urgently-needed sources of propagules (Cabin et al. 2000b, Cabin, et al. 2002a). This is reinforced by numerous sources of information on successful propagation of native plants specifically for landscaping (e.g., TNC 1997, Tamimi 1999, Friday 2000, Wong 2003, Bornhorst and Rauch 2003, Lilleeng-Rosenberger and Chapin 2005, CTAHR 2006). The



**Attachment**  
**Cumulative and Secondary Impacts**

system (i.e., it will not be connected to any other public or private system, there will be no impact to present or future irrigation well owners in the Wailea/South Maui area related to transmission and storage of Honua'ula's water.

Honua'ula, the widened Pi'ilani Highway, the Wailea Ike Drive/Wailea Alanui Drive intersection improvements, and the off-site water and wastewater infrastructure is are not expected to cause secondary impacts to marine water resources. As discussed in Section 3.5.2 (Nearshore Marine Environment), the results of the nearshore water quality assessment and further evaluation of the potential changes to groundwater composition indicate that there is little or no potential for alteration of the marine environment or negative impacts to marine waters due to Honua'ula. The assessment concludes that: "the estimates of changes to groundwater and surface water would result in a decrease in nutrient and sediment loading to the ocean relative to the existing condition. With such a scenario, it is evident that there would be no expected impacts to the nearshore marine ecosystem owing to development of Honua'ula."

In addition, as discussed in Section 4.5 (Noise) and Section 4.6 (Air Quality), Honua'ula, the widened Pi'ilani Highway, the Wailea Ike Drive/Wailea Alanui Drive intersection/improvements, and the off-site water and wastewater infrastructure is are not anticipated to significantly impact the acoustical environment or air quality and thus will not significantly contribute to cumulative and secondary impacts associated with these issues. Finally, adherence with Chapter 20.35, MCC regarding outdoor lighting ensures cumulative and secondary impacts related to light pollution will not impact sensitive surrounding land uses.

**Attachment**  
**Cumulative and Secondary Impacts**

research shows that even small preserves consisting of individual trees are being deemed as appropriate and feasible by USFWS and DLNR when managed in combination with regional preserve areas, such as at La'opua on Hawai'i Island (Leonard Bisel Associates, LLC and Geometric Associates 2008). Protected and managed natural areas in south Maui in proximity to Honua'ula include the 'Auwahi I restoration area (10 acres) and Pu'u o Kali (236 acres) Forest Reserves and the Kanaloa (876 acres) and 'Ahihi-Kina'u (1,238 acres) Natural Area Reserves – substantial habitats that are ~~more than~~ host higher diversity of known native plants for the Blackburn's sphinx moth than those found in Honua'ula, and contain a greater diversity of native plant species than Honua'ula.

Honua'ula will make lasting contributions to preserving the archaeological and cultural resources of the region by preserving archaeological sites *in situ* and through the preparation and implementation of the CRPP (see Section 4.1 (Archaeological and Historic Resources) and Section 4.1 (Cultural Resources)). The CRPP sets forth selection criteria for archaeological sites to be preserved and short- and long-term preservation measures, including buffer zones and interpretative signs, as appropriate for each site and types of native flora to be used for landscaping for buffer zones. The CRPP: 1) was prepared in consultation with interested and concerned parties, cultural advisors, Na Kūpuna O Maui, the Maui County Cultural Resources Commission, the Maui/Lāna'i Island Burial Council, the DLNR, Na Ala Hele, SHPD, OHA, and various knowledgeable individuals; 2) ~~will be~~ has been submitted to SHPD and OHA for review and recommendations; and 3) will be provided Maui County Cultural Resources Commission for review and adoption after receipt of comments and recommendations from SHPD and OHA. Through this collaborative process the CRPP will be refined to provide additional information including: 1) the nature of access to religious, ceremonial, and confirmed burial sites; 2) determination of appropriate traditional protocols and practices; and 3) establishment of educational and community stewardship programs.

An assessment of the potential impacts on groundwater resources of Honua'ula concludes that the creation of Honua'ula will not impair Wailea Resort's golf course irrigation wells, with the possible exception of a salinity increase in Wailea Resort's Well 2, which is directly downgradient of Honua'ula's on-site wells. Decreased pumping of Honua'ula's on-site wells would alleviate this potential impact. With respect to Honua'ula's off-site wells, an estimated six active downgradient irrigation wells may be impacted by a potential increase in salinity due to reduced flowrate, which current calculations indicate may be on the order of five percent. It is not known if the increase in salinity would materially impair the utility of the wells; however if the utility of the wells is materially impaired, additional wells (pumping the same combined amount of water) in the area north of Maui Meadows would distribute the draft over a greater area and would alleviate the impact downgradient. Honua'ula Partners, LLC commits to providing these additional wells if the utility of active downgradient wells is materially impaired. All existing on- and off-site wells are fully permitted by the State CWRM. All new wells will be developed in compliance with all requirements of Chapter 174C, HRS (State Water Code) and HAR, Chapters 13-167 to 13-171, as applicable, pertaining to CWRM and administration of the State Water Code. In addition, since the Honua'ula water system will be a private, closed

**Attachment  
Drainage System**

**4.8.3 Drainage System**

**Honua'ula**

Honua'ula is on the lower southwestern slope of Haleakala. Site elevations range from 320 feet to 710 feet with slopes of generally three to 17 percent. The Property and areas immediately mauka are undeveloped. The Wailea Resort, including three golf courses, is located makai of Honua'ula.

Currently, surface runoff mauka of the Property sheet flows over the Property or through natural drainage paths toward the ocean. The Property is generally semi-arid, with rainfall averaging about 15 inches per year. Drainage characteristics impacting the site are typical of the western slope of Haleakala.

There are approximately 15 natural drainageways in which runoff flows through the Property. Considering the relatively low rainfall at the Property, these drainage ways are generally dry throughout the year. There are no existing drainage improvements mauka of the Property. The entire property is designated on the FIRM as Zone C X, which is outside of the 500-year flood plain in an area of minimal flooding (Figure 1). The Department of the Army, United States Corps of Engineers has determined that the Property does not contain any navigable waters or other waters of the United States; therefore a Department of Army (DA) permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 (Section 10) and Section 404 of the Clean Water Act (Section 404) is not required for any proposed or future work.

Based on County drainage standards, existing (pre-development) flow (based on a 100 year 24 hour storm) from the Property is calculated to be 2,195 cubic feet per second (cfs).

**Off-Property Areas**

There are nine existing culvert crossings spanning the Pi'iani Highway widening area from Kilohana Drive to Wailea Ike Drive. The highway drainage system consists of concrete swales, curb/gutter, catch basins/grated drain inlets and drain pipes at along the highway. These systems drain to the existing culverts and then to the adjoining gulches. No retention systems currently exist within the highway right-of-way. Mauka offsite flows are currently intercepted by a concrete drainage ditch located along the eastern boundary of the highway and are then conveyed to the existing culverts. Existing flows within highway widening area were calculated to be approximately 65.2 cfs based on a 25-year, one-hour storm recurrence interval in accordance with DOT Design Criteria for Highway Drainage (2006).

Stormwater from the Wailea Alanui/Wailea Ike Drive intersection is collected and disposed of by the existing roadway drainage system. Runoff from the north portion of the intersection flows northward toward an existing catch basin about 300 feet away. Runoff from the south portion of the intersection flows southward to a catch basin about 400 feet

**ATTACHMENT  
DRAINAGE SYSTEM**

## Attachment Drainage System

away. Existing flows from the north portion of the intersection were calculated to be approximately 1.2 cfs. Existing flows from the south portion of the intersection were calculated to be approximately 1.3 cfs. The calculations are based on a 50-year, one-hour storm recurrence interval in accordance with the County of Maui's "Rules for the Design of Storm Drainage Facilities."

The currently there are no drainage improvements in the areas of the areas of: 1) Honua'ula's off-site wells, waterline, and storage tank; and 2) the wastewater transmission line alignment for possible connection to the Mākena Resort WWRF.

### POTENTIAL IMPACTS AND MITIGATION MEASURES

#### Honua'ula

Drainage from Honua'ula is not expected to have a significant adverse effect on groundwater, downstream properties, or marine waters. In accordance with the County of Maui's "Rules for the Design of Storm Drainage Facilities," all drainage improvements will be designed so that there will be no increase in the peak rate of stormwater runoff leaving the Property compared to existing conditions. The post-development runoff from the Property is estimated to be 3,114 cfs, an increase of 919 cfs over calculated existing conditions (pre-development). The discussion below sets forth the means by which Honua'ula will address this additional runoff in compliance with County of Maui requirements.

Runoff will be collected and managed through a drainage system. Roadways, homes, buildings, and other facilities within Honua'ula will increase impervious areas within the Property thereby increasing surface runoff flow rates and volumes. However, approximately half of the Property will be open space, including the Native Plant Preservation Area, other Native Plant Conservation Areas, natural gulches, open space buffers along Pī'ilani Highway and the border of Maui Meadows, and the golf course. The extensive open space and the golf course are expected to assist drainage control as open space areas will provide pervious areas for percolation of runoff and golf course greens, fairways, and plants will either absorb runoff or slow drainage flows. Of the 18 inches of average annual rainfall received on the Property, it is assumed that one-third of the rainfall percolates to groundwater and the remaining two-thirds evaporates to the atmosphere or becomes runoff.

To manage drainage within the Property, the drainage system will include detention basins, drainage pipes, open channels, and roadway culverts. This system will be designed to not only manage flood control but also to reduce pollution associated with stormwater. Runoff will be stored in 26-27 detention basins located on the Property in low lying areas within the golf course, or along the makai Property boundary. Each of the detention basins will have a drainage outlet consisting, in part, of a vertical perforated pipe within a gravel mound which will act as a filter. In addition to reducing the peak runoff rate by detention storage, this configuration will also capture floatables and suspended solids in the basin

## Attachment Drainage System

and allow for settling of fine particles and pollutants, thus reducing sediments and pollutants in the water released from the detention basins. All detention basins will be designed with the proper volume to allow adequate draw-down time for water quality treatment. In addition, the detention basins will be maintained so that the capacity is not impaired. As design progresses a maintenance program will be developed. In general, the detention basins will contain markers so that the depth of silt at the bottom can be measured. When the silt reaches a certain level, the silt will be removed and properly disposed of. With the use of detention basins, the peak rate of runoff leaving the Property will not increase over current conditions and seepage of water into the ground from the detention basins will actually increase the amount of percolation to groundwater. Residential areas will be graded so that runoff flows to drain inlet structures. From the drains, the flow will be piped through a series of drain lines in the roadways to the detention basins. The majority of the drain lines will be 18-inch diameter and the remaining will be 24-inch diameter.

To supplement the detention system Low Impact Development (LID) techniques will be incorporated into the design of Honua'ula where appropriate. LID comprises a set of approaches and practices designed to reduce runoff of water and pollutants from the site at which they are generated. By means of infiltration, evapotranspiration, and rainwater reuse, LID techniques manage water and water pollutants at the source thereby reducing stormwater flows to detention basins. A goal of LID is to maintain or closely replicate predevelopment hydrology of the site with an understanding that rainwater is not merely a waste product to be disposed of, but a resource to be reused.

With LID techniques small-scale practices are employed to control stormwater runoff on-site. The practices are designed to work in concert with other stormwater best management practices such as detention basins. While LID techniques span a wide range of design considerations, infiltration and filtration are two primary practices. Infiltration practices are engineered structures or landscape features designed to capture and infiltrate runoff. Infiltration can both reduce the volume of water discharged from the site and contribute to groundwater recharge. Examples of infiltration practices include: 1) infiltration basins and trenches which are shallow depressions designed to infiltrate stormwater through permeable soils; 2) rain gardens and other vegetated treatment systems that provide a planted depression to collect rainwater (usually from a single home) and allow absorption on-site; and 3) disconnected down spouts, which are roof gutter downspouts that are not connected to the sewer system to allow roof water to drain to lawns and gardens (or rainwater storage barrels) and permit plants and soils filter pollutants.

Similar to infiltration practices, filtration practices treat runoff by filtering it through media designed to capture pollutants (such as sand or vegetation). Like infiltration, filtration can both reduce the volume of water discharged from the site and contribute to groundwater recharge, but filtration practices have the added advantage of providing increased pollutant removal. Examples of filtration practices include: 1) bioswales, which are landscaped drainage courses with gently sloped sides filled with vegetation, compost

and/or rocks designed to slow down water flows and trap pollutants and silt; 2) vegetated swales which are smaller, broad, shallow, channels with dense vegetation covering the side slopes and bottom to trap pollutants, promote infiltration, and reduce flow velocity; and 3) vegetated filter strips, which are bands of vegetation intended to treat sheet flow from adjacent impervious areas (such as parking lots) by slowing runoff velocities, filtering out sediment and other pollutants, and providing some infiltration into underlying soils.

LID practices can also effectively treat and manage non-point source pollution from drainage by filtering "first flush" runoff volumes. Non-point source pollution typically results from rainwater washing across impermeable surfaces such as roadways, parking lots, and sidewalks and with it picking up pollutants such as oil, detergents, pesticides, fertilizer, and pet wastes. Most surface pollutants are collected during the first one-half inch, or "first flush" of a storm event. LID practices can filter these pollutants before they reach detention basins. Traditional conveyance systems, such as drains and catch basins in parking lots and roadways can also be designed to capture this first flush with installed filtering materials.

Strategically integrated LID practices applied throughout the Property—from individual building sites to larger areas such as parking lots and roadways—can lessen stormwater flows to detention basins and increase the length of time for flows to travel to detention basins. The increased time allows for greater opportunities for groundwater recharge, filtration, and evapotranspiration. LID practices can result in enhanced environmental performance, while at the same time reducing costs compared to traditional stormwater management approaches.

As an application of LID, ~~Natural~~ natural open drainage channels will be provided throughout the site to divert runoff toward the detention basins. Open channels also will be provided at the upper limits of the Property to direct mauka off-site runoff entering the Property to natural drainage ways on-site. These channels will remain natural and unlined with concrete. Roadway culverts will be provided throughout the Property to divert runoff under major streets and prevent flooding. In addition, bioswales, landscape elements designed to remove silt, ~~may~~ will be ~~an option~~ provided along roadways where appropriate.

Section 3.5.1 (Groundwater) contains discussion on potential impacts due to percolation of stormwater and irrigation water to groundwater. In general, reductions in nitrogen and phosphorus loading are expected, which would result in positive impacts regarding groundwater flowing to the ocean and ocean water quality. Section 3.5.2 (Nearshore Marine Environment) contains discussion on potential impacts to ocean water quality. The nearshore water quality assessment (MRC 2010; Appendix D) concludes that: "the estimates of changes to groundwater and surface water would result in a decrease in nutrient and sediment loading to the ocean relative to the existing conditions. With such a scenario, it is evident that there would be no expected impacts to the nearshore marine ecosystem owing to development of Honua'ula."

All drainage systems and detention basins will be designed in accordance with the "Rules for the Design of Storm Drainage Facilities in the County of Maui." In addition any detention basin with vertical dimensions that exceed its horizontal dimensions will also be in compliance with all provisions of HAR Title 11, Chapter 11-23 (Underground Injection Control). In compliance with County of Maui Ordinance No. 3554 (Condition 6), the Preliminary Engineering Report (Appendix P) includes a Drainage Master Plan and Phasing Plan of improvements.

#### Off-Property Areas

The widening of Pihlani Highway from Kilohana Drive to Wailea Ike Drive will increase impervious surfaces by approximately 5.8 acres. The post-development runoff from the highway widening area is estimated to be 76.8 cfs, an increase of 11.6 cfs over calculated existing conditions (pre-development). The additional runoff will be retained in accordance with DOT Design Criteria for Highway Drainage (2006) and DOT Storm Water Permanent Best Management Practices Manual (2007) so that there is no increase in the peak rate of stormwater runoff compared to existing conditions.

Drainage system improvements will include grated drain inlets, catch basins, manholes, underground drainlines, surface retention basins and subsurface retention systems, extension of existing culverts, and construction of new inlet and outlet structures. The increased runoff will be retained via the retention systems. Coordination with the Army Corp of Engineers, Department of Health and Department of Land and Natural Resources will be undertaken during the planning and design of the highway widening to address applicable permitting requirements for culvert modification work. In addition to reducing peak flow rates, the proposed stormwater system will reduce the discharge of pollutants to the maximum extent practicable in accordance with the DOT Storm Water Permanent Best Management Practices Manual (2007).

A National Pollutant Discharge Elimination System (NPDES) permit for discharge of stormwater associated with construction activities will be obtained and the requirements of the approved NPDES permit and Best Management Practices (BMPs) plan will be adhered to during construction. At a minimum silt fences, diversion berms, gravel egress, truck wash down areas and dust screens will be included in the BMP plan.

The post-development runoff from the Wailea Alanui/Wailea Ike Drive intersection improvements is estimated to be 1.0 cfs for the north portion of the intersection and 1.6 cfs from the south portion, an increase over calculated existing conditions (pre-development) of 0.1 cfs for the north portion and 0.3 cfs for the south portion. These increases are nominal and the existing drainage system has the capacity to accommodate this additional runoff. Existing drainage patterns will not be altered and the intersection improvements will have no adverse drainage impacts on the existing drainage facilities or downstream properties.

**Attachment  
Drainage System**

No significant changes to current drainage patterns are expected in the areas of: 1) Honua'ula's off-site wells, waterline, and storage tank; and 2) the wastewater transmission line alignment for possible connection to the Makena Resort WWRF. Figure 2 shows location of this water and wastewater infrastructure.

The waterline alignment provides for an underground waterline within in an unpaved easement approximately 12,000 linear feet in length and 30 feet in width. The wastewater alignment provides for underground wastewater transmission and R-1 return lines within an unpaved easement approximately 6,400 linear feet in length and 30 feet in width. The 30-foot easement widths allow for access and maintenance parallel to the underground lines. Because the waterline and wastewater and R-1 return lines will be underground and the easements will not be paved, significant changes to current drainage patterns are not expected.

# ATTACHMENT ELECTRICAL SYSTEM

#### 4.8.6 Electrical System

The Kīhei-Mākena region is serviced by a 69 kV (kilovolt) power line that runs from the 'Ulupalakua Ranch, mauka of Honua'ula, to the MECO substation (Wailea Substation) located on a separate parcel (TMK 212-1-08: 043) near the western boundary of the makai portion of the Property. The Wailea Substation is currently being fed by transmission lines from the Maalaea Power Plant, northwest of the Property and from Kealahou Switchyard, mauka of the Property. The substation converts the 69 kV power to 12.47 kV for distribution to the Wailea area. The converted 12.47 kV lines run within a 12-foot wide easement along the makai boundary of the Property. The Wailea Substation is nearly filled to capacity.

MECO supports net energy metering as a way to encourage the use of eligible renewable energy electricity generators by residential and commercial customers. Net energy metering allows a MECO customer to: 1) offset all or part of the electricity they would normally receive from MECO with energy produced by the customer's renewable generation system (e.g. solar photovoltaic system); and 2) export any excess electricity they produce to the MECO grid for use by MECO in meeting electrical demand elsewhere.

MECO customers that own or lease an eligible renewable energy generator may enter into an agreement with MECO to connect their generator to the utility grid, allowing it to feed surplus electricity into the grid. Net energy metering means that any kilowatt-hours the customer's renewable energy generator feeds into the grid will be subtracted from the kilowatt-hours of electricity the customer obtains from MECO to determine the net amount of kilowatt-hours. The customer is then billed only on the net kilowatt-hours.

By Public Utility Commission (PUC) order, net energy metering is available to MECO customers on a first come, first served basis until the sum of the total energy received from the renewable energy generators equals four percent of MECO's current system peak demand. This cap is in place because when MECO customers participate in net energy metering, they receive credit at the retail rate for self-produced electricity. The retail electric rate that MECO charges includes not only recovery of the cost of producing electricity, but also the cost for: 1) facilities (e.g., lines, substations, etc.) to deliver power to MECO customers; 2) maintaining and operating facilities; and 3) administrative and other operating costs, such as billing. Those MECO customers who produce their own electricity on-site only incur the cost of generating the electricity, not additional delivery and other costs. By receiving credit at the full retail rate, in essence, the MECO customer who net meters is receiving a subsidy from all other customers. By providing a cap, the subsidy can be kept to a reasonable level and still help to support small to medium renewable energy producers.

#### POTENTIAL IMPACTS AND MITIGATION MEASURES

When fully built-out, the peak forecasted electrical demand for Honua'ula is estimated to be 9,467.11,103.3 kilowatts (kW) per month. This peak forecasted electrical demand

represents "conventional" demand without consideration of solar water heating, renewable energy systems, or other measures to reduce the energy consumption. Honua'ula Partners, LLC's electrical engineer calculated this demand in consultation with MECO based on empirical values derived from records of past electrical consumption of other similar facilities. The total forecasted demand includes estimated electrical loads for: 1) single- and multi-family homes; 2) neighborhood commercial uses; 3) golf course facilities including the clubhouse and maintenance facility; and 4) infrastructure facilities, including well pumps, the reverse osmosis facility, the wastewater reclamation facility, and streetlights.

Honua'ula Partners, LLC's electrical engineer has been in communication with MECO to ensure service is provided. Based on the forecasted Honua'ula electrical demand and use, MECO anticipates additional transformer units or new substation development may be necessary. The current plans for the Property include an area for the expansion of the existing substation (Figure 1).

MECO is aware that Honua'ula Partners, LLC will provide area for the expansion of the existing substation but at this time cannot confirm that the expansion area is needed without more detailed information, including projections for electrical demand for other proposed projects in the region. MECO has stated that they continuously attempt to plan for additional substation sites to meet the electrical demand of the community. Honua'ula Partners, LLC's electrical engineer will continue to coordinate with MECO regarding the need for expanding the substation and Honua'ula Partners, LLC will continue to include an area for the expansion of the existing substation on Honua'ula plans.

It has not yet been determined whether expansion of the existing substation will be necessary. Honua'ula Partners, LLC's electrical engineer has provided available information regarding Honua'ula to MECO for their review and planning purposes. MECO has stated that additional review is required during the design development stage of Honua'ula to determine if expansion of the existing substation will be necessary. MECO has also stated that although the current capacity of the MECO electrical system to serve Honua'ula may be limited, with continuously evolving demands for MECO's service, along with MECO's on-going efforts to upgrade and maintain their system to serve new and existing loads, capacity may be in place and adequate to serve Honua'ula by the time Honua'ula is under construction. MECO will continue to review its electrical system and requirements as Honua'ula progresses into the design development stage so that MECO will be able to evaluate: 1) the size of actual electrical loads that MECO is required to serve; 2) the dates when these loads need to be energized by MECO; and 3) the state of the MECO electrical system at the time when these loads are expected to be connected.

In anticipation of the need, Honua'ula Partners, LLC will continue to include an area for the expansion of the existing substation on Honua'ula plans. Should MECO not require additional area, the existing substation would not be expanded. Since MECO cannot make a determination until Honua'ula is within the design development stage, details on the requirements for serving Honua'ula are not available at this time. Should the substation be

**Attachment  
Electrical System**

expanded, however, MECO's additional equipment (i.e. transformers, switchgear, cabling, etc.) and structures currently are anticipated to be similar to what is presently constructed at the existing substation. In response to a question from the Maui Planning Commission on the Draft EIS regarding the feasibility of the Wailea Substation expansion to include batteries for the storage of energy, a MECO representative noted that battery storage is expensive, but feasibility would not be evaluated based only on cost, but on many different considerations, such as land availability, integration design, system impact, etc. The MECO representative stated that MECO was exploring this option near the Wailea Substation as there are grant funds that may be available to offset the cost.

Maui Electric Company (MECO) strictly complies with all applicable Federal, State, and County regulations regarding public safety and the environment. MECO designs its substations in accordance with current and applicable codes and standards. Presently, the National Electrical Code, 2008 Edition, and the Uniform Building Code, 1997 Edition, as approved by the County of Maui, along with the National Electrical Safety Code, 2002 Edition, govern minimum separation and clearance requirements. In addition, MECO's substation equipment installations meet all applicable County, State, and Federal environmental regulations and guidelines and do not contain toxic substances.

All new electrical lines within Honou'ula will be underground and Honou'ula Partners, LLC proposes to place underground the existing overhead lines that run over the Property in the mauka-makai direction and along the makai boundary.

To facilitate renewable energy generation and net energy metering within Honou'ula, Honou'ula Partners, LLC will consider providing "photovoltaic ready" homes and commercial buildings to allow home and business owners the option of installing their own photovoltaic system. Features of "photovoltaic ready" homes and buildings could include: 1) roof slopes orientated for optimal photovoltaic efficiency and aesthetic appeal; and 2) specific items such as inverters, grid intertie components, and fundamental wiring to easily connect to roof top photovoltaic panels. "Photovoltaic ready" homes and buildings would make installation of photovoltaic systems more attractive for home and building owners, thereby encouraging net metering agreements with MECO and on-site power generation. Because of the cap imposed by the PUC on the amount of total energy received from renewable energy generators, it may not be possible for all homes and buildings within Honou'ula to participate in net energy metering, and therefore not all homes in Honou'ula would need to be "photovoltaic ready" in anticipation of being able to participate in net energy metering.

Honou'ula Partners, LLC is committed to limiting the environmental impact of Honou'ula by reducing energy consumption. Energy-saving concepts and devices will be encouraged in the design of Honou'ula. In compliance with Chapter 344 (State Environmental Policy) and Chapter 226 (Hawaii State Planning Act), HRS, all Honou'ula buildings, activities, and grounds will be designed with energy-saving considerations. Design standards will specify low-impact lighting and will encourage energy-efficient building design and site development practices.

**Attachment  
Electrical System**

In compliance with County of Maui Ordinance No. 3554 (Condition 30), Honou'ula Partners, LLC will design and construct energy systems for all residential units to meet all applicable ENERGY STAR requirements established by the EPA in effect at the time of construction. Energy systems will include all hot water systems, roof and attic areas, outside walls, windows, air cooling systems, and heating systems.

The ENERGY STAR program was established in 1992 for energy-efficient computers. Now a joint program under the EPA and the U.S. Department of Energy, the ENERGY STAR program has grown to encompass more than 35 energy-efficient product categories for homes and workplace.

Homes that earn the ENERGY STAR designation must meet guidelines for energy efficiency set by the EPA. ENERGY STAR qualified homes can include a variety of energy-efficient features, such as effective insulation, high performance windows, tight construction and ducts, efficient heating and cooling equipment and ENERGY STAR qualified lighting and appliances.

In further compliance with County of Maui Ordinance No. 3554, Honou'ula Partners, LLC will: 1) equip all residential units (single-family and multi-family) with a primary hot water system at least as energy efficient as a conventional solar panel hot water system, sized to meet at least 80 percent of the hot water demand for the unit. (Condition 30); 2) ensure that all air cooling systems and all heating systems for laundry facilities, swimming pools, and spa areas will make maximum use of energy-efficient construction and technology (Condition 30); and 3) obtain confirmation from MECO that the proposal to relocate and/or landscape MECO facilities is incorporated in the Project District Phase II application and site plan (Condition 18).

Equipping all residential units with a primary hot water system at least as energy efficient as a conventional solar panel hot water system, sized to meet at least 80 percent of the hot water demand for the unit is expected to reduce the energy consumption of individual Honou'ula homes by approximately 32 percent since energy consumption for hot water heating is typically about 40 percent of total residential energy use. Based on average residential energy consumption of approximately 600 kilowatt-hours (kWh) per home per month, at full build out of all homes in Honou'ula a 32 percent reduction in energy use would result in a savings of 220,800 kWh per month. In relation to total energy demand for all of Honou'ula the residential hot water systems would reduce total electrical demand by approximately 8.5 percent.

In addition to the water heating systems provided with all homes, if a homeowner chooses to install a photovoltaic system, electrical demand could be further reduced. Assuming a homeowner installs a 2 kW PV system and assuming a very conservative four hours per day of usable sunlight, an additional reduction in energy consumption (2 kW x 4 hours/day x 30 days/month) of 240 kWh per month would be contributed by each such home with a photovoltaic system. Assuming that 200 homeowners choose to install a PV system the total reduction in energy demand would be 48,000 kWh per month (200

**Attachment  
Electrical System**

homes x 240 kWh/month equals 48,000 kWh/month) and the resulting energy savings would equal approximately 1.85 percent of Honua'ula's total energy demand.

Cumulatively, a 10.4 percent reduction in energy consumption could be achieved with the energy savings from the hot water systems combined with 200 homes installing a photovoltaic system. Additional reductions in energy consumption are anticipated as a result of: 1) meeting all applicable ENERGY STAR requirements; 2) ensuring that all air cooling systems and all heating systems for laundry facilities, swimming pools, and spa areas make maximum use of energy-efficient construction; and 3) and other energy conservation measures; however the projected reduction in energy consumption from these additional measures has not been calculated.

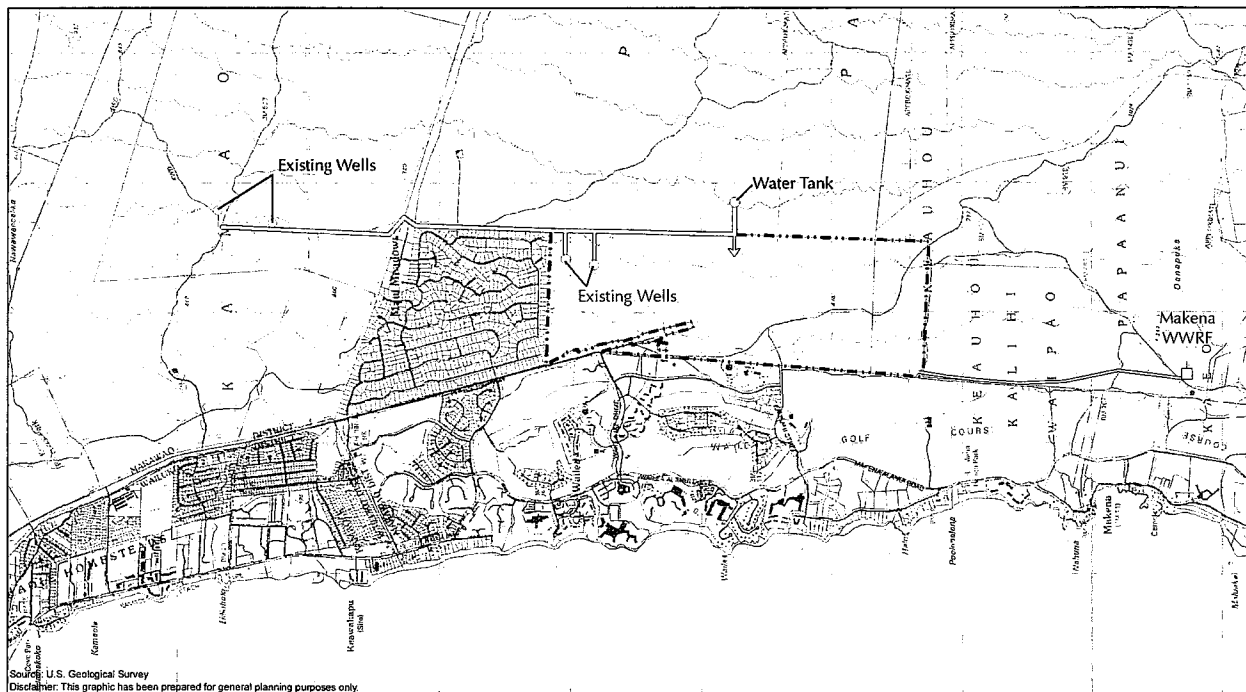
The following additional energy saving methods and technologies will also be considered during the design phase of Honua'ula:

- Use of site shading, orientation, and naturally ventilated areas to reduce cooling load;
- Maximum use of day lighting;
- Use of high-efficiency compact fluorescent lighting;
- Exceeding Model Energy Code requirements;
- Roof and wall insulation, radiant barriers, and energy efficient windows;
- Use of solar parking lot lighting;
- Use of light color or "green" roofs;
- Use of roof and gutters to divert rainwater for landscaping;
- Use of landscaping for dust control and to minimize heat gain to area; and
- Use of photovoltaics, fuel cells and other renewable energy sources.
- Installation of right-sized air conditioning systems with duct work that does not pass through unconditioned space (i.e. attic) unless the duct itself is insulated.
- Installation of zoned air conditioning systems with programmable thermostats.
- Installation of energy feedback devices in homes, such as a TED (The Energy Detective) so occupants can monitor energy use and adapt behavior to reduce power use.

**ATTACHMENT  
FIGURE 2  
REGIONAL LOCATION**

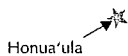


# ATTACHMENT FIGURE 13 TRAILS NETWORK



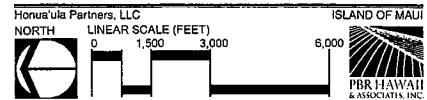
## LEGEND

- Honua'ula
- Water Well / Tank
- Proposed Water Lines
- Wastewater Reclamation Facility
- Proposed Wastewater Line
- Makawao - Pukalani - Kula Community Plan
- Kihei - Makena Community Plan

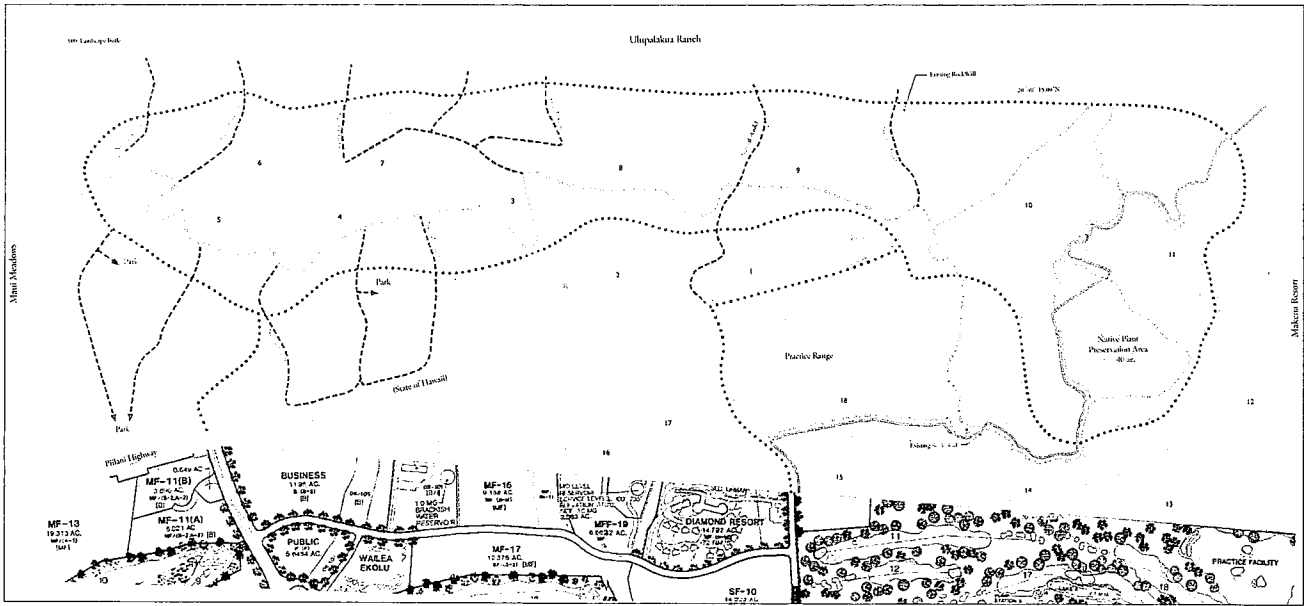


**Figure 2**  
Regional Location

## Honua'ula



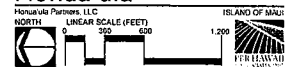
# ATTACHMENT GROUNDWATER



**LEGEND**

- - - - - Connector Loop (6' to 8' wide)
- - - - - Minor Street Path (5' to 6' wide)
- - - - - Scenic Trail
- - - - - Cultural/Nature Trail
- - - - - Gulch Trail - Mauika/Makai Connectors
- - - - - Kanaio - Kalama Road Trail

**Figure 13**  
Trail Network  
**Honua'ula**



Plan By: **VITA**

Disclaimer: This graphic has been prepared for general planning purposes only.

## Attachment Groundwater

### 3.5.1 Groundwater

Tom Nance Water Resource Engineering (TNWRE) conducted an assessment of the potential impact on groundwater resources from the creation of Honua'ula. Information and conclusions from the assessment are summarized below. The complete assessment report is included in Appendix B. In response to a request from the Maui Planning Commission, TNWRE prepared a supplemental report which contains data for all wells in the Kama'ole Aquifer available from the CWRM. Information from this supplemental report is summarized below. The complete supplemental report is also included in Appendix B. In their letter commenting on the Draft EIS dated May 20, 2010, CWRM stated that the Draft EIS "thoughtfully discusses groundwater and surface water issues." The complete CWRM letter is included in Appendix AA.

The Property and the wells that will supply the Property are located in the Kama'ole Aquifer System. The system comprises a triangular-shaped area of approximately 89 square miles, with its apex at the top of Haleakala and its base along the 11-mile length of shoreline from Waiakoa Gulch on the north to Cape Kina'u on the south. The Waiakoa Gulch boundary of the aquifer is coincident with the Wailuku-Makawao district boundary, but is otherwise of no known hydrologic significance. The southern boundary of the aquifer is the southwest rift zone of Haleakala, which is likely to be a barrier to groundwater flow. Groundwater in the Kama'ole Aquifer exists as a basal lens from the shoreline as far inland as the 1,700-foot contour. The direction of groundwater flow in the basal lens is mauka to makai.

The Property, located toward the western and southern end of the Kama'ole Aquifer, is generally semi-arid, with rainfall averaging about 18 inches per year. Because of the relatively dry conditions on and above the Property, there are no perennial streams on the Property or in the vicinity. Runoff occurs in the mauka-to-makai gulches which cross the Property only during, and for a short time following, intense rainfall events.

In 1990, the CWRM set the sustainable yield of the Kama'ole Aquifer at 11 million gallons per day (MGD). This was based on a computed groundwater recharge of 25 MGD and the assumption that 44 percent of the recharge could be withdrawn by wells without adversely impacting the integrity of aquifer. However, several far more detailed and sophisticated studies on the aquifer's recharge have been completed since then (USGS 1999; Waimea Water Services Inc. 2004; USGS 2007). These studies indicate that the recharge amount on which the CWRM's sustainable yield is based is substantially underestimated; the actual sustainable yield of the aquifer may be as much as 50 percent greater than the 1990 CWRM estimate. The most recent of these studies—which is considered to be the most reliable—estimates the groundwater flowrate to be 3.4 MGD per mile, which is the rate used by TNWRE in analyzing impacts to groundwater (TNWRE 2010a).

According to CWRM records, there are a total of 134 wells within the Kama'ole Aquifer System, many of which are more than 60 years old and no longer in use. Of the 134

## Attachment Groundwater

wells, 43 are known or presumed to be in use, 47 are no longer in use or do not draw from the basal lens, and 44 are of unknown status relative to their use (TNWRE 2010b). Current actual aquifer pumpage is estimated to be approximately 4.0 MGD (TNWRE 2010a; TNWRE 2010b).

Examination of CWRM data shows that reporting of chlorides and water levels to CWRM is minimal. Only three of the 43 wells in the aquifer that are known or presumed to still be active are presently reporting this information. For wells for which TNWRE has independent data, chloride levels have been stable for a decade of monthly sampling.

No well has been drilled to sufficient depth through the basal lens to define the depth and character of transition zone anywhere in the aquifer. However, what is known or can be reasonably surmised regarding the transition zone is that:

- Groundwater levels along the 1,700-foot contour are approximately six feet above sea level; therefore, the midpoint of the transition zone below the 1,700-foot contour would be approximately 240 feet below sea level;
- Wells along or just below the 600-foot contour have water levels from 2.6 to 3.1 feet above sea level, indicating a midpoint of the transition zone below the 600-foot contour between 100 and 125 feet below sea level; and
- The stability of the transition zone, although not directly measured, can be inferred from the stability of chlorides pumped by wells. The most accurate and complete data of chlorides for the region shows stable chloride levels for a decade.

The Underground Injection Control Line<sup>2</sup>, as established by the State DOH, is located approximately along the 600-foot elevation contour, above the majority of the Property.

Currently, Honua'ula has four brackish wells. Two of these are on the Property (Wailea 670 1 and 2). The other two are off-site (Kama'ole 1 and 2) in an area north of Maui Meadows and on land owned by Haleakalā Ranch. The total safe yield of the four wells, with one as standby, is 1.3 MGD (TNWRE 2010a). All of the wells are within the Kama'ole Aquifer System and are fully permitted by CWRM.

### POTENTIAL IMPACTS AND MITIGATION MEASURES

#### Water Resources

Four aspects of Honua'ula have the potential to impact water resources: 1) use of groundwater for potable consumption and landscape irrigation; 2) generation, treatment, and reuse of domestic wastewater; 3) increase in surface water runoff; and 4) percolation of excess landscape irrigation to groundwater. Potential impacts to groundwater may

<sup>2</sup> Underground Injection Control Line (UIC) means the line on the DOH Underground Injection Control maps which separates exempted aquifers and underground sources of drinking water (Section 11-23-03, HAR).

### Attachment Groundwater

occur in two geographically distinct areas: 1) beneath and downgradient of the Property itself; and 2) downgradient of Honua'ula's off-site wells.

**Use of Groundwater** – Honua'ula's potable and irrigation water supply will be provided by brackish wells. As noted above, four of these wells have already been developed: two are on the Property (Wailea 670 Wells 1 and 2); and the other two are off-site (Kama'ole Wells 1 and 2) in an area north of Maui Meadows. All of the wells are fully permitted by CWRM. Honua'ula's total average groundwater use at full build-out is projected to be approximately 1.7 MGD. To provide for summertime maximum use periods and to have standby capacity, two more wells will be needed. Depending on actual water use rates that materialize, a third new well may or may not be needed as Honua'ula approaches build-out. For more information on Honua'ula's water system, see Section 4.8.1 (Water System).

Honua'ula spans a 1.9-mile length of coastline mauka of the shoreline. Assuming a lateral dispersion on the order of 10 degrees, Honua'ula's potential impacts on groundwater may occur across a 2.3-mile section of the shoreline. The existing groundwater flowrate discharging into the marine environment in this area is estimated to be on the order of 7.8 MGD.

Five of Wailea Resort's nine golf course irrigation wells are within this downgradient and lateral zone. According to CWRM records, the draft of these wells is approximately 1.4 MGD as a year-round average. However, because Wailea Resort's Well 2 (No. 4126-02) is nearly directly downgradient from Honua'ula's on-site wells, it is the only well in which there may be a potential increase in salinity due to the potential decrease of groundwater flow being taken up by the on-site Honua'ula wells. Decreased pumping of Honua'ula's on-site wells would alleviate this potential impact.

Honua'ula's well system, with on-site and off-site wells, was specifically engineered to minimize impacts to Wailea Resort's golf course irrigation wells. Honua'ula's two on-site wells are fully permitted by CWRM and have been in place for nearly 20 years; however they cannot supply all water needed for Honua'ula. Rather than drill additional wells on-site, which could lead to potentially adverse impacts to Wailea Resort's downgradient wells, Honua'ula's off-site wells will draw from groundwater flows removed from Wailea Resort's wells, in an area north of Maui Meadows that has far less downgradient water withdrawals. The use of this off-site water within Honua'ula lessens the need for groundwater withdrawals from on-site Honua'ula wells, thus preserving more groundwater flow to the downgradient Wailea Resort wells.

Honua'ula's off-site wells, located north of Maui Meadows, and potential new wells in the same area, span an 0.8-mile long length at about the 580-foot elevation and have the potential to impact groundwater flow along an approximate 1.4-mile long shoreline segment. The existing groundwater flow rate discharging into the marine environment in this area is estimated to be on the order of 4.8 MGD. Use of Honua'ula's off-site wells is calculated to reduce this flow rate by approximately 27 percent.

### Attachment Groundwater

Based on CWRM records, there are 20 wells in this downgradient and lateral zone. Most of these wells are more than 50 years old and are no longer in use. However, at least six are relatively recent (installed since the 1990s) and were developed to provide brackish landscape irrigation water for condominium parcels. The total draft of these wells is likely to be in the range of 0.12 to 0.30 MGD as a year round average. With the use of Honua'ula's off-site wells, the active downgradient irrigation wells may be impacted by a potential increase in salinity due to reduced flowrate, which current calculations indicate may be on the order of five percent. If the actual impact materially impairs the utility of the downgradient landscape irrigation wells, additional wells (pumping the same combined amount of water) in the area north of Maui Meadows to distribute the draft over a greater area would alleviate the impact so that the utility of downgradient wells is not materially impaired.

**Wastewater Generation, Treatment, and Reuse** – Two alternatives are being considered for treatment of Honua'ula's wastewater: 1) develop, maintain, and operate a private on-site WWRF; or 2) transport wastewater to the Makena WWRF for treatment and return the treated effluent to Honua'ula for irrigation use. With either alternative, wastewater will be treated to R-1 quality and used for golf course irrigation. Potential impacts related to use of R-1 water for irrigation are discussed in the discussions below regarding percolation to groundwater and summary of impacts. For more information on Honua'ula's wastewater system see Section 4.8.2 (Wastewater System).

**Collection and Detention of Rainfall Runoff** – Honua'ula will use detention basins so that there will be no increase in the peak rate of stormwater runoff leaving the Property compared to existing conditions. Of the 18 inches of average annual rainfall received on the Property, it is assumed that one-third of the rainfall percolates to groundwater and the remaining two-thirds evaporates to the atmosphere or becomes runoff.

Runoff will be stored in 26 detention basins located on the Property in low lying areas, within the golf course, or along the makai Property boundary. Each of the detention basins will have a drainage outlet consisting, in part, of a vertical perforated pipe within a gravel mound which will act as a filter. In addition to reducing the peak runoff rate by detention storage, this configuration will also capture floatables and suspended solids in the basin, thus reducing sediments in the water released from the detention basins. With the use of detention basins, the peak rate of runoff leaving the Property will not increase over current conditions and seepage of water into the ground from the detention basins will actually increase the amount of percolation to groundwater. Potential impacts regarding percolation to groundwater are discussed below. For more information on Honua'ula's drainage system see Section 4.8.3 (Drainage System).

**Percolation to Groundwater** – Irrigation water used within Honua'ula will be a combination of: 1) brackish water from wells; 2) R-1 quality recycled water from the either

#### Attachment Groundwater

the on-site WWRF or the Mākēna WWRF; and 3) concentrate from reverse osmosis (RO) treatment of the potable supply.<sup>3</sup>

To calculate potential changes to groundwater, the groundwater assessment study made the following assumptions:

- The salinity of water from the brackish well water will be 0.95 parts per thousand (ppt);
- The R-1 water from the on-site WWRF or the Mākēna WWRF will have 775 µM (micromoles)(10.85 milligrams per liter (mg/l) nitrogen and 165 µM (2.00 mg/l) phosphorus;
- Essentially all of the nitrogen and phosphorus in the brackish well water that is run through the RO treatment process will be contained in the concentrate that is used for irrigation;
- Rainwater percolating to groundwater will have an increase in nitrogen of 20 µM and an increase in phosphorus of 2.0 µM over existing conditions;
- Fertilizer applications in landscaped areas will be at three pounds per 1,000 square feet per year for nitrogen and at 0.5 pounds per 1,000 square feet per year for phosphorus; of these applications 10 percent of the applied nitrogen and two percent of the applied phosphorus will be carried in the percolate below the root zone.
- Percolation of excess applied irrigation water will occur from irrigating: 1) the golf course and driving range; 2) landscaping along roadways and in buffer areas; 3) parks and other landscaped public areas; and 4) residential parcels. It is assumed that 10 percent of the applied irrigation water on the golf course percolates to groundwater and 15 percent of applied irrigation water on other irrigated landscaped areas percolates to groundwater. At build-out, the total percolation to groundwater of excess applied irrigation is estimated to be 0.206 MGD.
- For all the irrigation water, it is assumed that the portion percolating through the root zone will have a salinity increase of 10 percent and a 50 percent reduction of nitrogen and phosphorus concentrations as a result of plant uptake and processes in the soil; and
- In the hundreds of feet of travel by the percolate through the vadose zone (the unsaturated lavas between the ground surface and groundwater) and the thousands of feet of travel for groundwater to discharge at the shoreline, natural processes will remove 80 percent of dissolved nitrogen and 95 percent of dissolved phosphorus.

<sup>3</sup> Brackish well water will be treated by RO to produce potable water for Honua'ula. The RO process generates brine concentrate in the course of producing potable water. However, by diluting the brine water with other non-potable water (brackish and R-1), the salt content will be reduced to a degree that it can be used for irrigation, thus avoiding the use of injection wells to dispose of the brine. See Section 4.8.1 (Water System) for more details.

#### Attachment Groundwater

The net potential change is calculated to be: a 2.9 percent reduction in flowrate; a 0.6 percent increase in salinity; a reduction in nitrogen loading of 4.3 percent; and a reduction in phosphorus of 4.8 percent.

The net decrease in nitrogen and phosphorus is due to several compounding reasons; 1) existing groundwater is already high in nitrogen and phosphorus due to naturally occurring processes upgradient of the Honua'ula wells; 2) pumping of the two on-site Honua'ula wells will thus decrease nitrogen and phosphorus in groundwater flowing to the ocean because of the reduced groundwater flow; 3) the total amount of groundwater withdrawn from the Honua'ula wells will not all percolate to groundwater, as some will be absorbed by plants, evaporate, or be captured as runoff in the detention basins; 4) for the water that does percolate to groundwater or flow from detention basins, natural processes will remove 80 percent of dissolved nitrogen and 95 percent of dissolved phosphorus in the hundreds of feet of travel by the percolate through the vadose zone (the unsaturated lavas between the ground surface and groundwater) and the thousands of feet of travel for groundwater to discharge at the shoreline.

**Summary of Potential Impacts** – Table 1 below presents a compilation of potential changes to groundwater in the area downgradient of Honua'ula after full build-out incorporating the assumptions noted in the previous discussions.

MGD as a year round average). It is not known if the increase in salinity would materially impair the utility of the wells; however if the utility of the wells is materially impaired, additional wells (pumping the same combined amount of water) in the area north of Maui Meadows would distribute the draft over a greater area and would alleviate the impact downgradient. Honua'ula Partners, LLC commits to distributing the draft over a greater area if the utility of active downgradient wells is demonstrated to be materially impaired.

In addition, Honua'ula Partners LLC will construct an upgradient golf course monitor well to a depth that will allow the well to also be used to monitor the transition zone below the basal lens; however, available data from wells across the entire aquifer, and more specifically in the mauka-makai corridor that may be affected by Honua'ula's wells, does not indicate a monitor well is needed. Nonetheless, the monitor well will be installed prior to the start of use of Honua'ula's production wells and periodic profiling of salinity and temperature through the monitor well's water column will be performed. This data will be used to track salinity in the basal lens and the movement, if any, of the transition zone.

All existing on- and off-site wells are fully permitted by CWRM. All new wells will be developed in compliance with all requirements of Chapter 174C, HRS (State Water Code) and HAR, Chapters 13-167 to 13-171, as applicable, pertaining to CWRM and administration of the State Water Code. The CWRM application process for water-use permits entails: 1) the preparation of an extensive application that includes analysis of: a) the public interest; b) the rights of the Department of Hawaiian Home Lands; c) any interference with any existing legal uses; and d) alternatives; 2) a thorough public and agency review process; 3) public hearing(s); and 4) a formal decision from CWRM. Well well construction/pump installation permits also have requires an extensive application process that includes with thorough review by the State Department of Health (DOH) for compliance with DOH rules and standards, including the appropriateness of the well location. Therefore, there will be extensive analysis, review, and evaluation of potential impacts of any new wells.

**Cattle Ranching**

Cattle ranching activities upslope of the Property and the off-site Honua'ula wells have very limited potential for contamination of Honua'ula's groundwater sources. The areas used for cattle ranching upslope of the Property are dry, hot, and un-irrigated; therefore cattle grazing in these areas is extensive, not intensive. The two- and 10-year zones of contribution would potentially cover the area from the 500-foot elevation (a short distance down slope from the highest point of the Property) to the 1,600-foot elevation (approximately 10,000 feet upslope of the Property). These elevations are the vertical travel distances for contaminants to reach groundwater. Substantial natural protection is provided by these distances as well as the multiple layers of successive lava flows, and therefore upslope cattle ranching activities are not expected to impact Honua'ula's groundwater sources.

**Table 1. Compilation of Potential Changes to Groundwater in the Area Downgradient of Honua'ula After Full Build-Out**

Component Flow	Flowrate (MGD)	Salinity (PPT)	Nitrogen (lbs/day)	Phosphorus (lbs/day)
Pre-Development Groundwater	7.8	1.00	228.3	5.217
Withdrawal by On-site Wells (No. 4125-01 and -02)	0.43	0.95	12.59	0.288
Percolation From the Project Site to Groundwater	No Change	No Change	0.14	0.0077
<ul style="list-style-type: none"> <li>Percolating Rainfall</li> <li>Percolation From the Golf Course</li> <li>RO Concentrate</li> <li>WWRF Effluent</li> <li>Brackish Water</li> <li>Applied Fertilizer Dissolved in Percolate</li> </ul>	0.0203 0.0274 0.0240 --	2.651 0.440 1.045 --	0.170 0.248 0.070 0.788	0.0010 0.0114 0.0004 0.0066
<ul style="list-style-type: none"> <li>Percolation From Other Landscaped Areas</li> <li>Brackish Water</li> <li>Applied Fertilizer Dissolved in Percolate</li> </ul>	0.1336 --	1.045 --	0.391 0.981	0.0022 0.0082
Post-Development Groundwater	7.5753	1.0062	218.498	4.9665
<ul style="list-style-type: none"> <li>Amounts</li> <li>Change Compared to Pre-Development Flowrate</li> </ul>	-2.9%	+0.62%	-4.3%	-4.8%

As shown on Table 1 the computed changes to groundwater in the area downgradient of Honua'ula are: 1) a relatively small 2.9 percent reduction in flow rate discharging into the marine environment; 2) a relatively insignificant 0.6 percent increase in salinity; 3) a reduction in nitrogen loading of 4.3 percent (a positive impact regarding ocean water quality); and 4) a reduction in phosphorus of 4.8 percent (a positive impact regarding ocean water quality). The largest factor contributing to these results is that most of the groundwater supply (about 75 percent) will come from the off-site Kama'ole wells; the use of this off-site water will: 1) lessen the need for groundwater withdrawals from on-site Honua'ula wells, thus preserving more groundwater flow to downgradient wells; and 2) contribute to groundwater recharge flowing toward the downgradient wells.

Based on these results, the hydrologic assessment concludes that the creation of Honua'ula will not impair Wailea Resort's golf course irrigation wells, with the possible exception of a salinity increase in Wailea Resort's Well 2 (No. 4126-02), which is directly downgradient of Honua'ula's two on-site wells. Decreased pumping of Honua'ula's on-site wells would alleviate this potential impact.

An estimated six active downgradient wells may be impacted by a potential increase in salinity due to reduced flowrate resulting from Honua'ula's off-site wells, which current calculations indicate may be on the order of five percent. These downgradient brackish wells were developed to provide landscape irrigation for individual condominium parcels, and the combined draft of all of these wells is relatively small (in the range of 0.12 to 0.30

### Attachment Groundwater

#### Golf Course

To ensure that Honua'ula's golf course is developed and operated in an environmentally responsible manner and potential impacts to water resources are mitigated, Environmental & Turf Services, Inc., prepared a comprehensive Best Management Practices (BMPs) document adhering to the DOH's "Golf Course Best Management Practices" guidelines (DOH 2005). The BMPs also satisfy all previous DOH recommendations regarding golf courses, including, "Guidelines Applicable to Golf Courses in Hawaii" (Version 6, DOH 2002) and "Twelve Conditions Applicable to all New Golf Course Development" ("12 Conditions;" Version 4, DOH 1992). The BMPs further satisfy specific conditions of County of Maui Ordinance No. 3554 that require compliance with several of the DOH's "12 Conditions." Sections of the BMP document relative to groundwater protection are summarized below. Appendix C contains the complete BMP document.

The overall goal of the Honua'ula BMPs is to reduce the turf chemical and water inputs required to manage the 18-hole golf course and to minimize waste generation. The most important BMP is the use of Seashore paspalum grass throughout the golf course. Traditionally, Hawaii golf courses have used bermudagrass, which presents an excellent playing surface under typical Hawaii conditions. However, the new varieties of Seashore paspalum rival bermudagrass in turf quality and have many additional environmental attributes, including tolerance of alternative water sources and high sodium and salt levels, the potential to substantially reduce fertilizer requirements (including a two-thirds reduction in nitrogen requirements) and minimal need for herbicides and fungicides.

**Groundwater Monitoring** – Two monitoring wells are tentatively proposed for installation on-site. An existing irrigation well will also be sampled. Baseline sampling and semi-annual operational phase sampling will be done. Analytes will include pesticides and relevant key metabolites, standard field parameters (such as pH and temperature), nitrate, phosphorus, and inorganic substances relevant to the ongoing nearshore monitoring program (see Section 3.5.2 (Nearshore Marine Environment)). A contingency plan is proposed that would trigger pesticide use restrictions or bans if pesticides are detected at predetermined concentrations. The groundwater monitoring program and protocol will be prepared in accordance with the DOH's Golf Course BMPs (DOH 2005) and will continue until DOH certifies that no further monitoring is required based on review of the data.

In providing and executing the groundwater monitoring program, Honua'ula Partners, LLC will also be in compliance with County of Maui Ordinance No. 3554:

- Condition 18a, which requires compliance with Condition 1 of DOH's "12 Conditions," which relates to establishing baseline groundwater/vadose zone and nearshore water quality (see Section 3.5.2 (Nearshore Marine Environment)) data and reporting findings to DOH; and
- Condition 18b, which requires compliance with Condition 2 and 3 of DOH's "12 Conditions;" specifically;

### Attachment Groundwater

- o Condition 2 of DOH's "12 Conditions" relates to establishing a groundwater monitoring program; and
- o Condition 3 of DOH's "12 Conditions" requires immediate action if data from the monitoring system indicates increased levels of a contaminate that poses, or may pose, a threat to public health and the environment.

**Water Conservation** – Water conservation is central to the functioning of the golf course. While non-potable water will be used for all golf course irrigation, the golf course will also include a modern irrigation system designed to use non-potable water efficiently. The key component of the irrigation system will be a central computer to store information for every sprinkler, including the type of sprinkler, nozzle sizes, location, soil type, slope, infiltration, exposure, etc., so that the exact amount of water needed is applied (i.e., not just turning on sprinklers for a set duration). Cycle/soak features will prevent runoff when heavy irrigation is needed. Flow management features will ensure optimum pressure and amount to every sprinkler.

Records of irrigation procedures will be maintained for each management zone. Each management zone will be treated independently; the highest priority zones (greens, tees, fairways) will receive the highest amounts of water, while lower priority zones (secondary roughs, natural areas) will receive less water. These priority designations will help efficiently manage overall water use on the golf course, providing the highest level of playability and aesthetics while incorporating water conservation and environmentally sustainable management practices.

In designing and implementing a detailed and efficient irrigation system, Honua'ula Partners, LLC will also be in compliance with County of Maui Ordinance No. 3554 Condition 18d, which requires compliance with Condition 5 of DOH's "12 Conditions," which relates to use of treated wastewater for golf course irrigation (see section 4.8.2 (Wastewater System) and the need for an irrigation plan).

**Golf Course Maintenance Center** – The golf course maintenance center is expected to be located near the Kaunahā Street entrance. It will be a modern, carefully designed, fenced and secured, state-of-the-art complex containing offices, a maintenance shop, and equipment and material storage. It will be designed to achieve these objectives: operational efficiency; worker health and safety; environmental protection (i.e., containment and management of chemicals and fuels so that the surrounding environment will not be impacted); and compliance with all Federal, State, and County regulations. The golf maintenance center is located in an area sufficiently distanced from residential uses and will be designed to further lessen noise to surrounding uses.

The maintenance center site will be graded, and curbs will be erected, so that parking lot drainage cannot flow directly into drainage features. Catch basins will capture contaminated stormwater runoff and any spills and will be tied to a drainage system that terminates in a treatment system to remove sediments, floating debris, and petroleum contaminants. The system will be designed with consideration that runoff from the

### Attachment Groundwater

maintenance facility complex may include soil, sand, grass clippings; petroleum products (small amounts of oil and gasoline), fertilizers, and other typical hard surface runoff substances. There should be minimal to no presence of pesticides in runoff water due to the use of closed-loop recirculating systems and special containment pads.

The maintenance center will include a recycling wash water system for turfgrass equipment. The system will be capable of capturing grass clippings, oil and grease, and trace organics and will include a closed-loop wash/recycle wash-down water system independent of the stormwater drainage system.

Fuel storage will be within a split, above-ground fuel tank. One tank will be used for gasoline, and one for diesel. Both tanks will have double walls with vehicle barriers for accident prevention. The tanks will conform to the Uniform Fire Code and National Fire Protection Association regulations for above-ground tanks and will be designed to meet above-ground regulatory storage requirements in the State of Hawaii.

Pesticide/bioicide storage will be in a pre-fabricated building specifically designed for pesticide storage to be ventilated, fire resistant, vapor explosion resistant, vandalism protected, spill self-contained, and climate controlled. The building will be designated and posted as a pesticide storage area (as required by law) with a list of all chemicals contained in storage on file in the superintendent's office. Fertilizer and other dry bulk material typically contained in bag form will be stored in a separate building with masonry walls to prevent corrosion caused by fertilizer salts.

A self-contained concrete mixing/loading pad, enclosed on three sides, will be designed to safely contain any spill, or emergency release of materials and prevent release of any chemicals or spray mix other than proper application to the turf.

Golf course maintenance equipment and vehicles used on-site will be stored in a paved area of the maintenance center. The floor of the equipment storage area will be hard surfaced, allowing easy clean-up of oil leaks, spills, or other fluids that might come from the equipment. Proper absorbent materials throughout the storage area will allow for quick clean up of spills. No fluids will be allowed to escape this area. Floor drains will not be allowed.

In providing a state-of-the-art golf course maintenance center, Honua'ula Partners, LLC will also be in compliance with County of Maui Ordinance No. 3554:

- Condition 18e, which requires compliance with Condition 6 of DOH's "12 Conditions," which relates to storage of petroleum products for fueling golf carts, maintenance vehicles, and emergency power generators that pose potential risk to groundwater;
- Condition 18f, which requires compliance with Conditions 7, 8, and 11 of DOH's "12 Conditions," specifically:

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- o Condition 7 of DOH's "12 Conditions" relates to buildings designed to house fertilizers and biocides;
- o Condition 8 of the DOH's "12 Conditions" relates to a golf course maintenance plan and program and is discussed below;
- o Condition 11 of the DOH's "12 Conditions" relates to: 1) fugitive dust during construction, which is addressed in Section 4.6 (Air Quality) and 2) application of pesticides and chemicals, which is discussed below; and
- Condition 18g, which requires compliance with Condition 9 of DOH's "12 Conditions," which relates to minimizing noise from golf course maintenance activities.

**Integrated Pest Management** – Integrated Pest Management (IPM) is an interdisciplinary program that manages pest control tactics in a single system to prevent unacceptable levels of pest damage. IPM uses the least toxic control approach to address pest problems, using chemical controls only when other strategies are not effective. Appropriate control methods are generally not designed to eradicate pest populations but to manage turf grass in the most economical way with the least effect possible on people, property, and the environment.

The use of IPM avoids the conventional spray approach to pest management and is likely to reduce pesticide use by 30 percent or more. This approach ultimately develops harder turf grass and increases the population of beneficial organisms and natural enemies to pests. Control tactics are implemented based on pest populations and not by spray intervals and calendar dates.

There is no single pest control method that provides complete control of turf grass pathogens (pathogens cause disease), but the multifaceted IPM approach provides the best and most economical control of pests. Golf courses, like other agricultural commodities, are susceptible to occasional attacks from a rather complex list of pests. These pests and causal agents may be observed during various climatic conditions and life cycles. They may be controlled by a variety of methods. With the IPM approach, pest populations are monitored such that an appropriate treatment is implemented when pest pressure exceeds the action tolerance level of damage to turf. A threshold is a level of damage or potential damage such as the number of insects or weeds per square foot of turf. The treatment may be one of a variety of pest control measures (e.g., mechanical removal, biorational products, chemical treatments, etc.). The IPM approach will work on every defined management area but must be tailored for each tee, green, fairway, and rough.

Monitoring control systems will provide the basis for developing thresholds and determining any actions necessary for control. The system should be simple, accurate, and part of the daily regimen for turfgrass management. Pests may be defined as bacteria, plant pathogenic fungi, insects, nematodes, rodents, viruses, weeds, etc. The information obtained through monitoring will provide site specific educational knowledge and limit the levels of predictable loss to turf grass. Pest occupancy is very weather-dependent;



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therefore it is necessary to observe pest populations for several years to have a good idea about the range of pest problems.

A fertilizer/nutrient management plan will provide site-specific guidelines and plant requirements to maintain healthy turf grass, avoiding the over-application of nutrients resulting in transportation of dissolved nutrients off-site. Approximately half of the nitrogen fertilizer applied to turf grass is incorporated into the plant; the other half can be found stored in the soil and lost to the atmosphere. Thus there is limited fertilizer nitrogen remaining that can leach into ground water or be transported as runoff into surface water (Petrovic 1990; Cohen 1999). Golf courses can be managed so nitrogen from fertilizers does not contaminate ground water supplies (Petrovic 1990; Cohen 1999).

Biorational/organic products (fungi, bacteria, viruses, nematodes, and non-target insects) will be used whenever it is feasible, and there is a scientific basis to support their use. Biorational products can provide an effective and efficient method of eradicating disease and other pest pressures. Additional methods, such as applying composts containing microorganisms as top dressing and the use of compost teas may also suppress diseases before they harm turfed areas. EKO Compost, located in Pu'unohi, manufactures and sells compost and compost-based mixtures. When applied as top dressing, EKO compost has been shown to improve yellowing areas on tees and fairways (Burgett 2006; EKO 2006).

Chemical treatments will only be used when a pest is present at significant levels to cause damage and should only be applied when the pest is most vulnerable to the pesticide (i.e., in juvenile stages of development) and when the environment is best suited to manage the application (e.g., not when soil is saturated, or during windy or rainy weather to prevent the amount of potential drift and surface water runoff). If the pest infestation is limited in scope, spot treatments may be possible. When applying chemical controls it is important that equipment is properly calibrated and adequately maintained. Pesticide will be rotated (alternative chemicals, or alternative pest control methods and cultivation controls) to reduce the possibility of pests becoming resistant to the applied chemicals, and also to reduce the frequency of chemical applications.

In implementing an Integrated Pest Management program, Honua'ula Partners, LLC will also be in compliance with County of Maui Ordinance No. 3554 Condition 18f, which requires compliance with Conditions 7, 8, and 11 of DOH's "12 Conditions," specifically:

- Condition 7 of DOH's "12 Conditions" relates to buildings designed to house fertilizers and biocides and was discussed above;
- Condition 8 of DOH's "12 Conditions" relates to a golf course maintenance plan and program in regard to: 1) use of fertilizers and biocides which is discussed above; and 2) irrigation, which was discussed above;
- Condition 11 of DOH's "12 Conditions" relates, to 1) fugitive dust during construction which is addressed in Section 4.6 (Air Quality) and 2) application of pesticides and chemicals, which is discussed above.

# ATTACHMENT NOISE

#### 4.5 NOISE

Y. Ebisu & Associates prepared an acoustic study to: 1) study the existing and future noise environment in the environs of Honua'ula; and 2) evaluate potential noise impacts associated with Honua'ula, including the widening of P'i'ilani Highway; and 3) provide recommendations for minimizing noise impacts. Appendix N contains the complete acoustic study. Y. Ebisu & Associates also prepared a separate acoustic study specifically for the widening of P'i'ilani Highway. Appendix R contains the complete P'i'ilani Highway Widening Project Final EA. Appendix F of the Final EA contains the acoustic study specifically for the widening of P'i'ilani Highway.

Sources of noise in the vicinity of the Property stem from traffic traveling along P'i'ilani Highway and other surrounding roads, distant construction, and natural sources, such as wind, rain, and birds. Sources of noise in the vicinity of the Wailea Alanui Drive intersection include traffic noise from vehicles transverse the intersection. Sources of noise in the vicinities of the off-site wells, waterline, storage tank, and the wastewater transmission line alignment for possible connection to the Makena Resort WWRF (off site water and sewer infrastructure) include activity associated with human habitation, and natural sources, such as wind, rain, and birds.

Currently, existing traffic noise levels along P'i'ilani Highway south of Maui Meadows in the immediate vicinity of the Property do not exceed U.S. Federal Highway Administration (FHWA) or State DOT noise standards for residential structures. However, existing traffic noise levels at two residences adjacent to P'i'ilani Highway north of the P'i'ilani Highway/Okalani Drive/Mikioi Place currently exceed State DOT noise standards for residential structures.

Some existing residences makai of P'i'ilani Highway presently benefit from the noise shielding effects of walls which have been constructed along the lot boundary lines. Residences in the Maui Meadows subdivision on the mauka side of the highway benefit from the noise shielding effect of the large highway cuts. In general, if the visual lines of sight between the residences are blocked by the walls or the highway cuts, residences experience lower traffic noise levels due to the sound attenuation effects of the obstructions.

Along Wailea Ike Drive existing traffic noise levels do not exceed the FHWA or DOT noise standards for residential structures at Wailea 'Ekolu Village, which is located on the south side of Wailea Ike Drive. Existing traffic noise levels from Wailea Ike Drive also do not exceed FHWA and DOT noise standards for commercial buildings.

#### POTENTIAL IMPACTS AND MITIGATION MEASURES

Potential impacts on the ambient quality of the site and surrounding area due to the creation of Honua'ula, the widening of P'i'ilani Highway, the Wailea Alanui Drive intersection improvements, and the off-site water and wastewater infrastructure, are

primarily limited to short-term construction activity and, in the long-term, increases in traffic and human activity within the community.

**Short-term Impacts** – During construction of Honua'ula, the widening of P'i'ilani Highway, the Wailea Ike Drive and Wailea Alanui Drive intersection improvements, and the off-site water and wastewater infrastructure there will likely be noise impacts associated with operation of heavy construction machinery, paving equipment, and material transport vehicles, and possible blasting to break or dislodge rock. As an alternative to blasting, the use of chemical expansion to break or dislodge rock will be considered. Chemical demolition agents are non-toxic and provide environmentally-friendly, safe, controlled demolition. Expansive powders are mixed with water and poured into pre-drilled holes in rock. The non-explosive demolition agent swells and exerts significant expansive thrust on the hole-wall. After a certain period, the pressure induced by the chemical non-explosive demolition agent fractures the wall and splits the rock across the line of the drill holes. These chemicals easily split and fracture mass rock without producing any noise or vibration.

During construction of Honua'ula, the widening of P'i'ilani Highway, the Wailea Ike Drive and Wailea Alanui Drive intersection improvements, and the off-site water and wastewater infrastructure proper mitigating measures will be employed to minimize construction-related noise impacts and comply with all Federal and State noise control regulations. Increased noise activity due to construction will be limited to daytime hours and persist only during the construction period. Noise from construction activities will be short-term and will comply with State DOH noise regulations (HAR, Chapter 11-46, Community Noise Control). When construction noise exceeds, or is expected to exceed, the DOH's allowable limits, a permit must be obtained from the DOH. Specific permit restrictions for construction activities are:

- No permit shall allow any construction activities that emit noise in excess of the maximum permissible sound levels before 7:00 a.m. and after 6:00 p.m. of the same day, Monday through Friday;
- No permit shall allow any construction activities that emit noise in excess of the maximum permissible sound levels before 9:00 a.m. and after 6:00 p.m. on Saturday; and
- No permit shall allow any construction activities that would emit noise in excess of the maximum permissible sound levels on Sundays and holidays.

The acoustic study concludes that adverse impacts from construction noise (from the widening of P'i'ilani Highway and creation of Honua'ula) are not expected to affect public health and welfare due to the temporary nature of the work and the administrative controls regulating noise impacts. Public health and welfare are also not expected to be affected due to the construction of the Wailea Alanui Drive intersection improvements and the off-site water and wastewater infrastructure.

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Noise

**Long-term Impacts** – The acoustic study concludes that the widening of Pi'ilani Highway and the creation of Honua'ula will not cause increases in traffic noise levels that would exceed DOT's criteria signifying a substantial change, which is defined as an increase of 15 decibels (dB) or more over existing conditions. By the year 2022 maximum increases in traffic noise levels in the vicinity of Honua'ula should not increase more than 10 decibels (dB) along Pi'ilani Highway and 3.6 dB along Wailea Iike Drive as a result of: 1) regional growth in traffic volumes; 2) the widening of Pi'ilani Highway; 3) the creation of Honua'ula; and 4) the planned extension of Pi'ilani Highway into Honua'ula to connect with Kaunakahi Street.

While a substantial change in noise levels (as defined by DOT) will not occur, by the year 2022 the number of residences along Pi'ilani Highway subject to noise levels that exceed DOT residential noise standards is projected to increase from two residences under existing conditions to:

- 13 residences due to regional increases in traffic even if Pi'ilani Highway is not widened and Honua'ula is not built;
- 14 residences if Pi'ilani Highway is widened and Honua'ula is not built; and
- 16 residences if Pi'ilani Highway is widened and Honua'ula is built.

In other words, noise levels along Pi'ilani Highway are projected to increase even if Pi'ilani Highway is not widened and Honua'ula is not built. Noise levels at two residences adjacent to Pi'ilani Highway currently exceed State DOT noise standards for residential structures. By 2022 this number will increase to 13 due to regional increases in traffic conditions even if Pi'ilani Highway is not widened and Honua'ula is not built. If Pi'ilani Highway is widened and Honua'ula is built, by 2022 noise levels at three additional residences adjacent to Pi'ilani Highway would exceed State DOT noise standards for residential structures. Thus, the direct impact of widening Pi'ilani Highway and building Honua'ula is that three additional residences adjacent to Pi'ilani Highway would exceed State DOT noise standards for residential structures compared to projected future conditions if Pi'ilani Highway is not widened and Honua'ula is not built. Therefore the primary noise impacts to residences adjacent to Pi'ilani Highway are from regional increases in traffic that are projected to occur even if Pi'ilani Highway is not widened and Honua'ula is not built, and not the direct result of the widening of Pi'ilani Highway and the building of Honua'ula.

Under all of the above scenarios, by the year 2022 future traffic noise levels along Pi'ilani Highway fronting Honua'ula and along Wailea Iike Drive should not exceed FHWA and DOT noise standards for residential or commercial structures. Future traffic noise levels along the Pi'ilani Highway extension into Honua'ula should not exceed FHWA and DOT noise standards for residential or commercial structures, since adequate setback distances from the highway extension's centerline will be provided in accordance with Section 19.90A.030(E)(6), MCC. In addition, DOT's criteria for a substantial change in noise levels will not be exceeded for existing residences at Wailea 'Ekolu Village and Diamond Resort.

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To mitigate impacts to residences along Pi'ilani Highway subject to noise levels that exceed FHWA and DOT residential noise standards, sound attenuating walls are recommended in accordance with DOT's traffic noise abatement policy<sup>1</sup>. Walls fronting two lots mauka of Pi'ilani Highway and one lot makai of Pi'ilani Highway have a possibility of being considered as reasonable and feasible under the current DOT traffic noise abatement policy. Landscaping should be considered on the roadway side of sound attenuating walls to mitigate potential visual impacts and the potential for graffiti.

Appendix R contains the Pi'ilani Highway Widening Project Final EA specifically addressing the impacts (including noise impacts) of the widening Pi'ilani Highway is being prepared and will be submitted to the State OEQC for public and State agency review. The DOT will be the accepting authority for the EA has accepted the final EA and issued a Finding of No Significant Impact which was published in the OEQC's *The Environmental Notice* on May 8, 2012.

While a specific acoustic study was not prepared for the Wailea Iike Drive and Wailea Alanui Drive intersection improvements, long-term impacts are not expected to be significant as the improvements will accommodate anticipated future traffic while providing similar vehicle flow and queuing times at the intersection as compared to existing conditions.

Long-term noise impacts from the off-site water and wastewater infrastructure are not expected to be significant, as after these facilities are created there will be very little to no noise generating activity associated with on-going operations.

To mitigate potential noise from golf course maintenance activities and facilities, in compliance with County of Maui Ordinance No. 3554 (Condition 18g), the golf maintenance center is located in an area sufficiently distanced from residential uses and will be designed to further lessen noise to surrounding uses. All golf course maintenance will be conducted in a manner so as not to cause a nuisance to residents.

<sup>1</sup> "Noise Analysis and Abatement Policy," State of Hawaii Department of Transportation, Highways Division, Materials Testing and Research Branch, June 1997. Under this policy if the cost of the sound attenuating wall does not exceed \$35,000 per benefited residence, construction of the walls can be considered to be reasonable and feasible.

# ATTACHMENT RECREATIONAL FACILITIES

## Attachment Recreational Facilities

### 4.10.5 Recreational Facilities

There are over 3.8 acres of total park land per 1,000 residents in the Kihei-Mākena area. Over 90 percent of Kihei-Mākena's parks are either directly on a beach, or separated from a beach by a road. The Kihei-Mākena public currently has access to ten tennis courts, three tot lots, six sport fields, four sport courts, and two community centers, in addition to the supplemental facilities offered by resorts in the area. The following County public parks and community centers are available in the region:

- Kama'ole Beach Park (I, II, III);
- Charlie Young Beach;
- Kalama Beach Park;
- Kama'ole Point;
- Keonekai Park;
- Cove Park;
- Kilohana Park;
- Kihei Community Center;
- Kenolio Recreation Complex; and
- Kenolio Park;
- Po'olenalena Beach Park;
- Kalepolepo Beach Park, Lot 2-A;
- Haycraft Park (Ma'alaea);
- Ma Poia 'Oe la'u Park;
- Kihei Beach Preserve;
- Hale Pii'ilani Park; and
- Kihei Aquatic Center.

The total County-owned sub-regional park space in the Kihei-Mākena region is approximately 114.2 acres, with the bulk of the community's parks categorized as special use beach parks. Special use parks serve a regional or islandwide populace because their activities or points of interest are tied to a specific location.

Kilohana Park, located on Kilohana Drive, is the County park facility nearest to Honua'ula.

Despite a relatively large ratio of park area to people in comparison to other communities, according to the *Public Facilities Assessment Update County of Maui (R.M. Towill Corporation 2007)* the Kihei-Mākena region has a deficiency of County park space and facilities, including beach parks; however there is still land area available that is more than adequate to accommodate future park development (R.M. Towill Corporation 2007). The County is in the process of developing a 44-acre park site near Kihei Elementary School, which will include six sports fields and a gym with community meeting rooms. According to the Public Facilities Assessment, the County also has a 150-acre parcel mauka of Kamali'i Elementary school which may be developed for a park, or used as an

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exchange for suitable park land in another area of the region (R.M. Towill Corporation 2007).

There are currently 28.8 acres of County beach parks the Kihei-Mākena region (R.M. Towill Corporation 2007). This does not include Ulua, Wailea, Polo, Palaua, Keawakapu, Makena, and other beaches that are not County beach parks. Using a standard of 40 square feet of beach park space per person, and based on population projections of the Maui Planning Department, the *Public Facilities Assessment Update County of Maui* (R.M. Towill Corporation 2007) projects a need for an additional 37 acres of County beach park space by 2030.

In addition to County parks, Mākena State Park is located in the Kihei-Mākena region. This 164-acre scenic wildland beach park is characterized by prominent cinder cone Pu'u Ola'i and a large white sand beach. Because it is a State park, the 164 acres of Mākena State Park is not included in the inventory of County beach parks provided in the *Public Facilities Assessment Update County of Maui* (R.M. Towill Corporation 2007), nor is the area of Mākena State Park considered in relation to the projected need for an additional 37 acres of County beach park space by 2030.

Wailea Resort contains several recreational facilities, including the three championship golf courses, an 11-court tennis center, and white sand beaches with public access, as well as amenities within the Wailea Resort. Public beaches fronting or near the Wailea Resort include: Ulua Beach, Wailea Beach, and Polo Beach. The Mākena Resort includes the Mākena North and South golf courses as well as the Mākena Tennis Club. Public beaches fronting or near the Mākena Resort include: Palaua Beach and Po'olenalena Beach.

In addition to parks and related recreation facilities, the Kihei-Mākena region also contains facilities for recreational boaters at the Kihei Ramp. The 11.5 acre Kihei Ramp facility is managed by the Department of Land and Natural Resources. Division of Boating and Ocean Recreation and contains three boat ramps (accommodated by one 35 foot-wide ramp), two loading docks, and parking for cars and trailers. The *Public Facilities Assessment Update County of Maui* (R.M. Towill Corporation 2007) projects the need for three additional boat ramps island wide by 2030 based on island-wide population increases projected by the Maui Planning Department.

**POTENTIAL IMPACTS AND MITIGATION MEASURES**

Honua'ula will include: 1) neighborhood parks open to the public but privately maintained; 2) over 12 miles of pedestrian and bike trails along the community's roadways, gulches, and drainage ways, including a scenic trail along portions of the golf

<sup>1</sup> The park planning standards used in the *Public Facilities Assessment Update County of Maui* were obtained from: 1) Department of Parks and Recreation, City and County of Honolulu (1980); 2) Department of Parks and Recreation, County of Maui, *Open Space and Outdoor Recreation Plan* (2002); and 3) National Recreation and Parks Association (INHPA 2000).

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course that will link to several other trail segments and a Nature/Cultural trail that will border the Native Plant Preservation Area and traverse an adjacent Native Plant Conservation Area (Figure 12); and 3) an 18-hole homeowner's golf course and related recreational facilities.

To provide the greater community the opportunity to enjoy the recreational benefits of the golf course, in compliance with County of Maui Ordinance No. 3554 Honua'ula Partners, LLC will:

- Allow one non-profit organization per quarter, other than Maui Junior Golf Association ("Maui Junior Golf"), to use the golf course and clubhouse for a fund-raising activity (Condition 12a);
- Develop an organized instructional program for junior golfers from September to January each year, allow Maui Junior Golf to use the golf course in accordance with an instructional program, and sponsor one Maui Junior Golf fund-raising tournament per year (Condition 12b);
- Allow for the Maui Interscholastic League and the Hawai'i High School Athletic Association to each use the golf course once per year for an official golf tournament or regular season playoff if requested (Condition 12c); and
- Allow for Maui residents to play at the golf course on Tuesday of each week at a discounted rate that does not exceed 40 percent of the average market rate in South Maui for green fees and golf cart rental fees (Condition 12d).

To help alleviate the shortage of park space and facilities in the Kihei-Mākena region, in compliance with County of Maui Ordinance No. 3554 (Condition 11), Honua'ula Partners, LLC will develop six acres of private parks and 84 acres of open space within Honua'ula. The private parks will be open to the public and privately maintained. Furthermore, the private parks and open space will not be used to satisfy the park assessment requirements under Section 18.16.320, MCC, or for future credits under the subdivision ordinance. The Director of Parks and Recreation and Honua'ula Partners, LLC agree that the park assessment will be satisfied with an in-lieu cash contribution for the entire project. The amounts and timing of payment of the in-lieu fees shall be subject to the provisions of Section 18.16.320, MCC. This cash contribution will be used to upgrade Maui County parks and facilities, which may include beach parks, as determined by the Department of Parks and Recreation in accordance with their park facility priorities.

Additionally, in compliance with County of Maui Ordinance No. 3554 (Condition 10), Honua'ula agrees that in-lieu of the dedication of a Little League Field and related amenities and based on current land and construction cost estimates for the Little League Field, not less than \$5,000,000 will be paid to the County upon Project District Phase II approval for the development of the South Maui Community Park. The amount shall not be credited against future park assessments.

In their comment letter on the E/EIS/SPN, the Department of Parks and Recreation (DPR) stated that they have no objections to Honua'ula. DPR stated further:

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The 6 acres of private parks and 84 acres of open space proposed to be developed outside of park assessment requirements, in addition to the agreement to satisfy the provisions of Section 18.16.320, Maui County Code, with an in-lieu cash contribution for the entire project, meets with our approval. The applicant's offer of payment not less than \$5,000,000 to the County in lieu of the dedication of a Little League Field, upon Project District Phase II approval for the development of the South Maui Community Park is also acceptable. Finally, the applicant's agreement to support Maui Junior Golf, MIL athletic groups, and provide reduced rates for kama'aina is a favorable commitment.

In addition, in their comment letter on the Draft EIS DPR stated:

The Draft Environmental Impact Statement for the subject project adequately addresses the concerns of the Department of Parks and Recreation. We have no additional comments or objections to the subject project at this time.

Regarding beach use by Honua'ula residents, it is assumed that some Honua'ula residents will go to Maui beaches; however the number of Honua'ula residents going to a specific beach on any given day cannot be known and it cannot be assumed that Honua'ula residents will patronize only the beaches nearby Honua'ula, such as Ulua, Wailea, Polo, Palauea, Po'olenalena, Keawakapu, and Makena beaches; rather it is likely that they could choose to go to any beach in the Kihei-Makena region or on the entire island.

Maui Planning Department population projections indicate that the Maui and the Kihei-Makena populations are increasing. This increase is projected with or without Honua'ula. The additional population will use public facilities, such as beaches. Therefore increased beach use and associated impacts will occur with or without Honua'ula.

Furthermore, many of Honua'ula's future residents may already be existing Maui residents making periodic use of public facilities such as beaches because Honua'ula's 450 on-site workforce affordable homes must be offered for sale to Maui residents. Based on a household size of 2.5 people per household approximately 1,125 (73 percent) of Honua'ula's future 1,541 full-time residents may be existing Maui residents.

Regarding the Kihei Boat Ramp and boat ramp facilities on Maui in general, it is not anticipated that Honua'ula will trigger the need for additional boat ramp facilities considering that: 1) the County projects a population increase with or without Honua'ula; 2) approximately 73 percent of Honua'ula's future residents may already be exiting Maui residents; and 3) relatively few new boat ramps will be necessary by 2030 to support the island wide population increase projected by the County.

# ATTACHMENT REFERENCES

Attachment  
References

10 REFERENCES

Attachment  
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# ATTACHMENT TRAILS AND ACCESS

## Attachment Trails and Access

### 4.3 TRAILS AND ACCESS

Honua'ula is accessed directly from the Kihei southern terminus of Pi'ilani Highway, which is a two-lane State highway. There are several unimproved roads on the Property that provide limited access within the Property.

Remnant segments of a road referred to as the Kanaio-Kalama roadway are present along a portion of an existing jeep road which was constructed atop the same alignment. The original alignment is not followed by the current jeep road and only a small modified segment of the Kanaio-Kalama roadway exists. Water-worn cobbles and boulders, representing objects foreign to the environment presumably used in the original construction of the Kanaio-Kalama roadway, can be seen on either side of the jeep road in certain locations. Portions of the roadway may also have been modified for use by the military.

Discontinuous segments of steppingstone trails are present within the southern portion of Honua'ula. Researchers such as Chapman and Kirch (1979) proposed that a pattern of transience existed between coastal and inland areas. Foot trails linking upland and coastal settlements were used by travelers from upland areas to gain access to the coast and marine resources.

#### POTENTIAL IMPACTS AND MITIGATION MEASURES

The creation of Honua'ula will make the Property much more accessible relative to the current limited access. Honua'ula will include a system of pedestrian and bike trails along the community's roadways, gulches, and drainage ways (Figure 13). This secondary circulation system of linked pedestrian/bike trails will connect residential areas to the village mixed use areas, neighborhood parks, golf course clubhouse, and other areas and will provide residents a meaningful alternative to driving within the community.

A connector loop trail that ranges in width from six to eight feet will be suitable for walking and biking throughout the community. This trail will circle the Property from its northern to southern boundary and connect to the Wailea Ike Drive and Pi'ilani Highway intersection. A minor street path from Kaukahi Street will allow connection from Wailea to trail systems throughout Honua'ula. A proposed scenic trail along portions of the golf course will also link to several other trail segments and is expected to provide sweeping views, both mauka and makai.

~~The Native Plant Preservation Area contains known archaeological and cultural sites. Therefore, to protect the integrity of these sites and native plants, the Native Plant Preservation Area will remain undisturbed and development will be prohibited, with the exception of a Nature/Cultural trail that will border the Native Plant Preservation Area and traverse the adjacent Native Plant Conservation Area.~~

### Attachment Trails and Access

As recommended by the Honua'ula cultural impact assessment, Honua'ula will provide traditional native Hawaiian mauka-makai access trails across the Property (*ala i ke kai* (pathway to the ocean) and the *ala i ke kula* (pathway to the uplands)). These trails will follow the Property's natural gulches from mauka to makai.

The steppingstone trail segments within the Property, which represent discontinuous remnants of traditional trails, will be preserved *in situ*. In their current state they are truncated not only by prior disturbances, but also by private land holdings and existing developments that straddle portions of traditional land divisions. Segments beyond the boundaries of Honua'ula are beyond the jurisdiction of Honua'ula Partners, LLC.

In terms of the Kanaio-Kalama road, only a small modified segment still exists, with major segments of the original alignment altered by an existing jeep road. In addition, the integrity of the roadway has been lost outside of the Property both at the Kalama and Kanaio segments, which are under multiple ownerships. In a letter dated July 31, 2009, Nā Ala Hele of the DNR Division of Forestry and Wildlife (DOFAW) states that no documentation of the Kanaio-Kalama roadway could be found in the royal grant patents of the Property that were awarded in 1850. Also, no record exists of the road being in existence prior to 1892, when the U.S. Highways Act was passed. Thus, the Kanaio-Kalama roadway is not considered to be a public highway. However, to further enhance mauka-makai access across the Property, the approximate route of the Kanaio-Kalama road will be incorporated into the Honua'ula trail system. This functionally equivalent route will approximate the alignment shown on the current TMK map (Figure 3), and thus will run diagonally from Kaukahi Street, through the Native Plant Preservation Area, to the southeast corner of the Property.

The Native Plant Preservation Area contains known archaeological and cultural sites. Therefore, to protect the integrity of these sites and native plants, the Native Plant Preservation Area will remain undisturbed and development will be prohibited, with the exception of: 1) the Kanaio-Kalama trail, which will transverse through the Native Plant Preservation Area; and 2) a Nature/Cultural trail that will border the Native Plant Preservation Area.

In their July 31, 2009 letter, Nā Ala Hele also stated, "The proposed development of walking trails and the preservation of the stepping stone trail will provide recreational opportunities that can highlight the historical and cultural values of the area."

Overall, Honua'ula will not be a gated community; however, builders of some individual areas or specific homeowner's associations or residents may choose to gate individual areas. No gated community areas have been proposed, but it has not been determined if any areas would be gated or where these areas would be located within the Property or at what phase they would be built. However, any gated area would not be so restricted to prohibit anyone with a legitimate reason from accessing an area. Specifically, any gated area would not be designed to exclude access to any cultural or archaeological resources.

### Attachment Trails and Access

Typically gated communities evoke images of mini mansions in exclusive enclaves, but restricted access multi-family townhouse and other higher density developments can also be classified as "gated communities." While some upscale gated communities cater to upper income level residents, there are also many gated communities that are geared to average homebuyers. Although gated communities are often criticized as elitist and homogeneous, data suggests that gated communities are not necessarily reserved only for the rich (Nasser 2002). The 2001 American Housing Survey conducted by the U.S. Census Bureau reported that more than seven million households live in a type of gated community. The statistics also show that residents of gated communities belong to many different demographic types, not just the wealthy. Gated communities are popular with young families with children, retirees, second-home buyers, professionals, and many others. The elderly have been attracted to gated communities since the 1970s. Other potential buyers include empty nesters who are away frequently on vacations and young double-income families in which no one is home during the day (Blakely 1999). For second-home buyers, gated communities are especially attractive for the security they provide during long periods of vacancy (Blakely 1999).

Research shows that motivations for living in a gated community reflect, to varying degrees, a range of social values (Blakely & Snyder 1997). Some people are drawn to gated communities for prestige; some are looking for privacy; some want to protect themselves from crime and traffic (Blakely & Snyder 1997). For some, gated communities provide an added measure of security, less traffic, and increased pedestrian safety, a peaceful and quiet setting, social familiarity with neighbors, a sense of community, and shared ownership of space. Gated communities are attractive for residents as they provide protection and usually offer a high level of residential amenity and recreational value. The sense of community and belonging felt by residents may afford a more valuable notion of 'security' than is provided by gates alone as residents within gated communities tend to know or recognize each other thereby being able to easily identify non-residents (Quintal & Thompson 2007). Through restrictions on design and access, gated communities may help to reduce uncertainty by enabling residents to exert greater control over their living environment (Quintal & Thompson 2007). For some, gated communities provide for both security and a self-directed, democratic community in which all members of the association are active participants in community governance (Blakely 1999). While gated communities may not appeal to all, they do offer features many find attractive for their choice of style and quality of living.

In some municipalities gated communities have been considered "cash cows" for local governments because the developer initially provides all infrastructure (roads, landscaping, parks, community centers, etc) within the community and the residents pay homeowner's fees for the on-going maintenance of these common facilities. Thus, initially the developer, and then the residents pay for services that may typically be borne by government; however the residents in gated communities still pay property taxes to government based on property values, which may be higher in gated communities (Le Coix 2004). Therefore gated communities can be particularly desirable for local

### Attachment Trails and Access

governments and in some areas are seen as a public-private partnership rather than an attempt to secede from the public realm (Le Goix 2004).

While research has shown that gated communities provide a sense of community and stability for their residents (Quintal & Thompson 2007), critics of gated communities believe that when people wall themselves from others they are cutting themselves from the mixed, open society that is needed for a social and political democracy (Drew & McGuigan 2005). Rather than being involved in an open society, critics argue that gated communities tend to foster segregation where better-off citizens gradually become less encumbered by collective social burdens (Blakely 1999; Drew & McGuigan 2005). Thus people with the necessary resources can quietly secede from the large and diverse public into homogenous enclaves within which their earnings need not be redistributed to people less fortunate than themselves (Blakely 1999). Others contend that gated communities offer a false sense of security as many nonresidents may have access to the communities, such as delivery people, maintenance workers, and other visitors (Drew & McGuigan 2005). Thieves may also seek out gated communities because of the perception of more valuable goods within the gates (Nasser 2002). Alternatively, others have theorized that gated communities cause crime to be redistributed to areas outside the gated communities (Le Goix 2004).

All neighborhoods, gated and non-gated, have the same ultimate goals: safety and security, no crime, safe streets, slow traffic, and a stable quality of life. To some extent, gated communities attain these goals and in this respect have a positive influence on the lives of those residents. Honua'ula seeks to achieve these goals through design, with key objectives of reflecting community values, emphasizing vibrant community development, and creating a sense of place.

Building on overall goals of safe and secure neighborhoods, the Maui Police Department recommends incorporating principles of Crime Prevention Through Environmental Design (CPTED) into the design of Honua'ula. The goal of CPTED is to prevent crime by designing a physical environment that positively influences human behavior. The theory is based on four principles: 1) *natural surveillance*, which refers to the placement of physical features that maximize visibility of the neighborhood so residents can observe their surroundings; 2) *access management*, which involves guiding people by using signs, well-marked entrances and exits, and landscaping so visitors can be seen entering and exiting; 3) *territoriality*, which is the clear delineation of space to create pride or ownership and a vested interest of owners in their neighborhood; and 4) *physical maintenance*, which includes repair and general upkeep to maintain a well-kept appearance and neighborhood pride.

# ATTACHMENT WASTEWATER SYSTEM

**Attachment  
Wastewater System**

**4.8.2 Wastewater System**

The Wailea area is serviced by the Kihei WWRF, located approximately four miles northwest of Honou'ula. Sewage from the Wailea area is conveyed to the Kihei WWRF via the South Kihei Collection System, which consists of trunk sewer mains running along Wailea Alanui Drive and South Kihei Road. Other Kihei communities along this route are also served by this system. The Kihei WWRF currently has unused capacity; however, the collection and transmission system may not be adequate to support Honou'ula. In addition, the County desires to reserve the unused plant capacity to accommodate other development in the existing service area, rather than extend the service area to Honou'ula.

The Makena Wastewater Corporation owns and operates the Makena WWRF, which is approximately one mile south of Honou'ula. The Makena WWRF ~~was~~ is currently designed to handle wastewater flows of 720,000 gallons per day (gpd) and is also designed to be expandable to handle 1.54 million gallons per day (mgd). Currently the facility is only handling ~~397,413~~ 114,440 gpd, leaving an unused capacity of ~~328,587~~ 605,560 gpd.

Currently, the Honou'ula Property does not contain any wastewater infrastructure and is not served by a wastewater collection system. Honou'ula is located in the critical wastewater disposal area as determined by the Maui Wastewater Advisory Committee. No new cesspools are allowed in this area.

**POTENTIAL IMPACTS AND MITIGATION MEASURES**

Wastewater from Honou'ula will be managed to protect human health and the environment, and Honou'ula will not rely upon or burden any public facilities. Using County of Maui design standards, ~~Wailea-Okamete Corporation~~ projected the average wastewater flow from Honou'ula at full build-out is projected to be ~~0-562-MGD~~ 380,000 gpd.

**Wastewater Treatment**

Honou'ula will not rely upon or burden any public wastewater facilities. In compliance with County of Maui Ordinance No. 3554 (Condition 17), Honou'ula Partners, LLC will either participate in the operation of a private WWRF and system that accommodates the needs of Honou'ula (Alternative 1) or provide a WWRF on-site (Alternative 2). No cesspools will be developed within Honou'ula. Connection to the Makena WWRF would be in conformance with the option of participating in the operation of a private wastewater treatment facility, and therefore is being considered for Honou'ula wastewater treatment.

In further compliance with County of Maui Ordinance No. 3554, Honou'ula Partners, LLC ~~will~~ 1) provided a sewage disposal analysis to the Maui County Council that has been reviewed and commented on by DOH, DLNR, the County Department of Environmental

**Attachment  
Wastewater System**

Management, and DWS before Project District Phase II approval (Condition 16)<sup>10</sup>; and 2) will ensure that sewer rates for the residential workforce housing units will be no higher than the residential sewer rates set by the County in its annual budget, for as long as the units are subject to Chapter 2.96, MCC (Condition 17). Sewer rates for Honou'ula's market rate residential units have not yet been established; however, the Makena WWRF is regulated as a public utility by the State Public Utility Commission (PUC), as are all private wastewater companies. If an on-site WWTF is built at Honou'ula, it will also be a private facility. The PUC prescribes rates, tariffs, charges and fees, for public utilities.

Wastewater system design, and construction, and operation will be in accordance with County standards and all wastewater plans and facilities will conform to applicable provisions of: Chapter 11-62, HAR (Wastewater Systems); Section 11-62-27, HAR (Recycled Water Systems); and Chapter 11-21, HAR (Cross-Connection and Backflow Control). Chapter 11-62, HAR (Wastewater Systems) specifically requires that wastewater systems shall not create or contribute to foul or noxious odors.

In complying with the DOH regulations, Honou'ula Partners, LLC will also be in compliance with County of Maui Ordinance No. 3554:

- Condition 18c, which requires compliance with Condition 4 of DOH's "12 Conditions Applicable to All New Golf Course Development" relating to connecting the golf course clubhouse and other golf course facilities to a WWRF; and
- Condition 18d, which requires compliance with Condition 5 of the DOH's "12 Conditions Applicable to All New Golf Course Development" relating to use of treated wastewater for golf course irrigation.

**Alternative 1 – Makena WWRF** – The first, and preferred, alternative is to transport wastewater to the Makena WWRF for treatment. Wastewater from Honou'ula would be conveyed to the Makena WWRF via a pump station and force main. R-1 recycled water would be pumped back to Honou'ula for golf course irrigation use. Figure 2 shows the proposed wastewater alignment for possible connection to the Makena Resort WWRF. The alignment provides for underground wastewater transmission and R-1 return lines approximately 12-inches in diameter within an unpaved easement approximately 6,400 linear feet in length and 30 feet in width. The 30-foot easement width allows for access and maintenance parallel to the underground transmission line.

Makena WWRF (as well as the County Kihei WWRF) uses a process called "extended aeration activated sludge/coagulation/filtration" to treat wastewater. With this process wastewater first passes through bar screens to remove large debris. The screened wastewater then enters aeration lagoons where naturally-occurring micro-organisms (called "activated sludge") consume organic material. The micro-organisms settle to the

<sup>10</sup> Honou'ula Partners, LLC submitted the sewage disposal analysis to the Maui County Council on May 11, 2010. After receiving the analysis, the Maui County Council accepted the analysis and did not subject Honou'ula to any additional conditions or amendments. As a result, Condition 16 has been fully satisfied.

**Attachment  
Wastewater System**

bottom of a clarifier, and are returned to the aeration lagoon. Flocculants like ferric chloride and/or polymer are added to the clarified water to agglomerate small particles into larger particles that can be removed by a granular media filtration process. The filtered water is then disinfected using UV light prior to reuse.

Transporting wastewater to the Mākēna WWRF for treatment provides the benefit of consolidating wastewater services for both Honua'ūla and Mākēna, allowing economies of scale in the treatment process and consolidated regulatory compliance. Sufficient golf course land is available within both Honua'ūla and the Mākēna Resort to reuse 100 percent of the recycled water for irrigation.

While there is currently unused capacity at the Mākēna WWRF, it may be necessary to expand certain portions of the Mākēna WWRF in the future to provide a small amount of additional capacity to accommodate the total projected Honua'ūla wastewater flows along with the projected Mākēna Resort flows before each project is completely built out.

The Mākēna WWRF is currently designed to handle wastewater flows of 720,000 gpd and is also designed to be expandable to 1.54 million gallons per day (mgd). Currently, the facility is only handling 114,440 gpd, leaving an unused capacity of 605,560 gpd based on the current capacity of 720,000 gpd. Future development within Mākēna Resort is estimated to produce flows of 276,973 gpd. Therefore the total flow from the Mākēna Resort is projected to be 391,413 gpd at build-out. See Table 5 below.

After the build-out of Honua'ūla, the total Honua'ūla wastewater flow is projected to be 380,000 gpd. Combined with the total Mākēna Resort flow, the combined flow from both Mākēna Resort and Honua'ūla would be 771,413 gpd, which is 51,413 gpd more than the current capacity of 720,000 gpd of the Mākēna WWRF. See Table 1 below. Preliminary indications are that the headworks, effluent filters, and UV disinfection systems would require modifications to handle the additional capacity. Expansion of the Mākēna WWRF will not be necessary until both Honua'ūla and Mākēna Resort approach 90 percent of build out, which could be 10 to 20 years from now. As both Honua'ūla and Mākēna Resort will be built out over a number of years, improvements can be implemented at the appropriate time, when needed.

**Table 1. Current and Projected Mākēna WWRF Capacities**

Description	GPD
Current Mākēna Resort flow	114,440
Future Mākēna Resort flow	276,973
<b>Total Mākēna Resort flow at build-out</b>	<b>391,413</b>
Honua'ūla flow at build out	380,000
<b>Total Mākēna Resort and Honua'ūla flow at build-out</b>	<b>771,413</b>
Current Mākēna WWRF Capacity	720,000
<b>Additional capacity required to accommodate both Mākēna Resort and Honua'ūla at build-out</b>	<b>51,413</b>

Conveying wastewater from Honua'ūla to the Mākēna WWRF will require a pump station to receive the flows from Honua'ūla. The pump station would be located at the southwest corner of the Property at approximately the same location as an on-site WWRF. The pump station would convey the wastewater via a force main directly to the Mākēna WWRF. For recycled water to be returned to Honua'ūla, a recycled wastewater pump station located at or near the Mākēna WWRF and a force main would be required. See Figure 2 for the location of the wastewater force main route to the Mākēna WWRF.

Honua'ūla Partners, LLC has had substantive discussions about this alternative with the Mākēna WWRF owner, Mākēna Wastewater Corporation, and they support the connection; however, formal agreements with Mākēna Wastewater Corporation have not yet been finalized.

**Alternative 2 – On-Site Treatment Plant** – The second alternative is to construct an on-site WWRF that is capable of treating all of the Honua'ūla wastewater to R-1 standards. The on-site WWRF would be located at the southwest corner of the Property on approximately four acres of land. R-1 water would be delivered to the Honua'ūla golf course water features for storage and eventual irrigation of the golf course and other landscaped areas. RO concentrate from the on-site desalination facility (see Section 4.8.1 (Water System)) would be blended with the R-1 water.

A membrane bioreactor (MBR) wastewater treatment system is proposed for the on-site WWRF to produce R-1 quality water for non-potable use. The MBR process is a biological process (activated sludge process) combined with a separation process (membrane system). MBR systems are widely used throughout the world and are considered an industry standard for the production of reliable R-1 recycled water. In addition, MBR systems have the smallest footprint of the various biological treatment systems available and provide the highest quality recycled water.

In a MBR system the first element of the wastewater treatment process is screening to remove debris. This takes place in an enclosed building to control odors. Air collected from the building is then passed through a biofilter to remove odors. During the MBR process, wastewater is pumped into aeration basins, where a population of naturally-occurring microbes (activated sludge) treats the water by consuming organic matter. The activated sludge is separated from the water using membranes, located in the MBR basins. The activated sludge is pumped back to the head-end of the aeration basin to be used again.

Periodically, excess activated sludge must be removed (wasted) from the treatment system. The activated sludge goes through a thickening process to form dewatered solids. The dewatered solids will be taken to the County landfill for composting by EKO Compost, which operates a composting facility at the landfill. At build-out the on-site WWRF is expected to produce approximately 17 wet tons of dewatered solids per week. EKO Compost has the capacity to accept this amount of dewatered solids for composting.

The treated water will be disinfected using ultraviolet (UV) light. The treated water will flow through concrete channels containing banks of submerged UV light bulbs. The water

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**Wastewater System**

will be disinfected as it passes by the bulbs and is exposed to the UV light. The UV light penetrates the cells of pathogenic organisms, rendering them unable to replicate. The disinfected water exiting the channel will meet R-1 standards and will be suitable for reuse. A pump station located adjacent to the UV channel will deliver the R-1 water to the Honua'ula golf course.

Another potential approach to treating Honua'ula wastewater in lieu of the MBR is via an extended aeration activated sludge process, followed by addition of coagulant chemicals and granular media or cloth disk filtration. The main difference between MBRs and other R-1 treatment technologies (such as the extended aeration activated sludge/coagulation/filtration process used at the Mākena and County Kihei WWRFs) is the method of separating the suspended solids from the water. MBRs have thin membranes with many thousands of micro-perforations, which are too small for the passage of suspended solids and microorganisms present in the wastewater, but large enough to allow the passage of water molecules. In the extended aeration activated sludge/coagulation/filtration process, combination flocculants like ferric chloride and/or polymer are added to treated water to agglomerate small particles into larger particles that can be removed by a granular media filtration process. When coupled with a suitable disinfection system, both MBR systems and extended aeration activated sludge/coagulation/filtration systems are capable of reliably producing R-1 quality water that meets all DOH R-1 water quality standards. In addition, MBR systems require less land area to treat a given flow than extended aeration activated sludge/coagulation/filtration systems. This is because the MBR membranes perform the equivalent treatment of gravity sedimentation and filtration in one tank. Additional land area within Honua'ula would have to be set aside for the WWRF if this approach is taken. An extended aeration activated sludge/coagulation/filtration system was used. The extended aeration activated sludge/coagulation/filtration approach is currently used at the Mākena WWRF and the Kihei WWRF.

**On-Site Collection System**

The on-site wastewater collection system will collect flows from the various areas and uses within Honua'ula. Sewer lines will essentially follow the proposed roadway system. A network of eight-inch gravity sewer lines will collect wastewater from homes and buildings throughout the site within four service areas. In each of these service areas, the sewer lines will follow the topography and will flow by gravity. Pump stations will be used where the topography requires flows to travel upslope.

All wastewater flows will flow to the southwest corner of Honua'ula. From there the flows will either enter the on-site WWRF for treatment or will be pumped to the Mākena WWRF for treatment.

**Recycled Water Use**

After treatment—at either the possible on-site WWRF or the existing Mākena WWRF—recycled water will be stored in lined water features located on the golf course. Brine water from the RO facility will be mixed with the recycled water. The mixed

**Attachment**  
**Wastewater System**

recycled/brine water will then be distributed for irrigation purposes. In compliance with County of Maui Ordinance No. 3554 (Condition 17), none of the recycled water will be placed into injection wells.

The Mākena WWRF includes an unlined wet weather storage/disposal back-up basin to handle treated peak wet weather flows in conformance with DOH rules. This basin accommodates treated water when quantities exceed the irrigation requirements, such as in time of wet weather when golf course irrigation may not be necessary or when peak flows enter the wastewater system due to storm water runoff. Treated water discharged into the basin either percolates or evaporates. If an on-site WWRF is built for Honua'ula, a similar wet weather storage/disposal basin will be provided for management of recycled water during extended wet weather periods after the golf course water features are full. Treated water stored in the wet weather storage/disposal back-up basin will percolate, evaporate, or be pumped back to the treatment plant for additional treatment. The basin will be designed to accommodate the peak recycled water flow rate and will have storage volume of approximately 4.6 million gallons, or the capacity to store approximately 12 days of average dry weather flow and therefore no recycled water will be discharged.

Recycled water (including the mixed recycled/brine water) will be distributed in piping systems that are completely separate from potable water distribution piping systems. The DOH has established requirements for piping systems used to distribute recycled water to the points of use. The DOH requirements are designed to reduce the risk of accidental cross-connection between potable and non-potable systems. Honua'ula piping systems will be in full compliance with these requirements.

The use of R-1 irrigation water is not expected to have negative impacts on groundwater or nearshore waters. See Section 3.5 (Groundwater Resources and Water Quality) for complete discussion on potential impacts to groundwater and nearshore waters.



# ATTACHMENT WATER SYSTEM

## Attachment Water System

### 4.8.1 Water System

Potable water for the Kīhei-Wailea region is presently supplied by the 'Īao Aquifer, which also supplies the Wailuku-Kahului region. A 36-inch and an 18-inch transmission main convey water from the 'Īao Aquifer to the Kīhei-Wailea area. As of July 21, 2003, the 'Īao Aquifer was designated as a groundwater management area by the State CWRM. The sustainable yield of the 'Īao Aquifer is 20.0 MGD, and existing water use is 18.940 MGD (Wilson Okamoto/CWRM, 2008).

The Property, and the wells that will supply the Property, are located in the Kama'ole Aquifer System. The system comprises a triangular-shaped area of approximately 89 square miles, with its apex at the top of Haleakala and its base along the 11-mile length of shoreline from Waiakoa Gulch on the north to Cape Kīna'u on the south. Groundwater in the Kama'ole Aquifer exists as a basal lens from the shoreline as far inland as the 1,700-foot contour. In 1990, the CWRM set the sustainable yield of the Kama'ole Aquifer at 11 MGD. This was based on a computed groundwater recharge of 25 MGD and the assumption that 44 percent of the recharge could be withdrawn by wells without adversely impacting the integrity of aquifer. However, several far more detailed and sophisticated studies on the aquifer's recharge have been completed since then (USGS 1999; Waimea Water Services Inc. 2004; USGS 2007). These studies indicate that the recharge amount on which the CWRM's sustainable yield is based is substantially underestimated; the actual sustainable yield of the aquifer may be as much as 50 percent greater than the 1990 CWRM estimate. Current actual aquifer pumpage is estimated to be approximately 4.0 MGD (TNWRE 2010a).

The County of Maui does not have any water service lines to the Honua'ūia Property. Existing water systems in the vicinity of the Property include the County Maui Meadows System to the north and the County Potable Wailea Resort System to the west. The Maui Meadows System consists of a high-level 0.5 MG tank located at the 799 foot elevation and a mid-level 1.0 MG tank located at the 563 foot elevation. The Wailea Resort System consists of a low-level 2.0 MG tank at the 210 foot elevation south of Wailea Ike Drive and a mid-level 3.0 MG tank at the 374-foot elevation. The potable Wailea 3.0 MG tank is located on the west side of the Honua'ūia makai boundary and serves most of the Wailea Resort. The Wailea Resort also operates a private non-potable system for golf course irrigation. There is also an existing 1.0 MG water tank located on the Honua'ūia Property above Kaūkahi Street that will be dedicated to the County of Maui to provide service to properties below Honua'ūia.

Honua'ūia has four brackish wells. Two of these are on the Property (Wailea 670 1 and 2). The other two are off-site (Kama'ole 1 and 2) in an area north of Maui Meadows and on land owned by Haleakalā Ranch. The total safe yield of the four wells, with one as standby, is 1.37 MGD (TNWRE 20092010a). All of the wells are within the Kama'ole Aquifer System and are fully permitted by CWRM.

### POTENTIAL IMPACTS AND MITIGATION MEASURES

**Attachment  
Water System**

Honua'ula will not rely upon or burden any County water system or facilities. Instead, Honua'ula Partners, LLC will develop, maintain, and operate a private water system providing both potable and non-potable water for use within Honua'ula. The complete water system will include a:

1. Non-potable system supplied by brackish wells to provide water for irrigation of common areas and within individual parcels;
2. Potable system supplied by RO treated water, using brackish groundwater as the feedwater supply, to provide drinking water and other potable water needs; and
3. Golf course irrigation system supplied by recycled wastewater (R-1 quality), concentrate from the RO treatment of the potable supply, and brackish groundwater from the non-potable irrigation system.

The average daily potable water use for Honua'ula is estimated to be 0.34 MGD at build-out. Non-potable water will be used for all irrigation within Honua'ula, including single-family and multifamily lots. The average non-potable demand for irrigation excluding the golf course is estimated to be 0.810 MGD at build-out. The non-potable demand for golf course irrigation is estimated to be 0.717 MGD. Brackish well water will be used to supply all Honua'ula water needs. The brackish well water will supply the feedwater for the RO system, thus producing potable water. Concentrate from the RO treatment of the potable supply will also be produced. Much of the potable waste water will be recycled (R-1) then mixed with the RO concentrate and used for golf course irrigation. With this system, the total average withdrawal from brackish wells is estimated to be 1.7 MGD.

To provide for summertime maximum use periods and to have standby capacity, two more wells will be needed. Depending on actual water use rates that materialize, a third new well may or may not be needed as Honua'ula approaches build-out. New wells will be developed within the Haleakala Ranch source development area north of Maui Meadows where the existing off-site wells are located. Section 3.5.1 (Groundwater) contains the discussion on the potential impact of existing and new wells.

The existing off-site wells and any new off-site wells will be connected to Honua'ula by an approximately 12-inch diameter underground water line running roughly parallel to the upper boundary of Maui Meadows in an unpaired easement approximately 12,000 linear feet in length and 30 feet in width. The 30-foot easement width allows for access and maintenance parallel to the underground transmission line.

Honua'ula's private water system will be provided in compliance with County of Maui Ordinance No. 3554 (Condition 1). In further compliance with County of Maui Ordinance No. 3554 (Condition 1), Honua'ula Partners, LLC will: 1) comply with applicable water ordinances that pertain to the supply and transmission of water from the island of Maui when such ordinances are enacted; 2) offer to the County the right to purchase the water system when completed at the cost of development of the system; and 3) ensure that the water rates for the residential workforce housing units will be no higher than the general

**Attachment  
Water System**

water consumer rates set by the County in its annual budget, for as long as the units are subject to Chapter 2.96, MCC.

In addition, non-potable water will be used for all irrigation purposes in compliance with County of Maui Ordinance No. 3554 (Condition 14)

In developing, maintaining, and operating the water system, Honua'ula Partners, LLC will comply with all requirements of Chapter 174C, HRS (State Water Code) and HAR, Chapters 13-167 to 13-171, as applicable, pertaining to CWRM and administration of the State Water Code. As recommended by CWRM, Honua'ula Partners, LLC will coordinate with the County to incorporate Honua'ula into the County's Water Use and Development Plan. Honua'ula Partners, LLC will also comply with: 1) DOH Engineering and Capacity report requirements; and 2) the County's Water Availability Policy, codified as Chapter 14.12, MCC. The above oversight processes ensure adequacy of the water source and that water source development will not interfere or conflict with County plans for source development. In addition, as stated in Section 3.5.1 (Groundwater), the UIC line<sup>10</sup>, as established by the State DOH, is located approximately along the 600-foot elevation contour, above the majority of the Property. Therefore Honua'ula's on- and off-site wells are below the UIC line. Since the wells will provide the source of water for Honua'ula's potable (and non-potable) water system, setbacks will be established which may restrict new and existing injection well construction. Honua'ula Partners, LLC will inform landowners located within the setbacks surrounding the wells of the effect of such setbacks on the injection well development potential of their properties.

**Potable System**

**Source and Treatment** – Brackish well water will be treated by RO to produce potable water for Honua'ula. The RO process involves initially passing the brackish water through a filter to remove particulate matter. The filtered water is then forced through a membrane under pressure. The membrane acts as a barrier to salts and other constituents. The water that passes through the membrane may be further chemically treated and disinfected, as necessary, prior to use.

The RO process generates brine in the course of producing potable water. However, by diluting the brine water with other non-potable water (brackish and R-1), the salt content will be reduced to a degree that it can be used for irrigation, thus avoiding the use of injection wells to dispose of the brine. In periods of extended wet weather when irrigation requirements are minimal, it may be necessary to dispose of the RO concentrate in a disposal well with delivery in the saltwater zone below the basal lens. Such a disposal well will be in compliance with all provisions of HAR Title 11, Chapter 11-23 (Underground Injection Control).

<sup>10</sup> Underground Injection Control Line (UIC) means the line on the DOH Underground Injection Control maps which separates exempted aquifers and underground sources of drinking water (Section 11-23-03, HAR).

**Attachment  
Water System**

The RO plant will be located at the eastern border of the Property next to a water storage tank. A portion of the brackish water will bypass the RO plant for use as non-potable water for irrigation.

The RO plant and other components of the water system will be subject to regulation as a public water system and will meet requirements of the State DOH, including HAR Chapters 11-20 (Potable Water Systems), 11-21 (Cross-Connection & Backflow Control), and 11-25 (Operating Personnel in Water Treatment Plants). The water treatment facility and other components of the water system (i.e., storage, piping, pumps, and disinfection) are subject to the approval of the DOH Safe Drinking Water Branch before start up. In addition to successfully completing the start up testing process, the water system will be required to satisfy all components of HAR Chapter 11-20 (Potable Water Systems), including:

- Demonstration of capacity requirements and satisfactory technical, managerial, and financial capabilities to enable the system to comply with safe drinking water standards and requirements, including:
  - o An adequate water source to serve current and future water users;
  - o Adequate system technical performance;
  - o An infrastructure replacement plan that includes estimates of the useful life and plans for the eventual replacement of the public water system's infrastructure;
  - o An operational plan that includes a preventative and corrective maintenance program;
  - o A clear management organization and communication structure;
  - o An emergency response plan;
  - o Adequate financial capacity and dedicated sources of income, including income and cash reserves to pay annual operating expenses, unexpected significant repairs, and planned major work;
  - o Adequate budget controls, including performance reviews of actual expenditures and annual budgets, procedures to safeguard financial assets, and maintenance of detailed financial records that clearly identify sources of income and expenses involved in operating the public water system; and
  - o Demonstration of credit worthiness, including: 1) long-term dedicated revenue projections showing sufficient revenue for: a) operating and maintaining the public water system; b) performing anticipated repairs; c) replacement of major equipment; d) future expansion; and e) repayment of loans; and 2) credit reports that indicate that the public water system is financially healthy and credit worthy.
- Approval of the Director of Health prior to use, which is based upon the submission of a satisfactory engineering report meeting requirements of DOH;
- Identification (within the engineering report) of all potential sources of contamination and evaluation of alternative control measures that could be implemented to reduce or eliminate the potential for contamination, including treatment of the water source; water quality analysis for all regulated contaminants;

**Attachment  
Water System**

- performed by the State Laboratories Division of the State of Hawaii, will be submitted to DOH to demonstrate compliance with all drinking water standards;
- Assessment to delineate a source water protection area and creation of a source water protection plan, including activities to protect the source of drinking water;
  - Operation of the system by certified distribution and water treatment plant operators meeting the requirements of DOH;
  - Design and operation of the potable system to prevent the cross-connection with the non-potable system and the possibility of backflow of water from the non-potable system to the drinking water system—the two systems must be clearly labeled and physically separated by air gaps or reduced pressure principle backflow prevention devices to avoid contaminating the drinking water supply and all non-potable spigots and irrigated areas must be clearly labeled with warning signs to prevent the inadvertent consumption of non-potable water
  - Addressing the potential of contaminating activities (as identified in the Hawaii Source Water Assessment Plan) within the source water protection area and activities that will be implemented to prevent or reduce the potential for contamination of the drinking water source.

Further, the County's Water Availability Policy, codified as Chapter 14.12, Maui County Code (MCC), requires verification of a long-term, reliable supply of water before subdivisions are approved. In accordance with Section 14.12.050 MCC, in reviewing and commenting on water source engineering reports the DWS Director shall consider (among other things) the following factors:

- Cumulative impacts;
- CWRM's Water Resources Protection Plan;
- The general plan and relevant community plans;
- The adverse impacts on surrounding aquifers and stream systems, including:
  - o Water levels;
  - o Water quality, including salinity levels;
  - o Surface water-groundwater interactions; and
  - o Adverse impacts on other existing, future, or planned wells;
- The adverse impacts on the water needs of residents currently being served and projected to be served by DWS;
- The adverse impacts on environmental resources that are rare or unique to the region and the project site (including natural, cultural, or human-made resources of historic, archaeological, or aesthetic significance);
- The adverse impacts on the exercise of traditional and customary Native Hawaiian rights and practices;
- United States Geological Survey studies;
- Whether the applicant is in full compliance with the State water code and County's water reporting laws;
- Whether the affected water source, including groundwater, surface water, or other source of water will exceed;

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Water System**

- o 90 percent of the sustainable yield;
- o Instream flow standards; or
- o Interim instream flow standards;
- The adverse impacts to the water needs of residents currently on a County "wait list" for water meters;

In addition, Honua'ula's private water system will be regulated as a public utility by the State Public Utility Commission (PUC). The PUC: 1) prescribes rates, tariffs, charges and fees; 2) determines the allowable rate of earnings in establishing rates; 3) issues guidelines concerning the general management of public utility businesses; and 4) acts on requests for the acquisition, sale, disposition or other exchange of utility properties, including mergers and consolidations.

**Pressure Zones and Storage** – The elevation of the Property ranges from 320 to 710 feet. To provide service and adequate water pressure over this range of elevation, the Property was divided into two pressure zones, correlating with a high and a low water storage system approximately divided by the 530-foot elevation. Water storage will be required for each pressure zone. A lower 0.5 MG potable water tank (at an approximate 640-foot elevation) will service the lower portion of the Property (below the 530 foot elevation) and will be located on-site along the eastern border adjacent to the RO plant. A higher 0.2 MG potable water tank (at an approximate 810-foot elevation) will be located off-site and east (mauka) of the Property and will service the upper portion of the Property (above the 530 foot elevation).

**Distribution** – The potable water distribution system will largely follow the proposed roadway system providing potable water service to residential lots and other buildings. Pressure-reducing valves will be used to regulate excessive pressures within the pressure zones.

**Non-Potable System**

**Source** – There are three sources of non-potable water: 1) brackish well water; 2) brine water from the RO facility; and 3) R-1 recycled water returned from the WWRF (see Section 4.8.2, Wastewater System).

**Pressure Zones and Storage** – Comparable to the potable water system, the Property is separated into two pressure zones for non-potable water due to the elevation difference across the Property. Storage tanks will be provided for each pressure zone. A lower 1.0 MG non-potable water tank will be located on site at the 640 foot elevation adjacent the RO plant. A higher 0.5 MG non-potable water tank will be located off-site and east (mauka) of the Property at the 810 foot elevation. Golf course irrigation water, supplied primarily from the WWRF, will be stored in lined water features located on the golf course.

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**Distribution** – Similar to the potable system, the non-potable water distribution system will largely follow the proposed roadway system providing non-potable water to irrigate individual residential lots, roadway buffers, and other landscaped areas. A separate distribution system will be used to irrigate the golf course. Pressure reducing valves will be used to regulate excessive pressures within the pressure zones.

**Estimated Water Infrastructure Cost and Consumer Rates**

TNWRE prepared estimates of the cost to construct and operate Honua'ula's potable and non-potable water systems (2010c). The estimates are summarized below. Appendix B contains the complete estimate report.

The estimated potable and non-potable water infrastructure cost is \$21 million. This includes costs for: construction and testing the required off-site wells, piping from the off-site wells to the on-site storage tank, booster pumps, on- and off-site potable and non-potable storage tanks, and the RO plant. It does not include piping for distribution to individual Honua'ula homes and businesses.

Based on infrastructure costs and assumptions such as infrastructure efficiencies, electrical power costs, and costs for operating personnel, administration, and maintenance, the daily operating cost for both potable and non-potable systems would be \$3,000 per day. The cost of capital recovery would be \$4,950 per day. The cost to consumers, with and without capital recovery would be as follows:

Estimated Cost in Dollars per Thousand Gallons Cost Items Included	Potable Water	Non-Potable Water
Based on Operation and Maintenance Exclusively (No Capital Recovery)	\$4.00	\$2.00
Based on Operation, Maintenance, and Full Capital Recovery	\$10.64	\$5.32

For fiscal year 2010-2011 the cost for potable water for general water consumers set by the County in its annual budget is \$1.70 per 1,000 gallons for users that use up to 10,000 gallons bi-monthly. The price increases for users that use more than 10,000 gallons bi-monthly. In compliance with County of Maui Ordinance No. 3554 (Condition 1) water rates for the residential workforce housing units will be no higher than the general water consumer rates set by the County in its annual budget, for as long as the units are subject to Chapter 2.96, MCC.

**Water Conservation**

Honua'ula Partners, LLC is committed to aggressive water conservation strategies to reduce consumption, conserve resources, and minimize water demands. The goal is to reduce the total water requirements through a combination of water saving equipment and strategies. To conserve water within Honua'ula, Honua'ula Partners, LLC will implement

**Attachment  
Water System**

water conservation recommendations of the County of Maui Department of Water Supply, including:

- Using climate-adapted plants for landscaping;
- Preventing over watering by automated systems;
- Not allowing single pass cooling pursuant to Section 14.21.20, MCC;
- Installing low-flow fixtures and devices throughout the community pursuant to Section 16.20A.680, MCC; and
- Maintaining fixtures to prevent leaks.

Water conservation is also central to the functioning of the golf course. While non-potable water will be used for all golf course irrigation, the golf course will also include a modern irrigation system designed to use non-potable water efficiently. The key component of the irrigation system will be a central computer to store information for every sprinkler, including the type of sprinkler, nozzle sizes, location, soil type, slope, infiltration, exposure, etc., so that the exact amount of water needed is applied (i.e., not just turning on sprinklers for a set duration). Cycle/Soak features will prevent runoff when heavy irrigation is needed. Flow management features will ensure optimum pressure and amount to every sprinkler.

Records of irrigation procedures will be maintained for each management zone. Each management zone will be treated independently; the highest priority zones (greens, tees, fairways) will receive the highest amounts of water, while lower priority zones (secondary roughs, natural areas) will receive less water. These priority designations will help to efficiently manage overall water use on the golf course, providing the highest level of playability and aesthetics while incorporating water conservation and environmentally sustainable management practices.

In designing and implementing a detailed and efficient irrigation system, Honua'ula Partners, LLC will also be in compliance with County of Maui Ordinance No. 3554 Condition 18d, which requires compliance with Condition 5a of DOH's "12 Conditions Applicable to All New Golf Course Development." Specifically Condition 5a of the DOH's conditions relates to providing an irrigation plan.

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3.7 WILDLIFE RESOURCES

Several wildlife surveys of the Property have been conducted since 1988 (Bruner 1988, 1993, and 2004; SWCA 2010c). SWCA completed the most recent wildlife survey of the Honua'ula Property in 2009 (SWCA 2010c), which included the area of the Pi'ilani Highway extension ROW that traverses the Property (both the portion owned by the State and the portion owned by 'Ulupalakua Ranch), and the area of the Maui Electric substation. Specific objectives of the survey included: 1) documenting the presence and relative abundance of birds and mammals with the Property; and 2) determining the presence and abundance of any protected species within the Property, including migratory shorebirds, waterbirds, Federal and State of Hawaii listed endangered or threatened species, and "species of concern." Key findings of the SWCA survey are presented below. Appendix H contains the complete survey.

SWCA also completed wildlife surveys for the areas of: 1) the alternative wastewater transmission line alignments for possible connection to the Makena Resort WWRF, which is located approximately one mile south of Honua'ula (Appendix H); 2) the off-site wells, waterline, and storage tank (Appendix E); 3) the widening of Pi'ilani Highway (Appendix D of the Pi'ilani Highway Widening Project Final EA contained in Appendix R of this EIS); and 4) the Wailea Ike Drive and Wailea Alanui Drive intersection improvements (Appendix B of the Wailea Ike Drive and Wailea Alanui Drive Intersection Improvements Final EA contained in Appendix S of this EIS).

Since the wildlife survey of the areas of the wastewater transmission line alignments was conducted, a decision has been made regarding which preferred alignment to use. For more information on the selected wastewater alignment for possible connection to the Makena Resort WWRF see Section 4.8.2 (Wastewater System) and Figure 2. Appendix H contains the complete wildlife survey of the alternative wastewater transmission line alignments.

**Endangered Species**

Although not detected during previous surveys (Bruner 1988, 1993, and 2004), evidence of endangered Blackburn's sphinx moths (*Manduca blackburni*) was found within the Honua'ula Property during the SWCA (2010c) survey, including frass, cut stems and leaves, and live caterpillars. Evidence was limited to a single species of non-native weed: the tree tobacco (*Nicotiana glauca*). No adult Blackburn's sphinx moths were observed within the Property. Similarly, tree tobacco (*Nicotiana glauca*) plants were found along the Pi'ilani Highway widening corridor and the selected wastewater transmission line alignment for possible connection to the Makena Resort WWRF. However, only tree tobacco (*Nicotiana glauca*) plants at one point along the selected alignment showed substantial leaf damage that could be possibly attributed to the Blackburn's sphinx moth caterpillar.

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A single endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) was sighted flying seaward over the Property near the southern boundary. No other bats were observed during the survey. *Kiawe* trees, which are abundant on the Property, have been documented as roost trees for the Hawaiian hoary bat, thus, while not observed, it is possible that Hawaiian hoary bats roost within the Property.

No Federal or State of Hawai'i listed threatened, endangered, or candidate species were observed in the areas of: 1) the off-site wells, waterline, and storage tank; 2) the widening of Pi'ilani Highway; and 3) the Wailea Ike Drive and Wailea Alanui Drive intersection improvements.

**Native Birds**

The endemic *pueo* (*Asio flammeus sandwichensis*) (short-eared owl) was the only native bird species observed within the Property. Six *pueo*, 12 barn owls, and six other unidentified owls were sighted in grassland habitat, but no owl nests were found. Grasslands present on the Property are likely to provide good foraging and nesting habitat for owls; however, ground nesting increases vulnerability to predation by rats (*Rattus* spp.), cats (*Felis catus*), and the small Indian mongoose (*Herpestes auropunctatus*), all of which are present in the area.

Native Indigenous seabirds that may fly over the Honua'ula area during the day include the greater frigate bird or 'iwa (*Fregata minor palmerstoni*) and tropic birds (*Phaethon* spp.). Native Endemic seabirds that may fly over the site at night include the endangered Hawaiian petrel (*Pterodroma sandwichensis*) and the threatened Newell's shearwater (*Puffinus auricularis newelli*). While seabirds may traverse the area at night during the breeding season (February 1 through December 15), they do not nest on within the Property.

A single *pueo* (*Asio flammeus sandwichensis*) and a single 'iwa bird (*Fregata minor*) was observed during the survey of the alternative wastewater transmission line alignments. The *pueo* sighting did not occur on the selected wastewater alignment but in the vicinity. For more information on the selected wastewater alignment for possible connection to the Makena Resort WWRF see Section 4.8.2 (Wastewater System) and Figure 2.

No native birds were observed in the areas of: 1) the off-site wells, waterline, and storage tank; 2) the widening of Pi'ilani Highway; and 3) the Wailea Ike Drive and Wailea Alanui Drive intersection improvements.

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**Migratory Birds**

A single non-native Northern harrier (*Circus cyaneus*) was observed flying over *wiliwili* trees in the southern portion of Honou'ula (SWCA 2010c). Pacific Golden-Plover or *Kōlea* (*Pluvialis fulva*) have been observed in the vicinity (Bruner 1988 and 2004); however, they were not seen during the course of the SWCA (2010c) survey.

No migratory birds were observed in the areas of the alternative wastewater transmission line alignments.

The Pacific Golden-Plover was observed in the areas of: 1) the off-site wells, waterline, and storage tank; and 2) the Wailea Ike Drive and Wailea Alanui Drive intersection improvements. While not observed during the survey of the alternative wastewater line alignments, the Pacific Golden Plover is expected to occur in these areas during the migratory season.

**Introduced Birds**

SWCA biologists observed 16 species of introduced birds within the Property. The most abundant were: Japanese white-eye (*Zosterops japonicus*), nutmeg manikin (*Lonchura punctulata*), zebra dove (*Geopelia striata*) and northern cardinal (*Cardinalis cardinalis*). Also common were: African silverbills (*Lonchura cantans*) and red-crested cardinals (*Paroaria coronata*). Another survey (Bruner 2004) identified other common birds: house finch (*Carpodacus mexicanus*), black francolin (*Francolinus francolinus*), nutmeg manikin (*Lonchura punctulata*), and northern cardinal (*Cardinalis cardinalis*).

A few cattle egrets (*Bulbulcus ibis*) were observed in the areas of: 1) the widening of Pīlani Highway; and 2) the Wailea Ike Drive and Wailea Alanui Drive intersection improvements.

Various other introduced bird species were observed in the areas of: 1) the alternative wastewater transmission line alignments; 2) the off-site wells, waterline, and storage tank; 3) the widening of Pīlani Highway; and 4) the Wailea Ike Drive and Wailea Alanui Drive intersection improvements. The most abundant species common to all areas were the zebra dove (*Geopelia striata*) and common myna (*Acridotheres tristis*).

**Mammals**

The endangered Hawaiian Hoary Bat was the only native mammal observed during the SWCA (2010c) survey of the Property. Small herds of axis deer (*Axis axis*) were commonly seen. The small Indian mongoose (*Herpestes javanicus*) was observed, but was uncommon. Cats (*Felis catus*), rats (*Rattus spp.*) and mice (*Mus musculus*), while not observed, are expected to be present within the Property due to its proximity to the Maui Meadows subdivision and the Wailea Resort. While not present during the survey, domestic cattle (*Bos taurus*) are sometimes grazed in the northern portion of the Property.

No Federal or State of Hawai'i listed threatened, endangered, or candidate mammal species were observed in the areas of: 1) the alternative wastewater transmission line alignments; 2) the off-site wells, waterline, and storage tank; 3) the widening of Pīlani Highway; and 4) the Wailea Ike Drive and Wailea Alanui Drive intersection improvements.

**POTENTIAL IMPACTS AND MITIGATION MEASURES**

Honou'ula is not expected to significantly impact effect any listed or candidate endangered or threatened species insofar as extensive mitigation measures will be implemented to offset, avoid, and minimize impacts, leading to a net benefit as defined in Chapter 195D, HRS. Evidence of the endangered Blackburn's sphinx moth (*Manduca blackburni*) was found within the Honou'ula Property and a single endangered Hawaiian healy-bat (*Lasiorhynchus sinuatus*) was sighted flying seaward over the Property. No other Federal or State of Hawai'i listed threatened or endangered animal species were identified on the Property. Several mitigation measures will be implemented to protect these endangered species and other animal species.

**Endangered Species**

**Blackburn's Sphinx Moth** – While evidence of the Live caterpillars and other sign of Blackburn's sphinx moths (*Manduca blackburni*) was have been found within the Honou'ula property (frass, cut stems and leaves, and live caterpillars), no adult Blackburn's sphinx moths were observed.

Based on the presence of the non-native tree tobacco (*Nicotiana glauca*) and native host plants for the endangered Blackburn's sphinx moth, the USFWS has expressed concern that "habitat loss within the project site could adversely impact Blackburn's sphinx moth populations within this region of Maui."

As discussed above in Section 3.6 (Botanical Resources) and below in the following sections, Honou'ula Partners, LLC proposes both on- and off-site measures to protect and enhance native plants and habitat for the Blackburn's sphinx moth.

To protect Blackburn's sphinx moths on-site, Honou'ula Partners, LLC will:

- Provide Protect habitat for Blackburn's sphinx moths within the 40-acre Native Plant Preservation Area (see Section 3.6, Botanical Resources). While a preserve for native plants, the only non-native species that will be allowed to remain in this area will be the tree tobacco (*Nicotiana glauca*) so as to provide food and habitat for the moths. However, because the intent of the Native Plant Preservation Area is to protect valuable native plant species, consideration is being given to propagating 'area (*Nothocestrum latifolium*) (a native Blackburn's sphinx moth host plant) in this area to replace the non-native tree tobacco. The ultimate outcome of this effort is unknown because the Property is at a lower elevation than the elevation where

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native 'aiea usually grows. If 'aiea becomes established within the Native Plant Preservation Area and is used by the Blackburn sphinx moth, then non-native tobacco trees will be removed. Removal of non-native tree tobacco will only occur in the season when Blackburn sphinx moths are underground. Precautions will be taken to ensure pupae are not harmed;

- Remove non-native tree tobacco from the Property outside the Native Plant Preservation Area prior to construction. This will be done in consultation with biologists from DLNR and the USFWS to prevent accidental take of the Blackburn's sphinx moth caterpillar;
- Ensure against accidental take of Blackburn sphinx moths along the alternative selected wastewater transmission line alignments for possible connection to the Mākena Resort WWRF (see Section 4.8.2, Wastewater and Figure 2) by requiring a qualified wildlife biologist to screen any tree tobacco plants along the selected alignment for signs of moths (frass, cut stems or leaves, caterpillars, pupae, or adults). If any evidence of moths is found, trees will be identified and protected against disturbance, and USFWS and the Maui DLNR office will be consulted;
- Monitor construction operations to prevent accidental take of the various Blackburn's sphinx moth life stages. Should moths be found, host plants will be marked for protection and not removed until deemed appropriate by DLNR and USFWS biologists;
- Enact restrictions on landscaping and gardening within the completed Honua'ula community to prevent propagation of any plant in the Solenaceae (Night shade) family that may attract Blackburn's sphinx moths;
- Implement a translocation program in consultation with DLNR and the USFWS for Blackburn's sphinx moth caterpillars, particularly for caterpillars found in landscaped areas of Honua'ula; and
- Continue wildlife surveys from November to May during the Honua'ula construction period to look for signs of endangered Blackburn sphinx moths and protect individual moths from destruction.

For off-site mitigation, Honua'ula Partners, LLC will:

1. Acquire a perpetual conservation easement of approximately 224-acres on a currently unprotected portion of property owned by Ulupalakua Ranch adjacent to the eastern boundary of the State of Hawaii Kanaio Natural Area Reserve; and
2. Fund and implement the continuation and expansion of restoration efforts within the Auwahi Forest Restoration Project area, just north of the Kanaio Natural Area Reserve, including fencing of approximately 130 acres, unguilate removal, and plant restoration activities.

Figure 1.2a shows the proposed locations of the on- and off-site mitigation areas. The on- and off-site mitigation measures and areas are subject to the approval of the Habitat Conservation Plan by USFWS and DLNR.

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The Kanaio and Auwahi areas have been pinpointed by USFWS, USGS, Medeiros, Loope, and Chimera (1993), VanGelder and Conant (1998), Price et al (2007), and The Nature Conservancy to be of high value for Blackburn's sphinx moth habitat and native dryland forest and shrubland species including wiliwili and a number of threatened and endangered species.

The proposed approximately 224-acre perpetual conservation easement adjacent to the eastern boundary of the Kanaio Natural Area Reserve contains native dry land habitat and is considered to be particularly high quality habitat for the Blackburn's sphinx moth, due in large part to the presence of many native host plants for both adult and juvenile life stages of the Blackburn's sphinx moth.

As part of Honua'ula Partners, LLC's conservation efforts, the eight-foot unguilate fence that currently exists along the eastern and southern border of the approximately 224-acre area will be extended along the remaining borders of the parcel, and unguilates will be removed from the enclosure. A 10-foot wide fire break will be established along the inside perimeter of the fence to minimize the risk of fires started outside the parcel from entering the mitigation area. In addition, a cross fencing plan for adjacent ranch land is being developed in coordination with Ulupalakua Ranch. Cross fencing will be designed to facilitate cattle grazing in such a pattern to enhance fire control immediately adjacent to the protected area. The fence and fire breaks will be maintained in perpetuity.

At the Auwahi Forest Restoration Project, Honua'ula Partners, LLC will fund and implement a 15-year restoration program covering an area of approximately 130-acres. This will include: a) fencing of, and unguilate removal from, approximately 130 acres of Blackburn's sphinx moth conservation area; and b) dry forest restoration to benefit the Blackburn's sphinx moth, and native dry shrubland plant species. Restoration activities will include removal of invasive weeds and propagation and out-planting of native species, including many native host plants for both adult and juvenile life stages of the Blackburn's sphinx moth.

While an eight foot fence already exists around the entire 184-acre Auwahi Forest Restoration Project, some cattle grazing continues in most of the area within the enclosure. As part of the program funded and implemented by Honua'ula Partners, LLC, cattle fences will be moved or installed and cattle will be removed from restoration areas.

Restoration efforts at the Auwahi Forest Restoration Project started in 1997 have been very successful, with 28 native species naturally reproducing after only 10 years of restoration efforts. The mitigation program implemented by Honua'ula Partners, LLC will build on this success, and will include mechanical and chemical removal of invasive plant species and enhancement of the native vegetation through propagation. A 10-foot wide fire break will be established along the inside perimeter of the fence, and the cross-fencing plan described above will benefit the Auwahi mitigation area as well as the Kanaio conservation easement area. Honua'ula Partners, LLC will establish an endowment to ensure that fences, firebreaks, and restored areas will be maintained in perpetuity.



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The proposed on- and off-site measures to protect native plants and Blackburn's sphinx moth habitat proposed by Honua'ula Partners, LLC provide a net conservation benefit (as required under Chapter 195D, HRS) through:

1. The protection and propagation of additional native host plants for both larval and adult Blackburn's sphinx moth (including the native host species *Alia* (*Nothocestrum spp.*) and halapepe (*Pleomele spp.*)); and
2. Creation and protection of a higher number species of native host plants than currently exists on the Property.

The on- and off-site mitigation areas together provide approximately 394 acres of native dry shrublands for the perpetual protection and propagation of native dryland plants, including wiliwili. Through the perpetual protection and enhancement of these areas, a stable core habitat area will be secured for the moth, providing net benefit to this covered species, as well as a large number of additional native dryland species.

To implement the on- and off-site mitigation measures Honua'ula Partners, LLC will finalize its draft Habitat Conservation Plan. The on- and off-site mitigation areas are subject to the approval of the Habitat Conservation Plan by USFWS and DLNR. The purpose of the Habitat Conservation Plan is to:

1. Offset the potential impact of Honua'ula on two Covered Species (Blackburn's sphinx moth and nēnē) with measures to protect and provide a net benefit to these species; and
2. Provide avoidance and minimization measures expected to avoid any negative impacts on five additional endangered species (the Hawaiian duck, Hawaiian silp, Hawaiian coot, Hawaiian petrel, and Hawaiian Hoary bat), one threatened species (Newell's shearwater), one candidate endangered species (ʻāwīkiwīki), and the Hawaiian short-eared owl (pueo).

The Habitat Conservation Plan will be in support of an Incidental Take Permit (ITP) in accordance with Section 10(a)(1)(B) of the federal Endangered Species Act (ESA) of 1973, as amended, and an Incidental Take License (ITL) in accordance with Chapter 195D, HRS. The Habitat Conservation Plan will include specific avoidance, minimization, and mitigation measures; measures of success, and implementation specifics, including details on administration, monitoring and reporting, and funding.

Honua'ula Partners, LLC will fund the initial 15-year period covered by the Habitat Conservation Plan and the ITP/ITL. To secure funding in perpetuity for the maintenance of the on- and off-site mitigation areas after the initial 15-year period, Honua'ula Partners, LLC will establish an endowment, which will be overseen by the Honua'ula Master Home Owners' Association with financial management provided by a licensed real property management company.

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**Hawaiian Hoary Bat** – A single endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) was sighted flying seaward over the Property but no evidence of roosting or foraging was observed; however definitive conclusions about habitat use by bats cannot be made based on existing evidence.

Hawaiian hoary bats are known to roost in native and non-native trees greater than 15 feet tall. During the peak pup rearing season between June 1 and September 15, young Hawaiian hoary bat pups may be incapable of flight and harmed or killed if their roost site is disturbed. The removal of *Kiawe* trees during construction may result in the loss of roosting habitat, but many large stature trees suitable for roosting will be preserved and others will be propagated for landscaping. To minimize the potential for harm to juveniles, removal and trimming of trees greater than 15 feet tall will be avoided during the peak pup rearing season between June 1 and September 15. To further protect Hawaiian hoary bats, and in conformance with County of Maui Ordinance No. 3554 Condition 9, Honua'ula Partners, LLC will:

- Provide a qualified wildlife biologist to monitor for bats during construction. Should bats be found, assistance will be requested from the USFWS;
- Conduct additional bat point count surveys before construction to document any changes in abundance of bats and determine habitat utilization during the wet and dry seasons;
- Monitor clearing of habitat trees 15 feet in height and taller during construction to reduce the potential take of nonvolent juvenile bats; and
- Propagate native tree species for landscaping to provide suitable bat roosting habitat and mitigate for the loss of possible roosting trees during construction.

In addition to the above protection avoidance and mitigation minimization measures, a multi-species draft Habitat Conservation Plan (to include the candidate endangered ~~ʻāwīkiwīki~~) will be prepared under finalized in collaboration with USFWS and DLNR, in accordance with Section 10(a)(1)(B) of the Endangered Species Act and in collaboration with DLNR and USFWS Chapter 195D, HRS. The final Habitat Conservation Plan will provide: 1) measures to offset the potential impact of Honua'ula on two Covered Species; and 2) avoidance and minimization measures expected to avoid any negative impacts on five additional endangered species (including the Hawaiian hoary bat), one threatened species, one candidate endangered species, and the Hawaiian short-eared owl (pueo). Because avoidance and minimization measures are expected to avoid any impacts to the Hawaiian hoary bat, an ITP/ITL will not be requested for the Hawaiian hoary bat.

**Nēnē** – Nēnē are currently not found at or near the Property (SWCA 2010c); however creation of golf greens and lawns may conceivably attract nēnē. As discussed below, avoidance and minimization measures will be implemented in regard to native birds; however SWCA estimates that there may be direct or indirect take of nēnē as a result of golf course operations. The final Habitat Conservation Plan will include measures to offset the potential impact of Honua'ula on nēnē and provide a net benefit. In addition the

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HCP will be in support of an ITP/ITL for Blackburn's sphinx moth and nēnē in accordance with Section 10(a)(1)(B) of the federal Endangered Species Act (ESA) of 1973, as amended, and Chapter 195D, HRS.

**Other Endangered Species** – Avoidance and minimization measures expected to avoid any negative impacts on additional endangered species (the Hawaiian duck, Hawaiian silt, Hawaiian coot, and Hawaiian petrel) are discussed below. Similar to the nēnē these species are not currently found at the Property, but may be attracted to the Property after construction of the golf course. The final Habitat Conservation Plan will include avoidance and minimization measures to avoid any impacts to the Hawaiian duck, Hawaiian silt, Hawaiian coot, and Hawaiian petrel. Because these measures are expected to avoid any impacts to these species, an ITP/ITL for these species will not be requested.

### Native Birds

The endemic *pueo* (*Asio flammeus sandwichensis*) (short-eared owl) was the only native bird species observed within the Property, although no nests were found. Construction within what is currently grassland may potentially disturb roosting and nesting *pueo*. After construction, *pueo* may be permanently displaced from the Property due to the loss of grassland habitat. To minimize potential impacts to native *pueo*, and in conformance with County of Maui Ordinance No. 3554 Condition 9, Honua'ula Partners, LLC will:

- Conduct additional *pueo* surveys before construction to document any changes in abundance of *pueo* and habitat use during the wet and dry seasons; and
- Conduct nest searches when necessary ahead of construction activities, and delay construction around any areas found to contain *pueo* nests until chicks have fledged.

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Several species of native endemic seabirds (including the endangered Hawaiian petrel (*Pterodroma sandwichensis*) and the threatened Newell's shearwater (*Puffinus auricularis newelli*)) may traverse the area but they do not nest on the Property at night during the breeding season (February 1 through December 15) however, none are known to nest within the Property. Any outdoor lighting could result in seabird disorientation, fall-out, injury, and mortality. Young birds (fledglings) traversing the Property between September 15 and December 15, in their first flights from mountain nests to the sea, are particularly vulnerable. Seabirds are attracted to lights and after circling the lights they may collide with nearby wires, buildings, or other structures or they may land on the ground due to exhaustion. Downed seabirds are subject to high mortality caused by collision with automobiles, predation by dogs, cats, and wild animals, and starvation. To minimize potential impacts to native seabirds Honua'ula Partners, LLC will:

- Shield outdoor lights in compliance with Chapter 20.35 (Outdoor Lighting), MCC, and the Seabird Friendly Lighting Solution guide provided by USFWS;
- Avoid night-time construction, and provide, and
- Provide all staff with information regarding seabird fall-out.

After construction of the golf course, water features and open fairways may attract a number of endangered bird species that currently are not present. These may include *ko'oa* (Hawaiian duck) (*Anas wyvilliana*), *ae'o* (Hawaiian silt) (*Himantopus mexicanus knudseni*), *'āiaie ke'oke'o* (Hawaiian coot) (*Fulica alai*), *'āiaie-ūhi* (*Callineta chroleopus sandwichensis*), and *nēnē* (*Branta sandwicensis*). In addition, there is the potential for lighting to attract threatened *'ā'o* (Newell's shearwater) (*Puffinus auricularis newelli*) and endangered *'ua'u* (Hawaiian petrel) (*Pterodroma sandwichensis*). The native migratory *kōlea*, which was not seen on the Property at the time of the SWCA (2010c) survey, frequently uses roads and open spaces when wintering in Hawai'i and may be displaced if construction occurs during the migratory season. However, it is anticipated that landscaped open spaces, gardens, and lawns and fairways on the Property will provide additional habitat that *kōlea* can use. To minimize potential impacts to other native birds Honua'ula Partners, LLC will:

- Shield outdoor lights in compliance with Chapter 20.35 (Outdoor Lighting), MCC, and avoid the Seabird Friendly Lighting Solution guide provided by USFWS;
- Avoid night-time construction;
- Implement measures prohibiting the free movement of pets, discouraging the feeding of feral animals, and preventing increases in the populations of house mice, rats, mongoose, and feral cats by:
  - o Incorporating these measures into community rules and regulations, such as covenants, conditions, and restrictions; and
  - o Developing a public education program to ensure effectiveness; and
- Employ a Natural Resources Manager to help develop and implement specific conservation programs to insure the protection of native plants and animals within

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the Native Plant Preservation Area and other Native Plant Conservation Areas throughout the Property.

In addition to the above avoidance and minimization measures, the draft Habitat Conservation Plan will be finalized in collaboration with USFWS and DLNR in accordance with Section 10(a)(1)(B) of the Endangered Species Act and Chapter 195D, HRS. The final Habitat Conservation Plan will provide: 1) measures to offset the potential impact of Honua'ula on two Covered Species (including nēnē); and 2) avoidance and minimization measures expected to avoid any negative impacts on five additional endangered species (including the Hawaiian duck, Hawaiian silt, Hawaiian coot, and Hawaiian petrel), one threatened species (Newell's shearwater), one candidate endangered species, and the Hawaiian short-eared owl (pueo).

**Mammals**

Non-native mammals such as axis deer (*Axis axis*), mongoose (*Herpestes javanicus*), cats (*Felis catus*), rats (*Rattus spp.*) and mice (*Mus musculus*), pose a threat to native plant and animal species within Honua'ula. For example, feral ungulates are known to graze on native plants, degrade and destroy habitat, disrupt topsoil leading to erosion, and facilitate the establishment of non-native plants (SWCA 2010a). To control potential threats from non-native mammals and in conformance with County of Maui Ordinance No. 3554 Conditions 7 and 8, Honua'ula Partners, LLC will:

- Fence the perimeter of the Property, and other areas as appropriate, to exclude feral ungulates from the *Kiawe-wiliwili* shrubland. A fence has already been erected, however fencing requirements will be reviewed and updated as the Native Plant Preservation Area and Native Plant Conservation Areas are established and site construction begins;
- Prepare and implement an Animal Management Plan, including an ungulate management plan, to ensure that goats, deer, pigs, and stray cattle are removed in a humane manner from the Native Plant Preservation Area and the Native Plant Conservation Areas. The Animal Management Plan will be prepared in cooperation with DLNR for submittal during Project District Phase II processing and approved by DLNR prior to submittal of Project District Phase III processing;
- Inform owners within Honua'ula that the area is subject to the intrusion of mammals such as axis deer, pigs, rodents, and the impacts and management plan associated with such intrusions; and
- Employ a Natural Resources Manager to help develop and implement specific conservation programs to insure the protection of native plants and animals within the Native Plant Areas and other Native Plant Conservation Areas throughout the Property.

