

November 16, 2006

Mr. Chris Yuen  
Hawaii Planning Dept.  
Aupuni Center, 101 Pauahi Street,  
Suite 3, Hilo, HI 96720

Re: Environmental Impact Statement, Sea Mountain at Punalu`u

Mr. Yuen:

I have been asked to review the DEIS for the proposed Sea Mountain at Punalu`u development by the Environmental Center. As you are well aware, Punalu`u is a unique marine ecosystem that is home to a variety of endemic Hawaiian and federally protected species. We know that the nature of these balanced ecosystems is often fragile, and therefore may not respond well to anthropogenic impacts. Further, this area represents an environment like few others in the world; where people have the opportunity to view protected sea turtles in their natural environment.

I have major concerns with the DEIS written by consultants Group 70 International, Inc. including flaws in survey techniques, unsupported conclusions, and incorrectly stated facts pertaining to the ecology of marine ecosystems. Although I will address my concerns in greater detail below, I will summarize them here.

1. **No sea turtle surveys were conducted.** Although extensive data is available, they failed to reference any specific studies relating to population densities at Punalu`u for either foraging green sea turtles (*Chelonia mydas*; Honu) or nesting hawksbill sea turtles (*Eretmochelys imbricate*; Honu`ea).
2. **No quantitative marine biological survey was conducted.** The authors make extensive statements regarding these unsurveyed marine communities including the lack of effect of anthropogenic disturbance and nutrient load upon them.
3. **Facts regarding effects of nutrients upon marine ecosystems are incorrect.** The authors make statements regarding the potential for nutrient impacts upon the coastal zone which contradict existing peer-reviewed scientific literature previously written by a DEIS author (Dollar & Atkinson 1992) and countless others.

Page 1-13, Groundwater Quality, Paragraph 3.

The authors state that "There are no indications, according to data produced in the engineering reports, golf course management plan and marine biology report, that the project has significant potential to negatively influence groundwater." However, this was based upon a qualitative (non-enumerated) assessment of the coastal zone; essentially there was no quantitative survey of the marine habitat, therefore the authors are in no way qualified to make such statements regarding groundwater effects. Further, the information provided on the potential influence of

groundwater contradicts the work published by one of the authors\* of the EIS (Dollar\* & Atkinson), which states that leaching 10% of the N from golf course fertilizer accounted for an increase in groundwater Nitrogen flux to the bay (Keauhou, HI) of 116%; leaching of 1% Phosphorus resulted in 22%; at another site (Waikoloa, HI) levels were 229% (Nitrogen) and 400% (Phosphorus) in coastal brackish ponds and 80% at the shoreline. Obviously, nutrients from fertilizers can have a significant impact upon the groundwater of sites on the island of Hawai'i.

Page 1-14, Flora and Fauna, Fauna, Paragraph 2, DEIS states “The project site is often home to nesting Hawksbill and Green Sea Turtles. Additional visitors in the area may cause damage to their habitat or interfere with their nesting patterns.” This is an understatement of the possible impacts of such development upon sea turtles. For example factors such as beach use, lighting, vegetation, and changes in beach chemistry can have adverse effects upon nesting sea turtles (Lutz & Musick 1996). Further, the negative impact of high anthropogenic nutrient flow into the coastal zone has obviously been ignored as detailed above.

Page 1-16, Coastal Water: The statement that the nutrients will have not impact upon groundwater and/or coastal waters is misleading; see above.

Page 1-18, Topography, Soils and Drainage: The scientific evidence for percolation having the stated effect upon groundwater is lacking; there is no evidence showing that nutrients and pollutants will be removed as it moves through the topsoil. In fact, data from the Dollar & Atkinson (1992) paper greatly contradicts this conclusion and states that increased nutrients added to the system will have an enormous effect upon the local nutrient budget.

Page 1-18, Coastal Water:, 1<sup>st</sup> paragraph, “Along with the turf, additional nutrients will be filtered through percolation.” Again see above.

Page 1-18, Coastal Water:, 2nd paragraph, The statement “There is little potential for impact to these populations from changes in water chemistry.” This is not true. Interestingly when the base-line value for Punalu'u were presented there was no mention of how they relate to Hawai'i Department of Health (HDOH) water quality standards. HDOH standards are used to assess whether local water qualities are in compliance with state and federal regulations. Since the authors chose variables used by the HDOH to assess water quality one would think that a comparison between state standards and existing Punalu'u levels would be warranted. However, they were not conducted by the DEIS authors. However, when we compare these levels recorded by the DEIS to state standards we found that nitrate and chl *a* concentrations at Punalu'u already exceed HDOH water quality standards; further development can only increase their levels and the levels of other regulated water quality parameters, bringing them out of compliance, and possibly resulting in algal blooms.

The statement “Long-term studies of turtle populations indicate that the numbers of turtles have increased, while the growth rate has slowed.” is true, although the authors reference the wrong Balazs & Chaloupka (2004) paper in making that distinction. However, the statement “If the slowed growth rate is a result of decreased food sources (marine algae), the only effect of the project may be a benefit to turtle populations owing to an increase in algal growth through slight

increases in nutrient fluxes.” is not correct for several reasons. **1)** The authors have already claimed that there “are no indications... that the project has significant potential to negatively influence groundwater” Although this statement is incorrect in the first place they cannot have it both ways. **2)** If we correctly assume that there will be an enormous change in the nutrient (nitrogen & phosphorus) inputs to the system, the above statement is, at best, a dangerous oversimplification. For example, it is well known that significant nitrogen loading changes the physical structure and food web relationships in coastal communities, and thus changes fish production (Deegan et al. 2002). **3)** There is local evidence showing that high nutrient loadings can have adverse effects upon sea turtles. For example, a case study investigating the waters off Honokowai, West Maui has shown that the area has an increase in anthropogenic nutrients, have subsequently developed frequent, substantial macroalgal blooms, and that the percentage of green sea turtles infected with fibropapilloma disease (an epizootic disease characterized by fibromas and papillomas lesions) has significantly increased. **4)** Based upon the data presented here the authors are not qualified to make statements about the possible effects of increased nutrient inputs on turtles.

Page 1-19, Flora and Fauna:, It is very disconcerting that there is no mention of nesting hawksbill sea turtles here, nor do there appear to be any plans to account for their presence. The fact that the EIS does not acknowledge a Federally Protected Endangered Species is inexcusable and shows that lack of scientific credibility that went into this EIS. For example, over the past 10 years there have been 7 confirmed hawksbill sea turtle nestings at Punalu’u with many other false nestings, and unconfirmed nesting events. Additionally, 20 confirmed hawksbill sea turtle nesting events have taken place at adjacent Koloa and Kawa beaches, along with numerous false nesting and unconfirmed nesting events (Personal communication, NPS biologists, 13 Nov 2006).

Page 2-9, Section 2.2.5 Resource Management, “Programs to protect the honu (turtles) will be in place with increased signage, education of staff and visitors and the use of resort personnel to assist in the management of the resource areas within the control of the resort.” This level of protection will not be adequate to mitigate the impact that the proposed development would cause.

Page 2-13, Section 2.2.6.4 Wastewater, If the first two statements “Biological nutrient removal will be included with the treatment process to mitigate down gradient impacts. (Figure 2-3) Additional filtration would occur via the irrigation process.” Then I do not understand how the third can be true “No impacts to coastal waters are anticipated from use of recycled water for golf course irrigation.” Again, see above statements regarding the effects of anthropogenic nutrients upon coastal systems.

Page 4-19, 4.10.1 Surface Water Features (Onsite):, Again the authors continue to incorrectly state that lava rock has some ability to remove nutrient and pollutants and thus prevent it from reaching either groundwater or nearby coastal waters; here they state “Due to the highly permeable characteristic of the underlying project soils, which consists predominantly of lava, it is uncommon for runoff to reach the sea coast. Runoff is usually infiltrated into the highly permeable soil and rock formations beneath the underlying aquifers.” Again, the author’s peer-reviewed paper (Dollar & Atkinson 1992), contradicts these statements, as do countless others.

Page 5-72, 5.2.15 Coastal Waters, Probable Impacts. Again the authors misstate the facts. They state that “Qualitative evaluation of nearshore marine biota indicates a very depauperate community that is the result of very rigorous physical conditions of salinity variation and wave impact. Hence, any changes in groundwater composition owing to the project would not likely have any effect on the biotic composition of the area as such communities are already subjected to severe natural stresses.” This is incorrect, we know that anthropogenic stress does not cancel natural stress, it increases the overall stress load significantly (Benedetti-Cecchi et al. 2001); severe natural stresses, plus significant anthropogenic stresses, can lead to ecosystem failure.

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EIS “B. Marine and Pond Community Structure

Weather conditions consisting of strong tradewinds, and accompanying high surf, that occurred during all days of fieldwork precluded safe underwater surveying of the outer reef areas off the project site. The offshore marine areas were qualitatively assessed by divers working from shore within the nearshore area that was inside of the zone of breaking waves. Pond biota was assessed by divers wading through the ponds and qualitatively estimating abundance of biota.”

From this description it appears that no quantitative marine survey was conducted.

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EIS “C. Biotic Community Structure

1. Marine Community Structure

“As noted in the Methods section, weather conditions during the present survey precluded assessment of marine communities beyond the surf line. Examination of the accessible area, however, provides a qualitative indication of the overall marine community structure of the nearshore region.” Again, the authors state that no quantitative study was conducted of the site, yet they continue to make statements about the coral and invertebrate communities; no data on fishes. Again, if quantitative surveys were not conducted on this site as part of the DEIS then authors cannot make statements regarding the status of, condition of, or interactions with said communities (as the DEIS does in this section).

The DEIS statements regarding “None of the results of this study indicate any abnormal characteristics to the Punalu’u turtle population.” are correct. However, this does not mean that an evaluation of the Punalu’u green sea turtle or hawksbill sea turtle population was evaluated by the DEIS.

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“While such potential increases are probably measurable, they would not likely cause any alteration to the marine and pond communities for several reasons. First, the maximum

increases to groundwater nutrient concentration are within the envelope of natural variability found on the Island of Hawaii.” This not necessarily true; many values are 1) higher than HDOH standards and 2) I question the amount of “pristine groundwater” being collected from wells in West Hawaii (Kona). It is well known that West Hawai`i has unusually high nutrient concentrations in its groundwater and previous studies have documented that developments have enhanced the unnaturally high levels resulting in coastal water quality and coral reef degradation.

Therefore the DEIS statement “In summary, it does not appear that any of the planned activities of the proposed Sea Mountain Village project will result in negative impacts to the marine and pond environments.” is incorrect.

Further the DEIS statement that “In comparison to these natural factors, the small alterations in groundwater dynamics that may result from the proposed project will not likely have any effect. In fact, should there be any effect of nutrient subsidies, it may be the augmentation of marine algal stocks, which are the main food source of sea turtles which inhabit the area.” is a dangerous oversimplification; see statements above regarding sea turtles, macroalgae, and nutrients.

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“5. Qualitative evaluation of nearshore marine biota indicates a depauperate community that is the result of very rigorous physical conditions of salinity variation and wave impact. Hence, any changes in groundwater composition owing to the project would not likely have any effect on the biotic composition of the area, as such communities are already subjected to maximal natural stresses.”

As noted by the authors, the marine survey was qualitative; therefore they cannot make statements regarding that community or the possible effects of changes in groundwater composition upon them.

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“6. Evaluations of changes to groundwater from golf course irrigation are estimated to potentially add up to 10% to the concentration of total Nitrogen, and 6% during normal operations and 15% during grow-in of total Phosphorus. While such subsidies may be detectable, they are not likely to result in any changes to the composition of marine or pond biotic communities. Groundwater concentrations of N and P in the ponds are already high, and non-limiting to pond biota. Hence, the estimated maximum subsidies would not likely change the overall nutrient dynamics as exists at present. Such subsidies also would not have an effect on the nearshore marine environment as mixing processes are sufficient to remove the input from land within a very narrow nearshore zone.

Authors fail to mention that the projected addition of 10% total nitrogen (a conservative estimate) can lead to a 440% increase in the nitrogen outflow into the nearshore coastal system (Dollar & Atkinson 1992).

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“7. While Punalu’u Bay contains a large population of federally protected turtles, there is little potential for impact to these populations from changes in water chemistry. Long-term studies of turtle populations indicate that the numbers of turtles have increased, while the growth rate has slowed. If the slowed growth rate is a result of decreased food sources (marine algae), the only effect of the project may be a benefit to turtle populations owing to an increase in algal growth through slight increases in nutrient fluxes to the ponds and nearshore marine environment.

The authors are not qualified to make such statements for reasons state previously.

I look forward to your response on the matter and will expect comments relating to all problems discussed above.

Sincerely,

A handwritten signature in black ink, appearing to read "Jason P. Turner". The signature is written in a cursive style with a large initial "J" and "P".

Jason P. Turner

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University of Hawai'i at Hilo