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The Honorable Ikaika Anderson, Chair, & Members
of the Zoning and Planning Committee
530 S. King Street, Room 202
Honolulu, Hawaii 96813

RE: Bill 65 (2012)—To Adopt the Revised 'Ewa Development Plan

Dear Chair Anderson and Members of the Zoning and Planning Committee:

Good evening. My name is Charles L. Morgan. I am an environmental planner with Planning Solutions, Inc. (PSI) and am here to address questions that have been voiced on the water quality within a proposed Lagoon by HASEKO (Ewa), Inc. (Haseko) at Hoakalei Resort in 'Ewa Beach. Briefly, I will testify that the current water quality in the existing water body that forms the Lagoon is very high and that plans for its use will only enhance this water quality.

In preparing my testimony I have been able to take advantage of my own education, training, and expertise, as well as the knowledge and experience of other PSI personnel who have been on Haseko's environmental planning team since the late 1980's, working on and coordinating its environmental, entitlement permits, and compliance for the development. This includes working with numerous federal, state and county agencies, including the Department of Army, Corps of Engineers for its Section 404 permit and the State Department of Health for its Section 401 water quality certification.

Credentials

I received a B.A. degree in chemistry from the University of California, San Diego (Revelle College) and a PhD degree in Limnology and Oceanography from the University of Wisconsin-Madison. Limnology, a scientific discipline well represented at the University of Wisconsin, is the multidisciplinary study (physics, chemistry, and biology) of freshwater aquatic systems, including lakes, rivers, upland wetlands, and other fresh and brackish water bodies.

Since making my home in Hawai'i in 1984, I have worked on a variety of ocean-related topics. For the past dozen years, I have been employed as an environmental planner for PSI. During this time I have studied various water quality issues associated with many projects throughout Hawai'i. These include the preparation of applications for permits from the State Department of Health (NPDES construction and discharge permits, Water Quality Certifications, and NPDES General Permit coverage for construction, hydro-testing, and dewatering) and permit water quality compliance monitoring for many projects.

One such project that is similar in many respects to the one at the Hoakalei Resort is the Hilton Hawaiian Duke Kahanamoku Lagoon Restoration project. I was on the team that conducted the environmental impact analysis and obtained the environmental and land

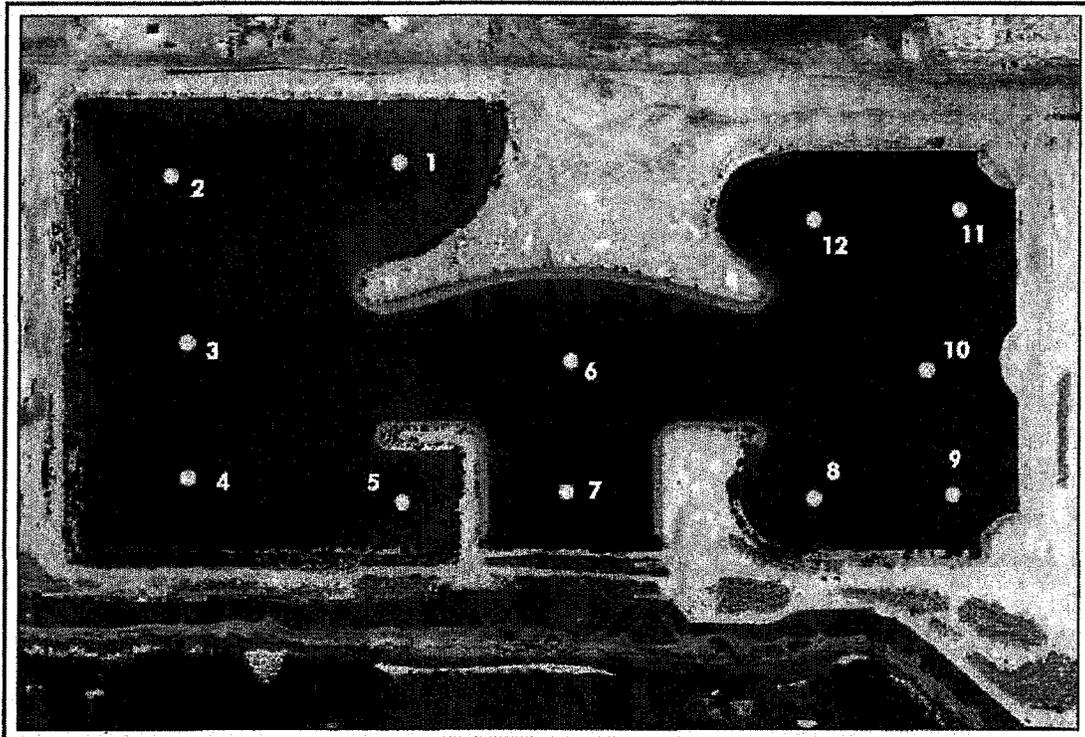
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use permits for that successful effort. That project transformed the Lagoon from a stagnant, unattractive, and little-used water body that it had become into the clean, attractive public recreational asset that it is today. Currently, I am responsible for the coordination and evaluation of water quality monitoring in the existing basin, nearby groundwater monitoring wells, the water features in the adjacent Hoakalei Golf Course, and nearby Māmala Bay coastal waters.

Lagoon Basin Excavation

Haseko began excavating the existing basin in January 2004. The work was completed in August 2008. Haseko began testing the water quality in it in April 2005 and has continued the monitoring since then, periodically collecting surface and near-bottom samples from the monitoring stations shown in Figure 1.

Figure 1 – Water Quality Monitoring Stations

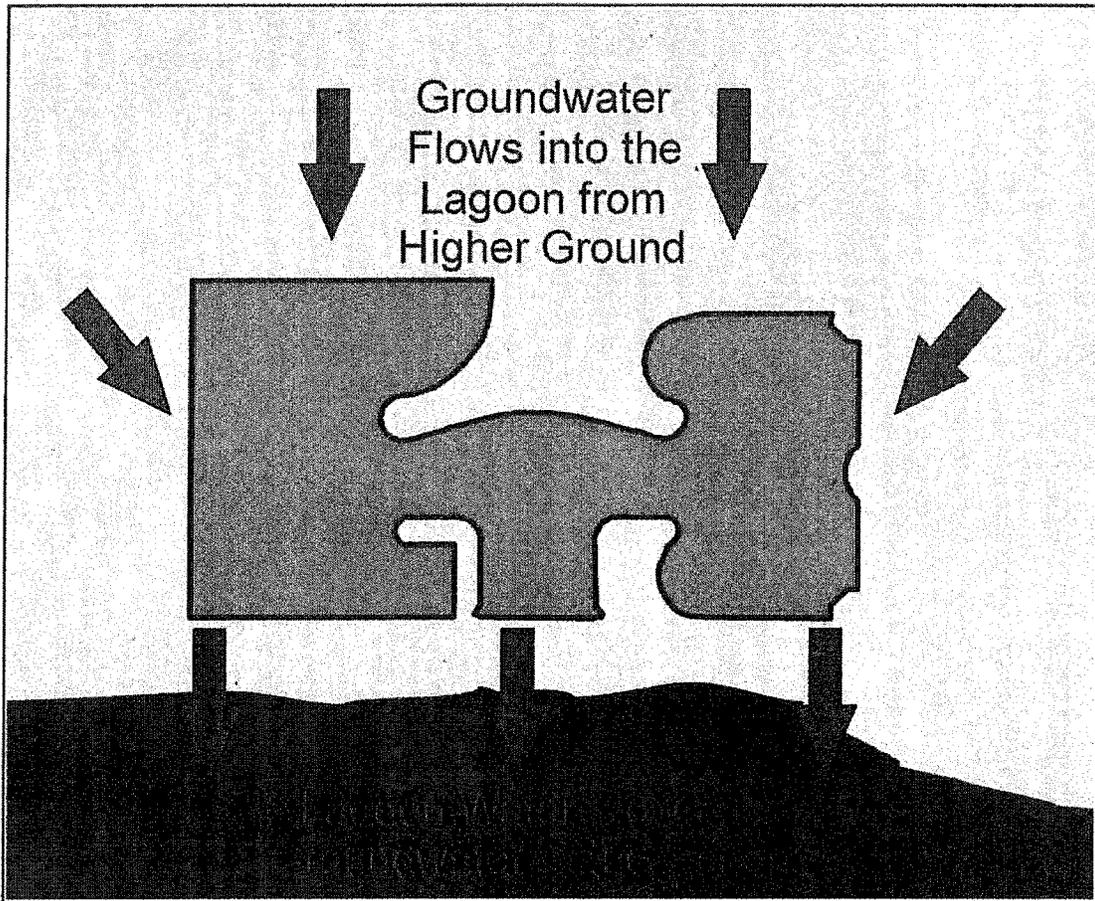


While the excavation activities were ongoing, the water within the basin was relatively turbid and showed several other characteristics consistent with elevated levels of suspended sediments from the excavation activities. Since the excavation was completed, the suspended sediment levels have dropped and water quality is high relative to State water quality standards.

The results of the tests that have been conducted within the basin over the past four years indicate that the Lagoon water is basically an exposure of groundwater that flows slowly through the excavation from *mauka* to *makai* (see Figure 2). Data that have been

collected since the excavation was completed show that the Lagoon water salinity is about 25% that of seawater.

Figure 2 – Assumed Water Flows through Lagoon



Overall, the water quality in the Lagoon is very good; it is well-oxygenated and relatively clear, with no significant plankton populations that can make the water turbid and unattractive. Currently there is no significant water quality variation throughout the Lagoon and no indication of stagnation or contamination. Existing bacterial levels in the water in the basin are very low, and a test to determine the rate at which human-derived *Enterococcus* bacterial contamination could occur when recreational use intensifies have shown that these bacteria die within a few hours of being introduced to the Lagoon water. These results predict a low probability that contamination will impact users once the Lagoon is devoted to recreation.

Haseko's Plans for the Lagoon

Haseko is planning for two basic kinds of recreational activities. It will reserve the deeper waters of the Lagoon, which reach depths in excess of 20 feet, for water activities such as canoeing, kayaking, paddle boarding, pedal boating, and others. No craft that use

fossil fuels for propulsion will be allowed in the Lagoon, except for maintenance activities or security if necessary.

Haseko plans to excavate a public swimming cove in fast land behind one corner of the Lagoon. The bottom of this cove and the adjacent beach will be covered with clean sand. The bottom of the cove will slope gently from the shoreline to depths of about 5 feet. The collected data show that the water throughout the Lagoon is already quite clean; Haseko will make it even better within the swimming coves. It will achieve this by flushing them with pumped water, ensuring a turnover of at least four times per day.

It will accomplish this using one of two methods. One method entails flushing the cove continuously with water pumped from the Lagoon, treating it as necessary to kill any bacteria. As the water from the cove is discharged into the main Lagoon, it will enhance the already good water quality of the Lagoon as well. Alternatively, water may be pumped into the cove from one or more deep saltwater wells drilled nearby. It will supply enough well water to replace the entire volume of water in the cove at least four (4) times per day. The source of this saltwater is physically isolated from surface and shallow groundwater runoff. It is clean and essentially bacteria free and would be discharged into injection wells and have no impact on the Lagoon water quality.

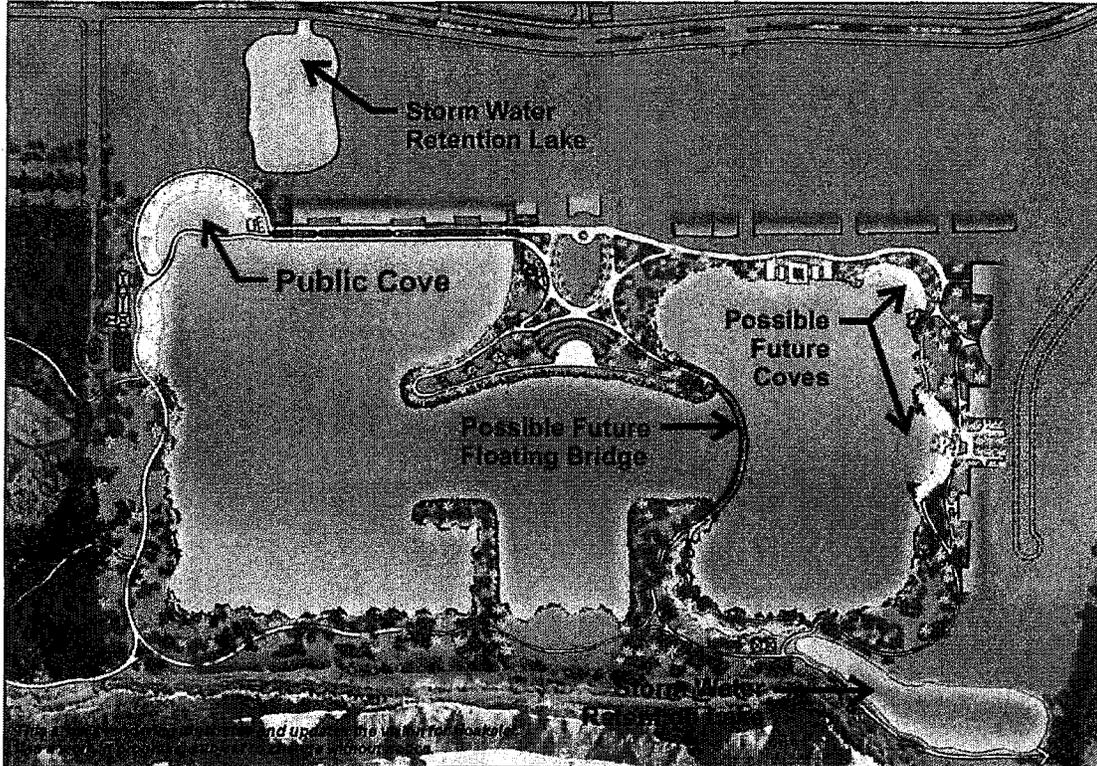
Haseko understands that a key contributing factor to the maintenance of the Lagoon will be the careful maintenance of the aquatic plants, or *limu*, that currently comprise the dominant substrate on the Lagoon bottom. To date, this *limu*, consisting mostly of a common local Hawaiian species, *Chara zeylanica*, appears to be consuming most of the dissolved phosphate and a good portion of the nitrates that are carried into the Lagoon by groundwater flows, converting these nutrients into biomass and removing them from the water column. This process appears to explain why no buildup of phytoplankton species has occurred in the Lagoon water, which would cause the water to be green and turbid. Haseko plans periodically to remove a portion of this *limu* from the Lagoon bottom to offset the buildup of this biomass and thus keep the Lagoon in a biological and chemical balance.

Another factor that will help keep the Lagoon water quality high will be the configuration of the surrounding lands. The drainage system for the adjacent lands is specifically designed to minimize direct surface water runoff into the Lagoon. Rainwater runoff from most of the land around the basin will be routed first into lakes created especially to receive storm water runoff and retain it while it percolates into the ground. In addition, the comprehensive water quality monitoring program that is already in place will be continued.

Figure 3 shows a preliminary design concept for the Lagoon. Haseko is continuing to refine this as it conducts more detailed analysis and consults with others.

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Figure 3 – Preliminary Conceptual Design for Lagoon



The results of the scientific work that has been done to date indicate that the Lagoon will have good water quality and that it, together with the swimming coves that are planned adjacent to it, will represent a valuable recreational and scenic addition to the area.

Sincerely,

Charles L. Morgan, PhD