

LIEUTENANT GOVERNOR

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GOVERNOR OF HAWAII

MAR 29 2 09 PM '90



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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AGENDA

FOR THE MEETING OF THE
COMMISSION ON WATER RESOURCE MANAGEMENT

DATE: March 29, 1990
TIME: 2:00 p.m.
PLACE: Lanai High School Cafeteria
Fraser Avenue
Lanai City, Lanai, Hawaii

1. Resubmittal: Y.Y. Valley Corporation Application for Stream Channel Alteration Permit, Maunawili Stream and Tributaries, Kailua, Oahu
- ✓ 2. Resubmittal: Petition for Designating the Island of Lanai as a Water Management Area

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
Honolulu, Hawaii

March 29, 1990

Chairperson and Members
Commission on Water Resource Management
State of Hawaii
Honolulu, Hawaii

Gentlemen:

RESUBMITTAL
Petition for Designating the
Island of Lanai as a Water Management Area

Introduction

On March 2, 1989, the Commission on Water Resource Management received a written petition to designate the Island of Lanai as a Water Management Area for the purpose of regulating the use of ground-water resources. The petition was submitted by Mr. John D. Gray on behalf of the 168 residents of Lanai. This petition stated that resort development on Lanai in the future would cause water demand to exceed the available water supply.

On May 17, 1989 the Commission approved the continuance of the designation process for Lanai and subsequently held a public hearing on August 29, 1989 to receive oral and written testimony. Mr. Gray requested a contested case hearing, but the Office of the Attorney General has subsequently advised the Commission that the law does not provide for a contested case hearing in the designation process. A contested case could arise later in the permitting stage when individual rights, privileges, or duties are determined.

Pursuant to HRS §174C-46 Commission staff conducted an investigation of Lanai's hydrology, reviewed the public testimony and existing literature, and evaluated comments of other governmental agencies. Findings of Fact have been prepared which summarize that investigation. To allow sufficient time for public review of the Lanai Water Resources Findings of Fact, the Commission deferred action on the petition for designating Lanai as a water management area at its January 31, 1990 meeting.

Hawaii's Water Code, HRS §174C-44 establishes eight criteria which the Commission must consider in deciding whether to designate a ground water area as a water management area under the Code:

[§174C-44] Ground water criteria for designation. In designating an area for water use regulation, the Commission shall consider the following:

- (1) Whether an increase in water use or authorized use may cause the maximum rate of withdrawal from the ground water source to reach ninety percent of the sustainable yield of the proposed water management area;
- (2) There is an actual or threatened water quality degradation as determined by the department of health;
- (3) Whether regulation is necessary to preserve the diminishing ground water supply for future needs, as evidenced by excessively declining ground water levels;

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- (4) Whether rates, times, spatial patterns, or depths of existing withdrawals of ground water are endangering the stability or optimum development of the ground water body due to upconing or encroachment of salt water;
- (5) Whether the chloride contents of existing wells are increasing to levels which materially reduce the value of their existing uses;
- (6) Whether excessive preventable waste is occurring;
- (7) Serious disputes respecting the use of ground water resources are occurring; or
- (8) Whether water development projects that have received any federal, state, or county approval may result, in the opinion of the Commission, in one of the above conditions.

Notwithstanding an imminent designation of a water management area conditioned on a rise in the rate of ground water withdrawal to a level of ninety per cent of the area's sustainable yield, the Commission, when such level reaches the eight per cent level of the sustainable yield, may invite the participation of water users in the affected area to an informational hearing for the purposes of assessing the ground water situation and devising mitigative measures. [L 1987, c45, pt of § 2]

Analysis

Staff has prepared a Findings of Fact to provide an objective assessment of the current and future water resource situation on Lanai. Staff analyzed recent hydrologic studies to determine the reasonableness of and consistency between hydrologic estimations presented, being cognizant of previous public testimony and Maui County comments. The report examines relevant references and adopts a conservative stance in its analysis of the water situation. The report makes no recommendations for Commission action.

The staff's updated proposed Findings of Fact reach the following ultimate factual determinations:

1) Hydrologic Assessment of High-Level Aquifer

Sustainable Yield of Aquifer	6 mgd
Total Future Potable Water Demand	4.5 mgd
% of Sustainable Yield	75 %

- 2) Non-potable water demands of planned land developments would be satisfied through basal aquifer sources and treated wastewater effluent which should provide a total of 1.4 mgd;

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- 3) Efforts are underway to upgrade the existing potable water distribution system. Wells 8 through 10 have been drilled in an effort to upgrade the existing water distribution system capacity to utilize the high-level water supply while existing pumps could also be lowered and/or existing wells could also be deepened to help prevent water shortages which have occurred in the past. Alternative sources consisting of non-potable treated wastewater are available, however, a basal ground-water source has yet to be discovered;
- 4) If planned alternative sources of supply do not materialize and full land development continues then future withdrawals could exceed 90% of the ultimate sustainable yield of the island's high-level aquifer.
- 5) None of the ground-water criteria cited in §174C-44, HRS, has been met to support the designation of the island as a water management area according to the following analysis:

Criterion 1.

Whether an increase in water use or authorized use may cause the maximum rate of withdrawal from the ground water source to reach ninety percent of the sustainable yield of the proposed water management area.

Discussion

From the analysis of existing data and methodology used by hydrologists in determining a sustainable yield for the island of Lanai, the estimate of 6 mgd for potable water from high-level dike aquifer is considered reasonable. A sustainable yield for the basal aquifer is unknown although it is anticipated that it can supply useful non-potable water.

Maximum future projected potable water demand on the high-level aquifer from all projects could reach 4.5 mgd. This demand is based on conservative estimates and consideration of maximum demands stated from all development related reports. In light of updated information regarding projected potable demand, the Findings of Fact total future demand on the high-level aquifer is sufficiently conservative.

Given a sustainable yield of 6 mgd and a total projected future demand of 4.5 mgd, the maximum annual average withdrawal from Lanai's high-level ground water source would be 75%. This condition would not warrant designation although the Commission, pursuant to 174C, HRS, may coordinate an informational meeting for all water users to devise mitigative measures.

Development of new and/or modification of existing well sources is necessary to increase the present potable water supply infrastructure's ability. Such efforts are presently underway while additional alternative non-potable sources are also being pursued. Once potable hardware is in place, it should not be ignored that if planned alternative non-potable water sources fail to materialize then withdrawals from the high-level aquifer could reach the 90% of its the sustainable yield.

Conclusion: NO DESIGNATION

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Criterion 2.

There is an actual or threatened water quality degradation as determined by the Department of Health.

Discussion

There is no evidence of water quality degradation. Neither the Department of Health nor any individual has found or shown actual or threatened water quality degradation on Lanai.

Conclusion: NO DESIGNATION

Criterion 3.

Whether regulation is necessary to preserve the diminishing ground water supply for future needs, as evidenced by excessively declining ground water levels.

Discussion

Declining groundwater levels have been observed in wells with a significant drop in recent years. These water level reductions have been mainly due to the increase of pineapple irrigation from the introduction of full time drip irrigation combined with the recent drought conditions experienced throughout the state.

Future reductions in head levels will affect well configurations rather than the high-level ground water supply. If wells are modified then reduction in water table levels can be tolerated without harming the ground water supply for future needs.

Conclusion: NO DESIGNATION

Criterion 4.

Whether rates, times, spatial patterns, or depths of existing withdrawals of ground water are endangering the stability or optimum development of the ground water body due to upconing or encroachment of salt water.

Discussion

None of the existing wells have exhibited any evidence that upconing or salt water encroachment will be a problem. Recently drilled exploratory well Nos. 9 and 10 have yielded warm and brackish water from the Palawai basin but there is no reason to believe that, if developed, these wells would endanger other wells or the stability of the entire high-level ground water aquifer.

Conclusion: NO DESIGNATION

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Criterion 5.

Whether the chloride contents of existing wells are increasing to levels which materially reduce the value of their existing uses.

Discussion

There has not been any observable chloride concentration increases in existing wells over the past 50 years. Recently drilled wells 9 & 10 show high chloride contents which are due to geothermal activity isolated within the Palawai caldera.

Conclusion: NO DESIGNATION

Criterion 6.

Whether excessive preventable waste is occurring.

Discussion

No comment has been made through petitions or testimony regarding preventable waste and there is no evidence of excessive preventable water waste occurring on Lanai. However, the 180 gpd per capita on Lanai is slightly high compared to normal domestic use elsewhere in the state.

Conclusion: NO DESIGNATION

Criterion 7.

Serious disputes respecting the use of ground water resources are occurring.

Discussion

Since there is a single private purveyor and developer of water on Lanai, actual serious disputes are not now and have not occurred on the island in the sense that there are separate competing water wells drawing from a common aquifer. However, some dispute has arisen based on speculation that future water from the sole purveyor may be allocated to the disadvantage of the residents of Lanai should drought conditions or unforeseen events limit water withdrawals.

Conclusion: NO DESIGNATION

Criterion 8.

Whether regulation is necessary to preserve the diminishing ground water supply for future needs, as evidenced by excessively declining ground water levels.

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Discussion

Ground water levels have declined since water development began on Lanai but at a relatively safe rates given the elevations of the water tables and their corresponding responses to region wide pumping. Recent increases in pumpages due to drip irrigation and development construction will lower water levels which should later stabilize at an equilibrium head. It is foreseen that future needs will be met without harm to the high-level aquifer according to the planning efforts of Lanai Company.

Conclusion: NO DESIGNATION

CONCLUSION:

None of the groundwater criteria cited in HRS §174C-44 has been met to support the designation of Lanai as a water management area.

RECOMMENDATIONS:

Given the findings of its investigation and the conclusions reached, the staff recommends that the island of Lanai not be designated as a water management area at this time. In light of present information staff further recommends that the Commission take the following actions to protect Lanai's water resources:

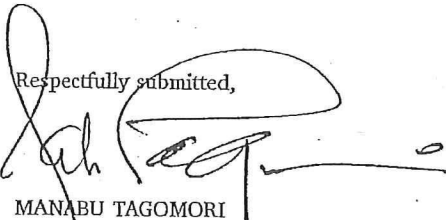
1. Require Lanai Company to immediately commence monthly reporting of water use to the Commission, under the authority of Chapter §174C-83, HRS, which would include pumpage, water level, temperature, and chloride measurements from all wells and shafts;
2. In addition to monthly water use reporting and pursuant to Secs. 174C-43 & 44, HRS, require Lanai Company to monitor the hydrologic situation so that if and when ground-water withdrawals reach the 80-percent-of-sustainable-yield rate, the Company can expeditiously institute public informational meetings in collaboration with the Commission to discuss mitigative measures;
3. Require Lanai Co. to formulate a water shortage plan that would outline actions to be taken by the Company in the event a water shortage situation occurs. This plan shall be approved by the Commission and shall be used in regulating water use on Lanai if the Commission should exercise its declaratory powers of a water emergency pursuant to Section 174C-62(g) of the State Water Code. A draft of this plan should be available for public and Commission review no later than the beginning of October 1990 and shall be approved by the Commission no later than January 1991;
4. That the Commission hold annual public informational meetings on Lanai during the month of October to furnish and receive information regarding the island's water conditions. The public shall be duly notified of such meetings;

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5. Authorize the Chairperson to re-institute water-management-area designation proceedings and, hence, re-evaluations of ground-water conditions on the island if and when:
 - a. The static water-level of any production well falls below one-half its original elevation above mean sea level, or
 - b. Any non-potable alternative source of supply contained in the Company's water development plan fails to materialize and full land development continues as scheduled.
 - c. Items 1, 2, and 3 are not fulfilled by Lanai Company.

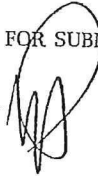
Respectfully submitted,



MANABU TAGOMORI
Deputy Director

Attach.

APPROVED FOR SUBMITTAL



WILLIAM W. PATY, Chairperson

State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
Honolulu, Hawaii

March 29, 1990

Chairperson and Members
Commission on Water Resource Management
State of Hawaii
Honolulu, Hawaii

Gentlemen:

RESUBMITTAL
Y. Y. Valley Corporation
Application for Stream Channel Alteration Permit
Maunawili Stream and Tributaries, Kailua, Oahu

Y. Y. Valley Corporation proposes to construct the Royal Hawaiian Country Club and golf course in Maunawili Valley in two phases. The golf course design in Phase 1 will require the installation of seven bridges and three pipe culvert crossings over perennial and intermittent streams, three concrete ford crossings, and twenty single culverts in drainageways (gulches that carry water only during storms). Two offstream ponds are also proposed. Only Phase 1 channel alterations, shown on Exhibit A, are being considered at this time.

PROJECT DESCRIPTION

The seven proposed bridges will have clear spans over perennial and intermittent stream channels to minimize disturbance to the existing streambeds. Concrete abutments will be located above and away from the stream banks. The three 48- or 54- inch pipe culvert crossings will be embedded in to streambed to a depth of 6 to 9 inches and will be constructed below the normal flow line with gravel and stones epoxied to simulate natural substrate. The culverts will drain a small area of 54 acres and will be sized to pass the peak discharge of a 10-year storm with provisions for overflow. Three concrete fords are also proposed to provide stable at-grade crossings for carts and maintenance vehicles.

Pond 1 will be designed for sediment control and irrigation purposes. Pond 2 will be utilized for irrigation. Construction adjacent to the bank of Makawao Stream for Pond 1 will include a concrete headwall and a 4-feet wide by 70-feet long concrete-rubble-masonry (CRM) spillway along the northern tip of Pond 1. In addition, a CRM riprap about 135 feet long and 20-feet wide will protect the Makawao stream bank along the southwest side. Pond 2 will have construction similar to Pond 1, including two concrete headwalls along its eastern side abutting the Makawao stream bank, a CRM riprap about 140 feet long by 20 feet wide to protect the bank - fill, and a 4-feet wide by 40-feet long CRM spillway along the pond's northern tip.

To eliminate pumping at Pond 1, a 12-inch diameter inverted siphon about 300 feet long will be installed between the two ponds to regulate water level. Four electrical conduits encased in a concrete jacket and one irrigation line about 4-inches in diameter will be installed alongside the siphon in Makawao Stream.

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To provide stable crossings for grading equipment and minimize disturbance to the streams during construction, temporary pipe culverts will be installed adjacent to all proposed bridge locations. These culverts will be removed after bridge construction has been completed and streambeds will be restored to their natural condition.

Although the golf course was designed to largely conform to existing site conditions, twenty single culverts would be installed within existing swales.

AGENCY REVIEW

The Corps of Engineers has no objection to the applicant's proposal to use pipe culverts in lieu of bridges at crossings B-2, B-3 and B-3A and the installation of the siphon and utility crossing. The Corps requires that the activity not significantly disrupt the movement of indigenous aquatic life. The applicant in this instance has consulted informally with the Corps and the U.S. Fish and Wildlife Service to assure that his culvert and pond designs do not impede the migration of aquatic species.

The City and County of Honolulu Department of Land Utilization confirms that the proposed improvements lie outside the Special Management Area. The Department asked to what extent the proposed storage ponds would (a) alter flows in Makawao and Maunawili streams or (b) impound waters which would otherwise inundate the wetland at the base of the valley. If stream flows or the quantity of waters reaching the wetland are changed, what effects would this have on existing flora and fauna? What long-term effect would it have on the wetland system?

The University of Hawaii Environmental Center commented on the design of the culvert structures, noting that the loose fill overlying culverts should be compacted to withstand possible overtopping. The Center urged the careful design of antiseep collars on the culverts and the use of hooded culverts to enhance flow at intermediate stages it asked if consideration had been given to spillway design, grassed slopes, and maintenance of slopes to adequately carry the overflow from a major storm. Also, were measures to prevent blockage of culvert inlets included in the design and was an estimate made on the life of the ponds, including provisions for sediment removal to maintain storage capacity? (A copy of the agency's comments was forwarded the applicant.)

The Division of Aquatic Resources states that the tributaries are not known to provide significant aquatic habitat and, from the aquatic resources standpoint, it has no objections to the project.

The Division of Forestry and Wildlife states that Maunawili Stream and its tributaries flow into Kawainui Marsh, an important habitat for waterbirds and related marsh flora and fauna. The stream alterations should not restrict water movement to the Marsh, and that precautionary measures must be taken to prevent the in flow of silt and pollutants.

The Division of Historic Preservation notes that the archaeological contract for this project includes monitoring of the construction of culvert crossings. Therefore, the issuance of a permit should have no adverse effect on significant historic sites.

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The Division of State Parks, the Natural Area Reserve System and the County Department of Public Works had no comments or objections to the proposed project. The Office of Conservation and Environmental Affairs indicates the project is not located within the Conservation District.

The 90-day deadline for Commission action on this application is April 9, 1990.

ANALYSIS

The project site is drained by several perennial and intermittent streams. The streams can be described as shallow riffle-pool systems with heavy riparian overgrowth. Maunawili Stream serves as the major collector stream for numerous tributary streams and unnamed drainageways. Maunawili Stream crosses Kalaniana'ole Highway, discharges into Kawainui Marsh, and ultimately flows into Kailua Bay. Portions of Maunawili Stream have been channelized and existing culverts at some road crossings impede the movement of native species upstream. Average flow for Makawao Stream is 4.93 cubic feet per second. Makawao Stream is partially diverted by the Maunawili Ditch system for irrigation in Waimanalo.

Aquatic Species. Between 1975 and 1984, aquatic species have been sampled at 24 different stations within the Maunawili Stream system. Within and downstream of the Phase 1 project area there are 4 stations on Maunawili Stream, 7 stations on Makawao Stream and 3 more stations on Ainoni Stream. The following species have been observed:

Lower Reaches:	crayfish, pond snail (<i>Melanoides</i> sp.), chinese catfish, carp, smallmouth bass, guppies/mollies and tilapia
Middle Reaches:	crayfish, pond snail, chinese catfish, smallmouth bass, guppies/mollies, tilapia and swordtails
Upper Reaches:	o'pae kala'ole, Tahitian prawn, crayfish, pond snail, guppies/mollies and swordtails

On July 30, 1986, staff accompanied a US Fish and Wildlife Service biologist and the applicant's consultant on a survey of the stream. The Service, in its letter of August 11, 1986, reported that no endemic o'opu, hihiwai, or o'pae were observed. The only abundant native species observed throughout the stream was the native snail *Melanoides* sp. Introduced species such as the crayfish, swordtails, guppies and tilapia were also observed.

Potential Impact to Instream Uses. The use of clear span bridges will not alter the bed and banks of the streams they cross nor impede the migration of aquatic species within the stream system. By embedding the 48- or 54- inch culverts in the streambed and grouting the culvert invert with gravel and stones, the culverts will simulate the natural substrate thereby decreasing flow velocities within the pipe and providing a surface native species can utilize to move upstream. Ford crossings and pipe culverts will be installed at swales and minor drainageways with minimal flow and, as such, will not affect aquatic species habitat. Water for the ponds will be obtained from on-site wells and

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runoff; no diversion of streamflow is proposed. Therefore, Kawainui Marsh will not be affected. The streambed at the inverted siphon will be restored to its natural condition following construction. Silt fences will be utilized during pond construction to minimize the movement of silt into Makawao Stream.

The project developer has retained a firm to provide continuous stream water quality monitoring to insure that the State water quality standards are met. The applicant has utilized bridge and culvert designs that are sensitive to instream needs.

RECOMMENDATION

That the Commission approve the issuance of a stream channel alteration permit to Y. Y. Valley Corporation for the construction of seven bridges, three culvert crossings, three concrete fords, twenty pipe culverts within drainageways, and two ponds with siphon and utility lines buried under Makawao Stream with supporting facilities at Maunawili Stream and tributaries at TMK: 4-2-08: por. 1 and 4-2-09: por. 1, Kailua, Oahu, Hawaii. This permit shall be valid for a period of two years from the date of approval, March 15, 1990, and subject to the following conditions:

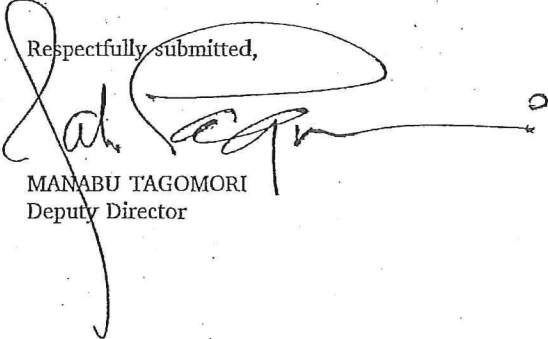
1. The applicant shall comply with all other applicable statutes, ordinances, and regulations of the Federal, State, and City and County of Honolulu governments.
2. The applicant, his successors, and his assigns shall indemnify, defend, and hold the State of Hawaii harmless from and against any loss, liability, claim for property damage, personal injury, or death arising out of any act or omission of the applicant or his successors, assigns, officers, employees, contractors, and agents under these permits or related to the granting of this permit.
3. The applicant shall notify the Department, by letter, of the actual dates of project initiation and completion.
4. Before proceeding with any work authorized by the Commission, the applicant shall submit two copies of the construction plans and specifications to the Department for approval as to consistency with the conditions of the permit and the declarations set forth in the permit application.
5. The applicant shall utilize erosion control measures during construction to minimize turbidity (such as scheduling of work during periods of low streamflow) and prevent debris, construction materials, including cement, petroleum products, and other pollutants, from entering the stream. Wash and dust control water shall be properly disposed of.

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6. In the event that subsurface cultural remains such as artifacts, burials or deposits of shells or charcoal are encountered during excavation work, the applicant shall stop work in the area of the find and contact the Department's Division of Historic Preservation (548-6408) immediately. This office will assess the situation and recommend mitigation, if necessary.

Respectfully submitted,


MANABU TAGOMORI
Deputy Director

Attach.

APPROVED FOR SUBMITTAL:



WILLIAM W. PATY, Chairperson