

February 24, 1998
Mr. Kevin Eckert
Hawaiian Electric Company
P. O. Box 2750
Honolulu, Hawaii 96840
Dear Mr. Eckert:

Subject: Hawaiian Electric Company Integrated Vegetation Management Program;
Use of Herbicides in Watershed Areas

We have the following comments on your April 15, 1997 letter concerning the above subject matter. It is our understanding that Hawaiian Electric Company (HECO) seeks approval from the Board of Water Supply (BWS) to use the herbicides Accord, Garlon, Banvel, and Escort as described in the subject integrated vegetation management (IVM) program.

We apologize for the inordinate delay in sending you these comments. Our review process involved seeking comments from the State Departments of Agriculture (DOA) and Health (DOH). Their replies did not reach us until October 31, 1997 and February 3, 1998, respectively. Enclosed are copies for your information and review. Please note, BWS does not have regulatory authority to approve or disapprove pesticide use on Oahu. Therefore, our input should be regarded only as comments and viewpoints on this matter.

We support HECO's efforts to provide a reliable and continuous electric power supply to the people of Oahu and appreciate the need to keep undesirable vegetation from growing onto and impacting its facilities. Electric service interruptions can shut down our pumping operations creating loss in water service to our customers.

It is our understanding that HECO has historically controlled undesirable vegetation by manual cutting with chain saws. While manual cutting is a useful method for quickly removing target vegetation from contact with electric lines, HECO reports the control was very short term and incomplete. Further, the cuttings left on site were unsightly a fire hazard, and creates obstruction to right-of-ways. HECO also reports that chain saws were depositing, on the ground, approximately 1.5 to 3 gallons of petroleum bar and chain oil per acre.

In response to these concerns, HECO cites IVM as a safer and more effective alternative to manual cutting. The program uses on average less than 0.5 to 1.5 gallons of herbicides per acre to control undesirable vegetation. HECO reports that the herbicides would be selectively applied to undesirable vegetation while promoting the growth of desirable species. Since many of HECO's transmission towers are located within watershed and deeply forested areas of Oahu, implementing IVM would mean the use of herbicides in these areas.

All our potable water from our wells comes from the Koolau and Waianae mountain watershed areas. Because of the permeability of the volcanic rock and soil that make up Oahu, much of the rain which percolates to underground volcanic formations are stored in large groundwater basins known as aquifers that float upon seawater, and is continuously recharged by rainfalls.

As rainwater percolates to the aquifer, it travels through the surface of the soil before entering the porous basal subsurface. In the interior sections of Oahu, some of the water will travel very short distances and accumulate in natural reservoirs called dike compartments, while others will travel longer distances, through the subsurface strata, on its way to the pumping station. This travel time influences the quality of the water source. The more time the water spends in contact with the soil and subsurface, the more minerals the water will pick up. Decomposition of time dependent organic substances are also enhanced. This is the reason sources closer to the Koolaus and/or located at higher elevations above sea level will produce water that has very different quality characteristics than wells closer to sea level where mixing with sea water occurs. The Honolulu watershed forest reserve was specifically established for the purpose of enhancing maximum recharge and to protect and preserve the long term quality of the groundwater supply for metropolitan Honolulu which has essentially remained free of chemical contamination.

Oahu's soil is essentially basaltic rock that has been weathered to clays, silts, sand, and loams. It also contains complex enzymes, microbes, and other chemical and biological compounds. These components give the soil a certain ability to adsorb as well as decompose organic materials. The soil and subsurface also contain mineral substances (such as nitrates) that are miscible with water. The impacts of return irrigation water carrying salts and nutrients to the water table have been known for many decades.

The soil's adsorptive and decomposition properties gave rise to the notion for some people, of it being a protective barrier that guards the quality of the underlying groundwater aquifer from unwanted substances. Some purported the safety of pesticide and nutrient use based on this ability to retain and decompose substances before they reach the groundwater table. For many years, the continual good quality of Oahu's water sources reinforced this belief. However, improvements to instrumentation and analytical procedures for measuring and detecting extremely low concentrations of substances in drinking water, revealed new information about the vulnerability of our aquifers to contamination by applied chemicals.

In 1977, a spill of ethylene dibromide near a private well focused attention for the first time on the possibility of pesticide contamination of groundwater in Hawaii and the vulnerability of the island's water sources to activities taking place on the surface of the land. Since that time, a number of groundwater wells on Oahu, and the neighbor islands, have been found to contain long lived pesticide contamination. The data has dramatically reshaped earlier notions of the soil's protective and adsorptive properties and brought with it new concerns about groundwater vulnerability. We continue to believe in the protective properties of Oahu's soils. If it were not for these properties, pesticide findings and levels would probably be higher than what is being found today. However, the adsorptive property of soils is not infinite. At some point, we believe a threshold will be reached and the soil will begin to release substances attached to it or allow substances to pass through to the underlying aquifer.

Today, we operate a significant number of wells with known pesticide contamination. Most of the wells are located in Central Oahu which have a long agricultural history. Many required expensive treatment to lower the pesticide concentration to acceptable levels for drinking. For a number of the wells, contamination levels have dramatically increased since they were first detected and measured. Recently, several of our metropolitan Honolulu sources have also been found to have low levels of pesticides.

We believe these experiences send an important and powerful message to all of us. Given our experiences and the reasons for setting aside lands as conservation districts or restricted watersheds, we are understandably concerned about any proposed long term use of herbicides in these areas, particularly within proximity of active spring, well, tunnel, and shaft sources of water. We feel watersheds that directly supply and are hydrologically connected to our water sources should be afforded maximum protection. Our reasons for such conservatism are based on the high permeability of our soils and aquifer; short travel distances between application area and our sources; our experiences with pesticide presence; and the continuance of new discoveries of well water contamination.

The argument may be made that pesticide use and regularity of application under the IVM program are not the same as the amount applied nor the frequency conducted over agricultural lands. Further, we understand that the products for use under the IVM have low leaching potential and degrade rapidly in the environment. We do not dispute these comments. However, we believe there is reason to be concerned when we receive information indicating that Banvel "does not bind to soil particles and is highly mobile, posing a threat to groundwater" and Garlon (trichlorpyr) "does not strongly absorb to soil particles."

Recent DOH test results on our water supplies do not indicate any presence of glyphosate (Roundup) nor any petroleum type products. We are pleased with these findings. Glyphosate is currently regulated under federal and state drinking water regulations. We estimate that most of the current Roundup use is probably not in deeply forested regions and watersheds, but in residential, commercial, and industrial areas. The glyphosate results might be extrapolated to indicate that its use in watersheds may be safe. Given the historic use of manual cutting, the data might suggest that this practice may also be safe. However, we have a concern when we receive information that some of the alternative to manual cutting "is highly mobile, posing a threat to groundwater."

We support early decisions to protect certain areas of Oahu and to restrict activities within them that could impact groundwater quality. We believe continuing these restrictions is in the public interest, allows recharge to continue to its fullest, protects groundwater quality, and helps to minimize the list of contaminated sources for the future.

In summary, we are concerned about the use of herbicides in watershed areas for the reasons cited above. Concurrently, we have solicited and received input from DOH and DOA on this matter. These agencies, along with HECO indicate that herbicide use in watershed areas is safe if properly used.

Based on their information, we recommend DOH, DOA and HECO establish an agreement that HECO will mitigate any drinking water source contaminated (however unlikely) by any pesticides used under their IVM program. Conducting a regular water monitoring program for the pesticides used under the IVM program is also recommended.

Thank you for the opportunity to comment. If you have any questions, please call Erwin Kawata at 527-5283.

Very truly yours

RAYMOND H. SATO
Manager and Chief Engineer

EOTP EXHIBIT T-26 Mr. Kevin Eckert