August 20, 2009

U.S. Environmental Protection Agency
Ground Water Office (WTR-9)
75 Hawthorne Street
San Francisco, CA 94105

ATTN: Nancy Rumrill

RE: Comments on Revised Draft Lahaina, HI WWRF UIC Permit Number HI50710003

Dear Ms Rumrill:

I am providing comments herein regarding the referenced Underground Injection Control (UIC) Permit that U.S. Environmental Protection Agency (EPA) has proposed issuing to the applicant, County of Maui for the Lahaina Wastewater Reclamation Facility (WWRF). I want to thank the EPA for having the first public hearing on the draft permit and for making changes in the proposed revised draft permit to reflect the concerns expressed by our community, and also for granting us this opportunity for further input and discussion.

I believe the time has come to finalize this permit. The longer the discussion goes on, the longer the old permit continues with no limits on pollutant loads. Every day an additional 200 pounds of nitrogen are injected. At current effluent flow and concentration levels, every year of a compliance schedule represents 70,000 more pounds of nitrogen released. Whatever details cannot be worked out at this time can be included as special permit requirements for future completion.

I urge the EPA to act quickly to enact real reductions in the loads of pollutants being injected into the groundwater from the Lahaina WWRF. These injected pollutant loads, along with other land-based pollutants, are causing rapid reef decline and endangering public health. There is widespread consensus both within the scientific community and the community at large that we know the following:

- Maui has a more than 20 year history of nuisance algae blooms that have contributed to the degradation of coral reefs, one the island's most important cultural, natural and economic assets.
- Algae store and use nutrients from land-based sources for growth, resulting in flourishing blooms.
- Nutrient fueled algal blooms are a major cause of decline of coral reef ecosystems.
- Multiple nutrient sources (agriculture and urban activities, injection wells, septic tanks and cesspools) contribute to impact on coral reefs.
- The cost of nuisance algae to Maui's economy is estimated in excess of $20 million/year for the Kihei region alone, via noxious odors and reduced aesthetic values of that coast.
- An ecological shift from productive coral reef to algal beds is underway at sites around Maui

- Sources of pollutants include nutrients from agricultural and urban lands that are transported to nearshore waters where these nutrients contribute to the unusual abundances of algae.
- Another source of nutrients is treated wastewater disposed of by injection into the groundwater that then seeps into the ocean at the shoreline of popular Kihei and Kaanapali beaches and to the ocean side of the Kahului Treatment Plant. Nutrients in the injected effluent contribute to great abundances of algae at these sites.
- Algal blooms in other sites are likely sustained by nutrients from land-based fertilizers, septic tanks and / or cesspools.
- The rapid decline of coral reef ecosystems represents a crisis requiring immediate action.
- The current level of scientific understanding is sufficient to support immediate management actions.
- Treatment technologies and land management practices exist that can reduce land-based nutrient loads from these various nutrient sources.
- If we do not act now to reduce nutrient inputs from land-based sources, the algal blooms will continue, and likely become more severe as Maui's population increases.

Ample evidence to support these consensus statements exists both in the administrative record of this permit and in the scientific literature and data. (See references and information on the web at http://www.hawaii.edu/kahekili/algalworkshop.html)

I recognize that the injection wells are not the only source of nutrients causing coral decline, but they are a significant source of nitrogen and other pollutants including toxic chemical and bacteria. The Department of Health has reported that waters receiving the injection well effluents are impaired by concentrations of nitrogen that exceed water quality standards.

Comment No. 1 - Support limitations in concept

. I support in concept the injection volume/rate limitation, injection fluid limitations, the limitation of total nitrogen mass loading, the interim injection fluid limitations on fecal indicator bacteria, and the wastewater treatment requirement for attaining R-1 standards by non-chlorine disinfection. However, specific comments are submitted herein in regards to further development of these permit conditions.

Comment No. 2 – Discharges should be regulated under Clean Water Act NPDES permit

Please see my prior testimony of November 6, 2008 and the testimony of the DIRE Coalition in which compelling arguments for issuance of an NPDES permit and implementation of other aspects of the Clean Water Act (Section 401 certification) are provided. In the Statement of Basis, EPA proposes mass nitrogen limitations to minimize the potential for impacts to down gradient sources of drinking water and the environment. **Given the real and potential adverse impacts to public health and the environment, a greater level of detail should be**

provided to the public including an explanation of why the discharges are not being regulated under the Clean Water Act NPDES permits, and the technical and regulatory basis for the proposed limitations. For example, describe how the proposed injection rate limits were derived from the County injectate data or provide the technical basis for the Total Nitrogen action level of 10 mg/L.

Comment No. 3 - Part II.C. 3. Injection Volume Rate Limitation

The draft permit proposes 7.0 MGD as the average weekly injection rate and 10.0 MGD as the maximum for any one day. The Statement of Basis says the County can meet these limits based on review of last 4.5 years of flow data. It also says that the average design treatment capacity is 9 MGD if both the 1975 and 1985 sides of the plant are used and that the facility currently treats 4-6 MGD using the 1985 side only. I request that the permit limit total effluent (combined injectate and reuse flows) to the reliable plant capacity to treat to required standards. I request that the Statement of Basis or Fact Sheet describe the current plant treatment capacity and how the limits were derived, including any consideration of current plant performance data. If allowances are included for future growth or restoration of capacity from the 1975 plant, these allocations should be explicitly identified.

According to information available on the County of Maui website, "the reliable plant capacity for liquids treatment is currently approximately 4.5 mgd on an ADW basis. The estimated ADW capacity is below the average observed flow to the plant. It is probable that the plant has not had any problems meeting permit requirements because the third clarifier has been available during peak months. If it is assumed that all secondary clarifiers are in service, the maximum month capacity is 6.6 mgd, which translates to an ADW capacity of 5.5 mgd." (Schematic **Design Report Lahaina Wastewater Reclamation Facility; CH2M** HILL, **September** 20, 2006 **Project Number:** 176853.PS.02 available on the web at http://www.co.maui.hi.us/documents/Environmental%20Management/Wastewater%20Division/wwrfreport.PDF)

Comment No. 4 - Part II.C.d Injection Fluid Limitations for BOD_5 and TSS

I request that the permit limitations reflect the minimum secondary treatment standards as defined by EPA at Code of Federal Regulations (CFR) Title 40 Part 133 (40 CFR Part 133). Specifically, for composite samples, in addition to a 30-day average concentration of 30 mg/L for BOD_5 and TSS, I request a 7-day average concentration limit of 45 mg/L for BOD_5 and TSS. I request mass limitations in addition to concentration limits for BOD_5 and TSS. I request that the proposed grab sample concentration limit of 60 mg/L limit for BOD_5 and TSS be maintained. If EPA does not honor these requests, I request an explanation of why these minimum treatment standards would not apply.

According to U.S. EPA NPDES Permit Writer's Manual [PDF Format] - Chapter 5, Section 5.2, the 1972 CWA required POTWs to meet performance-based requirements based on available wastewater treatment technology that all Publicly Owned Treatment Works were required to meet by July 1, 1977. More specifically, Section 301(b) (1) (B) of the CWA requires that EPA develop secondary treatment standards for POTWs as defined in Section

304(d) (1) of the Act. Based on this statutory requirement, EPA developed secondary treatment regulations which are specified in 40 CFR Part 133. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of BOD5, TSS, and pH. Secondary treatment standards, therefore, are defined by the limitations provided in Exhibit 1

EXHIBIT 1
Secondary Treatment Standards
Parameter 30-Day /Average 7-Day Average
5-Day BOD 30 mg/l 45 mg/l
TSS 30 mg/l 45 mg/l
pH 6 - 9 s.u. (instantaneous) –
Removal 85% BOD5 and TSS –

According to 40 CFR §122.45(f), permit writers must apply these secondary treatment standards as mass-based limits using the design flow of the plant. Permit writers may also apply concentration-based effluent limitations for both 30-day and7-day average limitations.

Comment No. 5- Part II.C. 4. e Total Nitrogen Action Levels

I previously requested that the action level be lowered to 7 mg/L total nitrogen with a daily maximum effluent limitation of 10 mg/L Please provide the basis for the proposed action level of 10 mg/L total nitrogen. I request that the permit conditions include increased monitoring frequency to daily monitoring if the action level is exceeded in order that the required reporting and corrective actions take place in a shorter time frame than currently proposed.

Comment No. 6 - Part II.C. 5 Total Nitrogen Mass Limits

I support having total nitrogen mass limitations. However, I request an expedited schedule for nitrogen reductions (ie. greater reduction of nitrogen in a shorter time frame). Table 1 is a table of estimated current nitrogen mass loading to the injection wells derived from monthly average effluent total nitrogen concentration, effluent flow, and injection rates provided by County of Maui Wastewater Reclamation Department. The proposed permit has phased reduction in total nitrogen limits with the final effluent limits of 6000 lbs/ calendar month, and 15,000 per calendar quarter by December 31, 2015. The proposed permit requirements, while representing significant reductions from previously permitted loads, do not seem to propose a significant reduction in actual monthly nitrogen loads being released to the environment from the treatment plant. I request that the Statement of Basis or Fact Sheet include comparison of proposed limits to current pollutant loads, and percent reduction over current discharges**. I request that the permit include nitrogen mass limitation that cap nitrogen loads at current levels beginning on the effective data of the permit. Specifically, I request that the mass based injectate limits for total nitrogen be established such that the average nitrogen mass injected not exceed the 95th percentile of the current actual effluent loading and that the daily maximum**

nitrogen mass injected not exceed the 98th percentile of the current actual discharge level.

Table 1 Lahaina Wastewater Reclamation Facilty Total Nitrogen Load

Year	Avg Effluent /Injectate Total Nitrogen (mg/L)	Effluent Average Daily Flow (MGD)	Effluent Total Daily Nitrogen Load (lbs/day)	% injected	Injection Well Volumetric Flow Rate (MGD)	InjectateTotal Daily Nitrogen Load (lbs/day)	Annual Injectate Volume (MG)	Injectate Nitrogen Mass (lbs/yr as TN)
2006	7.38	4.74	292	74	3.49	215	1,273	78,356
2007	6.63	4.54	252	69	3.15	174	1,151	63,609
2008	6.60	4.44	205	76	3.40	187	1,239	68,217
mean	6.87	4.58	250	73	3.35	192	1,221	70,061

Permitted and Actual Discharges	7-day Average Injectate Flow (MGD)*	Daily maximum injecate flow (MGD)	Long Term AverageTN (lbs/day)***	TN (lbs/calendar month)	TN (lbs/calendar quarter)	Annual Load TN (lbs/year) ***	TN concentration (mg/L) **
Current Permit Limit **	9	19.8	no limit	no limit	no limit	no limit	10
Revised Permit Limit -effective date	7	10	318	12000	29000	116000	10
Revised Permit Limit -12/31/2011	7	10	241	9000	22000	88000	
Revised Permit Limit -12/31/2015	7	10	164	6000	15000	60000	
Current discharge level *. ***	4.58		192	5838	17515	70,061	
* average flow rate for current discharge is long term average 2006-2008							
** current permit has an action level rather than a limit for nitrogen concentration							
*** these are not permit limits they are load estimates at permitted limits or actiual discharge rates, not actual permit limits							

At the permitted 7MGD average flow, reducing nitrogen by 1 mg/L reduces load by 58 lbs/day (21,309 lbs/year)

At the permitted 7MGD average flow, reducing nitrogen by 1 mg/L reduces load by 58 lbs/day (21,309 lbs/year)

At current injectate flow of 3 MGD, reducing nitrogen by 1 mg/L reduces load by 25 pounds per day; (9132 lbs/year)

I request that mass limits be expressed as pounds per day, in keeping with pending Total Maximum Daily Load (TMDL) requirements. I request that reporting of Total Nitrogen mass be monthly rather than quarterly. I request that the permit contain a reopener clause to allow limits to be changed in the future based on a TMDL. I request EPA set a high priority on completion of TMDL studies in areas where waters may be impaired due to the injection of the Lahaina WWRF effluent.

Comment 7 PART II C.6. Interim Injection Fluid Limitations

I support the interim requirement to monitor the effluent for fecal indicator bacteria. I request that EPA require the permittee to conduct a microbial characterization of effluent to include identification of pathogens, indicator organisms, and antibiotic resistant organisms. Study should include a demonstration that effluent does not contain levels of microorganisms that are harmful to human health. This characterization should be done for effluents for any method of disposal considered (injection or reuse). This characterization is necessary to

determine if greater levels of disinfection or different indicators are needed in order to protect public health and the environment. Emerging issues include that existing disinfection technology and fecal indicators do not adequately protect against viruses, and emerging anti-biotic resistant bacteria.

According to the **Report of the Experts Scientific Workshop On Critical Research Needs for the Development of New or Revised Recreational Water Quality Criteria (EPA 823-R-07-006),** wastewater treatment/disinfection may be effective in reducing the number of these traditional fecal indicators but ineffective in reducing/inactivating some pathogens of concern (Blatchley et al., 2007). Whether the criteria are protective would depend on the effectiveness of treatment in reducing the levels of pathogens and the relative reduction in indicator organisms. According to the findings of the experts' workgroup, "Secondary wastewater treatment with chlorination could provide a false sense of security for protozoa and viruses. This reflects the higher degree of effectiveness of chlorine in killing/deactivating bacteria relative to viruses and protozoa. Given that current indicators are bacteria and would be reduced to a greater extent than viruses and protozoa, low indicator levels might suggest that waters impacted by POTWs were relatively pathogen-free when they still contained a significant virus and
protozoan load"

Blatchley, ER, III; Gong, WL; Alleman, JE; Rose, JB; Huffman, DE; Otaki, M; Lisle, JT. 2007. Effects of wastewater disinfection on waterborne bacteria and viruses. Water Environment Research 79(1): 81-92

In addition I request that a maximum chlorine residual limit be set rather than the vague "lowest possible residual chlorine". I request that the permit require injectate monitoring and reporting for total residual chlorine concentration, and that the allowable total chlorine residual not exceed sate or federal water quality criteria for the protection of aquatic life.

Comment 8 - PART II C.7. Wastewater Treatment Requirements

I support the requirement for R-1 treatment standards. I repeat previous requests that EPA require the permittee to conduct a microbial characterization of effluent to include identification of pathogens, indicator organisms, and antibiotic resistant organisms. The study should include a demonstration that effluent does not contain levels of microorganisms that are harmful to human health. This characterization should be done for effluents for any method of disposal considered (injection or reuse). This characterization is necessary to determine if greater levels of disinfection or different indicators are needed in order to protect public health and the environment. Emerging issues include that existing disinfection technology and fecal indicators do not adequately protect against viruses, and emerging anti-biotic resistant bacteria.

Comment 9 – Part II. D.3 Monitoring Frequency

BOD_5 and TSS are not included in the table of monitoring frequencies. Please clarify the proposed monitoring frequency. I request that the monitoring frequency for BOD_5, TSS, Nitrate-Nitrogen and Total Nitrogen to be three times per week. I request that monitoring frequency be once per day for fecal coliform, total residual chlorine or other indicators of disinfection process performance.

Comment 10 – Part II. D.9 Reporting Frequency

I request that all monthly data be reported monthly. I request that data reported under UIC permits be made available to the public online.

Comment 11 – Request Additional Monitoring

I request that the EPA require monitoring of groundwater and ocean waters to determine the fate and transport of pollutants released by the injection wells, and the impact of injectate on groundwater and ocean water quality. The monitoring wells should be adequate to delineate the effluent plume. This is necessary to demonstrate protection of the Underground Source of Drinking Water (USDW) under the Lahaina Treatment Plant (per the Statement of Basis and 1994 initial permit application), as well as shallow brackish water that may in the future be used as a source of drinking water with reverse osmosis treatment. In addition the monitoring wells will provide information needed to determine the level of treatment needed to protect uses (aquatic life, recreation) in nearshore waters.

Comment 12 – Compliance with State Water Quality Standards

EPA did not provide response to a number of requests and issues raised by my comments on the original permit including requests for an NPDES permit, aquatic toxicity testing, and compliance with coastal zone management policy. I request that EPA demonstrate in the record of decision how the permit limits and conditions ensure that the injectate does not cause or contribute to exceedances of state water quality standards. There are documented water quality impairments in which the injection well effluents are implicated as a cause. It is the duty of EPA and the permittee to demonstrate that this permit is not in violation of state water quality standards.

Comment 13 – Permit Term and Compliance schedule

I request that the permit be limited to a five year term. and include the following schedule of compliance.

Effective data of permit meet following limits:

- Mass limitation of nitrogen at current levels (daily average not to exceed 95th percentile and daily maximum not to exceed 98^{th} percentile of current actual mass discharge rate;
- Concentration limit of 7 mg/L daily average (current actual concentration level);
- Bacterial monitoring and limits that meet R-2 standards

Within 1 year from effective date:

- Submit a plan for achieving total nitrogen reduction to meet end compliance goals.
- Submit a complete effluent characterization meeting the requirements of an NPDES permit application; and additionally characterizing the effluent concentration of any pollutants for which there are state water quality standards, including toxic chemicals. Method detection limits should be sufficiently sensitive to measure at water quality criteria concentration levels. (This data will be necessary for a full assessment of the reasonable potential for the discharge to cause or contribute to ongoing documented impairment and nonattainment of state water quality standards.)

Within 3 years of effective date:

- Achieve a 25% reduction in total nitrogen mass limits

Within five years of effective date

- Achieve a 50% reduction in total nitrogen load

Closing

Please expedite the issuance of a permit that is protective of water quality that supports designated uses of recreation, aquatic life support, and coral reef conservation. Thank you for your time and attention to these matters. Please notify me of your decision by email at wqcinc@hawaii.rr.com.

Best regards,
Robin S. Knox
728A Kupulau Dr.
Kihei, HI 96753

September 21, 2009

U.S. Environmental Protection Agency
Ground Water Office (WTR-9)
75 Hawthorne Street
San Francisco, CA 94105

ATTN: Nancy Rumrill

RE: Comments on Revised Draft Lahaina, HI WWRF UIC Permit Number HI50710003

Dear Ms Rumrill:

I am providing comments herein regarding the referenced Underground Injection Control (UIC) Permit that U.S. Environmental Protection Agency (EPA) has proposed issuing to the applicant, County of Maui for the Lahaina Wastewater Reclamation Facility (WWRF).

Introductory remarks

Experience and Qualifications of the Commentor

My name is Robin S, Knox and I am a water quality professional. My testimony is on behalf of myself, however I believe I am uniquely qualified to provide you with a perspective that incorporates the concerns of many stakeholders, and recommendations founded on best use of available scientific knowledge and traditional wisdom My testimony and recommendations are based on my specific knowledge and experience applicable to the development of the Lahaina permit including a Bachelor of Science degree in Agriculture and Environmental Health; graduate studies in environmental engineering; three years research experience using nitrogen stable isotopes to trace nitrogen in coastal environments, five years experience as a wastewater permit writer, water quality modeler and water quality planner; and 20 years experience providing water quality consulting and Clean Water Act compliance services to private sector, non-governmental organizations, and state, federal, and local governments.

For the past three years I have been living and working on the Island of Maui. I have been actively engaged in research of land-based pollution including identifying impacts and means of monitoring, assessment and control. For the past year I have been working with the University of Hawaii doing research sponsored by the Hawaii Coral Reef Initiative. Working extensively within the community of Maui Island, I have gained an understanding of the existing water quality conditions and how people and resources are impacted. I have both learned from and provided technical support and education to a wide range of stakeholders including Maui Nui Marine Resources Council, Maui Tomorrow Foundation, South Maui Sustainability Group, West Maui Preservation Association, Pacific Whale Foundation, Surfrider, Coral Reef Alliance, Digital Bus, the DIRE Coalition, Honolua Bay Coalition, West and Central Maui Soil and Water Conservation Districts, NOAA Hawaiian Islands Humpback Whale National Marine Sanctuary, US Army Corps of Engineers, Department of Health (DOH) Environmental Planning Office, Department of Land and Natural Resources, Division of Aquatic Resources (DAR), County government (including Office of the Mayor, County Council, General Plan Advisory Council, Planning Department and Planning Commission)

and private sector real estate development corporations. These experiences provide me with a perspective that includes not only science and regulation, but an understanding of the larger ecological and cultural context of these decisions.

It is my hope that the perspective and recommendations I offer will be of benefit to all parties affected by these decisions. I want to thank the EPA for having two public hearings and a public information meeting to facilitate public participation in this process. It is truly inspirational to see laws being implemented with input and direction from the citizens who are impacted by the decisions.

This Permit in Larger Context

I understand that the Environmental Protection Agency (EPA)'s decision is primarily regarding the protection of drinking water under the authority of the Safe Drinking Water Act; and that EPA must have appropriate authority and rational basis for its permit decisions. However, I believe to effectively fulfill its mission of environmental protection, EPA needs to view this permit in a larger context and take actions both within the permit, and within other programmatic jurisdictions to require adequate environmental protection of human health and natural resources on Maui Island. The larger context means maintaining a viewpoint of the reality of interconnectedness of manmade and natural ecosystems systems and not allowing bureaucratic boundaries to create an illusion of separation. In the cultural context of the ahupua'a system of land management, the interconnectedness of the land and water are recognized. The ocean and the coral are honored, revered, nurtured and sustained for the benefit of all; in return healthy coral ecosystems sustain our island and fisheries. Traditional approaches include use of prohibitions (kapu) or limits to protect resources.

Management approaches developed under the Clean Water Act also recognize this interconnectedness and provide methods to control land-based pollution to support desired uses of the water. The approaches can be consistent whether the receptor to be protected is human health or aquatic life; whether the use is drinking water protection or aquatic life protection. These management approaches rely upon controlling the mass of pollutants entering the waterbodies such that the concentration of materials in the waterbody supports the designated (desired and legally protected) use. By aligning overall ecological concepts and management approaches, requirements protective of drinking water under the SDWA can also be aligned with programs to protect the overall physical, chemical, and biological integrity of the nations' waters under the CWA.

A close analysis of the factual scientific, legal, and regulatory evidence submitted into the record of decision for this permit establishes that 1) the wastewater injectate includes pollutants such as nutrients, pathogens, and toxic substances; 2) the wastewater injectate is reaching the nearshore ocean waters; 3) the wastewaters are not required to be disinfected prior to injection therefore pose a threat to water resources, both for both drinking water and recreational uses; 4) the nearshore waters receiving injectate have experienced use impairment including nuisance algal blooms, declining coral health; and declining fisheries; 5) the DOH has reported such impairments to EPA and to Congress and; DOH or EPA are required to take

actions including establishing total maximum daily loads for pollutants causing impairments; 6) the demonstrated interconnectedness of the injectate disposal to use impairment provides the nexus for requiring a National Pollutant Discharge Elimination System permit and water quality-based effluent limits as required by the Clean Water Act; and 7) there are other sources of the pollutants in question that may contribute to impairments; and 8) EPA cannot issue a UIC permit that does not comply with provisions of the Coastal Zone Management Act, Executive Orders protecting coral reefs and the Clean Water Act. (See comments of the Dire Coalition submitted by Jeffrey Schwartz).

EPA must act timely to issue the renewed permit because failure to act authorizes the continued discharge under the current permit authorization with no limits on nitrogen mass loading or requirements for bacterial monitoring or disinfection; such an authorizations would not be lawful in that it allows continuation of practices that are causing current use impairments, in violation of the state water quality standards, Clean Water Act requirements, and Coastal Zone Management Act requirements. There are many questions regarding the level of pollutant control needed that cannot be resolved at this time, however EPA must move forward now with a management decision that is protective of water resources.
In doing so it may be useful for EPA to model the UIC requirements after those established in the NPDES program. It is frequently the case in the development of NPDES permits that all information needed to establish a water quality-based limit does not exist. In such cases, interim limits are established, and permit conditions and other actions are put in place to resolve data gaps. In this way both immediate action and need to address uncertainty are addressed. EPA must move forward to act based on what we do know rather than justify inaction based on what we don't know. I propose that EPA issue the permit with the following features:

1. Cap nitrogen mass load at current actual discharge levels on effective date of permit;
2. Require actual 50% reduction by effective date of permit plus five years;
3. Require submittal of a nitrogen mass reduction plan by effective date of permit plus one year; or alternatively information to support establishment of alternative mass limitation; reduction goals and plan to achieve those goals;
4. Require bacterial monitoring and attainment of R-1 treatment standards as proposed in the revised draft permit.

In the specific comments section below, I propose interim limits based on what is known from a simple analysis of readily available data. More sophisticated analyses can be performed if data are available. Specific guidance on writing water quality-based permit limits can be found U.S. EPA NPDES Permit Writer's Manual [PDF Format]. and in the Technical Support Document for Water Quality-based Toxics Control, found on the web at http://www.epa.gov/npdes/pubs/owm0264.pdf.

Specific Permit Terms and Conditions

I support in concept the injection volume/rate limitation, injection fluid limitations, the limitation of total nitrogen mass loading, the interim injection fluid limitations on fecal indicator bacteria, and the wastewater treatment requirement for attaining R-1 standards by non-chlorine disinfection. Specific comments are submitted herein in regards to further development of these permit conditions. By reference I refer you to my previously submitted testimony on these matters. This testimony is to amend, not replace any prior testimony. I request that all questions raised and specific requests made in this and prior testimony be specifically addressed in the permit rationale (Fact Sheet of Statement of Basis) that accompanies the final permit decision.

Comment No. 1 – Limit nitrogen mass to current levels beginning effective date of permit

We know that current levels of wastewater injection contribute approximately 192 lbs per day on average of total nitrogen to the groundwater environment. (See table 1 – Estimate based on data provided by County of Maui). We know that the algae are growing on sewage effluent and that their growth can be stimulated by sewage additions. We know that this is not the only source, but that the combined total of all sources of nitrogen contributing to ocean waters are exceeding standards and impairing uses. Clearly loading from the sewage source and possibly other sources must be decreased. EPA's revised draft permit proposes nitrogen mass limit reductions that do not represent real reductions over current discharge levels at the end of the compliance schedule (2015), and in fact would allow increases in nitrogen loading over current levels in the interim. Table 2 provides a comparison of estimated current pollution load to EPA proposed limits. I am requesting that the permit not allow any increases over current nitrogen levels and include nitrogen reductions in future years (see comment 2).

Table 1 Lahaina Wastewater Reclamation Facility Total Nitrogen Load

Year	Avg Effluent /Injectate Total Nitrogen (mg/L)	Injection Well Volumetric Flow Rate (MGD)	InjectateTotal Daily Nitrogen Load (lbs/day)	Injectate Total Nitrogen Mass (lbs/ month)	Injectate Total Nitrogen Mass (lbs/quarter)	Annual Injectate Volume (MG)	Injectate Total Nitrogen Mass (lbs/yr)
2006	7.38	3.49	215	6,530	19,589	1,273	78,356
2007	6.63	3.15	174	5,301	15,902	1,151	63,609
2008	6.60	3.40	187	5,685	17,054	1,239	68,217
mean	6.87	3.35	192	5,838	17,515	1,221	70,061

Table 2 Comparison of Current Discharges to Proposed and Requested Nitrogen Mass Limitations

Description	CURRENT DISCHARGE Total Nitrogen lbs/calendar month	CURRENT DISCHARGE Total Nitrogen lbs/calendar quarter	EPA PROPOSED LIMITS Total Nitrogen lbs/calendar month	EPA PROPOSED LIMITS Total Nitrogen lbs/calendar quarter	REQUESTED LIMITS Total Nitrogen lbs/calendar month	REQUESTED LIMITS Total Nitrogen lbs/calendar quarter
Current Discharge	5838	17515				
Effective Date of Permit			12000	29000	6000	18000
December 31, 2011			9000	22000	6000	18000
December 31, 2015			6000	15000	3000	9000

Comment number 2 – Reduce nitrogen load limits

We know that the current level of nitrogen reaching ocean waters from all sources are too high to attain state water quality standards; and that sewage injection at the Lahaina WWRF contributes nitrogen to the groundwater where it seeps into the nearshore environment, and contributes to harmful algal blooms that impair aquatic life and recreational uses. We also know that nitrogen discharges to underground sources of drinking water should be limited to protect human health and attain drinking water quality criteria.

EPA must limit the overall mass of nitrogen released through injection in addition to setting concentration limits. Setting only a concentration limit at the drinking water criteria level as a policy to attain the criteria is under protective unless one assumes that all discharges are less than the criteria, and that the releases are completely mixed in the environment prior to encountering a receptor. Even this approach does not actually protect groundwater quality, but rather allows degradation of water quality and increasing nitrate concentration up to the point where the water would no longer be acceptable for drinking water use. We know that these assumptions cannot be supported. We know from the Statement of Basis for the permit that the wastewater is not thought to be completely mixed within the aquifer. The wells create a buoyant plume of wastewater effluent below an underground source of drinking water, and in the vicinity of even more shallow future drinking water supplies; nitrogen could be accumulating in these sources of water supply.

EPA must limit and reduce from current levels the total mass of nitrogen discharged to groundwater in order to protect the underground sources of drinking water for current and future generations. Continued discharges for a ten year permit term at the current daily nitrogen mass loading rate would introduce more than 700,000 pounds of nitrogen into the aquifer, potentially increasing the nitrogen mass and concentration in the sources of drinking water supply. I request a 50% reduction from current actual discharge rates as shown in Table 2.

Comment No 3. Require Fate and Transport Studies

According to the Statement of Basis, the precise path and movement of the plume has not been determined. The applicant should be required to provide information regarding the fate and transport of nitrogen, pathogens, and other pollutants released with injected wastewaters. This information at a minimum should include: groundwater monitoring to determine pollutant concentrations and groundwater quality upgradient and downgradient of the treatment plant; monitoring and mathematical modeling to identify the extent of the wastewater plume and potential for impact to current and future underground sources of drinking water The applicant should identify the mass transport and fate of the materials injected into the groundwater answering questions such as, "How much of the nitrogen injected is denitrified (goes to nitrogen gas) in groundwater or benthos; how much reaches the ocean; what is the mass and concentration of nitrates reaching our drinking water supply?" EPA has a duty to develop permit conditions that are protective of water quality, the applicant has a duty to demonstrate that the activity they are seeking to permit does not pose a reasonable potential to cause or contribute to exceedances of water quality standards.

Comment No. 4 - Part II.C. 3. Injection Volume Rate Limitation

The draft permit proposes 7.0 MGD as the average weekly injection rate and 10.0 MGD as the maximum for any one day. Documentation was previously submitted citing 5.5 MGD as the reliable dry weather capacity of the plant (see my comments dated June 23, 3009). Data provided by County of Maui (personal communication from Scott Rollins December 4, 2008 – See Attachment 1) indicate that the Lahaina Daily Wastewater Plant Flows have ranged from 4.140 MGD to 4.910 MGD. Injectate flows are less than total plant effluent flows, (averaging 3.35 MGD for the period 2006-2008) so an average injectate limit of 5.5 MGD should be achievable.

I request that the injectate volumetric flow rate be limited to 5.5 MGD average weekly injection rate and 7.0 MGD as the maximum for any one day. These levels represent a reduction over currently proposed permit limits, but should be achievable (based on information provided by County of Maui.) Please provide a technical rationale for any alternative limits (including those currently proposed) that compares the actual current plant effluent and injectate flows to the proposed limits.

Comment 5 - PART II C.6. Interim Injection Fluid Limitations and. PART II C.7. Wastewater Treatment Requirements

I support the interim requirement to monitor the effluent for fecal indicator bacteria I support the requirement for R-1 treatment standards no later than December 31, 2011. The urgent need

for bacterial monitoring and injectate disinfection is supported by testimony submitted August 20, 2009 by marine microbial ecologist Melissa Garren (Scripps Institution of Oceanography) who reported preliminary findings that Lahaina injectate had high abundances of bacteria, and that freshwater seeps (known to contain nitrogen from a sewage source) and injectate exhibited a large percentage of culturable bacteria, even in the presence of antibiotics. It was also reported that "bacteria injected into wells have the potential to grow in the saline environments".

Comment No. 6 – Permit Reopener clause.

I request that the permit contain a reopener clause to allow modification of permit limits in the future if needed based on results of TMDLs, wastewater plume delineation, reasonable potential analysis, or other assessment of fate and transport that supports development of final water quality-based effluent limitations.

Other Actions by EPA and DOH

In keeping with the need to address the bigger picture of protection of water resources and aquatic life, I request that the EPA underground injection control program administrators request that the EPA and Hawaii Department of Health (DOH) Clean Water Act administrators assign the Lahaina area receiving waters as the highest priority for water quality assessment and TMDL development. A TMDL is necessary in order that EPA and the county be adequately guided in determining final water quality-based effluent limits that are supportive of attaining designated uses and water quality standards.

I also request that the EPA and DOH require County of Maui to apply for an NPDES permit and provide adequate information in the application to allow a demonstration that continued injection well discharges would not represent a reasonable potential to cause or contribute to violations of state water quality standards.

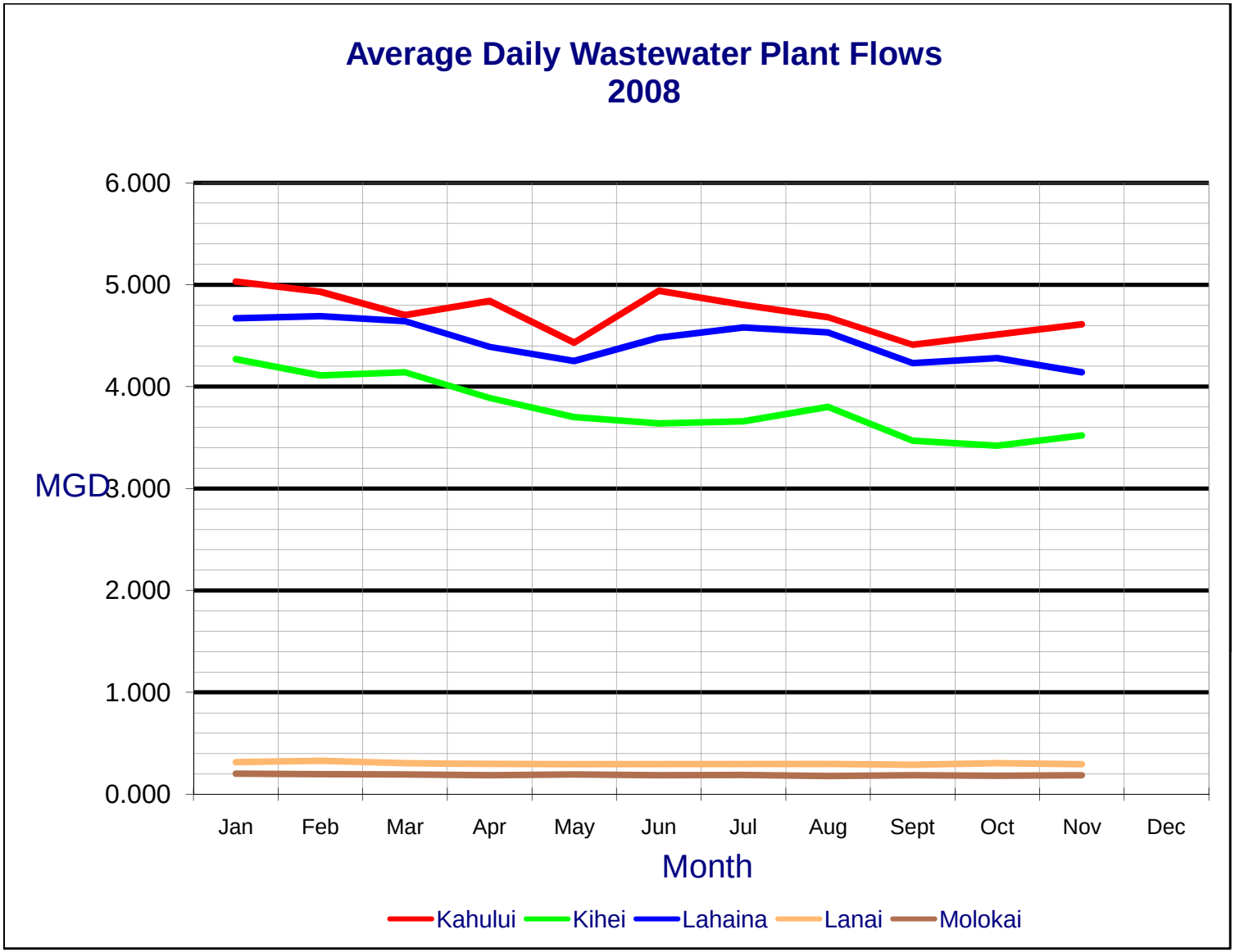
Closing

Thank you for your time and attention to these matters. Please notify me of your decision by email at [redacted]

Best regards,
Robin S. Knox
728A Kupulau Dr.
Kihei, HI 96753

2008 AVERAGE DAILY FLOWS

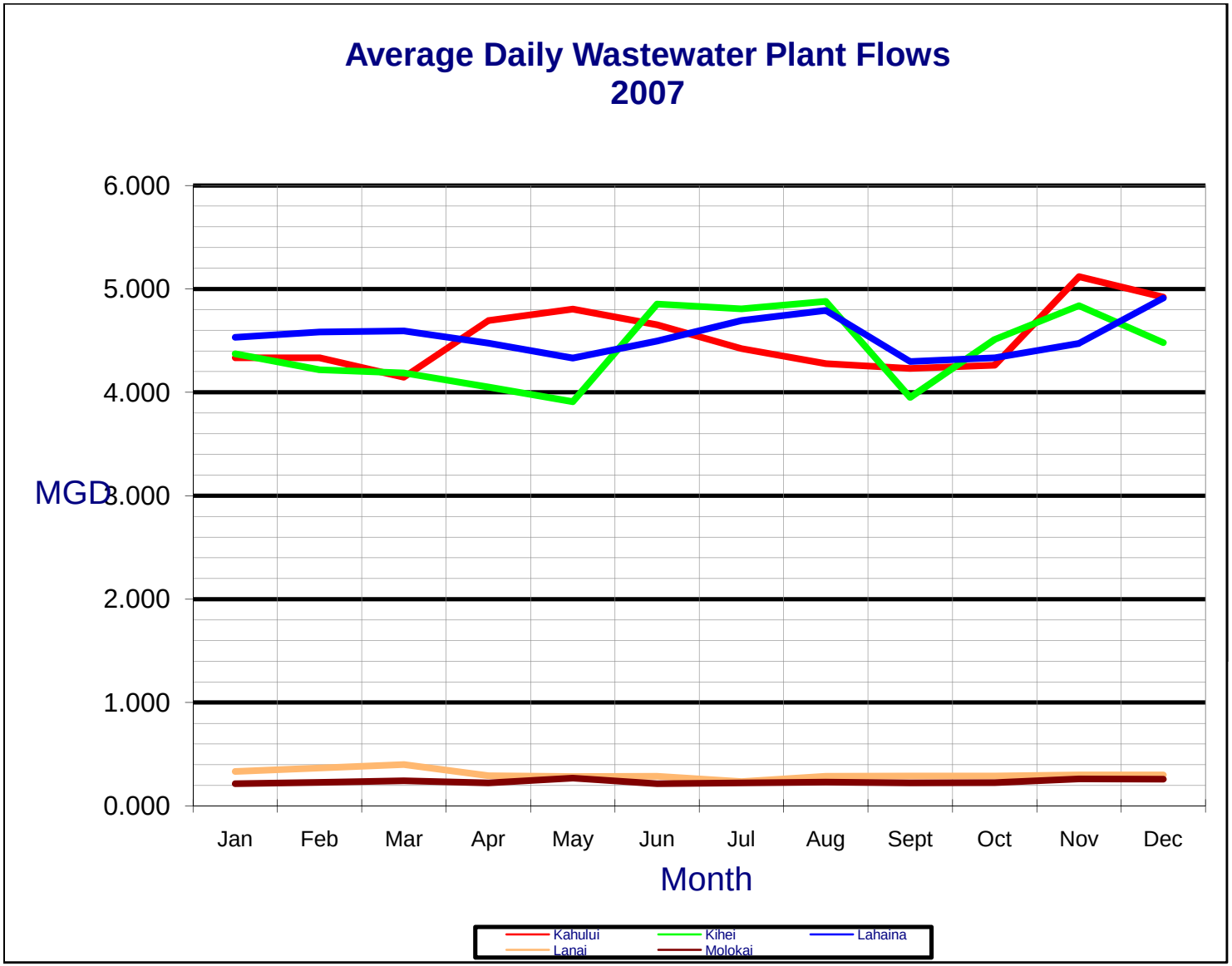
WWRF	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average (MG/D)
Kahului	5.030	4.930	4.700	4.840	4.430	4.940	4.800	4.680	4.410	4.510	4.610		4.72
Kihei	4.270	4.110	4.140	3.890	3.700	3.640	3.660	3.800	3.470	3.420	3.520		3.78
Lahaina	4.670	4.690	4.640	4.390	4.250	4.480	4.580	4.530	4.230	4.280	4.140		4.44
Lanai	0.315	0.328	0.307	0.299	0.295	0.299	0.296	0.298	0.291	0.307	0.297		0.30
Molokai	0.203	0.197	0.195	0.187	0.195	0.186	0.190	0.179	0.187	0.181	0.186		0.19
TOTAL (M	14.5	14.3	14.0	13.6	12.9	13.5	13.5	13.5	12.6	12.7	12.8	0.0	13.44



Note that flows are taken from the OP10 data

2007 AVERAGE DAILY FLOWS

WWRF	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Average (MG/D)
Kahului	4.334	4.334	4.145	4.694	4.803	4.651	4.420	4.276	4.230	4.260	5.117	4.920	4.52
Kihei	4.370	4.216	4.186	4.050	3.908	4.853	4.807	4.878	3.949	4.509	4.836	4.480	4.42
Lahaina	4.532	4.583	4.593	4.475	4.330	4.495	4.694	4.791	4.297	4.333	4.473	4.910	4.54
Lanai	0.334	0.368	0.402	0.294	0.286	0.287	0.236	0.289	0.291	0.290	0.300	0.300	0.31
Molokai	0.216	0.228	0.245	0.224	0.269	0.217	0.224	0.230	0.224	0.226	0.261	0.260	0.24
TOTAL (M	13.8	13.7	13.6	13.7	13.6	14.5	14.4	14.5	13.0	13.6	15.0	14.9	14.02



Note that flows are taken from the OP10 data