STATEMENT OF BASIS
FOR THE U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION IX
CLASS V UNDERGROUND INJECTION CONTROL PERMIT # HI50710003
MAUI COUNTY, DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Facility Information

Name and Address of Owner:

County of Maui, Wastewater Reclamation Division
Department of Environmental Management
200 South High Street
Wailuku, Maui, HI 96793

Location of Facility:

Lahaina Wastewater Reclamation Facility
3300 Honoapiilani Highway
Honokowai, Lahaina, Maui, Hawaii 96761-9413

Contacts:

Dave Taylor, Wastewater Reclamation Division Chief
County of Maui, Department of Environmental Management
2200 Main Street, Suite 100
Wailuku, Maui, Hawaii 96793
Phone: (808) 270-7421

Cheryl K. Okuma, Esq., Director
County of Maui, Department of Environmental Management
2200 Main Street, Suite 100
Wailuku, Maui, Hawaii 96793

Regulatory Contact

Nancy Rumrill, Environmental Engineer
United States Environmental Protection Agency, Region 9
Ground Water Office, WTR-9
75 Hawthorne Street
San Francisco, CA 94105
Phone: (415) 972-3293
email: Rumrill.Nancy@epa.gov

I. Purpose of the Statement of Basis

EPA has prepared this Statement of Basis for the revised draft permit to be issued to the County

of Maui, Department of Environmental Management (the County) to operate the four Class V injection wells at their Lahaina Wastewater Reclamation Facility (the LWRF or facility). Pursuant to the Underground Injection Control (UIC) regulations in 40 CFR § 124.7, the purpose of the Statement of Basis is to describe the principle facts and considerations that went into preparing the draft permit. To meet these objectives, this Statement of Basis describes the facility, the draft permit history, and the revised permit conditions for this draft permit.

In a prior action, EPA public noticed a draft permit on August 24, 2008, with a Statement of Basis supporting that draft permit. Because of a significant degree of public interest in the draft permit, EPA extended the public comment period until November 6, 2008 and held a public hearing to hear public statements, pursuant to the public involvement regulations in Title 40, Section 124.12 of the Code of Federal Regulations (CFR). In consideration of the public comments, EPA revised the draft permit to incorporate new conditions. EPA also obtained additional information concerning the proposed use of groundwater in the area.

II. Facility Description

The County owns and operates the Facility. The LWRF provides secondary treatment to domestic wastewater with advanced effluent sand filtration. The facility has two parallel treatment plants, one built in 1975, and the second added in 1985. The average design treatment capacity is 9 million gallons per day (mgd), if both the 1975 and 1985 sides are used. The facility currently treats approximately 4-6 mgd using the 1985 side only. The facility disposes of most of the treated wastewater into four (4) gravity fed Class V injection wells. Total injection volume into the UIC wells averages about 3 to 5 mgd.

Approximately 1 mgd of treated wastewater is reclaimed to R-1 quality, pursuant to Hawaii State Regulations § 11-62-26, by the addition of ultraviolet disinfection. Reclaimed water to R-1 quality means that it is treated to sufficiently filter and disinfect the wastewater of bacteria and viruses for it to be used safely to water areas frequented by people (such as lawns, parks, and golf courses). This reclaimed wastewater is reused at the plant and distributed to a nearby golf course, pineapple company, and to construction contractors.

Underground Sources of Drinking Water

Upon review of the facility area, EPA believes that the injectate will not impact any public or private drinking water wells located up gradient of the plant. Potable ground water is typically tapped in the upland areas of the Lahaina District. The injection wells are approximately 1500 to 1900 feet from the shoreline of West Maui at about 30 feet mean sea level (msl) elevation. There are public and private drinking water wells located on the mountain slopes up gradient of the plant, with the nearest well about 2.4 miles away at an elevation of around 900 feet msl.

Rainfall recharges ground water in the higher elevations and a layer of fresh ground water, called a basal lens, floats on saltwater in the unconfined aquifer flowing toward the ocean. This aquifer is also known as the basal aquifer. Information provided in a letter from the County dated April

7, 1994 for the initial permit application delineates the Underground Source of Drinking Water (USDW) below the LWRF. A USDW is defined at 40 CFR § 144.3, in relevant part, as an aquifer or its portion which contains a sufficient quantity of ground water to supply a public water system and contains fewer than 10,000 mg/l total dissolved solids (TDS). According to the information provided by the County, the TDS of the aquifer was estimated at less than 10,000 mg/l between 28 to 95 feet bgs (approximately 28 feet bgs is the top of the water table). Therefore, a USDW is located above the injection zone at approximately that depth. The total depth of the wells is 180 to 255 feet.

The geology into which treated effluent is injected consists of highly permeable basalt lava flows. Some of the lava rock formation above the injected effluent may be less permeable, but can be fractured. Injection of treated wastewater effluent at the wells is expected to form a plume within the aquifer, extending from the wells to the coast. TDS at 180 feet was reported as 32,228 mg/l, similar to sea water. The injected effluent has a TDS of approximately 900 to 1500 mg/l. Because the injected effluent is less dense than the receiving water in the aquifer, the effluent plume will rise buoyantly. The plume will have a tendency to float up toward the basal aquifer of lesser TDS. However, while these plume migration scenarios are our understanding of the hydrology in the area, the precise path and movement of the plume has not been conclusively determined.

Although the coastal area is typically not used to sink drinking water wells, a pumping well is proposed approximately one-quarter mile southwest of the LWRF injection wells. The proposed well is planned to be located at 10 feet msl to a total depth of 210 feet. This well is expected to be pumping salt water to use primarily in a cooling system. A fraction of the pumped water would be put through a reverse osmosis system for potable use. This proposed use of groundwater in the area is an important consideration in protection of groundwater for human consumption.

Therefore, to protect the USDW and ground water that is currently planned to be used for potable water, EPA is proposing conditions in the draft permit to encourage greater reuse, reduce total nitrogen and minimize pathogens in the injected effluent. The proposed conditions will also address the main concerns brought to our attention in the previous public comment period.

III. Draft Permit Background

The UIC permit for the LWRF expired on June 12, 2005. The County had a duty to reapply and obtain a new permit, as required by 40 CFR § 144.51(b), to continue their injection activities. Because the County submitted a timely and complete application for renewal, pursuant to 40 CFR § 144.37, the conditions of the expired permit continue in force until the effective date of a new permit.

EPA issued the original final UIC Permit to the County on March 15, 1995, and a revision to that final permit on June 11, 1996. In 1999, EPA issued a permit modification for the UIC permit which finalized injection flows at 9.0 mgd (average) for any calendar week and 19.8 mgd for any

day, and a total nitrogen action level at 10 mg/l.

Regulatory Authority

This proposed permit will be issued pursuant to the Underground Injection Control (UIC) provisions of the Safe Drinking Water Act (SDWA) of the U.S. Environmental Protection Agency (EPA), codified at Title 40 of the Code of Federal Regulations (CFR), Parts 124, 144, 146, 147, and 148. The renewed permit will have a new number HI50710003 and will be issued for a period of 10 years (unless the permit is terminated for reasonable cause pursuant to 40 CFR 144.40). EPA will review the permit every five years to determine whether it should be modified, revoked and reissued, terminated, or a minor modification made as provided in 40 CFR 144.39, 144.40, and 144.41.

IV. Specific Permit Conditions

The following sections describe the new proposed conditions of the draft permit, which will ensure protection of ground water and the public health. The proposed conditions place new injection rate, fluid concentration, and mass loading limitations on the County. In addition, the proposed conditions will require interim and future compliance for more stringent requirements on wastewater treatment. The County will also have to demonstrate compliance with new monitoring and reporting conditions for the new contaminant limits.

Well Operation

Injection Rate Limitation

The injection rate limits in the existing permit are based on maximum treatment capacity of the plant, and are set at an average injection rate to not exceed 9.0 mgd for any calendar week, and a maximum injection rate to not exceed 19.8 mgd for any one day. The County currently operates at average injection flow rates of between 3-5 mgd.

EPA is proposing a change from these maximum capacities to an average injection rate of 7.0 mgd for any calendar week and a maximum rate of 10.0 mgd for any one day. The County can reasonably meet these injection rates based on review of the LWRF historical operating flows for the past four and a half years.

The County may submit a new permit application in the future to request an increase in their injection rate. Limiting the operating flows to the present values will allow EPA the opportunity to review such requests for a permit modification and to consider the potential impact to ground water and public health in association with any increase in the injection quantity. Increases to higher injection flows without adequate EPA review of additional impacts may increase the chance of harm to the environment and/or public health.

Injection Fluid Limitations

The County's existing permit already has conditions to limit Biochemical Oxygen Demand

(BOD_5) or Suspended Solids to 60 mg/l for any grab sample. EPA is proposing to add limits for either BOD_5 or Suspended Solids to not exceed 30 mg/l based on the arithmetic average of the results of the analyses of composite samples taken within a 30 consecutive calendar day period. The County is required to comply with these conditions under the Hawaii State Department of Health rules. Therefore, EPA proposes to make the requirement in the federal permit consistent with the existing State requirements.

EPA is proposing to add a Nitrate concentration limit of 10 mg/l, which is the maximum contaminant level (MCL) drinking water standard to protect the USDW from this contaminant.

The total nitrogen action level will not be changed in this proposed permit. EPA finalized the total nitrogen action level in June, 1999, by permit modification. The total nitrogen action level of the injectate is 10 mg/l. If the action level is exceeded, then the County will have to correct the problem. Because nitrates are a component of the total nitrogen, this condition will help prevent an exceedence of the nitrate limit.

Total Nitrogen Mass Loading Limits

EPA is proposing total nitrogen mass loading limits for the injected effluent in the revised draft permit to minimize the potential for impacts to down gradient sources of drinking water and the environment. The County will have to comply with limits of 12,000 pounds of Total Nitrogen per calendar month and 29,000 pounds of Total Nitrogen per calendar quarter. These limits are considerably lower than the maximum potential nitrogen load that the County could discharge under the existing permit's requirements. However, the County can reasonably meet the proposed limits based on EPA's review of historical operating data.

EPA is also proposing for the County to reduce their total nitrogen mass loading by approximately 25 percent by December 31, 2011. The condition in the draft permit gives the County until this future compliance date to meet the mass loading limits of 9,000 pounds of Total Nitrogen per calendar month and 22,000 pounds of Total Nitrogen per calendar quarter. The County is already able to meet this reduced mass limit a majority of the time based upon review of the historical operating data. EPA anticipates that the County will comply with these mass loading reductions through greater nitrogen removal and/or more reuse.

Lastly, EPA is proposing for the County to reduce their total nitrogen mass loading by approximately 50 percent by December 31, 2015. Specifically, the proposed limits are 6,000 pounds of Total Nitrogen per calendar month and 15,000 pounds of Total Nitrogen per calendar quarter. These limits can feasibly be met through greater reuse of treated effluent, enhanced nitrogen removal efficiencies, and/or water conservation and infiltration reduction programs to reduce inflow to the treatment plant.

EPA considered that nitrogen from the injected effluent can accumulate in the ground water and can be a health risk if used for potable water. In addition, information presented during the public comment period and the public hearing indicates that the effluent plume travels with ground water to the coastal water and contributes to nitrogen loading in the near coastal environment. Evidence has shown that nitrogen is a nutrient for algae growth in the coral reef

environment and can be detrimental to the near coastal environment. These proposed limits will therefore ensure that the injection activity is protective of USDWs and public health while also minimizing the environmental impact that the injection plume may have on the coastal water.

Interim Injection Fluid Limitations

EPA is proposing a new permit condition for the injected effluent setting a fecal coliform concentration limit to protect the ground water and the USDWs. The County will have to meet a concentration of 100 MPN (most probable number) of fecal coliform per 100 ml. For chlorination disinfection, the County will be required to operate the chlorination process to achieve the lowest possible residual chlorine while still complying with the permit limit for Fecal Coliform Bacteria.

This permit term is necessary to establish a quantitative pathogen reduction standard, which has not previously been in place for this facility, in order to protect ground water quality and public health. Although the injection fluid is currently exposed to some chlorination, the intent is not to achieve a particular level of disinfection. Rather, the County adds chlorine to the wastewater treatment process to prevent biofouling in the injection wells. This interim condition will ensure that the injection fluid is disinfected to an adequate level to protect ground water and USDWs from pathogens in the waste stream.

Wastewater Treatment Requirement

In addition, to ensure adequate disinfection of the injectate for protection of ground water quality and USDWs, while facilitating maximum levels of water reuse, EPA is proposing a permit condition to require by December 31, 2011, that all injection fluid be treated to R-1 standards by non-chlorine disinfection as specified in the Hawaii State Regulations § 11-62-26 (c) (1), (d)(1), and (e). This proposed condition will also allow the best level of waste water disinfection, if disposed of through injection, to protect down gradient groundwater and the coastal environment.

While the primary basis for this condition is to comply with pathogen reduction standards in potential drinking water sources, EPA believes the use of ultraviolet disinfection will allow the County to increase over time the percent of wastewater from this facility that is reclaimed for beneficial use. Moreover, since the LWRF was initially constructed as a reclamation facility, using federal grant money, EPA finds it appropriate to place reasonable conditions in the permit that will shift practices at LWRF from injection to higher levels of reuse.

Monitoring and Reporting of Results

Injection Fluid Analysis

The parameters table in the permit has been updated to include the new parameter concentrations and mass loading values to ensure that the County demonstrates compliance through monitoring of the parameters.

Reporting of Results

EPA has included a condition for the County to report quarterly on their status to meet the future compliance dates.

Reporting of Noncompliance

Twenty-four Hour Reporting

EPA has included in the 24 hour reporting condition in the draft permit that the County shall report to the EPA by telephone if they have a fecal coliform exceedence or R-1 quality is not met for the injected fluids within 24 hours from the time the County becomes aware of the circumstances.