



**STATE OF HAWAII
DEPARTMENT OF HEALTH
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RATIONALE: APPLICATION FOR RENEWAL OF UNDERGROUND INJECTION CONTROL (UIC) PERMIT

PERMITTEE: COUNTY OF MAUI (COM), DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

**FACILITY: LAHAINA WASTEWATER RECLAMATION FACILITY (LWRF)
FACILITY IDENTIFICATION NO. 6-5641.01**

FACILITY ADDRESS

Lahaina Wastewater Reclamation
Facility
3300 Honoapiilani Highway
Lahaina, HI 96761

PERMITTEE MAILING ADDRESS

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Department of Environmental
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This Rationale includes the legal requirements and technical rationale that serve as the basis for the requirements of the draft permit.

A. Permit Information

1. UIC Permit No. UM-1357 became effective on February 25, 1986 - February 24, 1991; administratively extended to October 1, 1992; renewed October 2, 1992 – October 1, 1995; administratively extended to June 27, 1996; renewed June 28, 1996 – June 27, 1999; administratively extended to December 27, 1999; renewed March 29, 2000 – March 28, 2004; current permit issued on March 29, 2004 and expired on March 28, 2009. The Permittee reapplied for a UIC permit renewal on September 26, 2008. The Hawaii Department of Health (DOH) administratively extended the UIC permit three (3) times for periods of six (6) months each and four (4) times for periods of one (1) calendar year each, pending the reapplication process. The permit has been administratively extended to September 28, 2015.

The Permittee also applied for the replacement of Injection Well Nos. 1, 3 & 4 on November 2, 2009. DOH has not acted on this application.

2. The Director of Health (Director) proposes to issue a permit to discharge to underground injection wells and has included in the proposed permit those terms and conditions which are necessary to carry out the provisions of Hawaii Revised Statutes (HRS), Chapters 91 and 340E and Hawaii Administrative Rules (HAR), Chapters 11-23 and 11-54.

B. Facility Setting

1. Facility Operation and Location

Lahaina Wastewater Reclamation Facility (LWRF) is operated by the County of Maui (COM), Department of Environmental Management.

LWRF is located at 3300 Honoapiilani Highway, Honokowai, Lahaina, Maui; at Tax Map Key No. 2:4-4-002:029; at latitude 20°56'55" N and longitude 156°41'25"W; Facility Identification No. 6-5641.01.

LWRF's injection well description:

Injection Well No.	1	2	3	4
Elevation	30 feet	30 feet	25 feet	26 feet
Diameter	20 inches	20 inches	20 inches	20 inches
Depth	200 feet	180 feet	225 feet	255 feet

2. UIC Line

The LWRF is located below (makai of) the UIC Line (red line on figure below).



3. Summary of Existing Injection Limitations

a. Injection Characteristics

Injectant from LWRF is limited to secondary treated domestic wastewater effluent, as described in HAR, Section 11-62-26 of Title 11, Chapter 62, "Wastewater Systems."

b. Injection Limitations and Prohibitions

Injectant is exclusively limited to the injectant described in the injection characteristics; furthermore, any injectant not described in the injection characteristics is explicitly prohibited unless the injectant characteristics of the permit are revised accordingly.

There shall be no discharge into the injection wells of hazardous wastes as defined by Title 40, Code of Federal Regulations (CFR), Part 261.

Injection Pressure is limited to gravity flow of the injectant into the injection wells.

Injection Quantity and Rate into Injection Well Nos. 1, 2, 3, & 4 is initially limited to the wastewater treatment plant design average flow of 9,000,000 gallons per day (gpd) for every calendar week and the design maximum disposal quantity of 19,800,000 gpd for every day.

The concentrations of the injectant for Biochemical Oxygen Demand (BOD₅) shall not exceed 30 milligrams per liter (mg/l) based on the arithmetic average of the results of the analyses of composite samples. In no case shall any grab sample exceed 60 mg/l of BOD₅.

The concentration of the injectant for Suspended Solids shall not exceed 30 mg/l based on the arithmetic average of the results of the analyses of composite samples. In no case shall any grab sample exceed 60 mg/l of suspended solids.

c. Lahaina Tracer Study results

The “Executive Summary” of the June 2013 “Lahaina Groundwater Tracer Study, Lahaina, Maui, Hawai‘i: Final Report,” University of Hawaii stated that:

“In sum, our results conclusively demonstrate that a hydrogeologic connection exists between LWRF Injection Wells 3 and 4 and the nearby coastal waters of West Maui. Eighty-four days following injection, FLT tracer dye introduced to these wells began to emerge from very nearshore seafloor along North Kaanapali Beach, approximately 0.85 km (0.5 miles) to the southwest of the LWRF. As proposed by Hunt and Rosa (2009), our results substantiate the conclusion that due to geologic controls that include a hydraulic barrier created by valley fills to the northwest, the main wastewater effluent plume from the LWRF travels obliquely towards the southwest. An estimated 64 percent of the Well 3&4 effluent follows this route and discharges at coast. The peak concentration of the FLT dye occurred 9 to 10 months following injection, with an average transit time of approximately 15 months. Since the treated wastewater plume is broad, the injectate [injectant] travel time takes from about three months to arrive, to over an estimated four years for the draining trailing edge fully exit the coast. During this time, there is significant loss of nitrogen due to extensive denitrification and other suboxic to anoxic microbial degradation processes fueled by a sustained supply of organic matter transport within by effluent plume. The release of dissolved phosphorus, on the other hand, is relatively enriched. The treated wastewater discharges from the seafloor mixed with other marine and fresh waters predominantly as diffuse flow (>90%), but also through a patchwork of hundreds of very small (ca. 5 cm²) submarine springs. This central discharge

area occurs as two adjacent clusters of diffuse flow and springs with a combined total seafloor area of 2,300 m². The emerging waters appear well mixed in the nearshore zone and, being relatively warm and brackish, spread over an area visible by thermal infrared imaging that covers an ocean surface area more than 167 acres in size. The lateral distribution of the FLT tracer dye agrees well with the lateral limits of the ES-4 anomalously warm ocean surface water plume detected by air. These conclusions drawn from both the Interim Report and this Final Report are summarized and discussed below.”

4. Compliance Summary

Several environmental groups have filed a lawsuit against COM, arguing that the COM's injections into the groundwater through injection wells at LWRF violate the Clean Water Act (CWA) because they are discharging pollutants to coastal waters of the United States without a National Pollutant Discharge Elimination System (NPDES) permit. On May 30, 2014, Judge Susan Oki Mollway of the United States District Court, determined, based on the record before her, that the groundwater beneath LWRF functioned as a “conduit” of pollutants discharged by COM through the UIC into coastal waters. Judge Mollway concluded that COM's discharge of pollutants into the aquifer beneath LWRF without an NPDES permit violates the CWA. The record before Judge Mollway included information from the June 2013 “Lahaina Groundwater Tracer Study, Lahaina, Maui, Hawai'i: Final Report” (Tracer Study). The Tracer Study concluded that effluent discharged into Injection Well Nos. 3 & 4 was detected at two (2) submarine seep clusters (seeps). The Judge relied on evidence that more than half of the effluent made its way “relatively rapidly” into the ocean. Effluent discharged into Injection Well No. 2 was not detected. Phosphorus measured at each seep is approximately 0.4-0.5 mg/l. The phosphorus regulatory limit is 20 ug/l (0.02 mg/l). Nitrogen concentration levels were just below the nitrogen regulatory limit of 150 ug/l (0.15 mg/l). This UIC permit will consider Water Quality Standards under HAR, Chapter 11-54 in determining future compliance.

On November 15, 2012, DOH received COM's NPDES application for LWRF. DOH has not completed the review of the NPDES application and has not to date required COM to take any specific corrective action to address the pollutants emitted at the seeps. DOH has been reviewing the evidence and deciding how best to address the emission of pollutants to coastal waters at the seeps. DOH has continued the submarine seep monitoring after the Tracer Study was completed. The monitoring data show that there are changes to the injectant as it moves from the bottom of the injection well to the seeps. Pollutants discharged from the injection well are mixed with the groundwater, diluted and, to some extent, treated as they move through the subsurface. Nitrogen levels emitted at

the seeps have varied over time even while the injectant levels were relatively constant. Based on post-study seep monitoring data, nitrogen at times exceeded the 0.15 mg/l regulatory limit with results in the approximate range of two (2) to six (6) mg/l. Therefore, DOH has added nitrogen as a pollutant to be addressed in the permit. These facts should be considered in issuing a permit that properly controls the discharge of pollutants into the coastal waters.

COM, as regulated by DOH, has direct control over what is injected through the injection wells and only indirect impact on what is emitted at the seeps. DOH's UIC regulations require compliance with other rules, laws, and regulatory programs. HAR, Sections 11-23-11(c), 11-23-16(a), and 11-23-18(b). HAR, Section 11-23-11(d) gives the Director the ability to set limitations on injection quantity and quality. DOH has decided to issue a UIC permit to COM that will limit the volume of wastewater injected through the injection wells and therefore limit the discharge of pollutants into the coastal waters at the seeps. The permit requires continued monitoring so DOH can determine in the future whether additional control measures are needed to protect coastal waters.

C. Applicable Plans, Policies, and Regulations

1. Hawaii Administrative Rules, Chapter 11-23, Underground Injection Control

On July 6, 1984, HAR, Title 11, Department of Health, Chapter 23 became effective (hereinafter HAR, Chapter 11-23). HAR, Chapter 11-23 was amended and compiled on November 12, 1992. HAR, Chapter 11-23 was last amended on October 21, 2000 to add Section 11-23-24, Timely processing. HAR, Chapter 11-23 establishes standard permit conditions and requirements for UIC permits issued in Hawaii.

HAR, Section 11-23-01, states, "The purpose of this chapter is to establish a state underground injection control (UIC) program in order to protect the quality of the state's underground sources of drinking water (USDW) from pollution by subsurface disposal of fluids. Toward this end, conditions are specified to govern the location, construction and operation of injection wells so that injected fluids do not migrate and pollute USDW."

A UIC permit is required for LWRF by HAR, Section 11-23-11 (a) which states, "No injection well shall be operated, modified or otherwise utilized without a UIC permit issued by the department."

HAR, Section 11-23-11 (c) states, "All injection wells shall be operated in such a manner that they do not violate any of the department's administrative rules under title 11, Hawaii Administrative Rules, regulating various aspects of water quality and pollution, and chapters 342-B, 342-D, 342-F, 342-H, 342-J, 342-L, and 342-N, HRS. The rules include, without limitation: (1) Chapter 11-20, "Rules

Relating To Public Water Systems,” (2) Chapter 11-54, “Water Quality Standards,” and (3) Chapter 11-62, “Wastewater Systems.”

The Director is authorized to set permit limits under HAR, Section 11-23-11(d), which states, “[t]he operation of all injection wells shall also conform to any limitations on quantity and quality of the injected fluid as are deemed appropriate by the director for the purposes of this chapter.”

LWRF’s injection activity has been allowed under HAR, Section 11-23-16(a) which states, “The director shall issue a UIC permit for wells which propose to inject into exempted aquifers on the following basis: (1) Existing or new injection wells do not or will not endanger the quality of underground sources of drinking water. (2) Existing or new injection wells are designed and are or will be constructed or modified to operate without causing a violation of these rules or other applicable laws. (3) Proposed injection wells are designed and built in compliance with the standards and limitations stated in sections 11-23-07 to 11-23-10.”

HAR, Section 11-23-18 (b) states, “If the operation of the injection well or wells is additionally regulated by other pollution control programs, e.g., National Pollution Discharge Elimination System (NPDES), the adherence to their monitoring and reporting requirements shall be considered a requirement of this chapter.”

2. Hawaii Administrative Rules, Chapter 11-54, Water Quality Standards

On November 12, 1982, HAR, Title 11, Department of Health, Chapter 54 became effective (hereinafter HAR, Chapter 11-54). HAR, Chapter 11-54 was amended and compiled on October 6, 1984; April 14, 1988; January 18, 1990; October 29, 1992; April 17, 2000; October 2, 2004; June 15, 2009; October 21, 2012; and the most recent amendment was on December 6, 2013. HAR, Chapter 11-54 establishes beneficial uses and classifications of state waters, the state anti-degradation policy, zones of mixing standards, and water quality criteria that are applicable to the Pacific Ocean seaward of LWRF.

This draft permit considers the requirements of HAR, Chapter 11-54.

D. Rationale for Injection Limitations and Prohibitions

- 1. Limit injection flow volume, for all injection wells, to the current daily average of 3,500,000 gallons per day (gpd) effective on the permit issuance date.**

This restriction is designed to immediately prevent the emission of pollutants at the seeps from getting worse while COM prepares to reduce its injections. DOH

will not allow any increase in overall injection flow volume to occur from all of the injection wells.

2. Reduce injection flow volume limit at Injection Well Nos. 3 & 4 to 1,750,000 gpd after one (1) year from permit issuance date.

The Tracer Study concludes that effluent discharged into Injection Well Nos. 3 & 4 was the source of effluent detected at the seeps. Reducing the injection flow volume at Injection Well Nos. 3 & 4 is expected to reduce the concentration of effluent at the seeps.

3. Reduce injection flow volume limit at Injection Well Nos. 3 & 4 to 875,000 gpd after three (3) years from permit issuance date.

Similar to Condition 2's rationale, the continued reduction of injection flow volume into Injection Well Nos. 3 & 4 may further reduce the concentration of effluent detected at the seeps. The step-reductions will also help DOH evaluate the effectiveness of regulating discharge quantity for each well set, Nos. 1 & 2 and Nos. 3 & 4, and for the entire injection well system. Having a two (2) year period between injection flow volume reductions will allow the reduction's effect to be measured and confirmed. DOH will use this information to evaluate if further injection flow volume reductions are needed or if permit conditions need to be modified.

E. Rationale for Monitoring and Reporting Requirements

1. Increase Type I effluent quality monitoring requirement from once every 12 months to once every month.

Type I monitoring consists of test parameters that measure wastewater treatment effectiveness. Effluent quality monitoring will be increased to provide more data to validate adequate wastewater treatment during the specific monitoring periods. Reduction of the Type I testing frequency will depend upon the DOH approved course of action outlined in the Phosphorus and Nitrogen Management Plan (PNMP).

2. Increase Type II effluent quality monitoring requirement from once every 12 months to once every month.

Type II monitoring consists of test parameters related to nutrient concerns such as phosphorus and nitrogen. Effluent quality monitoring will be increased to provide more data to compare with the results of the seep monitoring. Reduction of the Type II testing frequency will depend upon the DOH approved course of action outlined in the PNMP.

F. Rationale for Conditions

1. Operating Conditions

The Permittee shall comply with DOH Standard UIC permit conditions and additional requirements as set forth herein which are included as part of the draft permit.

2. Monitoring and Reporting Conditions

The Permittee shall comply with DOH Standard UIC permit conditions and additional requirements as set forth herein which are included as part of the draft permit.

3. Management Conditions

The Permittee shall comply with DOH Standard UIC permit conditions and additional requirements as set forth herein which are included as part of the draft permit.

4. General Conditions

The Permittee shall comply with all monitoring and reporting requirements included in the draft permit and in the DOH Standard UIC permit conditions.

5. Other Conditions - Special Studies and Additional Monitoring Requirements

DOH is requiring COM to submit a Submarine Seep Monitoring Plan (SSMP) within 90 calendar days from the permit issuance date. The SSMP must continue the testing protocols established in the Tracer Study to measure pollutants at the seeps. COM must start monitoring the seeps within 180 calendar days from the permit issuance date.

Seep monitoring will measure the effectiveness of the corrective actions and will determine compliance. Because the US District Court based their decision on the groundwater quality data from the Tracer Study, the groundwater sampling protocol established in the Tracer Study is required to be continued in the SSMP to keep the data consistent with data that has already been collected. Cessation of seep monitoring will depend upon the DOH approved course of action outlined in the PNMP.

To address the requirements of HAR, Sections 11-23-11 (c), 11-23-16 (a), and 11-23-18 (b), DOH is requiring COM to develop and implement a PNMP within two (2) years of permit issuance date.

Compliance as measured at the seeps may be achieved through other means than flow reduction. DOH is seeking the best available options to address compliance. The PNMP should produce an appropriate course of action agreeable to DOH. The actions stemming from the PNMP will likely become conditions in future UIC permit(s).

G. Public Participation

Although this facility is not an underground source of drinking water (USDW), the DOH has determined that this UIC permit shall follow the public notice requirements of HAR, Section 11-23-14.

Persons wishing to comment upon or object to the proposed draft UIC permit in may submit their comments in writing either in person or by mail, to:

Safe Drinking Water Branch
Environmental Management Division
Department of Health
State of Hawaii
919 Ala Moana Boulevard, Room 308
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