

## **FACT SHEET**

for the U.S. Environmental Protection Agency's  
Modification of Puna Geothermal Venture's  
Underground Injection Control  
Class V Geothermal Permit #HI596002

### Location:

Puna Geothermal Venture  
14-3860 Kapoho-Pahoia Road  
Pahoia, Hawaii, 96778

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### I. Purpose of the Fact Sheet

Pursuant to the Underground Injection Control (UIC) regulations in Title 40, Part 124.8 of the Code of Federal Regulations (CFR), the purpose of this fact sheet is to briefly describe the principle facts and considerations that went into preparing the proposed modifications to the subject permit.

### II. Permit Action

Pursuant to 40 CFR §§ 144.39 and 144.41, EPA has determined that the permit modifications requested by PGV represent a major modification of the permit, which necessitates issuance of a Draft Permit for public notice and comment, in accordance with 40 CFR part 124 requirements. Only the proposed modifications to the existing permit are subject to comment (see 40 CFR §144.39).

### III. Permit Modifications

#### *"Major" versus "Minor" Modifications*

Modifications to a UIC permit must be requested by the Permittee (PGV) according to 40 CFR § 144.39. The distinction of a "major" permit modification is any modification that does not meet the criteria of a "minor modification" as defined in 40 CFR § 144.41. EPA has determined that the modifications requested by PGV and being proposed in the Draft Permit are "major" and therefore these must be presented for the public's examination and an opportunity for the public to submit any comments or questions on these proposed modifications. EPA is presenting the modifications in red-highlighted text within the Draft Permit for easier identification of the proposed permit changes.

#### *Redrill Operations*

This Draft Permit would authorize PGV to perform redrill operations on Well KS-11 and apply the generic redrill operations on other injection wells. The redrill operations proposed within the Draft Permit are specific to Well KS-11, but also apply generally to all injection wells in the field. The proposed redrill operations are relatively common in the geothermal industry, and can minimize potential impact on the geological sequence of fresh water formations which occur at shallower depths nearer the surface. The use of a single hole for deep redrilling minimizes the surface "footprint" and reduces the number of penetrations that are begun from the surface. The redrilling is carried out by systematically plugging off the lower portion of the existing hole, then subsequently drilling out a new portion of the lower hole in a different direction from the previously plugged portion. The newly "redrilled" portion of the hole is finished by installing protective casing in that newly drilled hole. While there are numerous reasons for carrying out redrilling operations, the most common one is "premature breakthrough of fluids" which Well KS-11 is experiencing. Premature breakthrough causes a problem when the fluids that are injected do not undergo enough of a circuitous path through the geothermally-heated injection zone to be adequately heated before being produced back to the surface from a producing well. This has the effect of generating less electricity, since the amount of electricity generated is proportional to the amount of heat the produced water contains. PGV has requested to redrill Well KS-11 into a portion of the hot geothermally-heated rock that is not so directly connected to the production wells.

The "Generic" description of redrilling operations applies to any future injection wells that are determined to be redrill candidates. The generic operations do not appreciably differ in principle from those specific to Well KS-11, however, the Draft Permit requires PGV to supply well-specific plans for any future redrill operations in advance for EPA approval. Since EPA is providing notice and an opportunity for public comment on these specific procedures now, implementation of any of these activities, as authorized by this permit, will be handled as a minor permit modification and require pre-notification of EPA and adherence to all other terms and conditions of the permit.

### *Well Conversion*

The Draft Permit also clarifies that the term "conversion" as used in this permit refers to either converting an injection well to non-injection or converting a non-injection well to injection. For example, Well KS-4 was previously authorized to inject, but is currently a producing well after EPA granted approval for PGV to convert it from injector status in November 2006. KS-13 is currently an injection well after EPA granted approval for PGV to convert it from producer status in February 2006. It is common in the geothermal industry to have individual wells perform such multiple functions. The EPA requires that these changes in functions be documented so that the wells are compliant with applicable regulations and that their current operating status is known. The Draft Permit now reflects that there are four injection wells authorized for operation.

### *Scale Control*

It is common in a geothermal field to implement various techniques of scale control measures. It is also sometimes necessary to employ mechanical removal operations requiring a rig as appropriate for the development of this geothermal field for efficiently generating electrical power. Removal operations are expected to occur at various times in the life of the geothermal field. Procedurally, these operations will be quite similar each time they occur. A description of these operations is provided in the Draft Permit, and EPA proposes to authorize such operations at any injection well, subject to advance notice.

### *Financial Assurance*

PGV will submit revised or supplemental financial assurance for the total amount of \$1,761,000, which is the updated estimate of costs for a third party to plug and abandon the four existing injection wells. The permit requires PGV to annually demonstrate financial responsibility. Prior to the construction of a new injection well or conversion of an existing well to injection, the financial assurance mechanism shall be modified to reflect the additional cost of plugging and abandoning the additional well.

### *Duration of the Permit*

The proposed permit modification would not extend the term of PGV's existing permit. Rather, PGV's modified permit will remain effective for a period of ten (10) years from its original effective date of May 16, 2006, therefore until May 16, 2016.

## IV. Public Participation

Pursuant to 40 CFR 124.10, the public is being given thirty (30) days to review and comment on the modifications to the permit. The Draft Permit with modifications highlighted in red text, the public notice, and this fact sheet are available at the following locations:

Pahoa Public Library  
15-3070 Pahoa-Kalapana Road  
Pahoa, Hawaii 96778-7714  
(808) 965-2171

Hilo Public Library  
300 Waianuenue Road  
Hilo, HI 96720  
(808) 933-8888

and at the EPA Region 9 San Francisco Library at 75 Hawthorne Street, San Francisco, CA 94105.

The aforementioned documents are also available on EPA's website at:  
<http://www.epa.gov/region9/water/groundwater/uic-permits.html>.

The public is being notified of this thirty-day public comment period by publication of a notice on July 26, 2009, in the Hawaii Tribune-Herald, in Hilo, Hawaii.

The public comment period begins on July 26, 2009 and ends on August 25, 2009. During this period, all written comments on the Draft Permit can be sent, faxed, or emailed to George Robin using the contact information listed on the first page of this fact sheet. George Robin is also available by phone for any questions regarding the Draft Permit.

A request for a public hearing may be made during the 30-day comment period. It should be in writing and should state the nature of the issues proposed to be raised at the hearing. A public hearing will be held only if significant interest is shown (see 40 CFR §§124.11 and 124.12).

All persons, including the applicant, who object to any condition of the Draft Permit or EPA's decision to prepare a Draft Permit must raise all reasonably ascertainable issues and submit all reasonable arguments supporting their position by the close of the comment period (see 40 CFR §124.13). The public comment period shall automatically be extended to the close of any public hearing on this permit, and may also be reopened if such reopening could expedite decision making (see 40 CFR §§124.12 and 124.14).

## V. Final Decision Making Process

After the close of the public comment period, EPA will review and consider all comments relevant to the UIC permit and application. A response to comments will be sent to the applicant and each person who has submitted written comments or requested notice of the final permit decision. The response to comments will contain: a response to all significant comments on the draft permit; EPA's final decision; any permit conditions that are changed and the reasons for the changes; and procedures for appealing the decision. The final decision shall be to either issue or deny the modifications to the permit. The final decision shall become effective no sooner than thirty (30) days after the service of the notice of decision. Within thirty (30) days after the final permit decision has been issued, any person who filed comments on the Draft Permit, participated in any Public Hearing on this matter, or takes issue with any changes in the Draft Permit, may petition the Environmental Appeals Board to review any condition of the permit decision.

Commenters are referred to 40 CFR §124.19 for procedural requirements of the appeal process. If no comments request a change in the Draft Permit, the permit shall become effective immediately upon issuance (see 40 CFR §124.15).

#### VI. Additional Information

For additional information regarding EPA's draft modifications to the UIC permit, please contact George Robin at (415) 972-3532 or toll-free at (866) EPA-WEST, or via email at [robin.george@epa.gov](mailto:robin.george@epa.gov).