

**Lightning Dock Geothermal (HI-01) LLC
Project
Class V Injection Well 53-07
(GTHT-001)**

**G-112 Form
OCD Santa Fe Office
Conditions of Approval
(3/19/2013)**

1) **G-104 Form:** The operator shall submit a final G-104 Form with all other associated G-Form information (i.e., G-105, G-106 and G-107) with required logs and well test information (19.14.55.8 NMAC) for this G-112 submittal (19.14.63 NMAC and 19.14.93 NMAC) to OCD for approval prior to Injection into Well 53-07.

2) **Water Quality Sampling Plan:** The operator shall provide a water quality sampling plan (plan) to OCD for approval prior to injecting any produced geothermal fluid into Well 53-07. The operator shall comply with OCD's approved ASTM sample procedure(s) with environmental water quality sampling and analytical laboratory testing that complies with EPA Quality Assurance/Quality Control (QA/QC) and Data Quality Objectives (DQOs).

The operator shall sample for the constituents specified in Tables 1 through 3 of its Discharge Permit (GTHT-01) using the specified methods. The operator shall collect environmental water quality samples from Production Well 45-07 before, during and just before the end of well testing. Injection Well 53-07 shall be sampled before and immediately at the end of well testing. During Production Well 45-07 well testing, the operator shall collect a sample and notify the OCD within 24-hours of discovery whenever daily production well field testing water quality parameters (i.e., temperature, oxidation/reduction, pH and Specific Conductivity) vary by +/- 25%. The operator shall request permission from each water supply well owner (see Table 3 of GTHT-01 to allow the operator to conduct water quality testing, including the analytes and methods specified in Tables 1 through 3, water quality analyte suites, and monitor well static water-levels during testing to help assess the capacity of the reservoir to sustain production of geothermal fluids for the extraction of heat and any heat loss observed during well testing.

3) **Water Quality Sample Method:** When sampling for WQCC DP parameters, the operator shall sample any Production Well 45-07, Injection Well 53-07, and Water Supply Wells utilizing ASTM E-947-83 (Standard Specification for Sampling Single-Phase Geothermal Liquid or Steam for Purposes of Chemical Analysis) whenever possible.

4) **Water Quality Monitoring Parameters:** The operator shall monitor for the analyte suites listed in Tables 1 through 3 as specified in Condition of Approval 2 (COA 2) above. The operator shall assess the potential for the effluent from any Production Well 45-07 into Injection Well 53-07 to adversely affect ground water quality at any place of withdrawal for the present or reasonably foreseeable future in water supply wells located within one-half mile from Injection Well 53-07. OCD may require the operator to implement corrective action(s) if water quality exceeds the greater of the WQCC ground water standards specified at 20.6.2.3103 NMAC or background at any place of withdrawal of ground water for the present or reasonably foreseeable future use. The operator shall conduct operations in such manner so as to protect fresh water and in a manner consistent with the requirements specified in GTHT-01.

- 5) **Water Quality Background:** The operator shall obtain ground water quality data from any Production Well ~~45-07~~ and Injection Well 53-07 as specified in COAs 2 through 4 to help determine background geothermal reservoir water quality conditions.
- 6) **Correlative Rights:** The operator shall monitor the geothermal reservoir for sustainable production well capacity for the long-term extraction of heat to efficiently produce power, prevent waste and protect correlative rights of nearby geothermal lease owners sharing the reservoir. The operator shall implement commercially reasonable efficient geothermal engineering power generation design, operations, and environmental best management practices to address applicable regulations and to prevent pollution.
- 7) **Geothermal Waste:** The operator shall minimize geothermal waste of heat from geothermal reservoir fluids treated and/or stored at surface, and prevent the reinjection of unfiltered-high turbidity cooled geothermal reservoir fluids treated and/or stored at surface back into the reservoir. "Geothermal Waste" includes the inefficient, excessive, or improper management of reservoir thermal fluid production, use, or dissipation of geothermal fluid heat (e.g., transporting or storage methods that cause or tend to cause unnecessary surface heat loss of the geothermal resource, and/or reinjection of cold reservoir fluids back into the geothermal reservoir resulting in inefficient and/or decreased geothermal reservoir temperature(s)). In addition, the operator shall not locate, space, construct, equip, operate, produce, or vent any well in a manner that results or tends to result in unnecessary heat and/or evaporative losses or in reducing the ultimate economic recovery of geothermal resources.
- 8) **Water Evaporation:** The operator shall accurately monitor and estimate evaporation losses (See COA 12) to the water resource(s) including, all geothermal production fluid evaporative losses from surface management operations to ensure that its water rights are adequate to replace the net loss of the ground water resources due to its surface fluid management operations. Surface fluid management operations may include annual production well testing, well work over, repair, maintenance, and/or anytime geothermal reservoir fluids are exposed to ambient air conditions.

The operator shall monitor the in-flow/out-flow rate(s) and fluid level in ponds/pits to maintain adequate free board, prevent overflow, and to detect leaks and spills. The operator shall record evaporation fluid loss volumes and shall total cumulative losses from in ponds/pits at least daily during well testing. The operator shall report pond/pit volumes daily to OCD during well testing.

The operator shall report to OCD when evaporative losses from surface management of produced geothermal fluids exceed the operator's available water rights during well testing and/or during geothermal operations. This may constitute a "Resource Impairment" determination by OCD. OCD may require the operator to submit a "Water Replacement Plan" (See COA 12) to resolve the situation. The operator shall conduct annual production well testing as specified in GTHT-1. Operator shall provide information on to verify that the size and extent of the geothermal reservoir as specified in GTHT-1 has the capacity to produce geothermal fluids at the 250 degree Fahrenheit bottom hole temperature and that geothermal fluids production is sustainable during production to prevent termination of the OCD project permit(s) (See Section 14).

- 9) **Mechanical Integrity Testing Initial Reporting:** The operator shall submit an initial G-103 Sundry Notice for an injection well Mechanical Integrity Test (MIT) before initial injection into Injection Well 53-07 to be witnessed and approved by the OCD, and OCD shall be given an opportunity to witness the MIT.

The operator shall ensure that the UIC Class V Geothermal Injection Well 53-07, MITs performed subsequent to well workover, unless it occurs after the 4th year, since the last EPA MIT, shall not

disrupt the 5-year MIT schedule. In general, the well shall be tested every 5-years regardless of well workover MITs conducted between the required EPA MIT 5-year MIT schedule. The operator may proceed at its own risk when attempting to perform an MIT with external equipment on the well head, i.e., BOPE, which could be the cause of a well MIT failure.

10) Mechanical Integrity Testing Subsequent Reporting: The operator shall submit a subsequent G-103 Sundry Notice to report MIT results for OCD approval in accordance with COA 9 above and prior to injection into Well 53-07 (19.14.54.8C(2) NMAC).

If OCD does not witness the MIT, the Operator shall submit the original MIT chart with required information, test type, witness signatures, and chart recorder calibration information with MIT chart for approval prior to injecting into a well. This submittal shall start of the OCD Underground Injection Control (UIC) Program 5-Year MIT injection well monitoring schedule. The operator shall file a G-103 Sundry Notice in a timely manner whenever an injection well is no longer needed as an injection well. OCD may modify GTHT-01 when this occurs. The operator shall submit a new G-112 Form shall be filed with the OCD for approval if the same well is needed for use as an injection well at a later date. OCD may again modify GTLT-01 if this occurs.

For injection wells under completion, the operator may submit a Cement Bond Log (CBL) and Casing Integrity Test (CIT) performed during and/or after Well 53-07 completion to the OCD attached to a "Subsequent" G-103 Form to satisfy the MIT requirement prior to injection into Injection Well 53-07.

11) OCD Discharge Permit (GTHT-001): The operator shall ensure that any OCD approved G-104 and G-112 Permits shall also comply with the terms and conditions of GTHT-01. The operator shall request a minor "Modification" to the permit for any changes to its permit to include any new and/or removed existing UIC Class V Geothermal injection/disposal well(s) prior to commercial power production operations and/or as needed at least 30-days in advanced of plans for OCD approval.

~~**12) Water Replacement Plan (WRP):** The operator shall furnish OCD information sufficient to demonstrate that its proposed plan(s) and/or any modified plan(s) of operation will not result in a "diversion" of ground water beyond water rights owned or leased by the operator, and that water temperature at the location from which the water will be produced is greater than 250 degree Fahrenheit bottom hole temperature. Bottom hole temperature shall mean the highest temperature measured in the well or bore hole, and is normally attained directly adjacent to the producing zone, and commonly at or near the bottom of the borehole.~~

~~This information shall include the information specified by The Office of the State Engineer (OSE) and shall be submitted to the OCD in order that OSE may render an opinion inclusive of a reasonable share of reservoir production and/or rate, allocation and/or equitable apportionment of ground water (to the operator) as can be practically determined (practically produced without waste, that is substantially in proportion to the quantity of recoverable geothermal resources under the landowner/leaseholder property relative to the total recoverable geothermal resources in the geothermal reservoir system) for the OCD pursuant to NMSA 1978 Section 71-5-2.1 as to whether a "Water Replacement Plan(s) - WRP" is necessary based on available water rights and planned extraction and injection operations.~~

~~In the event that OSE (a) opines that a WRP is necessary, (b) declines to opine, or (c) the temperature of produced water is less than 250 degree Fahrenheit, in which case, all Production Well 45-07 operations (and/or all applicable project production well locations) shall be subject to OSE Jurisdiction. The operator shall also continue to comply with all applicable OCD Jurisdictions.~~

13)12) Applicable Regulations: The operator shall comply with the terms and conditions of GTHT-01, the Geothermal Resources Conservation Act (Chapter 71, Article 5 NMSA 1978, and OCD's Geothermal Regulations (Title 19, Chapter 14 NMAC). The operator shall comply with the applicable sections of Water Quality Control Commission Regulations (20.6.2.5000 – 5006 NMAC) while any Underground Injection Control (UIC) Class V Geothermal Injection and/or Disposal Wells are being used as injection wells. The operator shall ensure that all of its geothermal field activities comply with the applicable provisions of 20.6.2 NMAC and 20.6.4 NMAC.

14)13) Termination of Injection Authority: The operator shall comply with the above Conditions of Approval or OCD may after notice and hearing (or without notice and hearing in event of an emergency, subject to the provision of NMSA 1978 Section 71-5-17) terminate the operator's injection permit.

Disclaimer: Please be advised that OCD's approval does not relieve Los Lobos Renewable Power, L.L.C. from responsibility if their operations pose a threat to ground water, subsurface trespass, water supply/diversion, surface water, human health or the environment. In addition, OCD approval does not relieve Los Lobos Renewable Power, L.L.C. of responsibility for compliance with any other federal, state, or local laws and/or regulations.