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8 **STATE OF CALIFORNIA**
9 **NATURAL RESOURCES AGENCY**
10 **DEPARTMENT OF CONSERVATION**
11 **GEOLOGIC ENERGY MANAGEMENT DIVISION**

12 **ORDER TO PERFORM REMEDIAL WORK**

13
14 **No. 1435**

15 **Operator: Amedee Geothermal Venture I (AGVI)**

16 **Field: Amedee**
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I. Introduction

The State Oil and Gas Supervisor (**Supervisor**), acting through the Geologic Energy Management Division (**CalGEM**), and under the authority of Division 3 of the Public Resources Code (**PRC**) (commencing with PRC section 3700) and title 14 of the California Code of Regulations (**Regulations**), may order tests and remedial work concerning geothermal resource operations which, in the Supervisor's judgment, are necessary to prevent damage to life, health, property, and natural resources. (PRC, §§ 3712, 3714, and 3741; Regulations, § 1954.)

Based on CalGEM's records, Amedee Geothermal Venture I (**Operator**) is the operator of the wells identified in **Attachment A**, incorporated herein (**the Wells**), and the appurtenant facilities (as defined in Regulations sections 1920.1 and 1954) (**the Facilities**). As described in more detail below, CalGEM has determined that there has been an ongoing and interconnected series of uncontrolled discharges of geothermal fluids at and around the "NorCal" 2 well (API No. 0403590075), which if not addressed has the potential to make remediation and/or plugging and abandonment of the well dangerous or infeasible to complete. In addition, CalGEM has reason to believe that the integrity of the "NorCal" 2 well may be compromised and contributing to the occurrence of the discharges. Leaks and other uncontrolled well releases could present a risk of harm to life, health, property, and natural resources. (See PRC, §§ 3739 and 3740; Regulations, §§ 1935, 1952.) Generally, a geothermal well that has demonstrated the integrity of its cement and casing does not pose such a risk. Although Operator has employed some mitigation measures to address the uncontrolled discharges, CalGEM believes Operator has failed to take every reasonable effort and endeavor to prevent future occurrences. (See PRC, §§ 3739 and 3740.)

Therefore, pursuant to PRC sections 3712, 3714, 3739, 3740, and 3741 and Regulations sections 1935, 1952, and 1954, the Supervisor is ordering Operator to submit a plan to demonstrate the integrity of the "NorCal" 2 well and its isolation from the fluids expressed at surface around the well within fifteen (15) days of this Order. In the event of negative or inconclusive test results, Operator is required to submit a remediation work plan and

corresponding Notice of Intention (NOI), or otherwise submit an NOI to plug and abandon the "NorCal" 2 well and decommission its appurtenant facilities, if not already decommissioned, within fifteen (15) days after submitting such results.

Attachment B contains a list of definitions and authorities that are applicable to this Order.

II. Alleged Acts/Omissions

Based on CalGEM's records, at all times relevant to this Order, Operator was the "operator" of the Wells, as defined in PRC section 3709. The "NorCal" 1 well was drilled in 1986 (API No. 0403590076) and the "NorCal" 2 well (API No. 0403590075) was drilled in 1988. The Wells are located near the Amedee Hot Springs area in Honey Lake Valley, California.

Geothermal operators are required to equip wells with sufficient casing and to maintain those wells in good condition to prevent damage to life, health, property, and natural resources. (PRC, §§ 3739 and 3740; Regulations, §§ 1935, 1952.) In addition, Regulations section 1935.2 requires that surface casing "provide for control of formation fluids"

On September 14, 2021, CalGEM staff conducted an inspection of the Wells and observed that geothermal fluid was discharging into the well cellar of the "NorCal" 2 well and surrounding area in an uncontrolled manner. On October 20, 2021, CalGEM issued a Notice of Violation (NOV) requiring Operator to take immediate action to correct the uncontrolled discharge and, due to mechanical integrity concerns, submit a work plan to remediate the "NorCal" 2 well by October 29, 2021. (**Attachment C**, incorporated herein.) In correspondence dated March 16, 2022, CalGEM approved Operator's proposal to perform concrete work on the well cellar but continued to have concerns regarding the well's mechanical integrity; CalGEM requested that the Operator submit a remediation work plan and corresponding NOI by May 31, 2022. (**Attachment D**, incorporated herein.)

On or about May 26, 2022, Operator ran a caliper log on the production casing of the "NorCal" 2 well; no log was run on the surface casing. On September 18 and 27, 2022, CalGEM staff conducted follow-up inspections of the Wells and observed the following:

- The discharge of geothermal fluids had stopped at and around the "NorCal" 2 well (i.e., no fluid was entering the well cellar or discharging into the surrounding

area),

- The "NorCal" 2 well had a new well cellar that was intact and dry of fluids, and
- The "NorCal" 1 well pump was operating.

On August 15, 2023, CalGEM staff conducted an additional inspection of the Wells and observed the "NorCal" 1 well not to be operating, and again observed an uncontrolled discharge of geothermal fluids occurring around the "NorCal" 2 well but this time not into the well cellar. On November 13, 2023, CalGEM issued a subsequent NOV requiring Operator to take immediate action to correct the uncontrolled discharge and to inform CalGEM of Operator's planned steps to remediate the "NorCal" 2 well by December 29, 2023.

(**Attachment E**, incorporated herein.) Upon the request of the Operator, and as indicated in correspondence dated December 5, 2023, CalGEM extended this date to January 5, 2024.

(**Attachment F**, incorporated herein.)

In correspondence received by CalGEM on January 18, 2024, Operator stated that the "NorCal" 2 well was in good condition based on its inspections and tests performed on the well, and the uncontrolled discharges were related to fractures around the nearby Amedee Fault as well as constraints in Operator's ability to operate the "NorCal" 1 well to maintain the reservoir at a sufficiently low enough level to prevent discharges. On May 29, 2024, CalGEM staff conducted a follow-up inspection of the Wells and again observed the "NorCal" 2 well cellar to be dry and intact, no discharges occurring around the well, and the "NorCal" 1 well pump to be operating.

As indicated above, Operator's remediation of the "NorCal" 2 well cellar has prevented the future occurrence of geothermal fluid discharge into the cellar but not the area immediately surrounding it *while the "NorCal" 1 well is not operating*. Further, Operator has not provided CalGEM with documentation demonstrating the integrity of the well's surface casing. For these reasons, CalGEM has reason to question the mechanical integrity of the "NorCal" 2 well's surface casing and the condition of its cement. If the "NorCal" 2 well lacks mechanical integrity, CalGEM is concerned that this creates a risk of an uncontrolled well release which could result in harm to human health or the environment.

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1 In addition, CalGEM is concerned that continuous uncontrolled discharges of
2 geothermal fluids increases the risk of degradation of the surface equipment, well pad,
3 wellbore, well cellar, and the surrounding area, making future remediation and/or plugging
4 and abandonment work dangerous or infeasible. Further, CalGEM is concerned that
5 Operator's approach of responding to the observed conditions at the surface near the
6 "NorCal" 2 well by operating the "NorCal" 1 well subjects the wellbore and its surrounding
7 area to ongoing, if intermittent, degradation, including potential harm to the geothermal
8 reservoir. Moreover, CalGEM believes running the pump at the "NorCal" 1 well is not a viable
9 option because this mitigation measure is prone to mechanical, maintenance, or other
10 operational issues, and therefore does not represent a long-term solution.

11 As of the date of this Order, Operator has not provided CalGEM with a work plan or NOI
12 to remediate the "NorCal" 2 well nor a long-term plan of action to address the uncontrollable
13 discharge situation.

14 III. Operator's Required Actions

15 For the reasons stated herein, the Supervisor has determined that immediate action is
16 necessary to protect life, health, property, and natural resources. Therefore, pursuant to 3712,
17 3714, 3739, 3740, and 3741 and Regulations sections 1935, 1952, and 1954, **IT IS HEREBY**
18 **ORDERED** that Operator submit a plan, with timeline to be approved by CalGEM, to
19 demonstrate the integrity of the "NorCal" 2 well's surface casing and its isolation from the fluids
20 expressed at surface around the well within **fifteen (15) days** of this Order. In the event of
21 negative or inconclusive test results, Operator is required to submit a remediation work plan
22 and corresponding NOI, or otherwise submit an NOI to plug and abandon the "NorCal" 2 well
23 and decommission its appurtenant facilities, if not already decommissioned, within fifteen (15)
24 days after submitting such results.

25 Please contact Jerry Salera (Jerry.Salera@conservation.ca.gov) and Mathew Densmore
26 (Mathew.Densmore@conservation.ca.gov) with any questions concerning the required work,
27 requests for extensions, and to submit any required documentation.

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1 **IV. Operator's Appeal Rights**

2 Operator may appeal this Order by filing a timely written notice of appeal with the
3 Director as described in Division 3 of PRC sections 3762 to 3768. (PRC, §§ 3743, subd. (d).) If this
4 Order is mailed to you, the Director must receive the appeal within fifteen (15) days from the
5 date the Supervisor mails the Order. To file an appeal, a written notice of appeal may be sent
6 via U.S. mail to:

7 Department of Conservation
8 Director's Office of Appeals
9 715 P Street, MS 19-06 (Legal Office, Chief Counsel)
10 Sacramento, California 95814

11 Or via electronic mail to:

12 CalGEMAppeals@conservation.ca.gov.

13 If Operator files a timely written notice of appeal, Operator will be informed of the
14 appeal hearing date, time, and place. Following the hearing, Operator will receive a written
15 decision that affirms, sets aside, or modifies the appealed order.

16 If Operator does not file a timely written notice of appeal, or if the Order is affirmed
17 following an appeal, this Order will become a final order and CalGEM may contract for
18 performance of the work, pursuant to PRC section 3744, if, within thirty (30) days of this Order,
19 Operator has not, in good faith, commenced the work ordered. Any costs incurred by
20 CalGEM to obtain compliance with this Order, which may include penalties and interest, will
21 constitute a lien against Operator's real or personal property per PRC section 3772. (PRC, §
22 3768.)

23 **V. Other Potential Actions to Enforce This Order**

24 Failure to comply with Section III (Operator's Required Actions) of this Order could
25 subject Operator to further enforcement action, including civil penalties, as appropriate. PRC
26 section 3754 makes it a misdemeanor for any person who violates, fails, neglects, or refuses to
27 comply with any of the provisions of the geothermal conservation laws commencing at PRC
28 section 3700. PRC section 3771 makes it a misdemeanor to fail or neglect to comply with an

order of the Supervisor. Each day's further failure, refusal, or neglect is a separate and distinct offense. (PRC, § 3771).

DATED: 9/12/2024

Doug Ito

Doug Ito
State Oil and Gas Supervisor