DOCKETED	
Docket Number:	79-AFC-04C
Project Title:	Compliance - Application for Certification of DWR Bottlerock Geothermal Project
TN #:	232906
Document Title:	2018 Annual CEC Interim Conditions of Compliance Report
Description:	2018 Annual CEC Interim Conditions of Compliance Report
Filer:	Terra Rogers
Organization:	Bottle Rock Power, LLC
Submitter Role:	Applicant
Submission Date:	5/4/2020 6:09:33 PM
Docketed Date:	5/5/2020

2018 ANNUAL CALIFORNIA ENERGY COMMISION INTERIM CONDITIONS OF COMPLIANCE REPORT

BOTTLE ROCK POWER, LLC

GEOTHERMAL FACILITY

TABLE OF CONTENTS

LIST OF ATTACHMENTS:

Appendix 1: Interim Conditions of Compliance

Compliance Matrix

Annual Energy Facility Compliance Fee - Proof of Payment

Appendix 2: Renewed LCAQMD ATC's and PTO's

GAMP Participation – Proof of Payment

Appendix 3: Figure 1 - Vegetation Monitoring Map

Table 1 - Vegetation and Soil Boron Analytical Results

Vegetation and Soil Boron Analytical Reports

Figure 2 - Water Monitoring Map

Table 2 - Groundwater and Surface Water Analytical Results

Groundwater and Surface Water Analytical Reports

1.0 Introduction

This report presents the 2018 compliance verification results for the Bottle Rock Power, LLC (BRP) geothermal facility located at 7385 High Valley Road in Cobb, California.

The Bottle Rock Power, LLC facility suspended operations on March 31, 2015. Clean Energy Partners, LLC acquired 100% of the equity ownership interest in BRP Holdco, LLC on November 20, 2015, but the actual ownership of the Facility did not change. BRP continued to own the Facility on November 20, 2015 and continues to own it today. Additionally, operational control of the Facility has not changed. BRP contracts for certain select services such as security with a third party, but Baseload Clean Energy Partners, LLC/ Bottle Rock Power, LLC remain responsible for daily compliance with the Interim Conditions of Certification for the non-operational status of the Facility.

This verification is conducted in accordance with the Interim Conditions of Certification summarized in the California Energy Commission (CEC) letter addressed to BCEP on January 28, 2016. In this letter, energy commission staff determined which of the original Conditions of Compliance (COC's) were applicable during BRP's non-operational status. For ease of reference, this Letter is attached as Appendix 1; and the below report re-states the line-item detail of the applicable COC's found in the CEC Decision on the Petition to Amend the Conditions of Certification for the Bottle Rock Geothermal Power Plant, Docket 79-AFC-04C.

2.0 Annual Verification of Interim Conditions of Compliance

COM-1 Unrestricted Access

The project owner shall ensure that Energy Commission staff, and delegated agencies or consultants have unrestricted access to the facility site and the records maintained on-site.

The Bottle Rock Power, LLC geothermal power plant has been off-line since March, 2015. There are no longer any employees, and the building is no longer in active use. The facility doors, perimeter fencing, and access road gates are all locked and secured. A caretaker is contracted to periodically visit and inspect the grounds; or accompany any scheduled agency site inspections.

COM-2 Compliance Record

The project owner must maintain copies of all project files and submittals.

Bottle Rock Power, LLC maintains copies of all project files and submittals, in either hard-copy, electronic PDF, or both.

COM-3 Compliance Verification Submittals

The project owner is responsible for the content and delivery of all verification submittals to the Compliance Project Manager (CPM).

The project owner for Bottle Rock Power, LLC acknowledges that they are responsible for the content and delivery of all verification submittals to the CPM.

COM-5 Compliance Matrix

The project owner must submit a compliance matrix to the CPM with each Annual Compliance Report.

A one-year compliance matrix is included with this report in Appendix 1.

COM-6 Monthly Compliance Report/Key Event List

During project initiation, construction or closure the project owner will submit a Monthly Compliance Report.

Bottle Rock Power, LLC recognizes that in the event of re-purposing or closure of the project, Monthly Compliance Reports will be submitted to the CPM during construction or closure activities.

COM-7 Annual Compliance Report

After construction is complete the project owner must submit Annual Compliance Reports instead of Monthly Compliance Reports. Annual Compliance Reports are due for each year of commercial operation and may be required for a specified period after decommissioning to monitor closure compliance.

Bottle Rock Power, LLC recognizes that Annual Compliance Reports are due for each year of commercial operation, and may be required for a specified period after decommissioning to monitor closure compliance. Although the Bottle Rock Power, LLC facility was not in commercial operation in 2018; and the intention is to repurpose and not decommission the project, this annual report for 2018 has been prepared for submittal to the CPM.

COM-9 Annual Energy Facility Compliance Fee

Pursuant to the provisions of Section 25806(b) of the Public Resources Code, the project owner is required to pay an annually adjusted compliance fee.

The Annual Energy Facility Compliance Fee of $28,428.00 was paid by Bottle Rock Power, LLC to the CEC on May 7, 2018. A copy of this proof of payment is included in Appendix 1.

COM-10 Amendments, Ownership Changes, Staff-Approved Project Modifications, and Verification Changes

The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, to modify the design, operation, or performance requirements of the project, or to transfer ownership or operational control of the facility.

Bottle Rock Power, LLC acknowledges this condition.

COM-11 Reporting of Complaints, Notices and Citations

The project owner shall provide posted telephone number, and if not staffed twenty-four hours per day, must include automatic answering. The project owner must respond to all recorded complaints, and notify the CPM of any complaints, official notices, warnings, citations, court orders or fines. Copies of all relevant information must be included in the Annual Compliance Report.

The Bottle Rock Power, LLC facility ceased operations including wellfield steam production in March, 2015. Since this time, BRP has maintained a 24-hour accessible cell number that includes automatic answering/recording, and is carried by the contracted caretaker. This number is clearly posted on access gate signage. All received calls/messages are forwarded to contracted project managers by the caretaker; and promptly addressed.

Bottle Rock Power, LLC acknowledges CPM notification of any complaints, official notices, warnings, court orders or fines. No complaints were received by BRP during the year of non-operational status in 2018, and no notification to the CPM was required.

COM-12 Emergency Response Site Contingency Plan

Prior to the start of commercial operation, the project owner must submit for CPM review and approval, an Emergency Response Site Contingency Plan.

An Emergency Response Site Contingency Plan had been previously submitted for CPM review prior to the original Bottle Rock Power, LLC start-up in 1983, and re-start-up in 2007.

COM-13 Incident Reporting Requirements

Within 12 hours the project owner must notify the CPM, by telephone and email, of any incident at the power plant that results or could result in emergency reporting to any federal, state, or local agency.

Bottle Rock Power, LLC acknowledges this condition. No incidents occurred during BRP's year of non-operational status in 2018 that required emergency reporting to any Federal, State, or local agency, or CPM notification.

COM-14 Non-Operation

If the facility ceases operation temporarily, either planned or unplanned, for longer than one week, but less than three months, the project owner must notify the CPM.

Bottle Rock Power, LLC provided notification to the CPM of their indefinite length, suspended operations, prior to the stoppage of power production and shutting-in the wellfield on March 31, 2015. Bottle Rock Power, LLC remained in non-operational status in 2018 and intent on re-purposing, not decommissioning the project.

COM-15 Closure Planning

To ensure that a facility's closure and long-term maintenance do not pose a threat to public health and safety or to environmental quality, the project owner must coordinate with the Energy Commission to plan and prepare for eventual permanent closure.

A Closure Plan generated by Dames & Moore in 1996 for Bottle Rock Power, LLC is on file with the CEC. Additionally, decommissioning tasks and cost estimates were updated and submitted for CEC review in 2013.

COM-16 Closure Financial Assurances

A. Financial Surety Mechanism: Surety Bond

The project owner must provide financial assurances to the Energy Commission, guaranteeing adequate and readily available funds to finance interim operation, and facility closure, as needed. The financial assurances shall be in the form of an irrevocable closure surety bond and standby trust fund. The standby trust fund shall have as its Beneficiary the California State Energy Resources Conservation and Development Commission. Alternatively, a trust account, letter of credit, restricted bank account or other mechanism may be used if the mechanism and its provisions, including the institution involved, are approved by the CPM as providing an equivalent level of financial assurance.

The required level of financial assurance was set at $1,341,500 by CEC staff in December, 2013, to be escalated 5% over 5-Years for contingency, as follows:

2014	$1,341,500
2015	$1,408,575
2016	$1,475,650
2017	$1,542,725
2018	$1,609,800
2019–On	$1,676,875 (no further contingency escalation).

The level of financial assurance required for 2016 was held by bond, but was not updated for 2018.

AQ 1-1

The project owner shall summarize in an annual compliance report any interactions with the LCAQMD. The project owner shall immediately inform the CEC CPM and APB in writing of any formal appeals filed with the LCAQMD.

BRP maintained their on-going working relationship with the LCAQMD throughout the year. BRP continued to comply with the conditions delineated on each Authority to Construct (A/C) or Permit to Operate (P/O). An Annual Throughput report was completed and fees paid to renew the project's PTO's and ATC's for the 2018-2019 year; and the Quarterly Air Quality Reports were submitted. Copies of the Renewed Air Permits are contained in Appendix 2.

AQ 1-6

The project owner shall furnish proof of installation and maintenance of the meteorological station and submission of the data there from in a form acceptable to the LCAQMD. The submittals shall be noted in periodic compliance reports filed with the CEC CPM.

Bottle Rock Power, LLC operated and maintained an onsite meteorological station, and data was available to LCAQMD, as requested.

AQ 1-7

The project owner shall submit in the Annual Compliance Report a statement describing project owner's participation in GAMP.

During 2018, Bottle Rock Power, LLC attended GAMP quarterly meetings via contracted representative. GAMP VI Year 17 (2018) Cost Share was invoiced for $12,516, and paid October 6, 2018. Receipt for payment of this amount is included in Appendix 2.

AQ 1-8

The project owner shall submit in the Annual Compliance Report to the CEC CPM appropriate confirmation from the LCAQMD that all ATC's and PTO's are current and active under the Terms and Conditions of LCAQMD Rules and Regulations. The project owner shall also include in this report a statement identifying any complaints and actions of resolution for air quality for the Bottle Rock facility.

Bottle Rock Power, LLC complied with all Authority to Construct (A/C or ATC) and Permit to Operate (P/O or PTO) conditions, in accordance with LCAQMD rules and regulations. Annual throughput calculations and report were submitted to LCAQMD, and fees paid to renew the project's PTO's and ATC's for the 2018-2019 year (Appendix 2). No nuisance odor complaints, or actions of resolution for air quality were received in 2018.

AQ AC21-5, AC22-4, AC24-6, AC25-6, AC26-6

The operator shall provide safe access for representatives of the District, ARB, or EPA to inspect, review records, or collect samples as approved by the APCO, from this facility. Should the plant be secured by locks or gates, the District shall be provided keys, combinations or other means to gain immediate access for purpose of testing or inspection.

The Bottle Rock Power, LLC geothermal power plant has been off-line since March 31, 2015. There are no longer any employees, and the building is no longer in active use. The facility doors,

perimeter fencing, and access road gates are all locked and secured. A caretaker is contracted to periodically visit and inspect the grounds; or accompany any scheduled or requested agency site inspection. The cell number to reach the contracted caretaker is clearly posted on the facility access gates. Additionally, this phone number was provided to LCAQMD to provide communication with the Caretaker for site access to maintain the District's ambient air quality monitoring stations located on the project grounds.

CR4-5

Project owner shall ensure that the existing fence on the north side of site CA-LAK-609 is maintained. A statement verifying compliance shall be provided in each Annual Compliance Report filed with the CEC CPM.

Bottle Rock Power, LLC, inspected the fence on the north side of site CA-LAK-609. Bottle Rock Power, LLC also inspected the border fencing for an archeological site located on the Binkley Leasehold. The fence in the archeological site was found in good condition, but the one in the northeast area was not in good condition in some places, and will be fixed once the rainy season ends.

Fence surrounding the west corner of archeological site.

Fence on the north side of site CA-LAK-609

BR 5-1f & 5-3h

Annually, the project owner shall inspect all previously disturbed areas for soil erosion impacts and shall take corrective action whenever necessary. The project owner shall submit to the CEC CPM in the Annual Compliance Report the results of the monitoring and an explanation that verifies compliance with this condition.

No earth moving activities were performed in 2018, but Bottle Rock Power, LLC recognizes that such activities are restricted to the dry months (April to October).

In 2018 BRP completed drainage inspections on the access road to the West Coleman pad; as well as drainage inspections on High Valley Road in the area of the curves and the excavated Francisco Pad spoils area. Inspection of the previously disturbed areas of soil erosion indicated that previous

hydro-seeding efforts had taken well, rock dispersions were working as intended, and additional corrective action was not required.

High Valley Road Photos taken of the lower, middle and upper sections of High Valley Road show that annual grass continued to reestablish itself through 2018, and jute netting is almost gone in some sections. No additional work was performed in 2018, BRP will continue monitoring for changes.

Lower re-seeded section of High Valley Road

Middle re-seeded section of High Valley Road

Upper re-seeded section of High Valley Road

West Coleman Road: Drainage ditches, energy dispersers, culverts, inlets, outlets, and diversions were inspected and though most were in good repair, some will need some maintenance after the rainy season is over.

Area around West Coleman Road

The Francisco Spoils Pile and Steam field yard sedimentation areas: Inspections indicated that the hydro-seeding was successful, completely covered with new growth; basin controls (inlets, outlets, diversions, weirs, spillways) were in good working order. No additional work was performed in 2018.

Area around Francisco Spoils

Re-Injection line: Additional anchoring supports installed in 2014 continued to prevent the line from expanding into the access road, and stabilized the line on the roadway crossing Cow Creek. It is expected that some work will be required in 2019 after the rainy season is over. No additional work was performed in 2018.

Injection Line Area

BR 5-2

One year prior to power plant deactivation, the project owner shall include in the decommissioning plan a biological resources element identifying mitigation measures. The project owner shall submit the biological resources element of the decommissioning plan in consultation with CDFG of adequacy ad acceptability.

Bottle Rock Power, LLC remained in non-operational status in 2018 and intent on re-purposing, not decommissioning, the project. However, BRP recognizes that one-year prior to closure of the project, BRP will include a biological resources element in the decommissioning plan.

BR 5-3a

The project owner shall include the results and a discussion of the year's required monitoring (visual inspections; soil/needle tissue boron analysis) in the Annual Compliance Report.

Bottle Rock Power, LLC continued monitoring vegetation in the project area in 2018. Needle and understory soil samples were collected and analyzed for boron concentration. Samples were collected of both canopy needles. BRP monitors the same trees each year, and locations are shown in Figure 1, Appendix 3. Analytical results are presented in Table 1, Appendix 3. Associated Laboratory reports are presented in Appendix 3.

Coleman Pad and surrounding area

Coleman Pad and surrounding area, overall the trees in the area were in good health with new needle growth. Smaller trees in more sun-exposed slopes still exhibit some drought stress, indicated by reduced needle length and reduced needle density. The monitored trees were healthy, with no needle browning appreciated. Normal lower canopy, shaded understory needle and branch shedding has continued on A-1, and this medium-sized tree no longer had any accessible branches for needle collection and analysis.

Tree A-1

Tree A-2

West Coleman Road

West Coleman Pad and surrounding area, overall the trees in the area were in good health with new needle growth. Smaller trees in more sun-exposed slopes still exhibit drought stress, as indicated by reduced needle length and reduced needle density. The monitored trees varied in drought-related health. Trees designated as B-1 and B-22 are younger trees, showing some light needle browning at the tips of their needles. The tree designated as B-3 is a mature tree with no needle browning noted.

Tree B-1

Tree B-2

Tree B-3

Access Road

Inter-pad access road and surrounding area, these are relatively young trees. No needle browning was noted. Both trees appear to have marginal vigor. Smaller trees in more sun-exposed slopes exhibit more drought stress, as indicated by reduced needle length and reduced needle density. Normal lower canopy, shaded understory needle and branch shedding has continued.

Tree C-1

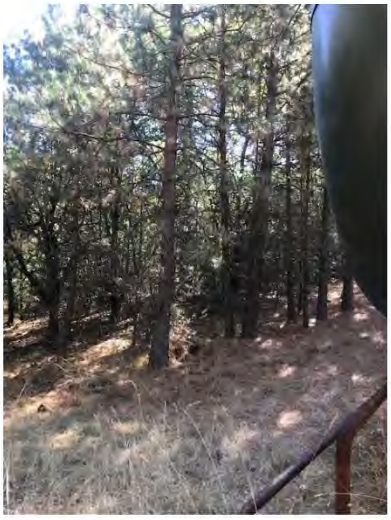
Tree C-2

North of Plant fence line

Main plant and surrounding area, overall the trees in the area are in good health. Smaller trees in more sun-exposed slopes exhibit drought stress, as indicated from reduced needle length, reduced needle density, and some needle tip burning. D-1 and D-2 on the uppermost slope with greatest sun exposure, are fairly young trees. No needle browning was noted. The tallest tree (D-3, > 10 meters) downslope on more shaded, level ground exhibited good new needle growth. Normal lower canopy, shaded understory needle and branch shedding has continued on D-3, and this large tree did not have any accessible branches for needle collection. Photo was taken of adjacent tree to show healthy needle growth in this immediate area.

Tree D-1

Tree D-2



Tree D-3

BR 5-3b

The project owner shall include the results and a discussion of the year's required monitoring (surface water sampling and analysis) in the Annual Compliance Report.

Regional surface water quality was monitored through the quarterly sampling of the following locations: Kelsey Creek near Kelseyville (SW-6), Kelsey Creek above High Valley Road (SW-7), High Valley Creek above Kelsey Creek (SW-8), Adler Creek above Glenbrook (SW-9), and Kelsey Creek above Glenbrook (SW-10). Water monitoring locations are shown in Figure 2, Appendix 3.

Sampling procedures were consistent with EPA ground surface water sampling protocols. Data collected and analyzed include physical water quality parameters, selected major/minor element concentrations, dissolved metals concentrations and coliform bacteria. Samples were collected in reagent prepared containers provided by analytical laboratories Analytical Sciences of Petaluma and Alpha Analytical Laboratories, also of Petaluma. These included two, one-liter Nalgene for cations and anions; two, 250 ml Nalgene for total coliform and turbidity; and a 100 ml glass vial for dissolved oxygen. Date and time were recorded with each sample collection. Samples were labeled in the field and placed in an ice chest for transportation to the laboratory along with the proper chain of custody documentation.

Surface water monitoring analytical results for 2018 are summarized in Table 2 in Appendix 3. Laboratory reports are presented in Appendix 3.

BR 5-3c

The project owner shall include the results and a discussion of the year's required monitoring (groundwater sampling and analysis) in the Annual Compliance Report.

Regional groundwater quality was monitored through the quarterly sampling of the following locations: Jadiker residence (GW-0), Barrett Spring (GW-1), Union Spring (GW-2), Francisco Well (GW-3), Coleman Well (GW-4), and Wright Spring (GW-5). Figure 1 shows all groundwater and surface water sampling locations. Sampling of Union Spring (GW-2) has not been conducted in many years due to unsafe access and large amounts of poison oak in the area. Access to Coleman Well (GW-4) and Wright Spring (GW-5) was not available in 2018 due to closed and posted gate. Additionally, sites GW-2 and GW-5 are located on leases managed by the Calpine Corporation and access is restricted.

Sampling procedures were consistent with EPA ground surface water sampling protocols. Data collected and analyzed include physical water quality parameters, selected major/minor element concentrations, dissolved metals concentrations and coliform bacteria. Samples were collected in reagent prepared containers provided by analytical laboratories Analytical Sciences of Petaluma and Alpha Analytical Laboratories, also of Petaluma. These included two, one-liter Nalgene for cations and anions; and one, 250 ml Nalgene for turbidity. Date and time were recorded with each sample collection. Samples were labeled in the field and placed in an ice chest for transportation to the laboratory along with the proper chain of custody documentation.

Groundwater monitoring analytical results for 2018 are summarized in Table 2 in Appendix 3. Laboratory reports are presented in Appendix 3.

BR 5-3d

The project owner shall include the results and a discussion of the year's required monitoring (biennial wildlife) in the Annual Compliance Report.

Since 1984, Bottle Rock Power, LLC has monitored wildlife use of the guzzlers and nesting boxes installed as part of the original construction mitigation plan. After more than thirty years, the disturbance incurred during original construction has long since passed, and the wildlife prefer to utilize the natural environment rather than the man-made boxes and water sources. No monitoring was done during 2018.

BR 5-3i

The Annual Compliance Report will collate and summarize all monitoring results including methodologies used to satisfy conditions 5-3a – 5-3h.

Methodologies used to satisfy conditions 5-3a – 5-3d are detailed in each respective section of this Annual Report.

The monitoring results for Soil/Needle Tissue Boron analysis are shown in Table 1, Appendix 3.

The monitoring results for Surface Water analysis are shown in Table 2, Appendix 3.

The monitoring results for Groundwater analysis are shown in Table 2, Appendix 3.

BR 5-3j

The project owner in consultation with CEC CPM will take action to correct any specific mitigation measure or monitoring program is determined to be ineffective, or if the CEC CPM receives any submittal, complaints, or other information from the project owner, other agencies, or the public, that indicates one or more significant impacts are occurring on the leasehold subject to CEC jurisdiction.

Bottle Rock Power, LLC acknowledges this condition.

WR 6-1

Project owner shall, during any period of suspension, utilize no new surface water as the source for any maintenance or other necessary activity without first notifying and obtaining the required authorization from the appropriate federal, state, county or local agencies.

Bottle Rock Power, LLC acknowledges this condition.

WR 6-2

Project owner shall maintain on file the Spill Contingency and Containment Plan (SCCP) originally required by the CVRWQCB.

Bottle Rock Power, LLC maintains and updates as needed their Spill Prevention Countermeasure Control Plan. The plan was updated in 2018. A copy of this plan is available upon request.

WR 6-3

Project owner shall submit annually to the CVRWQCB and to the CEC CPM, via the Annual Compliance Report, a record of maintenance and corrective measures to the spill containment system.

There are five (5) storm water collection sumps located within the BRP facility yard. These sumps flow into the cooling tower over flow pits, and gravity drain into the Coleman Pad injection well. BRP contractors conduct inspections during and after stormwater events to ensure the system is operating correctly. All pumps were serviced in 2018, including periodic use of portable electric sump pumps and cleaning of injection well and cooling tower filter screens. In an effort to maximize stormwater collection and retention from the main plant yard, the upper cooling tower weir was removed in the previous year. This allowed the level of the cooling tower basin that could gravity drain to the injection well to be lowered an additional 3 feet, adding significant stormwater collection capacity during rainfall events.

WR 6-4

Project owner shall submit annually to the CVRWQCB and to the CEC CPM, via the Annual Compliance Report, a record of maintenance and corrective measures to the waste water disposal system.

In 2018, the Bottle Rock Power, LLC facility was not operating. Consequently, the domestic water waste disposal system did not receive much use or require any maintenance.

WR 6-5

Project owner shall maintain quarterly records of the volume of water pumped from the on-site supply well.

Bottle Rock Power, LLC maintained records in 2018 of monthly water pumpage from domestic wells #1 and #2.

WR 6-6

Project owner shall submit annually to the CEC CPM a record of maintenance and operation of the drainage sump pump discharge to the injection wells(s).

There are five (5) storm water collection sumps located within the BRP facility yard. These sumps flow into the cooling tower over flow pits, and gravity drain into the Coleman Pad injection well. BRP contractors conduct inspections during and after stormwater events to ensure the system is

operating correctly. All pumps were serviced in 2018, including periodic use of portable electric sump pumps and cleaning of injection well and cooling tower filter screens. In an effort to maximize stormwater collection and retention from the main plant yard, the upper cooling tower weir was removed in the previous year. This allowed the level of the cooling tower basin that could gravity drain to the injection well to be lowered an additional 3 feet, adding significant stormwater collection capacity during rainfall events.

S 8-4

At least six months prior to scheduled decommissioning, the project owner shall submit site restoration plans to the CEC CPM for review and approval.

Bottle Rock Power, LLC remained in non-operational status in 2018 and intent on re-purposing, not decommissioning the project. However, BRP recognizes that six months prior to scheduled decommissioning, BRP will submit site restoration plans to the CEC CPM.

CE 9-5

At least six months prior to scheduled decommissioning, the project owner shall submit its site reclamation plan to the CEC CPM for review and approval.

Bottle Rock Power, LLC remained in non-operational status in 2018 and intent on re-purposing, not decommissioning the project. However, BRP recognizes that six months prior to scheduled decommissioning, BRP will submit site reclamation plan to the CEC CPM.

SWM 11-7

The project owner shall notify the CEC CPM in writing within 10 days of becoming aware of an impending (waste management -related) enforcement action.

Bottle Rock Power, LLC acknowledges this condition.

SWM 11-8

The project shall include the results of sludge testing in a report provided to the CEC CPM.

In 2018, the Bottle Rock Power, LLC facility was not operating. Consequently, the cooling tower was not in use for heat rejection from power generation or condensation of produced steam. The cooling tower was cleaned in 2015, but no sludge removal and disposal were performed in 2018.

S 12-8

Project owner shall notify the CEC CPM of any changes to the approved accident prevention program and provide verification of California Occupational Safety and Health Administration (Cal/OSHA) approval of said changes.

Bottle Rock Power, LLC acknowledges this condition.

S 12-9

During any suspension, the project owner shall notify the CEC CPM in writing in the event of a violation that could involve DOSHA action, and the necessary corrective action.

Bottle Rock Power, LLC acknowledges this condition.

S 12-10

Within 90 days of suspending operations, the project owner shall submit the following to the CEC CPM: (1) a list of all hazardous chemicals and the quantities that are to remain on site during any suspension, and (2) the signature of the responsible Plant Manger certifying compliance with this condition.

In 2016, and updated Hazardous Materials Inventory list was provided to the CPM. Additionally, in 2018 the Hazardous Materials Inventory list was updated and filed with Lake County CUPA.

TS&N 13-2

The project owner shall also inspect the transmission line annually to ensure that the line maintains required clearances especially during the fire season. In the event that noncompliance is determined by the CDF, the CDF shall require the project owner to take measures necessary to correct the noncompliance.

PG&E performed several inspections during 2018, and cleared transmission inter-connections lines utilized by Bottle Rock Power, LLC as needed. PG&E inspections during 2018 were court-mandated.

N 16-1

Project owner shall comply with Lake County's noise ordinance, which is 55 dBA Ld and 45 dBA Ln at any point beyond the property line of the source.

Bottle Rock Power, LLC was not operating in 2018. No noise complaints were received in 2018.

Appendix 1

Interim Conditions of Compliance

Compliance Matrix

Annual Energy Facility Compliance Fee – Proof of Payment

2016 Summary of BRP's Interim Conditions of Certification

COC #	COC Summary: Compliance	Comments
COM-1	Unrestricted Site Access	Staff has reviewed all BRP Compliance COCs and recommends that these COCs are required during BRP's non-operational status.
COM-2	Ongoing Compliance Records	
COM-3	Compliance Verification Submittals	
COM-5	Compliance Matrix	
COM-6	Monthly Compliance Reporting and Key Event List	
COM-7	Annual Compliance Reporting	
COM-9	Annual Energy Compliance Fee	
COM-10	Amendments, Ownership Changes, Staff Approved Project Modifications and Verification Changes	COM-10 notification requirements are also required and remain applicable during BRP's non-operational status.
COM-11	Compliant, Notice and Citation Reporting	Staff has reviewed all BRP Compliance COCs and recommends that these COCs are required during BRP's non-operational status.
COM-12	Emergency Response Site Contingency Plan	
COM-13	Incident Reporting Requirements	
COM-14	Non-Operation Requirements	COM-14 Executive Director oversight for suspension/closure determinations are required during BRP's non-operational status.
COM-15	Closure Planning Requirements	Staff has reviewed all BRP Compliance COCs and recommends that these COCs are required during BRP's non-operational status.
COM-16	Closure Financial Assurances	
COC #	**COC Summary: Air Quality (AQ)**	**Comments**
AQ 1-1	The Lake County Air Quality Management District (LCAQMD) shall perform all duties and functions normally conducted by the APCD District and shall have authority to issue a Permit to Operate…	Maintenance activities are required and permitted equipment (such as the emergency engine) may operate during the interim period, therefore staff recommends retaining these COCs to ensure current or future plant activity during non-operation is properly regulated. With compliance of these AQ COCs the project remains in compliance with all
AQ 1-6	Operate/maintain on-site meteorological station	
AQ 1-7	Geysers' Air Monitoring Program (GAMP) participation	
AQ 1-8	Maintain all Authorities to Construct (ATCs) and Permits to Operate	

	(PTOs)	applicable laws, ordinances, regulations, and standards (LORS) and ensures no significant direct or cumulative impact to the environment will occur.
AC21-5 AC22-4 AC24-6 AC25-6 AC26-6	Maintain immediate and safe facility access for regulatory agency inspection, record review, sampling and testing.	Staff has reviewed all BRP AQ COCs and recommends that these COCs are required during BRP's non-operational status.
COC #	**COC Summary: Cultural Resources**	**Comments**
4-5	Existing fence maintenance	Staff has reviewed all BRP Cultural Resource COCs and recommends that this COC is required during BRP's non-operational status.
COC #	**COC Summary: Biological Resources**	**Comments**
5-1f	Annual Erosion Control Report	Staff has reviewed all BRP Biological Resource COCs and recommends that these COCs are required during BRP's non-operational status.
5-2	Decommissioning Plan	
5-3a	Boron Drift/Leaf Tissue Monitoring	
5-3b	Surface Water Sampling	
5-3c	Groundwater Sampling	
5-3d	Nest box and Wildlife Water Basin Maintenance	
5-3h	Erosion Monitoring	
5-3i	Biological Resources Mitigation and Monitoring Status Report	
5-3j	Ineffective Mitigation Determination and Response	

COC #	COC Summary: Water Resources	Comments
6-1	Notification of New Surface Water Utilization	Staff has reviewed all BRP Water Resource COCs and recommends that these COCs are required during BRP's non-operational status.
6-2	Spill Contingency and Containment Plan	
6-3	Impermeable spill collection-containment system	
6-4	Domestic Waste Water and Control Systems Maintenance	
6-5	Quarterly recordation of onsite well water pumping volume	
6-6	Storm water discharge	
COC #	**COC Summary: Soils**	**Comments**
8-4	Decommissioning Site Restoration Plan	Staff has reviewed all BRP Soil COCs and recommends that this COC is required during BRP's non-operational status.
COC #	**COC Summary: Civil Engineering**	**Comments**
9-5	Site Reclamation Plan	Staff has reviewed all BRP Civil Engineering COCs and recommends that this COC is required during BRP's non-operational status.
COC #	**COC Summary: Solid Waste Management**	**Comments**
11-7	Impending Waste Management-related Enforcement Action Notification	Staff has reviewed all BRP Solid Waste Management COCs and approves Calpine's recommendation that these COCs are required during BRP's non-operational status.
11-8	Cooling Tower Sludge Testing and Reporting	

COC #	**COC Summary: Safety**	**Comments**
12-8	Accident Prevention Program Compliance	Staff has reviewed all BRP Safety COCs and approves Calpine's recommendation that these COCs are required during BRP's non-operational status.
12-9	California Department of Occupational Safety and health Administration (Cal/DOSHA) on-site safety inspections	
12-10	Non-essential chemicals, solvents and lubricant removal	
COC #	**COC Summary: Transmission Line Safety & Nuisance (TLSN)**	**Comments**
13-2	Transmission line code maintenance	Staff has reviewed all BRP TLSN COCs and recommends that this COC is required during BRP's non-operational status.
COC #	**COC Summary: Noise**	**Comments**
16-1	Compliance with Lake County's noise ordinance compliance and complaint investigation	Staff has reviewed all BRP Noise COCs and recommends that this COC is required during BRP's non-operational status.

BRP 2018 Compliance Snapshot

	Due Date											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lake County Air Quality Management District												
Annual Throughput Report										**31**		
ATC & PTO Renewal										**31**		
Quarterly Power Plant Report		**15**				**30**			**30**		**30**	
Serpentine Dust Control Plan Update											**30**	
GAMP Meeting			**X**			**X**			**X**			**X**
CARB - Greenhouse Gas Emissions Report				**10**								
CARB - SF6 Facility Report						**1**						
California Division of Oil, Gas & Geothermal Resources												
Production Report	**31**	**28**	**31**	**30**	**31**	**30**	**31**	**31**	**30**	**31**	**30**	**31**
Injection Well MIT (2-Year)(2018)											**15**	
Central Valley Regional Water Qualitgy Control Board												
Semi-Annual Injectate Report	**X**						**X**					
Injectate Sampling												**X**
Lake County Community Development												
Emergency Response Contingency Plan Update	**15**						**15**					
Lake County Environmental Health												
Site Inspection (3-Year)(2020)						X						
AB2185 Hazardous Materials Business Plan - Chemical Inventory Update						**30**						**31**
CAL FIRE Hazardous Materials Storage Update & Permit Renewal						**30**						
Lake County Unified Hazardous Materials/Waste Permit Renewal	**31**											
CA BOE Hazardous Waste Generation Annual Final-Fee		**28**										
CA BOE Occupational Lead Poisoning Prevention Fee		**28**										
CA BOE Waste Manifest Verification & Annual Pre-Payment								**31**				
Hazardous Waste Management Plan (4-Y)												
California Energy Commission												
Annual Compliance Report				**X**								
Annyal Fee							**1**					
1304 Generation & Sales Report	**31**			**30**			**31**			**31**		
Vegetational Sampling				**X**								
Soil Sampling											**X**	
Erosion Control Inspection				**X**						**X**		
Avian & Biological Survey (2-Year)(2018)				**X**	**X**	**X**	**X**	**X**	**X**			
Cooling Tower Bateria Sampling (Legionella - When Operating)						*X*						*X*
SW & GW Sampling	**X**			**X**			**X**			**X**		
Annual SW & GW Report				**X**								
Department of Energy												
EIA 860 Report			**5**									
EIA 906 Report	**NA**											
EIA 923 Report			**19**									
DOSH												
Pressure Vessel & Propane Tank Permit Renewal (2021)											**26**	
Elevator Inspection & Permit Renewal (Taken out of Service 2017)										**19**		
FCC												
Radio License Renewal (10-Year)(2026)			**14**									
OSHA												
300 Recordable Incident Log (When Operating)	**31**											
Bridge Crane Load Test (Before Use)										**30**		

Bottle Rock Power, LLC

15096

California Energy Commission

5/25/2018

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
5/7/2018	Bill	2671	28,428.00	28,428.00		28,428.00
					Check Amount	28,428.00

Cash - City National B Bottle Rock CEC Docket #79-AFC-4C 7/1/17 - 6 28,428.00

104091

Rev 2/14

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov

INVOICE NO.: 2671

DATE: May 7, 2018

Brian Harms, Gen Mgr
Bottle Rock Power, LLC
PO Box 326
Cobb, CA 95426

PROJECT: BOTTLE ROCK Power, LLC
CEC DOCKET #: 79-AFC-4C

Please return copy of invoice with your remittance and make payable to: >	**CALIFORNIA ENERGY COMMISSION ACCOUNTING OFFICE 1516 NINTH STREET, MS 2 SACRAMENTO, CA 95814-5512**
For:	
Annual Energy Facility Compliance Fee Period of July 1, 2018 - June 30, 2019	$ 28,428.00
DUE AND PAYABLE UPON RECEIPT	
Sub-Total	
Sales Tax	
Amount Due	$ 28,428.00

ENTERED 5/18/18 HV

For Accounting use only

APPROPRIATION: ITEM _____ **CH.** _____ **F.Y.** 18/19

- ☐ **REIMBURSEMENT** _____
- ☐ **EXPENDITURE** _____
- ☑ **REVENUE-GENERAL** 3062-33602000-4129200
- ☐ **REVENUE-SPECIAL ACCOUNT** _____

Orig. - CLIENT
Dup. - ACCOUNITNG--INVOICE REGISTER
Trip. - ACCOUNTING --FILE
Quad. - INFORMATION COPY

Appendix 2

Current Year LCAQMD Authorities to Construct and Permits to Operate

GAMP Participation – Proof of Payment

PERMIT TO OPERATE

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # P/O 2010-09

By: Douglas Gearhart

Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* V/b

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Alice Bray
Owner: Bottle Rock Power, LLC
Mailing Address: 4010 Stone Way N, Suite 400, Seattle, WA 98103

Facility: Bottle Rock Power Plant
Location: 7557 High Valley Rd., Cobb, CA. Sec 5, T11N, R8W, MDB&M Lake County Francisco/Coleman Leasehold

Name and Equipment Description: **Bottle Rock Power Plant**

One (1) fifty-five (55) megawatt geothermal power plant with abatement equipment installed and operated as described in conditions attached to the Modified Determination of Compliance dated February 22, 1982. Two (2) mechanical vacuum pumps of 50% capacity to the surface condenser non-condensable gas removal systems. Equipment piping and valves on AECS for Stretford Delay Tank skimmer pipe and Oxidizer Tank air spargers. Up to two (2) mercury scrubbing/absorption columns vessels with activated carbon media, associated piping and valves. Condensate H2S abatement system (pumps, piping, & valving) including condensate line reroute valving and piping to cooling tower basin; a condensate sparging system in the cooling tower basin; position and/or orientation changes of the distribution header to increase contact time and efficiency, and use of Iron Chelate (Fe•HEDTA) catalyst. Distributed Control System, incorporating a central control system for the steamfield, power plant, and abatement systems with an Allen Bradley Control Logix automated processor.

Permit Conditions

Condition 1: Emissions

A. The emissions limitations contained below shall apply during normal power plant operation, outages, and/or curtailments. All equipment shall be regularly maintained in good working order and operated in a manner to prevent or minimize air emissions.

B. Hydrogen sulfide (H2S) emissions from the Bottle Rock Power Plant shall be limited to a maximum of five (5) pounds per hour during power plant generation and all outages. All untreated steam or condensate shall be returned to a treatment or re-injection point to ensure this level of emissions is maintained.

C. The H2S content in the sweet gas from the Stretford shall not exceed 10ppmv, prior to dilution in the cooling tower.

D. The H2S concentration from the gland Steam Seal System vent shall not exceed 250 ppmw, and the H2S emission rate shall not exceed 0.1 lbs/hr.

E. Upon failure of the AECS, Bottle Rock Power, LLC (BRP) shall curtail operations to a level necessary to comply with the five (5) lbs/hr H2S emissions limitation.

F. In the event of generalized atmospheric conditions or localized dangerous contamination of such a nature as to constitute an emergency creating a danger to the health and welfare of the citizens of Lake County, the Air Pollution Control Officer (APCO) will take immediate action by requiring BRP to reduce H2S or other emissions, or to discontinue emissions entirely.

G. The off-gas vent to the atmosphere shall not be utilized at any time. The turbine by-pass, mechanical vacuum pumps, or other Lake County Air Quality Management District (LCAQMD) approved method shall be used to avoid direct venting into the atmosphere of undiluted non-condensables. The LCAQMD shall be notified when cold start-ups in excess of five (5) lbs H2S/hr are to occur and may cancel such activity if deemed necessary.

H. The access road from Bottle Rock Road to the power plant shall be paved to ensure that the generation of fugitive particulate matter is minimized. This shall apply to the primary access roads, should the primary access routes change.

I. The permit holder shall properly install and maintain a properly sized, winterized condensate (cooling tower working water, condensate reroute valving and piping) H2S abatement system modification incorporating the availability of an iron chelate (Fe•HEDTA) catalyst, hydrogen peroxide, and other additives as approved by the APCO, to achieve an overall emissions rate specified in this permit.

Condition 2: Administrative

A. Bottle Rock Power (BRP) shall maintain and operate the power plant, Air Emissions Control System (AECS), and associated ancillary equipment as described in submitted specifications and drawings and subsequent permit modifications in accordance with good operating practices and procedures to meet the emissions limit in Condition 1. The power plant and abatement system components shall be adequately maintained and winterized.

B. The AECS system shall consist of: A) A surface condenser to facilitate the partitioning of H2S into the non condensable gas phase; B) A Stretford Abatement System (SAS) as modified to include a 10 inch diameter skimming pipe on the delay tank and two oxidizer tank air spargers and with the ability to return the H2S gas treatment components of the AECS operation to the pre-modification operation.; C) Secondary condensate treatment which includes iron chelate and/or other approved secondary abatement chemical, and reaction time to ensure the power plant will comply with the emission limitation specified in Condition #1; D) A turbine by-pass system sufficiently sized to accept 100% of full steam flow during generating outages so that the power plant AECS can be utilized to treat steam normally stacked during the outage; E) If a solids removal system is necessary as a result of solids formation in the condensate, such facility shall be incorporated into the system; F) In the event of generation loss, an alternate source of power to enable continued use of the AECS specified above shall be available; and G) A properly permitted, compliant stand by generator or alternate power supply capable of sustaining station power and the Emergency Stacking System shall be available for use in case of concurrent transmission line and generator failure.

C. The major components of the AECS, Stretford, Turbine by-pass, and condensate abatement system shall have a 99% operating availability excluding scheduled maintenance on these individual major components.

D. BRP shall maintain alarms and switches on the following units to ensure immediate corrective action is initiated to prevent outages and potential stacking: **Turbine Generator Unit –** 1) Excessive vibration switch, alarm and trip; 2) Lateral motion switch on the turbine shaft, alarm and trip; 3) High lube oil temperature switch, alarm and trip; 4) Low lube oil pressure switch with indicating light in control room; Main **Lube Oil Reservoir low level, alarm –** 1) Over-speed switch, alarm and trip; 2) High hydrogen gas temperature and low purity hydrogen alarm and trip; 3) Seal oil level switch and alarm; 4) Differential pressure switch to prevent low differential pressure between the seal oil and hydrogen pressure, alarm and trip; 5) Generator moisture detector and alarm; 6) Vacuum switch to prevent low vacuum in the seal oil detaining tank, alarm and trip; 7) Turbine bearing metal temperature alarm and trip; **Condensers –** 1) Pressure switch to prevent condenser pressures from exceeding design levels, alarm and trip; 2) Condensate level switches to start and stop pump, prevent excessively high condensate levels in hot well; 3) High or low condensate levels alarms; **Cooling Towers –** 1) Float indicators to indicate levels and associated low, low-low, high, and high-high alarms; 2) Vibration switches and alarms on each cooling tower fan. **Electrical System –** 1) Generator differential current trip and alarm; 2) Generator over-current trip and alarm; 3) Generator ground fault trip and alarm; 4) Generator anti-motoring trip and alarm; 5) Generator field ground trip and alarm; 6) Generator stator over temperature alarm and trip; 7) Loss of excitation trip and alarm; 8) System negative phase sequence trip and alarm; 9) Transformer differential current trip and alarm; 10) Transformer over-current trip and alarm; 11) Transformer ground fault trip

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

and alarm; 12) Transformer sudden pressure trip and alarm; 13) Transformer winding temperature alarm; 14) Transformer oil temperature alarm.
E. The power plant abatement system shall have an operator on site at all times. The operator must be able to immediately take necessary corrective action in the event of power plant outage or equipment malfunction in order to meet the conditions of the Determination of Compliance.
F. A) Regarding secondary abatement: BRP shall maintain the ability to control the pH of treated condensate, provide for the oxidation of H2S utilizing H2O2 or iron chelate, ensure a residence time of 75 or more seconds and incorporate the ability to add on a catalyst injection capability to the secondary system should operating experience show such is necessary. Chemical storage capacity shall be as specified in the AFC amendments and no less than one (1) weeks supply shall remain on-site at all times. Alternatively, BRP can provide information acceptable to the LCAQMD and ARB establishing pH adjustment and control is not necessary at the power plant or provide temporary facilities (portable) for the injection of NaOH during power plant start-ups.
G. Regarding the turbine by-pass to power plant main condenser system: BRP shall maintain reliable and proven valves, noise attenuation of the valving, and desuperheating of by-passed steam/or account for in the design of the system, the ability to successfully by-pass 100% of the steam load.
H. Should BRP no longer operate the steam field, an agreement between BRP and the steam field operator is required to be filed with the LCAQMD within 60 days. This agreement shall specify with the steam supplier the responsibilities of turbine operations, bypass and emergency stacking abatement systems, as well as the interface between the stacking system controls.
I. The condensate piping and valving servicing the Power Plant and permanent addition of the iron chelate chemical injection system shall be refined and maintained. The condensate reroute and iron chelate addition modifications shall be installed in a manner so as to minimize emissions from the facility by extending the contact time with oxygenated cooling tower basin waters to the maximum extent and consistent with documentation in the application and permit review issuance. Injection of iron chelated catalyst at the cooling tower basin or within the cooling tower circulating water shall be incorporated.
J. The cooling tower shall have a guaranteed drift rate of no more than 0.002% of the circulating water design rate.
K. The unitized automated control and reporting system, "Distributed Control System" (DCS), shall include several levels of redundancies, backup processors, backnp power for well head automated valves, and central controls for all power plant, steam field, and abatement system operations.
L. The gas ejectors shall remain operable and available for use in the event of failure of the mechanical vacuum pump.
M. All AECS equipment drain or discharge seal water shall be directed to the rich condensate collection and disposal system.
N. Up to two mercury scrubber vessels shall be maintained in good operating condition between the water knockout and the delay tank. Sulfur product shall be treated as hazardous waste unless analyses prove otherwise.

Condition 3: Records and Reporting

A. The LCAQMD shall be notified pursuant to Rule 510, upon breakdown and/or loss of emissions control from this facility. Within one (1) hour following any power plant outage or malfunction resulting in emissions in excess of five (5) pounds per hour H2S, BRP shall advise the LCAQMD 1) the cause of the exceed; 2) actions taken or proposed to achieve compliance and 3) estimate of emissions and duration of noncompliance. BRP shall maintain a log of power plant outages along with explanations for the outages and malfunctions. In the event that power plant outages recur because of equipment malfunctions that are not indicated by alarms, BRP shall retrofit alarms on the malfunctioning equipment as possible. The log shall be available for inspection upon the request of the staffs of the LCAQMD, California Air Resources Board (ARB), California Energy Commission (CEC), and Environmental Protection Agency (EPA).
B. Reports shall be issued quarterly to the LCAQMD detailing: A) Hours of operation; B) Any periods for which abatement equipment malfunctioned and the action taken; C) Chemicals utilized for treatment of condensate; D) Periods of scheduled and unscheduled outages and the reasons for such outages; and E) Summary of the output of continuous emissions monitors with explanations of any irregularities.
C. BRP shall furnish the records specified in Condition 3B to the District 15 days upon reqnest, or no later than October 31st of each year.

Condition 4: Modification

A. BRP shall submit an application for and receive an Anthority to Construct Permit prior to any significant deletions, additions, modifications, or operational changes to the herein permitted power plant support systems and equipment.

Condition 5: Testing and Maintenance

A. BRP shall utilize the current LCAQMD approved source testing procedure to determine H2S emissions from cooling tower. Should an alternate test method be requested, BRP shall submit a detailed performance test plan to the LCAQMD at least 30 days prior to such tests. BRP shall maintain test plan to determine the particulate emissions rate and components of particulate emitted. If an alternate plan is proposed it must receive LCAQMD and CEC staff approval before such tests may be conducted to determine compliance. The ARB shall arbitrate difference if concurrence on a test procedure cannot be reached between CEC, BRP and the LCAQMD and recommend a binding procedure. Safe sampling access and ports shall be provided to enable the LCAQMD to gather samples from the freshly treated condensate, cooling tower stack and treated gas from the Stretford system.
B. BRP shall take all reasonable measures to comply with any fnture air emittent or ambient standard or guideline adopted for present non-criteria pollutants (i.e., Mercury, Boron, Arsenic, Radon222, etc.) by responsible State or Federal agencies and comply with guidelines established as part of BRP's certification by the CEC.
C. BRP shall promptly fund appropriate studies as requested by the APCO to ascertain the impact of operations at the residence located approximately 1900 ft east of the Francisco pad, should residents in good faith file complaints with the APCO indicating the air quality is worsening or becoming a nuisance or unhealthful as a result of BRP's operation. These studies shall include, but not be limited to, monitoring at the residence to determine H2S levels and particulate or other components which are believed or known to be in geothermal steam, tracer tests or source tests. Such studies shall be approved by the APCO prior to initiation. Reasonable mitigation steps shall be applied upon request of the APCO to attempt to remedy any unlawful impacts caused by the BRPP upon the residence.
D. The incoming steam to the power plant shall be analyzed annually and reported to the LCAQMD for Radon222 and its daughters, Mercury, Arsenic, Silica, Boron, Benzene, Ammonia, and total suspended solids. The results of these tests shall be reviewed by the APCO to determine if continued annual testing will snffice, or if more frequent analysis is necessary. Results of any tests performed upon the cooling tower sludge shall also be forwarded to the LCAQMD.
E. H2S emissions shall be monitored continuously by measuring total volume flow rates and H2S concentrations at the incoming steam, outlet of the Stretford unit, and in the treated condensate. A log of such monitoring shall be maintained and be made available to LCAQMD staff upon request. Stretford Tail gas monitor output shall be recorded on a continuous paper strip chart recorder or an APCO approved equivalent device. The devices must have accuracies of +1 ppm, provide measurements at least every 15 minutes, and be accessible to LCAQMD staff. Flow rate measuring devices must have accuracies of +/-5% at 40% to 100% of the total flow rate and calibrations must be performed at least quarterly. Calibration records must be made available to LCAQMD staff upon request. Monitoring shall be required pursuant to Section 42303 of the California Health and Safety Code. In the event that acceptable continuous monitors are not available, BRP shall conduct testing no less than once every 30 days to ensure the efficiencies of the H2S abatement systems are being maintained. The testing procedure used to determine compliance must be approved by the APCO. A log of such testing shall be maintained and be available to LCAQMD staff upon request. A summary of the monitoring and/or testing shall be forwarded to the LCAQMD every three (3) months.
F. BRP shall operate and maintain an on-site meteorological station capable of determining wind direction, wind speed, standard deviation of the direction, and temperature. Such data shall be immediately available on-site and shall be furnished to the LCAQMD upon request and in quarterly reports coordinated with major emissions events such as Stretford outages, well vents, etc.
G. Compliance monitoring shall be conducted by BRP. Constituents to be monitored include Arsenic, Boron, Mercury, Radon 222, Benzene, Silica, and Particulates in addition to H2S. Constituents shall be measured both as suspended aerosols and fall-out. Monthly composite samples of fall-out shall be collected using a wet/dry collector. Constituents other than H2S shall be measured per the ARB/EPA sampling method. BRP, CEC, and LCAQMD shall agree upon methods used in sampling and analysis. The monitoring program will be reviewed periodically by the APCO and the feasibility and necessity for continuance determined. The site for such monitoring shall be in the Cobb Valley area unless BRP and the LCAQMD agree upon a mutually acceptable alternative site. If BRP continues to participate in a combined effort with other developers such as the Geysers Air Monitoring Program (GAMP), or an alternative monitoring program acceptable to the LCAQMD and CEC, this condition shall not be exercised except as needed beyond the capabilities of GAMP.
H. BRP shall maintain sampling ports on the influent and effluent sides for each mercury scrubber and measure and report measured efficiency of mercury scrubbing to the LCAQMD. A log shall be maintained of unit maintenance to include dates of media changes and the reason for change out, any events of plugging, and all coincident mercury measurements made in sulfur product. The log shall be forwarded quarterly to the LCAQMD, or provided upon request.
I. Mercury Scrubber equipment shall be operated within supplier/manufacturers specifications. BRP shall continuously monitor the scrubbers for pressure loss utilizing the DCS measurements prior to the delay tank and on the backside of the mechanical pumps, and incorporate alert and maintenance action warning levels prior to generation unit trip due to overpressure or back pressure of scrubbing media, and BRP shall maintain a local gauge on the mercury scrubber to measure pressure drop across the unit. This shall act as a physical backup and check of the DCS measurements.
J. BRP shall cause to be performed tests that establish compliance with permit emissions limitations under anticipated plant and AECS components operating scenarios, consistent with existing facility LCAQMD permits and the DOC. This shall include cooling tower stack source testing as described in Appendix 2 of the permit reviews and the DOC. Planned operating scenarios shall be described in writing, include required emission testing protocols, and be provided the APCO a minimum of two weeks prior to any operational tests or scheduled source testing. To the extent possible, operating scenarios shall identify measurable parameters that can indicate compliance, or the lack thereof to be correlated with cooling tower stack emissions testing. A source test plan consistent with the facility permit requirements to determine H2S emissions, for any operating scenario of more than one week duration, shall be provided two weeks prior to testing the scenario. Source tests plans shall be approved by the LCAQMD prior to testing. Required cooling tower stack source testing can be delayed and H2O2 addition presumed unnecessary, unless requested by the APCO, provided all of the following are met: 1) AECS components are available, supplied and operable; 2) The cooling tower basin water has excess available dissolved oxygen and the hot well condensate is directed to the cooling tower basin; 3) Incoming steam is 450 ppmw H2S or less; 4) the Fe•HEDTA concentration is 5 ppm or greater in the working water; and 5) Delivered steam to the plant does not exceed 150,000 lbs/hr.

Condition 6: Identification and Access

A. BRP shall provide safe access for representatives of the LCAQMD, ARB, or EPA to inspect, review records, or collect samples as approved by the APCO, from this facility. Should the plant be secured by locks or gates, the LCAQMD shall be provided keys, combinations or other means to gain immediate access for purpose of testing or inspection.
B. BRP shall provide a telephone number at which the operator or a representative can be reached to ensure LCAQMD entry for inspection purposes. If for considerations of safety, BRP cannot provide access within one (1) hour of notification/request, BRP shall forward in writing within one (1) week a letter explaining the reasons entry within one (1) hour could not be allowed the LCAQMD staff.

PERMIT TO OPERATE

Permit # P/O 2014-07

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date: 10/31/2018* *Valid through: 10/31/2019* *Category: II*

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray	*Facility:*	Bottle Rock Power Plant
Owner:	Bottle Rock Power, LLC	*Location:*	7557 High Valley Rd., Cobb, CA.
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103		Sec 5, T11N, R8W, MDB&M Lake County Francisco/Coleman Leasehold

Name and Equipment Description: **Emergency Backup Diesel Generator and Propane Generator**

One (1) Condec-Lima Electric Model AA90614DK generator set, powered by a 1982 model year 760hp Cummins VTA-1710-6-1 diesel engine (S/N 37106133) and one (1) Generac Model 0046742 generator set, powered by a 16hp Generac VII18 propane engine (S/N 4350062).

Permit Conditions

Condition 1: Emissions

A. All equipment shall be regularly maintained in good working order pursuant to manufacturer's guidelines and operated in a manner to prevent or minimize air emissions. The Lake County Air Quality Management District (LCAQMD) shall be notified pursuant to Rule 510, regarding equipment breakdown.

B. The total ROG, PM-10, SOx or NOx emission rate for this facility shall not exceed 25 tons per 12-month period. This emission rate determination shall be consistent with the methodology and assumptions used to evaluate the application under which this permit was issued.

C. Visible emissions shall not exceed Ringelmann 1 (20% opacity) from the diesel engine generator exhaust stack for more than three (3) minutes in any one (1) hour.

Condition 2: Administrative

A. This permit has been issued and is valid for emergency diesel engine generator use when neither house power nor commercial line power is available because of an emergency or line maintenance outage. Use of the generator for any other purpose will subject the source to NSR and reassessment under the Air Toxics Control Measure (ATCM) for Compression Ignition engines to include control equipment retrofit or other upgrades. The propane generator may be used for prime power when commercial line power is not available.

B. Testing and Maintenance operations are allowed for up to 20 hours per 12-month period for the diesel engine.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

D. Bottle Rock Power, LLC (BRP) shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act as specified in Sections 44300 - 44394 of the California Health and Safety Code as well as the ATCM for Stationary Compression Ignition Engines.

E. Within 180 days of initial operation, BRP shall apply for a Permit to Operate, and prove compliance with these conditions.

F. A health risk assessment may be required for this facility should engine hours of operation exceed 200 hours per year for the diesel engine generator.

Condition 3: Records and Reporting

A. BRP shall maintain a monthly log of usage for each engine that shall list and document emergency use hours of operation, maintenance and testing hours of operation, initial startup hours, and all other hours of operation.

B. BRP shall document fuel usage for each engine by retention of fuel purchase records, accounting for all fuel used in the engines. Log entries shall be retained for a minimum of 36 months, with 24 months of the most recent entries retained on-site. The log shall meet all requirements of the ATCM for Stationary Compression Ignition Engines.

C. BRP shall maintain a non-resettable hour meter capable of displaying 9,999 hours for each engine.

D. BRP shall furnish for each engine, an annual record of fuel use (gallons), and generator use (hours), breaking down hours of testing, maintenance, and emergency (diesel engine) or prime (propane engine) use, meeting the reporting requirements of the ATCM for Stationary Compression Ignition Engines, and in a format acceptable to the LCAQMD within 15 days of request, and by October 31st of each year.

Condition 4: Modification

A. BRP shall apply for and receive an Authority to Construct permit prior to the addition of new equipment or significant modification of permitted equipment.

Condition 5: Monitoring

A. The herein permitted facility shall not cause a public nuisance nor make a measurable contribution to any Ambient Air Quality Standard exceed. Should this facility result in odor or health complaints, the LCAQMD may require under Sections 430 and 670, monitoring, testing and mitigation by BRP to abate said condition.

Condition 6: Identification and Access

A. This permit shall be posted at the equipment site and be available for BRP's reference and LCAQMD staff inspection. If locks or unmanned gates are used to secure the project area, the LCAQMD or its representative, will be given free access of entry for the purposes of monitoring, or inspecting during normal business hours or periods of generator use.

PERMIT TO OPERATE

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # P/O 2014-09

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* II

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray	*Facility:*	Bottle Rock Power Plant
Owner:	Bottle Rock Power, LLC	*Location:*	Bottle Rock Power Steamfield Storage Yard
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103		7557 High Valley Rd. Cobb, CA 95426

Name and Equipment Description: **Gasoline and/or Diesel Dispensing Facility**

One (1) ConVault above ground split storage tank (500 gallons unleaded and 500 gallons diesel). Phase I vapor recovery: pressure/vacuum (P/V) vent (make Husky, model 5885), 11 ft. Phase II vapor recovery: One (1) diesel dispenser and one (1) unleaded dispenser (make Fillrite, model 305AST), two (2) nozzles (make Husky, model H5010), and two (2) hoses (make Dayco, model DL 509).

Permit Conditions

Condition 1: Emissions

A. The Phase I vapor recovery system shall be properly connected and utilized during all storage tank filling operations.

B. The Phase II vapor recovery system shall be properly connected and utilized during all vehicle fueling.

C. Bottle Rock Power, LLC (BRP) shall maintain all equipment in good working order pursuant to manufacturer's guidelines and applicable California Air Resources Board (ARB) certification, and operate in a manner to prevent or minimize air emissions and gasoline leaks.

D. BRP shall immediately correct any gasoline or vapor leak, and all equipment breakdowns shall be reported to the Lake County Air Quality Management District (LCAQMD) pursuant to Section 510, LCAQMD Rules and Regulations.

Condition 2: Administrative

A. This permit has been issued for the purpose of on site fuel dispensing (no fuel sales), with annual use not to exceed 50,000 gallons.

B. The Phase I vapor recovery system installed on the storage tank(s) shall meet the certification requirements of the ARB.

C. The Phase II vapor recovery system shall be maintained to meet ARB certification requirements.

D. All gasoline storage tanks shall have submerged drop tube/fill pipes terminating a maximum of 6" from the tank bottom.

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

E. Properly gasketed caps shall be maintained on the product fill adapter and vapor adapter on all gasoline storage tanks.

F. BRP shall maintain hold open latches on all nozzles unless otherwise exempt.

G. BRP shall conspicuously post and maintain an approved "Air Toxic Risk" warning notice on each dispenser and maintain the warning signs in a good readable condition.

H. When a component is determined to be defective the equipment shall be immediately removed from use by BRP.

I. When a component is determined to be defective and the component is tagged "Out of Order", BRP shall not use or permit the use of the component until the component is properly repaired, replaced or adjusted and re-inspected, or authorized for use.

J. BRP shall comply with the requirements of the Air Toxic "Hot Spots" Information and Assessment Act as specified in Sections 44300-44394 of the California Health and Safety Code.

Condition 3: Records and Reporting
A. BRP shall provide the LCAQMD a written report of annual gasoline use within 15 days of request and annually by October 31st of each year.

Condition 4: Modification
A. BRP shall apply for and receive an Authority to Construct permit prior to the addition or alteration of any piping, dispenser(s), vapor recovery equipment, or tank(s). Equipment replacement for routine maintenance is allowed with LCAQMD concurrence.

B. If gasoline use exceeds 50,000 gallons for any one (1) year, BRP shall apply for and receive an Authority to Construct permit for the increase of use.

Condition 5: Monitoring
A. The herein permitted facility shall not cause a public nuisance nor make a measurable contribution to any Ambient Air Quality Standard exceed. Should the operation of this facility result in odor or health complaints, or be determined to be an unacceptable health risk, the LCAQMD may require under Sections 430 and 670, monitoring, testing, and mitigation by BRP to abate said condition.

Condition 6: Identification and Access
A. This permit shall be posted at the equipment site and be available for BRP's reference and LCAQMD staff inspection. The LCAQMD or its representative shall be given free access of entry for the purposes of monitoring, inspecting or collecting samples during normal business hours.

PERMIT TO OPERATE

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # P/O 2010-04

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Alice Bray
Owner: Bottle Rock Power, LLC
Mailing Address: 4010 Stone Way N, Suite 400
Seattle, WA 98103

Facility: Bottle Rock Facility
Location: Sec 5, T11N, R8W, MDB&M Lake County
Francisco/Coleman Leasehold, Cobb Valley, CA

Name and Equipment Description: **Steam Transmission Line Modifications**

Three (3) gate valves on the Steam Transmission Line to provide full isolation of the Francisco Pad, West Coleman Pad, and Power Plant. Two (2) sets of steam wash nozzles, and associated pumps, valves, and piping, located upstream of the main steam separator. Variable speed chemical feed pumps on the emergency steam stacking emissions control system connected to the Distributed Control System.

Permit Conditions

Condition 1: These modifications were done to the previously existing geothermal fluid (steam) transmission pipeline, steam wash, and emergency steam stacking system servicing the Bottle Rock Power Plant; all other permits, associated conditions, and limitations are not modified. The pipeline shall be constructed and operated in a manner to not increase steam stacking during scheduled and unscheduled power generation or transmission line outages or during power plant startups and shutdowns of the unit. Equipment utilized and/or modified which is significantly different than that described in the permit application is subject to permit application and review.

Condition 2: Pipeline cleanout, testing and startup emissions shall be consistent with the submitted project application and minimized to the extent feasible. Bottle Rock Power, LLC (BRP) shall provide the Lake County Air Quality Management District (LCAQMD) seventy-two (72) hours advance notice of scheduled cleanout and testing operations and obtain prior Air Pollution Control Officer (APCO) approval for the date and time of emissions release or obtain a variance.

Condition 3: All drain water discharged shall be directed to the rich condensate collection and disposal line.

Condition 4: This permit does not modify or make less restrictive any emission limitation, reporting, and/or monitoring/testing requirements that presently exist for this facility.

Condition 5: BRP shall provide the LCAQMD, no less than thirty (30) days subsequent to installation of the herein authorized modification, with as-built drawings for the modification, including all steam or gas vent locations.

Condition 6: BRP shall provide safe access to sampling ports that enable representatives of the LCAQMD, California Air Resources Board, or Environmental Protection Agency to collect samples, as approved by the APCO, from the steam stacking muffler, condensate collection basins, or any point release of steam, gas, or emissions to the ambient air.

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

PERMIT TO OPERATE

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # P/O 85-034A

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray
Owner:	Bottle Rock Power, LLC
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103

Facility:	Coleman Padsite
Location:	600m N of S, 320m E of W, Section 5, T11N, R8W, MDB&M, Lake County Coleman Pad, Bottle Rock / Francisco Leasehold, Cobb Valley, CA

Name and Equipment Description: **Coleman 4-5**

One (1) geothermal production well, associated valving, condensate and rock removal (catcher), and bleed muffler servicing the Bottle Rock Geothermal Power Plant.

Permit Conditions

Condition 1 The herein permitted well shall be operated in compliance and consistent with the steam transmission and power plant Authority to Construct (A/C) and Permit to Operate (P/O) conditions where applicable. The herein permitted well shall be operated in compliance with all Lake County Air Quality Management District (LCAQMD), State, and Federal laws and regulations.

Condition 2 Bottle Rock Power, LLC (BRP) shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the planned venting of any well or group of wells in the LCAQMD owned or operated by BRP in an amount in excess of either 3,000 lbs of steam per hour per well or 20,000 lbs of steam per hour total. Testing to characterize emissions may be required by the Air Pollution Control Officer (APCO) for significant well bleeds or vents. In the event source testing of any geothermal well is deemed necessary by the APCO, BRP will provide safe access and sampling ports.

Condition 3 BRP shall submit to the LCAQMD an application for, and receive, an A/C or modify permit prior to constructing, erecting, altering or replacing any equipment which may cause, potentially cause, reduce, control or eliminate the issuance of air contaminants. This does not include normal and routine maintenance nor well clean out and repairs. It does include deepening, altering or increasing the well bore size in a manner to constitute a modification of the source. BRP shall notify the LCAQMD in advance of, and receive approval for, any planned reworking/maintenance of any of the herein permitted production wells. Conditions for approval of such maintenance work will consider the level and duration of emissions, and the conditions incorporated in current BRP A/C permits and performance plans. BRP shall within thirty (30) days after the completion of re-drilling, re-working or flow testing submit to the LCAQMD the results of any routine or required chemical analysis and/or testing accomplished for the herein listed geothermal development wells that indicate emissions or potential emissions into the air.

(Conditions 4 through 12 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

Condition 4 BRP shall promptly notify the LCAQMD in writing should they learn of, or encounter conditions where toxic air emissions of concern from an occupational standpoint occur and which are allowed to disperse into the ambient air.

Condition 5 If locks or unmanned gates are used to secure the project area, the LCAQMD will be given keys or combinations and allowed free access of entry for purposes of monitoring, collection of samples and inspecting. If locks or access codes are changed periodically, BRP shall promptly forward new keys or access codes.

Condition 6 BRP will install and utilize when determined practicable, and when requested by the APCO, an in-line continuous hydrogen sulfide (H2S) monitor or other appropriate equipment to ascertain the levels of this pollutant released at the main steam transmission line prior to the turbine main steam stop valve as a result of operating the herein permitted wells. The results of such monitoring will be immediately available to LCAQMD personnel upon request.

Condition 7 Road and pad dust for three (3) minutes or more duration will be kept below Ringlemann 2 at all times by making use of watering, oiling or surfacing of roads or by such other means deemed appropriate.

Condition 8 The herein permitted well shall not create a nuisance nor make a measurable contribution to Ambient Air Quality Standard exceeds. BRP shall limit emissions during maintenance bleed operation to no more than twenty-four (24) pounds per day. Certain temporary exceptions may be granted for clearing the well, breakdowns or testing operations if they are short term and performed during periods of good dispersion as determined by the LCAQMD. BRP shall log steam flow rates and venting duration, and report to the LCAQMD on a monthly basis the amounts vented to atmosphere covered by this condition. Upon request the H2S levels of such venting shall be measured and reported to the LCAQMD.

Condition 9 This permit is for a single geothermal production well. BRP agrees that this permit does not establish a precedent for issuing future permits to BRP.

Condition 10 If it is determined that emissions limitations, as required by Rule 421.B of LCAQMD Rules and Regulations cannot be maintained, then BRP shall, with approval of the LCAQMD, install and utilize additional equipment or technology as necessary to bring emissions into compliance. This may include, but is not limited to, cycling of or the gas capping of any well in violation of rules and regulations or otherwise vented through a collection system and abated as required by that source permit. An exception may be granted by the APCO on a case by case basis for clearing gas capped wells or dealing with unanticipated breakdowns provided data is gathered to convince the APCO that coincident air dispersion is good and emissions are unlikely to effect any member of the public.

Condition 11 BRP agrees to promptly fund reasonable studies or tests as required by the LCAQMD, to ascertain the impact of steam production activities specifically at the residence located approximately 1900 ft. east of the Francisco pad should the resident in good faith file complaints with the LCAQMD indicating a nuisance or unhealthful air quality exists as a result of development activity on the Francisco leasehold. These studies shall include, but not be limited to monitoring at the residence to determine H2S levels and particulate, or other components which are believed or known to be in geothermal steam, tracer tests or source tests of emission sources on the leasehold. Such studies shall be approved by the LCAQMD prior to the initiation. Reasonable mitigation steps shall be applied upon request of the LCAQMD to attempt to remedy any unlawful impacts of the development project upon the residence.

Condition 12 At the request of the LCAQMD, BRP shall fund or install and maintain an air quality monitoring site (H2S, wind direction, wind speed, temperature) to assist the LCAQMD in determining compliance and the validity of emission limitations set forth in these conditions for the BRP Power Plant and Francisco Steamfield Project. It is agreed that this Condition is not intended nor does it require a monitoring station on a well by well basis. If chemical or particulate analysis performed as part of source testing suggests the need for further study including air dispersion analysis, BRP will assist, perform or assist in financing such studies if deemed reasonable and necessary by the APCO.

PERMIT TO OPERATE

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # P/O 2014-10

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Alice Bray
Owner: Bottle Rock Power, LLC
Mailing Address: 4010 Stone Way N, Suite 400
Seattle, WA 98103

Facility: Coleman Padsite
Location: 600m N of S, 320m E of W, Section 5, T11N, R8W, MDB&M, Lake County
Coleman Pad, Bottle Rock / Francisco Leasehold, Cobb Valley, CA

Name and Equipment Description: **Coleman 6-5**

One (1) geothermal production/injection well, associated valving, condensate and rock removal (catcher), and bleed muffler servicing the Bottle Rock Geothermal Power Plant. One (1) geothermal production well condensate collection piping system constructed of: 20' x 36" slotted and solid pipe, with cone reducer, one (1) 12" cleanout, and two (2) knock-out pots.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit Hydrogen Sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verified breakdown and for hot-liner installations, Lake County Air Quality Management District (LCAQMD) Rule 510 and procedures shall apply. In the event of atmospheric conditions (*e.g.*, drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds or less of H2S per hour consistent with the BRP H2S Abatement Plan, at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: a) Place into operation additional H2S abatement capacity, or b) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppm volume.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine or upon experiencing red/pink plume exiting the cyclone, the well logger shall immediately obtain bulk samples of the drilled material and log the event in the abatement logbook, and shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). "Experiencing a pink/red plume" shall mean a plume of greater than 5% opacity lasting for 30 or more seconds. For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean: drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine content. The LCAQMD shall be promptly notified by phone at 263-7000, provided a portion of the divided bulk samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten (10) working days of sampling. Bulk Samples collected upon experiencing a pink/red plume shall be promptly analyzed by XRF, or other acceptable means, to include at a minimum arsenic, chrome, nickel and cadmium. BRP shall, to the extent practical attempt to collect a sample of the particulate from the pink/red plume, and/or assist the LCAQMD in such an attempt, for analysis as described.

E. During drilling in significant serpentine, or while experiencing a pink/red plume, visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine or drilling conditions contributing to the formation of pink/red plume.

Condition 2: Administrative

A. This permit has been issued for the geothermal well to function in either injection or production mode. The well is constructed at a total depth of 10,700 feet and includes a well bore, well head, valving, piping, flanges, geothermal fluid transmission line header connections, side leg kick-out, two part slotted liner, and associated corrosion mitigation injection equipment. This permit allows drilling for well maintenance; significant drilling and work overs may require an Authority to Construct permit for the modification. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP H2S abatement plan approved by the APCO or subsequent approved revision, shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15 ppmw sulfur.

D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.
E. BRP shall utilize the same particulate scrubbing system (or an equivalent system approved by the APCO) as that utilized in recent drilling projects as described in the permitting reviews and includes the following configuration: a) A multi-port 60 GPM or greater adjustable low pressure water injection system in the 13" inside diameter portion of the blooie line (non-constricting venturi) combined with at least 20,000 lbs/hr steam. The constricting venturi scrubber shall not be required when drilling in greater than 20,000 lbs/hr of steam, or when the pressure drop exceeds four (4) PSI across the venturi. Both constricting and non-constricting venturis' shall be as submitted and reviewed by the LCAQMD; b) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; a shortened outlet barrel to approximately 1.25 times the inlet height; and acceptable measurement devices to ensure flows and pressures are properly monitored; c) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound logbook and the emission and/or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD within 15 days of occurrence; and d) The APCO may modify these requirements based upon presentation of new information and selection of alternatives proven to be more effective.
F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

Condition 3: Notification
A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.
B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.
C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD owned or operated by BRP. This notice shall also apply to scheduled installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Muffler utilization; e) Abatement utilization; and f) The likelihood or need for future occurrences.
D. Upon APCO request, BRP shall notify the LCAQMD at least twenty-four (24) hours in advance of planned switch from production to injection or injection to production mode of the well.
E. In the event that any emissions or the steam plume obscure visibility or create a hazard, BRP shall ensure that posting, warning or other necessary steps are made to ensure safe passage for the public.
F. BRP shall promptly notify in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as a mitigation.
G. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine or crystalline silica material actually encountered during drilling.

Condition 4: Modification
A. BRP shall apply for and receive an Authority to Construct permit prior to the addition of different or new equipment not identified in this permit or covered in the permitting review.

Condition 5: Monitoring and Testing
A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, H2S, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, H2S, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in μg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly put into a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is placed on vent for 30 or more days. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.
B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten (10) days after written notice, to open the well for a 4 to 8 hour duration.
C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.
D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.
E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.
F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.
G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).
H. If the well is placed on long-term standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.
I. Upon request of the APCO, BRP shall fund, install and maintain an air quality monitoring site (H2S, wind direction, wind speed and temperature) to assist the District in determining compliance with the H2S Ambient Air Quality Standard (AAQS). Continued participation in the Geysers Air Monitoring Program or a similar monitoring program will continue to be required during and beyond the scope of this project.
J. If significant dust complaints are received BRP shall fund, install, and maintain a continuous Federal Equivalent Method Particulate Matter (PM) or LCAQMD approved alternate sampler within fifteen (15) days of request by the APCO.
K. Upon request of the APCO, BRP shall fund, install, and maintain an LCAQMD approved H2S air quality monitoring station, and/or provide access, siting, and power for an LCAQMD monitoring station, during the new drilling, located between the rig and the property line nearest the closest downwind residence in order to monitor H2S emissions associated with construction.

Condition 6: Identification and Access
A. This permit shall be posted at the project site during the time the drill is on site, and be available for BRP and LCAQMD staff upon request.
B. BRP shall provide the LCAQMD, ARB and, Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.

PERMIT TO OPERATE

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # P/O 2014-08

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date: 10/31/2018* *Valid through: 10/31/2019* *Category: II*

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Alice Bray
Owner: Bottle Rock Power, LLC
Mailing Address: 4010 Stone Way N, Suite 400
Seattle, WA 98103

Facility: Coleman Padsite
Location: 600m N of S, 320m E of W, Section 5, T11N, R8W, MDB&M, Lake County
Coleman Pad, Bottle Rock / Francisco Leasehold, Cobb Valley, CA

Name and Equipment Description: **Emergency Backup Propane Generator**

One (1) Generac Guardian Model Generator, powered by a 32 HP, Generac 922cc V-Twin propane engine, S/N:5281627, Model Year 2008.

Permit Conditions

Condition 1: Emissions

A. All equipment shall be regularly maintained in good working order, pursuant to manufacturer's guidelines, and operated in a manner to prevent or minimize air emissions.

B. The total ROG, PM-10, SOx or NOx emission rate for this facility shall not exceed 25 tons per 12-month period.

C. The Lake County Air Quality Management District (LCAQMD) shall be notified pursuant to Rule 510 regarding equipment breakdown.

D. Visible emissions shall not exceed Ringelmann 1 (20% opacity) from the engine exhaust stack for more than three (3) minutes in any one (1) hour.

Condition 2: Administrative

A. This permit has been issued and is valid for emergency generator use when commercial line power is not available because of an emergency or line maintenance outage. Load shedding for cost reduction is not allowed under this permit. Such anticipated use will subject the source to NSR and reassessment.

B. Testing and maintenance operations are allowed for up to 50 hours per 12-month period.

C. The generator shall be propane fueled only, conversion or replacement with diesel shall require reassessment and compliance with the Air Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines.

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

D. Bottle Rock Power, LLC (BRP) shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act as specified in Sections 44300 - 44394 of the California Health and Safety Code.

Condition 3: Records and Reporting

A. BRP shall maintain a monthly log of usage that shall list and document emergency use hours of operation, maintenance and testing hours of operation, initial startup hours and all other hours of operation.

B. BRP shall document fuel usage by retention of fuel purchase records, accounting for all fuel used in the engine. Log entries shall be retained for a minimum of 36 months, with 24 months of the most recent entries retained on-site.

C. BRP shall maintain a non-resettable hour meter capable of displaying 9,999 hours.

D. BRP shall furnish an annual record of fuel use (gallons) and generator use (hours), breaking down hours of testing, maintenance, and emergency use in a format acceptable to the LCAQMD within 15 days of request, and by October 31st of each year.

Condition 4: Modification

A. BRP shall apply for and receive an Authority to Construct permit prior to the addition of new equipment or significant modification of permitted equipment.

Condition 5: Monitoring

A. The herein permitted facility shall not cause a public nuisance nor make a measurable contribution to any Ambient Air Quality Standard exceed. Should this facility result in odor or health complaints, the LCAQMD may require under Sections 430 and 670, monitoring, testing and mitigation by BRP to abate said condition.

Condition 6: Identification and Access

A. This permit shall be posted at the equipment site and be available for BRP's reference and LCAQMD staff during inspection. If locks or unmanned gates are used to secure the project area, the LCAQMD or its representative will be given free access of entry for the purposes of monitoring or inspecting during normal business hours or periods of generator use.

AUTHORITY TO CONSTRUCT

Permit # A/C 2010-14

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart

Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date: 10/31/2018* *Valid through: 10/31/2019* *Category: Vb*

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Alice Bray
Owner: Bottle Rock Power, LLC
Mailing Address: 4010 Stone Way N, Suite 400, Seattle, WA 98103

Facility: Bottle Rock Facility
Location: Sections 5&6, T11N, R8W, MDB&M, Lake County
Bottle Rock / Francisco Leasehold, Cobb Valley, CA

Name and Equipment Description: **Steam Transmission Line**

One (1) geothermal fluid collection line, associated valving, condensate collection including re-injection line, and steam release abatement system with particulate and H2S removal servicing the Bottle Rock Geothermal Power Plant and one (1) 2002 78hp John Deere Backhoe Loader EIN #MM5E57. Francisco Pad: one (1) 6,200 gallon vent tank, one (1) 1,500 gallon vent tank, one (1) TECO-Westinghouse (or equivalent) 20 hp electric motor, one (1) 500 gpm Gorman-Rupp (or equivalent) pump, Associated piping, instrumentation, and valves. Coleman Pad: one (1) 1,500 gallon vent tank, up to two (2) 20,000 gallon Baker tanks, one (1) TECO-Westinghouse (or equivalent) 20 hp electric motor, one (1) 500 gpm Gorman-Rupp (or equivalent) pump, associated piping, instrumentation, and valves. West Coleman Pad: one (1) 6,200 gallon vent tank, one (1) 1,500 gallon vent tank, associated piping, instrumentation, and valves.

Permit Conditions

Condition 1: Emissions

A. Condensate bleeds shall be opened and utilized only as necessary during cold start-up of the geothermal fluid transmission line. Other bleeds necessitated by continuous normal operation of this line shall total less than 0.3 lbs hydrogen sulfide (H2S) per hour during any one hour. If necessary, abatement systems shall be installed and/or utilized to ensure fugitive H2S emissions of less than 0.3 lbs/hr.

B. Abatement equipment to be utilized and available to prevent venting of air pollutants into the ambient air shall include an Emergency Stacking H2S Abatement System* capable of treating 100% of the total steam flow delivered through the transmission line; a by-pass to the surface condenser of the serviced power plant and abatement to the same level of emissions as required of the power plant; and the ability to remotely and within minutes cut back steam flow to not more than 50% of full steam flow. All abatement facilities shall be used in series and individually as necessary to ensure that an emissions rate of not more than 5 lbs H2S/hr is obtained.

* This abatement system is described in detail in a document entitled, Emergency Steam Stacking H2S Abatement Study, Bottle Rock Steam Gathering System Final Report; February 1982, Job No. 52-3184-001 by Gibbs & Hill for MCR.

C. Dust emissions of three (3) minutes duration in any one (1) hour will be kept below 20% opacity by use of water, palliatives, or surfacing of roads, pads and parking areas during the construction and operation of condensate collection system modification.

D. In the event of generalized atmospheric conditions or localized dangerous contamination of such a nature as to constitute an emergency creating a danger to the health and welfare of the citizens of Lake County, the Lake County Air Quality Management District (LCAQMD) will take immediate action by requiring Bottle Rock Power, LLC (BRP) to reduce or discontinue air contaminant emissions immediately from fluid (steam) transmission lines. A hearing shall be held by the LCAQMD Hearing Board as soon as practical after such action has been taken to determine whether such reduction or discontinuance shall continue, and if so, under what conditions.

E. Steam stacking under normal operations shall be treated by the use of the turbine by-pass to power plant condenser and abated utilizing the power plant abatement system. A de-mister or water scrubber shall be used to ensure compliance with LCAQMD Rule 411 when venting directly downstream and utilizing the steam stacking emergency abatement system.

F. When the total accumulative emissions from this development project during construction reach the five (5) pounds per hour level, or public nuisance issues be validated, BRP shall, at the request of the Air Pollution Control Officer (APCO), assist in obtaining funding to install and maintain, or fund the LCAQMD to install and maintain, an air quality monitoring site (H2S, wind direction, wind speed, temperature) to assist the LCAQMD in determining compliance and the validity of emission limitations as set forth in these conditions.

G. Regarding the turbine by-pass to main condenser power plant abatement system, BRP shall, to the extent possible, work to incorporate reliable and proven valves, noise attenuation of the valving, and desuperheating of by-passed steam/or account for in the design of the system, to maintain the ability to

(Conditions 1 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

successfully by-pass 100% of the steam load.
H. BRP shall operate and maintain the Emergency Steam Stacking Abatement System as permitted and as subsequently modified. At a minimum the following shall be operated as needed: de-superheat failure alarm, adequate water source and injection rate to facilitate abatement of H2S and aerosol/mist; emergency electric generator with sufficient power for the operation of all supply systems for water, chemicals, etc., and enable continuous operation of the system independent of service line power; mist eliminators with ~50% 4um, and 95% 8um cutoffs; ability to automatically initiate abatement upon a direct venting event; sized to treat up to 1,000,000 pounds of steam per hour; proper winterization by insulation, heating, etc., of the NaOH storage and delivery lines, water source and all other components necessary for operation adversely effected by freezing weather; mechanisms to ensure proper calibration and checks of the chemical delivery system; planned retrofit of a catalyst injection system should such be required to facilitate attainment of the specified emissions limitation; ability to treat 450 ppm H2S steam at 500,000 lbs per hour for up to 100 hours without chemical delivery; and acoustical treatment of valves and piping to ensure system availability during stacking and compliance with use permit and occupational noise standards.
The above Emergency Stacking Abatement System shall be operationally perfected during the initial use phase. The mole ratio of H2S in excess of five (5) lbs/hr to NaOH shall be 1.0 to 6.0 (H2S:NaOH) and for H2O2 it shall be 1.0 to 4.0 (H2S:H O2). Ratios may be altered as determined consistent with obtaining the most efficient use of necessary chemicals while attaining the five (5) lbs H2S/hr limitation. At the LCAQMD's request, BRP shall prepare and submit an abatement performance plan pursuant to LCAQMD Rule 655.

Condition 2: Administrative
A. This permit is for a single geothermal steam transmission line servicing a single 55 megawatt power plant and subsequent modification of the condensate collection system. The steam transmission line system shall be maintained in good working order and shall be available under all normal conditions of operation.
B. An abatement contingency plan will be prepared/updated and submitted to the LCAQMD within 180 days of issuance of this permit outlining those actions to be taken to reduce emissions to acceptable levels in the event of extended simultaneous outage (in excess of 90 min.) of the power plant and associated steam transmission line abatement equipment. The plan will include at a minimum: 1) How field operations staff will be made aware of and be prepared to implement the plan; 2) Methods to be utilized to reduce emissions; 3) How LCAQMD staff can be assured of and aided in determining compliance with the plan; and 4) How notification of such outage and reduction of emissions will occur.
C. These conditions are based on the assumption that this project as conditioned will not result in violation of LCAQMD Rules and Regulations. This permit is also subject to concurrence by the California Air Resources Board and the Environmental Protection Agency within thirty (30) days of receipt, and prior to becoming effective.

Condition 3: Records and Reporting
A. BRP shall notify the LCAQMD at least twenty-four (24) hours in advance of any scheduled venting of the pipeline or well facilities.
B. The APCO or his representative's approval shall be obtained prior to any cold start-up of the geothermal fluid transmission line which is expected to result in more than five (5) lbs H2S/hr emissions. The APCO shall give his approval unless existing meteorological and/or prevailing air quality indicates poor air dispersion exists at the time. The APCO may cancel cold start-ups once initiated if, in his opinion, it becomes necessary.
C. BRP shall install a device capable of monitoring total steam flows to the plant, stacking muffler or other likely venting points, and will provide records and summary reports of gathered data to the LCAQMD after reasonable request for same. This information shall be held as confidential if allowed by law and so requested by BRP in writing per Section 533 of LCAQMD Rules and Regulations.
D. Within one hundred eighty (180) days after initial operation BRP shall submit to the LCAQMD an application for a Permit to Operate the pipeline system.

Condition 4: Modification
A. BRP shall submit an application for and receive an Authority to Construct prior to the commencement of construction in the event any further additions are proposed to the pipeline system.
B. Significant deviations from conditions of this permit can only be granted by the APCO after a public hearing or by Hearing Board action.

Condition 5: Monitoring and Testing
A. If the chemical analysis of ambient air indicates to the APCO that substantial change to existing conditions is resulting from operations of BRP's pipeline systems, and the APCO determines that this change would require further study to ascertain compliance, including air dispersion analysis, BRP will assist, perform, or assist in obtaining financing of such studies deemed reasonable and prudent by BRP and the APCO.
B. BRP will perform or cause to be performed on a bi-annual basis, a source test for all components listed below upon written request by the LCAQMD. The LCAQMD will approve the sampling and chemical analytical techniques prior to planning for tests and be contacted forty-eight (48) hours prior to source testing in order to certify the analytical techniques.
STEAM CONDENSATE/TOTAL STEAM: Benzene, Ammonium (total), Arsenic, Bicarbonate and Carbonate, Sulfates, Chlorides, Nitrates, Calcium, Boron (total), Hydrogen Sulfide (total), Fluorides (total), Iron, Conductivity (mhos 25oC), Mercury (total), pH, Total dissolved solids, and Total suspended solids.
GAS PHASE: Benzene, Particulate in Steam (ug particulate/g of Steam, Arsenic, Lead, Cadmium, Total Sulfur, Boron), Mercury Vapor, Carbon Dioxide, Radon 222 and daughters, Methane, NonMethane Hydrocarbons, Carbon Dioxide, Other non-gases as indicated by condensate analysis NESHAPS pollutants as requested, Steamflow and Temperature.
C. Upon request of the APCO, BRP shall ensure that reliable H2S monitoring equipment is installed, calibrated, operated and maintained, capable of measuring H2S from stacked and delivered steam once every 24 hours. Records and summary reports of gathered monitoring data shall be provided to the LCAQMD upon request.

Condition 6: Identification and Access
A. If locks or secured gates are utilized to protect the project area, the LCAQMD will be provided keys or combinations and will have free access of entry and exit for District personnel or representatives for the purposes of monitoring and inspection.

AUTHORITY TO CONSTRUCT

Permit # A/C 2006-11

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart

Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray
Owner:	Bottle Rock Power, LLC
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103

Facility:	Coleman Padsite
Location:	600m N of S, 320m E of W, Section 5, T11N, R8W, MDB&M, Lake County Coleman Pad, Bottle Rock / Francisco Leasehold, Cobb Valley, CA

Name and Equipment Description: **Coleman 1A-5 Re-Drill**

Geothermal drilling rig and accessories (NCPA Rig #1), Four electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three air compressors (Cummins QSK19-C700 700 HP turbocharged diesel powered air compressors), one down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H2O2; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds of H2S using abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: 1) Place into operation additional H2S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos containing ore. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

Condition 2: Administrative

A. This permit has been issued as a modification to include cleanout, forking or deepening of the well as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H2S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

E. BRP shall utilize the same particulate abatement system described in the permitting review(s) and includes the following configuration: 1) A non-constricting venturi in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr air/steam and a converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam, or when the pressure drop exceeds 4 PSI across the

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

converging to diverging section, or for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Both venturis shall utilize a multi-port 60 GPM or greater adjustable low pressure water injection system as described in the permit review. 2) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure constricting and non-constricting interchangeable spool injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; an outlet barrel approximately 1.25 times the inlet height; an open drop arrangement at the terminus of a full 'cone,' sized 18", or alternatively with written APCO approval a drop hopper that separates liquid and gas then dropping into a water jet venturi or other re-circulating pump system for cuttings removal; and acceptable measurement devices to ensure flows and pressure are properly monitored. 3) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD. 4) The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.
F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

Condition 3: Notification
A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.
B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.
C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to schedule installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.
D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.
E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

Condition 4: Modification/Additions
A. BRP shall apply for and receive an Authority to Construct (A/C) a modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

Condition 5: Monitoring and Testing
A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in μg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days, or upon written request of the APCO. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.
B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.
C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.
D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.
E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.
F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.
G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).
H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.
I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as GAMP, approved by the APCO shall fulfill this requirement.

Condition 6: Identification and Access
A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, LCAQMD staff or representatives will be given free access of entry for the purposes of monitoring or inspecting.
B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.

This permit is based on the equipmeut and process submitted by BRP and considered in the A/C assessment. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.

AUTHORITY TO CONSTRUCT

Permit # A/C 2006-05

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart

Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date: 10/31/2018 Valid through: 10/31/2019 Category: IV*

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray
Owner:	Bottle Rock Power, LLC
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103

Facility:	Coleman Padsite
Location:	600m N of S, 320m E of W, Section 5, T11N, R8W, MDB&M, Lake County Coleman Pad, Bottle Rock / Francisco Leasehold, Cobb Valley, CA

Name and Equipment Description: **Coleman 3-5 Re-Drill**

Geothermal drilling rig and accessories (NCPA Rig #1), Four electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three air compressors (Cummins QSK19-C700 700 HP turbocharged diesel powered air compressors), one down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H2O2; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds of H2S using abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: 1) Place into operation additional H2S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos containing ore. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

Condition 2: Administrative

A. This permit has been issued as a modification to include cleanout, forking or deepening of the well as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H2S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

E. BRP shall utilize the same particulate abatement system described in the permitting review(s) and includes the following configuration: 1) A non-constricting venturi in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr air/steam and a converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam, or when the pressure drop exceeds 4 PSI across the

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

converging to diverging section, or for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Both venturis shall utilize a multi-port 60 GPM or greater adjustable low pressure water injection system as described in the permit review. 2) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure constricting and non-constricting interchangeable spool injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; an outlet barrel approximately 1.25 times the inlet height; an open drop arrangement at the terminus of a full 'cone,' sized 18", or alternatively with written APCO approval a drop hopper that separates liquid and gas then dropping into a water jet venturi or other re-circulating pump system for cuttings removal; and acceptable measurement devices to ensure flows and pressure are properly monitored. 3) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD. 4) The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.
F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

Condition 3: Notification
A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.
B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.
C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to schedule installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.
D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.
E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

Condition 4: Modification/Additions
A. BRP shall apply for and receive an Authority to Construct (A/C) a modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

Condition 5: Monitoring and Testing
A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in μg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days, or upon written request of the APCO. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.
B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.
C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.
D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.
E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.
F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.
G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).
H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.
I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as GAMP, approved by the APCO shall fulfill this requirement.

Condition 6: Identification and Access
A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, LCAQMD staff or representatives will be given free access of entry for the purposes of monitoring or inspecting.
B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in the A/C assessment. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.

AUTHORITY TO CONSTRUCT

Permit # A/C 2006-06

Lake County Air Quality Management District
2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray
Owner:	Bottle Rock Power, LLC
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103

Facility:	Coleman Padsite
Location:	600m N of S, 320m E of W, Section 5, T11N, R8W, MDB&M, Lake County Coleman Pad, Bottle Rock / Francisco Leasehold, Cobb Valley, CA

Name and Equipment Description: **Coleman 5-5 Re-Drill**

Geothermal drilling rig and accessories (NCPA Rig #1), Four electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three air compressors (Cummins QSK19-C700 700 HP turbocharged diesel powered air compressors), one down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H2O2; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds of H2S using abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: 1) Place into operation additional H2S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos containing ore. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

Condition 2: Administrative

A. This permit has been issued as a modification to include cleanout, forking or deepening of the well as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H2S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

E. BRP shall utilize the same particulate abatement system described in the permitting review(s) and includes the following configuration: 1) A non-constricting venturi in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

air/steam and a converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam, or when the pressure drop exceeds 4 PSI across the converging to diverging section, or for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Both venturis shall utilize a multi-port 60 GPM or greater adjustable low pressure water injection system as described in the permit review. 2) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure constricting and non-constricting interchangeable spool injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; an outlet barrel approximately 1.25 times the inlet height; an open drop arrangement at the terminus of a full 'cone,' sized 18", or alternatively with written APCO approval a drop hopper that separates liquid and gas then dropping into a water jet venturi or other re-circulating pump system for cuttings removal; and acceptable measurement devices to ensure flows and pressure are properly monitored. 3) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD. 4) The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.
F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

Condition 3: Notification
A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.
B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.
C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to schedule installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.
D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.
E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

Condition 4: Modification/Additions
A. BRP shall apply for and receive an Authority to Construct (A/C) a modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

Condition 5: Monitoring and Testing
A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in μg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days, or upon written request of the APCO. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.
B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.
C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.
D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff npon request at the drill site.
E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.
F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.
G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).
H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.
I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as GAMP, approved by the APCO shall fulfill this requirement.

Condition 6: Identification and Access
A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, LCAQMD staff or representatives will be given free access of entry for the purposes of monitoring or inspecting.
B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in the A/C assessment. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.

AUTHORITY TO CONSTRUCT

Permit # A/C 2006-30

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart

Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Alice Bray
Owner: Bottle Rock Power, LLC
Mailing Address: 4010 Stone Way N, Suite 400, Seattle, WA 98103

Facility: Coleman Padsite
Location: 600m N of S, 320m E of W, Section 5, T11N, R8W, MDB&M, Lake County Coleman Pad, Bottle Rock / Francisco Leasehold, Cobb Valley, CA

Name and Equipment Description: **Coleman 7-5**

Geothermal drilling rig and accessories (NCPA Rig #1, equivalent or surperior), four (4) electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three (3) air compressors (Cummins QSK19-C700 700 HP turbocharged diesel powered air compressors), one (1) down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H2O2; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (*e.g.*, drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds of H2S per hour using the approved abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: 1) Place into operation additional H2S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour:

- Ringelmann 0.5 (10% opacity) for detached plume at the cyclone;
- Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and
- Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos containing ore. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

Condition 2: Administrative

A. This permit has been issued for the construction of a geothermal production well to include a fork leg from the main bore as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H2S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

E. BRP shall utilize the same particulate abatement system described in the permitting review(s) and recently utilized and includes the following configuration: 1) A non-constricting venturi in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr air/steam and a converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam, or when the pressure drop exceeds 4 PSI across the converging to diverging section, or for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Both venturis shall utilize a multi-port 60 GPM or greater adjustable low pressure water injection system as described in the permit review; 2) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure constricting and non-constricting interchangeable spool injection treatment; an approximate eight foot (or greater length) section of rectangular dncting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; an outlet barrel approximately 1.25 times the inlet height; an open drop arrangement at the terminus of a full 'cone,' sized 18", or alternatively with written APCO approval a drop hopper that separates liquid and gas then dropping into a water jet venturi or other re-circulating pump system for cuttings removal; and acceptable measurement devices to ensure flows and pressure are properly monitored; 3) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Snch occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD; and 4) The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.
F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

Condition 3: Notification
A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.
B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.
C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to schedule installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.
D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.
E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

Condition 4: Modification/Additions
A. BRP shall apply for and receive an Authority to Construct (A/C) a modification permit prior to the addition of different or new equipment not identified iu the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

Condition 5: Monitoring and Testing
A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well withiu sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Brouides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Coudensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in μg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon written request of BRP and concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.
B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.
C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.
D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipmeut to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.
E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.
F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resouree, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissious from testing shall be limited to the amount specified in Conditiou 1.
G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment duriug air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO withiu three (3) working days of finishing mud water treatment(s).
H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.
I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of cousiderable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as GAMP, approved by the APCO shall fulfill this requirement.

Condition 6: Identification and Access
A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upou request. If locks or unmanned gates are used to secure the project area, LCAQMD staff or representatives will be given free access of entry for the purposes of monitoring or inspecting.
B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testiug, and/or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in this A/C Review. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.

AUTHORITY TO CONSTRUCT

Permit # A/C 2006-31

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas G. Gearhart

Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray
Owner:	Bottle Rock Power, LLC
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103

Facility:	Coleman Padsite
Location:	600m N of S, 320m E of W, Section 5, T11N, R8W, MDB&M, Lake County Coleman Pad, Bottle Rock / Francisco Leasehold, Cobb Valley, CA

Name and Equipment Description: **Coleman 8-5**

Geothermal drilling rig and accessories (NCPA Rig #1, equivalent or surperior), four (4) electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three (3) air compressors (Cummins QSK19-C700 700 HP turbocharged diesel powered air compressors), one (1) down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H2O2; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (*e.g.*, drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds of H2S per hour using the approved abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: 1) Place into operation additional H2S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour:

- Ringelmann 0.5 (10% opacity) for detached plume at the cyclone;
- Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and
- Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos containing ore. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

Condition 2: Administrative

A. This permit has been issued for the construction of a geothermal production well to include a fork leg from the main bore as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H2S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

E. BRP shall utilize the same particulate abatement system described in the permitting review(s) and recently utilized and includes the following configuration: 1) A non-constricting venturi in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr air/steam and a converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam, or when the pressure drop exceeds 4 PSI across the converging to diverging section, or for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Both venturis shall utilize a multi-port 60 GPM or greater adjustable low pressure water injection system as described in the permit review; 2) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure constricting and non-constricting interchangeable spool injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; an outlet barrel approximately 1.25 times the inlet height; an open drop arrangement at the terminus of a full 'cone,' sized 18", or alternatively with written APCO approval a drop hopper that separates liquid and gas then dropping into a water jet venturi or other re-circulating pump system for cuttings removal; and acceptable measurement devices to ensure flows and pressure are properly monitored; 3) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD; and 4) The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.
F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

Condition 3: Notification
A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.
B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.
C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to schedule installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.
D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.
E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

Condition 4: Modification/Additions
A. BRP shall apply for and receive an Authority to Construct (A/C) a modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

Condition 5: Monitoring and Testing
A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in μg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon written request of BRP and concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.
B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.
C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.
D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.
E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.
F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.
G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).
H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.
I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as GAMP, approved by the APCO shall fulfill this requirement.

Condition 6: Identification and Access
A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, LCAQMD staff or representatives will be given free access of entry for the purposes of monitoring or inspecting.
B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in this A/C Review. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.

PERMIT TO OPERATE

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # P/O 85-030A

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Alice Bray
Owner: Bottle Rock Power, LLC
Mailing Address: 4010 Stone Way N, Suite 400
Seattle, WA 98103

Facility: Francisco Padsite
Location: 400m S of N, 310m E of W, Sections 5, T11N, R8W, MDB&M, Lake County
Francisco Pad, Francisco / Bottle Rock Leasehold, Cobb Valley, CA

Name and Equipment Description: **Francisco 3-5**

One (1) geothermal production well, associated valving, condensate and rock removal (catcher) and bleed muffler servicing the Bottle Rock Geothermal Power Plant.

Permit Conditions

Condition 1 The herein permitted well shall be operated in compliance and consistent with the steam transmission and power plant Authority to Construct (A/C) and Permit to Operate (P/O) conditions where applicable. The herein permitted well shall be operated in compliance with all Lake County Air Quality Management District (LCAQMD), State, and Federal laws and regulations.

Condition 2 Bottle Rock Power, LLC (BRP) shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the planned venting of any well or group of wells in the LCAQMD owned or operated by BRP in an amount in excess of either 3,000 lbs of steam per hour per well or 20,000 lbs of steam per hour total. Testing to characterize emissions may be required by the Air Pollution Control Officer (APCO) for significant well bleeds or vents. In the event source testing of any geothermal well is deemed necessary by the APCO, BRP will provide safe access and sampling ports.

Condition 3 BRP shall submit to the LCAQMD an application for, and receive, an A/C or modify permit prior to constructing, erecting, altering or replacing any equipment which may cause, potentially cause, reduce, control or eliminate the issuance of air contaminants. This does not include normal and routine maintenance nor well clean out and repairs. It does include deepening, altering or increasing the well bore size in a manner to constitute a modification of the source. BRP shall notify the LCAQMD in advance of, and receive approval for, any planned reworking/maintenance of any of the herein permitted production wells. Conditions for approval of such maintenance work will consider the level and duration of emissions, and the conditions incorporated in current BRP A/C permits and performance plans. BRP shall within thirty (30) days after the completion of re-drilling, re-working or flow testing submit to the LCAQMD the results of any routine or required chemical analysis and/or testing accomplished for the herein listed geothermal development wells that indicate emissions or potential emissions into the air.

(Conditions 4 through 12 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

Condition 4 BRP shall promptly notify the LCAQMD in writing should they learn of, or encounter conditions where toxic air emissions of concern from an occupational standpoint occur and which are allowed to disperse into the ambient air.

Condition 5 If locks or unmanned gates are used to secure the project area, the LCAQMD will be given keys or combinations and allowed free access of entry for purposes of monitoring, collection of samples and inspecting. If locks or access codes are changed periodically, BRP shall promptly forward new keys or access codes.

Condition 6 BRP will install and utilize when determined practicable, and when requested by the APCO, an in-line continuous hydrogen sulfide (H2S) monitor or other appropriate equipment to ascertain the levels of this pollutant released at the main steam transmission line prior to the turbine main steam stop valve as a result of operating the herein permitted wells. The results of such monitoring will be immediately available to LCAQMD personnel upon request.

Condition 7 Road and pad dust for three (3) minutes or more duration will be kept below Ringlemann 2 at all times by making use of watering, oiling or surfacing of roads or by such other means deemed appropriate.

Condition 8 The herein permitted well shall not create a nuisance nor make a measurable contribution to Ambient Air Quality Standard exceeds. BRP shall limit emissions during maintenance bleed operation to no more than twenty-four (24) pounds per day. Certain temporary exceptions may be granted for clearing the well, breakdowns or testing operations if they are short term and performed during periods of good dispersion as determined by the LCAQMD. BRP shall log steam flow rates and venting duration, and report to the LCAQMD on a monthly basis the amounts vented to atmosphere covered by this condition. Upon request the H2S levels of such venting shall be measured and reported to the LCAQMD.

Condition 9 This permit is for a single geothermal production well. BRP agrees that this permit does not establish a precedent for issuing future permits to BRP.

Condition 10 If it is determined that emissions limitations, as required by Rule 421.B of LCAQMD Rules and Regulations cannot be maintained, then BRP shall, with approval of the LCAQMD, install and utilize additional equipment or technology as necessary to bring emissions into compliance. This may include, but is not limited to, cycling of or the gas capping of any well in violation of rules and regulations or otherwise vented through a collection system and abated as required by that source permit. An exception may be granted by the APCO on a case by case basis for clearing gas capped wells or dealing with unanticipated breakdowns provided data is gathered to convince the APCO that coincident air dispersion is good and emissions are unlikely to effect any member of the public.

Condition 11 BRP agrees to promptly fund reasonable studies or tests as required by the LCAQMD, to ascertain the impact of steam production activities specifically at the residence located approximately 1900 ft. east of the Francisco pad should the resident in good faith file complaints with the LCAQMD indicating a nuisance or unhealthful air quality exists as a result of development activity on the Francisco leasehold. These studies shall include, but not be limited to monitoring at the residence to determine H2S levels and particulate, or other components which are believed or known to be in geothermal steam, tracer tests or source tests of emission sources on the leasehold. Such studies shall be approved by the LCAQMD prior to the initiation. Reasonable mitigation steps shall be applied upon request of the LCAQMD to attempt to remedy any unlawful impacts of the development project upon the residence.

Condition 12 At the request of the LCAQMD, BRP shall fund or install and maintain an air quality monitoring site (H2S, wind direction, wind speed, temperature) to assist the LCAQMD in determining compliance and the validity of emission limitations set forth in these conditions for the BRP Power Plant and Francisco Steamfield Project. It is agreed that this Condition is not intended nor does it require a monitoring station on a well by well basis. If chemical or particulate analysis performed as part of source testing suggests the need for further study including air dispersion analysis, BRP will assist, perform or assist in financing such studies if deemed reasonable and necessary by the APCO.

PERMIT TO OPERATE

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

Permit # P/O 86-074A

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Alice Bray
Owner: Bottle Rock Power, LLC
Mailing Address: 4010 Stone Way N, Suite 400
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Facility: Francisco Padsite
Location: 400m S of N, 310m E of W, Sections 5, T11N, R8W, MDB&M, Lake County
Francisco Pad, Francisco / Bottle Rock Leasehold, Cobb Valley, CA

Name and Equipment Description: **Francisco 5-5**

One (1) geothermal production well, associated valving, condensate and rock removal (catcher) and bleed muffler servicing the Bottle Rock Geothermal Power Plant.

Permit Conditions

Condition 1 The herein permitted well shall be operated in compliance and consistent with the steam transmission and power plant Authority to Construct (A/C) and Permit to Operate (P/O) conditions where applicable. The herein permitted well shall be operated in compliance with all Lake County Air Quality Management District (LCAQMD), State, and Federal laws and regulations.

Condition 2 Bottle Rock Power, LLC (BRP) shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the planned venting of any well or group of wells in the LCAQMD owned or operated by BRP in an amount in excess of either 3,000 lbs of steam per hour per well or 20,000 lbs of steam per hour total. Testing to characterize emissions may be required by the Air Pollution Control Officer (APCO) for significant well bleeds or vents. In the event source testing of any geothermal well is deemed necessary by the APCO, BRP will provide safe access and sampling ports.

Condition 3 BRP shall submit to the LCAQMD an application for, and receive, an A/C or modify permit prior to constructing, erecting, altering or replacing any equipment which may cause, potentially cause, reduce, control or eliminate the issuance of air contaminants. This does not include normal and routine maintenance nor well clean out and repairs. It does include deepening, altering or increasing the well bore size in a manner to constitute a modification of the source. BRP shall notify the LCAQMD in advance of, and receive approval for, any planned reworking/maintenance of any of the herein permitted production wells. Conditions for approval of such maintenance work will consider the level and duration of emissions, and the conditions incorporated in current BRP A/C permits and performance plans. BRP shall within thirty (30) days after the completion of re-drilling, re-working or flow testing submit to the LCAQMD the results of any routine or required chemical analysis and/or testing accomplished for the herein listed geothermal development wells that indicate emissions or potential emissions into the air.

(Conditions 4 through 12 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

Condition 4 BRP shall promptly notify the LCAQMD in writing should they learn of, or encounter conditions where toxic air emissions of concern from an occupational standpoint occur and which are allowed to disperse into the ambient air.

Condition 5 If locks or unmanned gates are used to secure the project area, the LCAQMD will be given keys or combinations and allowed free access of entry for purposes of monitoring, collection of samples and inspecting. If locks or access codes are changed periodically, BRP shall promptly forward new keys or access codes.

Condition 6 BRP will install and utilize when determined practicable, and when requested by the APCO, an in-line continuous hydrogen sulfide (H2S) monitor or other appropriate equipment to ascertain the levels of this pollutant released at the main steam transmission line prior to the turbine main steam stop valve as a result of operating the herein permitted wells. The results of such monitoring will be immediately available to LCAQMD personnel upon request.

Condition 7 Road and pad dust for three (3) minutes or more duration will be kept below Ringlemann 2 at all times by making use of watering, oiling or surfacing of roads or by such other means deemed appropriate.

Condition 8 The herein permitted well shall not create a nuisance nor make a measurable contribution to Ambient Air Quality Standard exceeds. BRP shall limit emissions during maintenance bleed operation to no more than twenty-four (24) pounds per day. Certain temporary exceptions may be granted for clearing the well, breakdowns or testing operations if they are short term and performed during periods of good dispersion as determined by the LCAQMD. BRP shall log steam flow rates and venting duration, and report to the LCAQMD on a monthly basis the amounts vented to atmosphere covered by this condition. Upon request the H2S levels of such venting shall be measured and reported to the LCAQMD.

Condition 9 This permit is for a single geothermal production well. BRP agrees that this permit does not establish a precedent for issuing future permits to BRP.

Condition 10 If it is determined that emissions limitations, as required by Rule 421.B of LCAQMD Rules and Regulations cannot be maintained, then BRP shall, with approval of the LCAQMD, install and utilize additional equipment or technology as necessary to bring emissions into compliance. This may include, but is not limited to, cycling of or the gas capping of any well in violation of rules and regulations or otherwise vented through a collection system and abated as required by that source permit. An exception may be granted by the APCO on a case by case basis for clearing gas capped wells or dealing with unanticipated breakdowns provided data is gathered to convince the APCO that coincident air dispersion is good and emissions are unlikely to effect any member of the public.

Condition 11 BRP agrees to promptly fund reasonable studies or tests as required by the LCAQMD, to ascertain the impact of steam production activities specifically at the residence located approximately 1900 ft. east of the Francisco pad should the resident in good faith file complaints with the LCAQMD indicating a nuisance or unhealthful air quality exists as a result of development activity on the Francisco leasehold. These studies shall include, but not be limited to monitoring at the residence to determine H2S levels and particulate, or other components which are believed or known to be in geothermal steam, tracer tests or source tests of emission sources on the leasehold. Such studies shall be approved by the LCAQMD prior to the initiation. Reasonable mitigation steps shall be applied upon request of the LCAQMD to attempt to remedy any unlawful impacts of the development project upon the residence.

Condition 12 At the request of the LCAQMD, BRP shall fund or install and maintain an air quality monitoring site (H2S, wind direction, wind speed, temperature) to assist the LCAQMD in determining compliance and the validity of emission limitations set forth in these conditions for the BRP Power Plant and Francisco Steamfield Project. It is agreed that this Condition is not intended nor does it require a monitoring station on a well by well basis. If chemical or particulate analysis performed as part of source testing suggests the need for further study including air dispersion analysis, BRP will assist, perform or assist in financing such studies if deemed reasonable and necessary by the APCO.

AUTHORITY TO CONSTRUCT

Permit # A/C 2006-07

Lake County Air Quality Management District
2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Alice Bray
Owner: Bottle Rock Power, LLC
Mailing Address: 4010 Stone Way N, Suite 400
Seattle, WA 98103

Facility: Francisco Padsite
Location: 400m S of N, 310m E of W, Sections 5, T11N, R8W, MDB&M, Lake County
Francisco Pad, Francisco / Bottle Rock Leasehold, Cobb Valley, CA

Name and Equipment Description: **Francisco 2-5 Re-Drill**

Geothermal drilling rig and accessories (NCPA Rig #1), Four electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three air compressors (Cummins QSK19-C700 700 HP turbocharged diesel powered air compressors), one down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H2O2; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds of H2S using abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: 1) Place into operation additional H2S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos containing ore. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

Condition 2: Administrative

A. This permit has been issued as a modification to include cleanout, forking or deepening of the well as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H2S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

E. BRP shall utilize the same particulate abatement system described in the permitting review(s) and includes the following configuration: 1) A non-constricting venturi in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr air/steam and a converging venturi scrubber when

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

drilling in less than 20,000 lbs/hr of steam, or when the pressure drop exceeds 4 PSI across the converging to diverging section, or for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Both venturis shall utilize a multi-port 60 GPM or greater adjustable low pressure water injection system as described in the permit review. 2) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure constricting and non-constricting interchangeable spool injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; an outlet barrel approximately 1.25 times the inlet height; an open drop arrangement at the terminus of a full 'cone,' sized 18", or alternatively with written APCO approval a drop hopper that separates liquid and gas then dropping into a water jet venturi or other re-circulating pump system for cuttings removal; and acceptable measurement devices to ensure flows and pressure are properly monitored. 3) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD. 4) The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.
F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

Condition 3: Notification
A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.
B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.
C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to schedule installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.
D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.
E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

Condition 4: Modification/Additions
A. BRP shall apply for and receive an Authority to Construct (A/C) a modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

Condition 5: Monitoring and Testing
A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadminm, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in µg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days, or upon written request of the APCO. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.
B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.
C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.
D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.
E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.
F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.
G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).
H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.
I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as GAMP, approved by the APCO shall fulfill this requirement.

Condition 6: Identification and Access
A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, LCAQMD staff or representatives will be given free access of entry for the purposes of monitoring or inspecting.
B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in the A/C assessment. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.

AUTHORITY TO CONSTRUCT

Permit # A/C 2014-09

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart

Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray
Owner:	Bottle Rock Power, LLC
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103
Facility:	Francisco Padsite
Location:	400m S of N, 310m E of W, Sections 5, T11N, R8W, MDB&M, Lake County Francisco Pad, Francisco / Bottle Rock Leasehold, Cobb Valley, CA

Name and Equipment Description: **Francisco 4-5**

One (1) geothermal production/injection well, associated valving, condensate and rock removal (catcher), and bleed muffler servicing the Bottle Rock Geothermal Power Plant.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit Hydrogen Sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verified breakdown and for hot-liner installations, Lake County Air Quality Management District (LCAQMD) Rule 510 and procedures shall apply. In the event of atmospheric conditions (*e.g.*, drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds or less of H2S per hour, consistent with the BRP H2S Abatement Plan, at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: a) Place into operation additional H2S abatement capacity, or b) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppm volume.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine or upon experiencing red/pink plume exiting the cyclone, the well logger shall immediately obtain bulk samples of the drilled material and log the event in the abatement logbook, and shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). "Experiencing a pink/red plume" shall mean a plume of greater than 5% opacity lasting for 30 or more seconds. For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine content. The LCAQMD shall be promptly notified by phone at 263-7000, provided a portion of the divided bulk samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten (10) working days of sampling. Bulk Samples collected upon experiencing a pink/red plume shall be promptly analyzed by XRF, or other acceptable means, to include at a minimum arsenic, chrome, nickel and cadmium. BRP shall, to the extent practical attempt to collect a sample of the particulate from the pink/red plume, and/or assist the LCAQMD in such an attempt, for analysis as described.

E. During drilling in significant serpentine, or while experiencing a pink/red plume, visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine or drilling conditions contributing to the formation of pink/red plume.

Condition 2: Administrative

A. This permit has been issued for the geothermal well to function in either injection or production mode. The well is constructed at a total depth of 9,901 feet and includes a well bore, well head, valving, piping, flanges, geothermal fluid transmission line header connections, side leg kick-out, two part slotted liner, and associated corrosion mitigation injection equipment. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP H2S abatement plan approved by the APCO or subsequent approved revision, shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15 ppmw sulfur.

D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

E. BRP shall utilize the same particulate scrubbing system (or an equivalent system approved by the APCO) as that utilized in recent drilling projects as described in the permitting reviews and includes the following configuration: a) A multi-port 60 GPM or greater adjustable low pressure water injection system in the 13" inside diameter portion of the blooie line (non-constricting venturi) combined with at least 20,000 lbs/hr steam. The constricting venturi scrubber shall not be required when drilling in greater than 20,000 lbs/hr of steam, or when the pressure drop exceeds four (4) PSI across the venturi. Both constricting and non-constricting venturis' shall be as submitted and reviewed by the LCAQMD; b) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; a shortened outlet barrel to approximately 1.25 times the inlet height; and acceptable measurement devices to ensure flows and pressures are properly monitored; c) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound logbook and the emission and/or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD within 15 days of occurrence; and d) The APCO may modify these requirements based upon presentation of new information and selection of alternatives proven to be more effective.
F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.
G. BRP shall apply for a Permit to Operate and prove compliance with these conditions within 180 days of commercial operation.

Condition 3: Notification
A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.
B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.
C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD owned or operated by BRP. This notice shall also apply to scheduled installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Muffler utilization; e) Abatement utilization; and f) The likelihood or need for future occurrences.
D. Upon APCO request, BRP shall notify the LCAQMD at least twenty-four (24) hours in advance of planned switch from production to injection or injection to production mode of the well.
E. In the event that any emissions or the steam plume obscure visibility or create a hazard, BRP shall ensure that posting, warning or other necessary steps are made to ensure safe passage for the public.
F. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as a mitigation.
G. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine or crystalline silica material actually encountered during drilling.

Condition 4: Modification
A. BRP shall apply for and receive an Authority to Construct permit prior to the addition of different or new equipment not identified in this permit or covered in the permitting review.

Condition 5: Monitoring and Testing
A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, H2S, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, H2S, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in μg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly put into a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is placed on vent for 30 or more days. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.
B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten (10) days after written notice, to open the well for a 4 to 8 hour duration.
C. If analyses performed as part of Condition 5A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.
D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.
E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.
F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.
G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).
H. If the well is placed on long-term standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.
I. Upon request of the APCO, BRP shall fund, install and maintain an air quality monitoring site (H2S, wind direction, wind speed and temperature) to assist the District in determining compliance with the H2S Ambient Air Quality Standard (AAQS). Continued participation in the Geysers Air Monitoring Program or a similar monitoring program will continue to be required during and beyond the scope of this project.
J. If significant dust complaints are received BRP shall fund, install, and maintain a continuous Federal Equivalent Method Particulate Matter (PM) or LCAQMD approved alternate sampler within fifteen (15) days of request by the APCO.
K. Upon request of the APCO, BRP shall fund, install, and maintain an LCAQMD approved H2S air quality monitoring station, and/or provide access, siting, and power for an LCAQMD monitoring station, during the new drilling, located between the rig and the property line nearest the closest downwind residence in order to monitor H2S emissions associated with construction.

Condition 6: Identification and Access
A. This permit shall be posted at the project site during the time the drill is on site, and be available for BRP and LCAQMD staff upon request.
B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and/or air monitoring activities.

AUTHORITY TO CONSTRUCT

Permit # A/C 86-041A

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart

Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date: 10/31/2018* *Valid through: 10/31/2019* *Category: IV*

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Alice Bray
Owner: Bottle Rock Power, LLC
Mailing Address: 4010 Stone Way N, Suite 400
Seattle, WA 98103

Facility: Francisco Padsite
Location: 400m S of N, 310m E of W, Sections 5, T11N, R8W, MDB&M, Lake County
Francisco Pad, Francisco / Bottle Rock Leasehold, Cobb Valley, CA

Name and Equipment Description: **Francisco 6-5**

One (1) geothermal production well, associated valving, condensate and rock removal (catcher) and bleed muffler servicing the Bottle Rock Geothermal Power Plant.

Permit Conditions

Condition 1 Bottle Rock Power, LLC (BRP) shall perform and forward to the Lake County Air Quality Management District (LCAQMD), the following characterization of hot water, steam, particulates and/or gases emanating from the subject well(s) within sixty (60) days after completion of the initial geothermal drilling and testing. If the well is abandoned, no analyses will be necessary.

STEAM CONDENSATE/TOTAL STEAM: Benzene, Ammonium (total)*, Arsenic*, Bicarbonate and Carbonate, Sulfates, Chlorides, Nitrates, Boron (total)*, Hydrogen Sulfide (H2S) (total)*, Fluorides (total), Mercury (total), pH, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, and Steam Flow and Temperature*.

GAS PHASE: Benzene, Particulate in Steam (ug particulate/g of Steam, Arsenic, Lead, Cadmium, Total Sulfur, Boron), Ammonia, Mercury Vapor, Radon 222 and Daughters, Methane, Non-Methane Hydrocarbons, Carbon Dioxide, and NESHAPS pollutants as requested. Tests can be performed utilizing the bleed of the subject well(s) or during flow testing. Gas phase (non-condensables or steam diluted with air as appropriate to maintain gas phase and integrity of sample) tests are to be performed if wells are placed on long term standby bleed. The test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is planned and shall be approved by the LCAQMD prior to actual source testing. If the well is produced immediately, the LCAQMD may delay required testing (specifically those items without an asterisk) until circumstances require a sustained bleed status of the well, this shall be at the LCAQMD's option and BRP's request.

Condition 2 BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the planned venting of the herein permitted well or any associated group of well(s) in the LCAQMD owned or operated by BRP.

Condition 3 In the event source testing of the herein permitted geothermal well is deemed necessary by the Air Pollution Control Officer (APCO), BRP will be available within ten (10) days after written notice to open said well for a 4-8 hour duration.

Condition 4 If chemical or particulate analysis performed as part of Condition 1 suggests the need for further study, including air dispersion analysis, BRP will assist, perform or finance such studies if deemed reasonable and necessary by the APCO.

Condition 5 If locks or unmanned gates are used to secure the project area, the LCAQMD or its representative, will be given keys or combinations and

(Conditions 5 through 19 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

have free access of entry for purposes of monitoring, inspecting or collecting samples. If locks or combinations are periodically changed, BRP shall promptly forward new key(s) or combinations to the LCAQMD.

Condition 6 BRP shall limit emissions during drilling, initial clean out, and testing to a rate of no more than five (5.0) pounds of H2S per hour. Certain exceptions for resource testing may be allowed in writing by the APCO if such tests are 12 hours or less in duration and coincident meteorological conditions are verified as acceptable to the APCO. Detached plume opacity shall be controlled to a 10% opacity by the injection of no less than 60 GPM of water, and excessive splashover or carry through drift shall be prevented by properly sizing of the cyclone scrubber or other acceptable methods.

Condition 7 The DWR H2S Abatement Plan (Ex log) on file with the LCAQMD is accepted contingent upon changes incorporated in this condition, shall be followed and implemented and is incorporated herein by reference. Entries made into an onsite log book shall occur a minimum of four (4) times daily once abatement is initiated, and entries shall be made in ink and signed in a format acceptable to the LCAQMD. The abatement equipment, an abatement performance plan, and log book, shall be onsite prior to air drilling. The LCAQMD shall be promptly informed as to the responsible onsite person and location of the log book. The official log book shall be maintained at one location, and copies and/or any information contained therein shall be provided to the LCAQMD upon request. The wet cyclone particulate scrubber used as part of the emissions control system shall be maintained in good working order and supplied with a minimum of 60 GPM water. A device acceptable to the LCAQMD to ensure this flow shall be installed upon request of the LCAQMD. Any failures of this abatement system(s) while air drilling shall be logged in the referenced log book. Initial chemical storage shall be a minimum of 500 gallons of both peroxide and caustic to allow for the abatement of unexpected upset conditions and subsequently shall be maintained at a qnantity necessary for a 24 hour minimum supply based upon the current chemical use rate.

Condition 8 Road, pad and yard dust for three (3) minutes or more duration in any one (1) hour shall be kept below Ringelmann 2 at all times by making use of oiling or surfacing of roads used regularly and using a dust palliative and water during construction.

Condition 9 If during air drilling excessively high H2S levels are encountered, BRP shall either a) Put into operation additional H2S abatement capacity, or b) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high pockets of H2S will mean pockets resulting in abated emissions greater than five (5.0) pounds of H2S per hour or abated emissions levels in excess of 500 ppm volume.

Condition 10 Once a well is placed on standby bleed status it shall be tested to determine H2S emissions within three (3) days, and retested no sooner than one (1) week, and no less than two (2) weeks after the first test, and thereafter upon a 10 percent or greater change of flowrate. If approaching the allowable emissions limit, a program of testing may be required by the LCAQMD. A written brief monthly report shall be forwarded to the LCAQMD updating and clearly stating well status and estimated emissions of each well for the steamfield upon request of the LCAQMD.

Condition 11 BRP shall connect said development well to the Power Plant Steamfield Transmission Line within ninety (90) days of completion of the subject well(s). Under proven extenuating circumstances, exceptions to this condition can be allowed by the APCO.

Condition 12 The herein permitted well shall not create a nuisance or make a measurable contribution to Ambient Air Quality Standard exceeds. In the event that repeated and documented complaints are received, the LCAQMD reserves the rights to require under Section 430 of the Rules and Regulations additional monitoring, testing and mitigation to abate said nuisance(s) to acceptable levels.

Condition 13 BRP shall promptly notify the LCAQMD per Rule 510 and in writing should they learn of or encounter conditions where toxic air emissions of concern from an occupational standpoint occur and which are allowed to disperse into the ambient air as a mitigation.

Condition 14 BRP shall participate in the Geysers Air Monitoring Program or a similar air monitoring program, approved by the LCAQMD, in an equitable fashion with other developers to assist the LCAQMD in determining the compliance and validity of conditions set forth herein.

Condition 15 These conditions are for the herein listed geothermal development well. BRP agrees that this permit does not establish a precedent for issuing of future permits to BRP.

Condition 16 Within ninety (90) days, or sooner if practicable, after initial commercial operation, BRP will submit to the LCAQMD an application for a Permit to Operate for the herein listed geothermal well.

Condition 17 BRP agrees, consistent with conditions of initial permits issued for this project to promptly fund reasonable studies or tests as required by the LCAQMD, to ascertain the impact of steam production activities specifically at the residence located approximately 1900 feet east of the Francisco pad site. Reasonable mitigation steps shall be applied upon request to attempt to remedy any unlawful impacts of the development project upon the residence.

Condition 18 Should the phenomena described as a "pink or red plume" be encountered and sustained emissions occur during the construction or testing of the herein permitted geothermal well, BRP shall act to promptly enter such information into the abatement log book and shall promptly call the LCAQMD at 263-7000, and/or referenced staff members there at to ensure prompt notice. At the earliest possible time, BRP shall promptly provide for increased blooie line water injection capacity, higher efficiency separator and contactor or other system intended for the efficient abatement of high loading of small sized particulate (e.g., 0.5 to 5.0 micron) to control such abnormal emissions. Alternate technological approaches proposed by BRP and approved by the APCO shall be allowed and are encouraged.

Condition 19 In the event of generalized atmospheric conditions or localized dangerous contamination of such a nature as to constitute an emergency creating a danger to the health and welfare of the citizens of Lake County, the APCO will take immediate action by requiring the applicant to reduce H2S or other emissions, or to discontinue emissions entirely. In the event emissions are discontinued entirely, a hearing shall be held by the LCAQMD Hearing Board as soon as practical after such action has been taken to determine whether such discontinuance shall continue and if so, under what conditions.

AUTHORITY TO CONSTRUCT

Permit # A/C 17-76-36A

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart

Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date: 10/31/2018* *Valid through: 10/31/2019* *Category: IV*

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray
Owner:	Bottle Rock Power, LLC
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103

Facility:	Francisco Padsite
Location:	400m S of N, 310m E of W, Sections 5, T11N, R8W, MDB&M, Lake County Francisco Pad, Francisco / Bottle Rock Leasehold, Cobb Valley, CA

Name and Equipment Description: **Francisco 1-5**

One (1) geothermal production well, associated valving, condensate and rock removal (catcher) and bleed muffler servicing the Bottle Rock Geothermal Power Plant.

Permit Conditions

Condition 1 Bottle Rock Power, LLC (BRP) shall perform and forward to the Lake County Air Quality Management District (LCAQMD), the following characterization of hot water, steam, particulates and/or gases emanating from the subject well(s) within sixty (60) days after completion of the initial geothermal drilling and testing. If the well is abandoned, no analyses will be necessary.

STEAM CONDENSATE/TOTAL STEAM: Benzene, Ammonium (total)*, Arsenic*, Bicarbonate and Carbonate, Sulfates, Chlorides, Nitrates, Boron (total)*, Hydrogen Sulfide (H2S) (total)*, Fluorides (total), Mercury (total), pH, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, and Steam Flow and Temperature*.

GAS PHASE: Benzene, Particulate in Steam (ug particulate/g of Steam, Arsenic, Lead, Cadmium, Total Sulfur, Boron), Ammonia, Mercury Vapor, Radon 222 and Daughters, Methane, Non-Methane Hydrocarbons, Carbon Dioxide, and NESHAPS pollutants as requested. Tests can be performed utilizing the bleed of the subject well(s) or during flow testing. Gas phase (non-condensables or steam diluted with air as appropriate to maintain gas phase and integrity of sample) tests are to be performed if wells are placed on long term standby bleed. The test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is planned and shall be approved by the LCAQMD prior to actual source testing. If the well is produced immediately, the LCAQMD may delay required testing (specifically those items without an asterisk) until circumstances require a sustained bleed status of the well, this shall be at the LCAQMD's option and BRP's request.

Condition 2 BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the planned venting of the herein permitted well or any associated group of well(s) in the LCAQMD owned or operated by BRP.

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Condition 4 If chemical or particulate analysis performed as part of Condition 1 suggests the need for further study, including air dispersion analysis, BRP will assist, perform or finance such studies if deemed reasonable and necessary by the APCO.

Condition 5 If locks or unmanned gates are used to secure the project area, the LCAQMD or its representative, will be given keys or combinations and

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have free access of entry for purposes of monitoring, inspecting or collecting samples. If locks or combinations are periodically changed, BRP shall promptly forward new key(s) or combinations to the LCAQMD.

Condition 6 BRP shall limit emissions during drilling, initial clean out, and testing to a rate of no more than five (5.0) pounds of H2S per hour. Certain exceptions for resource testing may be allowed in writing by the APCO if such tests are 12 hours or less in duration and coincident meteorological conditions are verified as acceptable to the APCO. Detached plume opacity shall be controlled to a 10% opacity by the injection of no less than 60 GPM of water, and excessive splashover or carry through drift shall be prevented by properly sizing of the cyclone scrubber or other acceptable methods.

Condition 7 The DWR H2S Abatement Plan (Ex log) on file with the LCAQMD is accepted contingent upon changes incorporated in this condition, shall be followed and implemented and is incorporated herein by reference. Entries made into an onsite log book shall occur a minimum of four (4) times daily once abatement is initiated, and entries shall be made in ink and signed in a format acceptable to the LCAQMD. The abatement equipment, an abatement performance plan, and log book, shall be onsite prior to air drilling. The LCAQMD shall be promptly informed as to the responsible onsite person and location of the log book. The official log book shall be maintained at one location, and copies and/or any information contained therein shall be provided to the LCAQMD upon request. The wet cyclone particulate scrubber used as part of the emissions control system shall be maintained in good working order and supplied with a minimum of 60 GPM water. A device acceptable to the LCAQMD to ensure this flow shall be installed upon request of the LCAQMD. Any failures of this abatement system(s) while air drilling shall be logged in the referenced log book. Initial chemical storage shall be a minimum of 500 gallons of both peroxide and caustic to allow for the abatement of unexpected upset conditions and subsequently shall be maintained at a quantity necessary for a 24 hour minimum supply based upon the current chemical use rate.

Condition 8 Road, pad and yard dust for three (3) minutes or more duration in any one (1) hour shall be kept below Ringelmann 2 at all times by making use of oiling or surfacing of roads used regularly and using a dust palliative and water during construction.

Condition 9 If during air drilling excessively high H2S levels are encountered, BRP shall either a) Put into operation additional H2S abatement capacity, or b) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high pockets of H2S will mean pockets resulting in abated emissions greater than five (5.0) pounds of H2S per hour or abated emissions levels in excess of 500 ppm volume.

Condition 10 Once a well is placed on standby bleed status it shall be tested to determine H2S emissions within three (3) days, and retested no sooner than one (1) week, and no less than two (2) weeks after the first test, and thereafter upon a 10 percent or greater change of flowrate. If approaching the allowable emissions limit, a program of testing may be required by the LCAQMD. A written brief monthly report shall be forwarded to the LCAQMD updating and clearly stating well status and estimated emissions of each well for the steamfield upon request of the LCAQMD.

Condition 11 BRP shall connect said development well to the Power Plant Steamfield Transmission Line within ninety (90) days of completion of the subject well(s). Under proven extenuating circumstances, exceptions to this condition can be allowed by the APCO.

Condition 12 The herein permitted well shall not create a nuisance or make a measurable contribution to Ambient Air Quality Standard exceeds. In the event that repeated and documented complaints are received, the LCAQMD reserves the rights to require under Section 430 of the Rules and Regulations additional monitoring, testing and mitigation to abate said nuisance(s) to acceptable levels.

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Condition 14 BRP shall participate in the Geysers Air Monitoring Program or a similar air monitoring program, approved by the LCAQMD, in an equitable fashion with other developers to assist the LCAQMD in determining the compliance and validity of conditions set forth herein.

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AUTHORITY TO CONSTRUCT

Permit # A/C 86-042A

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date: 10/31/2018* *Valid through: 10/31/2019* *Category: IV*

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

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Owner: Bottle Rock Power, LLC
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Facility: Francisco Padsite
Location: 400m S of N, 310m E of W, Sections 5, T11N, R8W, MDB&M, Lake County
Francisco Pad, Francisco / Bottle Rock Leasehold, Cobb Valley, CA

Name and Equipment Description: **Francisco 7-5**

One (1) geothermal production well, associated valving, condensate and rock removal (catcher) and bleed muffler servicing the Bottle Rock Geothermal Power Plant.

Permit Conditions

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AUTHORITY TO CONSTRUCT

Permit # A/C 2008-28

Lake County Air Quality Management District
2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray
Owner:	Bottle Rock Power, LLC
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103
Facility:	Francisco Padsite
Location:	400m S of N, 310m E of W, Sections 5, T11N, R8W, MDB&M, Lake County Francisco Pad, Francisco / Bottle Rock Leasehold, Cobb Valley, CA

Name and Equipment Description: **Francisco 9-5**

Geothermal drilling rig and accessories (ThermaSource Rig # 108 or equivalent), three (3) electrical generators (1101 Hp CAT 3512 turbocharged PERP registered diesel engines), one (1) top drive engine (1205Hp Detroit diesel model R1638K40 turbocharged and after-cooled, PERP registered diesel engine), three (3) air compressors (717 Hp CAT 900 series turbocharged and after-cooled, diesel PERP registered engines), one (1) air compressor (700 Hp CAT C-18 turbocharged and after-cooled, PERP registered diesel engine), one (1) down hole misting pump (110 Hp Cummins QSB4.5 turbocharged PERP registered diesel engine); H2S abatement system utilizing high pressure injection of NaOH and H2O2; drawdown chemical flow metering devices; particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, water treatment and management systems, and metering and measuring devices and associated equipment.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit Hydrogen Sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verified breakdown and for hot-liner installations, Lake County Air Quality Management District (LCAQMD) Rule 510 and procedures shall apply. In the event of atmospheric conditions (*e.g.*, drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds or less of H2S per hour consistent with the BRP H2S Abatement Plan, at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: a) Place into operation additional H2S abatement capacity, or b) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppm volume.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine or upon experiencing red/pink plume exiting the cyclone, the well logger shall immediately obtain bulk samples of the drilled material and log the event in the abatement logbook, and shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). "Experiencing a pink/red plume" shall mean a plume of greater than 5% opacity lasting for 30 or more seconds. For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine content. The LCAQMD shall be promptly notified by phone at 263-7000, provided a portion of the divided bulk samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling. Bulk Samples collected upon experiencing a pink/red plume shall be promptly analyzed by XRF, or other acceptable means, to include at a minimum arsenic, chrome, nickel and cadmium. BRP shall, to the extent practical attempt to collect a sample of the particulate from the pink/red plume, and/or assist the LCAQMD in such an attempt, for analysis as described.

E. During drilling in significant serpentine, or while experiencing a pink/red plume, visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reducing the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine or drilling conditions contributing to the formation of pink/red plume.

Condition 2: Administrative

A. This permit has been issued for the construction of a geothermal production well to a total depth of 11,000 feet and includes a well bore, well head, valving, piping, flanges, geothermal fluid transmission line header connections, side leg kick-out, two part slotted liner, and associated corrosion mitigation injection equipment. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP H2S abatement plan approved by the APCO or subsequent approved revision, shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily.

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15 ppmw sulfur.
D. If a vapor dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602, then BRP shall with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.
E. BRP shall utilize the same particulate scrubbing system (or an equivalent system approved by the APCO) as that utilized in recent drilling projects as described in the permitting reviews and includes the following configuration: a) A multi-port 60 GPM or greater adjustable low pressure water injection system in the 13" inside diameter portion of the blooie line (non-constricting venturi) combined with at least 20,000 lbs/hr steam. The constricting venturi scrubber shall not be required when drilling in greater than 20,000 lbs/hr of steam, or when the pressure drop exceeds four (4) PSI across the venturi. Both constricting and non-constricting venturis' shall be as submitted and reviewed by the LCAQMD; b) Particulate control equipment incorporating: a smooth expansion blooie line with low pressure injection treatment; an approximate eight foot (or greater length) section of rectangular ducting sized and smoothed to the cyclone inlet to allow expansion and laminar flow into the cyclone inlet; a cyclone inlet with a trajectory that avoids the outlet barrel; a smooth internal surface with all protrusions and pockets removed; a shortened outlet barrel to approximately 1.25 times the inlet height; and acceptable measurement devices to ensure flows and pressures are properly monitored; c) If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case longer than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound logbook and the emission and/or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD within 15 days of occurrence; and d) The APCO may modify these requirements based upon presentation of new information and selection of alternatives proven to be more effective.
F. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.
G. BRP shall apply for a Permit to Operate and prove compliance with these conditions within 180 days of commercial operation.

Condition 3: Notification

A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.
B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) The estimate of emissions and duration of noncompliance.
C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD owned or operated by BRP. This notice shall also apply to scheduled installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Muffler utilization; e) Abatement utilization; and f) The likelihood or need for future occurrences.
D. In the event that any emissions or the steam plume obscure visibility or create a hazard, BRP shall ensure that posting, warning or other necessary steps are made to ensure safe passage for the public.
E. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occnr and are allowed to disperse into the ambient air as a mitigation.
F. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine or crystalline silica material actually encountered during drilling.

Condition 4: Modification

A. BRP shall apply for and receive an Authority to Construct permit prior to the addition of different or new equipment not identified in this permit or covered in the permitting review. The Hearing Board, at a properly noticed public hearing, may grant deviation from these conditions.

Condition 5: Monitoring and Testing

A. BRP shall perform and forward to the LCAQMD the followiug characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, H2S, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, H2S, Methane, Non Methane Hydrocarbons, Mercury Vapor, and Radon 222 and daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in μg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly put into a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is placed on vent for 30 or more days. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.
B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for a 4 to 8 hour duration.
C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.
D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.
E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.
F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan orrecommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.
G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).
H. If the well is placed on long-term standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.
I. At the request of the APCO, BRP shall fund, install and maintain an air quality monitoring site (H2S, wind direction, wind speed and temperature) to assist the District in determining compliance with the H2S Ambient Air Quality Standard (AAQS). Continued participation in the Geysers Air Monitoring Program or a similar monitoring program will continue to be required during and beyond the scope of this project.
J. If significant dust complaints are received BRP shall fund, install, and maintain a continuous Federal Equivalent Method Particulate Matter (PM) sampler within fifteen (15) days of request by the APCO.
K. BRP shall fund, install, and maintain, an H2S air quality monitoring station during the active drilling phase, located between the rig and the property line nearest the closest downwind residence in order to monitor H2S emissions associated with construction. This station shall include sufficient power and a port available for a PM monitor operated by LCAQMD or BRP if deemed necessary by the APCO. Upon written request, the APCO may approve the removal of the monitoring station provided significant impacts are not occurring. The H2S air quality monitoring station shall be re-installed and operated should significant impacts reoccur.

Condition 6: Identification and Access

A. This permit shall be posted at the project site during the time the drill is on site, and be available for BRP and LCAQMD staff upon request.
B. BRP shall provide the LCAQMD, ARB and, Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in this Authority to Construct assessment. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal AAQS.

AUTHORITY TO CONSTRUCT

Permit # A/C 2005-48

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Alice Bray
Owner: Bottle Rock Power, LLC
Mailing Address: 4010 Stone Way N, Suite 400
Seattle, WA 98103

Facility: West Coleman Padsite
Location: West Coleman 5-6, located on Bottle Rock West Coleman Padsite (1155m So. & 134.9m W of the NE Corner Section 6, T11N, R8W, MDB&M, Lake County, N 397,334 E 1,797,546)

Name and Equipment Description: **W. Coleman 5-6 Re-Drill**

Geothermal drilling rig and accessories (NCPA Rig #1), Four electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three air compressors (Cummins QSK19-C700 700 HP turbocharged diesel-powered air compressors PERP Registered), one down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H2O2; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds of H2S using abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: 1) Place into operation additional H2S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean: drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos-containing rock. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reduce the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

Condition 2: Administrative

A. This permit has been issued as a modification to include cleanout, forking or deepening of the well as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H2S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor-dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall, with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

E. BRP shall utilize the particulate scrubbing system as substantially described in the permitting review and includes the following configuration: 1) A smooth expansion blooie line with low-pressure constricting and non-constricting interchangeable venturis with water injection for venturi contact/scrubbing. The non-constricting venturi

(Conditions 2 through 6 are continued on the back of this card)

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located in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr air/steam, and an interchangeable converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam and/or pressure drop does not exceed 4 PSI across the converging to diverging section. The constricting venturi may be removed for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Venturis shall utilize a multi-port 60 GPM or greater adjustable low-pressure water injection system as described in the permit review. 2) An approximate eight foot section of rectangular ducting that is smoothed internally and matched to the cyclone inlet size to allow laminar flow into the cyclone inlet. 3) A properly sized cyclone separator with a tangential inlet flush with the top of the body and a flow trajectory that avoids striking the outlet barrel. The cyclone shall have a smoothed internal surface with all protrusions and pockets removed. An outlet barrel approximately 1.25 (preferred) to 1.45 times the inlet height with adequate cone clearance; and a 18"-21" open drop arrangement at the terminus of a full 'cone', or alternatively a drop hopper that separates liquid and gas then dropping into a water jet venturi or other recirculating pump system for cuttings removal. 4) Acceptable measurement devices to ensure flows and pressure are properly monitored. The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.

F. If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case more than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD.

G. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

Condition 3: Notification

A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.

B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) the estimate of emissions and duration of noncompliance.

C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to scheduled installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.

D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.

E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

Condition 4: Modification/Additions

A. BRP shall apply for and receive an Authority to Construct (A/C) modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

Condition 5: Monitoring and Testing

A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non-Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in μg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days, or upon written request of the APCO. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.

B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.

C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.

D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.

E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.

F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.

G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).

H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.

I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as Geysers Air Monitoring Program, approved by the APCO shall fulfill this requirement.

Condition 6: Identification and Access

A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, the LCAQMD or its representative, will be given free access of entry for the purposes of monitoring or inspecting.

B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in the A/C assessment. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.

AUTHORITY TO CONSTRUCT

Permit # A/C 2005-45

Lake County Air Quality Management District
2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray
Owner:	Bottle Rock Power, LLC
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103
Facility:	West Coleman Padsite
Location:	West Coleman 4-6, located on Bottle Rock West Coleman Padsite (1155m So. & 134.9m W of the NE Corner Section 6, T11N, R8W, MDB&M, Lake County, N 397,334 E 1,797,546)

Name and Equipment Description: **W. Coleman 4-6 Re-Drill**

Geothermal drilling rig and accessories (NCPA Rig #1), Four electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three air compressors (Cummins QSK19-C700 700 HP turbocharged diesel-powered air compressors PERP Registered), one down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H2O2; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds of H2S using abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: 1) Place into operation additional H2S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos-containing rock. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reduce the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

Condition 2: Administrative

A. This permit has been issued as a modification to include cleanout, forking or deepening of the well as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H2S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor-dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall, with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

E. BRP shall utilize the particulate scrubbing system as substantially described in the permitting review and includes the following configuration: 1) A smooth expansion blooie line with low-pressure constricting and non-constricting interchangeable venturis with water injection for venturi contact/scrubbing. The non-constricting venturi

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

located in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr air/steam, and an interchangeable converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam and/or pressure drop does not exceed 4 PSI across the converging to diverging section. The constricting venturi may be removed for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Venturis shall utilize a multi-port 60 GPM or greater adjustable low-pressure water injection system as described in the permit review. 2) An approximate eight foot section of rectangular ducting that is smoothed internally and matched to the cyclone inlet size to allow laminar flow into the cyclone inlet. 3) A properly sized cyclone separator with a tangential inlet flush with the top of the body and a flow trajectory that avoids striking the outlet barrel. The cyclone shall have a smoothed internal surface with all protrusions and pockets removed. An outlet barrel approximately 1.25 (preferred) to 1.45 times the inlet height with adequate cone clearance; and a 18"-21" open drop arrangement at the terminus of a full 'cone', or alternatively a drop hopper that separates liquid and gas then dropping into a water jet venturi or other recirculating pump system for cuttings removal. 4) Acceptable measurement devices to ensure flows and pressure are properly monitored. The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.

F. If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case more than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD.

G. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

Condition 3: Notification

A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.

B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) the estimate of emissions and duration of noncompliance.

C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to scheduled installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.

D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.

E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

Condition 4: Modification/Additions

A. BRP shall apply for and receive an Authority to Construct (A/C) modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

Condition 5: Monitoring and Testing

A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non-Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in μg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days, or upon written request of the APCO. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.

B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.

C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.

D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.

E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.

F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.

G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).

H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.

I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as Geysers Air Monitoring Program, approved by the APCO shall fulfill this requirement.

Condition 6: Identification and Access

A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, the LCAQMD or its representative, will be given free access of entry for the purposes of monitoring or inspecting.

B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in the A/C assessment. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.

AUTHORITY TO CONSTRUCT

Permit # A/C 2005-47

Lake County Air Quality Management District
2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart
Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray
Owner:	Bottle Rock Power, LLC
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103
Facility:	West Coleman Padsite
Location:	West Coleman 3-6, located on Bottle Rock West Coleman Padsite (1155m So. & 134.9m W of the NE Corner Section 6, T11N, R8W, MDB&M, Lake County, N 397,334 E 1,797,546)

Name and Equipment Description: **W. Coleman 3-6 Re-Drill**

Geothermal drilling rig and accessories (NCPA Rig #1), Four electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three air compressors (Cummins QSK19-C700 700 HP turbocharged diesel-powered air compressors PERP Registered), one down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H2O2; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds of H2S using abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: 1) Place into operation additional H2S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean: drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos-containing rock. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reduce the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

Condition 2: Administrative

A. This permit has been issued as a modification to include cleanout, forking or deepening of the well as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H2S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor-dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall, with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

E. BRP shall utilize the particulate scrubbing system as substantially described in the permitting review and includes the following configuration: 1) A smooth expansion blooie line with low-pressure constricting and non-constricting interchangeable venturis with water injection for venturi contact/scrubbing. The non-constricting venturi

(**Conditions 2 through 6 are continued on the back of this card**)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

located in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr air/steam, and an interchangeable converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam and/or pressure drop does not exceed 4 PSI across the converging to diverging section. The constricting venturi may be removed for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Venturis shall utilize a multi-port 60 GPM or greater adjustable low-pressure water injection system as described in the permit review. 2) An approximate eight foot section of rectangular ducting that is smoothed internally and matched to the cyclone inlet size to allow laminar flow into the cyclone inlet. 3) A properly sized cyclone separator with a tangential inlet flush with the top of the body and a flow trajectory that avoids striking the outlet barrel. The cyclone shall have a smoothed internal surface with all protrusions and pockets removed. An outlet barrel approximately 1.25 (preferred) to 1.45 times the inlet height with adequate cone clearance; and a 18"-21" open drop arrangement at the terminus of a full 'cone', or alternatively a drop hopper that separates liquid and gas then dropping into a water jet venturi or other recirculating pump system for cuttings removal. 4) Acceptable measurement devices to ensure flows and pressure are properly monitored. The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.

F. If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case more than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD.

G. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

Condition 3: Notification

A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.

B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) the estimate of emissions and duration of noncompliance.

C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to scheduled installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.

D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.

E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

Condition 4: Modification/Additions

A. BRP shall apply for and receive an Authority to Construct (A/C) modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

Condition 5: Monitoring and Testing

A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non-Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in μg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days, or upon written request of the APCO. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.

B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.

C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.

D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.

E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.

F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.

G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).

H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.

I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as Geysers Air Monitoring Program, approved by the APCO shall fulfill this requirement.

Condition 6: Identification and Access

A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, the LCAQMD or its representative, will be given free access of entry for the purposes of monitoring or inspecting.

B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in the A/C assessment. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.

AUTHORITY TO CONSTRUCT

Permit # A/C 2005-46

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart

Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date:* 10/31/2018 *Valid through:* 10/31/2019 *Category:* IV

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact:	Ms. Alice Bray
Owner:	Bottle Rock Power, LLC
Mailing Address:	4010 Stone Way N, Suite 400 Seattle, WA 98103

Facility:	West Coleman Padsite
Location:	West Coleman 2-6, located on Bottle Rock West Coleman Padsite (1155m So. & 134.9m W of the NE Corner Section 6, T11N, R8W, MDB&M, Lake County, N 397,334 E 1,797,546)

Name and Equipment Description: **W. Coleman 2-6 Re-Drill**

Geothermal drilling rig and accessories (NCPA Rig #1), Four electrical generators (CAT D-398TA 750 HP diesel engines PERP Registered), three air compressors (Cummins QSK19-C700 700 HP turbocharged diesel-powered air compressors PERP Registered), one down hole misting pump; hydrogen sulfide abatement system utilizing high pressure injection of NaOH and H2O2; and particulate control equipment consisting of misting down hole, constricting and non constricting venturi contactors, low pressure water spray, expanding blooie line, properly sized, smoothed, tangential wet cyclone, properly designed drop or hopper, water treatment and management systems, necessary metering and measuring devices and associated equipment.

Permit Conditions

Condition 1: Emissions

A. Bottle Rock Power, LLC (BRP) shall limit hydrogen sulfide (H2S) emissions during drilling, clean out, and testing to no more than five (5) pounds of H2S per hour and no more than twenty-four (24) pounds per day during all other phases of this project. During verifiable breakdown and for any hot-liner runs, Rule 510 and procedures shall apply. In the event of atmospheric conditions (e.g., drainage, limited mixing, fumigation, downwash, etc.) that result in complaints and concern in receptor areas from high levels of H2S, BRP agrees to reduce the H2S emission limit to two (2) pounds of H2S using abatement plan at the request of the Air Pollution Control Officer (APCO). Certain exceptions to the H2S emission limitations may be allowed by the APCO, in writing, for resource testing if such tests are 12 hours or less in duration and coincide with acceptable meteorological conditions verified by the APCO to ensure good dispersion.

B. If excessively high H2S levels are encountered during drilling, BRP will either: 1) Place into operation additional H2S abatement capacity, or 2) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high levels of H2S means abated emissions greater than five (5) pounds of H2S per hour or abated emission levels in excess of 500 ppmv.

C. Visible emissions shall not exceed the values listed below for more than three (3) minutes in any one (1) hour: • Ringelmann 0.5 (10% opacity) for detached plume at the cyclone; • Ringelmann 0.5 (10% opacity) for combustion emissions of engine exhaust; and • Ringelmann 1 (20% opacity) for road and pad dust emissions.

D. On commencement of air drilling in significant serpentine, the well logger shall obtain bulk samples that shall be analyzed for asbestos content using TEM, SEM or PLM (California Air Resources Board [ARB] Method 435 Procedures). For the purpose of defining a significant serpentine deposit during geothermal air drilling: "Significant Serpentine" shall mean; drill cutting samples from two consecutive ten-foot interval-drilling sections identified as having 10% or greater serpentine or other asbestos-containing rock. The Lake County Air Quality Management District (LCAQMD) shall be promptly notified by phone at 263-7000, provided samples of the drilled material, and unless otherwise agreed upon in writing, notified of the bulk asbestos analysis results within ten working days of sampling.

E. During drilling in significant serpentine visible emissions shall not exceed Ringelmann 0.25 (5% opacity) for detached plume at the cyclone. BRP shall: 1) Increase down hole misting; 2) Increase water loading at the venturi; 3) Reduce the drilling rate; 4) Use wetting agents; and/or 5) Implement additional solids filtration of working water. Such additional effort shall continue until drilling is clear of significant serpentine/asbestos.

Condition 2: Administrative

A. This permit has been issued as a modification to include cleanout, forking or deepening of the well as described in the application and permit review. This permit does not establish a precedent for the issuance of additional permits.

B. The submitted BRP (Tecton) H2S abatement plan approved by the APCO shall be implemented and followed, and is incorporated herein by reference. Logbook entries shall be made a minimum of four (4) times daily while drilling on air or in steam.

C. Diesel fuel utilized shall be California Low Sulfur Diesel containing less than 15ppmw sulfur.

D. If a vapor-dominated resource is encountered and it is determined that emissions cannot be maintained pursuant to Parts A & B of LCAQMD Rule 421; or the APCO determines that the well on stand-by (bleed) status will violate the intent of LCAQMD Rule 602 or the associated steamfield permit, then BRP shall, with approval of the APCO, install and utilize additional abatement equipment as necessary to bring emissions into compliance. This may include, but is not limited to, immediate conversion to an injector, gas capping, down-hole plugging, and/or the complete closing in of any well in violation of LCAQMD Rules and Regulations.

E. BRP shall utilize the particulate scrubbing system as substantially described in the permitting review and includes the following configuration: 1) A smooth expansion blooie line with low-pressure constricting and non-constricting interchangeable venturis with water injection for venturi contact/scrubbing. The non-constricting venturi

(Conditions 2 through 6 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

located in the smallest diameter portion of the blooie line (non-constricting venturi 12"-15") for use when flow of at least 20,000 lbs/hr air/steam, and an interchangeable converging venturi scrubber when drilling in less than 20,000 lbs/hr of steam and/or pressure drop does not exceed 4 PSI across the converging to diverging section. The constricting venturi may be removed for problematic operations when concurred with by the LCAQMD, such as well plug drill out or flow testing. Venturis shall utilize a multi-port 60 GPM or greater adjustable low-pressure water injection system as described in the permit review. 2) An approximate eight foot section of rectangular ducting that is smoothed internally and matched to the cyclone inlet size to allow laminar flow into the cyclone inlet. 3) A properly sized cyclone separator with a tangential inlet flush with the top of the body and a flow trajectory that avoids striking the outlet barrel. The cyclone shall have a smoothed internal surface with all protrusions and pockets removed. An outlet barrel approximately 1.25 (preferred) to 1.45 times the inlet height with adequate cone clearance; and a 18"-21" open drop arrangement at the terminus of a full 'cone', or alternatively a drop hopper that separates liquid and gas then dropping into a water jet venturi or other recirculating pump system for cuttings removal. 4) Acceptable measurement devices to ensure flows and pressure are properly monitored. The APCO may modify the cyclone drop out requirements based upon presentation of new information and selection of alternatives proven to be effective.

F. If during drilling the subject well, significant liquid, gas or particulate carry through occurs from the cyclone separator stack as a result of unusual circumstances or equipment failure, including but not limited to unexpected large steam or gas entries or water flashing down hole, BRP shall notify the LCAQMD immediately and in no case more than one (1) hour, per Rule Section 510. Such occurrences shall be logged in the bound abatement logbook and the emission and or resulting evidence documented, to the extent possible, by photographs or video recording. BRP shall provide information on such events and forward such to the LCAQMD.

G. BRP shall comply with the requirements of the Air Toxics "Hot Spots" Information and Assessment Act (AB2588) as specified in Sections 44300 - 44394 of the California Health and Safety Code.

Condition 3: Notification

A. BRP shall notify the LCAQMD pursuant to Rule 510, upon breakdown and/or loss of emissions control from this drilling project.

B. In the event that emissions exceed the allowable limits contained in Condition 1, BRP shall notify the LCAQMD within one (1) hour and shall report: a) The cause of the exceed; b) The actions taken or proposed to minimize emissions and achieve compliance; and c) the estimate of emissions and duration of noncompliance.

C. BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the scheduled venting of any well or group of wells in the LCAQMD. This notice shall also apply to scheduled installation of a liner while the well continues to produce steam. Unscheduled venting, necessary to prevent well damage, shall be reported as a breakdown pursuant to Rule 510. A written report shall be submitted to the LCAQMD, within three (3) days (72 hours) documenting: a) The need for venting; b) The duration of venting; c) Estimated steam flow and emissions; d) Cyclone or other equipment utilized; e) Abatement systems utilized; and f) The likelihood or need for future occurrences.

D. BRP shall promptly notify the LCAQMD in writing should any incident of occupational concern take place where toxic air emissions occur and are allowed to disperse into the ambient air as mitigation.

E. BRP shall provide a written report of any changes of the estimated amount of serpentine and crystalline silica material expected to be drilled during the air phase as early as practical. Upon completion of drilling, BRP shall provide a final report within sixty (60) days detailing any significant quantity of serpentine (or crystalline silica) material actually encountered during drilling.

Condition 4: Modification/Additions

A. BRP shall apply for and receive an Authority to Construct (A/C) modification permit prior to the addition of different or new equipment not identified in the application, this permit or covered in the permitting review. The LCAQMD Hearing Board, at a properly noticed public hearing, may grant a variance from these conditions.

Condition 5: Monitoring and Testing

A. BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam particulates and/or gases emanating from the subject well within sixty (60) days after the completion of drilling. If the well is to be abandoned, no analyses will be necessary. a) STEAM CONDENSATE/TOTAL STEAM - Ammonium, Arsenic, Asbestos, Benzene, Bicarbonate and Carbonate, Boron, Bromides, Cadmium, Chlorides, Chromium, Fluorides, Hydrogen Sulfide, Lead, Mercury, Nickel, Nitrates, pH, Silica, Selenium, Sulfates, Zinc, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, Steam Flow and Temperature. b) GAS PHASE - Ammonia, Benzene, Carbon Dioxide, Hydrogen Sulfide, Methane, Non-Methane Hydrocarbons, Mercury Vapor, and Radon 222 and Daughters. c) STEAM PARTICULATE*: Arsenic, Boron, Cadmium, Chromium, Lead, Nickel, Total Sulfur (mass all in μg/Kg of steam); Asbestos (fibers/Kg of steam); NESHAP and AB 2588 air pollutants as requested. Tests can be performed utilizing the bleed of the subject well. A test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is scheduled to occur and shall be approved by the APCO prior to actual source testing. If the well is promptly closed in to a no-vent state, these tests may be delayed upon request of BRP by concurrence of the APCO until such time as the well is produced to the steamline, or placed on vent for 30 or more days, or upon written request of the APCO. *Testing of this type shall consist at a minimum of an XRF analysis of suspended and/or dissolved solids.

B. In the event source testing is deemed necessary by the APCO, BRP shall be available within ten days after written notice, to open the well for 4 to 8 hour duration.

C. If analyses performed as part of Condition 5-A suggests the need for further study, including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.

D. BRP shall install and utilize an in-line continuous H2S monitor or other appropriate equipment to ascertain the levels of this pollutant as a function of depth of drilling. Logging data and test results shall be immediately available to LCAQMD staff upon request at the drill site.

E. Upon request of the APCO, BRP shall perform any additional analytical work necessary to characterize potential emissions from this well prior to applying for a Permit to Operate.

F. If a hot water resource is discovered during the drilling of this well, BRP shall, prior to testing to determine the extent of the resource, submit a test plan to the LCAQMD detailing expected air pollutants and mitigating measures. The LCAQMD will either approve the submitted plan or recommend additional mitigating measures necessary, in writing, prior to actual testing. Total emissions from testing shall be limited to the amount specified in Condition 1.

G. The treatment and use of mud waters for reuse in air drilling is acceptable provided: a) Oils or other hydrocarbons contaminating any reclaimed mud waters are separated prior to use in blooie line treatment during air drilling; and b) The water is analyzed for and shown free of asbestos, and the analysis results are provided to the APCO within three (3) working days of finishing mud water treatment(s).

H. If the well is placed on extended standby bleed, BRP shall test the well to determine the H2S emissions within three (3) days, and retest the well no sooner than one (1) week, and no later than two (2) weeks after the first test, and thereafter upon a 10% or greater change of flow rate. If emissions are within 90% of the allowable H2S limit, a program of additional testing may be required by the APCO. A written monthly report shall be forwarded to the LCAQMD updating the well status and the estimated emissions, upon request of the APCO.

I. BRP shall participate in or proportionately fund an air monitoring program to assist the LCAQMD in a continued determination of compliance. In the event of considerable public complaints, the LCAQMD may require additional monitoring, testing and studies to characterize said condition and possible mitigation (Section 430 and 670). Participation in a cooperative monitoring effort, such as Geysers Air Monitoring Program, approved by the APCO shall fulfill this requirement.

Condition 6: Identification and Access

A. This permit shall be posted at the project site during the time the drilling equipment is on site, and be available for BRP and LCAQMD staff upon request. If locks or unmanned gates are used to secure the project area, the LCAQMD or its representative, will be given free access of entry for the purposes of monitoring or inspecting.

B. BRP shall provide the LCAQMD, ARB, and Environmental Protection Agency staff entry and safe access to the project site/equipment for the purpose of inspection, source testing, and or air monitoring activities.

This permit is based on the equipment and process submitted by BRP and considered in the A/C assessment. The permit issuance is based on the assumption that the operation of this source, as conditioned, will not result in a violation of LCAQMD Rules and Regulations nor contribute to an exceed of any state or federal Ambient Air Quality Standard.

AUTHORITY TO CONSTRUCT

Permit # A/C 90-001

Lake County Air Quality Management District

2617 S. Main Street, Lakeport, CA 95453 (707) 263-7000, Fax (707) 263-0421

By: Douglas Gearhart

Douglas G. Gearhart, APCO

Type of Issuance: Renewal *Issuance Date: 10/31/2018* *Valid through: 10/31/2019* *Category: IV*

Operations under this permit must be conducted in compliance with all specifications and data included with the application under which this permit was issued. Equipment must be properly maintained and kept in good condition at all times. Post this permit or a facsimile (with conditions) in a conspicuous location on or near the equipment.

Contact: Ms. Alice Bray
Owner: Bottle Rock Power, LLC
Mailing Address: 4010 Stone Way N, Suite 400
Seattle, WA 98103

Facility: West Coleman Padsite
Location: 640m N of S, 150m W of E, Section 6, T11N, R8W, MDB&M, Lake County
Bottle Rock / Francisco Leasehold, Cobb Valley, CA

Name and Equipment Description: **W. Coleman 1-6 Re-Drill**

One (1) geothermal production well, associated valving, condensate and rock removal (catcher) and bleed muffler servicing the Bottle Rock Geothermal Power Plant.

Permit Conditions

Condition 1 Bottle Rock Power, LLC (BRP) shall operate the proposed abatement system to limit emissions during drilling, initial clean out, and testing to a rate of no more than five (5.0) pounds of hydrogen sulfide (H2S) per hour. Should atmospheric conditions result in nuisance complaints or H2S monitoring at the Glenbrook monitoring station exceed 15 ppb, BRP shall limit emissions to no more than two (2) pounds H2S per hour at the request of the Lake County Air Quality Management District (LCAQMD). Detached plume opacity shall be controlled to a 10% opacity by the injection of no less than 60 GPM and excessive splash over or carry through of drift shall be prevented by properly sizing a cyclone scrubber or other acceptable method. Should the well drilling encounter the condition described as "pink or red plume" during the air drilling, initial cleanout, or testing of the herein permitted geothermal well(s), BRP shall act promptly to enter such information into the abatement log book required as part of the performance plan and shall notify the LCAQMD within one (1) hour after such entry is made. BRP shall have posted on site with the permit, phone numbers of the LCAQMD office (263-7000) or Air Pollution Control Officer (APCO) (391-3232) for contact should such incident occur. BRP shall promptly install an improved blooie line water injection/cyclonic separator for the efficient abatement of high loading of small sized particulate (e.g. 0.5 to 5.0 micron). Said system shall be capable of a water injection capacity of a minimum of (400) GPM with as long a residence/contact time as is practicable. Alternate technological approached as proposed by BRP and approved by the APCO shall be allowed and encouraged, including a reduction in drilling rate and misting down hole.

Condition 2 Road, pad, and yard dust for three (3) minutes or more duration in any one (1) hour shall be kept below Ringelmann 0.5 at all times by making use of watering, palliatives, oiling/chip seal, or surfacing of raods used regularly. BRP shall perform or have performed, at LCAQMD request and by a LCAQMD approved method, geological sampling of serpentine exposures of the pad site and/or access road and provide analysis of the asbestos content of the material prior to the construction. BRP shall surface or otherwise cover and maintain all areas identified as containing significant amounts of asbestos which are subject to vehicular wear.

Condition 3 BRP shall promptly notify the LCAQMD in writing should they learn of or encounter conditions where toxic air emissions of concern from an occupational standpoint occur and which are allowed to disperse into the ambient air as a mitigation. BRP shall install, maintain, and operate a gas alarm at a location and as approved by the APCO.

Condition 4 The BRP H2S abatement plan on file with the LCAQMD is accepted contingent upon changes incorporated herein and shall be followed and implemented. Entries made into an onsite log book shall occur a minimum of four (4) times daily once abatement is initiated, and entries shall be made in ink and signed by a responsible person in a format acceptable to the LCAQMD. The abatement equipment, an abatement performance plan, and log book shall be onsite prior to air drilling. The LCAQMD shall be promptly informed as to the responsible onsite person and location of the log book. The official

(Conditions 4 through 14 are continued on the back of this card)

THIS PERMIT BECOMES VOID UPON CHANGE OF OWNERSHIP OR LOCATION

log book shall be maintained at one location, and copiesand/or any information contained therein shall be provided to the LCAQMD upon request. The wet cyclone particulate scrubber used as part of the emissions control system shall be maintained in good working order and supplied with a minimum of 60 GPM water. A device acceptable to the LCAQMD to ensure this flow shall be installed upon request of the LCAQMD. Any failures of this abatement system(s) while air drilling shall be logged in the referenced log book. Initial chemical availability on site shall be a minimum of 500 gallons of both peroxide and caustic to allow for the abatement of unexpected upset conditions and subsequently shall be maintained at a quantity necessary for a 24 hour minimum supply based upon the most recent chemical use rate. During well flow testing these limits shall not apply, and planned complete consumption of chemicals is allowable.

Condition 5 If during air drilling, excessively high H2S levels are encountered, BRP shall either a) Put into operation additional H2S abatement capacity, or b) Cease operation and close in the well according to appropriate standards of operation. For the purposes of this permit, excessively high pockets of H2S will mean pockets resulting in abated emissions greater than five (5.0) pounds of H2S per hour or abated emissions levels in excess of 500 ppm volume.

Condition 6 BRP shall perform and forward to the LCAQMD the following characterization of hot water, steam, particulates, and/or gases emanating from the subject well(s) within sixty (60) days after completion of the initial geothermal drilling and testing.

STEAM CONDENSATE/TOTAL STEAM: Benzene, Ammonium (total)*, Arsenic*, Bicarbonate and Carbonate, Sulfates, Chlorides, Nitrates, Boron (total) *, Hydrogen Sulfide (total)*, Fluorides (total), Mercury (total), pH, Total Dissolved Solids, Total Suspended Solids, Percent Non-Condensables, and Steam Flow and Temperature*.

GAS PHASE: Benzene, Ammonia, Mercury Vapor, Radon 222 and Daughters, Methane, Non-Methane, Hydrocarbons, Carbon Dioxide, and NESHAPS pollutants as requested.

PARTICULATE IN STEAM: (ug particulate/g of Steam) Arsenic, Lead, Cadmium, Total Sulfur, Boron. Tests can be performed utilizing the bleed of the subject well(s) or during flow testing. Gas phase (non-condensables or steam diluted with air as appropriate to maintain gas phase and integrity of sample) tests are to be performed if wells are placed on long term standby bleed. The test protocol shall be submitted to the LCAQMD at least three (3) weeks before such sample collection and analytical testing is planned and shall be approved by the LCAQMD prior to actual source testing. If the well is produced immediately, the LCAQMD may delay required testing (specifically those items without an asterisk) until circumstances require a sustained bleed status of the well; this shall be at the LCAQMD's option and initiated by BRP's timely written request.

Condition 7 If chemical or particulate analysis performed as part of Condition 6 suggests the need for further study including air dispersion analysis, BRP will assist, perform, or finance such studies if deemed reasonable and necessary by the APCO.

Condition 8 BRP shall notify the LCAQMD at least twenty-four (24) hours prior to initiating the planned venting of the herein permitted geothermal well(s) is deemed necessary by the LCAQMD, BRP will be available within ten (10) days after written notice to open said well for a 4-8 hour duration.

Condition 9 If locks or unmanned gates are used to secure the project area, the LCAQMD or its representative, will be given keys or combinations and have free access or entry for purposes of monitoring, inspecting, or collecting samples. If locks or combinations are periodically changed, BRP shall promptly forward new key(s) or combinations to the LCAQMD.

Condition 10 Once a well is placed on standby bleed status, it shall be tested to determine H2S emissions within three (3) days, and retested no sooner than one (1) week, and no less than two (2) weeks after the first test, and thereafter upon a 10 percent or greater change of flowrate. If the emissions limit allowed by LCAQMD regulation is approached, a program of additional testing may be required. A written brief monthly report shall be forwarded to the LCAQMD updating and clearly stating well status and estimated emissions of each well for the steamfield upon request to the LCAQMD.

Condition 11 BRP shall connect said development well the the BRP steamfield transmission line within sixty (60) days of completion of the subject well(s). Should compliance with this condition not be achieved, the APCO may require that regular emissions testing be instituted, and if necessary, reduced bleed emissions limitations than otherwise required herein. Under proven extenuating circumstances, exceptions to this condition can be allowed by the APCO.

Condition 12 BRP shall participate in the Geysers Air Monitoring Program or a similar air monitoring program, approved by the LCAQMD, in an equitable fashion with other developers to assist the LCAQMD in determining the compliance and validity of conditions set forth herein.

Condition 13 These conditions are for the herein listed geothermal development well. BRP agrees that this permit does not establish a precedent for issuing of future permits to BRP.

Condition 14 Should it be necessary to vent the well(s) located on the West Coleman pad site for a period of more than two weeks, additional reduction in emissions and/or drainage air monitoring for H2S and meteorology may be required to be installed and operated as approved by the APCO if emissions are shown to contribute to nuisance complaints or an exceed of the Ambient Air Quality Standard (AAQS). All reasonable costs of emissions reduction, installation, and operation of said station shall be the responsibility of BRP for duration of the venting.

The above fourteen (14) conditions are based on the assumption that this project as conditioned, will not result in violation of the LCAQMD Rules and Regulations nor cause or contribute to an exceed of any AAQS. This permit is also subject to concurrence by the California Air Resources Board and the Environmental Protection Agency within thirty (30) days of receipt.

Bottle Rock Power, LLC

15161

Geysers Air Monitoring Program

10/30/2018

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
10/3/2018	Bill	Ext GAMP FY 18/19	12,518.00	12,516.00		12,516.00
					Check Amount	12,516.00

PAYMENT RECORD

Send attached with check.

Cash - City National	Extension of the Geysers Air Monitoring Pro	12,516.00

104091

Rev 2/14

Appendix 3

Figure 1 - Vegetation Monitoring Map

Table 1 – Vegetation & Soil Boron Analytical Results

Vegetation & Soil Boron Analytical Reports

Figure 2 – Water Monitoring Map

Table 2 – Groundwater & Surface Water Analytical Results

Groundwater & Surface Water Analytical Reports

Bottle Rock Power, LLC - Vegetation Monitoring Locations

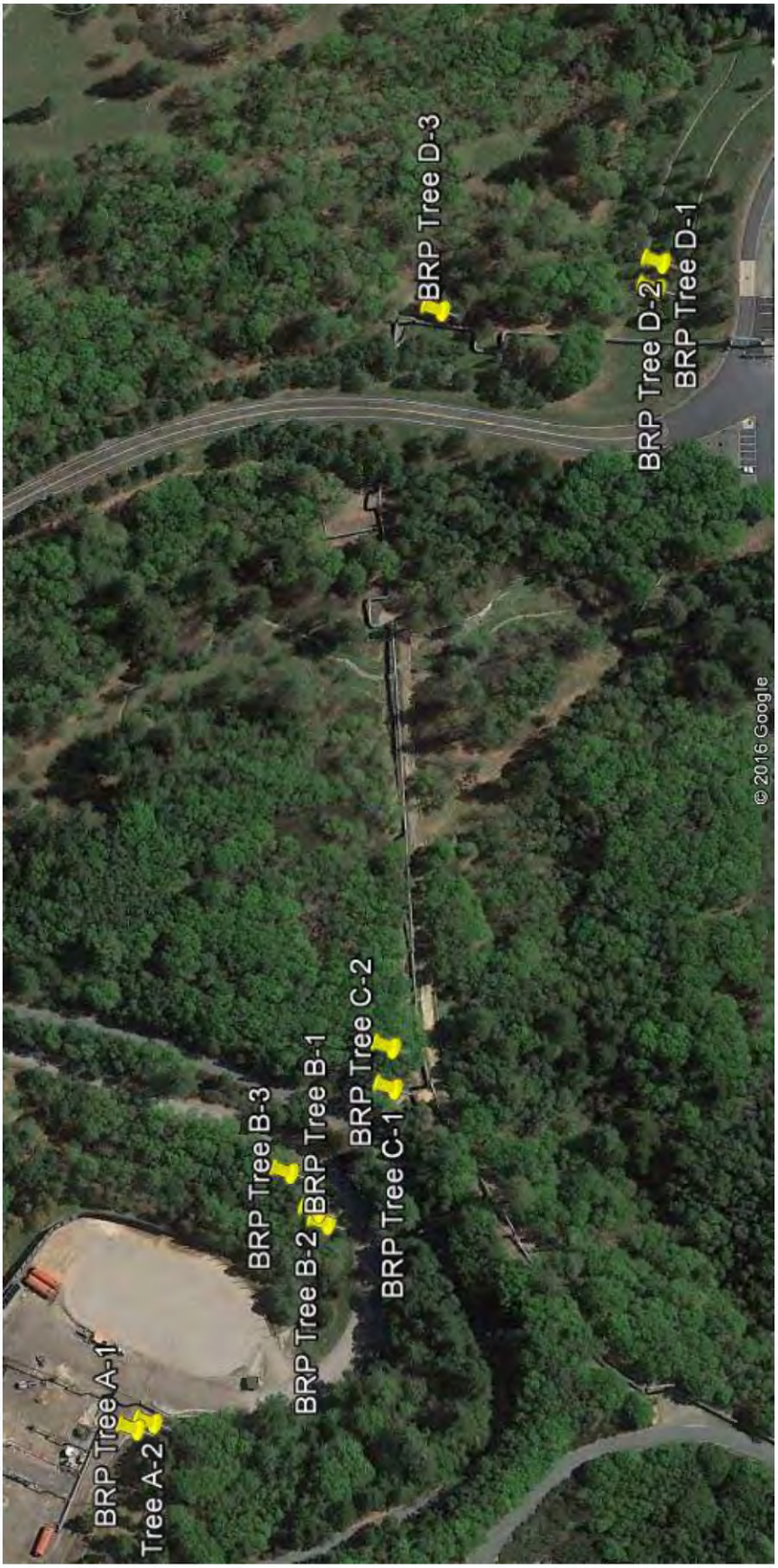


Table 1

Bottle Rock Power, LLC

2018 Vegetation Monitoring Data Needle & Soil Boron Analytical Results

Location ID	UTM Coordinates	Location Description	Sample Type	Boron (mg/kg)	Sample Type	Boron (mg/kg)
A-1	38.83734 -122.77257	Coleman Pad A3-a	Ponderosa Pine Needle	110	Base of Tree Soil	ND
A-2	38.83729 -122.77255	Coleman Pad A3-b	Ponderosa Pine Needle	37	Base of Tree Soil	ND
B-1	38.83675 -122.77177	West Coleman/Coleman Road BB1-a	Ponderosa Pine Needle	21	Base of Tree Soil	8.4
B-2	38.83678 -122.77173	West Coleman/Coleman Road (previously BB1-b) now B-2	Ponderosa Pine Needle	120	Base of Tree Soil	4.6
B-3	38.83687 -122.77157	West Coleman/Coleman Road previously BB1-c	Ponderosa Pine Needle	11	Base of Tree Soil	ND
C-1	38.83655 -122.77121	Access Road C-1	Ponderosa Pine Needle	240	Base of Tree Soil	ND
C-2	38.83655 -122.77105	Access Road C-2	Ponderosa Pine Needle	63	Base of Tree Soil	ND
D-1	38.83574 -122.76807	North of Plant Fence Line D-1	Ponderosa Pine Needle	15	Base of Tree Soil	ND
D-2	38.83572 -122.76796	North of Plant Fence Line D-2 (previously D-6)	Ponderosa Pine Needle	11	Base of Tree Soil	ND
D-3	38.8364 -122.76813	North of Plant Fence Line DD-2 (previously DD-2a & b)	Ponderosa Pine Needle	54	Base of Tree Soil	ND

ND - Not Detected

NA - Not Analyzed

Alpha Analytical Laboratories, Inc. email: clientservices@alpha-labs.com
Corporate: 208 Mason Street | Ukiah, CA 95482 | T: 707-468-0401 | F: 707-468-5267 | ELAP# 1551

14 January 2019

Bottle Rock Power
Attn: Jay Hepper
PO Box 326
Cobb, CA 95426
RE: Annual Needles
Work Order: 18L2891

Enclosed are the results of analyses for samples received by the laboratory on 12/26/18 15:35. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jeanette Poplin

Jeanette L. Poplin For Robbie C. Phillips
Project Manager

Alpha Analytical Laboratories, Inc. email: clientservices@alpha-labs.com
Corporate: 208 Mason Street | Ukiah, CA 95482 | T: 707-468-0401 | F: 707-468-5267 | ELAP# 1551

Bottle Rock Power	Project Manager: Jay Hepper	
PO Box 326	Project: Annual Needles	Reported:
Cobb, CA 95426	Project Number: [none]	01/14/19 07:52

Bay Area: 262 Rickenbacker Circle | Livermore, CA 94551 | T: 925-828-6226 | F: 925-828-6309 | ELAP# 2728
Central Valley: 9090 Union Park Way Suite 113 | Elk Grove, CA 95624 | T: 916-686-5190 | F: 916-686-5192 | ELAP# 2922
North Bay: 110 Liberty Street | Petaluma, CA 94952 | T: 707-769-3128 | F: 707-769-8093 | ELAP# 2303
San Diego Service Center: 2722 Loker Avenue West Suite A | Carlsbad, CA 92010 | T: 760-930-2555 | F: 760-930-2510

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
A-1N	18L2891-01	Other (W)	12/26/18 09:03	12/26/18 15:35
A-2N	18L2891-02	Other (W)	12/26/18 09:11	12/26/18 15:35
B-1N	18L2891-03	Other (W)	12/26/18 09:27	12/26/18 15:35
B-2N	18L2891-04	Other (W)	12/26/18 09:36	12/26/18 15:35
B-3N	18L2891-05	Other (W)	12/26/18 09:57	12/26/18 15:35
C-1N	18L2891-06	Other (W)	12/26/18 10:11	12/26/18 15:35
C-2N	18L2891-07	Other (W)	12/26/18 10:19	12/26/18 15:35
D-1N	18L2891-08	Other (W)	12/26/18 11:00	12/26/18 15:35
D-2N	18L2891-09	Other (W)	12/26/18 10:39	12/26/18 15:35
D-3N	18L2891-10	Other (W)	12/26/18 10:27	12/26/18 15:35

Alpha Analytical Laboratories, Inc. email: clientservices@alpha-labs.com
Corporate: 208 Mason Street | Ukiah, CA 95482 | T: 707-468-0401 | F: 707-468-5267 | ELAP# 1551

Bottle Rock Power	Project Manager: Jay Hepper	
PO Box 326	Project: Annual Needles	Reported:
Cobb, CA 95426	Project Number: [none]	01/14/19 07:52

	Result	Reporting Limit	Dilution	Batch	Prepared	Analyzed	Method	Note
A-1N (18L2891-01)		**Sample Type: Other (W)**				**Sampled: 12/26/18 09:03**		
Metals by EPA 6000/7000 Series Methods								
Boron	**110 mg/kg**	**3.9**	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
A-2N (18L2891-02)		**Sample Type: Other (W)**				**Sampled: 12/26/18 09:11**		
Metals by EPA 6000/7000 Series Methods								
Boron	**37 mg/kg**	**3.2**	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
B-1N (18L2891-03)		**Sample Type: Other (W)**				**Sampled: 12/26/18 09:27**		
Metals by EPA 6000/7000 Series Methods								
Boron	**21 mg/kg**	**3.7**	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
B-2N (18L2891-04)		**Sample Type: Other (W)**				**Sampled: 12/26/18 09:36**		
Metals by EPA 6000/7000 Series Methods								
Boron	**120 mg/kg**	**4.1**	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
B-3N (18L2891-05)		**Sample Type: Other (W)**				**Sampled: 12/26/18 09:57**		
Metals by EPA 6000/7000 Series Methods								
Boron	**11 mg/kg**	**4.0**	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
C-1N (18L2891-06)		**Sample Type: Other (W)**				**Sampled: 12/26/18 10:11**		
Metals by EPA 6000/7000 Series Methods								
Boron	**240 mg/kg**	**6.7**	2	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
C-2N (18L2891-07)		**Sample Type: Other (W)**				**Sampled: 12/26/18 10:19**		
Metals by EPA 6000/7000 Series Methods								
Boron	**63 mg/kg**	**3.7**	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
D-1N (18L2891-08)		**Sample Type: Other (W)**				**Sampled: 12/26/18 11:00**		
Metals by EPA 6000/7000 Series Methods								
Boron	**15 mg/kg**	**3.9**	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
D-2N (18L2891-09)		**Sample Type: Other (W)**				**Sampled: 12/26/18 10:39**		
Metals by EPA 6000/7000 Series Methods								
Boron	**11 mg/kg**	**4.0**	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
D-3N (18L2891-10)		**Sample Type: Other (W)**				**Sampled: 12/26/18 10:27**		
Metals by EPA 6000/7000 Series Methods								
Boron	**54 mg/kg**	**3.8**	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	

Alpha Analytical Laboratories, Inc. email: clientservices@alpha-labs.com
Corporate: 208 Mason Street | Ukiah, CA 95482 | T: 707-468-0401 | F: 707-468-5267 | ELAP# 1551

Bottle Rock Power	Project Manager: Jay Hepper	
PO Box 326	Project: Annual Needles	Reported:
Cobb, CA 95426	Project Number: [none]	01/14/19 07:52

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Analytical Sciences
P.O. Box 750336, Petaluma, CA 94975-0336
110 Liberty Street, Petaluma, CA 94952
(707) 769-3128
Fax (707) 769-8093

CHAIN OF CUSTODY

Lab Project Number: 1822891
Client's Project Name: **Bottle Rock Monitoring**
Client's Project Number: Annual Needles - 2018

CLIENT INFORMATION

Company Name: **Bottle Rock Power, LLC**
Address: **4010 Stone Way North, Ste. 400**
Seattle, WA 98103
Contact: **Laura Nofziger**
Phone #: **206-729-2400**
Fax #:
E-mail: lnofziger@altarockenergy.com
tderocher@altarockenergy.com / Jay Hepperegmail.com

TURNAROUND TIME (check one)

Same Day ____ 72 Hours ____
48 Hours ____ 24 Hours ____
5 Days ____ Normal X

Page 1 of 1

ANALYSIS

Item	Client Sample ID	Date Sampled	Time	Matrix	# Cont.	Presv. Y/N	Boron	Comments	Lab Sample #
1	A-1N	12/26/18	09:04	S	1	N	X		
2	A-2N	12/26/18	09:11	S	1	N			
3	B-1N	12/26/18	09:27	S	1	N			
4	B-2N	12/26/18	09:36	S	1	N			
5	B-3N	12/26/18	09:57	S	1	N			
6	C-1N	12/26/18	10:11	S	1	N			
7	C-2N	12/26/18	10:19	S	1	N			
8	D-1N	12/26/18	11:00	S	1	N			
9	D-2N	12/26/18	10:39	S	1	N			
10	D-3N	12/26/18	10:27	S	1	N			

SIGNATURES

Sampled By: ~~Ted De Rocher~~ Jay Hepper

Relinquished By: _____ Signature
12/26/18 15:35 Date Time

Received By: _____ Signature
12/26/18 1535 Date Time

Alpha Analytical Laboratories, Inc. email: clientservices@alpha-labs.com
Corporate: 208 Mason Street | Ukiah, CA 95482 | T: 707-468-0401 | F: 707-468-5267 | ELAP# 1551

11 January 2019

Bottle Rock Power
Attn: Jay Hepper
PO Box 326
Cobb, CA 95426
RE: Annual Soil
Work Order: 18L2887

Enclosed are the results of analyses for samples received by the laboratory on 12/26/18 15:35. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jeanette Poplin

Jeanette L. Poplin For Robbie C. Phillips
Project Manager

Alpha Analytical Laboratories, Inc. email: clientservices@alpha-labs.com
Corporate: 208 Mason Street | Ukiah, CA 95482 | T: 707-468-0401 | F: 707-468-5267 | ELAP# 1551

Bottle Rock Power	Project Manager: Jay Hepper	
PO Box 326	Project: Annual Soil	Reported:
Cobb, CA 95426	Project Number: 2018	01/11/19 16:45

Bay Area: 262 Rickenbacker Circle | Livermore, CA 94551 | T: 925-828-6226 | F: 925-828-6309 | ELAP# 2728
Central Valley: 9090 Union Park Way Suite 113 | Elk Grove, CA 95624 | T: 916-686-5190 | F: 916-686-5192 | ELAP# 2922
North Bay: 110 Liberty Street | Petaluma, CA 94952 | T: 707-769-3128 | F: 707-769-8093 | ELAP# 2303
San Diego Service Center: 2722 Loker Avenue West Suite A | Carlsbad, CA 92010 | T: 760-930-2555 | F: 760-930-2510

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
A-1S	18L2887-01	Other (W)	12/07/18 11:00	12/26/18 15:35
A-2S	18L2887-02	Other (W)	12/07/18 11:27	12/26/18 15:35
B-1S	18L2887-03	Other (W)	12/07/18 10:11	12/26/18 15:35
B-2S	18L2887-04	Other (W)	12/07/18 10:25	12/26/18 15:35
B-3S	18L2887-05	Other (W)	12/07/18 09:13	12/26/18 15:35
C-1S	18L2887-06	Other (W)	12/07/18 08:55	12/26/18 15:35
C-2S	18L2887-07	Other (W)	12/07/18 08:50	12/26/18 15:35
D-1S	18L2887-08	Other (W)	12/07/18 08:18	12/26/18 15:35
D-2S	18L2887-09	Other (W)	12/07/18 08:11	12/26/18 15:35
D-3S	18L2887-10	Other (W)	12/07/18 08:31	12/26/18 15:35

Alpha Analytical Laboratories, Inc. email: clientservices@alpha-labs.com
Corporate: 208 Mason Street | Ukiah, CA 95482 | T: 707-468-0401 | F: 707-468-5267 | ELAP# 1551

Bottle Rock Power	Project Manager: Jay Hepper	
PO Box 326	Project: Annual Soil	Reported:
Cobb, CA 95426	Project Number: 2018	01/11/19 16:45

	Result	Reporting Limit	Dilution	Batch	Prepared	Analyzed	Method	Note
A-1S (18L2887-01)		**Sample Type: Other (W)**				**Sampled: 12/07/18 11:00**		
Metals by EPA 6000/7000 Series Methods								
Boron	ND mg/kg	5.0	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
A-2S (18L2887-02)		**Sample Type: Other (W)**				**Sampled: 12/07/18 11:27**		
Metals by EPA 6000/7000 Series Methods								
Boron	ND mg/kg	5.0	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
B-1S (18L2887-03)		**Sample Type: Other (W)**				**Sampled: 12/07/18 10:11**		
Metals by EPA 6000/7000 Series Methods								
Boron	**8.4 mg/kg**	**3.6**	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
B-2S (18L2887-04)		**Sample Type: Other (W)**				**Sampled: 12/07/18 10:25**		
Metals by EPA 6000/7000 Series Methods								
Boron	**4.6 mg/kg**	**3.9**	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
B-3S (18L2887-05)		**Sample Type: Other (W)**				**Sampled: 12/07/18 09:13**		
Metals by EPA 6000/7000 Series Methods								
Boron	ND mg/kg	4.0	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
C-1S (18L2887-06)		**Sample Type: Other (W)**				**Sampled: 12/07/18 08:55**		
Metals by EPA 6000/7000 Series Methods								
Boron	ND mg/kg	3.7	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
C-2S (18L2887-07)		**Sample Type: Other (W)**				**Sampled: 12/07/18 08:50**		
Metals by EPA 6000/7000 Series Methods								
Boron	ND mg/kg	4.1	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
D-1S (18L2887-08)		**Sample Type: Other (W)**				**Sampled: 12/07/18 08:18**		
Metals by EPA 6000/7000 Series Methods								
Boron	ND mg/kg	3.5	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
D-2S (18L2887-09)		**Sample Type: Other (W)**				**Sampled: 12/07/18 08:11**		
Metals by EPA 6000/7000 Series Methods								
Boron	ND mg/kg	3.2	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	
D-3S (18L2887-10)		**Sample Type: Other (W)**				**Sampled: 12/07/18 08:31**		
Metals by EPA 6000/7000 Series Methods								
Boron	ND mg/kg	3.8	1	AA93340	01/04/19 10:00	01/07/19 16:53	EPA 6010B	

Alpha Analytical Laboratories, Inc. email: clientservices@alpha-labs.com
Corporate: 208 Mason Street | Ukiah, CA 95482 | T: 707-468-0401 | F: 707-468-5267 | ELAP# 1551

Bottle Rock Power	Project Manager: Jay Hepper	
PO Box 326	Project: Annual Soil	Reported:
Cobb, CA 95426	Project Number: 2018	01/11/19 16:45

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Analytical Sciences
P.O. Box 750336, Petaluma, CA 94975-0336
110 Liberty Street, Petaluma, CA 94952
(707) 769-3128
Fax (707) 769-8093

CHAIN OF CUSTODY

Lab Project Number: 18L2887
Client's Project Name: **Bottle Rock Monitoring**
Client's Project Number: Annual Soil - 2018

Company Information

Company Name: **Bottle Rock Power, LLC**
Address: **4010 Stone Way North, Ste. 400**
Seattle, WA 98103
Contact: **Laura Nofziger**
Phone #: **206-729-2400**
Fax #:
E-mail: lnofziger@altarockenergy.com
tderocher@altarockenergy.com / JayHepper@gmail.com

Turnaround Time Requested

Same Day ____ 72 Hours ____
48 Hours ____ 24 Hours ____
5 Days ____ Normal X

Page 1 of 1

Analysis

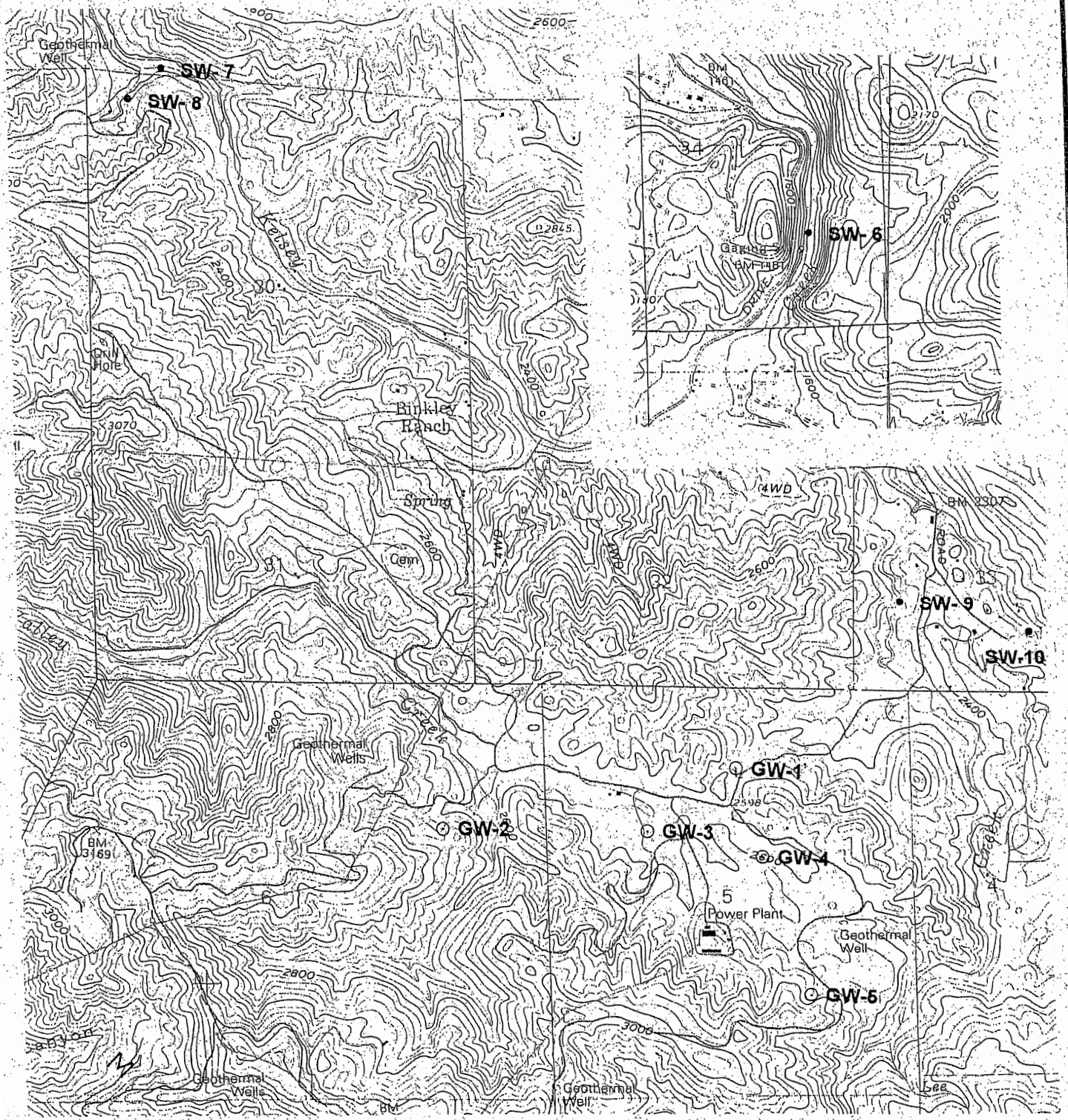
Item	Client Sample ID	Date Sampled	Time	Matrix	# Cont.	Presv. Y/N		Boron												Comments	Lab Sample #
1	**A-1S**	12/7/18	11:00	S	1	N		X													
2	**A-2S**	12/7/18	11:27	S	1	N															
3	**B-1S**	12/7/18	10:11	S	1	N															
4	**B-2S**	12/7/18	10:25	S	1	N															
5	**B-3S**	12/7/18	09:13	S	1	N															
6	**C-1S**	12/7/18	08:55	S	1	N															
7	**C-2S**	12/7/18	08:50	S	1	N															
8	**D-1S**	12/7/18	08:18	S	1	N															
9	**D-2S**	12/7/18	08:11	S	1	N															
10	**D-3S**	12/7/18	08:31	S	1	N															

Signatures

Sampled By: ~~Ted De Rocher~~ Jay Hepper

Relinquished By: _____ 12/26/18 15:35
Signature Date Time

Received By: _____ 12/26/18 1535
Signature Date Time



EGS INC

Bottle Rock Monitoring Program

Water Quality Sample Locations

Scale: 1inch = 2000 feet

Project No: 0068-026-02

Date: June 2003

FIG.1.1

Table 2
Bottle Rock Power, LLC
2018 Ground Water Surface Water Monitoring
1st Quarter Analytical Results

Location ID	GPS Coordinates	Location & Description	Arsenic µg/l	Calcium mg/l	Magnesium mg/l	Hardness mg/l	Boron mg/l	Copper mg/l	Iron mg/l	Lead mg/l	Manganese mg/l	Sodium mg/l	Zinc mg/l	pH	Electrical Conductivity µmS/cm	Disolved Oxygen mg/l	Turbidity NTU	Total Alkalinity mg/l	Nitrate mg/l	Sulfate mg/l	Total Suspended Solids mg/l	Total Coliform MPN
GW-0	38 50' 56.29" N 122 47' 15.97" W	Jadiker Well; Running seep behind house	ND	4.6	91	380	ND	ND	ND	ND	ND	1.9	ND	7.17	400	NA	ND	180	ND	24	ND	NA
GW-1	38 50' 27.84" N 122 45' 59.07" W	Barret Spring; Running seep at sharp turn, downslope on High Valley Road	ND	49	15	180	0.10	ND	ND	ND	0.11	8.6	ND	7.31	650	NA	ND	380	ND	1.9	ND	NA
GW-3	38 50' 21.57" N 122 46' 17.46 W	BRP WW1; Northern most water supply well	ND	35	9.7	130	0.43	ND	0.88	ND	0.15	24	ND	7.32	350	NA	4.8	170	ND	8.5	ND	NA
SW-6	38 55' 33.58" N 122 50' 39.91" W	Kelsey Creek - Downstream; ~ 3 miles west of HWY 29 on Kelsey Creek	NA	13	15	96	0.073	ND	ND	ND	ND	5.5	ND	7.45	210	5.6	7.7	100	NA	5.5	ND	250
SW-7	38 52' 04.62" N 122 47' 43.13" W	High Valley Creek; behind Binkley Ranch House	NA	21	12	100	0.094	ND	ND	ND	ND	4.9	ND	7.22	220	6.2	0.88	100	NA	7.5	ND	410
SW-8	38 52' 08.29" N 122 47' 40.01" W	Kelsey Creek - Middle; Northwest of Binkley Ranch House, upstream of confluence with High Valley Creek	NA	8.8	9.4	61	0.080	ND	0.11	ND	ND	5.4	ND	7.27	160	6.3	2.7	67	NA	4.1	ND	610
SW-9	38 50' 40.18" N 122 45' 29.61" W	Alder Creek; Adjacent to High Valley Road bridge crossing Alder Creek	NA	9.9	4.9	45	0.068	ND	ND	ND	ND	4.1	ND	7.16	110	5.7	1.9	50	NA	3.7	ND	200
SW-10	38 50' 36.22" N 122 44' 57.25" W	Kelsey Creek - Upstream; ~ 0.5 miles west of High Valley Road gate on Bottle Rock Road	NA	6.5	5.6	39	ND	ND	0.15	ND	ND	5.0	ND	7.24	110	5.2	3.8	47	NA	1.5	ND	250

ND = Not Detected
NA = Not Analyzed

Table 2
Bottle Rock Power, LLC
2018 Ground Water Surface Water Monitoring
2nd Quarter Analytical Results

Location ID	GPS Coordinates	Location & Description	Arsenic µg/l	Calcium mg/l	Magnesium mg/l	Hardness mg/l	Boron mg/l	Copper mg/l	Iron mg/l	Lead mg/l	Manganese mg/l	Sodium mg/l	Zinc mg/l	pH	Electrical Conductivity µmS/cm	Disolved Oxygen mg/l	Turbidity NTU	Total Alkalinity mg/l	Nitrate mg/l	Sulfate mg/l	Total Suspended Solids mg/l	Total Coliform MPN
GW-0	38 50' 56.29" N 122 47' 15.97" W	Jadiker Well; Running seep behind house	ND	4.6	93	390	ND	ND	ND	ND	ND	1.9	ND	7.31	600	NA	ND	370	ND	1.5	ND	NA
GW-1	38 50' 27.84" N 122 45' 59.07" W	Barret Spring; Running seep at sharp turn, downslope on High Valley Road	ND	50	16	190	0.11	ND	ND	ND	0.13	9.1	ND	7.05	380	NA	ND	180	ND	23	ND	NA
GW-3	38 50' 21.57" N 122 46' 17.46 W	BRP WW1; Northern most water supply well	ND	35	11	130	0.43	ND	0.14	ND	0.088	26	ND	7.57	350	NA	0.65	170	ND	9.3	ND	NA
SW-6	38 55' 33.58" N 122 50' 39.91" W	Kelsey Creek - Downstream; ~ 3 miles west of HWY 29 on Kelsey Creek	NA	15	22	130	0.082	ND	ND	ND	ND	6.3	ND	7.77	270	6.0	0.66	130	NA	4.5	ND	820
SW-7	38 52' 04.62" N 122 47' 43.13" W	High Valley Creek; behind Binkley Ranch House	NA	29	15	140	0.10	ND	ND	ND	ND	5.7	ND	7.76	280	6.2	0.76	130	NA	7.4	ND	520
SW-8	38 52' 08.29" N 122 47' 40.01" W	Kelsey Creek - Middle; Northwest of Binkley Ranch House, upstream of confluence with High Valley Creek	NA	13	11	78	0.083	ND	ND	ND	ND	5.8	ND	7.75	190	6.2	0.89	82	NA	3.5	ND	650
SW-9	38 50' 40.18" N 122 45' 29.61" W	Alder Creek; Adjacent to High Valley Road bridge crossing Alder Creek	NA	8.1	4.4	38	0.058	ND	ND	ND	ND	4.5	ND	7.68	110	6.6	0.66	44	NA	2.4	ND	330
SW-10	38 50' 36.22" N 122 44' 57.25" W	Kelsey Creek - Upstream; ~ 0.5 miles west of High Valley Road gate on Bottle Rock Road	NA	6.9	5.8	41	ND	ND	0.13	ND	ND	5.4	ND	7.89	77	5.5	2.0	50	NA	0.68	ND	1600

ND = Not Detected
NA = Not Analyzed

Table 2
Bottle Rock Power, LLC
2018 Ground Water Surface Water Monitoring
3rd Quarter Analytical Results

Location ID	GPS Coordinates	Location & Description	Arsenic µg/l	Calcium mg/l	Magnesium mg/l	Hardness mg/l	Boron mg/l	Copper mg/l	Iron mg/l	Lead mg/l	Manganese mg/l	Sodium mg/l	Zinc mg/l	pH	Electrical Conductivity µmS/cm	Disolved Oxygen mg/l	Turbidity NTU	Total Alkalinity mg/l	Nitrate mg/l	Sulfate mg/l	Total Suspended Solids mg/l	Total Coliform MPN
GW-0	38 50' 56.29" N 122 47' 15.97" W	Jadiker Well; Running seep behind house	ND	4.7	80	340	ND	ND	ND	ND	ND	1.9	ND	7.54	600	NA	ND	370	ND	1.8	ND	NA
GW-1	38 50' 27.84" N 122 45' 59.07" W	Barret Spring; Running seep at sharp turn, downslope on High Valley Road	ND	49	15	180	0.10	ND	0.18	ND	0.25	8.6	ND	7.39	400	NA	ND	180	ND	23	ND	NA
GW-3	38 50' 21.57" N 122 46' 17.46 W	BRP WW1; Northern most water supply well	ND	34	9.4	120	0.41	ND	0.41	ND	0.086	25	ND	7.64	370	NA	5.2	170	ND	9.4	7.7	NA
SW-6	38 55' 33.58" N 122 50' 39.91" W	Kelsey Creek - Downstream; ~ 3 miles west of HWY 29 on Kelsey Creek	NA	13	21	120	0.083	ND	ND	ND	ND	6.6	ND	7.65	300	7.6	ND	130	NA	1.6	ND	2400
SW-7	38 52' 04.62" N 122 47' 43.13" W	High Valley Creek; behind Binkley Ranch House	NA	40	21	180	0.18	ND	ND	ND	ND	8.6	ND	7.65	420	7.8	ND	200	NA	3.8	ND	820
SW-8	38 52' 08.29" N 122 47' 40.01" W	Kelsey Creek - Middle; Northwest of Binkley Ranch House, upstream of confluence with High Valley Creek	NA	8.3	7.0	50	ND	ND	ND	ND	ND	5.9	ND	7.59	140	8.1	0.81	60	NA	1.1	ND	2400
SW-9	38 50' 40.18" N 122 45' 29.61" W	Alder Creek; Adjacent to High Valley Road bridge crossing Alder Creek	NA	4.4	2.3	20	ND	ND	ND	ND	ND	4.5	ND	7.32	81	8.3	0.56	30	NA	1.1	ND	1200
SW-10	38 50' 36.22" N 122 44' 57.25" W	Kelsey Creek - Upstream; ~ 0.5 miles west of High Valley Road gate on Bottle Rock Road	NA	8.2	5.8	44	ND	ND	ND	ND	ND	6.0	ND	7.53	140	8.5	2.0	55	NA	0.65	ND	>2400

ND = Not Detected
NA = Not Analyzed

Table 2
Bottle Rock Power, LLC
2018 Ground Water Surface Water Monitoring
4th Quarter Analytical Results

Location ID	GPS Coordinates	Location & Description	Arsenic µg/l	Calcium mg/l	Magnesium mg/l	Hardness mg/l	Boron mg/l	Copper mg/l	Iron mg/l	Lead mg/l	Manganese mg/l	Sodium mg/l	Zinc mg/l	pH	Electrical Conductivity µmS/cm	Disolved Oxygen mg/l	Turbidity NTU	Total Alkalinity mg/l	Nitrate mg/l	Sulfate mg/l	Total Suspended Solids mg/l	Total Coliform MPN
GW-0	38 50' 56.29" N 122 47' 15.97" W	Jadiker Well; Running seep behind house	ND	4.8	87	372	ND	ND	ND	ND	ND	1.9	ND	8.01	530	NA	0.20	350	ND	2.0	ND	NA
GW-1	38 50' 27.84" N 122 45' 59.07" W	Barret Spring; Running seep at sharp turn, downslope on High Valley Road	ND	52	16	197	0.10	ND	0.36	ND	0.42	8.7	ND	7.73	360	NA	0.32	180	ND	24	ND	NA
GW-3	38 50' 21.57" N 122 46' 17.46 W	BRP WW1; Northern most water supply well	ND	35	10	132	0.42	ND	0.25	ND	0.11	25	ND	7.64	320	NA	1.0	170	ND	8.3	ND	NA
SW-6	38 55' 33.58" N 122 50' 39.91" W	Kelsey Creek - Downstream; ~ 3 miles west of HWY 29 on Kelsey Creek	NA	13	19	111	ND	ND	ND	ND	ND	7.1	ND	7.57	240	8.3	0.89	110	NA	5.7	ND	2000
SW-7	38 52' 04.62" N 122 47' 43.13" W	High Valley Creek; behind Binkley Ranch House	NA	36	20	174	0.11	ND	ND	ND	ND	7.5	ND	7.48	340	8.1	0.51	170	NA	9.1	ND	410
SW-8	38 52' 08.29" N 122 47' 40.01" W	Kelsey Creek - Middle; Northwest of Binkley Ranch House, upstream of confluence with High Valley Creek	NA	8.8	8.2	56	ND	ND	0.10	ND	ND	6.2	ND	7.34	150	8.8	1.9	60	NA	3.4	ND	650
SW-9	38 50' 40.18" N 122 45' 29.61" W	Alder Creek; Adjacent to High Valley Road bridge crossing Alder Creek	NA	7.9	3.9	36	ND	ND	ND	ND	ND	5.1	ND	7.24	110	8.8	0.56	45	NA	4.6	ND	260
SW-10	38 50' 36.22" N 122 44' 57.25" W	Kelsey Creek - Upstream; ~ 0.5 miles west of High Valley Road gate on Bottle Rock Road	NA	8.1	6.4	47	ND	ND	0.18	ND	ND	6.3	ND	7.35	140	8.7	3.8	56	NA	1.7	ND	1600

ND = Not Detected
NA = Not Analyzed

Analytical Sciences

Report Date: February 07, 2018

Laboratory Report

Ted De Rocher
Bottle Rock Power, LLC.
4010 Stone Way, North Suite 400
Seattle, WA 98103

Project Name: **Bottle Rock Monitoring - SW** **January 1st Quarter**

Lab Project Number: **8012901**

This 25 page report of analytical data has been reviewed and approved for release.

Michele Peters
Laboratory Director

P.O. Box 750336
Petaluma, CA 94975-0336
Telephone: (707) 769-3128

110 Liberty Street
Petaluma, CA
94952

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8012901-01	**SW-7**	Total Coliform	410	1
		E. Coli	1	1

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch:	B017414
Date Received:	01/29/18	Method:	SM 9223 B-2004		

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8012901-02	**SW-8**	Total Coliform	610	1
		E. Coli	16	1

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch:	B017414
Date Received:	01/29/18	Method:	SM 9223 B-2004		

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8012901-03	**SW-9**	Total Coliform	200	1
		E. Coli	19	1

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch:	B017414
Date Received:	01/29/18	Method:	SM 9223 B-2004		

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8012901-04	**SW-6**	Total Coliform	250	1
		E. Coli	8	1

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch:	B017414
Date Received:	01/29/18	Method:	SM 9223 B-2004		

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8012901-05	**SW-10**	Total Coliform	250	1
		E. Coli	12	1

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch: B017414
Date Received:	01/29/18	Method:	SM 9223 B-2004	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-01	**SW-7**	Calcium (Ca)	21	0.25
		Magnesium (Mg)	12	0.10
		Hardness	100	1.0

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	SM 2340 B-2011	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-02	**SW-8**	Calcium (Ca)	8.8	0.25
		Magnesium (Mg)	9.4	0.10
		Hardness	61	1.0

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	SM 2340 B-2011	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-03	**SW-9**	Calcium (Ca)	9.9	0.25
		Magnesium (Mg)	4.9	0.10
		Hardness	45	1.0

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	SM 2340 B-2011	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-04	**SW-6**	Calcium (Ca)	13	0.25
		Magnesium (Mg)	15	0.10
		Hardness	96	1.0

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	SM 2340 B-2011	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-05	**SW-10**	Calcium (Ca)	6.5	0.25
		Magnesium (Mg)	5.6	0.10
		Hardness	39	1.0

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	SM 2340 B-2011	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-01	**SW-7**	Boron (B)	0.094	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	4.9	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	EPA 6010B	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-02	**SW-8**	Boron (B)	0.080	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	0.11	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	5.4	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	EPA 6010B	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-03	**SW-9**	Boron (B)	0.068	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	4.1	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	EPA 6010B	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-04	**SW-6**	Boron (B)	0.073	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	5.5	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	EPA 6010B	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-05	**SW-10**	Boron (B)	ND	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	0.15	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	5.0	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	EPA 6010B	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8012901-01	**SW-7**	pH	7.22	HT	1.00

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017413
Date Received:	01/29/18	Method:	SM 4500-H B-2011	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8012901-02	**SW-8**	pH	7.27	HT	1.00

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch:	B017413
Date Received:	01/29/18	Method:	SM 4500-H B-2011		

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8012901-03	**SW-9**	pH	7.16	HT	1.00

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch:	B017413
Date Received:	01/29/18	Method:	SM 4500-H B-2011		

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8012901-04	**SW-6**	pH	7.45	HT	1.00

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch:	B017413
Date Received:	01/29/18	Method:	SM 4500-H B-2011		

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8012901-05	**SW-10**	pH	7.24	HT	1.00

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch:	B017413
Date Received:	01/29/18	Method:	SM 4500-H B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8012901-01	**SW-7**	Conductivity	220	0.5

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017413
Date Received:	01/29/18	Method:	SM 2510 B-2011	

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8012901-02	**SW-8**	Conductivity	160	0.5

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017413
Date Received:	01/29/18	Method:	SM 2510 B-2011	

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8012901-03	**SW-9**	Conductivity	110	0.5

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017413
Date Received:	01/29/18	Method:	SM 2510 B-2011	

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8012901-04	**SW-6**	Conductivity	210	0.5

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017413
Date Received:	01/29/18	Method:	SM 2510 B-2011	

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8012901-05	**SW-10**	Conductivity	110	0.5

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017413
Date Received:	01/29/18	Method:	SM 2510 B-2011	

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8012901-01	**SW-7**	Dissolved Oxygen	6.2	HT	0.20

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017355
Date Received:	01/29/18	Method:	SM 4500-O G-2011	

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8012901-02	**SW-8**	Dissolved Oxygen	6.3	HT	0.20

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017355
Date Received:	01/29/18	Method:	SM 4500-O G-2011	

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8012901-03	**SW-9**	Dissolved Oxygen	5.7	HT	0.20

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017355
Date Received:	01/29/18	Method:	SM 4500-O G-2011	

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8012901-04	**SW-6**	Dissolved Oxygen	5.6	HT	0.20

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017355
Date Received:	01/29/18	Method:	SM 4500-O G-2011	

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8012901-05	**SW-10**	Dissolved Oxygen	5.2	HT	0.20

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017355
Date Received:	01/29/18	Method:	SM 4500-O G-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8012901-01	**SW-7**	Turbidity	0.88	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017355
Date Received:	01/29/18	Method:	SM 2130 B-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8012901-02	**SW-8**	Turbidity	2.7	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017355
Date Received:	01/29/18	Method:	SM 2130 B-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8012901-03	**SW-9**	Turbidity	1.9	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017355
Date Received:	01/29/18	Method:	SM 2130 B-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8012901-04	**SW-6**	Turbidity	7.7	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017355
Date Received:	01/29/18	Method:	SM 2130 B-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8012901-05	**SW-10**	Turbidity	3.8	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017355
Date Received:	01/29/18	Method:	SM 2130 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8012901-01	**SW-7**	Total Alkalinity	100	5.0
		Bicarbonate Alkalinity	100	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch: B017409
Date Received:	01/29/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8012901-02	**SW-8**	Total Alkalinity	67	5.0
		Bicarbonate Alkalinity	67	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch: B017409
Date Received:	01/29/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8012901-03	**SW-9**	Total Alkalinity	50	5.0
		Bicarbonate Alkalinity	50	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch: B017409
Date Received:	01/29/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8012901-04	**SW-6**	Total Alkalinity	100	5.0
		Bicarbonate Alkalinity	100	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch: B017409
Date Received:	01/29/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8012901-05	**SW-10**	Total Alkalinity	47	5.0
		Bicarbonate Alkalinity	47	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch: B017409
Date Received:	01/29/18	Method:	SM 2320 B-2011	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-01	**SW-7**	Sulfate as SO4	7.5	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017404
Date Received:	01/29/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-02	**SW-8**	Sulfate as SO4	4.1	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017404
Date Received:	01/29/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-03	**SW-9**	Sulfate as SO4	3.7	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017404
Date Received:	01/29/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-04	**SW-6**	Sulfate as SO4	5.5	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017404
Date Received:	01/29/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-05	**SW-10**	Sulfate as SO4	1.5	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017404
Date Received:	01/29/18	Method:	EPA 300.0	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-01	**SW-7**	Total Suspended Solids	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/31/18	QC Batch: B017415
Date Received:	01/29/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-02	**SW-8**	Total Suspended Solids	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/31/18	QC Batch: B017415
Date Received:	01/29/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-03	**SW-9**	Total Suspended Solids	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/31/18	QC Batch: B017415
Date Received:	01/29/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-04	**SW-6**	Total Suspended Solids	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/31/18	QC Batch: B017415
Date Received:	01/29/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012901-05	**SW-10**	Total Suspended Solids	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/31/18	QC Batch: B017415
Date Received:	01/29/18	Method:	SM 2540 D-2011	

Quality Assurance Report

Hardness

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017403 - EPA 200.7										
Blank (B017403-BLK1)				Prepared: 01/25/18 Analyzed: 01/30/18						
Calcium (Ca)	ND	0.25	mg/L							
Magnesium (Mg)	ND	0.10	mg/L							
Hardness	ND	1.0	mg/L							

Metals

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017403 - EPA 200.7										
Blank (B017403-BLK1)				Prepared: 01/25/18 Analyzed: 01/30/18						
Boron (B)	ND	0.050	mg/L							
Copper (Cu)	ND	0.050	mg/L							
Iron (Fe)	ND	0.10	mg/L							
Lead (Pb)	ND	0.050	mg/L							
Manganese (Mn)	ND	0.020	mg/L							
Sodium (Na)	ND	0.10	mg/L							
Zinc (Zn)	ND	0.050	mg/L							
LCS (B017403-BS1)				Prepared: 01/25/18 Analyzed: 01/30/18						
Boron (B)	0.494	0.050	mg/L	0.500		99	70-130			
Iron (Fe)	0.517	0.10	mg/L	0.500		103	70-130			
Lead (Pb)	0.501	0.050	mg/L	0.500		100	70-130			
Manganese (Mn)	0.487	0.020	mg/L	0.500		97	70-130			
Sodium (Na)	0.484	0.10	mg/L	0.500		97	70-130			
Zinc (Zn)	0.509	0.050	mg/L	0.500		102	70-130			
LCS Dup (B017403-BSD1)				Prepared: 01/25/18 Analyzed: 01/30/18						
Boron (B)	0.494	0.050	mg/L	0.500		99	70-130	0.1	20	
Iron (Fe)	0.517	0.10	mg/L	0.500		103	70-130	0.08	20	
Lead (Pb)	0.501	0.050	mg/L	0.500		100	70-130	0.04	20	
Manganese (Mn)	0.487	0.020	mg/L	0.500		97	70-130	0.2	20	
Sodium (Na)	0.484	0.10	mg/L	0.500		97	70-130	0.1	20	
Zinc (Zn)	0.509	0.050	mg/L	0.500		102	70-130	0.006	20	
Matrix Spike (B017403-MS1)		**Source: 8012510-01**		Prepared: 01/25/18 Analyzed: 01/30/18						
Copper (Cu)	0.527	0.050	mg/L	0.500	0.012	103	70-130			
Matrix Spike (B017403-MS2)		**Source: 8012609-01**		Prepared: 01/29/18 Analyzed: 01/30/18						
Copper (Cu)	0.539	0.050	mg/L	0.500	0.014	105	70-130			

pH

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017413 - NO PREP										
Duplicate (B017413-DUP1)		**Source: 8012901-01**		Prepared & Analyzed: 01/29/18						
pH	7.21	1.00	pH Units		7.22			0.1	15	HT
Duplicate (B017413-DUP2)		**Source: 8012901-04**		Prepared & Analyzed: 01/29/18						
pH	7.46	1.00	pH Units		7.45			0.1	15	HT

Conductivity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017413 - NO PREP										
Duplicate (B017413-DUP1)		**Source: 8012901-01**		Prepared & Analyzed: 01/29/18						
Conductivity	223	0.5	µS/cm		221			0.9	15	
Duplicate (B017413-DUP2)		**Source: 8012901-04**		Prepared & Analyzed: 01/29/18						
Conductivity	215	0.5	µS/cm		213			0.9	15	

Dissolved Oxygen

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017355 - NO PREP										
Duplicate (B017355-DUP1)		**Source: 8012902-01**		Prepared & Analyzed: 01/29/18						
Dissolved Oxygen	4.77	0.20	mg/L		4.74			0.6	15	HT

Turbidity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017355 - NO PREP										
Duplicate (B017355-DUP1)		**Source: 8012902-01**		Prepared & Analyzed: 01/29/18						
Turbidity	4.76	0.50	NTU		4.80			0.8	15	

Alkalinity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017409 - NO PREP										
LCS (B017409-BS1)				Prepared & Analyzed: 01/29/18						
Total Alkalinity	975	5.0	mg CaC03/L	1000		97	80-120			
Duplicate (B017409-DUP1)		**Source: 8012512-01**		Prepared & Analyzed: 01/29/18						
Total Alkalinity	236	5.0	mg CaC03/L		236			0	20	
Bicarbonate Alkalinity	236	5.0	mg CaC03/L		236			0	20	
Carbonate Alkalinity	ND	5.0	mg CaC03/L		ND				20	
Hydroxide Alkalinity	ND	5.0	mg CaC03/L		ND				20	

Anions

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017404 - NO PREP										
Blank (B017404-BLK1)				Prepared & Analyzed: 01/25/18						
Sulfate as SO4	ND	0.50	mg/L							
Matrix Spike (B017404-MS1)		**Source: 8012419-03**		Prepared & Analyzed: 01/25/18						
Sulfate as SO4	11.4	0.50	mg/L	8.00	2.71	109	80-120			
Matrix Spike (B017404-MS2)		**Source: 8012902-03**		Prepared & Analyzed: 01/29/18						
Sulfate as SO4	10.4	0.50	mg/L	8.00	1.89	106	80-120			

Total Suspended Solids

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017415 - NO PREP										
Blank (B017415-BLK1)				Prepared & Analyzed: 01/31/18						
Total Suspended Solids	ND	5.0	mg/L							
Duplicate (B017415-DUP1)		**Source: 8012419-01**		Prepared & Analyzed: 01/31/18						
Total Suspended Solids	44.0	5.0	mg/L		43.0			2	15	
Duplicate (B017415-DUP2)		**Source: 8012909-01**		Prepared & Analyzed: 01/31/18						
Total Suspended Solids	198	5.0	mg/L		180			10	15	

Notes and Definitions

HT	The recommended holding time prior to analysis for dissolved oxygen, pH and residual chlorine is 15 minutes. This analysis was performed outside the recommended 15 minute holding time.
RDL	Reporting Detection Limit
ND	Analyte NOT DETECTED at or above the reporting detection limit (RDL)
RPD	Relative Percent Difference
NR	Not Reported

Analytical Sciences
P.O. Box 750336, Petaluma, CA 94975-0336
110 Liberty Street, Petaluma, CA 94952
(707) 769-3128
Fax (707) 769-8093

CHAIN OF CUSTODY

Lab Project Number: 8012901
Client's Project Name: **Bottle Rock Monitoring - SW**
Client's Project Number:

CLIENT INFORMATION

Company Name: **Bottle Rock Power, LLC**
Address: **P.O. BOX 326**
Cobb, CA 95426
Contact: **Ted DeRocher**
Phone #: **775-622-6311**
Fax #:
E-mail: lnofziger@altarockenergy.com
tderocher@altarockenergy.com

TURNAROUND TIME (check one)

Same Day ____ 72 Hours ____
48 Hours ____ 24 Hours ____
5 Days ____ Normal X

Temperature Received 6.5 °C

Page 1 of 1

Item	Client Sample ID	Date Sampled	Time	Matrix	# Cont.	Presv. Y/N	Bac-T: ALK., pH, EC	Turbidity & TSS	Hardness, SO4	B, Cu, Fe, Pb	Mn, Na & Zn	Diss. Oxygen	Bac-T				Field pH	Field TDS ppm		Comments	Lab Sample #
1	SW-7	1/28/18	16:05				X	X	X	X	X	X	X								01
2	SW-8	1/28/18	16:23				↓	↓	↓	↓	↓	↓	↓								02
3	SW-9	1/28/18	16:42				↓	↓	↓	↓	↓	↓	↓								03
4	SW-6	1/28/18	18:48				↓	↓	↓	↓	↓	↓	↓								04
5	SW-10	1/28/18	16:57				↓	↓	↓	↓	↓	↓	↓								05
6																					
7																					
8																					
9																					
10																					

SIGNATURES

Sampled By: Jay Hepper

Relinquished By: _____ Signature
1/29/18 08:30 Date Time

Received By: _____ Signature
1/29/18 0850 Date Time

Analytical Sciences

Report Date: May 09, 2018

Laboratory Report

Ted De Rocher
Bottle Rock Power, LLC.
4010 Stone Way, North Suite 400
Seattle, WA 98103

Project Name: **Bottle Rock Monitoring - SW** **2nd Quarter**

Lab Project Number: **8042702**

This 24 page report of analytical data has been reviewed and approved for release.

Michele Peters
Laboratory Director

P.O. Box 750336
Petaluma, CA 94975-0336
Telephone: (707) 769-3128

110 Liberty Street
Petaluma, CA
94952

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8042702-01	**SW-6**	Total Coliform	820	1
		E. Coli	8	1

Date Sampled:	04/26/18	Date Analyzed:	04/28/18	QC Batch: B017641
Date Received:	04/27/18	Method:	SM 9223 B-2004	

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8042702-02	**SW-7**	Total Coliform	520	1
		E. Coli	7	1

Date Sampled:	04/26/18	Date Analyzed:	04/28/18	QC Batch: B017641
Date Received:	04/27/18	Method:	SM 9223 B-2004	

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8042702-03	**SW-8**	Total Coliform	650	1
		E. Coli	21	1

Date Sampled:	04/26/18	Date Analyzed:	04/28/18	QC Batch: B017641
Date Received:	04/27/18	Method:	SM 9223 B-2004	

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8042702-04	**SW-9**	Total Coliform	330	1
		E. Coli	2	1

Date Sampled:	04/26/18	Date Analyzed:	04/28/18	QC Batch: B017641
Date Received:	04/27/18	Method:	SM 9223 B-2004	

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8042702-05	**SW-10**	Total Coliform	1600	1
		E. Coli	32	1

Date Sampled:	04/26/18	Date Analyzed:	04/28/18	QC Batch: B017641
Date Received:	04/27/18	Method:	SM 9223 B-2004	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-01	**SW-6**	Calcium (Ca)	15	0.25
		Magnesium (Mg)	22	0.10
		Hardness	130	1.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	SM 2340 B-2011	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-02	**SW-7**	Calcium (Ca)	29	0.25
		Magnesium (Mg)	15	0.10
		Hardness	140	1.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	SM 2340 B-2011	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-03	**SW-8**	Calcium (Ca)	13	0.25
		Magnesium (Mg)	11	0.10
		Hardness	78	1.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	SM 2340 B-2011	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-04	**SW-9**	Calcium (Ca)	8.1	0.25
		Magnesium (Mg)	4.4	0.10
		Hardness	38	1.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	SM 2340 B-2011	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-05	**SW-10**	Calcium (Ca)	6.9	0.25
		Magnesium (Mg)	5.8	0.10
		Hardness	41	1.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	SM 2340 B-2011	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-01	**SW-6**	Boron (B)	0.082	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	6.3	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	EPA 6010B	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-02	**SW-7**	Boron (B)	0.10	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	5.7	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	EPA 6010B	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-03	**SW-8**	Boron (B)	0.083	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	5.8	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	EPA 6010B	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-04	**SW-9**	Boron (B)	0.058	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	4.5	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	EPA 6010B	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-05	**SW-10**	Boron (B)	ND	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	0.13	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	5.4	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	EPA 6010B	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8042702-01	**SW-6**	pH	7.77	HT	1.00

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017659
Date Received:	04/27/18	Method:	SM 4500-H B-2011	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8042702-02	**SW-7**	pH	7.76	HT	1.00

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 4500-H B-2011		

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8042702-03	**SW-8**	pH	7.75	HT	1.00

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 4500-H B-2011		

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8042702-04	**SW-9**	pH	7.68	HT	1.00

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 4500-H B-2011		

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8042702-05	**SW-10**	pH	7.89	HT	1.00

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 4500-H B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8042702-01	**SW-6**	Conductivity	270	0.5

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 2510 B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8042702-02	**SW-7**	Conductivity	280	0.5

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 2510 B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8042702-03	**SW-8**	Conductivity	190	0.5

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 2510 B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8042702-04	**SW-9**	Conductivity	110	0.5

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 2510 B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8042702-05	**SW-10**	Conductivity	77	0.5

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017659
Date Received:	04/27/18	Method:	SM 2510 B-2011	

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8042702-01	**SW-6**	Dissolved Oxygen	6.0	HT	0.20

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017660
Date Received:	04/27/18	Method:	SM 4500-O G-2011	

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8042702-02	**SW-7**	Dissolved Oxygen	6.2	HT	0.20

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017660
Date Received:	04/27/18	Method:	SM 4500-O G-2011	

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8042702-03	**SW-8**	Dissolved Oxygen	6.2	HT	0.20

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017660
Date Received:	04/27/18	Method:	SM 4500-O G-2011	

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8042702-04	**SW-9**	Dissolved Oxygen	6.6	HT	0.20

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017660
Date Received:	04/27/18	Method:	SM 4500-O G-2011		

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8042702-05	**SW-10**	Dissolved Oxygen	5.5	HT	0.20

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017660
Date Received:	04/27/18	Method:	SM 4500-O G-2011		

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8042702-01	**SW-6**	Turbidity	0.66	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017660
Date Received:	04/27/18	Method:	SM 2130 B-2011		

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8042702-02	**SW-7**	Turbidity	0.76	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017660
Date Received:	04/27/18	Method:	SM 2130 B-2011		

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8042702-03	**SW-8**	Turbidity	0.89	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017660
Date Received:	04/27/18	Method:	SM 2130 B-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8042702-04	**SW-9**	Turbidity	0.66	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017660
Date Received:	04/27/18	Method:	SM 2130 B-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8042702-05	**SW-10**	Turbidity	2.0	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017660
Date Received:	04/27/18	Method:	SM 2130 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8042702-01	**SW-6**	Total Alkalinity	130	5.0
		Bicarbonate Alkalinity	130	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017658
Date Received:	04/27/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8042702-02	**SW-7**	Total Alkalinity	130	5.0
		Bicarbonate Alkalinity	130	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017658
Date Received:	04/27/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8042702-03	**SW-8**	Total Alkalinity	82	5.0
		Bicarbonate Alkalinity	82	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017658
Date Received:	04/27/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8042702-04	**SW-9**	Total Alkalinity	44	5.0
		Bicarbonate Alkalinity	44	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017658
Date Received:	04/27/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8042702-05	**SW-10**	Total Alkalinity	50	5.0
		Bicarbonate Alkalinity	50	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017658
Date Received:	04/27/18	Method:	SM 2320 B-2011	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-01	**SW-6**	Sulfate as SO4	4.5	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017661
Date Received:	04/27/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-02	**SW-7**	Sulfate as SO4	7.4	0.50

Date Sampled:	04/26/18	Date Analyzed:	05/01/18	QC Batch: B017661
Date Received:	04/27/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-03	**SW-8**	Sulfate as SO4	3.5	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017661
Date Received:	04/27/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-04	**SW-9**	Sulfate as SO4	2.4	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017661
Date Received:	04/27/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-05	**SW-10**	Sulfate as SO4	0.68	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017661
Date Received:	04/27/18	Method:	EPA 300.0	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-01	**SW-6**	Total Suspended Solids	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017664
Date Received:	04/27/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-02	**SW-7**	Total Suspended Solids	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017664
Date Received:	04/27/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-03	**SW-8**	Total Suspended Solids	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017664
Date Received:	04/27/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-04	**SW-9**	Total Suspended Solids	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017664
Date Received:	04/27/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042702-05	**SW-10**	Total Suspended Solids	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017664
Date Received:	04/27/18	Method:	SM 2540 D-2011	

Quality Assurance Report

Hardness

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017662 - EPA 200.7										
Blank (B017662-BLK1)				Prepared & Analyzed: 04/30/18						
Calcium (Ca)	ND	0.25	mg/L							
Magnesium (Mg)	ND	0.10	mg/L							
Hardness	ND	1.0	mg/L							

Metals

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017662 - EPA 200.7										
Blank (B017662-BLK1)				Prepared & Analyzed: 04/30/18						
Boron (B)	ND	0.050	mg/L							
Copper (Cu)	ND	0.050	mg/L							
Iron (Fe)	ND	0.10	mg/L							
Lead (Pb)	ND	0.050	mg/L							
Manganese (Mn)	ND	0.020	mg/L							
Sodium (Na)	ND	0.10	mg/L							
Zinc (Zn)	ND	0.050	mg/L							
LCS (B017662-BS1)				Prepared & Analyzed: 04/30/18						
Boron (B)	0.506	0.050	mg/L	0.500		101	70-130			
Copper (Cu)	0.509	0.050	mg/L	0.500		102	70-130			
Iron (Fe)	0.522	0.10	mg/L	0.500		104	70-130			
Lead (Pb)	0.520	0.050	mg/L	0.500		104	70-130			
Manganese (Mn)	0.525	0.020	mg/L	0.500		105	70-130			
Sodium (Na)	0.521	0.10	mg/L	0.500		104	70-130			
Zinc (Zn)	0.502	0.050	mg/L	0.500		100	70-130			
LCS Dup (B017662-BSD1)				Prepared & Analyzed: 04/30/18						
Boron (B)	0.505	0.050	mg/L	0.500		101	70-130	0.1	20	
Copper (Cu)	0.509	0.050	mg/L	0.500		102	70-130	0.04	20	
Iron (Fe)	0.521	0.10	mg/L	0.500		104	70-130	0.2	20	
Lead (Pb)	0.519	0.050	mg/L	0.500		104	70-130	0.1	20	
Manganese (Mn)	0.524	0.020	mg/L	0.500		105	70-130	0.2	20	
Sodium (Na)	0.520	0.10	mg/L	0.500		104	70-130	0.2	20	
Zinc (Zn)	0.500	0.050	mg/L	0.500		100	70-130	0.3	20	
Matrix Spike (B017662-MS1)		**Source: 8042702-04**		Prepared & Analyzed: 04/30/18						
Boron (B)	0.577	0.050	mg/L	0.500	0.058	104	70-130			
Copper (Cu)	0.509	0.050	mg/L	0.500	ND	102	70-130			
Iron (Fe)	0.561	0.10	mg/L	0.500	ND	112	70-130			
Lead (Pb)	0.517	0.050	mg/L	0.500	ND	103	70-130			
Manganese (Mn)	0.528	0.020	mg/L	0.500	ND	106	70-130			
Sodium (Na)	5.00	0.10	mg/L	0.500	4.47	105	70-130			
Zinc (Zn)	0.509	0.050	mg/L	0.500	ND	102	70-130			

Metals

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017662 - EPA 200.7										
Matrix Spike (B017662-MS2)		**Source: 8042702-05**		Prepared & Analyzed: 04/30/18						
Boron (B)	0.540	0.050	mg/L	0.500	ND	108	70-130			
Copper (Cu)	0.508	0.050	mg/L	0.500	ND	102	70-130			
Iron (Fe)	0.664	0.10	mg/L	0.500	0.132	106	70-130			
Lead (Pb)	0.513	0.050	mg/L	0.500	ND	103	70-130			
Manganese (Mn)	0.532	0.020	mg/L	0.500	0.009	105	70-130			
Sodium (Na)	5.88	0.10	mg/L	0.500	5.39	98	70-130			
Zinc (Zn)	0.507	0.050	mg/L	0.500	ND	101	70-130			

pH

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017659 - NO PREP										
Duplicate (B017659-DUP1)		**Source: 8042701-01**		Prepared & Analyzed: 04/27/18						
pH	7.30	1.00	pH Units		7.31			0.1	15	HT
Duplicate (B017659-DUP2)		**Source: 8043002-01**		Prepared: 04/27/18 Analyzed: 04/30/18						
pH	7.80	1.00	pH Units		7.81			0.1	15	

Conductivity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017659 - NO PREP										
Duplicate (B017659-DUP1)		**Source: 8042701-01**		Prepared & Analyzed: 04/27/18						
Conductivity	601	0.5	µS/cm		605			0.7	15	
Duplicate (B017659-DUP2)		**Source: 8043002-01**		Prepared: 04/27/18 Analyzed: 04/30/18						
Conductivity	490	0.5	µS/cm		488			0.4	15	

Alkalinity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017658 - NO PREP										
LCS (B017658-BS1)				Prepared & Analyzed: 04/27/18						
Total Alkalinity	986	5.0	mg CaC03/L	1000		99	80-120			
Duplicate (B017658-DUP1)		**Source: 8042618-02**		Prepared & Analyzed: 04/27/18						
Total Alkalinity	49.8	5.0	mg CaC03/L		49.8			0	20	
Bicarbonate Alkalinity	49.8	5.0	mg CaC03/L		49.8			0	20	
Carbonate Alkalinity	ND	5.0	mg CaC03/L		ND				20	
Hydroxide Alkalinity	ND	5.0	mg CaC03/L		ND				20	

Anions

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017661 - NO PREP										
Blank (B017661-BLK1)				Prepared & Analyzed: 04/27/18						
Sulfate as SO4	ND	0.50	mg/L							
LCS (B017661-BS1)				Prepared & Analyzed: 04/27/18						
Sulfate as SO4	8.50	0.50	mg/L	8.00		106	90-110			
LCS Dup (B017661-BSD1)				Prepared & Analyzed: 04/27/18						
Sulfate as SO4	8.60	0.50	mg/L	8.00		108	90-110	1	20	
Matrix Spike (B017661-MS1)		**Source: 8042701-01**		Prepared & Analyzed: 04/27/18						
Sulfate as SO4	10.5	0.50	mg/L	8.00	1.47	113	80-120			
Matrix Spike (B017661-MS2)		**Source: 8042702-03**		Prepared & Analyzed: 04/27/18						
Sulfate as SO4	12.0	0.50	mg/L	8.00	3.50	107	80-120			

Total Suspended Solids

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017664 - NO PREP										
Blank (B017664-BLK1)				Prepared & Analyzed: 04/30/18						
Total Suspended Solids	ND	5.0	mg/L							
Duplicate (B017664-DUP1)		**Source: 8042401-01**		Prepared & Analyzed: 04/30/18						
Total Suspended Solids	21.5	5.0	mg/L		20.5			5	15	

Notes and Definitions

HT	The recommended holding time prior to analysis for dissolved oxygen, pH and residual chlorine is 15 minutes. This analysis was performed outside the recommended 15 minute holding time.
RDL	Reporting Detection Limit
ND	Analyte NOT DETECTED at or above the reporting detection limit (RDL)
RPD	Relative Percent Difference
NR	Not Reported

Analytical Sciences
P.O. Box 750336, Petaluma, CA 94975-0336
110 Liberty Street, Petaluma, CA 94952
(707) 769-3128
Fax (707) 769-8093

CHAIN OF CUSTODY

Lab Project Number: 8042702
Client's Project Name: **Bottle Rock Monitoring - SW**
Client's Project Number:

Temperature Received 5.2

Page _____ of _____

CLIENT INFORMATION	
Company Name:	**Bottle Rock Power, LLC**
Address:	**P.O. BOX 326**
	Cobb, CA 95426
Contact:	**Ted DeRocher**
Phone #:	**775-622-6311**
Fax #:	
E-mail:	lnofziger@altarockenergy.com tderocher@altarockenergy.com

TURNAROUND TIME (check one)			
Same Day		72 Hours	
48 Hours		24 Hours	
5 Days		Normal	X

Item	Client Sample ID	Date Sampled	Time	Matrix	# Cont.	Presv. Y/N	Bac-T: ALK., pH, EC	Turbidity & TSS	Hardness, SO4	B, Cu, Fe, Pb	Mn, Na & Zn	Diss. Oxygen	Bac-T				Field pH	Field TDS ppm		Comments	Lab Sample #
1	SW-C	4/26	17:55				X	X	X	X	X	X	X								01
2	SW-7	4/26	13:00				↓	↓	↓	↓	↓	↓	↓								02
3	SW-8	4/26	13:27																		03
4	SW-9	4/26	14:15																		04
5	SW-10	4/26	15:17				↓	↓	↓	↓	↓	↓	↓								05
6																					
7																					
8																					
9																					
10																					

SIGNATURES

Sampled By: Jay Hepper

Relinquished By: _____ Signature

4/28/18 09:10 Date Time

Received By: _____ Signature

4/27/18 0900 Date Time

Analytical Sciences

Report Date: September 06, 2018

Laboratory Report

Ted De Rocher
Bottle Rock Power, LLC.
4010 Stone Way, North Suite 400
Seattle, WA 98103

Project Name: **Bottle Rock Monitoring - SW** **BRP930**

Lab Project Number: **8082902**

This 26 page report of analytical data has been reviewed and approved for release.

Michele Peters
Laboratory Director

P.O. Box 750336
Petaluma, CA 94975-0336
Telephone: (707) 769-3128

110 Liberty Street
Petaluma, CA
94952

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8082902-01	**SW-6**	Total Coliform	2400	1
		E. Coli	110	1

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch:	B017952
Date Received:	08/29/18	Method:	SM 9223 B-2004		

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8082902-02	**SW-7**	Total Coliform	820	1
		E. Coli	33	1

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch:	B017952
Date Received:	08/29/18	Method:	SM 9223 B-2004		

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8082902-03	**SW-8**	Total Coliform	2400	1
		E. Coli	20	1

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch:	B017952
Date Received:	08/29/18	Method:	SM 9223 B-2004		

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8082902-04	**SW-9**	Total Coliform	1200	1
		E. Coli	35	1

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch:	B017952
Date Received:	08/29/18	Method:	SM 9223 B-2004		

Total Coliform & E. Coli

Lab#	Sample ID	Compound Name	Result (MPN/100 mL)	RDL (MPN/100 mL)
8082902-05	**SW-10**	Total Coliform	>2400	1
		E. Coli	110	1

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017952
Date Received:	08/29/18	Method:	SM 9223 B-2004	

Metals (mg/L)

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-01	**SW-6**	Boron (B)	0.083	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	6.6	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Metals (mg/L)

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-02	**SW-7**	Boron (B)	0.18	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	8.6	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Metals (mg/L)

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-03	**SW-8**	Boron (B)	ND	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	5.9	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Metals (mg/L)

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-04	**SW-9**	Boron (B)	ND	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	4.5	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Metals (mg/L)

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-05	**SW-10**	Boron (B)	ND	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	6.0	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-01	**SW-6**	Calcium (Ca)	13	0.25
		Magnesium (Mg)	21	0.10
		Hardness	120	1.0

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-02	**SW-7**	Calcium (Ca)	40	0.25
		Magnesium (Mg)	21	0.10
		Hardness	180	1.0

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-03	**SW-8**	Calcium (Ca)	8.3	0.25
		Magnesium (Mg)	7.0	0.10
		Hardness	50	1.0

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-04	**SW-9**	Calcium (Ca)	4.4	0.25
		Magnesium (Mg)	2.3	0.10
		Hardness	20	1.0

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-05	**SW-10**	Calcium (Ca)	8.2	0.25
		Magnesium (Mg)	5.8	0.10
		Hardness	44	1.0

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8082902-01	**SW-6**	pH	7.65	HT	1.00

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017953
Date Received:	08/29/18	Method:	SM 4500-H B-2011	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8082902-02	**SW-7**	pH	7.65	HT	1.00

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017953
Date Received:	08/29/18	Method:	SM 4500-H B-2011	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8082902-03	**SW-8**	pH	7.59	HT	1.00

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch:	B017953
Date Received:	08/29/18	Method:	SM 4500-H B-2011		

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8082902-04	**SW-9**	pH	7.32	HT	1.00

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch:	B017953
Date Received:	08/29/18	Method:	SM 4500-H B-2011		

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8082902-05	**SW-10**	pH	7.53	HT	1.00

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch:	B017953
Date Received:	08/29/18	Method:	SM 4500-H B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8082902-01	**SW-6**	Conductivity	300	0.5

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch:	B017953
Date Received:	08/29/18	Method:	SM 2510 B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8082902-02	**SW-7**	Conductivity	420	0.5

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017953
Date Received:	08/29/18	Method:	SM 2510 B-2011	

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8082902-03	**SW-8**	Conductivity	140	0.5

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017953
Date Received:	08/29/18	Method:	SM 2510 B-2011	

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8082902-04	**SW-9**	Conductivity	81	0.5

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017953
Date Received:	08/29/18	Method:	SM 2510 B-2011	

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8082902-05	**SW-10**	Conductivity	140	0.5

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017953
Date Received:	08/29/18	Method:	SM 2510 B-2011	

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8082902-01	**SW-6**	Dissolved Oxygen	7.6	HT	0.20

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch:	B017919
Date Received:	08/29/18	Method:	SM 4500-O G-2011		

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8082902-02	**SW-7**	Dissolved Oxygen	7.8	HT	0.20

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch:	B017919
Date Received:	08/29/18	Method:	SM 4500-O G-2011		

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8082902-03	**SW-8**	Dissolved Oxygen	8.1	HT	0.20

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch:	B017919
Date Received:	08/29/18	Method:	SM 4500-O G-2011		

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8082902-04	**SW-9**	Dissolved Oxygen	8.3	HT	0.20

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch:	B017919
Date Received:	08/29/18	Method:	SM 4500-O G-2011		

Dissolved Oxygen

Lab#	Sample ID	Compound Name	Result (mg/L)		RDL (mg/L)
8082902-05	**SW-10**	Dissolved Oxygen	8.5	HT	0.20

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017919
Date Received:	08/29/18	Method:	SM 4500-O G-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8082902-01	**SW-6**	Turbidity	ND	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017919
Date Received:	08/29/18	Method:	SM 2130 B-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8082902-02	**SW-7**	Turbidity	ND	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017919
Date Received:	08/29/18	Method:	SM 2130 B-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8082902-03	**SW-8**	Turbidity	0.81	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017919
Date Received:	08/29/18	Method:	SM 2130 B-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8082902-04	**SW-9**	Turbidity	0.56	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017919
Date Received:	08/29/18	Method:	SM 2130 B-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8082902-05	**SW-10**	Turbidity	2.0	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017919
Date Received:	08/29/18	Method:	SM 2130 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8082902-01	**SW-6**	Total Alkalinity	130	5.0
		Bicarbonate Alkalinity	130	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017949
Date Received:	08/29/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8082902-02	**SW-7**	Total Alkalinity	200	5.0
		Bicarbonate Alkalinity	200	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017949
Date Received:	08/29/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8082902-03	**SW-8**	Total Alkalinity	60	5.0
		Bicarbonate Alkalinity	60	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017949
Date Received:	08/29/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8082902-04	**SW-9**	Total Alkalinity	30	5.0
		Bicarbonate Alkalinity	30	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017949
Date Received:	08/29/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8082902-05	**SW-10**	Total Alkalinity	55	5.0
		Bicarbonate Alkalinity	55	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017949
Date Received:	08/29/18	Method:	SM 2320 B-2011	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-01	**SW-6**	Sulfate as SO4	1.6	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017954
Date Received:	08/29/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-02	**SW-7**	Sulfate as SO4	3.8	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017954
Date Received:	08/29/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-03	**SW-8**	Sulfate as SO4	1.1	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017954
Date Received:	08/29/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-04	**SW-9**	Sulfate as SO4	1.1	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017954
Date Received:	08/29/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-05	**SW-10**	Sulfate as SO4	0.65	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017954
Date Received:	08/29/18	Method:	EPA 300.0	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-01	**SW-6**	Total Suspended Solids	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/31/18	QC Batch: B017938
Date Received:	08/29/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-02	**SW-7**	Total Suspended Solids	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/31/18	QC Batch: B017938
Date Received:	08/29/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-03	**SW-8**	Total Suspended Solids	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/31/18	QC Batch: B017938
Date Received:	08/29/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-04	**SW-9**	Total Suspended Solids	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/31/18	QC Batch: B017938
Date Received:	08/29/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082902-05	**SW-10**	Total Suspended Solids	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/31/18	QC Batch: B017938
Date Received:	08/29/18	Method:	SM 2540 D-2011	

Quality Assurance Report

Metals (mg/L)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017955 - EPA 200.7										
Blank (B017955-BLK1)				Prepared & Analyzed: 08/29/18						
Boron (B)	ND	0.050	mg/L							
Copper (Cu)	ND	0.050	mg/L							
Iron (Fe)	ND	0.10	mg/L							
Lead (Pb)	ND	0.050	mg/L							
Manganese (Mn)	ND	0.020	mg/L							
Sodium (Na)	ND	0.10	mg/L							
Zinc (Zn)	ND	0.050	mg/L							
LCS (B017955-BS1)				Prepared & Analyzed: 08/29/18						
Boron (B)	0.491	0.050	mg/L	0.500		98	70-130			
Copper (Cu)	0.542	0.050	mg/L	0.500		108	70-130			
Iron (Fe)	0.527	0.10	mg/L	0.500		105	70-130			
Lead (Pb)	0.524	0.050	mg/L	0.500		105	70-130			
Manganese (Mn)	0.527	0.020	mg/L	0.500		105	70-130			
Sodium (Na)	0.535	0.10	mg/L	0.500		107	70-130			
Zinc (Zn)	0.508	0.050	mg/L	0.500		102	70-130			
LCS Dup (B017955-BSD1)				Prepared & Analyzed: 08/29/18						
Boron (B)	0.492	0.050	mg/L	0.500		98	70-130	0.2	20	
Copper (Cu)	0.546	0.050	mg/L	0.500		109	70-130	0.6	20	
Iron (Fe)	0.526	0.10	mg/L	0.500		105	70-130	0.2	20	
Lead (Pb)	0.525	0.050	mg/L	0.500		105	70-130	0.2	20	
Manganese (Mn)	0.526	0.020	mg/L	0.500		105	70-130	0.1	20	
Sodium (Na)	0.536	0.10	mg/L	0.500		107	70-130	0.2	20	
Zinc (Zn)	0.508	0.050	mg/L	0.500		102	70-130	0.05	20	
Matrix Spike (B017955-MS1)		**Source: 8082418-01**		Prepared & Analyzed: 08/29/18						
Boron (B)	1.44	0.050	mg/L	0.500	0.896	108	70-130			
Copper (Cu)	0.585	0.050	mg/L	0.500	0.024	112	70-130			
Iron (Fe)	0.563	0.10	mg/L	0.500	ND	113	70-130			
Lead (Pb)	0.517	0.050	mg/L	0.500	ND	103	70-130			
Manganese (Mn)	0.593	0.020	mg/L	0.500	0.080	103	70-130			
Zinc (Zn)	0.567	0.050	mg/L	0.500	0.033	107	70-130			

Metals (mg/L)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017955 - EPA 200.7										
Matrix Spike (B017955-MS2)		**Source: 8082901-01**		Prepared: 08/30/18 Analyzed: 08/31/18						
Boron (B)	0.560	0.050	mg/L	0.500	ND	112	70-130			
Copper (Cu)	0.487	0.050	mg/L	0.500	ND	97	70-130			
Iron (Fe)	0.519	0.10	mg/L	0.500	ND	104	70-130			
Lead (Pb)	0.518	0.050	mg/L	0.500	ND	104	70-130			
Manganese (Mn)	0.501	0.020	mg/L	0.500	ND	100	70-130			
Zinc (Zn)	0.507	0.050	mg/L	0.500	ND	101	70-130			

Hardness

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017955 - EPA 200.7										
Blank (B017955-BLK1)				Prepared & Analyzed: 08/29/18						
Calcium (Ca)	ND	0.25	mg/L							
Magnesium (Mg)	ND	0.10	mg/L							
Hardness	ND	1.0	mg/L							

pH

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017953 - NO PREP										
Duplicate (B017953-DUP1)		**Source: 8082904-01**		Prepared & Analyzed: 08/29/18						
pH	6.86	1.00	pH Units		6.87			0.1	15	
Duplicate (B017953-DUP2)		**Source: 8083006-01**		Prepared & Analyzed: 08/30/18						
pH	7.33	1.00	pH Units		7.28			0.7	15	

Conductivity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017953 - NO PREP										
Duplicate (B017953-DUP1)		**Source: 8082904-01**		Prepared & Analyzed: 08/29/18						
Conductivity	359	0.5	µS/cm		360			0.3	15	
Duplicate (B017953-DUP2)		**Source: 8083006-01**		Prepared & Analyzed: 08/30/18						
Conductivity	348	0.5	µS/cm		350			0.6	15	

Dissolved Oxygen

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017919 - NO PREP										
Duplicate (B017919-DUP2)		**Source: 8082902-05**		Prepared & Analyzed: 08/29/18						
Dissolved Oxygen	8.52	0.20	mg/L		8.50			0.2	15	

Turbidity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017919 - NO PREP										
Duplicate (B017919-DUP2)		**Source: 8082902-05**		Prepared & Analyzed: 08/29/18						
Turbidity	2.05	0.50	NTU		2.04			0.5	15	

Alkalinity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017949 - NO PREP										
Blank (B017949-BLK1)				Prepared & Analyzed: 08/27/18						
Total Alkalinity	ND	5.0	mg CaC03/L							
Bicarbonate Alkalinity	ND	5.0	mg CaC03/L							
Carbonate Alkalinity	ND	5.0	mg CaC03/L							
Hydroxide Alkalinity	ND	5.0	mg CaC03/L							
LCS (B017949-BS1)				Prepared & Analyzed: 08/27/18						
Total Alkalinity	986	5.0	mg CaC03/L	1000		99	80-120			
Duplicate (B017949-DUP1)		**Source: 8082811-02**		Prepared: 08/27/18 Analyzed: 08/29/18						
Total Alkalinity	170	5.0	mg CaC03/L		171			0.5	20	

Anions

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017954 - NO PREP										
Blank (B017954-BLK1)				Prepared & Analyzed: 08/29/18						
Sulfate as SO4	ND	0.50	mg/L							
LCS (B017954-BS1)				Prepared & Analyzed: 08/29/18						
Sulfate as SO4	8.24	0.50	mg/L	8.00		103	90-110			
LCS Dup (B017954-BSD1)				Prepared & Analyzed: 08/29/18						
Sulfate as SO4	8.05	0.50	mg/L	8.00		101	90-110	2	20	
Matrix Spike (B017954-MS1)		**Source: 8082901-01**		Prepared & Analyzed: 08/29/18						
Sulfate as SO4	11.0	0.50	mg/L	8.00	1.76	116	80-120			
Matrix Spike (B017954-MS2)		**Source: 8082902-05**		Prepared & Analyzed: 08/29/18						
Sulfate as SO4	8.58	0.50	mg/L	8.00	0.65	99	80-120			

Total Suspended Solids

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017938 - NO PREP										
Blank (B017938-BLK1)				Prepared: 08/21/18 Analyzed: 08/22/18						
Total Suspended Solids	ND	5.0	mg/L							
Duplicate (B017938-DUP2)		**Source: 8083101-01**		Prepared & Analyzed: 08/31/18						
Total Suspended Solids	11700	5.0	mg/L		12000			2	15	

Notes and Definitions

HT	The recommended holding time prior to analysis for dissolved oxygen, pH and residual chlorine is 15 minutes. This analysis was performed outside the recommended 15 minute holding time.
RDL	Reporting Detection Limit
ND	Analyte NOT DETECTED at or above the reporting detection limit (RDL)
RPD	Relative Percent Difference
NR	Not Reported

Analytical Sciences
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CHAIN OF CUSTODY

Lab Project Number: 8082902
Client's Project Name: **Bottle Rock Monitoring - SW**
Client's Project Number: BRP930

CLIENT INFORMATION

Company Name: **Bottle Rock Power, LLC**
Address: **P.O. BOX 326**
Cobb, CA 95426
Contact: **Ted DeRocher**
Phone #: **775-622-6311**
Fax #:
E-mail: lnofziger@altarockenergy.com
tderocher@altarockenergy.com

TURNAROUND TIME (check one)

Same Day ____ 72 Hours ____
48 Hours ____ 24 Hours ____
5 Days ____ Normal X

Page 1 of 1

Item	Client Sample ID	Date Sampled	Time	Matrix	# Cont.	Presv. Y/N	ALK., pH, EC	Turbidity & TSS	Hardness, SO4	B, Cu, Fe, Pb	Mn, Na & Zn	Diss. Oxygen	Bac-T				Field pH	Field TDS ppm		Comments	Lab Sample #
							Bac-T														
1	SW-6	8/28/18	11:26				X	X	X	X	X	X	X								8082902-01
2	SW-7	8/28/18	12:53																		02
3	SW-8	8/28/18	13:03																		03
4	SW-9	8/28/18	12:11																		04
5	SW-10	8/28/18	11:55																		05
6																					
7																					
8																					
9																					
10																					

SIGNATURES

Sampled By: Jay Hopper
8/29/18 09:55
Date Time

Relinquished By:
Signature

Received By:
Signature
8/29/18 9:54
Date Time

Alpha Analytical Laboratories Inc.
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ELAP Certificates 1551, 2728, 2922, and 2303

12 December 2018

Bottle Rock Power
Attn: Ted De Rocher
PO Box 326
Cobb, CA 95426
RE: Surface Water
Work Order: 18K2461

Enclosed are the results of analyses for samples received by the laboratory on 11/26/18 10:07. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jeanette Poplin

Jeanette L. Poplin For Robbie C. Phillips
Project Manager

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW-6	18K2461-01	Water	11/25/18 16:49	11/26/18 10:07
SW-7	18K2461-02	Water	11/25/18 13:55	11/26/18 10:07
SW-8	18K2461-03	Water	11/25/18 14:14	11/26/18 10:07
SW-9	18K2461-04	Water	11/25/18 15:25	11/26/18 10:07
SW-10	18K2461-05	Water	11/25/18 15:53	11/26/18 10:07

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

	Result	Reporting Limit	Dilution	Batch	Prepared	Analyzed	Method	Note
SW-6 (18K2461-01)		**Sample Type: Water**				**Sampled: 11/25/18 16:49**		
Metals by EPA 200 Series Methods								
Boron	ND mg/L	0.10	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Calcium	**13 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Copper	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Iron	ND mg/L	0.10	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Lead	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Magnesium	**19 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Manganese	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Sodium	**7.1 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Zinc	ND mg/L	0.050	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Conventional Chemistry Parameters by APHA/EPA Methods								
Dissolved Oxygen	**8.3 mg/L**	**0.20**	1	AK82762	11/26/18 12:00	11/26/18 16:46	SM4500-O G	T-14
pH	**7.57 pH Units**	**1.00**	1	AK83568	11/26/18 12:00	11/26/18 16:30	SM4500-H+ B	T-14
Specific Conductance (EC)	**240 umhos/cm**	**10**	1	AK83568	11/26/18 12:00	11/27/18 08:11	SM2510B	
Total Alkalinity as CaCO3	**110 mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Total Suspended Solids	ND mg/L	5.0	1	AK83621	11/27/18 09:00	11/28/18 14:40	SM2540D	
Turbidity	**0.89 NTU**	**0.10**	1	AK83584	11/26/18 16:00	11/26/18 17:00	SM2130B	
Bicarbonate Alkalinity as CaCO3	**110 mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Carbonate Alkalinity as CaCO3	ND mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hydroxide Alkalinity as CaCO3	ND mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hardness, Total	**111 mg/L**	**5**	1	AK83380	11/28/18 09:02	11/28/18 15:26	SM2340B	
Anions by EPA Method 300.0								
Sulfate as SO4	**5.7 mg/L**	**0.50**	1	AK83585	11/26/18 13:00	11/26/18 14:06	EPA 300.0	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

	Result	Reporting Limit	Dilution	Batch	Prepared	Analyzed	Method	Note
SW-6 (18K2461-01)		**Sample Type: Water**				**Sampled: 11/25/18 16:49**		
Microbiological Parameters by APHA Standard Methods								
Total Coliforms	**2000 MPN/100mL**	**1.0**	1	AK83622	11/26/18 11:55	11/27/18 12:10	SM9223B	
E. Coli	**47 MPN/100mL**	**1.0**	1	AK83622	11/26/18 11:55	11/27/18 12:10	SM9223B	
SW-7 (18K2461-02)		**Sample Type: Water**				**Sampled: 11/25/18 13:55**		
Metals by EPA 200 Series Methods								
Boron	**0.11 mg/L**	**0.10**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Calcium	**36 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Copper	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Iron	ND mg/L	0.10	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Lead	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Magnesium	**20 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Manganese	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Sodium	**7.5 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Zinc	ND mg/L	0.050	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Conventional Chemistry Parameters by APHA/EPA Methods								
Dissolved Oxygen	**8.1 mg/L**	**0.20**	1	AK82762	11/26/18 12:00	11/26/18 16:46	SM4500-O G	T-14
pH	**7.48 pH Units**	**1.00**	1	AK83568	11/26/18 12:00	11/26/18 16:30	SM4500-H+ B	T-14
Specific Conductance (EC)	**340 umhos/cm**	**10**	1	AK83568	11/26/18 12:00	11/27/18 08:11	SM2510B	
Total Alkalinity as CaCO3	**170 mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Total Suspended Solids	ND mg/L	5.0	1	AK83621	11/27/18 09:00	11/28/18 14:40	SM2540D	
Turbidity	**0.51 NTU**	**0.10**	1	AK83584	11/26/18 16:00	11/26/18 17:00	SM2130B	
Bicarbonate Alkalinity as CaCO3	**170 mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Carbonate Alkalinity as CaCO3	ND mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hydroxide Alkalinity as CaCO3	ND mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hardness, Total	**174 mg/L**	**5**	1	AK83380	11/28/18 09:02	11/28/18 15:26	SM2340B	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

	Result	Reporting Limit	Dilution	Batch	Prepared	Analyzed	Method	Note
SW-7 (18K2461-02)		**Sample Type: Water**				**Sampled: 11/25/18 13:55**		
Anions by EPA Method 300.0								
Sulfate as SO4	**9.1 mg/L**	**0.50**	1	AK83585	11/26/18 13:00	11/26/18 14:22	EPA 300.0	
Microbiological Parameters by APHA Standard Methods								
Total Coliforms	**410 MPN/100mL**	**1.0**	1	AK83622	11/26/18 11:55	11/27/18 12:10	SM9223B	
E. Coli	**8.5 MPN/100mL**	**1.0**	1	AK83622	11/26/18 11:55	11/27/18 12:10	SM9223B	
SW-8 (18K2461-03)		**Sample Type: Water**				**Sampled: 11/25/18 14:14**		
Metals by EPA 200 Series Methods								
Boron	ND mg/L	0.10	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Calcium	**8.8 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Copper	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Iron	**0.10 mg/L**	**0.10**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Lead	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Magnesium	**8.2 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Manganese	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Sodium	**6.2 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Zinc	ND mg/L	0.050	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Conventional Chemistry Parameters by APHA/EPA Methods								
Dissolved Oxygen	**8.8 mg/L**	**0.20**	1	AK82762	11/26/18 12:00	11/26/18 16:46	SM4500-O G	T-14
pH	**7.34 pH Units**	**1.00**	1	AK83568	11/26/18 12:00	11/26/18 16:30	SM4500-H+ B	T-14
Specific Conductance (EC)	**150 umhos/cm**	**10**	1	AK83568	11/26/18 12:00	11/27/18 08:11	SM2510B	
Total Alkalinity as CaCO3	**60 mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Total Suspended Solids	ND mg/L	5.0	1	AK83621	11/27/18 09:00	11/28/18 14:40	SM2540D	
Turbidity	**1.9 NTU**	**0.10**	1	AK83584	11/26/18 16:00	11/26/18 17:00	SM2130B	
Bicarbonate Alkalinity as CaCO3	**60 mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Carbonate Alkalinity as CaCO3	ND mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hydroxide Alkalinity as CaCO3	ND mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hardness, Total	**56 mg/L**	**5**	1	AK83380	11/28/18 09:02	11/28/18 15:26	SM2340B	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

	Result	Reporting Limit	Dilution	Batch	Prepared	Analyzed	Method	Note
SW-8 (18K2461-03)		**Sample Type: Water**				**Sampled: 11/25/18 14:14**		
Anions by EPA Method 300.0								
Sulfate as SO4	**3.4 mg/L**	**0.50**	1	AK83585	11/26/18 13:00	11/26/18 14:37	EPA 300.0	
Microbiological Parameters by APHA Standard Methods								
Total Coliforms	**650 MPN/100mL**	**1.0**	1	AK83622	11/26/18 11:55	11/27/18 12:10	SM9223B	
E. Coli	**28 MPN/100mL**	**1.0**	1	AK83622	11/26/18 11:55	11/27/18 12:10	SM9223B	
SW-9 (18K2461-04)		**Sample Type: Water**				**Sampled: 11/25/18 15:25**		
Metals by EPA 200 Series Methods								
Boron	ND mg/L	0.10	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Calcium	**7.9 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Copper	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Iron	ND mg/L	0.10	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Lead	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Magnesium	**3.9 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Manganese	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Sodium	**5.1 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Zinc	ND mg/L	0.050	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Conventional Chemistry Parameters by APHA/EPA Methods								
Dissolved Oxygen	**8.8 mg/L**	**0.20**	1	AK82762	11/26/18 12:00	11/26/18 16:46	SM4500-O G	T-14
pH	**7.24 pH Units**	**1.00**	1	AK83568	11/26/18 12:00	11/26/18 16:30	SM4500-H+ B	T-14
Specific Conductance (EC)	**110 umhos/cm**	**10**	1	AK83568	11/26/18 12:00	11/27/18 08:11	SM2510B	
Total Alkalinity as CaCO3	**45 mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Total Suspended Solids	ND mg/L	5.0	1	AK83621	11/27/18 09:00	11/28/18 14:40	SM2540D	
Turbidity	**0.56 NTU**	**0.10**	1	AK83584	11/26/18 16:00	11/26/18 17:00	SM2130B	
Bicarbonate Alkalinity as CaCO3	**45 mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Carbonate Alkalinity as CaCO3	ND mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hydroxide Alkalinity as CaCO3	ND mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hardness, Total	**36 mg/L**	**5**	1	AK83380	11/28/18 09:02	11/28/18 15:26	SM2340B	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

	Result	Reporting Limit	Dilution	Batch	Prepared	Analyzed	Method	Note
SW-9 (18K2461-04)		**Sample Type: Water**				**Sampled: 11/25/18 15:25**		
Anions by EPA Method 300.0								
Sulfate as SO4	**4.6 mg/L**	**0.50**	1	AK83585	11/26/18 13:00	11/26/18 14:53	EPA 300.0	
Microbiological Parameters by APHA Standard Methods								
Total Coliforms	**260 MPN/100mL**	**1.0**	1	AK83622	11/26/18 11:55	11/27/18 12:10	SM9223B	
E. Coli	**16 MPN/100mL**	**1.0**	1	AK83622	11/26/18 11:55	11/27/18 12:10	SM9223B	
SW-10 (18K2461-05)		**Sample Type: Water**				**Sampled: 11/25/18 15:53**		
Metals by EPA 200 Series Methods								
Boron	ND mg/L	0.10	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Calcium	**8.1 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Copper	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Iron	**0.18 mg/L**	**0.10**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Lead	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Magnesium	**6.4 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Manganese	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Sodium	**6.3 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Zinc	ND mg/L	0.050	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Conventional Chemistry Parameters by APHA/EPA Methods								
Dissolved Oxygen	**8.7 mg/L**	**0.20**	1	AK82762	11/26/18 12:00	11/26/18 16:46	SM4500-O G	T-14
pH	**7.35 pH Units**	**1.00**	1	AK83568	11/26/18 12:00	11/26/18 16:30	SM4500-H+ B	T-14
Specific Conductance (EC)	**140 umhos/cm**	**10**	1	AK83568	11/26/18 12:00	11/27/18 08:11	SM2510B	
Total Alkalinity as CaCO3	**56 mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Total Suspended Solids	ND mg/L	5.0	1	AK83621	11/27/18 09:00	11/28/18 14:40	SM2540D	
Turbidity	**3.8 NTU**	**0.10**	1	AK83584	11/26/18 16:00	11/26/18 17:00	SM2130B	
Bicarbonate Alkalinity as CaCO3	**56 mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Carbonate Alkalinity as CaCO3	ND mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hydroxide Alkalinity as CaCO3	ND mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hardness, Total	**47 mg/L**	**5**	1	AK83380	11/28/18 09:02	11/28/18 15:26	SM2340B	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

	Result	Reporting Limit	Dilution	Batch	Prepared	Analyzed	Method	Note
SW-10 (18K2461-05)		**Sample Type: Water**				**Sampled: 11/25/18 15:53**		
Anions by EPA Method 300.0								
Sulfate as SO4	**1.7 mg/L**	**0.50**	1	AK83585	11/26/18 13:00	11/26/18 15:08	EPA 300.0	
Microbiological Parameters by APHA Standard Methods								
Total Coliforms	**1600 MPN/100mL**	**1.0**	1	AK83622	11/26/18 11:55	11/27/18 12:10	SM9223B	
E. Coli	**24 MPN/100mL**	**1.0**	1	AK83622	11/26/18 11:55	11/27/18 12:10	SM9223B	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

Metals by EPA 200 Series Methods - Quality Control

Analyte(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AK83380 - EPA 200 series NB										
Blank (AK83380-BLK1)				Prepared & Analyzed: 11/19/18						
Boron	ND	0.10	mg/L							
Calcium	ND	0.20	mg/L							
Copper	ND	0.020	mg/L							
Iron	ND	0.10	mg/L							
Lead	ND	0.020	mg/L							
Magnesium	ND	0.20	mg/L							
Manganese	ND	0.020	mg/L							
Sodium	ND	0.20	mg/L							
Zinc	ND	0.050	mg/L							
LCS (AK83380-BS1)				Prepared & Analyzed: 11/19/18						
Boron	0.502	0.10	mg/L	0.500		100	85-115			
Calcium	0.498	0.20	mg/L	0.500		99.7	85-115			
Copper	0.531	0.020	mg/L	0.500		106	85-115			
Iron	0.516	0.10	mg/L	0.500		103	85-115			
Lead	0.523	0.020	mg/L	0.500		105	85-115			
Magnesium	0.519	0.20	mg/L	0.500		104	85-115			
Manganese	0.525	0.020	mg/L	0.500		105	85-115			
Sodium	0.509	0.20	mg/L	0.500		102	85-115			
Zinc	0.509	0.050	mg/L	0.500		102	85-115			
LCS Dup (AK83380-BSD1)				Prepared & Analyzed: 11/19/18						
Boron	0.504	0.10	mg/L	0.500		101	85-115	0.477	20	
Calcium	0.499	0.20	mg/L	0.500		99.7	85-115	0.0602	20	
Copper	0.530	0.020	mg/L	0.500		106	85-115	0.208	20	
Iron	0.515	0.10	mg/L	0.500		103	85-115	0.233	20	
Lead	0.523	0.020	mg/L	0.500		105	85-115	0.0191	20	
Magnesium	0.520	0.20	mg/L	0.500		104	85-115	0.173	20	
Manganese	0.528	0.020	mg/L	0.500		106	85-115	0.551	20	
Sodium	0.510	0.20	mg/L	0.500		102	85-115	0.236	20	
Zinc	0.508	0.050	mg/L	0.500		102	85-115	0.118	20	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

Metals by EPA 200 Series Methods - Quality Control

Analyte(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AK83380 - EPA 200 series NB										
Duplicate (AK83380-DUP1)	**Source: 18K2459-03**			Prepared: 11/20/18 Analyzed: 11/28/18						
Boron	ND	0.10	mg/L		ND				20	
Calcium	4.88	0.20	mg/L		4.79			1.90	20	
Copper	ND	0.020	mg/L		ND				20	
Iron	ND	0.10	mg/L		ND				20	
Lead	ND	0.020	mg/L		ND				20	
Magnesium	86.2	0.20	mg/L		87.4			1.44	20	
Manganese	ND	0.020	mg/L		ND				20	
Sodium	1.88	0.20	mg/L		1.88			0.362	20	
Zinc	ND	0.050	mg/L		ND				20	
Matrix Spike (AK83380-MS1)	**Source: 18K1697-01**			Prepared: 11/20/18 Analyzed: 11/28/18						
Boron	0.660	0.10	mg/L	0.500	0.133	105	70-130			
Copper	0.502	0.020	mg/L	0.500	ND	100	70-130			
Iron	5.79	0.10	mg/L	0.500	5.23	112	70-130			
Lead	0.501	0.020	mg/L	0.500	ND	100	70-130			
Manganese	3.05	0.020	mg/L	0.500	2.52	106	70-130			
Sodium	38.7	0.20	mg/L	0.500	38.0	134	70-130			QM-4X
Zinc	0.600	0.050	mg/L	0.500	0.0883	102	70-130			
Matrix Spike (AK83380-MS2)	**Source: 18K2461-05**			Prepared: 11/20/18 Analyzed: 11/28/18						
Boron	0.531	0.10	mg/L	0.500	ND	106	70-130			
Copper	0.523	0.020	mg/L	0.500	ND	105	70-130			
Iron	0.709	0.10	mg/L	0.500	0.184	105	70-130			
Lead	0.505	0.020	mg/L	0.500	ND	101	70-130			
Manganese	0.518	0.020	mg/L	0.500	ND	102	70-130			
Sodium	6.83	0.20	mg/L	0.500	6.29	108	70-130			
Zinc	0.515	0.050	mg/L	0.500	ND	103	70-130			

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AK83380 - EPA 200 series NB										
Blank (AK83380-BLK1)				Prepared & Analyzed: 11/19/18						
Hardness, Total	ND	5	mg/L							
Duplicate (AK83380-DUP1)		**Source: 18K2459-03**		Prepared: 11/20/18 Analyzed: 11/28/18						
Hardness, Total	367	1	mg/L		372			1.33	20	
Batch AK83568 - General Prep (NB)										
Duplicate (AK83568-DUP1)		**Source: 18K2461-01**		Prepared: 11/26/18 Analyzed: 11/27/18						
Specific Conductance (EC)	236	10	umhos/cm		237			0.423	5	
pH	7.53	1.00	pH Units		7.57			0.530	20	
Batch AK83574 - General Prep (NB)										
Blank (AK83574-BLK1)				Prepared: 11/26/18 Analyzed: 11/27/18						
Total Alkalinity as CaCO3	ND	5.0	mg/L							
Bicarbonate Alkalinity as CaCO3	ND	5.0	mg/L							
Carbonate Alkalinity as CaCO3	ND	5.0	mg/L							
Hydroxide Alkalinity as CaCO3	ND	5.0	mg/L							
LCS (AK83574-BS1)				Prepared: 11/26/18 Analyzed: 11/27/18						
Total Alkalinity as CaCO3	988	5.0	mg/L	1000		98.8	80-120			
Duplicate (AK83574-DUP1)		**Source: 18K1551-02**		Prepared: 11/26/18 Analyzed: 11/27/18						
Total Alkalinity as CaCO3	91.7	5.0	mg/L		91.7			0.00	20	
Bicarbonate Alkalinity as CaCO3	90.5	5.0	mg/L		91.7			1.31	20	
Carbonate Alkalinity as CaCO3	ND	5.0	mg/L		ND			0.00	20	
Hydroxide Alkalinity as CaCO3	ND	5.0	mg/L		ND				20	

Alpha Analytical Laboratories Inc.
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Bay Area: 262 Rickenbacker Circle, Livermore, CA 94551 • Phone: (925) 828-6226 • Fax: (925) 828-6309
Central Valley: 9090 Union Park Way, Suite 113, Elk Grove, CA 95624 • Phone: (916) 686-5190 • Fax: (916) 686-5192
North Bay: 110 Liberty Street, Petaluma, CA 94952 • Phone: (707) 769-3128 • Fax: (707) 769-8093

Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AK83584 - General Prep (NB)										
Blank (AK83584-BLK1)				Prepared & Analyzed: 11/26/18						
Turbidity	ND	0.10	NTU							
Duplicate (AK83584-DUP1)		**Source: 18K2461-05**		Prepared & Analyzed: 11/26/18						
Turbidity	3.84	0.10	NTU		3.81			0.784	20	
Batch AK83621 - General Prep (NB)										
Blank (AK83621-BLK1)				Prepared: 11/27/18 Analyzed: 11/28/18						
Total Suspended Solids	ND	5.0	mg/L							
Duplicate (AK83621-DUP1)		**Source: 18K2249-01**		Prepared: 11/27/18 Analyzed: 11/28/18						
Total Suspended Solids	85.0	5.0	mg/L		80.0			6.06	30	
Duplicate (AK83621-DUP2)		**Source: 18K2284-02**		Prepared: 11/27/18 Analyzed: 11/28/18						
Total Suspended Solids	52.0	5.0	mg/L		55.3			6.21	30	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

Anions by EPA Method 300.0 - Quality Control

Analyte(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AK83585 - General Prep (NB)										
Blank (AK83585-BLK1)				Prepared & Analyzed: 11/26/18						
Sulfate as SO4	ND	0.50	mg/L							
LCS (AK83585-BS1)				Prepared & Analyzed: 11/26/18						
Sulfate as SO4	8.26	0.50	mg/L	8.00		103	90-110			
LCS Dup (AK83585-BSD1)				Prepared & Analyzed: 11/26/18						
Sulfate as SO4	7.97	0.50	mg/L	8.00		99.6	90-110	3.59	20	
Duplicate (AK83585-DUP1)		**Source: 18K2461-01**		Prepared & Analyzed: 11/26/18						
Sulfate as SO4	5.60	0.50	mg/L		5.66			1.07	20	
Matrix Spike (AK83585-MS1)		**Source: 18K2459-03**		Prepared & Analyzed: 11/26/18						
Sulfate as SO4	9.56	0.50	mg/L	8.00	2.01	94.4	80-120			
Matrix Spike (AK83585-MS2)		**Source: 18K2487-01**		Prepared & Analyzed: 11/26/18						
Sulfate as SO4	18.7	0.50	mg/L	8.00	11.3	92.8	80-120			

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Surface Water	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:40

Notes and Definitions

QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
T-14	Residual chlorine, dissolved oxygen, sulfite, and pH must be analyzed in the field to meet the EPA specified 15 minute hold time.
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
REC	Recovery
RPD	Relative Percent Difference

Analytical Sciences
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Fax (707) 769-8093

CHAIN OF CUSTODY

Lab Project Number: 18E2461
Client's Project Name: **Bottle Rock Monitoring - SW**
Client's Project Number: BRP930

CLIENT INFORMATION	
Company Name:	Bottle Rock Power, LLC
Address:	P.O. BOX 326
	Cobb, CA 95426
Contact:	Ted DeRocher
Phone #:	775-622-6311
Fax #:	
E-mail:	lnofziger@altarockenergy.com tderocher@altarockenergy.com

TURNAROUND TIME (check one)			
Same Day		72 Hours	
48 Hours		24 Hours	
5 Days		Normal	X

Temperature Received: 6-9

Page 1 of 1

Item	Client Sample ID	Date Sampled	Time	Matrix	# Cont.	Presv. Y/N	Bac-T: ALK., pH, EC	Turbidity & TSS	Hardness, SO4	B, Cd, Fe, Pb	Mn, Na & Zn	Diss. Oxygen	Bac-T				Field pH	Field TDS ppm		Comments	Lab Sample #
1	SW-6	11/25	16:49	W			X	X	X	X	X	X	X								
2	SW-7	11/25	13:55				↓	↓	↓	↓	↓	↓	↓								
3	SW-8	11/25	14:14																		
4	SW-9	11/25	15:25																		
5	SW-10	11/25	15:53	↓			↓	↓	↓	↓	↓	↓	↓								
6																					
7																					
8																					
9																					
10																					

SIGNATURES

Sampled By: Jay Hepper
11/26/18 10:07
Date Time

Relinquished By: _____
Signature

Received By: _____
Signature
11/26/18 1007
Date Time

Analytical Sciences

Report Date: February 07, 2018

Laboratory Report

Ted De Rocher
Bottle Rock Power, LLC.
4010 Stone Way, North Suite 400
Seattle, WA 98103

Project Name: **Bottle Rock Monitoring - GW** **January 1st Quarter**

Lab Project Number: **8012902**

This 19 page report of analytical data has been reviewed and approved for release.

Michele Peters
Laboratory Director

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Petaluma, CA 94975-0336
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110 Liberty Street
Petaluma, CA
94952

Metals by Graphite Furnace

Lab#	Sample ID	Compound Name	Result (µg/L)	RDL (µg/L)
8012902-01	**GW-3**	Arsenic (As)	ND	2.0

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch: B017411
Date Received:	01/29/18	Method:	EPA 200.9	

Metals by Graphite Furnace

Lab#	Sample ID	Compound Name	Result (µg/L)	RDL (µg/L)
8012902-02	**GW-0**	Arsenic (As)	ND	2.0

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch: B017411
Date Received:	01/29/18	Method:	EPA 200.9	

Metals by Graphite Furnace

Lab#	Sample ID	Compound Name	Result (µg/L)	RDL (µg/L)
8012902-03	**GW-1**	Arsenic (As)	ND	2.0

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch: B017411
Date Received:	01/29/18	Method:	EPA 200.9	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012902-01	**GW-3**	Calcium (Ca)	35	0.25
		Magnesium (Mg)	9.7	0.10
		Hardness	130	1.0

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	SM 2340 B-2011	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012902-02	**GW-0**	Calcium (Ca)	4.6	0.25
		Magnesium (Mg)	91	2.0
		Hardness	380	1.0

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	SM 2340 B-2011	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012902-03	**GW-1**	Calcium (Ca)	49	0.25
		Magnesium (Mg)	15	0.10
		Hardness	180	1.0

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	SM 2340 B-2011	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012902-01	**GW-3**	Boron (B)	0.43	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	0.88	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	0.15	0.020
		Sodium (Na)	24	2.0
		Zinc (Zn)	ND	0.050

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	EPA 6010B	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012902-02	**GW-0**	Boron (B)	ND	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	1.9	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	EPA 6010B	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012902-03	**GW-1**	Boron (B)	0.10	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	0.11	0.020
		Sodium (Na)	8.6	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	01/28/18	Date Analyzed:	02/02/18	QC Batch: B017403
Date Received:	01/29/18	Method:	EPA 6010B	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8012902-01	**GW-3**	pH	7.32	HT	1.00

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017413
Date Received:	01/29/18	Method:	SM 4500-H B-2011	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8012902-02	**GW-0**	pH	7.17	HT	1.00

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch:	B017413
Date Received:	01/29/18	Method:	SM 4500-H B-2011		

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8012902-03	**GW-1**	pH	7.31	HT	1.00

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch:	B017413
Date Received:	01/29/18	Method:	SM 4500-H B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8012902-01	**GW-3**	Conductivity	350	0.5

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch:	B017413
Date Received:	01/29/18	Method:	SM 2510 B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8012902-02	**GW-0**	Conductivity	400	0.5

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch:	B017413
Date Received:	01/29/18	Method:	SM 2510 B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8012902-03	**GW-1**	Conductivity	650	0.5

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch:	B017413
Date Received:	01/29/18	Method:	SM 2510 B-2011		

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8012902-01	**GW-3**	Turbidity	4.8	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch:	B017355
Date Received:	01/29/18	Method:	SM 2130 B-2011		

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8012902-02	**GW-0**	Turbidity	ND	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch:	B017355
Date Received:	01/29/18	Method:	SM 2130 B-2011		

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8012902-03	**GW-1**	Turbidity	ND	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch:	B017355
Date Received:	01/29/18	Method:	SM 2130 B-2011		

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8012902-01	**GW-3**	Total Alkalinity	170	5.0
		Bicarbonate Alkalinity	170	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch: B017409
Date Received:	01/29/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8012902-02	**GW-0**	Total Alkalinity	180	5.0
		Bicarbonate Alkalinity	180	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch: B017409
Date Received:	01/29/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8012902-03	**GW-1**	Total Alkalinity	380	5.0
		Bicarbonate Alkalinity	380	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/30/18	QC Batch: B017409
Date Received:	01/29/18	Method:	SM 2320 B-2011	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012902-01	**GW-3**	Nitrate as N	ND	0.15
		Sulfate as SO4	8.5	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017404
Date Received:	01/29/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012902-02	**GW-0**	Nitrate as N	ND	0.15
		Sulfate as SO4	24	1.0

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017404
Date Received:	01/29/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012902-03	**GW-1**	Nitrate as N	ND	0.15
		Sulfate as SO4	1.9	0.50

Date Sampled:	01/28/18	Date Analyzed:	01/29/18	QC Batch: B017404
Date Received:	01/29/18	Method:	EPA 300.0	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012902-01	**GW-3**	Total Suspended Solids	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/31/18	QC Batch: B017415
Date Received:	01/29/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012902-02	**GW-0**	Total Suspended Solids	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/31/18	QC Batch: B017415
Date Received:	01/29/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8012902-03	**GW-1**	Total Suspended Solids	ND	5.0

Date Sampled:	01/28/18	Date Analyzed:	01/31/18	QC Batch: B017415
Date Received:	01/29/18	Method:	SM 2540 D-2011	

Quality Assurance Report

Metals by Graphite Furnace

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017411 - EPA 200.9										
Blank (B017411-BLK1)				Prepared: 01/29/18 Analyzed: 01/30/18						
Arsenic (As)	ND	2.0	µg/L							
LCS (B017411-BS1)				Prepared: 01/29/18 Analyzed: 01/30/18						
Arsenic (As)	8.6	2.0	µg/L	10.0		86	85-115			
LCS Dup (B017411-BSD1)				Prepared: 01/29/18 Analyzed: 01/30/18						
Arsenic (As)	9.0	2.0	µg/L	10.0		90	85-115	4	20	
Matrix Spike (B017411-MS1)		**Source: 8012911-02**		Prepared: 01/29/18 Analyzed: 01/30/18						
Arsenic (As)	14.2	2.0	µg/L	10.0	5.6	86	70-130			
Matrix Spike (B017411-MS2)		**Source: 8012912-03**		Prepared: 01/29/18 Analyzed: 01/30/18						
Arsenic (As)	12.0	2.0	µg/L	10.0	2.9	91	70-130			

Hardness

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017403 - EPA 200.7										
Blank (B017403-BLK1)				Prepared: 01/25/18 Analyzed: 01/30/18						
Calcium (Ca)	ND	0.25	mg/L							
Magnesium (Mg)	ND	0.10	mg/L							
Hardness	ND	1.0	mg/L							

Metals

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017403 - EPA 200.7										
Blank (B017403-BLK1)				Prepared: 01/25/18 Analyzed: 01/30/18						
Boron (B)	ND	0.050	mg/L							
Copper (Cu)	ND	0.050	mg/L							
Iron (Fe)	ND	0.10	mg/L							
Lead (Pb)	ND	0.050	mg/L							
Manganese (Mn)	ND	0.020	mg/L							
Sodium (Na)	ND	0.10	mg/L							
Zinc (Zn)	ND	0.050	mg/L							
LCS (B017403-BS1)				Prepared: 01/25/18 Analyzed: 01/30/18						
Boron (B)	0.494	0.050	mg/L	0.500		99	70-130			
Iron (Fe)	0.517	0.10	mg/L	0.500		103	70-130			
Lead (Pb)	0.501	0.050	mg/L	0.500		100	70-130			
Manganese (Mn)	0.487	0.020	mg/L	0.500		97	70-130			
Sodium (Na)	0.484	0.10	mg/L	0.500		97	70-130			
Zinc (Zn)	0.509	0.050	mg/L	0.500		102	70-130			
LCS Dup (B017403-BSD1)				Prepared: 01/25/18 Analyzed: 01/30/18						
Boron (B)	0.494	0.050	mg/L	0.500		99	70-130	0.1	20	
Iron (Fe)	0.517	0.10	mg/L	0.500		103	70-130	0.08	20	
Lead (Pb)	0.501	0.050	mg/L	0.500		100	70-130	0.04	20	
Manganese (Mn)	0.487	0.020	mg/L	0.500		97	70-130	0.2	20	
Sodium (Na)	0.484	0.10	mg/L	0.500		97	70-130	0.1	20	
Zinc (Zn)	0.509	0.050	mg/L	0.500		102	70-130	0.006	20	
Matrix Spike (B017403-MS1)		**Source: 8012510-01**		Prepared: 01/25/18 Analyzed: 01/30/18						
Copper (Cu)	0.527	0.050	mg/L	0.500	0.012	103	70-130			
Matrix Spike (B017403-MS2)		**Source: 8012609-01**		Prepared: 01/29/18 Analyzed: 01/30/18						
Copper (Cu)	0.539	0.050	mg/L	0.500	0.014	105	70-130			

pH

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017413 - NO PREP										
Duplicate (B017413-DUP1)		**Source: 8012901-01**		Prepared & Analyzed: 01/29/18						
pH	7.21	1.00	pH Units		7.22			0.1	15	HT
Duplicate (B017413-DUP2)		**Source: 8012901-04**		Prepared & Analyzed: 01/29/18						
pH	7.46	1.00	pH Units		7.45			0.1	15	HT

Conductivity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017413 - NO PREP										
Duplicate (B017413-DUP1)		**Source: 8012901-01**		Prepared & Analyzed: 01/29/18						
Conductivity	223	0.5	µS/cm		221			0.9	15	
Duplicate (B017413-DUP2)		**Source: 8012901-04**		Prepared & Analyzed: 01/29/18						
Conductivity	215	0.5	µS/cm		213			0.9	15	

Turbidity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017355 - NO PREP										
Duplicate (B017355-DUP1)		**Source: 8012902-01**		Prepared & Analyzed: 01/29/18						
Turbidity	4.76	0.50	NTU		4.80			0.8	15	

Alkalinity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017409 - NO PREP										
LCS (B017409-BS1)				Prepared & Analyzed: 01/29/18						
Total Alkalinity	975	5.0	mg CaC03/L	1000		97	80-120			
Duplicate (B017409-DUP1)		**Source: 8012512-01**		Prepared & Analyzed: 01/29/18						
Total Alkalinity	236	5.0	mg CaC03/L		236			0	20	
Bicarbonate Alkalinity	236	5.0	mg CaC03/L		236			0	20	
Carbonate Alkalinity	ND	5.0	mg CaC03/L		ND				20	
Hydroxide Alkalinity	ND	5.0	mg CaC03/L		ND				20	

Anions

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017404 - NO PREP										
Blank (B017404-BLK1)				Prepared & Analyzed: 01/25/18						
Nitrate as N	ND	0.15	mg/L							
Sulfate as SO4	ND	0.50	mg/L							
Matrix Spike (B017404-MS1)		**Source: 8012419-03**		Prepared & Analyzed: 01/25/18						
Nitrate as N	1.97	0.15	mg/L	1.81	0.129	102	80-120			
Sulfate as SO4	11.4	0.50	mg/L	8.00	2.71	109	80-120			
Matrix Spike (B017404-MS2)		**Source: 8012902-03**		Prepared & Analyzed: 01/29/18						
Nitrate as N	1.96	0.15	mg/L	1.81	0.126	101	80-120			
Sulfate as SO4	10.4	0.50	mg/L	8.00	1.89	106	80-120			

Total Suspended Solids

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017415 - NO PREP										
Blank (B017415-BLK1)				Prepared & Analyzed: 01/31/18						
Total Suspended Solids	ND	5.0	mg/L							
Duplicate (B017415-DUP1)		**Source: 8012419-01**		Prepared & Analyzed: 01/31/18						
Total Suspended Solids	44.0	5.0	mg/L		43.0			2	15	
Duplicate (B017415-DUP2)		**Source: 8012909-01**		Prepared & Analyzed: 01/31/18						
Total Suspended Solids	198	5.0	mg/L		180			10	15	

Notes and Definitions

HT	The recommended holding time prior to analysis for dissolved oxygen, pH and residual chlorine is 15 minutes. This analysis was performed outside the recommended 15 minute holding time.
RDL	Reporting Detection Limit
ND	Analyte NOT DETECTED at or above the reporting detection limit (RDL)
RPD	Relative Percent Difference
NR	Not Reported

Analytical Sciences
P.O. Box 750336, Petaluma, CA 94975-0336
110 Liberty Street, Petaluma, CA 94952
(707) 769-3128
Fax (707) 769-8093

CHAIN OF CUSTODY

Lab Project Number: 8012902
Client's Project Name: **Bottle Rock Monitoring - GW**
Client's Project Number:

CLIENT INFORMATION

Company Name: **Bottle Rock Power, LLC**
Address: **P.O. BOX 326**
Cobb, CA 95426
Contact: **Ted DeRocher**
Phone #: **775-622-6311**
Fax #:
E-mail: lnofziger@altarockenergy.com
tderocher@altarockenergy.com

TURNAROUND TIME (check one)

Same Day ____ 72 Hours ____
48 Hours ____ 24 Hours ____
5 Days ____ Normal X

Temperature Received
6.5 °C

Page 1 of 1

ANALYSIS

Item	Client Sample ID	Date Sampled	Time	Matrix	# Cont.	Presv. Y/N	ALK., pH, EC	Turbidity & TSS	Hardness, SO4	B, Cu, Fe & Pb	Mn, Na, & Zn	As & NO3					Field pH	Field TDS ppm		Comments	Lab Sample #
1	GW-3	1/28/18	17:17	W			X	X	X	X	X	X									01
2	GW-6	1/28/18	17:35	↓			↓	↓	↓	↓	↓	↓									02
3	GW-1	1/28/18	18:20	↓			↓	↓	↓	↓	↓	↓									03
4																					
5																					
6																					
7																					
8																					
9																					
10																					

SIGNATURES

Sampled By: Jay Hepper

Relinquished By: _____ 1/29/18 08:48
Signature Date Time

Received By: _____ 1/29/18 0850
Signature Date Time

Analytical Sciences

Report Date: May 09, 2018

Laboratory Report

Ted De Rocher
Bottle Rock Power, LLC.
4010 Stone Way, North Suite 400
Seattle, WA 98103

Project Name: **Bottle Rock Monitoring - GW** **2nd Quarter**

Lab Project Number: **8042701**

This 19 page report of analytical data has been reviewed and approved for release.

Michele Peters
Laboratory Director

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110 Liberty Street
Petaluma, CA
94952

Metals by Graphite Furnace

Lab#	Sample ID	Compound Name	Result (µg/L)	RDL (µg/L)
8042701-01	**GW-0**	Arsenic (As)	ND	2.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017663
Date Received:	04/27/18	Method:	EPA 200.9	

Metals by Graphite Furnace

Lab#	Sample ID	Compound Name	Result (µg/L)	RDL (µg/L)
8042701-02	**GW-1**	Arsenic (As)	ND	2.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017663
Date Received:	04/27/18	Method:	EPA 200.9	

Metals by Graphite Furnace

Lab#	Sample ID	Compound Name	Result (µg/L)	RDL (µg/L)
8042701-03	**GW-3**	Arsenic (As)	ND	2.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017663
Date Received:	04/27/18	Method:	EPA 200.9	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042701-01	**GW-0**	Calcium (Ca)	4.6	0.25
		Magnesium (Mg)	93	2.0
		Hardness	390	1.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	SM 2340 B-2011	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042701-02	**GW-1**	Calcium (Ca)	50	0.25
		Magnesium (Mg)	16	0.10
		Hardness	190	1.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	SM 2340 B-2011	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042701-03	**GW-3**	Calcium (Ca)	35	0.25
		Magnesium (Mg)	11	0.10
		Hardness	130	1.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	SM 2340 B-2011	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042701-01	**GW-0**	Boron (B)	ND	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	1.9	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	EPA 6010B	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042701-02	**GW-1**	Boron (B)	0.11	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	0.13	0.020
		Sodium (Na)	9.1	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	EPA 6010B	

Metals

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042701-03	**GW-3**	Boron (B)	0.43	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	0.14	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	0.088	0.020
		Sodium (Na)	26	2.0
		Zinc (Zn)	ND	0.050

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017662
Date Received:	04/27/18	Method:	EPA 6010B	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8042701-01	**GW-0**	pH	7.31	HT	1.00

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017659
Date Received:	04/27/18	Method:	SM 4500-H B-2011	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8042701-02	**GW-1**	pH	7.05	HT	1.00

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 4500-H B-2011		

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8042701-03	**GW-3**	pH	7.57	HT	1.00

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 4500-H B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8042701-01	**GW-0**	Conductivity	600	0.5

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 2510 B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8042701-02	**GW-1**	Conductivity	380	0.5

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 2510 B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8042701-03	**GW-3**	Conductivity	350	0.5

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017659
Date Received:	04/27/18	Method:	SM 2510 B-2011		

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8042701-01	**GW-0**	Turbidity	ND	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017660
Date Received:	04/27/18	Method:	SM 2130 B-2011		

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8042701-02	**GW-1**	Turbidity	ND	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017660
Date Received:	04/27/18	Method:	SM 2130 B-2011		

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8042701-03	**GW-3**	Turbidity	0.65	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch:	B017660
Date Received:	04/27/18	Method:	SM 2130 B-2011		

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8042701-01	**GW-0**	Total Alkalinity	370	5.0
		Bicarbonate Alkalinity	370	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017658
Date Received:	04/27/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8042701-02	**GW-1**	Total Alkalinity	180	5.0
		Bicarbonate Alkalinity	180	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017658
Date Received:	04/27/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8042701-03	**GW-3**	Total Alkalinity	170	5.0
		Bicarbonate Alkalinity	170	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017658
Date Received:	04/27/18	Method:	SM 2320 B-2011	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042701-01	**GW-0**	Nitrate as N	ND	0.15
		Sulfate as SO4	1.5	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017661
Date Received:	04/27/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042701-02	**GW-1**	Nitrate as N	ND	0.15
		Sulfate as SO4	23	1.0

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017661
Date Received:	04/27/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042701-03	**GW-3**	Nitrate as N	ND	0.15
		Sulfate as SO4	9.3	0.50

Date Sampled:	04/26/18	Date Analyzed:	04/27/18	QC Batch: B017661
Date Received:	04/27/18	Method:	EPA 300.0	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042701-01	**GW-0**	Total Suspended Solids	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017664
Date Received:	04/27/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042701-02	**GW-1**	Total Suspended Solids	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017664
Date Received:	04/27/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8042701-03	**GW-3**	Total Suspended Solids	ND	5.0

Date Sampled:	04/26/18	Date Analyzed:	04/30/18	QC Batch: B017664
Date Received:	04/27/18	Method:	SM 2540 D-2011	

Quality Assurance Report

Metals by Graphite Furnace

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017663 - EPA 200.9										
Blank (B017663-BLK1)				Prepared & Analyzed: 04/30/18						
Arsenic (As)	ND	2.0	µg/L							
LCS (B017663-BS1)				Prepared & Analyzed: 04/30/18						
Arsenic (As)	10.2	2.0	µg/L	10.0		102	85-115			
LCS Dup (B017663-BSD1)				Prepared & Analyzed: 04/30/18						
Arsenic (As)	10.1	2.0	µg/L	10.0		101	85-115	1	20	
Matrix Spike (B017663-MS1)		**Source: 8042701-01**		Prepared & Analyzed: 04/30/18						
Arsenic (As)	10.4	2.0	µg/L	10.0	ND	104	70-130			
Matrix Spike (B017663-MS2)		**Source: 8042716-01**		Prepared & Analyzed: 04/30/18						
Arsenic (As)	8.6	2.0	µg/L	10.0	ND	86	70-130			

Hardness

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017662 - EPA 200.7										
Blank (B017662-BLK1)				Prepared & Analyzed: 04/30/18						
Calcium (Ca)	ND	0.25	mg/L							
Magnesium (Mg)	ND	0.10	mg/L							
Hardness	ND	1.0	mg/L							

Metals

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017662 - EPA 200.7										
Blank (B017662-BLK1)				Prepared & Analyzed: 04/30/18						
Boron (B)	ND	0.050	mg/L							
Copper (Cu)	ND	0.050	mg/L							
Iron (Fe)	ND	0.10	mg/L							
Lead (Pb)	ND	0.050	mg/L							
Manganese (Mn)	ND	0.020	mg/L							
Sodium (Na)	ND	0.10	mg/L							
Zinc (Zn)	ND	0.050	mg/L							
LCS (B017662-BS1)				Prepared & Analyzed: 04/30/18						
Boron (B)	0.506	0.050	mg/L	0.500		101	70-130			
Copper (Cu)	0.509	0.050	mg/L	0.500		102	70-130			
Iron (Fe)	0.522	0.10	mg/L	0.500		104	70-130			
Lead (Pb)	0.520	0.050	mg/L	0.500		104	70-130			
Manganese (Mn)	0.525	0.020	mg/L	0.500		105	70-130			
Sodium (Na)	0.521	0.10	mg/L	0.500		104	70-130			
Zinc (Zn)	0.502	0.050	mg/L	0.500		100	70-130			
LCS Dup (B017662-BSD1)				Prepared & Analyzed: 04/30/18						
Boron (B)	0.505	0.050	mg/L	0.500		101	70-130	0.1	20	
Copper (Cu)	0.509	0.050	mg/L	0.500		102	70-130	0.04	20	
Iron (Fe)	0.521	0.10	mg/L	0.500		104	70-130	0.2	20	
Lead (Pb)	0.519	0.050	mg/L	0.500		104	70-130	0.1	20	
Manganese (Mn)	0.524	0.020	mg/L	0.500		105	70-130	0.2	20	
Sodium (Na)	0.520	0.10	mg/L	0.500		104	70-130	0.2	20	
Zinc (Zn)	0.500	0.050	mg/L	0.500		100	70-130	0.3	20	
Matrix Spike (B017662-MS1)		**Source: 8042702-04**		Prepared & Analyzed: 04/30/18						
Boron (B)	0.577	0.050	mg/L	0.500	0.058	104	70-130			
Copper (Cu)	0.509	0.050	mg/L	0.500	ND	102	70-130			
Iron (Fe)	0.561	0.10	mg/L	0.500	ND	112	70-130			
Lead (Pb)	0.517	0.050	mg/L	0.500	ND	103	70-130			
Manganese (Mn)	0.528	0.020	mg/L	0.500	ND	106	70-130			
Sodium (Na)	5.00	0.10	mg/L	0.500	4.47	105	70-130			
Zinc (Zn)	0.509	0.050	mg/L	0.500	ND	102	70-130			

Metals

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017662 - EPA 200.7										
Matrix Spike (B017662-MS2)	**Source: 8042702-05**			Prepared & Analyzed: 04/30/18						
Boron (B)	0.540	0.050	mg/L	0.500	ND	108	70-130			
Copper (Cu)	0.508	0.050	mg/L	0.500	ND	102	70-130			
Iron (Fe)	0.664	0.10	mg/L	0.500	0.132	106	70-130			
Lead (Pb)	0.513	0.050	mg/L	0.500	ND	103	70-130			
Manganese (Mn)	0.532	0.020	mg/L	0.500	0.009	105	70-130			
Sodium (Na)	5.88	0.10	mg/L	0.500	5.39	98	70-130			
Zinc (Zn)	0.507	0.050	mg/L	0.500	ND	101	70-130			

pH

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017659 - NO PREP										
Duplicate (B017659-DUP1)		**Source: 8042701-01**		Prepared & Analyzed: 04/27/18						
pH	7.30	1.00	pH Units		7.31			0.1	15	HT
Duplicate (B017659-DUP2)		**Source: 8043002-01**		Prepared: 04/27/18 Analyzed: 04/30/18						
pH	7.80	1.00	pH Units		7.81			0.1	15	

Conductivity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017659 - NO PREP										
Duplicate (B017659-DUP1)		**Source: 8042701-01**		Prepared & Analyzed: 04/27/18						
Conductivity	601	0.5	µS/cm		605			0.7	15	
Duplicate (B017659-DUP2)		**Source: 8043002-01**		Prepared: 04/27/18 Analyzed: 04/30/18						
Conductivity	490	0.5	µS/cm		488			0.4	15	

Alkalinity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017658 - NO PREP										
LCS (B017658-BS1)					Prepared & Analyzed: 04/27/18					
Total Alkalinity	986	5.0	mg CaC03/L	1000		99	80-120			
Duplicate (B017658-DUP1)		**Source: 8042618-02**			Prepared & Analyzed: 04/27/18					
Total Alkalinity	49.8	5.0	mg CaC03/L		49.8			0	20	
Bicarbonate Alkalinity	49.8	5.0	mg CaC03/L		49.8			0	20	
Carbonate Alkalinity	ND	5.0	mg CaC03/L		ND				20	
Hydroxide Alkalinity	ND	5.0	mg CaC03/L		ND				20	

Anions

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017661 - NO PREP										
Blank (B017661-BLK1)				Prepared & Analyzed: 04/27/18						
Nitrate as N	ND	0.15	mg/L							
Sulfate as SO4	ND	0.50	mg/L							
LCS (B017661-BS1)				Prepared & Analyzed: 04/27/18						
Nitrate as N	1.95	0.15	mg/L	1.81		108	90-110			
Sulfate as SO4	8.50	0.50	mg/L	8.00		106	90-110			
LCS Dup (B017661-BSD1)				Prepared & Analyzed: 04/27/18						
Nitrate as N	1.93	0.15	mg/L	1.81		107	90-110	1	20	
Sulfate as SO4	8.60	0.50	mg/L	8.00		108	90-110	1	20	
Matrix Spike (B017661-MS1)		**Source: 8042701-01**		Prepared & Analyzed: 04/27/18						
Nitrate as N	1.96	0.15	mg/L	1.81	ND	109	80-120			
Sulfate as SO4	10.5	0.50	mg/L	8.00	1.47	113	80-120			
Matrix Spike (B017661-MS2)		**Source: 8042702-03**		Prepared & Analyzed: 04/27/18						
Nitrate as N	1.82	0.15	mg/L	1.81	ND	101	80-120			
Sulfate as SO4	12.0	0.50	mg/L	8.00	3.50	107	80-120			

Total Suspended Solids

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017664 - NO PREP										
Blank (B017664-BLK1)				Prepared & Analyzed: 04/30/18						
Total Suspended Solids	ND	5.0	mg/L							
Duplicate (B017664-DUP1)		**Source: 8042401-01**		Prepared & Analyzed: 04/30/18						
Total Suspended Solids	21.5	5.0	mg/L		20.5			5	15	

Notes and Definitions

HT	The recommended holding time prior to analysis for dissolved oxygen, pH and residual chlorine is 15 minutes. This analysis was performed outside the recommended 15 minute holding time.
RDL	Reporting Detection Limit
ND	Analyte NOT DETECTED at or above the reporting detection limit (RDL)
RPD	Relative Percent Difference
NR	Not Reported

Analytical Sciences
P.O. Box 750336, Petaluma, CA 94975-0336
110 Liberty Street, Petaluma, CA 94952
(707) 769-3128
Fax (707) 769-8093

CHAIN OF CUSTODY

Lab Project Number: 80427Q1
Client's Project Name: **Bottle Rock Monitoring - GW**
Client's Project Number:

Temperature Received: 3.9

Page ____ of ____

CLIENT INFORMATION

Company Name: **Bottle Rock Power, LLC**
Address: **P.O. BOX 326**
Cobb, CA 95426
Contact: **Ted DeRocher**
Phone #: **775-622-6311**
Fax #:
E-mail: lnofziger@altarockenergy.com
tderocher@altarockenergy.com

TURNAROUND TIME (check one)

Same Day		72 Hours	
48 Hours		24 Hours	
5 Days		Normal	X

ANALYSIS

Item	Client Sample ID	Date Sampled	Time	Matrix	# Cont.	Presv. Y/N	ALK., pH, EC	Turbidity & TSS	Hardness, SO4	B, Cu, Fe & Pb	Mn, Na, & Zn	As & NO3					Field pH	Field TDS ppm		Comments	Lab Sample #
1	GW-0	4/26	12:25				X	X	X	X	X	X									01
2	GW-1	4/26	13:55				↓	↓	↓	↓	↓	↓									02
3	GW-3	4/26	12:01				↓	↓	↓	↓	↓	↓									03
4																					
5																					
6																					
7																					
8																					
9																					
10																					

SIGNATURES

Sampled By: Jay Hoppe

Relinquished By: _____ Signature
4/27/18 9:00 Date Time

Received By: _____ Signature
4/27/18 0900 Date Time

Analytical Sciences

Report Date: September 06, 2018

Laboratory Report

Ted De Rocher
Bottle Rock Power, LLC.
4010 Stone Way, North Suite 400
Seattle, WA 98103

Project Name: **Bottle Rock Monitoring - GW** **BRP930**

Lab Project Number: **8082901**

This 20 page report of analytical data has been reviewed and approved for release.

Michele Peters
Laboratory Director

P.O. Box 750336
Petaluma, CA 94975-0336
Telephone: (707) 769-3128

110 Liberty Street
Petaluma, CA
94952

Metals by Graphite Furnace

Lab#	Sample ID	Compound Name	Result (µg/L)	RDL (µg/L)
8082901-01	**GW-0**	Arsenic (As)	ND	2.0

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017957
Date Received:	08/29/18	Method:	EPA 200.9	

Metals by Graphite Furnace

Lab#	Sample ID	Compound Name	Result (µg/L)	RDL (µg/L)
8082901-02	**GW-1**	Arsenic (As)	ND	2.0

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017957
Date Received:	08/29/18	Method:	EPA 200.9	

Metals by Graphite Furnace

Lab#	Sample ID	Compound Name	Result (µg/L)	RDL (µg/L)
8082901-03	**GW-3**	Arsenic (As)	ND	2.0

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017957
Date Received:	08/29/18	Method:	EPA 200.9	

Metals (mg/L)

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082901-01	**GW-0**	Boron (B)	ND	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	ND	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	ND	0.020
		Sodium (Na)	1.9	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Metals (mg/L)

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082901-02	**GW-1**	Boron (B)	0.10	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	0.18	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	0.25	0.020
		Sodium (Na)	8.6	0.10
		Zinc (Zn)	ND	0.050

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Metals (mg/L)

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082901-03	**GW-3**	Boron (B)	0.41	0.050
		Copper (Cu)	ND	0.050
		Iron (Fe)	0.41	0.10
		Lead (Pb)	ND	0.050
		Manganese (Mn)	0.086	0.020
		Sodium (Na)	25	0.40
		Zinc (Zn)	ND	0.050

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082901-01	**GW-0**	Calcium (Ca)	4.7	0.25
		Magnesium (Mg)	80	0.20
		Hardness	340	1.0

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082901-02	**GW-1**	Calcium (Ca)	49	0.25
		Magnesium (Mg)	15	0.10
		Hardness	180	1.0

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

Hardness

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082901-03	**GW-3**	Calcium (Ca)	34	0.25
		Magnesium (Mg)	9.4	0.10
		Hardness	120	1.0

Date Sampled:	08/28/18	Date Analyzed:	08/30/18	QC Batch: B017955
Date Received:	08/29/18	Method:	EPA 200.7	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8082901-01	**GW-0**	pH	7.54	HT	1.00

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017953
Date Received:	08/29/18	Method:	SM 4500-H B-2011	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8082901-02	**GW-1**	pH	7.39	HT	1.00

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017953
Date Received:	08/29/18	Method:	SM 4500-H B-2011	

pH

Lab#	Sample ID	Compound Name	Result (pH Units)		RDL (pH Units)
8082901-03	**GW-3**	pH	7.64	HT	1.00

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch:	B017953
Date Received:	08/29/18	Method:	SM 4500-H B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8082901-01	**GW-0**	Conductivity	600	0.5

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch:	B017953
Date Received:	08/29/18	Method:	SM 2510 B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8082901-02	**GW-1**	Conductivity	400	0.5

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch:	B017953
Date Received:	08/29/18	Method:	SM 2510 B-2011		

Conductivity

Lab#	Sample ID	Compound Name	Result (µS/cm)	RDL (µS/cm)
8082901-03	**GW-3**	Conductivity	370	0.5

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch:	B017953
Date Received:	08/29/18	Method:	SM 2510 B-2011		

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8082901-01	**GW-0**	Turbidity	ND	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017919
Date Received:	08/29/18	Method:	SM 2130 B-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8082901-02	**GW-1**	Turbidity	ND	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017919
Date Received:	08/29/18	Method:	SM 2130 B-2011	

Turbidity

Lab#	Sample ID	Compound Name	Result (NTU)	RDL (NTU)
8082901-03	**GW-3**	Turbidity	5.2	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017919
Date Received:	08/29/18	Method:	SM 2130 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8082901-01	**GW-0**	Total Alkalinity	370	5.0
		Bicarbonate Alkalinity	370	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017949
Date Received:	08/29/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8082901-02	**GW-1**	Total Alkalinity	180	5.0
		Bicarbonate Alkalinity	180	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017949
Date Received:	08/29/18	Method:	SM 2320 B-2011	

Alkalinity

Lab#	Sample ID	Compound Name	Result (mg CaC03/L)	RDL (mg CaC03/L)
8082901-03	**GW-3**	Total Alkalinity	170	5.0
		Bicarbonate Alkalinity	170	5.0
		Carbonate Alkalinity	ND	5.0
		Hydroxide Alkalinity	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017949
Date Received:	08/29/18	Method:	SM 2320 B-2011	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082901-01	**GW-0**	Nitrate as N	ND	0.15
		Sulfate as SO4	1.8	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017954
Date Received:	08/29/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082901-02	**GW-1**	Nitrate as N	ND	0.15
		Sulfate as SO4	23	1.0

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017954
Date Received:	08/29/18	Method:	EPA 300.0	

Anions

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082901-03	**GW-3**	Nitrate as N	ND	0.15
		Sulfate as SO4	9.4	0.50

Date Sampled:	08/28/18	Date Analyzed:	08/29/18	QC Batch: B017954
Date Received:	08/29/18	Method:	EPA 300.0	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082901-01	**GW-0**	Total Suspended Solids	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/31/18	QC Batch: B017938
Date Received:	08/29/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082901-02	**GW-1**	Total Suspended Solids	ND	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/31/18	QC Batch: B017938
Date Received:	08/29/18	Method:	SM 2540 D-2011	

Total Suspended Solids

Lab#	Sample ID	Compound Name	Result (mg/L)	RDL (mg/L)
8082901-03	**GW-3**	Total Suspended Solids	7.7	5.0

Date Sampled:	08/28/18	Date Analyzed:	08/31/18	QC Batch: B017938
Date Received:	08/29/18	Method:	SM 2540 D-2011	

Quality Assurance Report

Metals by Graphite Furnace

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017957 - EPA 200.9										
Blank (B017957-BLK1)				Prepared & Analyzed: 08/30/18						
Arsenic (As)	ND	2.0	µg/L							
LCS (B017957-BS1)				Prepared & Analyzed: 08/30/18						
Arsenic (As)	9.5	2.0	µg/L	10.0		95	85-115			
LCS Dup (B017957-BSD1)				Prepared & Analyzed: 08/30/18						
Arsenic (As)	9.6	2.0	µg/L	10.0		96	85-115	0.5	20	
Matrix Spike (B017957-MS1)		**Source: 8082901-03**		Prepared & Analyzed: 08/30/18						
Arsenic (As)	10.2	2.0	µg/L	10.0	ND	102	70-130			

Metals (mg/L)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017955 - EPA 200.7										
Blank (B017955-BLK1)				Prepared & Analyzed: 08/29/18						
Boron (B)	ND	0.050	mg/L							
Copper (Cu)	ND	0.050	mg/L							
Iron (Fe)	ND	0.10	mg/L							
Lead (Pb)	ND	0.050	mg/L							
Manganese (Mn)	ND	0.020	mg/L							
Sodium (Na)	ND	0.10	mg/L							
Zinc (Zn)	ND	0.050	mg/L							
LCS (B017955-BS1)				Prepared & Analyzed: 08/29/18						
Boron (B)	0.491	0.050	mg/L	0.500		98	70-130			
Copper (Cu)	0.542	0.050	mg/L	0.500		108	70-130			
Iron (Fe)	0.527	0.10	mg/L	0.500		105	70-130			
Lead (Pb)	0.524	0.050	mg/L	0.500		105	70-130			
Manganese (Mn)	0.527	0.020	mg/L	0.500		105	70-130			
Sodium (Na)	0.535	0.10	mg/L	0.500		107	70-130			
Zinc (Zn)	0.508	0.050	mg/L	0.500		102	70-130			
LCS Dup (B017955-BSD1)				Prepared & Analyzed: 08/29/18						
Boron (B)	0.492	0.050	mg/L	0.500		98	70-130	0.2	20	
Copper (Cu)	0.546	0.050	mg/L	0.500		109	70-130	0.6	20	
Iron (Fe)	0.526	0.10	mg/L	0.500		105	70-130	0.2	20	
Lead (Pb)	0.525	0.050	mg/L	0.500		105	70-130	0.2	20	
Manganese (Mn)	0.526	0.020	mg/L	0.500		105	70-130	0.1	20	
Sodium (Na)	0.536	0.10	mg/L	0.500		107	70-130	0.2	20	
Zinc (Zn)	0.508	0.050	mg/L	0.500		102	70-130	0.05	20	
Matrix Spike (B017955-MS1)		**Source: 8082418-01**		Prepared & Analyzed: 08/29/18						
Boron (B)	1.44	0.050	mg/L	0.500	0.896	108	70-130			
Copper (Cu)	0.585	0.050	mg/L	0.500	0.024	112	70-130			
Iron (Fe)	0.563	0.10	mg/L	0.500	ND	113	70-130			
Lead (Pb)	0.517	0.050	mg/L	0.500	ND	103	70-130			
Manganese (Mn)	0.593	0.020	mg/L	0.500	0.080	103	70-130			
Zinc (Zn)	0.567	0.050	mg/L	0.500	0.033	107	70-130			

Metals (mg/L)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017955 - EPA 200.7										
Matrix Spike (B017955-MS2)		**Source: 8082901-01**		Prepared: 08/30/18 Analyzed: 08/31/18						
Boron (B)	0.560	0.050	mg/L	0.500	ND	112	70-130			
Copper (Cu)	0.487	0.050	mg/L	0.500	ND	97	70-130			
Iron (Fe)	0.519	0.10	mg/L	0.500	ND	104	70-130			
Lead (Pb)	0.518	0.050	mg/L	0.500	ND	104	70-130			
Manganese (Mn)	0.501	0.020	mg/L	0.500	ND	100	70-130			
Zinc (Zn)	0.507	0.050	mg/L	0.500	ND	101	70-130			

Hardness

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017955 - EPA 200.7										
Blank (B017955-BLK1)				Prepared & Analyzed: 08/29/18						
Calcium (Ca)	ND	0.25	mg/L							
Magnesium (Mg)	ND	0.10	mg/L							
Hardness	ND	1.0	mg/L							

pH

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017953 - NO PREP										
Duplicate (B017953-DUP1)		**Source: 8082904-01**		Prepared & Analyzed: 08/29/18						
pH	6.86	1.00	pH Units		6.87			0.1	15	
Duplicate (B017953-DUP2)		**Source: 8083006-01**		Prepared & Analyzed: 08/30/18						
pH	7.33	1.00	pH Units		7.28			0.7	15	

Conductivity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017953 - NO PREP										
Duplicate (B017953-DUP1)		**Source: 8082904-01**		Prepared & Analyzed: 08/29/18						
Conductivity	359	0.5	µS/cm		360			0.3	15	
Duplicate (B017953-DUP2)		**Source: 8083006-01**		Prepared & Analyzed: 08/30/18						
Conductivity	348	0.5	µS/cm		350			0.6	15	

Turbidity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017919 - NO PREP										
Duplicate (B017919-DUP2)		**Source: 8082902-05**		Prepared & Analyzed: 08/29/18						
Turbidity	2.05	0.50	NTU		2.04			0.5	15	

Alkalinity

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017949 - NO PREP										
Blank (B017949-BLK1)				Prepared & Analyzed: 08/27/18						
Total Alkalinity	ND	5.0	mg CaC03/L							
Bicarbonate Alkalinity	ND	5.0	mg CaC03/L							
Carbonate Alkalinity	ND	5.0	mg CaC03/L							
Hydroxide Alkalinity	ND	5.0	mg CaC03/L							
LCS (B017949-BS1)				Prepared & Analyzed: 08/27/18						
Total Alkalinity	986	5.0	mg CaC03/L	1000		99	80-120			
Duplicate (B017949-DUP1)		**Source: 8082811-02**		Prepared: 08/27/18 Analyzed: 08/29/18						
Total Alkalinity	170	5.0	mg CaC03/L		171			0.5	20	

Anions

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017954 - NO PREP										
Blank (B017954-BLK1)				Prepared & Analyzed: 08/29/18						
Nitrate as N	ND	0.15	mg/L							
Sulfate as SO4	ND	0.50	mg/L							
LCS (B017954-BS1)				Prepared & Analyzed: 08/29/18						
Nitrate as N	1.85	0.15	mg/L	1.81		103	90-110			
Sulfate as SO4	8.24	0.50	mg/L	8.00		103	90-110			
LCS Dup (B017954-BSD1)				Prepared & Analyzed: 08/29/18						
Nitrate as N	1.84	0.15	mg/L	1.81		102	90-110	0.5	20	
Sulfate as SO4	8.05	0.50	mg/L	8.00		101	90-110	2	20	
Matrix Spike (B017954-MS1)		**Source: 8082901-01**		Prepared & Analyzed: 08/29/18						
Nitrate as N	1.94	0.15	mg/L	1.81	ND	107	80-120			
Sulfate as SO4	11.0	0.50	mg/L	8.00	1.76	116	80-120			
Matrix Spike (B017954-MS2)		**Source: 8082902-05**		Prepared & Analyzed: 08/29/18						
Nitrate as N	1.81	0.15	mg/L	1.81	ND	100	80-120			
Sulfate as SO4	8.58	0.50	mg/L	8.00	0.65	99	80-120			

Total Suspended Solids

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017938 - NO PREP										
Blank (B017938-BLK1)				Prepared: 08/21/18 Analyzed: 08/22/18						
Total Suspended Solids	ND	5.0	mg/L							
Duplicate (B017938-DUP2)		**Source: 8083101-01**		Prepared & Analyzed: 08/31/18						
Total Suspended Solids	11700	5.0	mg/L		12000			2	15	

Notes and Definitions

HT	The recommended holding time prior to analysis for dissolved oxygen, pH and residual chlorine is 15 minutes. This analysis was performed outside the recommended 15 minute holding time.
RDL	Reporting Detection Limit
ND	Analyte NOT DETECTED at or above the reporting detection limit (RDL)
RPD	Relative Percent Difference
NR	Not Reported

Analytical Sciences
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CHAIN OF CUSTODY

Lab Project Number: 8082901
Client's Project Name: **Bottle Rock Monitoring - GW**
Client's Project Number: BRP930

CLIENT INFORMATION

Company Name: **Bottle Rock Power, LLC**
Address: **P.O. BOX 326**
Cobb, CA 95426
Contact: **Ted DeRocher**
Phone #: **775-622-6311**
Fax #:
E-mail: lnofziger@altarockenergy.com
tderocher@altarockenergy.com

TURNAROUND TIME (check one)

Same Day ____ 72 Hours ____
48 Hours ____ 24 Hours ____
5 Days ____ Normal X

Page ____ of ____

ANALYSIS

Item	Client Sample ID	Date Sampled	Time	Matrix	# Cont.	Presv. Y/N	ALK., pH, EC	Turbidity & TSS	Hardness, SO4	B, Cu, Fe & Pb	Mn, Na, & Zn	As & NO3					Field pH	Field TDS ppm		Comments	Lab Sample #
1	GW-0	8/28/18	13:33				X	X	X	X	X	X									8082901-01
2	GW-1	8/28/18	12:21																		02
3	GW-3	8/28/18	13:55																		03
4																					
5																					
6																					
7																					
8																					
9																					
10																					

SIGNATURES

Sampled By: Jay Hepper

Relinquished By: _____ Signature
8/29/18 Date 09:55 Time

Received By: _____ Signature
8/29/18 Date 9:52 Time

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ELAP Certificates 1551, 2728, 2922, and 2303

12 December 2018

Bottle Rock Power
Attn: Ted De Rocher
PO Box 326
Cobb, CA 95426
RE: Groundwater
Work Order: 18K2459

Enclosed are the results of analyses for samples received by the laboratory on 11/26/18 10:07. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jeanette Poplin

Jeanette L. Poplin For Robbie C. Phillips
Project Manager

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Groundwater	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:54

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GW-1	18K2459-01	Water	11/25/18 15:02	11/26/18 10:07
GW-3	18K2459-02	Water	11/25/18 12:30	11/26/18 10:07
GW-0	18K2459-03	Water	11/25/18 13:15	11/26/18 10:07

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Groundwater	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:54

	Result	Reporting Limit	Dilution	Batch	Prepared	Analyzed	Method	Note
GW-1 (18K2459-01)		**Sample Type: Water**				**Sampled: 11/25/18 15:02**		
Metals by EPA 200 Series Methods								
Arsenic	ND ug/L	2.0	1	AK83367	11/28/18 09:00	11/29/18 10:39	EPA 200.9	
Boron	**0.10 mg/L**	**0.10**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Calcium	**52 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Copper	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Iron	**0.36 mg/L**	**0.10**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Lead	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Magnesium	**16 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Manganese	**0.42 mg/L**	**0.020**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Sodium	**8.7 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Zinc	ND mg/L	0.050	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Conventional Chemistry Parameters by APHA/EPA Methods								
pH	**7.73 pH Units**	**1.00**	1	AK83568	11/26/18 12:00	11/26/18 16:30	SM4500-H+ B	T-14
Specific Conductance (EC)	**360 umhos/cm**	**10**	1	AK83568	11/26/18 12:00	11/27/18 08:11	SM2510B	
Total Alkalinity as CaCO3	**180 mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Total Suspended Solids	ND mg/L	5.0	1	AK83621	11/27/18 09:00	11/28/18 14:40	SM2540D	
Turbidity	**0.32 NTU**	**0.10**	1	AK83584	11/26/18 16:00	11/26/18 17:00	SM2130B	
Bicarbonate Alkalinity as CaCO3	**180 mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Carbonate Alkalinity as CaCO3	ND mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hydroxide Alkalinity as CaCO3	ND mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hardness, Total	**197 mg/L**	**5**	1	AK83380	11/28/18 09:02	11/28/18 15:26	SM2340B	
Anions by EPA Method 300.0								
Nitrate as N	ND mg/L	0.40	1	AK83585	11/26/18 13:00	11/26/18 13:19	EPA 300.0	
Sulfate as SO4	**24 mg/L**	**1.0**	2	AK83585	11/26/18 13:00	11/26/18 15:24	EPA 300.0	
GW-3 (18K2459-02)		**Sample Type: Water**				**Sampled: 11/25/18 12:30**		
Metals by EPA 200 Series Methods								
Arsenic	ND ug/L	2.0	1	AK83367	11/28/18 09:00	11/29/18 10:39	EPA 200.9	
Boron	**0.42 mg/L**	**0.10**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Calcium	**35 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Copper	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Iron	**0.25 mg/L**	**0.10**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Lead	ND mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Magnesium	**10 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Manganese	**0.11 mg/L**	**0.020**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Sodium	**25 mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Zinc	ND mg/L	0.050	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Groundwater	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:54

	Result		Reporting Limit	Dilution	Batch	Prepared	Analyzed	Method	Note
GW-3 (18K2459-02)		**Sample Type: Water**				**Sampled: 11/25/18 12:30**			
Conventional Chemistry Parameters by APHA/EPA Methods									
pH	**7.64**	**pH Units**	**1.00**	1	AK83568	11/26/18 12:00	11/26/18 16:30	SM4500-H+ B	T-14
Specific Conductance (EC)	**320**	**umhos/cm**	**10**	1	AK83568	11/26/18 12:00	11/27/18 08:11	SM2510B	
Total Alkalinity as CaCO3	**170**	**mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Total Suspended Solids	ND	mg/L	5.0	1	AK83621	11/27/18 09:00	11/28/18 14:40	SM2540D	
Turbidity	**1.0**	**NTU**	**0.10**	1	AK83584	11/26/18 16:00	11/26/18 17:00	SM2130B	
Bicarbonate Alkalinity as CaCO3	**170**	**mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Carbonate Alkalinity as CaCO3	ND	mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hydroxide Alkalinity as CaCO3	ND	mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hardness, Total	**132**	**mg/L**	**5**	1	AK83380	11/28/18 09:02	11/28/18 15:26	SM2340B	
Anions by EPA Method 300.0									
Nitrate as N	ND	mg/L	0.40	1	AK83585	11/26/18 13:00	11/26/18 13:35	EPA 300.0	
Sulfate as SO4	**8.3**	**mg/L**	**0.50**	1	AK83585	11/26/18 13:00	11/26/18 13:35	EPA 300.0	
GW-0 (18K2459-03)		**Sample Type: Water**				**Sampled: 11/25/18 13:15**			
Metals by EPA 200 Series Methods									
Arsenic	ND	ug/L	2.0	1	AK83367	11/28/18 09:00	11/29/18 10:39	EPA 200.9	
Boron	ND	mg/L	0.10	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Calcium	**4.8**	**mg/L**	**0.10**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Copper	ND	mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Iron	ND	mg/L	0.10	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Lead	ND	mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Magnesium	**87**	**mg/L**	**0.20**	2	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Manganese	ND	mg/L	0.020	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Sodium	**1.9**	**mg/L**	**0.20**	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	
Zinc	ND	mg/L	0.050	1	AK83380	11/28/18 09:02	11/28/18 15:26	EPA 200.7	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Groundwater	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:54

	Result		Reporting Limit	Dilution	Batch	Prepared	Analyzed	Method	Note
GW-0 (18K2459-03)	**Sample Type: Water**					**Sampled: 11/25/18 13:15**			
Conventional Chemistry Parameters by APHA/EPA Methods									
pH	**8.01**	**pH Units**	**1.00**	1	AK83568	11/26/18 12:00	11/26/18 16:30	SM4500-H+ B	T-14
Specific Conductance (EC)	**530**	**umhos/cm**	**10**	1	AK83568	11/26/18 12:00	11/27/18 08:11	SM2510B	
Total Alkalinity as CaCO3	**350**	**mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Total Suspended Solids	ND	mg/L	5.0	1	AK83621	11/27/18 09:00	11/28/18 14:40	SM2540D	
Turbidity	**0.20**	**NTU**	**0.10**	1	AK83584	11/26/18 16:00	11/26/18 17:00	SM2130B	
Bicarbonate Alkalinity as CaCO3	**350**	**mg/L**	**5.0**	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Carbonate Alkalinity as CaCO3	ND	mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hydroxide Alkalinity as CaCO3	ND	mg/L	5.0	1	AK83574	11/26/18 12:00	11/27/18 08:32	SM2320B	
Hardness, Total	**372**	**mg/L**	**1**	1	AK83380	11/28/18 09:02	11/28/18 15:26	SM2340B	
Anions by EPA Method 300.0									
Nitrate as N	ND	mg/L	0.40	1	AK83585	11/26/18 13:00	11/26/18 13:51	EPA 300.0	
Sulfate as SO4	**2.0**	**mg/L**	**0.50**	1	AK83585	11/26/18 13:00	11/26/18 13:51	EPA 300.0	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Groundwater	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:54

Metals by EPA 200 Series Methods - Quality Control

Analyte(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AK83367 - EPA 200 series NB										
Blank (AK83367-BLK1)				Prepared & Analyzed: 11/19/18						
Arsenic	ND	2.0	ug/L							
LCS (AK83367-BS1)				Prepared & Analyzed: 11/19/18						
Arsenic	10.4	2.0	ug/L	10.0		104	85-115			
LCS Dup (AK83367-BSD1)				Prepared & Analyzed: 11/19/18						
Arsenic	9.50	2.0	ug/L	10.0		95.0	85-115	9.05	20	
Duplicate (AK83367-DUP1)		**Source: 18K1487-01**		Prepared & Analyzed: 11/19/18						
Arsenic	2.80	2.0	ug/L		2.32			18.8	20	
Matrix Spike (AK83367-MS1)		**Source: 18K1529-02**		Prepared & Analyzed: 11/19/18						
Arsenic	10.9	2.0	ug/L	10.0	ND	90.4	70-130			
Matrix Spike (AK83367-MS2)		**Source: 18K2459-03**		Prepared: 11/28/18 Analyzed: 11/29/18						
Arsenic	10.9	2.0	ug/L	10.0	ND	109	70-130			
Batch AK83380 - EPA 200 series NB										
Blank (AK83380-BLK1)				Prepared & Analyzed: 11/19/18						
Boron	ND	0.10	mg/L							
Calcium	ND	0.20	mg/L							
Copper	ND	0.020	mg/L							
Iron	ND	0.10	mg/L							
Lead	ND	0.020	mg/L							
Magnesium	ND	0.20	mg/L							
Manganese	ND	0.020	mg/L							
Sodium	ND	0.20	mg/L							
Zinc	ND	0.050	mg/L							

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Groundwater	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:54

Metals by EPA 200 Series Methods - Quality Control

Analyte(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AK83380 - EPA 200 series NB										
LCS (AK83380-BS1)				Prepared & Analyzed: 11/19/18						
Boron	0.502	0.10	mg/L	0.500		100	85-115			
Calcium	0.498	0.20	mg/L	0.500		99.7	85-115			
Copper	0.531	0.020	mg/L	0.500		106	85-115			
Iron	0.516	0.10	mg/L	0.500		103	85-115			
Lead	0.523	0.020	mg/L	0.500		105	85-115			
Magnesium	0.519	0.20	mg/L	0.500		104	85-115			
Manganese	0.525	0.020	mg/L	0.500		105	85-115			
Sodium	0.509	0.20	mg/L	0.500		102	85-115			
Zinc	0.509	0.050	mg/L	0.500		102	85-115			
LCS Dup (AK83380-BSD1)				Prepared & Analyzed: 11/19/18						
Boron	0.504	0.10	mg/L	0.500		101	85-115	0.477	20	
Calcium	0.499	0.20	mg/L	0.500		99.7	85-115	0.0602	20	
Copper	0.530	0.020	mg/L	0.500		106	85-115	0.208	20	
Iron	0.515	0.10	mg/L	0.500		103	85-115	0.233	20	
Lead	0.523	0.020	mg/L	0.500		105	85-115	0.0191	20	
Magnesium	0.520	0.20	mg/L	0.500		104	85-115	0.173	20	
Manganese	0.528	0.020	mg/L	0.500		106	85-115	0.551	20	
Sodium	0.510	0.20	mg/L	0.500		102	85-115	0.236	20	
Zinc	0.508	0.050	mg/L	0.500		102	85-115	0.118	20	
Duplicate (AK83380-DUP1)		**Source: 18K2459-03**		Prepared: 11/20/18 Analyzed: 11/28/18						
Boron	ND	0.10	mg/L		ND				20	
Calcium	4.88	0.20	mg/L		4.79			1.90	20	
Copper	ND	0.020	mg/L		ND				20	
Iron	ND	0.10	mg/L		ND				20	
Lead	ND	0.020	mg/L		ND				20	
Magnesium	86.2	0.20	mg/L		87.4			1.44	20	
Manganese	ND	0.020	mg/L		ND				20	
Sodium	1.88	0.20	mg/L		1.88			0.362	20	
Zinc	ND	0.050	mg/L		ND				20	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Groundwater	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:54

Metals by EPA 200 Series Methods - Quality Control

Analyte(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AK83380 - EPA 200 series NB										
Matrix Spike (AK83380-MS1)	**Source: 18K1697-01**			Prepared: 11/20/18 Analyzed: 11/28/18						
Boron	0.660	0.10	mg/L	0.500	0.133	105	70-130			
Copper	0.502	0.020	mg/L	0.500	ND	100	70-130			
Iron	5.79	0.10	mg/L	0.500	5.23	112	70-130			
Lead	0.501	0.020	mg/L	0.500	ND	100	70-130			
Manganese	3.05	0.020	mg/L	0.500	2.52	106	70-130			
Sodium	38.7	0.20	mg/L	0.500	38.0	134	70-130			QM-4X
Zinc	0.600	0.050	mg/L	0.500	0.0883	102	70-130			
Matrix Spike (AK83380-MS2)	**Source: 18K2461-05**			Prepared: 11/20/18 Analyzed: 11/28/18						
Boron	0.531	0.10	mg/L	0.500	ND	106	70-130			
Copper	0.523	0.020	mg/L	0.500	ND	105	70-130			
Iron	0.709	0.10	mg/L	0.500	0.184	105	70-130			
Lead	0.505	0.020	mg/L	0.500	ND	101	70-130			
Manganese	0.518	0.020	mg/L	0.500	ND	102	70-130			
Sodium	6.83	0.20	mg/L	0.500	6.29	108	70-130			
Zinc	0.515	0.050	mg/L	0.500	ND	103	70-130			

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Groundwater	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:54

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AK83380 - EPA 200 series NB										
Blank (AK83380-BLK1)				Prepared & Analyzed: 11/19/18						
Hardness, Total	ND	5	mg/L							
Duplicate (AK83380-DUP1)		**Source: 18K2459-03**		Prepared: 11/20/18 Analyzed: 11/28/18						
Hardness, Total	367	1	mg/L		372			1.33	20	
Batch AK83568 - General Prep (NB)										
Duplicate (AK83568-DUP1)		**Source: 18K2461-01**		Prepared & Analyzed: 11/26/18						
pH	7.53	1.00	pH Units		7.57			0.530	20	
Specific Conductance (EC)	236	10	umhos/cm		237			0.423	5	
Batch AK83574 - General Prep (NB)										
Blank (AK83574-BLK1)				Prepared: 11/26/18 Analyzed: 11/27/18						
Total Alkalinity as CaCO3	ND	5.0	mg/L							
Bicarbonate Alkalinity as CaCO3	ND	5.0	mg/L							
Carbonate Alkalinity as CaCO3	ND	5.0	mg/L							
Hydroxide Alkalinity as CaCO3	ND	5.0	mg/L							
LCS (AK83574-BS1)				Prepared: 11/26/18 Analyzed: 11/27/18						
Total Alkalinity as CaCO3	988	5.0	mg/L	1000		98.8	80-120			
Duplicate (AK83574-DUP1)		**Source: 18K1551-02**		Prepared: 11/26/18 Analyzed: 11/27/18						
Total Alkalinity as CaCO3	91.7	5.0	mg/L		91.7			0.00	20	
Bicarbonate Alkalinity as CaCO3	90.5	5.0	mg/L		91.7			1.31	20	
Carbonate Alkalinity as CaCO3	ND	5.0	mg/L		ND			0.00	20	
Hydroxide Alkalinity as CaCO3	ND	5.0	mg/L		ND				20	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Groundwater	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:54

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AK83584 - General Prep (NB)										
Blank (AK83584-BLK1)				Prepared & Analyzed: 11/26/18						
Turbidity	ND	0.10	NTU							
Duplicate (AK83584-DUP1)		**Source: 18K2461-05**		Prepared & Analyzed: 11/26/18						
Turbidity	3.84	0.10	NTU		3.81			0.784	20	
Batch AK83621 - General Prep (NB)										
Blank (AK83621-BLK1)				Prepared: 11/27/18 Analyzed: 11/28/18						
Total Suspended Solids	ND	5.0	mg/L							
Duplicate (AK83621-DUP1)		**Source: 18K2249-01**		Prepared: 11/27/18 Analyzed: 11/28/18						
Total Suspended Solids	85.0	5.0	mg/L		80.0			6.06	30	
Duplicate (AK83621-DUP2)		**Source: 18K2284-02**		Prepared: 11/27/18 Analyzed: 11/28/18						
Total Suspended Solids	52.0	5.0	mg/L		55.3			6.21	30	

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Bottle Rock Power	Project Manager: Ted De Rocher	
PO Box 326	Project: Groundwater	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:54

Anions by EPA Method 300.0 - Quality Control

Analyte(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch AK83585 - General Prep (NB)										
Blank (AK83585-BLK1)				Prepared & Analyzed: 11/26/18						
Sulfate as SO4	ND	0.50	mg/L							
Nitrate as N	ND	0.40	mg/L							
LCS (AK83585-BS1)				Prepared & Analyzed: 11/26/18						
Sulfate as SO4	8.26	0.50	mg/L	8.00		103	90-110			
Nitrate as N	1.85	0.40	mg/L	1.81		102	90-110			
LCS Dup (AK83585-BSD1)				Prepared & Analyzed: 11/26/18						
Nitrate as N	1.87	0.40	mg/L	1.81		103	90-110	0.969	20	
Sulfate as SO4	7.97	0.50	mg/L	8.00		99.6	90-110	3.59	20	
Duplicate (AK83585-DUP1)		**Source: 18K2461-01**		Prepared & Analyzed: 11/26/18						
Sulfate as SO4	5.60	0.50	mg/L		5.66			1.07	20	
Nitrate as N	ND	0.40	mg/L		ND				20	
Matrix Spike (AK83585-MS1)		**Source: 18K2459-03**		Prepared & Analyzed: 11/26/18						
Nitrate as N	1.84	0.40	mg/L	1.81	ND	94.4	80-120			
Sulfate as SO4	9.56	0.50	mg/L	8.00	2.01	94.4	80-120			
Matrix Spike (AK83585-MS2)		**Source: 18K2487-01**		Prepared & Analyzed: 11/26/18						
Nitrate as N	1.71	0.40	mg/L	1.81	ND	94.6	80-120			
Sulfate as SO4	18.7	0.50	mg/L	8.00	11.3	92.8	80-120			

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PO Box 326	Project: Groundwater	Reported:
Cobb, CA 95426	Project Number: BRP 930	12/12/18 10:54

Notes and Definitions

QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
T-14	Residual chlorine, dissolved oxygen, sulfite, and pH must be analyzed in the field to meet the EPA specified 15 minute hold time.
ND	Analyte NOT DETECTED at or above the reporting limit
dry	Sample results reported on a dry weight basis
REC	Recovery
RPD	Relative Percent Difference

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CHAIN OF CUSTODY

Lab Project Number: 18C2459
Client's Project Number: Bottle Rock Monitoring - GW
Client's Project Number: BRP 930

CLIENT INFORMATION

Company Name: Bottle Rock Power, LLC
Address: P.O. BOX 326
Cobb, CA 95426
Contact: Ted DeRocher
Phone #: 775-622-6311
Fax #:
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TURNAROUND TIME (check one)

Same Day ____ 72 Hours ____
48 Hours ____ 24 Hours ____
5 Days ____ Normal X

Temperature Received 6.9

Page 1 of 1

ANALYSIS

Item	Client Sample ID	Date Sampled	Time	Matrix	# Cont.	Presv. Y/N	ALK., pH, EC	Turbidity & TSS	Hardness, SO4	B, Cu, Fe & Pb	Mn, Na, & Zn	As & NO3				Field pH	Field TDS ppm		Comments	Lab Sample #
1	GW-1	11/25	15:02	W			X	X	X	X	X	X								
2	GW-3	11/25	12:30	↓			↓	↓	↓	↓	↓	↓								
3	GW-0	11/25	13:15	↓			↓	↓	↓	↓	↓	↓								
4																				
5																				
6																				
7																				
8																				
9																				
10																				

SIGNATURES

Sampled By: Jay Hopper

Relinquished By: _____ Signature
11/26/18 10:07 Date Time

Received By: _____ Signature
11/26/18 1007 Date Time