

**United States Environmental Protection Agency
Underground Injection Control Program**

FINAL PERMIT

Class V Non-hazardous Waste Injection Wells

Permit No. R9UIC-CA5-FY20-3 (the Permit)

Well Names: 25A-18G, 35A-18G, and 35-18G

Issued to:

**Elk Hills Power
4026 Skyline Road
Tupman, CA 93276**

TABLE OF CONTENTS

PART I. AUTHORIZATION TO INJECT	4
PART II. SPECIFIC PERMIT CONDITIONS	6
A. REQUIREMENTS PRIOR TO TESTING OR OPERATING.....	6
1. Financial Assurance	6
2. Field Demonstration Submittal, Notification, and Reporting.....	6
B. CONDITIONS FOR EXISTING WELLS	6
1. Surface Location	6
2. Existing Well Construction Details.....	7
3. Injection Formation Testing	7
4. Injection Interval.....	8
5. Monitoring Devices.....	8
6. Proposed Changes and Workovers.....	9
C. CORRECTIVE ACTION	10
1. Annual Zone of Endangering Influence Review	10
2. Implementation of Corrective Actions.....	10
D. WELL OPERATION	10
1. Required Demonstrations	10
2. Mechanical Integrity	11
3. Injection Pressure Limitation.....	14
4. Injection Volume (Rate) Limitation.....	14
5. Injection Fluid Limitation.....	15
6. Tubing/Casing Annulus Requirements	16
E. MONITORING, RECORDKEEPING, AND REPORTING OF RESULTS.....	16
1. Injection Fluid Monitoring Program	16
2. Monitoring Information.....	18
3. Monitoring Devices.....	18
4. Recordkeeping	19
5. Reporting	20
F. PLUGGING AND ABANDONMENT.....	22
1. Notice of Plugging and Abandonment.....	22
2. Plugging and Abandonment Plans	22
3. Cessation of Injection Activities.....	23
4. Plugging and Abandonment Report.....	23
G. FINANCIAL ASSURANCE REQUIREMENTS.....	24
1. Demonstration of Financial Assurance	24
2. Failure of Financial Assurance	24
3. Insolvency of Owner or Operator	25
H. DURATION OF PERMIT.....	25

PART III. GENERAL PERMIT CONDITIONS	25
A. EFFECT OF PERMIT	25
B. PERMIT ACTIONS	26
1. Modification, Revocation and Reissuance, or Termination	26
2. Transfers	26
C. SEVERABILITY	26
D. CONFIDENTIALITY	27
E. GENERAL DUTIES AND REQUIREMENTS	27
1. Duty to Comply.....	27
2. Penalties for Violations of Permit Conditions.....	27
3. Need to Halt or Reduce Activity Not a Defense.....	28
4. Duty to Mitigate.....	28
5. Proper Operation and Maintenance.....	28
6. Property Rights	28
7. Duty to Provide Information.....	28
8. Inspection and Entry.....	28
9. Submittal Requirements	29
10. Additional Reporting Requirements.....	30
11. Requirements Prior to Commencing Injection, Plugging and Abandonment Report, Duty to Establish and Maintain Mechanical Integrity	31
12. Continuation of Expiring Permit.....	31
13. Records of Permit Application.....	32
14. Availability of Reports	32

APPENDICES

APPENDIX A – Project Maps

APPENDIX B – Well Schematics

APPENDIX C – EPA Reporting Forms

APPENDIX D – Logging Requirements

APPENDIX E – EPA Region 9 UIC Pressure Falloff Requirements

APPENDIX F – Plugging and Abandonment Plan

APPENDIX G – Operating Data

APPENDIX H – Well Treatment Program

PART I. AUTHORIZATION TO INJECT

Pursuant to the Underground Injection Control (UIC) regulations of the U.S. Environmental Protection Agency (EPA) codified at Title 40 of the Code of Federal Regulations (CFR) Parts 124, 144, 145, 146, 147, and 148,

Elk Hills Power (EHP or the Permittee)
4026 Skyline Road
Tupman, CA 93276

is hereby authorized, as owner and operator, and contingent upon Permit conditions, to operate three existing injection wells. In February 2001, pursuant to a Class I UIC Permit CA200002 (the Class I UIC permit), EPA authorized the construction and operation of two (2) injection wells (25-18G and 35-18G) at EHP. The Class I UIC permit was modified in 2004 to authorize installation of two additional injection wells (25A-18G and 35A-18G). In 2010, Well 25-18G was plugged and abandoned. The three existing wells, 25A-18G, 35A-18G, and 35-18G (the Existing Wells), are located in Section 18, Township 31S, Range 24E, SW 1/4 at the Elk Hills Power Facility in Tupman, Kern County, California (the EHP Facility).

In 2011, EPA received a timely application for the renewal of the Class I UIC permit. Upon review, EPA determined that the injection formation, the Upper Tulare Formation, is an Underground Source of Drinking Water (USDW). EPA consulted with the State of California Central Valley Regional Water Quality Control Board, the California State Water Resources Control Board, and the California Geologic Energy Management Division (CalGEM, formerly known as the Division of Oil, Gas and Geothermal Resources, or DOGGR), and determined, based on the status of the injection formation and the injectate constituents, that the EHP injection wells would be more appropriately regulated by EPA through a UIC Class V injection permit instead of a Class I UIC permit. Accordingly, EHP submitted a Class V permit application and this Permit re-classifies the EHP injection wells as Class V wells and authorizes the Permittee to continue operation and injection into the three Existing Wells. Concurrent with this Class V UIC permit becoming effective, the Class I UIC permit renewal application will be withdrawn by EHP.

Pursuant to this Permit, EPA authorizes the Permittee to operate the three (3) Existing Wells as Class V injection wells, conditioned upon the Permittee meeting the Financial Assurance requirements set forth in Section II.G of this Permit. Injection operation of the Existing Wells will be limited to the maximum volume and pressure as previously established under EPA Permit No. CA200002.

After meeting the requirements of Part II Section A.1 of this Permit, injection is authorized to continue into the Upper Tulare Formation (Tulare Interval B) for the purpose of disposal of non-hazardous wastewater derived from power plant operations, including: turbine wash and cooling tower blowdown wastewater; plant area wash wastewater; reverse osmosis regeneration

Final
4 of 32

PART II. SPECIFIC PERMIT CONDITIONS

A. REQUIREMENTS PRIOR TO TESTING OR OPERATING

1. Financial Assurance

The Permittee's plugging and abandonment cost estimate and chosen financial assurance mechanism for the Existing Wells authorized by this Permit meet the requirements of 40 CFR § 144.52(a)(7). Refer to Permit Section G of this part.

2. Field Demonstration Submittal, Notification, and Reporting

- a. Prior to each field demonstration required by and described in the following Sections II.B.3.a.i. and ii., and Sections II.D.1.a., 2.a., and 2.b., the Permittee shall submit plans for procedures and specifications to the EPA Region 9 Groundwater Protection Section for approval at a minimum of sixty (60) days prior to the planned demonstration. Submittals shall be made in accordance with Section III.E.9 of this Permit. No demonstration in the Sections listed above (e.g., Sections II.B.3.a.i. and ii. and Sections II.D.1.a., 2.a., and 2.b.) may proceed without prior written approval from EPA.
- b. After receipt of approval of the Permittee's proposed field demonstrations in writing from EPA, the Permittee must provide notice to EPA at least thirty (30) days prior to performing any required field demonstrations.
- c. Unless otherwise specified elsewhere in this Permit, the Permittee shall submit results of each such field demonstration required by Sections II.B. through D. to EPA within sixty (60) days of completion, unless otherwise directed by EPA (Refer to Part III.E.9.b).

B. CONDITIONS FOR EXISTING WELLS

1. Surface Location

The three (3) Existing Wells authorized by this Permit are located at the below coordinates:

Well 25A-18G: Located at 35° 13' 50.73" N, 119° 26' 37.20" W

Well 35-18G: Located at 35° 13' 50.51" N, 119° 26' 29.29" W

Well 35A-18G: Located at 35° 13' 50.72" N, 119° 26' 33.18" W

The EHP Facility, where the Existing Wells are located, is in Section 18, Township 31S, Range 24E, SW 1/4 on the western side of the San Joaquin Valley, about 4.5 miles north of the town of Taft, CA.

2. Existing Well Construction Details

Well Schematics for the three Existing Wells authorized by this Permit are contained in Appendix B of this Permit. The Permittee shall at all times maintain the Existing Wells consistent with these Well Schematics, unless changes are authorized by EPA, as described in II.B.6.a

3. Injection Formation Testing

a. Pressure Fall Off Test (FOT)

- i. A FOT shall be performed approximately six (6) months after the Permit becomes effective, if a FOT has not been already been conducted within the last six (6) months pursuant to the Class I UIC permit. If a FOT has been performed within six (6) months under the Class I UIC permit, the next FOT shall be performed one year after the prior FOT.
- ii. The Permittee has historically determined and monitored formation characteristics by conducting the annual FOT in Well 35A-18G. For consistency, the Permittee may continue to conduct the FOT in this well, or may propose to test one of the other wells regulated under this permit to determine and monitor formation characteristics. The Permittee shall conduct the FOT after a radial flow regime has been established at an injection rate that is representative of the wastewater contribution to the well. The other injection wells shall either be inactive, or operated at a constant rate, prior to and during the FOT, in order to obtain reliable pressure data and accurate results. The Permittee shall conduct the FOT in accordance with EPA Region 9 guidance found in Appendix E, and as follows.
- iii. The Permittee shall submit to EPA for review and approval a detailed plan for the FOT that is developed in accordance with EPA Region 9 guidance in Appendix E. Once EPA provides written approval of the test plan, the Permittee may schedule the FOT, providing EPA at least thirty (30) days' notice before the test is conducted. The final FOT report shall be submitted to EPA within sixty (60) days of test completion.

- iv. The Permittee shall use the test results to recalculate the Zone of Endangering Influence (ZEI), consistent with procedures set forth at 40 CFR § 146.6(a)(1)(i), and to evaluate whether any additional corrective action will be required (refer to Section II.C.). The Permittee shall include a summary of the ZEI recalculation with the FOT report.
- v. After conducting the FOT required in Section II.B.3.a.i above, the Permittee shall conduct a FOT annually thereafter following the same procedures described in Sections II.B.3.a.ii. and iii. The Permittee may conduct the annual FOT in conjunction with the annual External Mechanical Integrity Test (MIT) demonstration, as required by Section II.D.2.a.iii.
- vi. The Permittee shall create a plot/graph of the latest static reservoir pressure of the injection zone and its cumulative behavior over time, the plot shall be included with the annual FOT report each year.

4. Injection Interval

This Permit authorizes injection at depths of 724 to 1,415 feet from Kelly bushing (KB) in well 25A-18G; from KB 698 to 1,795 feet in well 35-18G; and from KB 648 to 1,289 feet in well 35A-18G. The Existing Wells inject into the Tulare Interval B below the Tulare Clay and above the Amnicola Claystone, the two confining zones. The total dissolved solids (TDS) of the Tulare Interval B ranges between 4,485 and 8,720 mg/L, with an average TDS concentration of 5,025 mg/L, or more than twice the average TDS of the EHP injectate. Well schematics are included in Appendix B.

5. Monitoring Devices

The Permittee shall maintain the following monitoring devices in good operating condition at all times during operation of Wells 25A-18G, 35A-18G, and 35-18G:

- a. A tap on the discharge line between the injection pump and the wellhead or an alternative location proposed in a detailed written request by the Permittee and approved in writing by the EPA Director or their delegated representative for the purpose of obtaining representative samples of injection fluid; and
- b. Devices to continuously measure and record injection pressure, annulus pressure, flow rate, and injection volume, subject to the following:
 - i. Pressure gauges shall be of a design to provide:

- (a) A full pressure range of at least fifty (50) percent greater than the anticipated operating pressure; and
 - (b) A certified deviation accuracy of five (5) percent or less throughout the operating pressure range.
 - (c) Alerts, set at the injection pressure limitation established by this Permit in Part D.3.a, and at the injectate volume (rate) limitation as set in this Permit in Part D.4.a. are required in order to ensure injection remains within the limits established by this Permit.
- ii. Flow meters shall measure cumulative volumes and be certified for a deviation accuracy of five (5) percent or less throughout the range of injection rates allowed by the Permit.

6. Proposed Changes and Workovers

- a. The Permittee shall give advance notice to EPA, as soon as possible, pursuant to and in accordance with 40 CFR § 144.51(l), of any planned physical alterations or additions to any of the Existing Wells authorized by this Permit, including sidetracking and deepening or perforating additional intervals. Any changes in well construction, including changes in casing, tubing, packers, and/or perforations other than minor changes, will require prior written approval by EPA and may require a permit modification application under the requirements of 40 CFR § 144.39 or § 144.41. Modifications that are considered routine in well construction details, such as tubing dimensions and strengths, packer models, types and setting depths, and perforation interval changes within the permitted injection zone, may be processed by EPA as minor permit modifications, consistent with 40 CFR § 144.41(f) and Section III.B.1 of this Permit.
- b. For each Existing Well authorized by this Permit, the Permittee shall provide all records of well workovers, logging, or other subsequent test data to EPA within sixty (60) days of completion of the activity.
- c. The Permittee shall submit all reports required by this Permit using the appropriate reporting forms (see Appendix C).
- d. The Permittee shall perform a MIT on each Existing Well authorized by this Permit using the procedures set forth in Sections II.D.1.a. and II.D.2. within thirty (30) days of completion of workovers or alterations and prior to resuming injection activities, in accordance with Section II.D.1. The Permittee shall provide results of the MIT to EPA within sixty (60) days of completion.

C. CORRECTIVE ACTION

The Permittee is not required to conduct any corrective action, in accordance with 40 CFR §§ 144.55 and 146.7, prior to EPA granting authorization to inject under this Permit.

1. Annual Zone of Endangering Influence Review

Beginning in March, 2021 and annually every March thereafter, the Permittee shall review the ZEI calculation based on any new data obtained from the FOT and static reservoir pressure observations required by Part II.B.5.b. The Permittee shall provide to EPA a copy of the modified ZEI calculations, along with all associated assumptions and justifications, with the next Quarterly Report due in accordance with the schedule, set forth in Part II.E.5.b.

2. Implementation of Corrective Actions

- a. If any wells requiring corrective action, in accordance with 40 CFR §§ 144.55 and 146.7, are found within the modified ZEI referenced above, a list of the wells along with their locations and construction data shall be provided to EPA within thirty (30) days of their identification.
- b. The Permittee shall submit a plan for approval by EPA to re-enter, plug, and abandon the wells requiring corrective action per Part II.C.2.a., above, in a manner that does not allow movement of fluid containing any contaminant into USDWs, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 142 or may otherwise adversely affect the health of persons. The Permittee may submit an alternative plan to address the potential for fluid movement in any such wells to EPA.
- c. The Permittee may not commence corrective action activities without prior written approval from EPA.

D. WELL OPERATION

1. Required Demonstrations

a. Mechanical Integrity

- i. Within ninety (90) days of the effective date of this Permit, the Permittee shall propose a schedule to conduct a MIT to demonstrate that each Existing Well authorized by this Permit has mechanical

integrity consistent with 40 CFR § 146.8 and with Section II.D.2.a. The test should be planned for no more than 365 days after the prior well tests were conducted under the Class I permit. The Permittee shall demonstrate that there are not significant leaks: 1) in the casing and tubing (internal mechanical integrity) that would allow the movement of fluid containing any contaminant into USDWs, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 142 or may otherwise adversely affect the health of persons; and 2) through the casing wellbore annulus or vertical channels adjacent to the injection wellbore (external mechanical integrity).

b. Injectate Hazardous Waste Determination

- i. Within sixty (60) days of the effective date of this Permit, the Permittee shall certify that the existing Injectate “Hazardous Waste Determination” of each unique waste stream source injected into each Existing Well authorized by this Permit, as listed in Section II.D.5.a, in accordance with 40 CFR § 262.11, is unchanged. If a change is identified, a new determination must be performed within sixty (60) days of the effective date of this Permit.
- ii. Whenever there is a process change or a change in fluid chemical constituents or characteristics of the injectate at the power generating plant, or a plant shut down for any reason, the Permittee shall perform an additional “Hazardous Waste Determination” for each unique waste stream source listed in Section II.D.5.a. The Permittee should also refer to injectate testing requirements set forth in Section II.E.1., below. A letter with the results of the analyses shall be submitted to EPA within sixty (60) days of the “Hazardous Waste Determination” completion.

2. Mechanical Integrity

a. Mechanical Integrity Tests

Mechanical integrity testing shall conform to the following requirements throughout the life of each Existing Well authorized by this Permit and in accordance with the requirements set forth at 40 CFR §§ 144.51(q) and 146.8:

- i. Casing/Tubing Annular Pressure (Internal MIT)

In accordance with the timing requirements defined in Section II.D.2.b., below, the Permittee shall perform a pressure test on the annular space between the tubing and long string casing to demonstrate the absence of significant leaks in the casing, tubing and/or liner of each Existing Well. This test shall be for a minimum of thirty (30) minutes at a pressure equal to or greater than the maximum allowable surface injection pressure (MAIP). This test shall be performed on each Existing Well authorized by this Permit initially as described in Section II.D.1.a.

Detailed plans for conducting the Internal MIT must be submitted to EPA for review and approval. Once approved, the Permittee may schedule the Internal MIT, providing EPA at least thirty (30) days' notice before the Internal MIT is conducted. The final test report shall be submitted to EPA within sixty (60) days of test completion.

ii. Continuous Pressure Monitoring

The Permittee shall continuously monitor and record the tubing/casing annulus pressure and injection pressure by a digital instrument with a resolution of one tenth (0.1) psig of each Existing Well. The average, maximum, and minimum monthly results shall be included in the next Quarterly Report submitted to EPA pursuant to Section II.E.5.b., along with any additional records or data requested by EPA regarding the continuous monitoring data described in this Section.

iii. Injection Profile Survey (External MIT)

In conjunction with and consistent with the deadlines for the first FOT conducted under this Permit, as required in Section II.B.3.a., the Permittee shall conduct a demonstration that the injectate is confined to the proper zone for each Existing Well and submit the results of the demonstration to EPA for approval.

This demonstration shall consist of a radioactive tracer survey and a temperature log (as specified in Appendix D), or other diagnostic tool or procedure as approved by EPA.

Detailed plans for conducting the External MIT for each Existing Well must be submitted to EPA for review and approval. Once approved, the Permittee may schedule the External MIT, providing EPA at least thirty (30) days' notice before the External MIT is conducted. The

final test report shall be submitted to EPA within sixty (60) days of test completion.

b. Schedule for MITs

EPA may require that an Internal and/or External MIT be conducted, upon written request, at any time during the permitted life of each Existing Well. The Permittee shall also arrange and conduct Internal and External MITs in each Existing Well authorized by this Permit according to the following requirements and schedule:

- i. Within thirty (30) days from completion of any work-over operation where well integrity is compromised, an Internal MIT shall be conducted, and the results submitted to EPA for approval to verify that the well has mechanical integrity. Prior to this field demonstration, the Permittee shall submit testing plans to EPA, as described in Section II.A.2.
- ii. At least annually, an injection profile survey External MIT shall be conducted in accordance with 40 CFR § 146.8 and Section II.D.2.a.iii., above.
- iii. At least once every five (5) years, an Internal MIT shall be conducted in accordance with 40 CFR § 146.8 and Section II.D.2.a.i., above.

c. Loss of Mechanical Integrity

Within twenty-four (24) hours from the time the Permittee becomes aware of any loss of mechanical integrity in any Existing Well authorized by this Permit, the Permittee shall notify EPA of the situation and specify which of the following circumstances apply:

- i. The well fails to demonstrate mechanical integrity during a test; or
- ii. A loss of mechanical integrity becomes evident during operation; or
- iii. A significant change in the annulus or injection pressure occurs during normal operating conditions. See Section II.D.6.b.

In the event of a loss of mechanical integrity, the Permittee shall immediately suspend injection activities in the affected well and shall not resume operation until it has taken necessary actions to restore and confirm mechanical integrity

of the affected well, and EPA has provided written approval to recommence injection into the affected well.

The Permittee may not recommence injection after a workover which has compromised well integrity (such as unseating the packer, etc.) until it has received written approval from EPA that the demonstration of mechanical integrity is satisfactory.

3. Injection Pressure Limitation

For each Existing Well authorized by this Permit:

- a. Maximum allowable injection pressure (MAIP) is set at 200 psi. Appendix G presents historic operating pressures, under the previous UIC permit.
- b. In no case shall the Permittee inject at pressures that (i) initiate new fractures or propagate existing fractures in the injection zone or the confining zone, (ii) would allow the movement of fluid containing any contaminant into USDWs, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 142 or may otherwise adversely affect the health of persons, or (iii) allow injection fluids to migrate to oilfield production wells.

4. Injection Volume (Rate) Limitation

For each Existing Well authorized by this Permit:

- a. The injection rate shall not exceed 628,500 gallons per day.
- b. The Permittee shall not inject at a rate above the limit. This rate will be subject to an annual review based on the annual ZEI determinations performed as described in Part II.C.1.
- c. The Permittee may request an increase in the maximum rate allowed in Section II.D.4.a., above. Any such request shall be made in writing, along with a justification for the proposed increase, to EPA for its review and approval.
- d. Should any increase in injection rate be requested, the Permittee shall demonstrate to the satisfaction of EPA that the proposed increase will not interfere with the operation of the EHP Facility, its ability to meet conditions

described in this Permit, change its well classification, or cause migration of injectate or pressure buildup to occur beyond the AOR.

- e. The injection rate shall not cause an exceedance of the injection pressure limitation established pursuant to Section II.D.3.a.

5. Injection Fluid Limitation

- a. This Permit authorizes injection of the following fluids into the Existing Wells authorized by this Permit, non-hazardous wastewater derived from on-site power plant operations, including: turbine wash and cooling tower blowdown wastewater; plant area wash wastewater; reverse osmosis regeneration wastewater; plant and equipment drains wastewater; filter backwash wastewater; and non-oil-contaminated storm runoff wastewater. Injection fluids may include chemical additives for the purpose of facility and well operation and maintenance, and must be reported to EPA, if used.
- b. The Permittee shall not inject any hazardous waste, as defined by 40 CFR § 261, at any time. See also Section II.D.1.b.
- c. Injection fluids shall be limited to those authorized by this Permit, which includes those fluids produced by the Permittee as described in Section II.D.5.a., above.
- d. Particulate Filters may be used upstream of any Existing Well authorized by this Permit, at the discretion of the Permittee, to prevent formation plugging or damage from particulate matter. The Permittee shall include any filter specifications in the Quarterly Report due annually in January as required in Section II.E.6.c., including proposed particle size removal with any associated justification for the selected size. For any particulate filters used, the Permittee shall follow appropriate waste analysis and disposal practices consistent with local, state, and federal law, and provide documentation to EPA.
- e. Any well stimulation or treatment procedure (such as acidizing, etc.) performed at the discretion of the Permittee shall be proposed and submitted to EPA for approval. The procedure must include a detailed list of all proposed additives or chemicals to be used in the well stimulation or treatment. A general well stimulation plan is included in Appendix H. After approval is granted, notification to EPA is required at least thirty (30) days prior to performing the approved procedure. This requirement may be modified if the Permittee submits a standard operating procedure for well stimulation or treatment for EPA approval after the effective date of this Permit. This standard operating procedure must include all potential additives

that may be used. If the standard operating procedure plan is approved by EPA in writing, the Permittee may notify EPA within fifteen (15) days of the proposed well stimulation or treatment procedure, provided the procedure does not deviate in any way from the EPA-approved plan.

6. Tubing/Casing Annulus Requirements

For any Existing Well authorized by this Permit:

- a. The Permittee shall use and maintain corrosion-inhibiting annular fluid during well operation. See Appendix G for a complete, generic description and characterization of the annular fluid.
- b. The Permittee shall maintain a minimum pressure of one hundred (100) psig at shut-in conditions only, on the tubing/casing annulus.
- c. Any annular pressure measured outside of the established pressure range, as previously determined under EPA Permit No. CA200002, regardless of whether it otherwise meets the requirements of this Permit, shall be reported orally to EPA within twenty-four (24) hours, followed by a written submission within five (5) days, as a potential loss of mechanical integrity. In the submission, the Permittee must describe the event and include details, such as associated injection pressures and temperatures. The Permittee shall provide any additional information regarding the reported annular pressure event requested by EPA within sixty (60) days of receipt of a written request from EPA, or such other time frame established in writing by EPA.

E. MONITORING, RECORDKEEPING, AND REPORTING OF RESULTS

1. Injection Fluid Monitoring Program

On a quarterly basis, the Permittee shall sample and analyze injection fluids to yield representative data on their physical, chemical, and other relevant characteristics. Constituents to be included in the quarterly sampling and analysis are listed in Section II.E.1.a., below. Test results shall be submitted by the Permittee to EPA on a quarterly basis (see Section II.E.5., below).

Samples and measurements shall be representative of the monitored activity. The Permittee shall utilize applicable analytical methods described in Table I of 40 CFR § 136.3 or in EPA Publication SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," and as described below, unless other methods have been approved by EPA or additional approved methods or updates to the methods listed below become available.

a. Summary of Acceptable Analytic Methods

- i. Inorganic Constituents – USEPA Method 300.0, Part A for Major Anions and USEPA Method 200.8 for Cations and Trace Metals.
- ii. Solids – Standard Methods 2540C and 2540D for Total Dissolved Solids (TDS) and Total Suspended Solids (TSS).
- iii. General and Physical Parameters – appropriate USEPA methods for Temperature, Turbidity, pH, Conductivity, Hardness, Specific Gravity, Alkalinity, and Biological Oxygen Demand (BOD); and Density (see EPA Bulletin 712-C-96-032) under standard conditions.
- iv. Volatile Organic Compounds (VOCs) – USEPA Method 8260D.
- v. Semi-Volatile Organic Compounds (SVOCs) – USEPA Method 8270E.

b. Analysis of Injection and Formation Fluids

Within thirty (30) days after the effective date of this Permit, the Permittee shall perform injectate sampling and analyses as outlined in Section II.E.1.a., above. However, if no change in injection fluid has occurred from the prior permit, the Permittee shall certify no change within the specified time frame and is not required to conduct injectate sampling within 30 days of the Permit's effective date. If this is the case, the quarterly sampling as described in Section II.E.1 above shall be followed.

In addition, whenever there is a change in injection fluids; for example, whenever the injection fluid is no longer representative of previous samples and measurements that have been submitted and approved, the Permittee shall perform injectate sampling and analyses as outlined in Section II.E.1.a., above.

Further, on an annual basis, beginning one (1) year after the effective date of this permit, an evaluation shall be submitted to EPA in which the results of the injectate sampling are compared with the USDW quality and the USDW quality is compared with prior collected data. An evaluation of current conditions was provided in the Application, in Tables D-3, D-4 and D-5. The evaluations required by this condition shall compare newly collected USDW quality data with the initial values as provided in the Application and any subsequent measurements.

2. Monitoring Information

The Permittee shall maintain records of monitoring activity required under this Permit, including the following information and data:

- a. Date, exact location, and time of sampling or measurements;
- b. Name(s) of individual(s) who performed sampling or measuring;
- c. Exact sampling method(s) used;
- d. Date(s) laboratory analyses were performed;
- e. Name(s) of individual(s) who performed laboratory analyses;
- f. Types of analyses; and
- g. Results of analyses.

3. Monitoring Devices

a. Continuous Monitoring Devices

During all periods of operation of any authorized well, the Permittee shall measure the following wellhead parameters: (i) injectate rate/volume, (ii) injectate temperature, (iii) annular pressure, and (iv) injection pressure. All measurements must be recorded at minimum to a resolution of one tenth (0.1) of the unit of measure (e.g., injection rate and volume must be recorded to a resolution of one tenth (0.1) of a gallon; pressure must be recorded to a resolution of one tenth (0.1) of a psig; injection fluid temperature must be recorded to a resolution of one tenth (0.1) of a degree Fahrenheit. Exact dates and times of measurements, when taken, must be recorded and submitted. Each injection well shall have a dedicated flow meter, installed so it records all injection flow. To meet the requirements of this Section, the Permittee shall monitor the following parameters, at the prescribed frequency, and record the measurements at this required frequency, using the prescribed instruments (continuous monitoring requires a minimum frequency of at least one (1) data point every thirty (30) seconds):

Monitoring Parameter	Frequency	Instrument
Injection Rate (gallons per minute)	Continuous	Digital recorder
Daily Injection Volume (gallons)	Daily	Digital totalizer
Total Cumulative Volume (gallons)	Continuous	Digital totalizer
Well Head Injection Pressure (psig)	Continuous	Digital recorder
Annular Pressure (psig)	Continuous	Digital recorder
Injection Fluid Temperature (degrees Fahrenheit)	Continuous	Digital recorder

The Permittee must adhere to the required format below for reporting injection rate and well head injection pressure. An example of the required electronic data format:

<u>DATE</u>	<u>TIME</u>	<u>INJ. PRESS (PSIG)</u>	<u>INJ. RATE (GPM)</u>
mm/dd/yy	hh:mm:ss	XXXX.X	XXXX.X

Each data line shall include four (4) values separated by a consistent combination of spaces or tabs. The first value contains the date measurement in the format of mm/dd/yy or mm/dd/yyyy, where mm is the number of the month, dd is the number of the day and yy or yyyy is the number of the year. The second value is the time measurement, in the format of hh:mm:ss, where hh is the hour, mm are the minutes and ss are the seconds. Hours should be calculated on a twenty-four (24)-hour basis, i.e., 6 PM is entered as 18:00:00. Seconds are optional. The third value is the well head injection pressure in psig. The fourth column is injection rate in gallons per minute (gpm).

b. Calibration and Maintenance of Equipment

The Permittee shall calibrate and maintain on a regular basis all monitoring and recording equipment to ensure proper working order of all equipment.

4. Recordkeeping

- a. The Permittee shall retain the following records and shall have them available at the EHP Facility at all times for inspection by EPA or other authorized personnel, in accordance with the following:
 - i. All monitoring information, including required observations, calibration and maintenance records, recordings for continuous

monitoring instrumentation, copies of all reports required by this Permit, and records of all data used to complete the permit application;

- ii. Information on the physical nature and chemical composition of all injected fluids, including injectate, chemicals for the operation and maintenance of the facility and wells, and any additives for treatment, such as for well stimulation and/or acidization;
 - iii. Results of the injectate “Hazardous Waste Determination” according to 40 CFR § 262.11 (see Section II.D.1.b.). Results shall demonstrate that the injectate does not meet the definition of hazardous waste as defined in 40 CFR § 261;
 - iv. Records and results of MITs, FOTs, and any other tests and logs required by EPA, and any well work and workovers completed.
- b. The Permittee shall maintain copies (or originals) of all records described in Sections II.E.5.a.i. through vi., above, during the operating life of any Existing Well authorized by this Permit and shall make such records available at all times for inspection at the EHP Facility. The Permittee shall only discard the records described in Sections II.E.5.a.i. through vi., if:
- i. The records are delivered to the EPA Region 9 Groundwater Protection Section; or
 - ii. Written approval from EPA to discard the records is obtained.

5. Reporting

- a. The Permittee shall submit to EPA Quarterly Reports containing, at minimum, the following information gathered during the Reporting Period identified in Section II.E.6.b.:
 - i. Injection fluid characteristics for parameters specified in Section II.E.1.a.;
 - ii. When appropriate, Injectate Hazardous Waste Determination according to Section II.D.1.b.;
 - iii. The results of any additional MITs, FOTs, logging or other tests, as required by EPA;
 - iv. Any pressure tests, as required by Section II.D.2.a.i.;

- v. Shut-in static reservoir pressure cumulative behavior plot of the injection zone, as required by Section II.B.3.a.vi.;
 - vi. Hourly and daily values, submitted in electronic format, for the continuously monitored parameters specified for the injection wells in Section II.E.4.a.; and
 - vii. Monthly cumulative total volumes, as well as monthly average, minimum, and maximum values for the continuously monitored rate, pressure, and temperature parameters specified for the injection wells in Section II.E.4.a., unless more detailed records are requested by EPA.
- b. Quarterly Reports, with the applicable Appendix C forms, shall be submitted for the reporting periods by the respective due dates as listed below:

<u>Reporting Period</u>	<u>Report Due</u>
Jan, Feb, Mar	Apr 28
Apr, May, June	July 28
July, Aug, Sept	Oct 28
Oct, Nov, Dec	Jan 28

- c. For the Quarterly Report covering the reporting period of January, February, and March, the Permittee shall also include in that Report the following information collected during the prior year covering January through December:
- i. Annual reporting summary;
 - ii. Annual injection profile survey results as required in Section II.D.2.a.iii.;
 - iii. Annual ZEI recalculation as required in Section II.C.1.;
 - iv. A narrative description of any non-compliance with the Permit that occurred during the past year.
- e. In addition to meeting the submittal requirements of Section III.E.9., digital e-copies of all Quarterly Reports shall also be provided to the following:

California Geologic Energy Management Division

Inland District
Attention: District Deputy
Mark Ghann-Amoah
Via email at Mark.Ghann-Amoah@conservation.ca.gov

Central Valley Regional Water Quality Control Board
Attention: Permit Section
Dale Harvey
Via email at Dale.Harvey@waterboards.ca.gov

F. PLUGGING AND ABANDONMENT

1. Notice of Plugging and Abandonment

The Permittee shall notify EPA no less than sixty (60) days before abandonment of any Existing Well authorized by this Permit and shall not perform the plugging and abandonment activities until the Permittee receives written notice of approval by EPA.

2. Plugging and Abandonment Plans

The Permittee shall plug and abandon the well(s) as provided by the Plugging and Abandonment Plan submitted by the Permittee (see Appendix F) and approved by EPA, consistent with CalGEM's "Onshore Well Regulations" of the California Code of Regulations, found in Title 14, Natural Resources, Division 2, Department of Conservation, Chapter 4, Article 3, Sections 1722-1723 and 40 CFR § 146.10. Upon written notice to the Permittee, EPA may change the manner in which a well will be plugged, based upon but not limited to the following reasons: (a) if the well is modified during its permitted life, (b) if the proposed Plugging and Abandonment Plan for the well is not consistent with EPA requirements for construction or mechanical integrity, or (c) otherwise at EPA's discretion. Upon written notice, EPA may periodically require the Permittee to update the estimated plugging cost. To determine the appropriate level of financial assurance for the Plugging and Abandonment Plan, the Permittee has obtained a cost estimate from an independent third-party firm in the business of plugging wells. The estimate includes the costs of all the materials and activities necessary to pay an independent third-party contractor to completely plug and abandon the injection and monitoring wells, as established in the Plugging and Abandonment Plan.

3. Cessation of Injection Activities

After a cessation of injection operations for two (2) years for any Existing Wells authorized by this Permit, a well is considered inactive. In this case, the Permittee shall plug and abandon the inactive well in accordance with the approved Plugging and Abandonment Plans, contained in Appendix F, unless the Permittee:

- a. Provides notice to EPA of an intent to re-activate the well(s);
- b. Has demonstrated that the well(s) will be used in the future;
- c. Has described actions or procedures, satisfactory to EPA and approved in writing by EPA, which will be taken to ensure that the well(s) will not endanger USDWs during the period of inactivity, including annually demonstrating external mechanical integrity of the well(s); and
- d. Conducts an initial, Internal MIT on the inactive well(s) and subsequent Internal MITs every two (2) years thereafter while the well(s) remains inactive, demonstrating no loss of mechanical integrity. Note that the Permittee must restore mechanical integrity of the inactive well(s) or plug and abandon the well(s) if it fails the MIT.

4. Plugging and Abandonment Report

Within sixty (60) days after plugging any Existing Well authorized by this Permit, or at the time of the next Quarterly Report (whichever is sooner), the Permittee shall submit a report on Form 7520-19 (see Appendix C), as well as the detailed procedural activity of engineer's log and daily rig log to EPA. The report shall be certified as accurate by the person who performed the plugging operation and shall consist of either:

- a. A statement that the well was plugged in accordance with the approved Plugging and Abandonment Plan contained in Appendix F; or
- b. Where actual plugging differed from the Plugging and Abandonment Plan contained in Appendix F, a statement specifying and justifying the different procedures followed.

G. FINANCIAL ASSURANCE REQUIREMENTS

1. Demonstration of Financial Assurance

The Permittee is required to demonstrate and maintain financial assurance and resources sufficient to close, plug, and abandon any authorized underground injection operations by this Permit, as provided in the Plugging and Abandonment Plan contained in Appendix F and consistent with 40 CFR § 144 Subpart D.

In addition, the Permittee shall meet the following specific financial assurance requirements:

- a. Prior to the issuance of this Permit, the Permittee provided, and EPA approved in writing, a financial assurance instrument, consistent with Section II.A.1 of this Permit, to guarantee closure of the Existing Wells authorized by this Permit, in the amount of: \$630,000.
- b. For each Existing Well authorized by this Permit, the Permittee shall review and update, if needed, the financial assurance mechanism annually; a description of that review and any updates shall be set forth in the Quarterly Report due on April 30 of each year. At its discretion, and upon written request, EPA may require the Permittee to change to an alternate method of financial assurance. Any such change must be approved in writing by EPA prior to the change.
- c. EPA may periodically require the Permittee to update the estimated Plugging and Abandonment Plan (see Appendix F) and/or the cost associated with it, and the Permittee shall make such an adjustment within sixty (60) days of notice from EPA. Alternately, EPA may independently adjust the required financial assurance amount, as warranted.

2. Failure of Financial Assurance

The Permittee must notify EPA of the insolvency of a financial institution supporting the financial assurance as soon as possible, but no later than ten (10) days after the Permittee becomes aware of the insolvency. The Permittee shall submit to EPA a revised and/or new instrument of financial assurance, consistent with the terms of this Permit, within sixty (60) days after any of the following events occur:

- a. The institution issuing the bond or other financial instrument files for bankruptcy;

- b. The authority of the trustee institution to act as trustee, or the authority of the institution issuing the financial instrument, is suspended or revoked; or
- c. The institution issuing the financial instrument lets it lapse or decides not to extend it.

Failure to submit acceptable financial assurance may result in the termination of this Permit pursuant to 40 CFR § 144.40(a)(1).

3. Insolvency of Owner or Operator

An owner or operator must notify EPA by certified mail of the commencement of voluntary or involuntary proceedings under U.S. Code Title 11 (Bankruptcy), naming the owner or operator as debtor, within ten (10) business days after such an event occurs. A guarantor of a corporate guarantee must make such a notification if he/she is named as debtor, as required under the terms of the guarantee.

H. DURATION OF PERMIT

This Permit and the authorization to inject are issued for a period of ten (10) years unless terminated under the conditions set forth in Section III.B.1 or administratively extended under the conditions set forth in Section III.E.12.

PART III. GENERAL PERMIT CONDITIONS

A. EFFECT OF PERMIT

The Permittee is allowed to engage in underground injection well construction and operation in accordance with the conditions of this Permit. The Permittee shall not construct, operate, maintain, convert, plug, abandon, or conduct any injection activity not otherwise allowed by this Permit, nor conduct any activity in a manner that allows the movement of fluid containing any contaminant into USDWs, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 142 or may otherwise adversely affect the health of persons.

No injection fluids are allowed to migrate to any nearby oilfield production wells. Further, this Permit requires systematic and predictive documentation over the EHP Facility's operational life to ensure that no injection fluids, either presently or in the future, will migrate to oilfield or geothermal production wells.

Any underground injection activity not specifically authorized in this Permit is prohibited (40 CFR § 144.11). The Permittee must comply with all applicable provisions of the Safe Drinking Water Act (SDWA) and 40 CFR Parts 124, 144, 145, 146, 147 and 148. Such compliance does not constitute a defense to any action brought under Section 1431 of the SDWA, 42 U.S.C. § 300(i), or any other common law, statute, or regulation other than Part C of the SDWA. Issuance of this Permit does not convey property rights of any sort or any exclusive privilege, nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Nothing in this Permit shall be construed to relieve the Permittee of any duties under all applicable, including future, laws or regulations.

B. PERMIT ACTIONS

1. Modification, Revocation and Reissuance, or Termination

EPA may, for cause or upon request from the Permittee, modify, revoke and reissue, or terminate this Permit in accordance with 40 CFR §§ 124.5, 144.12, 144.39, 144.40, and 144.51(f). The Permit is also subject to minor modifications for cause as specified in 40 CFR § 144.41. The filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated non-compliance by the Permittee, does not stay the applicability or enforceability of any permit condition. EPA may also modify, revoke and reissue, or terminate this Permit in accordance with any amendments to the SDWA if the amendments have applicability to this Permit.

2. Transfers

This Permit is not transferable to any person unless notice is first provided to EPA and the Permittee complies with requirements of 40 CFR § 144.38. *See also* 40 CFR § 144.51(1)(3). EPA may require modification or revocation and reissuance of the Permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the SDWA.

C. SEVERABILITY

The provisions of this Permit are severable, and if any provision of this Permit or the application of any provision of this Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with 40 CFR §§ 2 and 144.5, any information submitted to EPA pursuant to this Permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the procedures contained in 40 CFR § 2 (Public Information). Claims of confidentiality for the following information will be denied:

1. Name and address of the Permittee; or
2. Information dealing with the existence, absence, or level of contaminants in drinking water.

E. GENERAL DUTIES AND REQUIREMENTS

The provisions of 40 CFR § 144.51 are incorporated by reference into this Permit, except as modified by specific provisions in this Permit. In addition, the following general duties and requirements apply to this Permit and the Permittee.

1. Duty to Comply

The Permittee shall comply with all applicable UIC Program regulations and all conditions of this Permit, except to the extent and for the duration such non-compliance is authorized by an emergency permit issued in accordance with 40 CFR § 144.34. Any permit non-compliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, or modification, or denial of a permit renewal application. Such non-compliance may also be grounds for enforcement action under the Resource Conservation and Recovery Act (RCRA).

2. Penalties for Violations of Permit Conditions

Any person who violates a permit requirement is subject to civil penalties, fines, and other enforcement action under the SDWA and may also be subject to enforcement actions pursuant to RCRA or other actionable authorities. Any person who willfully violates a permit condition may be subject to criminal prosecution.

3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit.

4. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize and correct any adverse impact on the environment resulting from non-compliance with this Permit.

5. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit.

6. Property Rights

This Permit does not convey any property rights of any sort, or any exclusive privilege.

7. Duty to Provide Information

The Permittee shall furnish to EPA, within a time specified, any information which EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to EPA, upon request, copies of records required to be kept by this Permit.

8. Inspection and Entry

The Permittee shall allow EPA, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

- a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Permit;
- b. Have access to and copy, at reasonable times, any records that are kept under the conditions of this Permit;
- c. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and
- d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the SDWA, any substances or parameters at any location.

9. Submittal Requirements

The Permittee shall follow the procedures set forth below for all submittals made to EPA under this Permit, including all notices and reports:

- a. All submittals to EPA shall be signed and certified by a responsible corporate officer or duly authorized representative consistent with the requirements of 40 CFR §§ 122.22, 144.32, and 144.51(k).
- b. Unless otherwise required by this Permit or rule, all submissions (including correspondence, reports, records and notifications) required under this Permit shall be in writing and mailed first class mail to the following address:

U.S. Environmental Protection Agency, Region 9
Water Division
UIC Program
Groundwater Protection Section (WTR-4-2)
75 Hawthorne St.
San Francisco, CA 94105-3901

and by e-mail to: albright.david@epa.gov.

- c. The compliance date for submittal of a report is the day it is mailed.

10. Additional Reporting Requirements

a. Planned Changes

The Permittee shall give notice to EPA as soon as possible of any planned physical alterations or additions to the permitted facility.

b. Anticipated Non-compliance

The Permittee shall give advance notice to EPA of any planned changes in the permitted facility or activity which may result in non-compliance with permit requirements.

c. Compliance Schedules

Reports of compliance or non-compliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Permit shall be submitted to EPA no later than thirty (30) days following each schedule date.

d. Monitoring Reports

Monitoring results shall be reported at the intervals specified elsewhere in this Permit.

e. Twenty-four Hour Reporting

i. The Permittee shall report to EPA any non-compliance which may endanger health or the environment, including:

(a) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an USDW; or

(b) Any non-compliance with a permit condition, or malfunction of the injection system, which may allow the movement of fluid containing any contaminant into a USDW, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 142 or may otherwise adversely affect the health of persons.

ii. Any information shall be provided orally within twenty-four (24) hours from the time the Permittee becomes aware of the circumstances. A written submission of all non-compliance as

described in Section III.E.10.e.i., above, shall also be provided to EPA within five (5) days of the time the Permittee becomes aware of the circumstances. The written submission shall contain: a description of the non-compliance and its cause; the period of non-compliance, including exact dates and times; if the non-compliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the non-compliance.

f. Other Non-compliance

At the time monitoring reports are submitted, the Permittee shall report in writing all other instances of non-compliance not otherwise reported pursuant to other reporting requirements outlined in this Permit. The Permittee shall submit the information listed in Section III.E.10.d.

g. Other Information

If the Permittee becomes aware that it failed to submit all relevant facts in the permit application, or submitted incorrect information in the permit application or in any report to EPA, the Permittee shall submit such facts or information within two (2) weeks of the time such facts or information becomes known.

11. Requirements Prior to Commencing Injection, Plugging and Abandonment Report, Duty to Establish and Maintain Mechanical Integrity

The Permittee shall comply with all applicable requirements set forth at 40 CFR §§ 144.51(m)-(q) and as outlined throughout this Permit.

12. Continuation of Expiring Permit

a. Duty to Re-apply

If the Permittee wishes to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittee must submit a complete application to EPA for a new permit at least three hundred sixty five (365) days before this Permit expires.

b. Permit Extensions

The conditions and requirements of an expired permit continue in force and effect in accordance with 5 U.S.C. § 558(c) until the effective date of a new permit, if:

- i. The Permittee has submitted a timely and complete application for a new permit; and
- ii. EPA, through no fault of the Permittee, does not issue a new permit with an effective date on or before the expiration date of the previous permit.

13. Records of Permit Application

The Permittee shall maintain records of all data required to complete the permit application and any supplemental information submitted with the permit application.

14. Availability of Reports

All reports prepared in accordance with the conditions of this Permit shall be available for public inspection at appropriate offices of the EPA. Permit applications, permits, and well operation data shall not be considered confidential.