Appendix 2 – Permit Templates

UNDERGROUND INJECTION CONTROL PROGRAM

PERMIT to Construct and Inject

Class I NON-HAZARDOUS Injection Wells

Permit No. UIC-AZI-FY22-#

[PROJECT NAME] Project

[COUNTY NAME] County, Arizona

Issued to:

[COMPANY NAME]
[ADDRESS LINE 1]
ADDRESS LINE 2
ADDRESS LINE 3]

AUTHORIZING SIGNATURE

_____

[Name of Director], Director

Water Quality Division

Arizona Department of Environmental Quality

Signed this ____ day of _____, 20_____

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PART I. AUTHORIZATION TO CONSTRUCT AND INJECT

Pursuant to the Underground Injection Control regulations of the Arizona Department of Environmental Quality codified at Title 18 of the Arizona Administrative Code, Chapter 9, Article 6

[COMPANY NAME]
[ADDRESS LINE 1
LINE 2
LINE3]

is hereby authorized, contingent upon Permit conditions, to construct and operate a Class I injection well facility used to dispose of non-hazardous waste generated by the Permittee's facility [for non-commercial facilities DURING THE MANUFACTURE OF XXX; for commercial facilities AND FROM OTHER SOURCES] at the [PROJECT NAME]. The Project is in [PROJECT LOCATION], Arizona, approximately [DISTANCE AND DIRECTION TO NEAREST LANDMARK], as depicted in Attachment A. The location is [LOCATION DESCRIPTION(Include Section, Township, Range, with latitude/longitude)]. The well [IS/WILL BE] located [DESCRIBE LOCATION].

The injection zone is within the [FORMATION NAME] Formation at the [FOR WELLS NOT YET DRILLED USE APPROXIMATE] depths of [NUMBER] feet to [NUMBER] feet below ground level. The authorized injection interval is within the [FORMATION NAME] Formation at the [FOR WELLS NOT YET DRILLED USE APPROXIMATE] depths of [NUMBER] to [NUMBER] feet below ground level.

[DESCIBE INJECTATE AND SOURCE OR PRODUCTION PROCESS] [INDICATE IF AQUIFER EXEMPTION IS REQUIRED OR HAS BEEN APPROVED]

For the permitted wells within the Area of Review (AOR), ADEQ will issue authorization to drill and construct only after requirements of Financial Responsibility in Part II, Section L of this Permit have been met. ADEQ will grant authorization to inject only after the requirements of Part II, Sections B, C and D of this Permit have been met. Operation of injection Well [WELL ID] will be limited to a maximum volume of [SPECIFY QUANTITY] and pressure of [SPECIFY QUANTITY]. All conditions set forth herein refer to Title 18, Chapter 9, Article 6 of the Arizona Administrative Code (A.A.C.) which are regulations in effect on the date that this Permit is effective.

This Permit consists of [NUMBER] pages plus Attachments, and includes all items listed in the Table of Contents. Further, it is based upon representations made by [COMPANY NAME] (the Permittee) and on other information contained in the administrative record. It is the responsibility of the Permittee to read, understand, and comply with all terms and conditions of this Permit.

This Permit and the authorization to construct, operate, and inject are issued for a period to include the approximate [NUMBER]-year Project operation unless terminated under the conditions set forth in Part III, Section B.1 of this Permit. This Permit and authorization to inject

shall also include any additional post-closure monitoring beyond [SPECIFY DURATION] years, if deemed necessary by ADEQ.

This Permit is issued on [DATE] and becomes effective on [DATE]. This Permit is issued for a period of xx years unless the Permit is terminated under the conditions set forth in Part III.B.1. or administratively extended under the conditions set forth in Part III.E.

Signed by

_____

[Name of Director], Director Water Quality Division
Arizona Department of Environmental Quality

PART II. SPECIFIC PERMIT CONDITIONS

A. REQUIREMENTS PRIOR TO DRILLING, TESTING, CONSTRUCTING, OR OPERATING

1. **Financial Assurance**
   The Permittee shall supply evidence of financial assurance prior to commencing any well drilling and construction, in accordance with Section G of this part.

2. **Field Demonstration Submittal, Notification, and Reporting**

   a. Prior to each demonstration or test required in this Permit, the Permittee shall submit plans and specifications for procedures to the ADEQ for approval 90 days prior to demonstration or testing activities. No demonstration or test in these sections may proceed without prior written approval from ADEQ.

   b. The Permittee must notify ADEQ at least thirty (30) days prior to performing any required field demonstrations or test, after ADEQ approves the plans/procedures for testing, in order to allow ADEQ to arrange to witness if so elected.

   c. The Permittee shall submit results of each demonstration or test required in Part II of this Permit to ADEQ within thirty (30) days of completion, unless otherwise noted.

[INCLUDE SECTION ON AQUIFER EXEMPTION IF APPLICABLE – SEE PART II.B IN CLASS III PERMIT TEMPLATE]

B. CONDITIONS FOR EXISTING WELLS AND PROPOSED WELLS

1. **Surface Location**
   [DESCRIBE LOCATION OF ANY EXISTING AND/OR PROPOSED WELLS]

2. **Existing Well Construction Details**
   A well schematic for the Well(s) is contained in Attachment B of this Permit. The Permittee shall at all times maintain the well consistent with this well schematic.

3. **Proposed Well Construction Details**
   The Permittee shall submit an updated Well Schematic for the Proposed Well and must receive written ADEQ approval prior to commencing drilling and construction of the well.

4. **Future Well Construction Beyond the Existing Well Identified in this Permit**
Prior to drilling any new injection well(s) not covered by this Permit, the Permittee must submit to ADEQ, for review and approval, a Permit application with detailed construction plans and procedures, including proposed field coordinates (Section, Township, Range, with latitude/longitude) for the surface and bottom hole locations of the proposed well(s). The Permittee shall also provide the drilling program details, and the distance between all wells, and any justification for the proposed separation distance between the wells, both at the surface and at the true vertical depth of the top of the injection interval.

5. **Injection Formation Testing**

a. Step-Rate Test (SRT)

i. Within ninety (90) days after the completion of the injection well, the Permittee shall conduct an SRT on the well to establish the maximum allowable surface injection pressure (MAIP). The report shall be submitted to ADEQ within sixty (60) days of test completion.

ii. Refer to Attachment F – Step Rate Test Procedure Guidelines. Refer also to Society of Petroleum Engineers (SPE) Paper #16798 for test design and analysis guidance.

iii. Injection into the well as proposed in the approved SRT procedure, which may include injecting above fracture pressure, will be temporarily authorized only until such time that ADEQ approves final injection requirements.

b. Pressure Fall Off Test (FOT)

i. Within one hundred eighty (180) days after ADEQ approves the completed SRT and establishes an MAIP for the well pursuant to Part II.D.3., the Permittee shall conduct an initial FOT to determine and monitor formation characteristics. A FOT shall be performed approximately six (6) months after the permit becomes effective, if an FOT has not been conducted within the last six (6) months under the prior permit. If an FOT has been performed within six (6) months under the prior permit, the next FOT shall be performed one year after the prior FOT. 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 after a radial flow regime has been established at an injection rate which is representative of the wastewater contribution to the well.

ii. The Permittee shall submit to ADEQ for review and approval a detailed plan for the FOT that is developed in accordance with Attachment E. Once ADEQ approves in writing the test plan, the Permittee may schedule the FOT. The final FOT report shall be submitted to ADEQ within sixty (60) days of test completion.

iii. The Permittee shall use the test results to calculate the Zone of Endangering Influence (ZEI), consistent with procedures set forth at A.A.C. R18-9-B612, and to evaluate whether any additional corrective action will be required (refer to Part II.C.). The Permittee shall include a summary of the ZEI recalculation with the FOT report.

iv. After the initial FOT, the Permittee shall conduct an annual FOT to monitor formation characteristics. The Permittee may conduct the annual FOT in conjunction with the annual External Mechanical Integrity Test demonstration, as required by Part II.D.2.a.i.i.i.

v. The Permittee shall create a plot/graph of the latest static reservoir pressure of the injection zone and its cumulative behavior over time, starting with the FOT conducted after the initial FOT; the plot shall be included with the annual FOT report each year.

c. Formation Testing Program
In addition to Part II.B.5.a. and b., above, the Permittee shall submit a detailed proposed formation testing program for each well for ADEQ review. The Permittee shall not commence construction of the Proposed Well until ADEQ has approved the proposed formation testing program.

6. Injection Interval

The [PROPOSED OR EXISTING WELLS] [ARE CURRENTLY/ WILL BE] injecting into the [DESCRIBE FORMATION] within the [NAME OF FACILITY]. Injection is only permitted into [FORMATION NAME] Formation within the depth range as depicted in the as-built diagrams in Attachment B (i.e., at a depth of approximately [NUMBER] to [NUMBER] feet bgs).

7. Monitoring Devices

The Permittee shall install and maintain in good operating condition at all times during the operation of each well, the following monitoring devices:

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 ADEQ 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.

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.

8. Proposed Changes and Workovers

a. The Permittee shall give advance notice to ADEQ as soon as possible, pursuant to and in accordance with A.A.C. R18-9-D635, of any planned physical alterations or additions to each well, 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, require prior written approval by ADEQ and may require a Permit modification under the requirements of A.A.C. R18-9-C632. 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 ADEQ as minor permit modifications consistent with A.A.C. R18-9-C633.

b. The Permittee shall provide all records of well workovers, logging, or other subsequent test data to ADEQ 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 contained in Attachment C.

d. The Permittee shall perform a Mechanical Integrity Test (MIT), using the procedures set forth in Part II.D.1 and Part II.D.2.a. within thirty (30) days of completion of workovers or alterations and prior to resuming injection activities. The Permittee shall provide results of the MIT to ADEQ within sixty (60) days of completion.

9. Testing during Drilling and Construction

a. The Permittee shall include logs and other tests conducted during drilling and construction including, at a minimum, deviation checks, casing logs, and injection formation tests as outlined in A.A.C. R18-9-E640.

b. The Permittee shall conduct open hole logs over the entire open hole sequence below the conductor casing.

c. The Permittee shall conduct formation evaluation logs and tests and shall provide and use those results to estimate and report values for porosity, permeability, compressibility, static formation pressure, effective thickness, lithology, and rock mechanical properties for both the injection and confining zones identified within the permitted geological sequence.

d. The Permittee shall collect and analyze full-diameter cores from the overlying confining unit [NAME OF FORMATION] and within the [NAME OF FORMATION] Formation during drilling of each proposed well.

e. Before surface, intermediate, and long string casings are set, the Permittee shall run dual induction/spontaneous potential/gamma ray/caliper (DIL/SP/GR/CAL) logs over the course of the entire open hole sequence after the well is drilled to each respective terminal depth. After each casing is set and cementing is completed, the Permittee shall conduct a cement bond evaluation over the course of the entire cased hole sequence. The cement bond evaluation shall enable the analysis of bond between cement and casing as well as any cement channeling in the borehole annulus.

f. During construction of each well, the Permittee shall obtain information relating to ground water at the site and submit to ADEQ. This information shall include a direct Total Dissolved Solids analysis of the target injection formation water to demonstrate the presence and characteristics of, or the lack thereof, any Underground Sources of Drinking Water (USDWs, as defined in A.A.C. R18-9-A605.

C. CORRECTIVE ACTION

The Permittee is required to conduct corrective actions as mandated in R18-9-D639, prior to ADEQ granting authorization to inject under this Permit.

1. Annual Zone of Endangering Influence Review

The Permittee shall annually review the ZEI calculation based on any new data obtained from the FOT and static reservoir pressure observations required by Part II.B.7.b. The Permittee shall provide to ADEQ 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.

2. Implementation of Corrective Action

a. If any wells requiring corrective action, in accordance with A.A.C. R18-9- D639, are found within the modified ZEI referenced in Part II.C.1., above, a list of the wells along with their locations and construction data shall be provided to ADEQ within thirty (30) days of their identification. ADEQ will determine whether corrective action is required and no corrective action shall be performed without authorization.

b. Corrective action may be required after permit issuance to address any wells within the area of review that may allow migration of fluids into underground sources of drinking water. ADEQ will use the annual FOT results and re-calculation of the ZEI, along with USDW monitoring results from the monitoring well, as described in Section E, Monitoring, Recordkeeping, and Reporting of Results to determine the potential need for any future corrective action.

c. The Permittee shall submit a plan for approval by ADEQ to re-enter, plug, and abandon the wells listed in Part II.C.2.a., above, in a way that prevents the migration of fluids into any USDWs. The Permittee may submit an alternative plan to address the potential for fluid migration in any of these wells to ADEQ.

d. The Permittee may not commence corrective action activities without prior written approval from ADEQ.

D. WELL OPERATION

1. Required Demonstrations

a. Mechanical Integrity

i. The Permittee shall propose a schedule to conduct a MIT to demonstrate each well authorized by this Permit has mechanical integrity consistent with A.A.C. R18-9-B613 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 previous permit. The Permittee shall demonstrate that there are no significant leaks in the casing and tubing (internal mechanical integrity) and that there is not significant fluid movement into or between USDWs 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 the each well authorized by this Permit, as listed in Section II.D.5.a, is unchanged. If a change is identified, a new determination must be performed within sixty (60) days of the effective date of this Permit. The results of the analysis shall demonstrate that the injectate does not meet the definition of hazardous waste as defined in A.R.S. § 49- 921.

ii. The Permittee shall submit a letter to ADEQ confirming that the "Hazardous Waste Determination" was carried out according to 40 CFR § 262.11 within sixty (60) days of it having been completed for the well.

iii. The Permittee shall perform an additional "Hazardous Waste Determination" whenever there is a process change or a change in fluid chemical constituents or characteristics of the injectate. The Permittee shall also refer to injectate testing requirements set forth in Part II.E.1., below.

2. Mechanical Integrity Testing

a. Mechanical Integrity Tests
Mechanical integrity testing shall conform to the following requirements throughout the life of any injection wells currently or in the future authorized by ADEQ under this Permit and in accordance with the requirements set forth at A.A.C. R18-9- D635.

i. Casing/Tubing Annular Pressure (Internal MIT)

In accordance with the timing requirements defined in Part 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. This test shall be for a minimum of thirty (30) minutes at a pressure equal to or greater than three hundred and fifty (350) pounds per square inch gauge (psig). If greater than the MAIP, it should be no greater than one hundred (100) psig or 10% of the MAIP, whichever is less. A well passes the MIT if there is less than a five (5) percent change in pressure over the thirty (30) minute period. A pressure differential of at least three hundred and fifty (350) psig between the tubing and annular pressures shall be maintained throughout the MIT. This test shall be performed on each well within five years of the previous Internal MIT and once every five (5) years thereafter.

Detailed plans for conducting the Internal MIT must be submitted to ADEQ for review and approval. Once approved, the Permittee may schedule the Internal MIT, providing ADEQ at least thirty (30) days' notice before the Internal MIT is conducted. The final test report shall be submitted to ADEQ 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. The average, maximum, and minimum monthly results shall be included in the next Quarterly Report submitted to ADEQ pursuant to Part II.E.5.b., along with any additional records or data requested by ADEQ regarding the continuous monitoring data described in this Section.

iii. Injection Profile Survey (External MIT)

The Permittee shall conduct a demonstration that the injectate is confined to the proper zone and submit the results of the demonstration to ADEQ for approval.

This demonstration shall consist of temperature and radioactive tracer surveys, and top perforation and packer checks (as specified in Attachment D) or another diagnostic tool or procedure as approved by ADEQ.

Detailed plans for conducting the external MIT must be submitted to ADEQ for review and approval. Once approved, the Permittee may schedule the External MIT, providing ADEQ at least thirty (30) days' notice before the External MIT is conducted. Results of the External MITs shall be submitted to ADEQ in the quarterly reports.

iv. Cement Evaluation Analysis

After installing and cementing casing, conducting a cement squeeze job, or any well cement repair for any approved injection well under this Permit, the Permittee shall submit to ADEQ cementing records and cement evaluation logs that demonstrate isolation of the injection interval and other formations from underground sources of drinking water. Surface casing, intermediate, and long string casing well bore annuli shall be cemented to ground surface. Analysis shall include cement evaluation

performed after each casing is set and cemented. Cement evaluation must assess the following four objectives:

a. Bond between casing and cement;

b. Bond between cement and formation;

c. Detection and assessment of any micro-annulus (small gaps between casing and cement); and

d. Identification of any cement channeling in the borehole annulus.

If the cement bond logs indicate a lack of sufficient cement or poor bonding at the base of USDWs and/or other critical intervals in any approved injection well under this Permit, remedial cementing may be required to place additional cement in the casing/wellbore annulus.

The Permittee may not commence or recommence injection on the well until it has received written notice from ADEQ that the cement valuation/demonstration is satisfactory.

After any repair that requires removing the tubing and packer from the well the Permittee shall conduct a casing evaluation log. A copy of the casing evaluation log shall be provided to ADEQ within sixty (60) days.

b. Schedule for MITs
ADEQ may require that an Internal and/or External MIT be conducted within thirty (30) days of a written request from ADEQ during the permitted life of any well authorized by this Permit. The Permittee shall also arrange and conduct MITs according to the following requirements and schedule:

i. Within thirty (30) days from completion of any workover operation where well integrity is compromised, an Internal MIT shall be conducted and submitted to ADEQ for approval to verify that the well has mechanical integrity. Prior to this field demonstration, the Permittee shall submit testing plans to ADEQ, as described in Part II.A.2.

ii. At least annually, an injection profile survey External MIT shall be conducted in accordance with A.A.C. R18-9-B613 and Part II.D.2.a.iii.

iii. At least once every five (5) years for each operating well authorized under this Permit, an Internal MIT shall be conducted in accordance with A.A.C. R18-9-B613 and Part 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 of any well authorized by this Permit, the Permittee shall notify ADEQ 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.

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 not until ADEQ has provided written approval prior to the recommencing of 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 ADEQ that the demonstration of mechanical integrity is satisfactory.

3. Injection Pressure Limitation
For any injection wells authorized pursuant to this Permit:

a. The maximum injection pressure (MAIP) measured at the wellhead shall not exceed [NUMBER] psig for injection into the [FORMATION NAME] Formation.

b. The Permittee may request a change in the maximum injection pressure allowed under Part II.D.3. Any such request shall be made in writing and justified to ADEQ with the results of a SRT. If ADEQ approves the change, the proposed MAIP would be added to the Permit as an attachment, becoming the enforceable MAIP.

c. 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. cause the movement of injection or formation fluids into or between USDWs, or
iii. allow injection fluids to migrate to any oil, gas, or geothermal field operations or production wells.

4. Injection Volume (Rate) Limitation

a. For any injection wells authorized pursuant to this Permit:

b. The injection rate shall not exceed [NUMBER] gallons per month or [NUMBER] gallons per day. This rate will be subject to an annual review based on the annual ZEI determinations as described in Part II.C.1.

c. The Permittee may request a change in the maximum rate allowed in Part II.D.4.a., above. Any such request shall be made in writing, along with a justification for the proposed increase, to ADEQ for review and approval.

a.

d. Should any increase in injection rate be requested, the Permittee shall demonstrate to the satisfaction of ADEQ that the proposed increase will not interfere with the operation of the 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.

b.

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

c.

5. Injection Fluid Limitation

a. This Permit authorizes the following injection fluids into the [Well ID]: [DESCRIBE FLUID AND SOURCES]. Fluids from other sources or any other types of waste fluids are prohibited from injection at this Facility.

b. The Permittee shall not inject any hazardous waste, as defined by A.R.S. § 49-921, at any time.

c. Injection fluids shall be limited to those authorized by this Permit, which are those fluids produced by the Permittee and authorized sources described in Part II.D.5.a. and Part II.D.5.b., above.

d. Any well stimulation or treatment procedure (such as acidizing, etc.) performed at the discretion of the Permittee shall be proposed and submitted to ADEQ for approval. If approval is granted, notification to ADEQ 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 ADEQ approval after the effective date of this Permit. If the standard operating procedure plan is approved by ADEQ in writing, the Permittee shall notify ADEQ within fifteen (15) days of the proposed well

stimulation or treatment procedure, provided the procedure does not deviate in any way from the ADEQ-approved plan.

6. Tubing/Casing Annulus Requirements

For any injection wells authorized pursuant to this Permit:

a. The Permittee shall use and maintain corrosion-inhibiting annular fluid during well operation. The annular fluid used in the [NAME OF WELL] is a [DESCRIBE FLUID] with a density of [NUMBER] pounds per gallon (ppg).

b. If the historic cyclic range of annular pressure fluctuation is not already known, then within the first three (3) months of normal injection operations after the effective date of this Permit, the Permittee shall monitor and record to determine that range. The pressure fluctuation data shall be submitted with the first Quarterly Report due after the effective date of the Permit.

c. Any annular pressure measured outside of the established normal pressure range, regardless of whether it otherwise meets the requirements of this Permit, shall be reported orally to ADEQ 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 ADEQ within sixty (60) days of receipt of a written request from ADEQ.

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. Test results shall be submitted by the Permittee to ADEQ on a quarterly basis.

Samples and measurements shall be representative of the monitored activity. The Permittee shall utilize applicable analytical methods described in Table I of 40 CFR 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 ADEQ or additional approved methods or updates to the methods become available.

Summary of Acceptable Analytical Methods

a. Inorganic Constituents –USEPA Method 300.0, Part A for Major Anions and USEPA Method 200.8 for Cations and Trace Metals.

b. Solids - Standard Methods 2540C and 2540D for Total Dissolved Solids (TDS) and Total Suspended Solids (TSS).

c. General and Physical Parameters – appropriate USEPA methods for Temperature, Turbidity, pH, Conductivity, Hardness, Specific Gravity, Alkalinity, and Biological Oxygen Demand (BOD); and Density and Viscosity (See EPA Bulletin 712-C-96-032) under standard conditions.

d. Volatile Organic Compounds (VOCs) - USEPA Method 8260D.

e. Semi-Volatile Organic Compounds (SVOCs) - USEPA Method 8270E.

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 field measurements;

b. Name(s) of individual(s) who performed sampling or measurement;

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 well authorized by this Permit, 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) gallon; pressure must be recorded to a resolution of one tenth (0.1) psig; injection fluid temperature must be recorded to a resolution of one tenth (0.1) degree Fahrenheit). Exact dates and times of measurements, when taken, must be recorded and submitted. The well shall have a dedicated flow meter, installed at or near the wellhead 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 sixty (60) seconds:

Monitoring Parameter	**Frequency**	**Instrument**
Injection rate (gpm)	Continuous	Digital Recorder
Daily injection volume (gallons)	Daily	Digital Totalizer
Total cumulative injection volume (gallons)	Continuous	Digital Totalizer
Well head injection pressure (psig)	Continuous	Digital Recorder
Annular pressure (psig)	Continuous	Digital Recorder
Injection fluid temperature (degrees F)	Continuous	Digital Recorder

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:

Date	**Time**	**Inj. Press (psig)**	**Inj. Rate (gpm)**
06/27/09	16:33:16	1525.6	65.8
06/27/09	17:33:16	1525.4	66.3

[DESCRIBE DATA SUBMISSION REQUIREMENTS, CONSIDER THEFOLLOWING] 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

All monitoring and recording equipment shall be calibrated and maintained on a regular basis to ensure proper working order.

4. Recordkeeping

a. The Permittee shall retain the following records and make them available at all times for examination by an ADEQ inspector:

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; and

iii. Results of the injectate "Hazardous Waste Determination" according to 40 CFR § 262.11 (See Part II.D.1.b.). Results shall demonstrate that the injectate does not meet the definition of hazardous waste as defined in A.R.S. § 49-921; and

iv. Records and results of MITs, FOTs, and any other tests and logs required by ADEQ, and any well work and workovers completed.

b. The Permittee shall maintain copies (or originals) of all records described in Part II.E.4.a.i. through iv., above, during the operating life of the well and shall make such records available at all times for inspection at the facility. The Permittee shall only discard the records described in Part II.E.4.a.i. through iv., if written approval from ADEQ to discard the records is obtained.

c. Except for information determined to be confidential under A.A.C. R18-9-A603, all permit applications, permits, reports, and well operation data prepared in accordance with the conditions of this Permit shall be available for public inspection at appropriate offices of ADEQ.

5. Reporting of Results

a. The Permittee shall submit to ADEQ Quarterly Reports containing, at minimum, the following information gathered during the Reporting Period identified in this Part (below):

i. Injection fluid characteristics for parameters specified in Part II.E.1.a.;

ii. When appropriate, Injectate Hazardous Waste Determination according to Part II.D.1.b.;

iii. The results of any additional MITs, FOTs, logging or other tests, as required by ADEQ;

iv. Any pressure tests, as required by Part II.D.2.a.i.;

v. Shut-in static reservoir pressure cumulative behavior plot of the injection zone;

vi. Hourly and daily values, submitted in electronic format, for the continuously monitored parameters specified for the injection wells in Part II.E.3.a.; and

vii. Monthly cumulative volumes, as well as monthly average, minimum and maximum values for the continuously monitored rate, pressure and temperature parameters specified for the injection well in Part II.E.3.a.,unless more detailed records are requested by ADEQ.

b. Quarterly Reports, with the applicable Attachment C forms, shall be submitted for the reporting periods by the respective due dates as listed below:

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

c. For the January Quarterly Report, the Permittee shall also include in that Report the following information collected during the prior year covering January through December:

i. Annual reporting summary (7520-8 in Attachment C);

ii. Annual injection profile survey results as required in PartII.D.2.a.iii.;

iii. Annual ZEI recalculation as required in Part II.C.1.; and

iv. A narrative description of all non-compliance that occurred during the past year.

d. In addition to meeting the submittal requirements of Part III.E.9., digital e- copies of all Quarterly Reports shall also be provided to the following:

Arizona Department of Environmental Quality
Water Quality Division, Groundwater, UIC Program
1110 West Washington Street
Phoenix, AZ 85007

F. PLUGGING AND ABANDONMENT

1. Notice of Plugging and Abandonment
The Permittee shall notify ADEQ no less than sixty (60) days before abandonment of any well authorized by this Permit and shall not perform the plugging and abandonment activities until the Permittee receives written notice of approval by ADEQ.

2. Plugging and Abandonment Plans
The Permittee shall plug and abandon the well as provided by the Plugging and Abandonment Plan submitted by the Permittee (see Attachment G) and approved by ADEQ, consistent with A.A.C. R18-9-B614. Upon written notice to the Permittee, ADEQ 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 ADEQ requirements for construction or mechanical integrity, or (c) otherwise at ADEQ's discretion. Upon written notice, ADEQ may periodically require the Permittee to estimate and to update the estimated plugging cost. To determine the appropriate level of financial assurance for the Plugging and Abandonment Plan, the Permittee shall obtain a cost estimate from an independent third-party firm in the business of plugging wells. The estimate shall include the costs of all the materials and activities necessary to pay an independent third-party contractor to completely plug and abandon the well 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 well 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 Attachment G, unless the Permittee:

a. Provides notice to ADEQ of an intent to re-activate the well;

b. Has demonstrated that the well(s) will be used in the future;

c. Has described actions or procedures, satisfactory to ADEQ and approved in writing by ADEQ, 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 and every two (2) years thereafter while the well remains inactive, demonstrating no loss of mechanical integrity. Note that the Permittee must restore mechanical integrity of the inactive well if the well fails the MIT.

4. Plugging and Abandonment Report

Within sixty (60) days after plugging any well, or at the time of the next Quarterly Report (whichever comes first), the Permittee shall submit a report on Form 7520-19, provided in Attachment C, as well as the detailed procedural activity of engineer's log and daily rig log to ADEQ. 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 Plans contained in Attachment G; or

b. Where actual plugging differed from the Plugging and Abandonment Plans contained in Attachment G, a statement specifying and justifying the different procedures followed.

G. FINANCIAL ASSURANCE REQUIREMENTS

1. Demonstration of Financial Responsibility

The Permittee shall demonstrate and maintain financial responsibility and resources sufficient to close, plug, and abandon any existing or future- permitted underground injection operations approved pursuant to this Permit, as provided in the Plugging and Abandonment Plan contained in Attachment G and consistent with A.A.C. R18-9-D636(A)(6).

a. The Permittee shall post an approved financial instrument such as a surety bond or other financial assurance in the amount of [SPECIFY $ AMOUNT] to guarantee groundwater monitoring and plugging and abandonment activities for closure and post-closure. Authority to construct, inject, and operate the wells under the authority of this Permit will be granted only after the financial instrument has been secured and approved by ADEQ.

b. The level and mechanism of financial responsibility shall be reviewed and updated annually, upon request of ADEQ. The Permittee shall provide ADEQ the financial responsibility update within sixty (60) days of receipt of a written request from ADEQ. The Permittee may be required to change to an alternate method of demonstrating financial responsibility. Any such change must be approved in writing by ADEQ prior to the change.

c. ADEQ may require the Permittee to estimate and to update the estimated plugging, and/or post-closure activity costs periodically. Such estimates shall be based upon costs that a third party would incur to carry out the required restoration activities, properly plug and abandon the wells, and perform post-closure monitoring activities, including materials, equipment, mud and disposal costs, and labor with appropriate contingencies.

2. Insolvency of Financial Institution

The Permittee shall submit an alternate instrument of financial responsibility acceptable to ADEQ within sixty (60) days after either of the following events occurs:

a. The institution issuing any bond or other financial instrument that is secured to demonstrate financial responsibility in accordance with Part II, Section G.1. of this Permit files for bankruptcy; or

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.

c. The institution issuing the financial instrument lets it lapse or decides not to extend it.

Failure to submit an acceptable financial demonstration may result in the termination of this Permit pursuant to A.A.C. R18-9-C634(A)(1).

3. Insolvency of Owner or Operator

The Permittee shall notify ADEQ 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. 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.

4. DURATION OF PERMIT

This Permit and the authorization to inject are issued for a period of [NUMBER] years unless terminated under the conditions set forth in Part III.B.1. or administratively extended under the conditions set forth in Part III.E.11.

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 other injection activity in a manner that allows the movement of fluid containing any contaminant (as defined by A.A.C. R18-9-A601) into USDWs (as defined A.A.C R18-9-A601).

Any underground injection activity not specifically authorized in this Permit is prohibited. The Permittee must comply with all applicable provisions of 18 A.A.C. 9, Article 6. 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 laws and regulations.

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

B. PERMIT ACTIONS

1. Modification, Revocation and Reissuance, or Termination

ADEQ may, for cause or upon request from the Permittee, modify, revoke and reissue, or terminate this Permit in accordance with A.A.C. R18-9-C631, C632, and C634. The permit is also subject to minor modifications for causes as specified in A.A.C. R18-9-C633. 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. ADEQ 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 ADEQ and the Permittee complies with requirements of A.A.C. R18-9-C630. ADEQ 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 A.A.C. R18-9-A603, any information submitted to ADEQ 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, ADEQ 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 A.R.S. § 49-205 (Public Information). Claims of confidentiality for the following information will be denied:

a. Name and address of the Permittee, or

b. Information dealing with the existence, absence, or level of contaminants in drinking water.

E. GENERAL DUTIES AND REQUIREMENTS

1. Duty to Comply

The provisions of R18-9-D635 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. The Permittee shall comply with all applicable UIC Program regulations and 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 A.A.C. R18-9-C625. Any permit non-compliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for 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. Any person who willfully violates permit conditions 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 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 ADEQ, within a time specified, any information which ADEQ 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 ADEQ, upon request, copies of records required to be kept by this Permit pursuant to A.A.C. R18-9- D635(A)8.

8. **Inspection and Entry**
   The Permittee shall allow ADEQ, or an authorized representative, upon the presentation of credentials and other documents as may be required pursuant to A.A.C. R18-9-D635(A)9 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. Signatory Requirements

All applications, reports, or other information submitted to ADEQ shall be signed and certified by a responsible corporate officer or duly authorized representative according to A.A.C. R18-9-C617.

10. Additional Reporting Requirements

a. Planned Changes - The Permittee shall give notice to ADEQ as soon as possible of any planned physical alterations or additions to the permitted facility affecting any of the terms and conditions of the permit.

b. Anticipated Non-compliance-The Permittee shall give advance notice to ADEQ 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 ADEQ no later than thirty (30) days following each schedule date.

d. Twenty-four Hour Reporting - The Permittee shall report to ADEQ any non-compliance which may endanger health or the environment. The following Information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances.

i. Any monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW; and

ii. Any non-compliance with a Permit condition, malfunction of the injection system, or loss of mechanical integrity, which may cause fluid migration into or between USDWs.

e. A written submission of all non-compliance shall also be provided to ADEQ 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.

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 ADEQ, the Permittee shall submit such facts or information within two (2) weeks of the time such facts or information becomes known.

11. Continuation of Expiring Permit

a. Duty to Reapply - If ADEQ requires the Permittee to continue an activity regulated by this Permit past the expiration date of this Permit, the Permittee must submit a complete application for a new permit at least one hundred and eighty (180) 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. ADEQ, 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.

UNDERGROUND INJECTION CONTROL PROGRAM

PERMIT to Construct and Inject

Class II Injection Wells

Permit No. UIC-AZII-FY22-#

[PROJECT NAME] Project

[COUNTY NAME] County, Arizona

Issued to:

[PERMITTEE NAME]

[ADDRESS LINE 1]

[ADDRESS LINE 2]

[ADDRESS LINE 3]

AUTHORIZING SIGNATURE

_____

[Name of Director], Director Water Quality Division

Arizona Department of Environmental Quality

Signed this____day of _____, 20___

Table of Contents

PART I. AUTHORIZATION TO CONSTRUCT AND INJECT

Pursuant to the Underground Injection Control regulations of the Arizona Department of Environmental Quality codified at Title 18 of the Arizona Administrative Code, Chapter 9, Article 6

[COMPANY NAME]
[ADDRESS LINE 1]
[LINE 2]
[LINE3]

is hereby authorized, contingent upon Permit conditions, to [construct and] operate [SPECIFY NEW OR EXISTING] Class II [SPECIFY TYPE] injection well facility used to dispose of [SPECIFY FLUID] generated by the Permittee's facility. The Project is in [PROJECT LOCATION], Arizona, approximately [DISTANCE AND DIRECTION TO NEAREST LANDMARK], as depicted in Attachment A. The location is [LOCATION DESCRIPTION (Include Section, Township, Range, with latitude/longitude)]. The well [IS/WILL BE] located [DESCRIBE LOCATION]. The injection zone is within the [FORMATION NAME] Formation at the [FOR WELLS NOT YET DRILLED USE APPROXIMATE] depths of [NUMBER] feet to [NUMBER] feet below ground level. The authorized injection interval is within the [FORMATION NAME] Formation at the [FOR WELLS NOT YET DRILLED USE APPROXIMATE] depths of [NUMBER] to [NUMBER] feet below ground level.

[DESCIBE INJECTATE AND SOURCE OR PRODUCTION PROCESS] [INDICATE IF AQUIFER EXEMPTION IS REQUIRED OR HAS BEEN APPROVED]

For the permitted wells within the area of review (AOR), ADEQ will issue authorization to drill and construct only after requirements of Financial Responsibility in Part II, Section L of this Permit have been met. ADEQ will grant authorization to inject only after the requirements of Part II, Sections B and C of this Permit have been met. Operation of injection [WELL ID] will be limited to a maximum volume of [SPECIFY QUANTITY] and pressure of [SPECIFY QUANTITY]. All conditions set forth herein refer to Title 18, Chapter 9, Article 6 of the Arizona Administrative Code (A.A.C.), which are regulations in effect on the date that this Permit is effective.

This Permit consists of [NUMBER] pages plus Attachments, and includes all items listed in the Table of Contents. Further, it is based upon representations made by [COMPANY NAME] (the Permittee) and on other information contained in the administrative record. It is the responsibility of the Permittee to read, understand, and comply with all terms and conditions of this Permit.

This Permit and the authorization to construct, operate, and inject are issued for a period to include the approximate [NUMBER]-year Project operation unless terminated under the conditions set forth in Part III, Section B.1 of this Permit. This Permit and authorization to inject shall also include any additional post-closure monitoring beyond [NUMBER] years, if deemed necessary by ADEQ.

This Permit is issued on [DATE] and becomes effective on [DATE]. This Permit is issued for a period of xx years unless the Permit is terminated under the conditions set forth in Part III.B.1. or administratively extended under the conditions set forth in Part III.E.

Signed by

_____

[Name of Director], Director Water Quality Division

Arizona Department of Environmental Quality

PART II. SPECIFIC PERMIT CONDITIONS

A. REQUIREMENTS PRIOR TO DRILLING, TESTING, CONSTRUCTING, OR OPERATING

1. **Financial Assurance**
   The Permittee shall supply evidence of financial assurance prior to commencing any well drilling and construction, in accordance with Section F of this part.

2. **Field Demonstration Submittal, Notification, and Reporting**

   a. Prior to each demonstration or test required in this Permit, the Permittee shall submit plans and specifications for procedures to the ADEQ for approval 90 days prior to demonstration or testing activities. No demonstration or test in these sections may proceed without prior written approval from ADEQ.

   b. The Permittee must notify ADEQ at least thirty (30) days prior to performing any required field demonstrations or test, after ADEQ approves the plans/procedures for testing, in order to allow ADEQ to arrange to witness if so elected.

   c. The Permittee shall submit results of each demonstration or test required in Part II of this Permit to ADEQ within thirty (30) days of completion, unless otherwise noted.

   [INCLUDE SECTION ON AQUIFER EXEMPTION IF APPLICABLE – SEE PART II.B IN CLASS III PERMIT TEMPLATE]

B. CONDITIONS FOR EXISTING WELLS AND PROPOSED WELLS

1. **Surface Location**
   [DESCRIBE LOCATION OF EXISTING AND PROPOSED WELLS]

2. **Existing Well Construction Details**
   A well schematic for each well is contained in Attachment B of this Permit. The Permittee shall at all times maintain the well consistent with this well schematic.

3. **Proposed Well Construction Details**
   The Permittee shall submit an updated well schematic for each proposed well and must receive written ADEQ approval prior to commencing drilling and construction of the well.

4. **Confining Zone**
   Notwithstanding any other provision of this Permit, the Permittee shall inject through the injection well only into a formation which is separated from any USDW by a confining zone that is free of known open faults or fractures within the area of review.

5. **Casing and Cementing**
   The Permittee shall case and cement each injection well to prevent the movement of fluids into or between USDWs. The Permittee shall use casing and cement designed for the life expectancy of the wells. The Permittee shall install in each injection well [SPECIFY CASING AND CEMENT PLAN CONSIDER THE FOLLOWING] 7-inch surface casing from the ground surface to a depth of approximately 450 feet, and at least 50 feet below the base of the lowermost USDW, and cement that entire length of casing back to the surface. The Permittee shall isolate the injection zone by placing 2-3/8 inch, long string casing from the surface to the top of the injection zone and cement this casing from the top of the injection zone to a minimum of 100 feet above the injection zone. The Permittee shall complete each injection well with a 1-inch tubing string with packer set inside the 2-3/8 inch long string casing.

6. **Logs and Tests**
   The Permittee shall obtain appropriate logs and perform tests during the drilling and construction or rework of new Class II injection wells. At a minimum deviation checks shall be performed on all holes. [DEPENDING ON AVAILABILITY OF SIMILAR DATA SPECIFY GEOPHYSICALTESTING][CONSIDER THE FOLLOWING]. The Permittee shall perform electric, gamma ray and caliper logs in the open hole, a cement bond, temperature or density log on the surface casing, and a cement bond log/variable density log on the long string casing.

   The Permittee shall submit to the Director, for all injection wells, cement records, a narrative report that interprets the well log(s) and test results, which specifically relate to the USDW and the confining zone adjacent to it, and a detailed description of the rationale used to make these interpretations. The narrative report shall be prepared by a knowledgeable log analyst and submitted to the Director. The Director may prescribe additional logs or waive logging requirements in the future should field conditions so warrant.

   For all new Class II wells at a minimum, the Permittee shall determine fluid pressure, fracture pressure and physical and chemical characteristics of the injection zone.

7. **Mechanical Integrity**
   The Permittee is prohibited from conducting injection operations in any injection well until it demonstrates: (1) the mechanical integrity of the injection well in accordance with Part II(D)(1)d of this Permit and (2) the Permittee has received notice from the Director that such a demonstration is satisfactory.

8. **Corrective Action**
   The Permittee is prohibited from conducting injection operations in any injection well until it has plugged all abandoned wells identified within the AOR.

9. **Completion Report**
   The Permittee shall prepare a Completion Report that summarizes the activities and the results of the testing required in Part II(B)1 through 7 of this Permit and submit

the Completion Report to the Director prior to the commencement of injection operations.

C. WELL OPERATIONS

1. Injection Formation

The Permittee shall inject only in the [NAME OF FORMATION] Formation located at the subsurface interval between approximately [NUMBER] and [NUMBER] feet below ground surface

2. Injectate Waste Determination

The Permittee shall not inject any hazardous substances as defined in A.R.S. § 49-921 or any other fluid, other than produced fluid obtained from [COMPANY NAME] production operations.

3. Injection Pressure Limitation

The Permittee shall not exceed a surface injection pressure maximum of [NUMBER] psi. The Permittee shall not inject fluid at a pressure which initiates fractures in the confining zone, adjacent to USDWs or causes the movement of injection or formation fluids into a USDW.

4. Injection Volume Limitation

Injection volume shall be limited to a maximum of [NUMBER] barrels per day per well.

5. Outermost Casing Limitation

For all of the injection wells, the Permittee is prohibited from injecting between the outermost casing protecting USDW and the well bore, and also from injecting directly into any USDW.

D. MONITORING, RECORDKEEPING, AND REPORTING OF RESULTS

1. Monitoring Program

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The Permittee shall obtain representative sample(s) of the fluid to be analyzed and conduct analysis(es) of the sample(s) in accordance with the approved methods and test procedures provided in applicable analytical methods described in Table I of 40 CFR or in EPA Publication SW-846, “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods”, unless other methods have been approved by ADEQ or additional approved methods or updates to the methods become available. The Permittee shall identify in its monitoring records the types of tests and methods used to generate the monitoring data.

b. The Permittee shall monitor and record injection pressure, flow rate and cumulative volume in each well at least [weekly FOR DISPOSAL OPERATIONS; monthly FOR ENHANCED RECOVERY OPERATIONS; daily DURING INJECTION AND WITHDRAWAL OF LIQUID HYDROCARBONS; daily DURING INJECTION OF CYCLIC STEAM OPERATIONS] beginning on the date the injection well commences operation and concluding when the injection well is plugged and abandoned. The Permittee shall compile the monitoring data monthly to complete the Annual Report pursuant to Section D(4) of this Permit.

c. The Permittee shall monitor the nature and composition of the injected fluid by sampling, analyzing and recording injected fluid for the parameters listed below, at the initiation of the injection operation and every [FREQUENCY] thereafter, and whenever the operator anticipates a change in the injection fluid.

[CONSIDER FOLLOWING PARAMETERS]

pH	Manganese
Specific Gravity	Total Dissolved Solids
Specific Conductance	Barium
Sodium	Hydrogen Sulfide
Chloride	Alkalinity
Iron	Dissolved Oxygen
Magnesium	Hardness

d. The Permittee shall make a demonstration of mechanical integrity in accordance with A.A.C. R18-9-B613 at least once every five years. In addition, the Permittee shall conduct a mechanical integrity test demonstration on any injection wells where and when the protective casing or tubing is removed from the well, the packer is reseated, or a well failure is likely, or as requested by the Director. The Permittee may continue operation of the injection well(s) only if the Permittee has demonstrated the mechanical integrity of the injection well(s) to the Director's satisfaction. The Permittee shall cease injection operations if a loss of mechanical integrity becomes evident or if the Permittee cannot demonstrate mechanical integrity.

1. 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 field measurements;

b. Name(s) of individual(s) who performed sampling or measurement;
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.

2. Recordkeeping

a. The Permittee shall retain the following records and make them available at all times for examination by an ADEQ inspector:

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;

iii. Results of the injectate waste determination according to 40 CFR § 262.11 (See Part II.C.2.). Results shall demonstrate that the injectate does not meet the definition of hazardous waste as defined in A.R.S. § 49-921; and

iv. Records and results of MITs and any other tests and logs required by ADEQ, and any well work and workovers completed.

v. The Permittee shall maintain copies (or originals) of all records described in Part II.D during the operating life of the well and shall make such records available at all times for inspection at the facility. The Permittee shall only discard the records if written approval from ADEQ to discard the records is obtained.

vi. Except for information determined to be confidential under A.A.C. R18-9-A603, all permit applications, permits, reports, and well operation data prepared in accordance with the conditions of this Permit shall be available for public inspection at appropriate offices of ADEQ.

3. Reporting of Results

a. The Permittee shall submit an Annual Report to the Director summarizing the results of the monitoring required in Part II of this permit. This report shall include monthly monitoring records of injected fluids, the results of any mechanical integrity test(s), and any major changes in characteristics or sources of injected fluids. The Permittee shall complete and submit this information with its Annual Report Form 7520-11 (Annual Disposal Injection Well Monitoring

Report). The Permittee shall submit the Annual Report to the Director no later than January 31st of each year, summarizing the activity of the calendar year ending the previous December 31st.

b. In addition to meeting the submittal digital e- copies of all reports shall also be provided to the following:

Arizona Department of Environmental Quality
Water Quality Division, Groundwater, UIC Program
1110 West Washington Street
Phoenix, AZ 85007

E. PLUGGING AND ABANDONMENT

1. Notice of Plugging and Abandonment

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

2. Plugging and Abandonment Plans

The Permittee shall plug and abandon the well as provided by the Plugging and Abandonment Plan submitted by the Permittee (see Attachment C) and approved by ADEQ, consistent with A.A.C. R18-9-B614. Upon written notice to the Permittee, ADEQ 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 ADEQ requirements for construction or mechanical integrity, or (c) otherwise at ADEQ's discretion. Upon written notice, ADEQ may periodically require the Permittee to estimate and to update the estimated plugging cost. To determine the appropriate level of financial assurance for the Plugging and Abandonment Plan, the Permittee shall obtain a cost estimate from an independent third-party firm in the business of plugging wells. The estimate shall include the costs of all the materials and activities necessary to pay an independent third-party contractor to completely plug and abandon the well 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 well 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 Attachment C, unless the Permittee:

a. Provides notice to ADEQ of an intent to re-activate the well;

b. Has demonstrated that the well(s) will be used in the future;

c. Has described actions or procedures, satisfactory to ADEQ and approved in writing by ADEQ, which will be taken to ensure that the well(s) will not endanger USDWs during the period of inactivity, including compliance with the technical requirements applicable to active wells unless waived by the Director.

4. Plugging and Abandonment Report

Within sixty (60) days after plugging any well, or at the time of the next Quarterly Report (whichever comes first), the Permittee shall submit a report on Form 7520-19, provided in Attachment C, as well as the detailed procedural activity of engineer's log and daily rig log to ADEQ. 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 Plans contained in Attachment C; or

b. Where actual plugging differed from the Plugging and Abandonment Plans contained in Attachment C, a statement specifying and justifying the different procedures followed.

F. FINANCIAL ASSURANCE REQUIREMENTS

1. Demonstration of Financial Responsibility

The Permittee shall demonstrate and maintain financial responsibility and resources sufficient to close, plug, and abandon any existing or future-permitted underground injection operations approved pursuant to this Permit, as provided in the Plugging and Abandonment Plan contained in Attachment C and consistent with A.A.C. R18-9-D636(A)(6).

a. The Permittee shall post an approved financial instrument such as a surety bond or other financial assurance in the amount of [SPECIFY $ AMOUNT PLUS CONTINGENCY] to guarantee plugging and abandonment activities for closure. Authority to construct, inject, and operate the wells under the authority of this Permit will be granted only after the financial instrument has been secured and approved by ADEQ.

b. The level and mechanism of financial responsibility shall be reviewed and updated periodically, upon request of ADEQ. The Permittee may be required to change to an alternate method of demonstrating financial responsibility. Any such change must be approved in writing by ADEQ prior to the change.

c. ADEQ may require the Permittee to estimate and to update the estimated plugging and abandonment costs periodically. Such estimates shall be based upon costs that a third party would incur to carry out the required restoration activities, properly plug and abandon the wells, and perform post-closure monitoring activities,

including materials, equipment, mud and disposal costs, and labor with appropriate contingencies.

2. Insolvency of Financial Institution

The Permittee shall submit an alternate instrument of financial responsibility acceptable to ADEQ within sixty (60) days after either of the following events occurs:

a. The institution issuing any bond or other financial instrument that is secured to demonstrate financial responsibility in accordance with Part II, Section F.1. of this Permit files for bankruptcy; or

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.

c. The institution issuing the financial instrument lets it lapse or decides not to extend it.

Failure to submit an acceptable financial demonstration may result in the termination of this Permit pursuant to A.A.C. R18-9-C634(A)(1).

3. Insolvency of Owner or Operator

The Permittee shall notify ADEQ 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. 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.

G. DURATION OF PERMIT

This Permit and the authorization to inject are issued for a period of [SPECIFY DURATION] years unless terminated under the conditions set forth in Part III.B.1. or administratively extended under the conditions set forth in Part III.E.11.

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 other injection activity in a manner that allows the movement of fluid containing any contaminant (as defined by A.A.C. R18-9-A601) into USDWs (as defined A.A.C R18-9-A601).

Any underground injection activity not specifically authorized in this Permit is prohibited. The Permittee must comply with all applicable provisions of 18 A.A.C. 9, Article 6. 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 laws and regulations.

B. PERMIT ACTIONS

1. Modification, Revocation and Reissuance, or Termination

ADEQ may, for cause or upon request from the Permittee, modify, revoke and reissue, or terminate this Permit in accordance with A.A.C. R18-9-C631, C632, and C634. The permit is also subject to minor modifications for causes as specified in A.A.C. R18-9- C633. 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.

ADEQ 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 ADEQ and the Permittee complies with requirements of A.A.C. R18-9-C630. ADEQ 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 A.A.C. R18-9-A603, any information submitted to ADEQ 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, ADEQ 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 A.R.S. § 49-205 (Public Information). Claims of confidentiality for the following information will be denied:

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

E. GENERAL DUTIES AND REQUIREMENTS

1. Duty to Comply

The provisions of R18-9-635 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. The Permittee shall comply with all applicable UIC Program regulations and 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 A.A.C. R18-9-C625. Any permit non-compliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application. Such non-compliance may also be grounds for enforcement action under the Federal 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. Any person who willfully violates permit conditions 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 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 ADEQ, within a time specified, any information which ADEQ 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 ADEQ, upon request, copies of records required to be kept by this Permit pursuant to A.A.C. R18-9-D635(A)8.

8. **Inspection and Entry**
   The Permittee shall allow ADEQ, or an authorized representative, upon the presentation of credentials and other documents as may be required pursuant to A.A.C. R18-9-D635(A)9 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. Signatory Requirements

All applications, reports, or other information submitted to ADEQ shall be signed and certified by a responsible corporate officer or duly authorized representative according to A.A.C. R18-9-C617.

10. Additional Reporting Requirements

a. Planned Changes - The Permittee shall give notice to ADEQ as soon as possible of any planned physical alterations or additions to the permitted facility affecting any of the terms and conditions of the permit.

b. Anticipated non-compliance-The Permittee shall give advance notice to ADEQ 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 ADEQ no later than thirty (30) days following each schedule date.

d. Twenty-four Hour Reporting - The Permittee shall report to ADEQ any non-compliance which may endanger health or the environment. The following Information shall be provided orally within 24 hours from the time the Permittee becomes aware of the following circumstances.

   i. Any monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW; and

   ii. Any non-compliance with a Permit condition, malfunction of the injection system, or loss of mechanical integrity, which may cause fluid migration into or between USDWs.

e. A written submission of all non-compliance shall also be provided to ADEQ 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.

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 ADEQ, the Permittee shall submit such facts or information within two (2) weeks of the time such facts or information becomes known.

11. Continuation of Expiring Permit

a. Duty to Reapply - If ADEQ requires the Permittee to continue an activity regulated by this Permit past the expiration date of this Permit, the Permittee must submit a complete application for a new permit at least one hundred and eighty (180) 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. ADEQ, 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.

UNDERGROUND INJECTION CONTROL PROGRAM

AREA PERMIT to Construct and Operate

Class III Solution Mining of [SPECIFY MINERAL] and Aquifer Restoration

Permit No. R9UIC-AZIII-FY22-#

[PROJECT NAME] Project [COUNTY NAME] County, Arizona

Issued to:

[COMPANY NAME] [ADDRESS LINE 1]

[ADDRESS LINE 2]

[ADDRESS LINE 3]

AUTHORIZING SIGNATURE

_____

[Name of Director], Director Water Quality Division
Arizona Department of Environmental Quality
Signed this_____ day of _____, 20_____

Table of Contents

PART I. AUTHORIZATION TO CONSTRUCT AND INJECT

Pursuant to the Underground Injection Control regulations of the Arizona Department of Environmental Quality codified at Title 18 of the Arizona Administrative Code, Chapter 9, Article 6

[COMPANY NAME]
[ADDRESS LINE 1]
[LINE 2]
[LINE3]

is hereby authorized, contingent upon Permit conditions, to construct and operate a Class III injection well facility and engage in [SOLUTION MINING FOR XXX] operations at the [PROJECT NAME]. The Project is in [PROJECT LOCATION], Arizona, approximately [DISTANCE AND DIRECTION TO NEAREST LANDMARK], as depicted in Attachment A. The location is [LOCATION DESCRIPTION (Include Section, Township, Range, with latitude/longitude)]. The Project will consist of approximately [NUMBER OF WELLS] Class III injection and recovery wells, [NUMBER] of hydraulic control (HC) wells, [NUMBER] observation wells (OW), [NUMBER] rinse verification monitoring wells (RVW), up to [NUMBER] intermediate monitoring wells (IMW), and [NUMBER] point-of-compliance (POC) wells. It will be operational [DESCRIBE OPERATION] over [DURATION] years at the Project site. [INCLUDE IF APPLICABLE: FOR AREAWIDE PERMITS FOLLOWING PHASED OPERATIONS AND EXPANSION] Mine operations will be implemented in stages:

- Stage 1: Years [RANGE OF YEARS]
- Stage 2: Years [RANGE OF YEARS]
- Stage 3: Years [RANGE OF YEARS]
- Post-production: Years [RANGE OF YEARS]
- Monitoring – [NUMBER OF YEARS]

[DESCRIBE OPERATIONAL PLAN] [DESCRIBE AREA OF REVIEW] [DESCRIBE WELLFIELD AREA]

[DESCIBE INJECTATE AND DEPTHS AUTHORIZED BY THE PERMIT] [DESCRIBE PRODUCTION PROCESS AT THE SURFACE]

[DESCRIBE THE MINERAL BEARING FEATURE AND DEPTH BGS AT THE PROJECT SITE]

[INDICATE IF AQUIFER EXEMPTION IS REQUIRED OR HAS BEEN APPROVED] [DESCRIBE WELLFIELD AND TYPES OF WELLS IN IT] [DESCRIBE GROUNDWATER MONITORING PLAN]

For the permitted wells within the Area of Review (AOR), ADEQ will issue authorization to drill and construct only after requirements of Financial Responsibility in Part II, Section L of this Permit have been met. ADEQ will grant authorization to inject only after the requirements of

Part II, Sections C, D, and E of this Permit have been met. Operation of injection [WELL ID] will be limited to a maximum volume of [SPECIFY QUANTITY] and pressure of [SPECIFY QUANTITY]. All conditions set forth herein refer to Title 18, Chapter 9, Article 6 of the Arizona Administrative Code (A.A.C.),, which are regulations in effect on the date that this Permit is effective.

This Permit consists of [NUMBER] pages plus Attachments, and includes all items listed in the Table of Contents. Further, it is based upon representations made by [COMPANY NAME] (the Permittee) and on other information contained in the administrative record. It is the responsibility of the Permittee to read, understand, and comply with all terms and conditions of this Permit.

This Permit and the authorization to construct, operate, and inject are issued for a period to include the approximate [NUMBER]-year Project operation and restoration life and the [NUMBER]-year post-rinsing monitoring period, unless terminated under the conditions set forth in Part III, Section B.1 of this Permit. This Permit and authorization to inject shall also include any additional post-rinsing monitoring beyond [NUMBER] years, if deemed necessary by ADEQ.

This Permit is issued on [DATE] and becomes effective on [DATE]. This Permit is issued for a period of x years unless the Permit is terminated under the conditions set forth in Part III.B.1. or administratively extended under the conditions set forth in Part III.E.

Signed by

_____

[Name of Director], Director
Water Quality Division
Arizona Department of Environmental Quality

PART II. SPECIFIC PERMIT CONDITIONS

A. REQUIREMENTS PRIOR TO DRILLING, TESTING, CONSTRUCTING, OR OPERATING

1. Financial Assurance

The Permittee shall supply evidence of financial assurance prior to commencing any well drilling and construction, in accordance with Section L of this part.

2. Field Demonstration Submittal, Notification, and Reporting

a. Prior to each demonstration or test required in this Permit, the Permittee shall submit plans and specifications for procedures to the ADEQ for approval 90 days prior to demonstration or testing activities. No demonstration or test in these sections may proceed without prior written approval from ADEQ.

b. The Permittee must notify ADEQ at least thirty (30) days prior to performing any required field demonstrations or test, after ADEQ approves the plans/procedures for testing, in order to allow ADEQ to arrange to witness if so elected.

c. The Permittee shall submit results of each demonstration or test required in Part II of this Permit to ADEQ within thirty (30) days of completion, unless otherwise noted.

B. [INCLUDE IF APPLICABLE] AQUIFER EXEMPTION

1. Exempted Zone

Concurrent with the issuance of this Permit, EPA is approving an Aquifer Exemption (AE) at the Project site. Pursuant to A.A.C. R18-9- A605 and A606, the exempted portion of the aquifer at the Project site is defined by the following lateral and vertical boundaries:

a. Lateral Aquifer Exemption Boundary [DESCRIBE]
b. Vertical Aquifer Exemption Boundaries

[DESCRIBE] Refer to Figures [LIST] in Attachment A.

2. No Migration into or between Underground Sources of Drinking Water (USDWs).

Pursuant to A.A.C. R18-9-A605 and A606 and the conditions established herein, during well construction and testing and the approximate [NUMBER]- year operation and restoration life of the [PROJECT NAME] Project and [NUMBER]-year post-rinsing monitoring period, the Permittee shall ensure that there is no migration of injection fluids, process by-products, or formation fluids that exceed the limits

specified in Part II.F of this Permit beyond the exempted zone described at Part II, Section B.1 and delineated as described in the Aquifer Exemption in Attachment A of this Permit.

C. WELL CONSTRUCTION

1. Location of Project Wells

a. [DESCRIBE WELL LOCATIONS]

b. After drilling and well construction is completed, the Permittee must submit final well location information, including distances in feet from the closest section lines in Sections [X] and [X] and latitude/longitude coordinates of the wells constructed under this Permit, including all hydraulic control, observation, monitoring, and POC wells. The distances and direction of each HC, OW, and POC well from the Project wellfield boundary shall also be provided in the Final Well Construction Report required under paragraph 9(a) of this section. If final well coordinates differ significantly from the proposed coordinates described above, justification and documentation of any communication with and approval by ADEQ shall be included.

2. Logging and Testing during Drilling and Construction

[DESCRIBE LOGS TO BE PERFORMED]

[DESCRIBE GEOPHYSICS] Additional geophysical surveys may be conducted as required by ADEQ. The cement bond log evaluation will enable the analysis of the bond between the cement and casing, as well as between the casing and formation, and shall allow detection and assessment of any micro-annuli between the casing and cement as well as any cement channeling in the borehole annulus. Refer to Attachment D for information on temperature logging guidelines and requirements for evaluation of zonal isolation after injection commences.

3. Drilling, Work-over, and Plugging Procedures and Records

Drilling, work-over, and plugging procedures shall comply with applicable portions of the Arizona Oil and Gas Conservation Commission's requirements in the Arizona Administrative Code, found at Title 12, Natural Resources, Chapter 7, Article I, R12-7-108 to R12-7-127, unless a section conflicts with UIC permit requirements. Drilling, work-over, and plugging procedures for each well or group of similarly constructed wells shall be submitted to ADEQ for approval. Once approved, a thirty (30)-day notice shall be submitted to ADEQ for witnessing purposes prior to construction of individual or groups of similarly constructed Class III wells. Procedures and records shall include the following:

a. Details for well construction and cementing casing strings and work- overs, and plugging procedures;

b. Records of daily Drilling Reports (electronic and hard copies);

c. Blowout Preventer (BOP) System testing on recorder charts including complete explanatory notes during the test(s), if applicable; and

d. Casing and other tubular and accessory measurement tallies.

Information to be provided for reporting forms such as, Completion of Construction Report, Well Rework Record, or, Plugging and Abandonment Plan (list in Attachment C) is also acceptable to include in the procedures. The Permittee shall also comply with the requirements of the Arizona Department of Water Resources minimum construction standards in the Arizona Administrative Code found at Title 12, Chapter 15, Article 8, Well Construction and Licensing of Drillers.

4. Well Casing and Drilling

Wells drilled and installed at the Project will include injection, recovery, HC, OW, and POC monitoring wells. Those wells shall be constructed to meet Class III requirements at A.A.C. R18-9-G646. In addition, IMWs will be converted from existing test wells and coreholes or drilled within the wellfield perimeter at locations surrounding active mine blocks, for monitoring and controlling the movement of ISR fluids within the wellfield. Newly drilled IMWs shall also be constructed to meet Class III requirements.

The well construction procedures described in Attachment B shall be binding on the Permittee. Where any conflict or inconsistency exists between Attachment B and the permit conditions, the permit condition shall supersede the procedure or detail in Attachment B. All wells shall be cased and cemented to prevent the migration of fluids into or between USDWs and into or out of the injection zone. The casing and cement used in the construction of each newly drilled well shall be designed for the life expectancy of the well and shall be maintained until the well is plugged and abandoned in accordance with Part II, Section I of this Permit.

ADEQ may require minor alterations to the construction requirements based upon information obtained during well drilling and related operations. Final casing setting depths will be determined by the field conditions, well logs, and other input from the Permittee and ADEQ staff. ADEQ approval must be obtained for any revisions of the procedures approved as referenced in Parts II.C.3 and II.C.4 of this Permit prior to installation, and these will be documented in the Final Well Construction Report (See paragraph 9(a) below).

[MODIFY AS REQUIRED FOR SPECIFIC GEOLOGY] Boreholes will be drilled in two stages. After driving surface casing to a depth of 20 feet, the upper stage will consist of a boring drilled from land surface through basin fill at least 40 feet below the first contact with competent bedrock. After casing for the first stage is cemented

in place, a smaller diameter borehole will be drilled into the bedrock to total depth. The borehole within the bedrock will remain open in most wells.

Screen may be installed in the bedrock section in the borehole if found to be unstable. Borehole diameters will be sufficient to allow for installation of casing that will accommodate the pumps and other downhole equipment.

[DESCRIBE WELL CONSTRUCTION DETAILS]

5. **Cementing**
[DESCRIBE WELL CEMENTING DETAILS SPECIFIC TO THE SITE GEOLOGY]

6. **Monitoring Devices**
The Permittee shall install and maintain in good operating condition:

    a. Sampling equipment upstream of the injection wellhead for the purpose of obtaining representative samples of injection fluids.

    b. Devices to continuously measure and record injection pressure, annulus pressures, flow rates, injection and production volumes, subject to the following:

        i. Pressure gauges shall be of a design to provide:

        ii. A full pressure range of at least fifty (50) percent greater than the anticipated operating pressure; and

        iii. A certified deviation accuracy of five (5) percent or less throughout the operating pressure range.

        iv. Flow meters shall measure cumulative volumes and be certified for a deviation accuracy of five (5) percent or less throughout the range of rates allowed by the permit.

    c. Conductivity or Other Sensors (if used):

        [DESCRIBE USE OF OTHER SENORS]

    The proposed demonstration procedures and results of the demonstration are subject to ADEQ review and approval.

7. **Injection Interval**
The Permittee shall only inject fluids at depths greater than [SPECIFY NUMBER] feet below the top of the competent bedrock zone ("bedrock exclusion zone") unless the Permittee has received written approval from the Director to expand the injection interval. To ensure that the injection interval is at least [SPECIFY NUMBER] feet

below the top of the bedrock zone, the Permittee shall case and cement all injection wells in a manner described at Part II, Sections C.4 and C.5 of this Permit from at least [SPECIFY NUMBER] feet above the bedrock surface or the top of the saturated zone, whichever is shallower, to at least [SPECIFY NUMBER] feet below the top of the bedrock zone. The Permittee will develop the injection interval for each well by drilling into the bedrock zone, beyond the bottom of the casing and cemented interval. Well screens in IMWs, observation, and POC wells will be installed through the interval below the bedrock exclusion zone to a depth and interval equivalent to the open-hole or screened completion intervals in the nearest injection, recovery, and HC wells.

8. **Injection Formation Testing**
[INCLUDE IF APPLICABLE] Aquifer testing will be performed upon installation of injection and recovery wells and used to determine the layout and number of recovery wells and injection and recovery rates in each mine block. Results of the aquifer tests will be compared to parameters used in the groundwater flow model, and the model parameters will be revised accordingly if the resulting test parameters are significantly different from those used in the model. Proposed formation testing procedures must be submitted to ADEQ for review and approval in accordance with Part II.A.2 of this Permit. Test results shall be reported to ADEQ in accordance with Part II.G of this Permit.

9. **Final Well Construction Report and Completion of Construction Notice**

    a. The Permittee must submit a Final Well Construction Report for all Project wells, including logging and other results, with a schematic diagram and detailed description of construction, including driller's log and materials used (e.g., tubing tally, cement type and amounts, and other materials and amounts), to ADEQ within sixty (60) days after completion of all Project wells within a specific mine block, including injection/recovery, HC, OW, monitoring, and POC wells. Construction details, downhole equipment, depths to key formation tops and the USDW base, if applicable, screened or open hole interval depths, and schematics of all Project wells shall be described in the Final Well Construction Report for each mine block.

    b. The Permittee shall also submit a notice of completion of construction to ADEQ (refer to Attachment G). Injection operations for a particular well or mine block may not commence until all related Project wells are completed and operational, all well and formation testing is complete, necessary reports are submitted, and ADEQ has inspected or otherwise reviewed and approved the construction and other details for the permitted wells and notified the Permittee of ADEQ's approval.

10. Proposed Changes and Work-overs

A well work-over is any physical alteration or addition to an existing well that results in a change in the composition, diameter, perforations, screen depths, tubing, packer depths, or depth of the well casing or a change in the cement in the outer annulus.

a. The Permittee shall give advance notice to ADEQ, as soon as possible, of any planned physical alterations or additions to the permitted Project wells. Any changes in well construction that deviate from approved construction parameters defined in Part II.C of this Permit shall require prior approval by ADEQ and may require a permit modification under the requirements of A.A.C. R18-9-C631 and C633.

b. In addition, the Permittee shall provide all records of well work- overs, logging, or other subsequent test data, including required mechanical integrity testing, to ADEQ within thirty (30) days of completion of the activity.

c. Attachment G contains a list of the appropriate ADEQ reporting forms for well changes or work-overs. Demonstration of mechanical integrity shall be performed within thirty (30) days of completion of work-overs or alterations and prior to resuming injection and recovery activities of the modified well, in accordance with Section E.3 of this part.

D. CORRECTIVE ACTION (PLUGGING AND ABANDONMENT PLAN)

Before injection and recovery wells are placed in service:

All existing non-Class III wells and coreholes within the proposed Project mine blocks and non-Class III wells and coreholes not intended for use as IMWs within [SPECIFY NUMBER] feet of a mine block shall be abandoned per the Plugging and Abandonment Plan (Attachment C of this Permit). The identification, location, and construction details of the wells and coreholes to be plugged and abandoned or used as IMWs are listed in Attachment C for each well and corehole within the AOR. ADEQ shall be notified, and final plugging and abandonment plans and procedures shall be submitted to ADEQ for approval at least thirty (30) days in advance of plugging operations. ADEQ approval will be provided within thirty (30) days if the plans and procedures are deemed complete and fully acceptable. If not provided within thirty (30) days, Permittee may assume ADEQ approval and proceed with plugging and abandonment operations.

E. WELL OPERATION

1. Description of Operations [DESCRIBE OPERATIONS]

a. Planned injection rates will vary in each of the three stages of mining operations as follows:

Stage 1 ([SPECIFY RANGE]) [NUMBER] gallons per minute (gpm)
Stage 2 ([SPECIFY RANGE]) [NUMBER] gpm
Stage 3 ([SPECIFY RANGE]) [NUMBER] gpm

During ISR operations, the extraction rate of recovery and HC wells shall not fall below one-hundred-one (101) percent of the injection rate on a 48-hour rolling average basis without prior written approval of a lower percentage from ADEQ. Net extraction volumes shall be maintained at one percent (1%) or greater, depending on the maintenance of an inward gradient of no less than 0.01 ft./ft. between OW pairs on a daily average basis. If the inward gradient cannot be maintained at 0.01 ft./ft, the net extraction rate or volume shall be increased to achieve that minimum inward gradient at all OW pairs. The choice and number of IMW, HC well and OW locations to be monitored during the three stages of ISR and rinsing operations shall be subject to ADEQ review and approval in accordance with Part II, Section F.5. The updated model and operational experience will be used to review and modify the proposed locations of HC wells, OWs, and IMWs in Stage 1 and 2 and beyond year 13 in Stage 3 of ISR operations.

An inward gradient of at least 0.01 ft./ft. between OW pairs shall be established prior to the commencement of injection of mining solution and maintained for demonstrating hydraulic control unless adjusted by ADEQ as described in Part II, Section H.1.b. Re-balancing of net extraction volumes to restore hydraulic control of ISR fluids shall be required on a 48-hour basis.
The Permittee may submit an operational and monitoring plan to demonstrate that a thirty (30)-day rolling average is as protective as the 48- hour flow volume re-balancing. If the Permittee demonstrates that re- balancing on greater than a 48-hour rolling average basis is as effective and protective as 48-hour re-balancing, ADEQ will consider the results of that demonstration for a revision to the re-balancing requirement. However, a change to that condition will not be authorized without prior written approval from ADEQ.

b. The Permittee shall measure specific conductance in the outer OWs to confirm hydraulic control at appropriate and approved depths throughout the monitored interval. Conductivity readings in the OWs shall not significantly exceed baseline conductivity and statistical noise levels, as determined by ADEQ approved procedures, to confirm hydraulic control.

c. Actions shall be taken to restore hydraulic control within 24 hours of detection that the extraction to injection ratio has fallen below one- hundred-one (101) percent or the inward gradient at any observation well pair is less than 0.01 ft./ft., or the specific conductance data in the outer OWs indicate a possible loss of hydraulic control. Actions shall also be taken on a timely basis to reverse outward ISR fluid movement detected in IMWs, HC, or other monitoring wells, and to contain ISR fluids to the wellfield during recovery, rinsing, and post- rinsing monitoring operations.

2. Demonstrations Required Prior to Injection

Injection operations may not commence until construction of all Project wells associated with subject injection operations in a specific mine block is complete and the Permittee has complied with the following mechanical integrity requirements.

The Permittee shall demonstrate that the Project wells have and maintain mechanical integrity consistent with A.A.C. R18-9-B613 and with paragraph 3 of Section E. The Permittee shall demonstrate that there are no significant leaks in the casing and tubing, and that there is not significant fluid movement through the casing/wellbore annulus or vertical channels adjacent to the wellbore. The Permittee may not commence initial injection into the wells or recommence injection after a work-over which has corrected any loss of well integrity, until the Permittee has received written notice from ADEQ that the demonstration provided is satisfactory and that injection is authorized.

3. Mechanical Integrity

Pursuant to A.A.C. R18-9-D635(A)(17), all injection and recovery wells, other Project (POC, HC, and observation) wells, and newly drilled IMWs shall maintain mechanical integrity at all times. Pursuant to A.A.C. R18-9-B613, the Permittee shall demonstrate mechanical integrity,
Parts I and II by the following methods and schedule:

a. Methods for Demonstrating Mechanical Integrity

Part I: Mechanical Integrity Pursuant to A.A.C. R18-9-B613(A)(1), the Permittee shall demonstrate Part I of the mechanical integrity requirement by the following methods:

i. Pressure testing - A packer will be installed immediately above the proposed injection interval, the wellbore will be completely filled with water, and a hydraulic pressure equal to or above the maximum allowable wellhead injection pressure but not less than 100 pounds per square inch (psi) will be applied. This test shall be for a minimum of thirty (30) minutes. A well shall pass the mechanical integrity test (MIT) if there is less than a five (5) percent decrease/increase in pressure over the thirty (30) minute period. A well shall not be operated at injection pressures greater than the maximum allowable injection pressure as set forth in Part II, Section E.4 below; and

ii. Continuous pressure monitoring - The tubing/casing annulus (if a packer is installed) and injection pressure in active injection wells shall be monitored and recorded continuously by a digital instrument with a resolution of one tenth (0.1) psi.

Part II: Mechanical Integrity Pursuant to A.A.C. R18-9-B613(A)(2), the Permittee shall demonstrate Part II of the mechanical integrity requirement in all Project wells by the following methods:

i. A review of the casing and cementing records to verify the absence of fluid movement through vertical channels adjacent to the well bore in existing test wells and coreholes that are converted to monitoring wells. Casing and cementing records shall be provided for all of the existing test wells and coreholes that will be converted to IMWs if the records are available. Part II mechanical integrity must be demonstrated in new monitoring wells as described below for new Project wells.

ii. A demonstration that the injectate solution (lixiviant) and ISR fluids are confined to the proper zone and monitored intervals are hydraulically isolated shall be conducted and submitted for review and subject to approval by ADEQ. A temperature log and casing caliper log shall be run in all new Project wells. Secondary temperature and tracer surveys may be required if a loss of external injection well integrity is detected or suspected. Secondary temperature logs shall be run in accordance with ADEQ guidance (in Attachment D), for evaluation of zonal isolation after injection commences in injection wells. Radioactive tracer surveys may also be required for evaluation of zonal isolation after injection commences in injection wells at the direction of ADEQ. Proposed MIT procedures must be submitted to ADEQ for review and approval. Once approved, the Permittee may schedule the external MIT, providing ADEQ at least thirty (30) days notice before the external MIT is conducted.

iii. After installing and cementing the casing, conducting a cement squeeze operation, or any well cement repair, the Permittee shall provide to the Director cementing records and cement evaluation logs that demonstrate isolation of the injection interval. Cement bond logs and temperature logs shall be run in wells with steel casing. Temperature logs shall be run in FRP and PVC cased wells. Cementing records and logs shall demonstrate complete filling of the annulus between the borehole wall and well casing with cement to a depth at least [SPECIFY DEPTH] feet above the specified geologic unit, whichever is shallower.

b. Cement evaluation must assess the following four objectives:

i. Bond between casing and cement;
ii. Bond between cement and formation;

iii. Detection and assessment of any micro-annuli (small gaps between casing and cement); and
iv. Identification of any absence of cement and cement channeling in the borehole annulus.

The Permittee shall not commence or recommence well operations until the Permittee has received written notice from ADEQ that the cement evaluation and demonstration is satisfactory. ADEQ notice will be provided within thirty (30) days if the evaluation is acceptable and the demonstration is satisfactory.

c. Schedule for Demonstrations of Mechanical Integrity

ADEQ may require that an MIT be conducted at any time during the permitted life of any well authorized by this Permit. The Permittee shall also arrange and conduct MITs per the following requirements:

i. A demonstration of mechanical integrity shall be made within thirty (30) days following the installation of a new Project or monitoring well. Injection and recovery wells shall be pressure tested for mechanical integrity in accordance with paragraph 3.a of this Section E no less frequently than once every five (5) years. If an injection well is inactive for two (2) years, a notice of actions and procedures must be provided to ADEQ that ensures USDWs will not be endangered during the period of temporary abandonment, or the well must be plugged and abandoned. Internal mechanical integrity of injection and recovery wells shall also be demonstrated within thirty (30) days after a work-over is conducted, the construction of the well is modified, or when loss of mechanical integrity becomes evident during injection operations.

ii. Results of the MITs shall be submitted to the Director in the quarterly reports described in Part II, Section G.2 of this Permit.

d. Loss of Mechanical Integrity

The Permittee shall notify ADEQ, in accordance with Part II, Section G, paragraph 2(h) of this Permit, under any of the following circumstances:

i. A well fails to demonstrate mechanical integrity during a test, or

ii. A loss of mechanical integrity becomes evident during operation, or

iii. A significant and anomalous change in the annular or injection pressure and/or rate occurs during normal operating conditions.

Furthermore, for new injection wells, the Permittee shall not commence injection, and for operating wells, the Permittee shall terminate injection and may not resume injection until the Permittee has taken necessary actions to restore integrity to the subject well and has demonstrated that the well has integrity as defined at Part II.E.3(a), above.

e. Prohibition without Demonstration

After the permit's effective date, the Permittee shall commence injection into the well only if:

i. The well has passed an internal pressure MIT in accordance with paragraph 3.a of this Section E; and

ii. The Permittee has received written notice from ADEQ that the internal pressure MIT demonstration is satisfactory.

4. Injection Pressure Limitation

a. Injection wells shall be operated at pressures less than the fracturing pressure of the formations open to injection in the bedrock oxide zone. Based on field test data at the Project site, a variable fracture pressure, measured at the top of the injection interval, will be used to establish maximum hydraulic pressure which may be exerted at the surface. The maximum wellhead pressure calculation will be based on the lowest measured fracture gradient of the weakest formation(s) open to injection in each well and be dependent on the depth to the top of the interval receiving the injection fluid and the specific gravity of the injectate, but in no event shall it exceed the calculated pressure that can be safely applied to well equipment. A safety factor of 0.9 shall be applied in the calculation of the maximum allowable surface injection pressure. In wells that are open to certain formations [SPECIFY FORMATIONS], fracture gradients (adjusted for the safety factor) of [SPECIFY ALTERNATE SAFETY FACTOR DESIRED] psi/ft., respectively, shall be applied in the calculation. The maximum allowable surface injection pressure will be established for each injection well on that basis. Refer to Attachment E for formation fracture pressure gradients of each formation.

b. In no case shall pressure in the injection zone during injection initiate new fractures or propagate existing fractures in the injection zone or the confining zone. In no case shall injection cause the movement of injectate or formation fluids into a USDW. Injection pressures shall be monitored using a digital instrument and recorded on a daily basis. Injection pressures that exceed the maximum allowable surface injection pressure shall be reduced immediately to a pressure not to exceed the maximum, or the well must be shut in pending correction of an equipment malfunction.

c. The injection pressure limitations in paragraph 4(a) of this Section E may be increased by the Director based on the results of valid step-rate tests or other ADEQ-approved injectivity tests in the respective proposed injection zone. The Director will determine any allowable increase based upon the step-rate test or other injectivity test results and other parameters reflecting actual injection operations. Step-rate testing shall be performed in accordance with the ADEQ Step- Rate Test Policy, which is included in Attachment H of this Permit.

d. Step-rate test and other types of injectivity test procedures shall be submitted for ADEQ review and approval at least thirty (30) days in advance of the tests.

Should the Director approve an increase in injection pressure limitations per paragraph 4(b) of this Section E, the increased limit shall be made part of this Permit by minor modification procedures (A.A.C. R18-9-C633).

5. Injection Volume (Rate) Limitation

a. Planned injection rates will vary in each of the three stages of mining operations as follows:
   - Stage 1 ([SPECIFY RANGE] years): [NUMBER] gpm or [NUMBER] million gallons per day (gpd)
   - Stage 2 ([SPECIFY RANGE] years): [NUMBER] gpm or [NUMBER] million gallons per day (gpd)
   - Stage 3 ([SPECIFY RANGE] years): [NUMBER] gpm or [NUMBER] million gallons per day (gpd).

The estimated maximum injection rates will vary in each of the three stages of mining as follows:

- Stage 1 ([SPECIFY RANGE] years): [NUMBER] gpm or [NUMBER] million gallons per day (gpd)
- Stage 2 ([SPECIFY RANGE] years): [NUMBER] gpm or [NUMBER] million gallons per day (gpd)
- Stage 3 ([SPECIFY RANGE] years): [NUMBER] gpm or [NUMBER] million gallons per day (gpd)

During ISR operations, the injection rate shall not exceed the recovery rate and the extraction rate of recovery and HC wells shall not fall below one-hundred-one (101) percent of the total wellfield injection rate on a daily average basis without prior written ADEQ approval. Net extraction volumes shall be maintained at one percent (1%) or greater, depending on the maintenance of an inward gradient of no less than 0.01 ft./ft. between observation well pairs on a daily average basis. If the inward gradient cannot be maintained at 0.01, the net extraction and/or

recovery rate or volume shall be increased to achieve that minimum inward gradient at all OW pairs.

b. The Permittee may request an increase in the maximum injection rate or a decrease in the minimum ratio of extraction to injection rate allowed in paragraph 5(a) above. Any such request shall be made in writing and appropriately justified to ADEQ. Should ADEQ approve an increase in injection rate limitations, the increased limit shall be made part of this Permit by minor modification procedures if the increase is in accordance with requirements at A.A.C. R18-9- C633.

c. Any request for an increase in the injection rate or decrease in the minimum ratio of extraction to injection rate shall demonstrate to the satisfaction of ADEQ that the increase in volume or reduction in the minimum ratio of extraction to injection rate will not interfere with the operation of the Project or its ability to meet conditions described in this Permit, change its well classification, or cause migration of fluids into USDWs or beyond the Project wellfield AOR and aquifer exemption (AE) boundary.

d. The injection rate increase shall not cause an exceedance of the injection pressure limitation established under paragraph 4(a) of this Section E.

6. Injectate Fluid Limitations

a. The Permittee shall not inject any solid wastes as defined by A.R.S. § 49-701.01.

b. Injection fluids shall be limited to only fluids authorized by this Permit and generated by the Project operation. No fluids shall be accepted from other sources for injection into the permitted wells.

c. Fresh water may be injected to assess the hydraulics of the injection and recovery patterns in the Project wellfield, to assess the performance of related surface facilities, and for rinsing operations.

d. [MODIFY SECTIONS d thru j BELOW AS APPROPRIATE] During ISR operations, the lixiviant shall consist of a dilute sulfuric acid solution that includes inorganic and organic constituents as defined below. The lixiviant shall have a pH of approximately [SPECIFY PH]. Organic compounds in the lixiviant shall be limited to those listed in Part II. Section F.7.(a) of this Permit. Should ADEQ approve an increase in constituent limits, the increased limit shall be made part of this Permit by minor modification procedures (A.A.C. R18-9- C633).

e. The forecast composition of the injectate and other ISR process solutions is provided in Attachment E. Inorganic constituents in the lixiviant shall be

limited to constituents in the neutralizing agents used for the purposes described in paragraph 6(f) of this Section E, and to constituents resulting from the interaction of lixiviant with groundwater and minerals in the zone. Concentrations of inorganic constituents in the lixiviant shall be subject to the requirements of paragraph 6(g) of this Section E.

f. During rinsing and closure, fresh groundwater may be injected to restore the zone to federal drinking water standards or pre-operational background concentrations, whichever are greater. The Permittee may also adjust the pH with neutralizing agents to aid in the precipitation of soluble metals.

g. At least thirty (30) days prior to commencement of the Project operations, the Permittee shall submit a report for the Director's approval that includes the name and grade of each process chemical that is proposed to be used at the ISR process. [DESCRIBE THE ISR PROCESS AND ALL FLUIDS AND CHEMICALS USED] The report shall also include recommendations, with justifications, as to which constituents of the reported chemicals should or should not be included in the Level 1 or Level 2 groundwater monitoring program defined at Part II.F.2 and the injectate monitoring program defined at Part II.F.7 of this Permit.

h. The Permittee may use a process chemical not included in the reports submitted pursuant to paragraph 6 (g) of this Section E above, provided the Permittee submits a report for the Director's approval at least thirty (30) days prior to the date of the proposed use of the chemical and receives written approval from the Director. Approved changes in process chemicals shall be made part of this Permit by minor permit modification procedures (A.A.C. R18-9-C633). Reports submitted pursuant to this section during Project operations must include information required by paragraph 6(g) of this Section E.

i. The Permittee shall expand the groundwater monitoring program defined at Part II.F.2 and the injectate monitoring program defined at Part II.F.7 as necessary to conform to the Director's conditions of approval of reports submitted pursuant to paragraphs 6(g) of this Section E.

j. The monitoring and advance notification requirements of Section E.6 and Section F.7 apply only to the lixiviant prior to injection and to constituents of process chemicals that may become part of the lixiviant.

F. MONITORING PROGRAM

1. Water Quality Monitoring Wells.

[DESCRIBE THE MONITORING PROGRAM, INCLUDING:

a. WELL NETWORK
b. WELL ASSIGNMENTS

c. MONITORING ALERTS
d. PURGING PROTOCOLS
e. PARAMETERS
f. AQUIFER QUALITY LIMITS
g. ANALYTES
h. MCLS
i. ALERTS AND ALERT LEVELS
j. WARNING SYSTEMS
k. EXCEEDENCE MANAGEMENT
l. RECORD KEEPING, ETC.]

2. Baseline Data and Statistical Methods
[DESCRIBE SIMILAR TO a., b., c., below]

a. Collect baseline water quality samples and analyze for all Level l and Level 2 parameters such that accepted statistical methods can be applied to assign alert levels (ALs) and aquifer quality limits (AQLs) at all POC, outer OWs, and inactive HC wells at the southern and eastern wellfield boundaries. [INCLUDE TABLE OF ALs and AQLs] For Process-Related Organics (Level 2), two (2) months of data collection with nondetectable organic levels will be sufficient for background characterization.

b. Submit to the Director a report containing mean baseline concentrations, standard deviations, ALs, and federal AQLs, based on statistical methods used to establish ALs and AQLs, as described at Section 2.4 in Attachment P and Section 2.5.3.1.2.1 of Attachment I of this Permit, or based on other methods approved by the Director, which establishes a means of verifying whether or not USDWs are endangered during Project recovery operations, rinsing, and post- rinsing, and establishes specific points at which contingency plans are activated.

c. Receive written approval from the Director for the baseline data, action levels, and statistical approach defined at paragraph 3(b) of this Section F, above. The ADEQ response will be provided within thirty (30) days if the report is complete and satisfactory.

3. Water Quality Monitoring Schedule
The Permittee shall comply with the monitoring schedule in Table 1 at the [SPECIFY NUMBER] POC wells and [SPECIFY NUMBER] outer OWs, in accordance with the final installation scheduled for those wells, for the approximately [SPECIFY DURATION]-year Project operation and restoration life and the [SPECIFY DURATION]-year post-rinsing monitoring period:

Table 1. Monitoring Schedule for the POC and Outer Observation Wells during Project Life and Post-Rinsing Period

Time Period	Water Quality Parameters	Sampling Frequency
Project	Level 1	At least once per quarter
Operation	Level 2	At least once annually
Post-Rinsing	Level 1	At least once per quarter for the first two (2) years after closure
	Level 2	At least once annually

Note: The Quarterly Compliance Monitoring Tables (Level 1 parameters) for each POC and monitoring well are presented in Table X and the Annual and Contingency Monitoring Tables (Level 2 parameters) for each POC and monitoring well are presented in Tables [XX and XX] in Appendix I of this Permit. Refer to Tables [XX and XX] for water quality monitoring well schedules.

4. **Hydraulic Control Monitoring Wells**
   [MODIFY AS APPROPRIATE] External monitoring of the ISR process around the perimeter of the Project wellfield shall be conducted to verify hydraulic control. This monitoring of the bedrock zone shall be performed using [SPECIFIY NUMBER] hydraulic control wells and [SPECIFIY NUMBER] OWs at the perimeter of the wellfield. Hydraulic control monitoring will entail using the OW pairs for head comparison and for verifying that the head gradient is inward, that is, from the outer OW toward the inner OW and wellfield. Head monitoring will be accomplished using pressure transducers placed in the OWs from which average daily head measurements will be recorded. In addition, the Permittee shall monitor specific conductance in the outer OWs to verify that hydraulic control is maintained and to detect any excursion. Fluids produced from the HC wells shall be monitored for specific conductance daily. The revisions to the installation and activation schedule, choice, and number of IMW, HC well, and OW locations to be monitored shall be subject to ADEQ review and approval.
5. **Specific Conductance Monitoring**
   [MODIFY AS APPROPRIATE]
   Prior to commencement of injection in new mine blocks, the Permittee shall comply with the following conductivity sensor monitoring requirements:

   a. The Permittee shall collect baseline conductivity measurements to establish the range of background specific conductance levels and baseline specific conductance measurements in the IMWs, outer OWs, and activated HC wells associated with the new mine blocks and in inactive HC wells at the southern and eastern wellfield perimeter prior to commencement of injection in the first activated mine block, in accordance with methods described in Attachment I. Where any conflict or inconsistency exists between Attachments and the permit conditions, the permit condition shall supersede the language in Attachments.

   b. For the purpose of detecting any loss of hydraulic control or any excursion of injection or ISR fluids at the perimeter of the wellfield, the Permittee shall

submit to the Director a report describing the results of baseline measurements and proposed procedures for identifying a statistically significant increase above statistical noise levels in conductivity values at the OW and specific conductance values at the IMW and HC wells confirming a loss of hydraulic control and a possible excursion requiring contingency actions.

c. Receive written approval from the Director for the baseline data, proposed action levels, and proposed procedures. The ADEQ response will be provided within thirty (30) days if the report is complete and satisfactory.

d. During Project ISR and rinsing operations, the Permittee shall monitor specific conductance in the outer OWs on a daily basis. Specific conductance in IMW and HC well fluids shall also be monitored daily.

6. Injectate Solution (Lixiviant) Monitoring
[MODIFY AS APPROPRIATE]

The Permittee shall comply with the following injectate solution monitoring requirements:

a. At least once per month, the Permittee shall measure the pH and the total concentration of [SPECIFY CONSTITUENTS] in the injectate solution using applicable analytical methods described in Table I of 40 CFR §136.3, in USEPA SW-846, Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, unless other methods have been approved by ADEQ. [CONSIDER THE FOLLOWING] The Permittee may request monthly monitoring be reduced to quarterly monitoring if the listed organics concentrations do not vary significantly during the first six (6) months of sampling. The requirement for monthly monitoring will be reinstated if concentrations vary significantly during quarterly sampling.

b. The Permittee shall modify the list of organic constituents required under the injectate solution monitoring program defined above, if the Permittee has received written approval from the Director for a change in the injectate solution, as detailed at Part II Section E.6. of this Permit, and the list described in paragraph 7(a) of this Section F, does not include all organic constituents which are present or could be present in the raffinate pond. [CONSIDER THE FOLLOWING]Monitoring for [LIST SPECIFIC CONSTITUENTS] may be discontinued if not detected in the first six (6) monthly sampling events.

c. The Permittee shall measure inorganic constituents in the pregnant leach solution (PLS) and lixiviant at least once per month using applicable analytical methods described in Table I of 40 CFR §136.3, in USEPA SW-846 unless other methods have been approved by ADEQ. The inorganic analytes to be measured shall include all constituents listed in Description of Operations of this Permit plus [SPECIFY ADDITIONAL CONSTITUENTS].

[CONSIDER THE FOLLOWING]The Permittee may request monthly monitoring be reduced to quarterly monitoring if the listed inorganics concentrations do no vary significantly during the first six (6) months of sampling. The requirement for monthly monitoring will be reinstated if concentrations vary significantly during quarterly sampling.

d. The Permittee shall modify the list of inorganic constituents in accordance with the requirements of Part II, Section E.6 of this Permit.

7. Groundwater Elevation Monitoring.

Groundwater depths and elevations, measured in feet relative to mean sea level, in the POC, IMWs, and OWs shall be measured on a quarterly basis and reported in accordance with this Permit.

8. Monitoring Information

Records of monitoring activity required under this Permit shall include:

a. Date, exact location, and time of sampling or field measurements;

b. Name(s) of individual(s) who performed sampling or measurement;

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.

9. Monitoring Devices

a. Continuous monitoring devices:
Temperature and injection pressure shall be measured using equipment of sufficient precision and accuracy, as described below. All measurements must be recorded at minimum to a resolution of one tenth of the unit of measure, except temperature (i.e., injection and production rates and volumes must be recorded to a resolution of a tenth of a gallon; pressure must be recorded to a resolution of a tenth of a psi gauge (psig); injection fluid temperature must be recorded to a resolution of one-degree Fahrenheit). Exact dates and times of measurements, when taken, shall be recorded and submitted. Injection and production rates shall be measured at or near the wellhead. Lixiviant temperature can be measured at a central distribution point. Produced fluid temperature shall be measured at or near the wellhead. The Permittee shall

continuously monitor and shall record the following parameters at the prescribed frequency shown in Table 2.

Table 2. Continuous Monitoring

Parameters	Frequency	Instrument
Injection rate (gpm)	Continuous	Digital Recorder
Daily injection volume (gallons)	Daily	Digital Totalizer
a. Total cumulative injection volume (gallons)	Continuous	Digital Totalizer
Injection pressure (psig)	Daily	Digital Recorder
Injection fluid temperature (degrees Fahrenheit)	Daily	Digital Recorder
Production rate (gpm)	Continuous	Digital Recorder
Daily produced fluid volume (gallons)	Daily	Digital Totalizer
Total cumulative produced fluid volume (gallons)	Continuous	Digital Totalizer
Produced fluid temperature (degrees Fahrenheit)	Daily	Digital Recorder
Specific conductance (mmhos/cm)	Continuous	Digital Recorder

b. Calibration and Maintenance of Equipment

All monitoring and recording equipment shall be calibrated and maintained on a regular basis to ensure proper working order.

G. RECORDKEEPING AND REPORTING

1. Recordkeeping

The Permittee shall retain the following records and make them available at all times for examination by an ADEQ inspector:

a. 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;

b. Information on the physical nature and chemical composition of all injected fluids; and

c. Records and results of MITs, any other tests required by ADEQ, and any well work-overs completed.

d. The Permittee shall maintain copies (or originals) of all records described in paragraphs (a) through (c) above during the operating life of the well and post-rinsing monitoring period and shall make such records available at all times for inspection at the facility.

e. Except for information determined to be confidential under A.A.C. R18-9-A603, all permit applications, permits, reports, and well operation data prepared in accordance with the conditions of this Permit shall be available for public inspection at appropriate offices of ADEQ.

f. The Permittee shall only discard the records described in paragraphs b through c if:
   i. The records are delivered to ADEQ, or
   ii. Written approval from the ADEQ Director to discard the records is obtained.

2. Reporting of Results

The Permittee shall submit, in accordance with the required schedule set out in Section G accurate reports to ADEQ containing, at minimum, the following information:

a. A map showing the current Project operational status and groundwater elevation contours based on the current quarterly monitoring data.

b. A table and graph showing daily cumulative injection volumes and recovery volumes and the daily percent recovery to injection volume in the Project over the reporting period. The report shall identify any 24-hour periods in which the volume recovered is less than the minimum percent of volume injected and any contingency actions taken during the reporting period.

c. A table and graphs comparing daily average head measurements in the eleven (11) outer OWs surrounding the Project wellfield with the same measurements in the eleven (11) inner OWs and a calculation of the head gradients between OW pairs.

d. A table and graph showing results of the specific conductance measurements and depths in the outer OWs compared to the established background and action levels identifying any statistically significant increase above statistical noise levels in conductivity values. The record shall also include a discussion of any increase that occurred, an evaluation of whether an excursion has occurred, and mitigating actions taken during the reporting period.

e. A table showing POC, IMWs, and outer observation well groundwater depths and elevations, analytical results, AQLs, and ALs along with a summary narrative, plus a graphical presentation of those results since inception of monitoring for the current reporting quarter. The records should also include a discussion of any exceedances that occurred and mitigating actions taken during the reporting period.

f. Results of monthly analyses of organics in the lixiviant.

g. Results of monitoring required at Part II.F.7 (pursuant to A.A.C. R18-9-G647(B)(1)) whenever the injection fluid is modified to the extent that previously reported analyses are incorrect or incomplete.

h. Results of mechanical integrity tests conducted during the reporting period.

i. A summary of the any plugging and abandonment activity conducted during the reporting period.

j. A summary of rinsing and closure operations conducted during the reporting period, including monitoring data from rinse verification and closure verification wells.

k. A table showing the average, maximum, and minimum monthly tubing/casing annulus and injection pressures.

l. If action is taken under either paragraphs (a) or (b) of Section H.1, a description of the causes and impacts of the loss of hydraulic control or the variance from the required recovery to injection ratio and the actions that were taken to correct the event.

3. **Submission of Quarterly Reports**
Quarterly reports shall be submitted by the dates listed below:

4. **Formation Testing and Geophysical Well Logging Reports**
Copies of all reports of formation testing and geophysical well logging conducted prior to beginning ISR operations shall be submitted to ADEQ and reviewed and approved by ADEQ before commencement of ISR operations is authorized.

5. **Submittal Address**
Copies of the monitoring results and all other reports required by this Permit shall be submitted to the following address:

Arizona Department of Environmental Quality
Water Quality Division, Groundwater, UIC Program

1110 West Washington Street
Phoenix, AZ 85007

H. CONTINGENCY PLANS

1. Loss of Hydraulic Control

a. The Permittee shall initiate the following actions within 24 hours of becoming aware that the volume of fluids recovered from the injection and recovery zone of the active mine blocks during a 24- hour period is less than one-hundred-one (101) percent of the amount of fluid injected during the same 24-hour period:

   i. adjust the flow rate for the recovery and/or injection wells and/or the HC wells to restore the percent of recovered fluid volume to at least one-hundred-one (101) percent of the injected volume,

   ii. inspect the injection and recovery lines, pumps, flow meters, totalizers, pressure gages, pressure transducers and other associated instruments and facilities,

   iii. initiate pressure testing of wells if the loss of fluids cannot be determined to be caused by a surface facility failure, and

   iv. repair the system as necessary to restore the percent of recovered fluid volume to at least one-hundred-one (101) percent of the injected volume.

b. A loss of hydraulic control is deemed to occur when the amount of fluid recovered during a 48-hour period is less than one-hundred-one (101) percent of the amount of fluid injected during the same 48-hour period. Loss of hydraulic control is also defined by an inward gradient (in head differential) of less than 0.01 ft./ft. or an outward gradient observed in any pair of OWs over a 48-hour period or by an action level in conductivity values above statistical noise levels in OWs over a 48-hour period. An inward gradient of less than 0.01ft./ft. (i.e., loss of hydraulic control) shall require action to restore the inward gradient to at least 0.01 ft./ft. in the subsequent 24-hour period.

   The minimum inward flow ratio and head differentials may be adjusted during the ISR operation if warranted by specific conductance data from outer OWs or head data from OW-pairs and from POC and other monitoring wells, subject to ADEQ review and approval.

The Permittee shall initiate the following actions within 24 hours of becoming aware of the loss of hydraulic control within the Project area for more than 48 consecutive hours, as defined above. The Permittee shall:

i. Cease or reduce injection in one or more wells as necessary to restore hydraulic control,

ii. operate injection, recovery, and HC wells to reverse a confirmed loss of hydraulic control and excursion indicated by a specific conductance exceedance at an outer OW or until the amount recovered equals an amount sufficient to restore the ratio of fluid recovered to injected during the prior 72-hour period to a minimum of one-hundred-one (101) percent and restore all OW pair head differentials to at least 0.01 ft./ft. to verify an inward flow gradient,

iii. verify proper operation of all facilities within the Project area, and

iv. perform any necessary repairs.

c. If action is taken under either paragraphs (a) or (b) above, the Permittee shall, in the next quarterly report, describe the causes and impacts of the loss of hydraulic control or the variance from the required recovery to injection ratio and the actions that were taken to correct the event.

2. Water Quality Exceedances at POC and outer observation wells

The following describes contingency plans to be followed after the verification of an AL or AQL exceedance in a POC or outer OW during the approximately [SPECIFY NUMBER OF YEARS] -year operation and restoration life and during the [SPECIFY NUMBER OF YEARS] -year post-rinsing monitoring period:

a. In the event of an AL exceedance during operational project life.

b. The Permittee shall collect a verification sample within five (5) days after becoming aware of an exceedance of an AL listed in [REFER TO TABLE OF ALs FOR WATER QUALITY PARAMETERS] in this Permit.

c. Within five (5) days after receiving the results of verification sampling from the laboratory, the Permittee shall notify the Director in a written report if the results indicate an exceedance.

d. If the results of verification sampling indicate that an AL has not been exceeded, the Permittee shall notify ADEQ of the results. No further action is required until the next scheduled monitoring round.

e. Within thirty (30) days of receiving the laboratory results verifying that an AL has been exceeded, the Permittee shall do the following:
    i. Submit a written report to ADEQ providing an evaluation of the cause, impacts, and any mitigation of the discharge responsible for the AL exceedance, or
    ii. Submit a written report to ADEQ which definitively demonstrates that the AL exceedance resulted from an error(s) in sampling, analysis, or statistical evaluation.

f. Upon review of the report documenting the AL exceedance, the Director may require additional monitoring and/or action beyond those specifically listed in this Permit.

g. In the event of an AQL exceedance during operational Project Life, rinsing, and post-rinsing monitoring period:
    i. The Permittee shall collect a verification sample within five (5) days of becoming aware of an exceedance of an AQL listed in [REFER TO TABLE OF AQLs FOR WATER QUALITY PARAMETERS] in this Permit.
    ii. Within five (5) days of receiving the results of verification sampling from the laboratory, the Permittee shall notify the Director of the results in a written report, regardless of whether the results are positive or negative.
    iii. If the results of verification sampling indicate that an AQL has not been exceeded, the Permittee shall notify ADEQ. No further action is required until the next scheduled monitoring round.
    iv. Within thirty (30) days of receiving the laboratory results verifying that an AQL has been exceeded, the Permittee shall submit a written report to ADEQ providing an evaluation of the cause, impacts, and any mitigation of the discharge responsible for the AQL exceedance or Submit a written report to ADEQ which definitively demonstrates that the AQL exceedance resulted from an error(s) in sampling, analysis, or statistical evaluation.
    v. Upon review of the report documenting the AQL exceedance, the Director may require additional monitoring and/or action beyond those specifically listed in this Permit.

I. RESTORATION, PLUGGING AND ABANDONMENT

Pursuant to A.A.C. R18-9-B614 and B608, the Permittee shall comply with the Wellfield Closure Strategy in Attachment F and the Plugging and Abandonment Plans in Attachment C in accordance with the schedule for aquifer restoration, groundwater monitoring, and plugging and abandonment activities to ensure adequate protection of USDWs. The Permittee shall also comply with the conditions at I.1 and I.2 below. Where

any conflict or inconsistency exists between the Plugging and Abandonment Plans and permit conditions, the permit conditions shall supersede the language in the Plugging and Abandonment Plans.

1. Closure and Plugging and Abandonment Plan

a. Constituents with primary MCLs: Within sixty (60) days after completing copper recovery operations in the injection and recovery zone of a specific mine block, the Permittee shall commence restoration activities for the zone. The groundwater in the injection and recovery zone shall be restored to concentrations which are less than or equal to primary MCLs defined at 40 CFR Part 141, or to pre-operational background concentrations if the pre- operational background concentrations exceed MCLs. The Permittee shall follow the procedure detailed at (c), below.

b. Constituents without primary MCLs: In addition to constituents with primary MCLs, the Permittee shall ensure that constituents which do not have primary MCLs do not impact USDWs in a way that could adversely affect the health of persons.

c. Closure and Plugging & Abandonment Procedure: The Permittee shall commence closure operations in the injection and recovery zone after copper recovery operations have been completed. During closure operations, the Permittee will cease injection of lixiviant and initiate rinsing of the injection and recovery zone by injection/recovery or recovery operations. At all times during injection and recovery zone rinsing, the Permittee shall maintain inward hydraulic gradients (i.e., maintaining hydraulic containment of the injection and recovery zone).

Closure of the wellfield will include rinsing to remove residual PLS, post-rinsing onitoring, and well abandonment, as described in the Wellfield Closure Strategy in Attachment F. After copper recoveries drop below the economic cutoff, ISR in each production block will be deemed complete and the block will be rinsed using fresh groundwater until applicable water quality standards are met. A three- step rinsing process will be implemented as follows:

i. Rinse three (3) pore volumes (based on a 3% fracture porosity of the orebody);
ii. Rest for one (1) year; and
iii. Rinse two (2) pore volumes.

The Permittee shall monitor the rinsing progress by analyzing fluids recovered from all recovery wells in the first mine block after rinsing Step 3. These data will then be used to determine the minimum number of sampled wells needed to confirm that rinsing has been

successful in the rinsing and closure of subsequent mine blocks. The results of that evaluation shall be submitted for ADEQ review and approval. The wells to be retained for sampling during rinsing operations in subsequent mine blocks shall be identified and the locations of those wells shall be provided before closure of other wells in a mine block is approved by ADEQ.

The Permittee will sample discharges for all Level 2 constituents defined at Part II.F of this Permit. If results of the Level 2 sampling show that one or more compounds are above primary MCLs and the pre-operational background concentrations, rinsing operations will continue until all compounds are below primary MCLs or the pre-operational background concentrations if pre-operational background concentrations exceed MCLs (AQLs).

If the Level 2 constituents in a well are below AQL concentrations, the Permittee may discontinue rinsing that well until the end of the thirty (30)- day period described below. If the Level 2 constituents in a well exceed the AQLs, the Permittee shall continue rinsing operations until such time that Level 2 constituent concentrations in the well are less than the AQLs for the Project.

When all individual rinse verification well concentrations within the injection and recovery zone of a specific mine block are below the AQLs, rinsing operations for all wells within the mine block will be discontinued for thirty (30) days. At the end of the thirty (30)-day period, the wells shall be re-sampled and if Level 2 constituent concentrations remain below the AQLs in all wells, the Permittee may cease all rinsing activities for the wells in the injection and recovery zone of that mine block.

The Permittee shall document the results of the closure operation in the subsequent quarterly monitoring report and notify ADEQ of the schedule for plugging and abandonment operations at least thirty (30) days in advance of commencing plugging and abandonment operations at wells to be plugged in an abandoned mine block. The Permittee shall identify the wells and locations of those wells to be retained as CVWs during the post- closure monitoring period in a closure report. The Permittee shall submit the notification, the closure report, and an updated Plugging and Abandonment Plan and schedule for ADEQ approval. The wells shall be abandoned in accordance with the Plugging and Abandonment Plan (Attachment C) and the Wellfield Closure Strategy in Attachment F unless modified for individual well conditions.

2. Post-Rinsing Monitoring

Monitoring at POC, outer OWs, CVWs, and other Project monitoring wells: To ensure that the restoration required at Section II.I(1), above, accomplished the objective of returning the injection and recovery zone to primary MCLs (or pre-operational background concentrations) and thereby providing adequate protection to surrounding USDWs, the Permittee shall comply with the Wellfield Closure Strategy in Attachment F of this Permit, the post-rinsing monitoring schedule at Part II. Section F.4 of this Permit and the AQL exceedance contingency plan established in

Part II, Section H.2, paragraph (b) of this Permit. The post-rinsing monitoring schedule at Part II. Section F.4 may be extended beyond five (5) years, as described in the Wellfield Closure Strategy, if water quality standards are not met for five consecutive years at all closure verification wells and outer OWs, and ADEQ deems it necessary to ensure adequate protection of USDWs. The Permittee shall submit a post-rinsing notification and report, with documentation, to ADEQ within thirty (30) days following completion of the post- rinsing monitoring program.

J. OPERATIONAL AND POST-RINSING AUDITS

[MODIFY AS APPROPRIATE] The Permittee shall submit a groundwater flow model evaluation and updated report within six (6) months of the completion of the first year of operation for each of the three stages and every five (5) years thereafter for Stages 1 and 3 until mine closure. The schedule for these audits may be adjusted, depending on the progress of Stage 1, 2, and 3 operations, subject to ADEQ review and approval. The groundwater flow model evaluation and updated report shall include: hydrographs; changes to the site conceptual model, if any; water balance(s); results of calibration and sensitivity analysis, as appropriate; model run logs; any changes to the input model parameters; specific conductance trend analysis for IMWs and OWs and any constituents in the compliance monitoring program, if determined appropriate; updated quarterly groundwater contour maps; and updates to the groundwater flow model to assess particle tracking (fate and transport). The model shall assess the performance of the operating mine blocks, rinsing of mine blocks, capture associated with hydraulic control wells, and any changes to the post-rinsing period required by this Permit and recommend adjustments to the post-rinsing monitoring period based on updated groundwater flow modeling results. Simulation of the injection/recovery well performance may be included in the assessment of operating mine block performance if warranted by ISR operational performance and monitoring data.

K. DURATION OF PERMIT

The duration of this Class III permit shall include well construction, corrective actions, and demonstrations required prior to injection under permit conditions in Part II, Sections C, D, and E of this Permit. After injection is authorized, the duration of this Class III permit shall include the approximately [SPECIFY DURATION] year Project operation and restoration life and [SPECIFY DURATION] year post-rinsing monitoring period unless terminated under the conditions set forth in Part III, Section B.1 of this Permit or administratively extended under the conditions set forth in Part III.E.11. The duration of this Class III permit shall include any post-rinsing monitoring required beyond five (5) years.

L. FINANCIAL RESPONSIBILITY

1. Demonstration of Financial Responsibility

The Permittee shall demonstrate and maintain financial responsibility and resources sufficient to meet the restoration and plugging and abandonment requirements established at Part II, Section I of this Permit and described in the Plugging and Abandonment Plan (Attachment C) and the Wellfield Closure Strategy (Attachment F) and consistent with A.A.C. R18-9- D636(A)(6), which the Director has chosen to apply.

a. The Permittee shall post an approved financial instrument such as a surety bond or other financial assurance in the amount of [SPECIFY $ AMOUNT] to guarantee aquifer restoration, groundwater monitoring, and plugging and abandonment activities for closure and post-closure. Authority to construct, inject, and operate the wells under the authority of this Permit will be granted only after the financial instrument has been secured and approved by ADEQ. The Closure Plan and detailed cost estimates for the [PROJECT NAME] Wellfield are provided in the permit application, which is included in Attachment C.

b. The level and mechanism of financial responsibility shall be reviewed and updated periodically, upon request of ADEQ. The Permittee may be required to change to an alternate method of demonstrating financial responsibility. Any such change must be approved in writing by ADEQ prior to the change.

c. ADEQ may require the Permittee to estimate and to update the estimated restoration, plugging, and/or post-closure activity costs periodically. Such estimates shall be based upon costs that a third party would incur to carry out the required restoration activities, properly plug and abandon the wells, and perform post-closure monitoring activities, including materials, equipment, mud and disposal costs, and labor with appropriate contingencies.

   [MINING COMPANY] must provide estimated closure costs and updated financial assurance for Stage 2 and 3 operations before initiating drilling and ISR operations in those stages. Those cost estimates and the updated financial assurance mechanism, if necessary, must be provided and reviewed for acceptance by ADEQ in accordance with Part II.L and A.A.C. R18-9-D636(A)(6), and 40 CFR Subpart F before [MINING COMPANY] will be authorized to begin those operations.

2. Insolvency of Financial Institution

The Permittee shall submit an alternate instrument of financial responsibility acceptable to ADEQ within sixty (60) days after either of the following events occurs:

a. The institution issuing any bond or other financial instrument that is secured to demonstrate financial responsibility in accordance with Part II, Section L.1. of this Permit files for bankruptcy; or

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.

c. Except for information determined to be confidential under A.A.C. R18-9-A603, all permit applications, permits, reports, and well operation data prepared in accordance with the conditions of this Permit shall be available for public inspection at appropriate offices of ADEQ.

Failure to submit an acceptable financial demonstration may result in the termination of this Permit pursuant to A.A.C. R18-9-C634(A)(1).

3. Insolvency of Owner or Operator

The Permittee shall notify ADEQ 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. 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.

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 other injection activity in a manner that allows the movement of fluid containing any contaminant (as defined by A.A.C. R18-9-A601) into USDWs (as defined A.A.C R18-9-A601).

Any underground injection activity not specifically authorized in this Permit is prohibited. The Permittee must comply with all applicable provisions of 18 A.A.C. 9, Article 6. 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 laws and regulations.

B. PERMIT ACTIONS

1. Modification, Revocation and Reissuance, or Termination

ADEQ may, for cause or upon request from the Permittee, modify, revoke and reissue, or terminate this Permit in accordance with A.A.C. R18-9-C631, C632, and C634. The permit is also subject to minor modifications for causes as specified in A.A.C. R18-9-C633. 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. ADEQ 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 ADEQ and the Permittee complies with requirements of A.A.C. R18-9-C630. ADEQ 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 A.A.C. R18-9-A603, any information submitted to ADEQ 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, ADEQ 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 A.R.S. § 49-205 (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

1. Duty to Comply

The provisions of R18-9-D635 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. The Permittee shall comply with all applicable UIC Program regulations and 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 A.A.C. R18-9-C625. Any permit non-compliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for 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. Any person who willfully violates permit conditions 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 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 ADEQ, within a time specified, any information which ADEQ 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 ADEQ, upon request, copies of records required to be kept by this Permit pursuant to A.A.C. R18-9- D635(A)8.

8. **Inspection and Entry**
   The Permittee shall allow ADEQ, or an authorized representative, upon the presentation of credentials and other documents as may be required pursuant to A.A.C. R18-9-D635(A)9 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. Signatory Requirements

All applications, reports, or other information submitted to ADEQ shall be signed and certified by a responsible corporate officer or duly authorized representative according to A.A.C. R18-9-C617.

10. Additional Reporting Requirements

a. Planned Changes - The Permittee shall give notice to ADEQ as soon as possible of any planned physical alterations or additions to the permitted facility affecting any of the terms and conditions of the permit.

b. Anticipated non-compliance-The Permittee shall give advance notice to ADEQ 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 ADEQ no later than thirty (30) days following each schedule date.

d. Twenty-four Hour Reporting

The Permittee shall report to ADEQ any non-compliance which may endanger health or the environment. The following Information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances.

i. Any monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW; and
ii. Any non-compliance with a permit condition, malfunction of the injection system, or loss of mechanical integrity, which may cause fluid migration into or between USDWs.

e. A written submission of all non-compliance shall also be provided to ADEQ 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.

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 ADEQ, the Permittee shall submit such facts or information within two (2) weeks of the time such facts or information becomes known.

11. Continuation of Expiring Permit

a. Duty to Reapply - If ADEQ requires the Permittee to continue an activity regulated by this Permit past the expiration date of this Permit, the Permittee must submit a complete application for a new permit at least one hundred and eighty (180) 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. ADEQ, 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.

UNDERGROUND INJECTION CONTROL PROGRAM

PERMIT [IF APPLICABLE: AREA PERMIT] to Construct and Inject

Class V Injection Wells

Permit No. UIC-AZV-FY22-#

[PROJECT NAME] Project

[COUNTY NAME] County, Arizona

Issued to:

[PERMITTEE NAME]

[ADDRESS LINE 1]

[ADDRESS LINE 2]

[ADDRESS LINE 3]

AUTHORIZING SIGNATURE

_____

[Name of Director], Director
Water Quality Division
Arizona Department of Environmental Quality
Signed this ____ day of _____ , 20__

PART I. AUTHORIZATION TO CONSTRUCT AND INJECT

Pursuant to the Underground Injection Control regulations of the Arizona Department of Environmental Quality codified at Title 18 of the Arizona Administrative Code, Chapter 9, Article 6

[COMPANY NAME]
[ADDRESS LINE 1]
[LINE 2 LINE3]

is hereby authorized, contingent upon Permit conditions, to [construct and] operate [SPECIFY NEW OR EXISTING] Class V [SPECIFY TYPE] injection well facility used to dispose of [SPECIFY FLUID] generated by the Permittee's facility. The Project is in [PROJECT LOCATION], Arizona, approximately [DISTANCE AND DIRECTION TO NEAREST LANDMARK], as depicted in Attachment A. The location is [LOCATION DESCRIPTION (Include Section, Township, Range, with latitude/longitude)]. The well [IS/WILL BE] located

[DESCRIBE LOCATION]. The injection zone is within the [FORMATION NAME] Formation at the [FOR WELLS NOT YET DRILLED USE APPROXIMATE] depths of [NUMBER] feet to [NUMBER] feet below ground level. The authorized injection interval is within the [FORMATION NAME] Formation at the [FOR WELLS NOT YET DRILLED USE APPROXIMATE] depths of [NUMBER] to [NUMBER] feet below ground level.

[DESCIBE INJECTATE AND SOURCE OR PRODUCTION PROCESS] [INDICATE IF AQUIFER EXEMPTION IS REQUIRED OR HAS BEEN APPROVED]

For the permitted wells within the area of review (AOR), ADEQ will issue authorization to drill and construct only after requirements of Financial Responsibility in Part II, Section L of this Permit have been met. ADEQ will grant authorization to inject only after the requirements of Part II, Sections B, C and D of this Permit have been met. Operation of injection [WELL ID] will be limited to a maximum volume of [SPECIFY QUANTITY] and pressure of [SPECIFY QUANTITY]. All conditions set forth herein refer to Title 18, Chapter 9, Article 6 of the Arizona Administrative Code (A.A.C.),, which are regulations in effect on the date that this Permit is effective.

This Permit consists of [NUMBER] pages plus Attachments, and includes all items listed in the Table of Contents. Further, it is based upon representations made by [COMPANY NAME] (the Permittee) and on other information contained in the administrative record. It is the responsibility of the Permittee to read, understand, and comply with all terms and conditions of this Permit. This Permit and the authorization to construct, operate, and inject are issued for a period to include the approximate [NUMBER]-year Project operation unless terminated under the conditions set forth in Part III, Section B.1 of this Permit. This Permit and authorization to inject shall also include any additional post-closure monitoring beyond [NUMBER] years, if deemed necessary by ADEQ.

This Permit is issued on [DATE] and becomes effective on [DATE]. This Permit is issued for a period of xx years unless the Permit is terminated under the conditions set forth in Part III.B.1. or administratively extended under the conditions set forth in Part III.E.

Signed by

_____

[Name of Director], Director
Water Quality Division
Arizona Department of Environmental Quality

PART II. SPECIFIC PERMIT CONDITIONS

A. REQUIREMENTS PRIOR TO DRILLING, TESTING, CONSTRUCTING, OR OPERATING

1. Financial Assurance

The Permittee shall supply evidence of financial assurance prior to commencing any well drilling and construction, in accordance with Section G of this part.

2. Field Demonstration Submittal, Notification, and Reporting

a. Prior to each demonstration or test required in this Permit, the Permittee shall submit plans and specifications for procedures to the ADEQ for approval 90 days prior to demonstration or testing activities. No demonstration or test in these sections may proceed without prior written approval from ADEQ.

b. The Permittee must notify ADEQ at least thirty (30) days prior to performing any required field demonstrations or test, after ADEQ approves the plans/procedures for testing, in order to allow ADEQ to arrange to witness if so elected.

c. The Permittee shall submit results of each demonstration or test required in Part II of this Permit to ADEQ within thirty (30) days of completion, unless otherwise noted.

[INCLUDE SECTION ON AQUIFER EXEMPTION IF APPLICABLE – SEE PART II.B IN CLASS III PERMIT TEMPLATE]

B. CONDITIONS FOR EXISTING WELLS AND PROPOSED WELLS

1. Surface Location

[DESCRIBE LOCATION OF EXISTING AND PROPOSED WELLS]

2. Existing Well Construction Details

A well schematic for each well is contained in Attachment B of this Permit. The Permittee shall at all times maintain the well consistent with this well schematic.

3. Proposed Well Construction Details

The Permittee shall submit an updated well schematic for each proposed well and must receive written ADEQ approval prior to commencing drilling and construction of the well.

4. Future Well Construction Beyond the Existing Well Identified in this Permit

Prior to drilling any new injection well(s) not covered by this Permit, the Permittee must submit to ADEQ, for review and approval, a permit application with detailed construction plans and procedures, including proposed field coordinates [SECTION, TOWNSHIP, RANGE, LATITUDE/LONGITUDE] for the surface and bottom hole locations of the proposed well(s). The Permittee shall also provide the drilling program details,and the distance between all wells, and any justification for the proposed separation distance between the wells, both at the surface and at the true vertical depth of the top of the injection interval.

5. Injection Formation Testing

a. Step-Rate Test (SRT)

i. Within ninety (90) days after the completion of the injection well, the Permittee shall conduct an SRT on the well to establish the maximum allowable surface injection pressure (MAIP). The report shall be submitted to ADEQ within sixty (60) days of test completion.

ii. Step Rate Test Procedure Guidelines. Refer to Society of Petroleum Engineers (SPE) Paper #16798 for test design and analysis guidance.

iii. Injection into the well as proposed in the approved SRT procedure, which may include injecting above fracture pressure, will be temporarily authorized only until such time that ADEQ approves final injection requirements.

b. Pressure Fall Off Test (FOT)

i. Within one hundred eighty (180) days after ADEQ approves the completed SRT and establishes an MAIP for the well pursuant to Part II.D.3., the Permittee shall conduct an initial FOT to determine and monitor formation characteristics. 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 after a radial flow regime has been established at an injection rate which is representative of the wastewater contribution to the well.

ii. The Permittee shall submit to ADEQ for review and approval a detailed plan for the FOT that is developed in accordance with Attachment D. Once ADEQ approves in writing the test plan, the

Permittee may schedule the FOT. The final FOT report shall be submitted to ADEQ within sixty (60) days of test completion.

iii. After the initial FOT, the Permittee shall conduct an annual FOT to monitor formation characteristics. The Permittee may conduct the annual FOT in conjunction with the annual External Mechanical Integrity Test demonstration, as required by Part II.D.3.

iv. The Permittee shall create a plot/graph of the latest static reservoir pressure of the injection zone and its cumulative behavior over time, starting with the FOT conducted after the initial FOT; the plot shall be included with the annual FOT report each year.

c. Formation Testing Program

In addition to Part II.B.5.a. and b., above, the Permittee shall submit a detailed proposed formation testing program for each well for ADEQ review as part of the proposed drilling program. The Permittee shall not commence construction of the well until ADEQ has approved the proposed formation testing program.

6. Injection Interval

The [PROPOSED OR EXISTING WELLS] [ARE CURRENTLY/ WILL BE] injecting into the [DESCRIBE FORMATION] within the [NAME OF FACILITY]. Injection is only permitted into [FORMATION NAME] Formation within the depth range as depicted in the as-built diagrams in Attachment B (i.e., at a depth of approximately [NUMBER] to [NUMBER] feet bgs).

7. Monitoring Devices

The Permittee shall install and maintain in good operating condition at all times during the operation of the Well(s), the following monitoring devices:

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 ADEQ for the purpose of obtaining representative samples of injection fluid; and

b. Devices to continuously measure and record injection pressure, annulus pressure, temperature, 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.

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.

8. Proposed Changes and Workovers

a. The Permittee shall give advance notice to ADEQ as soon as possible, pursuant to and in accordance with A.A.C. R18-9-D635, of any planned physical alterations or additions to the well(s), 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, require prior written approval by ADEQ and may require a permit modification under the requirements of A.A.C. R18-9-C632. 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 ADEQ as minor permit modifications consistent with A.A.C. R18-9- C633.

b. The Permittee shall provide all records of well workovers, logging, or other subsequent test data to ADEQ 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 contained in Attachment E.

d. The Permittee shall perform a Mechanical Integrity Test (MIT), using the procedures set forth in Part II.D.1 and Part II.D.2.a within thirty (30) days of completion of workovers or alterations and prior to resuming injection activities. The Permittee shall provide results of the MIT to ADEQ within sixty (60) days of completion.

9. Testing during Drilling and Construction

a. The Permittee shall include logs and other tests conducted during drilling and construction including, at a minimum, deviation checks, casing logs, and injection formation tests as outlined in A.A.C. R18-9-E640.

b. The Permittee shall conduct open hole logs over the entire open hole sequence below the conductor casing.

c. The Permittee shall conduct formation evaluation logs and tests and shall provide and use those results to estimate and report values for porosity, permeability, compressibility, static formation pressure, effective thickness, lithology, and rock mechanical properties for both the injection and confining zones identified within the permitted geological sequence.

d. The Permittee shall collect and analyze full-diameter cores from the overlying confining unit [NAME OF FORMATION] and within the [NAME OF FORMATION] Formation during drilling of the each well.

e. Before surface, intermediate, and long string casings are set, the Permittee shall run dual induction/spontaneous potential/gamma ray/caliper (DIL/SP/GR/CAL) logs over the course of the entire open hole sequence after the well is drilled to each respective terminal depth. After each casing is set and cementing is completed, the Permittee shall conduct a cement bond evaluation over the course of the entire cased hole sequence. The cement bond evaluation shall enable the analysis of bond between cement and casing as well as any cement channeling in the borehole annulus.

f. During construction of each well, the Permittee shall obtain information relating to ground water at the site and submit to ADEQ. This information shall include a direct Total Dissolved Solids analysis of the target injection formation water to demonstrate the presence and characteristics of, or the lack thereof, any Underground Sources of Drinking Water (USDWs, as defined in A.A.C. R18-9- A605.

C. CORRECTIVE ACTION

The Permittee is required to conduct corrective actions as mandated in R18-9-D639, prior to ADEQ granting authorization to inject under this Permit.

1. Annual AOR Review

The Permittee shall annually review the AOR calculation based on any new data obtained from the FOT and static reservoir pressure observations required by Part II.B.7.b. The Permittee shall provide to ADEQ a copy of the modified AOR 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.

2. Implementation of Corrective Action

a. If any wells requiring corrective action, in accordance with A.A.C. R18-9-D639, are found within the modified AOR referenced in Part II.C.1., above, a list of the wells along with their locations and construction data shall be provided to ADEQ within thirty (30) days of their identification. ADEQ will determine whether corrective action is required and no corrective action shall be performed without authorization.

b. Corrective action may be required after permit issuance to address any wells within the area of review that may allow migration of fluids into underground sources of drinking water. ADEQ will use the annual FOT results and re-calculation of the ZEI, along with USDW monitoring results from the monitoring well, as described in Section E, Monitoring, Recordkeeping, and Reporting of Results to determine the potential need for any future corrective action.

c. The Permittee shall submit a plan for approval by ADEQ to re-enter, plug, and abandon the wells listed in Part II.C.2.a., above, in a way that prevents the migration of fluids into any USDWs. The Permittee may submit an alternative plan to address the potential for fluid migration in any of these wells to ADEQ.

d. The Permittee may not commence corrective action activities without prior written approval from ADEQ.

D. WELL OPERATION

1. Required Demonstrations

a. Mechanical Integrity
The Permittee shall propose a schedule to conduct a MIT to demonstrate the Well(s) authorized by this Permit has mechanical integrity consistent with A.A.C. R18-9-B613 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 previous permit. The Permittee shall demonstrate that there are no significant leaks in the casing and tubing (internal mechanical integrity) and that there is not significant fluid movement into or between USDWs through the casing wellbore annulus or vertical channels adjacent to the injection wellbore (external mechanical integrity).

b. Injectate Waste Determination
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 the each well authorized by this Permit, as listed in Section II.D.5.a, is unchanged. If a change is identified, a new determination must be performed within sixty (60) days of the effective date of this Permit. The results of the analysis shall demonstrate that the injectate does not meet the definition of hazardous waste as defined in A.R.S. § 49-921.

The Permittee shall submit a letter to ADEQ confirming that the "Hazardous Waste Determination" was carried out according to 40 CFR § 262.11 within sixty (60) days of it having been completed for the well.

The Permittee shall perform an additional "Hazardous Waste Determination" whenever there is a process change or a change in fluid chemical constituents or characteristics of the injectate. The Permittee shall also refer to injectate testing requirements set forth in Part II.E.1., below.

2. Mechanical Integrity Testing

a. Mechanical Integrity Tests

Mechanical integrity testing shall conform to the following requirements throughout the life of any injection wells currently or in the future authorized by ADEQ under this Permit and in accordance with the requirements set forth at A.A.C. R18-9- D635.

i. Casing/Tubing Annular Pressure (Internal MIT)
In accordance with the timing requirements defined in Part 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. This test shall be for a minimum of thirty (30) minutes at a pressure equal to or greater than three hundred and fifty (350) pounds per square inch gauge (psig). If greater than the MAIP, it should be no greater than one hundred (100) psig or 10% of the MAIP, whichever is less. A well passes the MIT if there is less than a five (5) percent change in pressure over the thirty (30) minute period. A pressure differential of at least three hundred and fifty (350) psig between the tubing and annular pressures shall be maintained throughout the MIT. This test shall be performed on each well within five years of the previous Internal MIT and once every five (5) years thereafter.

Detailed plans for conducting the Internal MIT must be submitted to ADEQ for review and approval. Once approved, the Permittee may schedule the Internal MIT, providing ADEQ at least thirty (30) days' notice before the Internal MIT is conducted. The final test report shall be submitted to ADEQ 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. The average, maximum, and minimum monthly results shall be included in the next Quarterly Report submitted to ADEQ pursuant to Part II.E.5.b., along with any additional records or data requested by ADEQ regarding the continuous monitoring data described in this Section.

iii. Injection Profile Survey (External MIT)
The Permittee shall conduct a demonstration that the injectate is confined to the proper zone and submit the results of the demonstration to ADEQ for approval.

This demonstration shall consist of temperature and radioactive tracer surveys, and top perforation and packer checks or another diagnostic tool or procedure as approved by ADEQ.

Detailed plans for conducting the external MIT must be submitted to ADEQ for review and approval. Once approved, the Permittee may schedule the External MIT, providing ADEQ at least thirty (30) days' notice before the External MIT is conducted. Results of the External MITs shall be submitted to ADEQ in the quarterly reports.

b. Schedule for MITs

ADEQ may require that an Internal and/or External MIT be conducted within thirty

(30) days of a written request from ADEQ during the permitted life of any well authorized by this Permit. The Permittee shall also arrange and conduct MITs according to the following requirements and schedule:

i. Within thirty (30) days from completion of any workover operation where well integrity is compromised, an Internal MIT shall be conducted and submitted to ADEQ for approval to verify that the well has mechanical integrity. Prior to this field demonstration, the Permittee shall submit testing plans to ADEQ, as described in Part II.A.2.

ii. At least annually, an injection profile survey External MIT shall be conducted in accordance with A.A.C. R18-9-B613 and Part II.D.2.a.iii.

iii. At least once every five (5) years for each operating well authorized under this Permit, an Internal MIT shall be conducted in accordance with A.A.C. R18-9-B613 and Part 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 of any well authorized by this Permit, the Permittee shall notify ADEQ 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.

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 not until ADEQ has provided written approval prior to the recommencing of 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 ADEQ that the demonstration of mechanical integrity is

satisfactory.

3. Injection Pressure Limitation

For any injection wells authorized pursuant to this Permit:

d. Injection pressure measured at the wellhead shall not exceed [NUMBER] psig for injection into the [FORMATION NAME] Formation.
e.
f. The Permittee may request a change in the maximum injection pressure allowed under Part II.D.3. Any such request shall be made in writing and justified to ADEQ with the results of a SRT. If ADEQ approves the change, the proposed MAIP would be added to the Permit as an attachment, becoming the enforceable MAIP.
g.
h. In no case shall the Permittee inject at pressures that initiate new fractures or propagate existing fractures in the injection zone or the confining zone, cause the movement of injection or formation fluids into or between USDWs, or allow injection fluids to migrate to any other wells.

4. Injection Volume (Rate) Limitation

For any injection wells authorized pursuant to this Permit:

i. The injection rate shall not exceed [NUMBER] gallons per month or [NUMBER] gallons per day. This rate will be subject to an annual review based on the annual AOR determinations as described in Part II.C.1.
j.
k. The Permittee may request a change in the maximum rate allowed in Part II.D.4.a., above. Any such request shall be made in writing, along with a justification for the proposed increase, to ADEQ for review and approval.
l.
m. Should any increase in injection rate be requested, the Permittee shall demonstrate to the satisfaction of ADEQ that the proposed increase will not interfere with the operation of the 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.
n.
o. The injection rate shall not cause an exceedance of the injection pressure limitation established pursuant to Part II.D.3.

5. Injection Fluid Limitation

a. This Permit authorizes the following injection fluids into the [Well ID]: [DESCRIBE FLUID AND SOURCES]. Fluids from other sources or any other types of waste fluids are prohibited from injection at this Facility.

b. The Permittee shall not inject any hazardous waste, as defined by A.R.S. § 49-921, at any time.

c. Injection fluids shall be limited to those authorized by this Permit, which are those fluids produced by the Permittee and authorized sources described in Part II.D.5.a. and Part II.D.5.b., above.

d. Any well stimulation or treatment procedure (such as acidizing, etc.) performed at the discretion of the Permittee shall be proposed and submitted to ADEQ for approval. If approval is granted, notification to ADEQ 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 ADEQ approval after the effective date of this Permit. If the standard operating procedure plan is approved by ADEQ in writing, the Permittee shall notify ADEQ within fifteen (15) days of the proposed well stimulation or treatment procedure, provided the procedure does not deviate in any way from the ADEQ-approved plan.

6. Tubing/Casing Annulus Requirements

For any injection wells authorized pursuant to this Permit:

a. The Permittee shall use and maintain corrosion-inhibiting annular fluid during well operation. The annular fluid used in the [NAME OF WELL] is a [DESCRIBE FLUID] with a density of [NUMBER] pounds per gallon (ppg).

b. If the historic cyclic range of annular pressure fluctuation is not already known, then within the first three (3) months of normal injection operations after the effective date of this Permit, the Permittee shall monitor and record to determine that range. The pressure fluctuation data shall be submitted with the first Quarterly Report due after the effective date of the Permit.

c. Any annular pressure measured outside of the established normal pressure range, regardless of whether it otherwise meets the requirements of this Permit, shall be reported orally to ADEQ 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 ADEQ within sixty (60) days of receipt of a written request from ADEQ.

E. MONITORING, RECORDKEEPING, AND REPORTING OF RESULTS

1. [CONSIDER THE FOLLOWING] 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. Test results shall be submitted by the Permittee to ADEQ on a quarterly basis.

Samples and measurements shall be representative of the monitored activity. The Permittee shall utilize applicable analytical methods described in Table I of 40 CFR 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 ADEQ or additional approved methods or updates to the methods become available.

a. Summary of Acceptable Analytical 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 and Viscosity (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.

2. Monitoring Information

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

a. Date, exact location, and time of sampling or field measurements;

b. Name(s) of individual(s) who performed sampling or measurement;

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 well authorized by this Permit, 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) gallon; pressure must be recorded to a resolution of one tenth (0.1) psig; injection fluid temperature must be recorded to a resolution of one tenth (0.1) degree Fahrenheit). Exact dates and times of measurements, when taken, must be recorded and submitted.

The well shall have a dedicated flow meter, installed at or near the wellhead 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 sixty (60) seconds:

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:

[DESCRIBE DATA SUBMISSION REQUIREMENTS, CONSIDER THE FOLLOWING] 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

All monitoring and recording equipment shall be calibrated and maintained on a regular basis to ensure proper working order. Within 180 days of permit issuance, the Permittee shall submit to the ADEQ for prior written approval a one-time report describing the calibration procedures and the frequency at which the equipment will be calibrated.

4. Recordkeeping

a. The Permittee shall retain the following records and make them available at all times for examination by an ADEQ inspector:

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;

iii. Results of the injectate "Hazardous Waste Determination" according to 40 CFR § 262.11 (See Part II.D.1.b.). Results shall demonstrate that the injectate does not meet the definition of hazardous waste as defined in A.R.S. § 49-921; and

iv. Records and results of MITs, FOTs, and any other tests and logs required by ADEQ, and any well work and workovers completed.

b. The Permittee shall maintain copies (or originals) of all records described in Part II.E.4.a.i. through iv., above, during the operating life of the well and shall make such records available at all times for inspection at the facility. The Permittee shall only discard the records described in Part II.E.4.a.i. through iii., if written approval from ADEQ to discard the records is obtained. The submission of records, analytical results, recorded inspections, status reports, and any other reporting as specified and required by this Permit shall be accurate, current, and representative of the activity being monitored within the specified time frame for monitoring.

c. Except for information determined to be confidential under A.A.C. R18-9-A603, all permit applications, permits, reports, and well operation data prepared in accordance with the conditions of this Permit shall be available for public inspection at appropriate offices of ADEQ.

5. Reporting of Results

a. The Permittee shall submit to ADEQ Quarterly Reports containing, at minimum, the following information gathered during the Reporting Period identified in this Part (below):

   i. Injection fluid characteristics for parameters specified in Part II.E.1.a.;

   ii. The results of any additional MITs, FOTs, logging or other tests including ground water monitoring, if applicable, as required by ADEQ;

   iii. Information on workovers and well conversions.

   iv. Any pressure tests, as required by Part II.D.2.a.i.;

   v. Shut-in static reservoir pressure cumulative behavior plot of the injection zone;

   vi. Hourly and daily values, submitted in electronic format, for the continuously monitored parameters specified for the injection wells in Part II.E.3.a.; and

   vii. Monthly cumulative volumes, as well as monthly average, minimum and maximum values for the continuously monitored rate, pressure and temperature parameters specified for the injection well in Part II.E.3.a., unless more detailed records are requested by ADEQ.

b. Quarterly Reports, with the applicable Attachment E forms, shall be submitted for the reporting periods by the respective due dates as listed below:

c. For the January Quarterly Report, the Permittee shall also include in that Report the following information collected during the prior year covering January through December:

   i. Annual reporting summary (7520-8 in Attachment E);

   ii. Annual injection profile survey results as required in Part II.D.2.a.iii.;

   iii. Annual AOR recalculation as required in Part II.C.1.; and

   iv. A narrative description of all non-compliance that occurred during the past year.

d. In addition to meeting the submittal requirements of Part III.E.9., digital e-copies of all Quarterly Reports shall also be provided to the following:

Arizona Department of Environmental Quality
Water Quality Division
Groundwater, UIC Program
1110 West Washington Street
Phoenix, AZ 85007

F. PLUGGING AND ABANDONMENT

1. Notice of Plugging and Abandonment

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

2. Plugging and Abandonment Plans

The Permittee shall plug and abandon the well as provided by the Plugging and Abandonment Plan submitted by the Permittee (see Attachment F) and approved by ADEQ, consistent with A.A.C. R18-9-B614. Upon written notice to the Permittee, ADEQ 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 ADEQ requirements for construction or mechanical integrity, or (c) otherwise at ADEQ's discretion. Upon written notice, ADEQ may periodically require the Permittee to estimate and to update the estimated plugging cost. To determine the appropriate level of financial assurance for the Plugging and Abandonment Plan, the Permittee shall obtain a cost estimate from an independent third-party firm in the business of plugging wells. The estimate shall include the costs of all the materials and activities necessary to pay an independent third-party contractor to completely plug and abandon the well 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 well 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 Attachment F, unless the Permittee:

a. Provides notice to ADEQ of an intent to re-activate the well;

b. Has demonstrated that the well(s) will be used in the future;

c. Has described actions or procedures, satisfactory to ADEQ and approved in writing by ADEQ, 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 and every two (2) years thereafter while the well remains inactive, demonstrating no loss of mechanical integrity. Note that the Permittee must restore mechanical integrity of the inactive well if the well fails the MIT.

4. Plugging and Abandonment Report

Within sixty (60) days after plugging any well, or at the time of the next Quarterly Report (whichever comes first), the Permittee shall submit a report on Form 7520-19, provided in Attachment F, as well as the detailed procedural activity of engineer's log and daily rig log to ADEQ. 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 Plans contained in Attachment F; or

b. Where actual plugging differed from the Plugging and Abandonment Plans contained in Attachment F, a statement specifying and justifying the different procedures followed.

G. FINANCIAL ASSURANCE REQUIREMENTS

1. Demonstration of Financial Responsibility

The Permittee shall demonstrate and maintain financial responsibility and resources sufficient to close, plug, and abandon any existing or future-permitted underground injection operations approved pursuant to this Permit, as provided in the Plugging and Abandonment Plan contained in Attachment F and consistent with A.A.C. R18-9-D636(A)(6).

a. The Permittee shall post an approved financial instrument such as a surety bond or other financial assurance in the amount of [SPECIFY $ AMOUNT PLUS CONTINGENCY] to guarantee groundwater monitoring and plugging and abandonment activities for closure and post-closure. Authority to construct, inject, and operate the wells under the authority of this Permit will be granted only after the financial instrument has been secured and approved by ADEQ.

b. The level and mechanism of financial responsibility shall be reviewed and updated periodically, upon request of ADEQ. The Permittee may be required to change to an alternate method of demonstrating financial responsibility. Any such change must be approved in writing by ADEQ prior to the change.

c. ADEQ may require the Permittee to estimate and to update the estimated plugging, and/or post-closure activity costs periodically. Such estimates shall be based upon costs that a third party would incur to carry out the required restoration activities, properly plug and abandon the wells, and perform post-closure monitoring activities, including materials, equipment, mud and disposal costs, and labor with appropriate contingencies.

2. Insolvency of Financial Institution

The Permittee shall submit an alternate instrument of financial responsibility acceptable to ADEQ within sixty (60) days after either of the following events occurs:

a. The institution issuing any bond or other financial instrument that is secured to demonstrate financial responsibility in accordance with Part II, Section G.1. of this Permit files for bankruptcy; or

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.

c. The institution issuing the financial instrument lets it lapse or decides not to extend it.

Failure to submit an acceptable financial demonstration may result in the termination of this Permit pursuant to A.A.C. R18-9-C634(A)(1).

3. Insolvency of Owner or Operator

The Permittee shall notify ADEQ 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. 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 [SPECIFY DURATION] years unless terminated under the conditions set forth in Part III.B.1. or administratively extended under the conditions set forth in Part III.E.11.

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 other injection activity in a manner that allows the movement of fluid containing any contaminant (as defined by A.A.C. R18-9-A601) into USDWs (as defined A.A.C R18-9-A601).

Any underground injection activity not specifically authorized in this Permit is prohibited. The Permittee must comply with all applicable provisions of 18 A.A.C. 9, Article 6. 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 laws and regulations.

B. PERMIT ACTIONS

1. Modification, Revocation and Reissuance, or Termination

ADEQ may, for cause or upon request from the Permittee, modify, revoke and reissue, or terminate this Permit in accordance with A.A.C. R18-9-C631, C632, and C634. The permit is also subject to minor modifications for causes as specified in A.A.C. R18-9- C633. 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.

ADEQ 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 ADEQ and the Permittee complies with requirements of A.A.C. R18-9-C630. ADEQ 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 A.A.C. R18-9-A603, any information submitted to ADEQ 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, ADEQ 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 A.R.S. §49-205 (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

1. Duty to Comply

The provisions of R18-9-D635 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. The Permittee shall comply with all applicable UIC Program regulations and 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 A.A.C. R18-9-C625. Any permit non-compliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for 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. Any person who willfully violates permit conditions 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 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 ADEQ, within a time specified, any information which ADEQ 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 ADEQ, upon request, copies of records required to be kept by this Permit pursuant to A.A.C. R18-9-D635(A)8.

8. Inspection and Entry

The Permittee shall allow ADEQ, or an authorized representative, upon the presentation of credentials and other documents as may be required pursuant to A.A.C. R18-9-D635(A)9 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. Signatory Requirements

All applications, reports, or other information submitted to ADEQ shall be signed and certified by a responsible corporate officer or duly authorized representative according to A.A.C. R18-9-C617.

10. Additional Reporting Requirements

a. Planned Changes - The Permittee shall give notice to ADEQ as soon as possible of any planned physical alterations or additions to the permitted facility affecting any of the terms and conditions of the permit.

b. Anticipated non-compliance -The Permittee shall give advance notice to ADEQ 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 ADEQ no later than thirty (30) days following each schedule date.

d. Twenty-four Hour Reporting - The Permittee shall report to ADEQ any non-compliance which may endanger health or the environment. The following Information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances.

   i. Any monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW; and

   ii. Any non-compliance with a Permit condition, malfunction of the injection system, or loss of mechanical integrity, which may cause fluid migration into or between USDWs.

e. A written submission of all non-compliance shall also be provided to ADEQ 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.

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 ADEQ, the Permittee shall submit such facts or information within two (2) weeks of the time such facts or information becomes known.

11. Continuation of Expiring Permit

a. Duty to Reapply - If ADEQ requires the Permittee to continue an activity regulated by this Permit past the expiration date of this Permit, the Permittee must submit a complete application for a new permit at least one hundred and eighty (180) 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. ADEQ, 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.

UNDERGROUND INJECTION CONTROL PROGRAM

PERMIT to Construct and Inject

Class VI Injection Wells

Permit No. UIC-AZVI-FY22-#

[PROJECT NAME] Project

[COUNTY NAME] County, Arizona

Issued to:

[COMPANY NAME]

[ADDRESS LINE 1]

[ADDRESS LINE 2]

[ADDRESS LINE 3]

AUTHORIZING SIGNATURE

_____

[Name of Director], Director
Water Quality Division
Arizona Department of Environmental Quality
Signed this _____ day of_____, 20 _____

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PART I. AUTHORIZATION TO CONSTRUCT AND INJECT

Pursuant to the Underground Injection Control regulations of the Arizona Department of Environmental Quality codified at Title 18 of the Arizona Administrative Code, Chapter 9, Article 6

[COMPANY NAME]
[ADDRESS LINE 1]
[LINE 2 LINE3]

is hereby authorized, contingent upon Permit conditions, to construct and operate a Class VI injection well facility used to dispose of Carbon Dioxide (CO2) generated by the Permittee's facility [for non-commercial facilities DURING THE MANUFACTURE OF XXX; for commercial facilities AND FROM OTHER SOURCES] at the [PROJECT NAME]. The Project is in [PROJECT LOCATION], Arizona, approximately [DISTANCE AND DIRECTION TO NEAREST LANDMARK], as depicted in Attachment A. The location is [LOCATION DESCRIPTION (Include Section, Township, Range, with latitude/longitude)]. The well [IS/WILL BE] located [DESCRIBE LOCATION].

The injection zone is within the [FORMATION NAME] Formation at the [FOR WELLS NOT YET DRILLED USE APPROXIMATE] depths of [NUMBER] feet to [NUMBER] feet below ground level. The authorized injection interval is within the [FORMATION NAME] Formation at the [FOR WELLS NOT YET DRILLED USE APPROXIMATE] depths of [NUMBER] to [NUMBER] feet below ground level.

[DESCIBE INJECTATE AND SOURCE OR PRODUCTION PROCESS] [INDICATE IF AQUIFER EXEMPTION EXPANSION IS REQUIRED OR HAS BEEN APPROVED.]

For the permitted wells within the Area of Review (AOR), ADEQ will issue authorization to drill and construct only after requirements of Financial Responsibility in Part II, Section L of this Permit have been met. ADEQ will grant authorization to inject only after the requirements of Part II, Sections C, D, E and F of this Permit have been met. Operation of injection [WELL ID] will be limited to a maximum volume of [SPECIFY QUANTITY] and pressure of [SPECIFY QUANTITY]. All conditions set forth herein refer to Title 18, Chapter 9, Article 6 of the Arizona Administrative Code (A.A.C.), which are regulations in effect on the date that this Permit is effective.

This Permit consists of [NUMBER] pages plus Attachments, and includes all items listed in the Table of Contents. Further, it is based upon representations made by [COMPANY NAME] (the Permittee) and on other information contained in the administrative record. It is the responsibility of the Permittee to read, understand, and comply with all terms and conditions of this Permit.

This Permit and the authorization to construct, operate, and inject are issued for a period to include the approximate [NUMBER]-year Project operation unless terminated under the conditions set forth in Part III, Section B.1 of this Permit. This Permit and authorization to inject shall also include additional post-closure monitoring for at least fifty (50) years following cessation of injection unless an alternative timeframe is approved by ADEQ.

This Permit is issued on [DATE] and becomes effective on [DATE]. This Permit is issued for a period of xx years unless the Permit is terminated under the conditions set forth in Part III.B.1. or administratively extended under the conditions set forth in Part III.E.

Signed by

_____

[Name of Director], Director
Water Quality Division
Arizona Department of Environmental Quality

PART II. SPECIFIC PERMIT CONDITIONS

A. REQUIREMENTS PRIOR TO DRILLING, TESTING, CONSTRUCTING, OR OPERATING

1. Financial Assurance

The Permittee shall supply evidence of financial assurance prior to commencing any well drilling and construction, in accordance with Section L of this part.

2. Field Demonstration Submittal, Notification, and Reporting

a. Prior to each demonstration or test required in this Permit, the Permittee shall submit plans and specifications for procedures to the ADEQ for approval 90 days prior to demonstration or testing activities. No demonstration or test in these sections may proceed without prior written approval from ADEQ.

b. The Permittee must notify ADEQ at least thirty (30) days prior to performing any required field demonstrations or test, after ADEQ approves the plans/procedures for testing, in order to allow ADEQ to arrange to witness if so elected.

c. The Permittee shall submit results of each demonstration or test required in Part II of this Permit to ADEQ within thirty (30) days of completion, unless otherwise noted.

[INCLUDE SECTION ON AQUIFER EXEMPTION IF APPLICABLE – SEE PART II.B IN CLASS III PERMIT TEMPLATE

B. WELL CONSTRUCTION

1. Siting

The Permittee has demonstrated to the satisfaction of the Director that the well is in an area with suitable geology in accordance with the requirements of A.A.C. R18-9-J658.

2. Casing and Cementing

Casing and cement or other materials used in the construction of the well must have sufficient structural strength for the life of the geologic sequestration project. All well materials must be compatible with all fluids with which the materials may be expected to come into contact and must meet or exceed standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards acceptable to the Director. The casing and cementing program must prevent

the movement of fluids into or between USDWs for the expected life of the well in accordance with A.A.C. R18-9-J661. The casing and cement used in the construction of this well are shown in Attachment B of this Permit and in the administrative record for this Permit. Any change must be submitted in an electronic format for approval by the Director before installation.

3. Tubing and Packer Specification

Tubing and packer materials used in the construction of the well must be compatible with fluids with which the materials may be expected to come into contact and must meet or exceed standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards acceptable to the Director. The Permittee shall inject only through tubing with a packer set within the long string casing at a point within or below the confining zone immediately above the injection zone. The tubing and packer used in the well are represented in engineering drawings contained in Attachment B of this Permit. Any change must be submitted in an electronic format for approval by the Director before installation.

C. CONDITIONS FOR WELLS AND PROPOSED WELLS

1. Surface Location
[DESCRIBE LOCATION OF EXISTING AND PROPOSED WELLS]

2. Well Construction Details
A well schematic for each well is contained in Attachment B of this Permit. The Permittee shall at all times maintain the well consistent with this well schematic.

3. Proposed Well Construction Details
The Permittee shall submit an updated well schematic for each proposed well and must receive written ADEQ approval prior to commencing drilling and construction of the well.

4. Injection Formation Testing
Prior to the Director authorizing injection, the Permittee shall perform all pre-injection logging, sampling, and testing specified at A.A.C. R18-9-J662. This testing shall include:

a. Logs, surveys and tests to determine or verify the depth, thickness, porosity, permeability, lithology, and formation fluid salinity in all relevant geologic formations. These tests shall include:

i. Deviation checks;

ii. Logs and tests before and upon installation of the surface casing;

iii. Logs and tests before and upon installation of the long-string casing;

iv. Tests to demonstrate internal and external mechanical integrity; and

v. Any alternative methods that are required by and/or approved by the Director.

vi. Whole cores or sidewall cores of the injection zone and confining system and formation fluid samples from the injection zone;

vii. Records of the fluid temperature, pH, conductivity, reservoir pressure, and static fluid level of the injection zone;

viii. Tests to provide information about the injection and confining zones, including calculated fracture pressure and the physical and chemical characteristics of the injection and confining zones and the formation fluids in the injection zone;

ix. Tests to determine maximum allowable injection pressure; and

x. Tests to verify hydrogeologic characteristics of the injection zone, including:

a) A pressure fall-off test and
b) A pumping test or injectivity tests.

The Permittee shall submit to the Director for approval in an electronic format a schedule for logging and testing activities 30 days prior to conducting the first test and submit any changes to the schedule 30 days prior to the next scheduled test. The Permittee must provide the Director or their representative with the opportunity to witness all logging, sampling, and testing required under this Section.

5. Injection Interval

The Wells will inject into the [DESCRIBE FORMATION] within the [NAME OF FACILITY]. Injection by the Wells area only permitted into [FORMATION NAME] Formation within the depth range as depicted in the as-built diagrams in Attachment B (i.e., at a depth of approximately [NUMBER] to [NUMBER] feet bgs).

6. Monitoring Devices

The Permittee shall maintain continuous monitoring devices and use them to monitor injection pressure, flow rate, volume, the pressure on the annulus between the tubing and the long string of casing, annulus fluid level, and temperature. This monitoring shall be performed as described in the Testing and Monitoring Plan to meet the requirements of A.A.C. R18-9-J665. The Permittee shall maintain for ADEQ's inspection at the facility an appropriately scaled, continuous record of these

monitoring results as well as original files of any digitally recorded information pertaining to these operations.

7. **Pressure Fall-Off Test (FOT)**
   The Permittee shall conduct a pressure fall-off test at least once every five years unless more frequent testing is required by the Director based on site- specific information. The test shall be performed as described in the Testing and Monitoring Plan to meet the requirements of A.A.C. R18-9-J665.

8. **Proposed Changes and Workovers**
   The Permittee shall give advance notice to ADEQ as soon as possible, pursuant to and in accordance with A.A.C. R18-9-D635, of any planned physical alterations or additions to the Well, 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, require prior written approval by ADEQ and may require a permit modification under the requirements of A.A.C. R18-9-C632. 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 ADEQ as minor permit modifications consistent with A.A.C. R18-9-C633.

   For the Well, the Permittee shall provide all records of well workovers, logging, or other subsequent test data to ADEQ within sixty (60) days of completion of the activity.

   The Permittee shall submit all reports required by this Permit using the appropriate reporting forms contained in Attachment C.

   The Permittee shall perform a Mechanical Integrity Test (MIT), using the procedures set forth in Part II.F, within thirty (30) days of completion of workovers or alterations and prior to resuming injection activities, in accordance with Part II.D.1. The Permittee shall provide results of the MIT to ADEQ within sixty (60) days of completion.

9. **Testing during Drilling and Construction of Proposed Well**
   The Permittee shall include logs and other tests conducted during drilling and construction including, at a minimum, deviation checks, casing logs, and injection formation tests as outlined in A.A.C. R18-9-J662. The Permittee shall conduct Open Hole logs over the entire open hole sequence below the conductor casing.

   The Permittee shall conduct formation evaluation logs and tests and shall provide and use those results to estimate and report values for porosity, permeability, compressibility, static formation pressure, effective thickness, lithology, and rock mechanical properties for both the injection and confining zones identified within the permitted geological sequence.

The Permittee shall collect and analyze full-diameter cores from the overlying confining unit [NAME OF FORMATION] and within the [NAME OF FORMATION] Formation during drilling of the Proposed Well.

At a minimum, the owner or operator must determine or calculate the following information concerning the injection and confining zone(s):

a. fracture pressure;
b. other physical and chemical characteristics of the injection and confining zone(s); and
c. physical and chemical characteristics of the formation fluids in the injection zone(s).

Upon completion, but prior to operation, the owner or operator must conduct the following tests to verify hydrogeologic characteristics of the injection zone(s):

a. a pressure fall-off test; and,
b. a pump test; or
c. injectivity tests.

D. AREA OF REVIEW AND CORRECTIVE ACTION

The Area of Review (AOR) is the region surrounding the geologic sequestration project where USDWs may be endangered by the injection activity. The AOR is delineated using computational modeling that accounts for the physical and chemical properties of all phases of the injected CO2 stream and is based on available site characterization, monitoring, and operational data. The Permittee shall maintain and comply with the approved Area of Review and Corrective Action Plan (Attachment D of this Permit) which is an enforceable condition of this Permit and shall meet the requirements of A.A.C. R18-9-J659.

At the fixed frequency specified in Attachment D, or more frequently when monitoring and operational conditions warrant, the Permittee must reevaluate the AOR and perform corrective action and update Attachment D or demonstrate to the Director that no update is needed.

Following each AOR reevaluation or a demonstration that no evaluation is needed, the Permittee shall submit the resultant information in an electronic format to the Director for review and approval of the AOR results. Once approved by the Director, the revised Area of Review and Corrective Action Plan will become an enforceable condition of this Permit.

E. WELL OPERATION

1. Injection Pressure Limitation

Except during stimulation, the Permittee must ensure that injection pressure does not exceed 90 percent of the fracture pressure of the injection zone(s) so as to ensure that the injection does not initiate new fractures or propagate existing fractures in the injection zone(s). In no case shall injection pressure initiate fractures or propagate existing fractures in the confining zone or cause the movement of injection or formation fluids into a USDW. The maximum injection pressure limit is listed in Part I of this Permit.

2. Stimulation Program

Pursuant to requirements at A.A.C. R18-9-J657, all stimulation programs proposed by the Permittee must be approved by the Director as a permit modification and incorporated into Attachment B of this Permit.

3. Additional Injection Limitation

No injectate other than that identified in Part I of this Permit shall be injected except fluids used for stimulation, rework, and well tests as approved by the Director.

4. Annulus Fluid

The Permittee must fill the annulus between the tubing and the long string casing with a non-corrosive fluid approved by the Director.

5. Annulus/Tubing Pressure Differential

Except during workovers or times of annulus maintenance, the Permittee must maintain on the annulus a pressure that exceeds the operating injection pressure as specified in Part I of this Permit, unless the Director determines that such requirement might harm the integrity of the well or endanger USDWs.

6. Automatic Alarms and Automatic Shut-off System

a. The Permittee must:

i. Install, continuously operate, and maintain an automatic alarm and an automatic shut-off system or, at the discretion of the Director, down-hole shut- off systems, or other mechanical devices that provide equivalent protection; and

ii. Successfully demonstrate the functionality of the alarm system and shut-off system prior to the Director authorizing injection, and at a minimum of once every twelfth month after the last approved demonstration.

b. Testing under this Section must involve subjecting the system to simulated failure conditions and must be witnessed by the Director or his or her representative unless the Director authorizes an unwitnessed test in advance. The Permittee must provide notice in an electronic format 30 days prior to running the test and must provide the Director or their representative the opportunity to attend. The test must be documented using either a mechanical or digital device which records the value of the parameter of interest, or by a service company job record. A final report including any additional interpretation necessary for evaluation of the testing must be submitted in an electronic format within the time period specified in Section H of this Permit.

7. Precautions to Prevent Well Blowouts

At all times, the Permittee shall maintain on the well a pressure which will prevent the return of the injection fluid to the surface. The well bore must be filled with a high specific gravity fluid during workovers to maintain a positive (downward) gradient and/or a plug shall be installed which can resist the pressure differential. A blowout preventer must be installed and kept in proper operational condition whenever the wellhead is removed to work on the well. The Permittee shall follow procedures such as those below to assure that a backflow or blowout does not occur:

a. Limit the temperature and/or corrosivity of the injectate; and

b. Develop procedures necessary to assure that pressure imbalances do not occur.

8. Circumstances Under Which Injection Must Cease

Injection shall cease when any of the following circumstances arises:

a. Failure of the well to pass a mechanical integrity test;

b. A loss of mechanical integrity during operation;

c. The automatic alarm or automatic shut-off system is triggered;

d. A significant unexpected change in the annulus or injection pressure;

e. The Director determines that the well lacks mechanical integrity; or

f. The Permittee is unable to maintain compliance with any permit condition or regulatory requirement and the Director determines that injection should cease.

9. Approaches for Ceasing Injection

a. The Permittee must shut-in the well by gradual reduction in the injection pressure as outlined in Attachment G of this Permit; or

b. The Permittee must immediately cease injection and shut-in the well as outlined in the Emergency and Remedial Response Plan (Attachment K of this Permit).

F. MECHANICAL INTEGRITY

1. Standards

Other than during periods of well workover (maintenance) approved by the Director in which the sealed tubing-casing annulus is disassembled for maintenance or corrective procedures, the injection well must have and maintain mechanical integrity consistent with A.C.C. R18-9-J664. To meet these requirements, mechanical integrity tests/demonstrations must be witnessed by the Director or an authorized representative of the Director unless prior approval has been granted by the Director to run an un-witnessed test. In order to conduct testing without an ADEQ representative, the following procedures must be followed.

a. The Permittee must submit prior notification in an electronic format within the time period specified in Section L(3) of this Permit, including the information that no ADEQ representative is available, and receive permission from the Director to proceed;

b. The test must be performed in accordance with the Testing and Monitoring Plan (Attachment G of this Permit) and documented using either a mechanical or digital device that records the value of the parameter of interest; and

c. A final report including any additional interpretation necessary for evaluation of the testing must be submitted in an electronic format within the time period specified in Section H of this Permit.

2. Mechanical Integrity Testing

The Permittee shall conduct a casing inspection log and mechanical integrity testing as follows:

a. Prior to receiving authorization to inject, the Permittee shall perform the following testing to demonstrate internal mechanical integrity pursuant to A.A.C. R18-9-J662:

i. A pressure test with liquid or gas; and

ii. A casing inspection log; or

iii. An alternative approved by the Director that has been approved by the Administrator.

b. Prior to receiving authorization to inject, the Permittee shall perform the following testing to demonstrate external mechanical integrity pursuant to A.A.C. R18-9-J662:

i. A tracer survey such as an oxygen activation log; or

ii. A temperature or noise log; or

iii. An alternative approved by the Director that has been approved by the Administrator pursuant to requirements at A.A.C. R18-9-J664.

c. Other than during periods of well workover (maintenance) approved by the Director in which the sealed tubing-casing annulus is disassembled for maintenance or corrective procedures, the Permittee must continuously monitor injection pressure, injection rate, injection volumes; pressure on the annulus between tubing and long string casing; and annulus fluid volume as specified in A.A.C. R18-9-J664.

d. At least once per year, the Permittee must perform the following testing to demonstrate external mechanical integrity:

i. An Administrator-approved tracer survey such as an oxygen-activation log; or

ii. A temperature or noise log. The Director may require such tests whenever the well is worked over; or

iii. An alternative approved by the Director that has been approved by the Administrator.

e. After any workover that may compromise the internal mechanical integrity of the well, the well shall be tested by means of a pressure test approved by the Director and the well must pass the test to demonstrate mechanical integrity.

f. Prior to plugging the well, the Permittee shall demonstrate external mechanical integrity as described in the Injection Well Plugging Plan and that meets the requirements of A.A.C. R18-9-J667.

g. The Director may require the use of any other tests to demonstrate mechanical integrity other than those listed above with the written approval of the Administrator pursuant to requirements at A.A.C. R18-9-J664.

3. Prior Notice and Reporting

a. The Permittee shall notify the Director in an electronic format of his or her intent to demonstrate mechanical integrity in an electronic format at least 30 days prior to such demonstration. At the discretion of the Director a shorter time period may be allowed.

b. Reports of mechanical integrity demonstrations which include logs must include an interpretation of results by a knowledgeable log analyst. The Permittee shall report in an electronic format the results of a mechanical integrity demonstration within the time period specified in Section H of this Permit.

4. Gauge and Meter Calibration

The Permittee shall calibrate all gauges used in mechanical integrity demonstrations and other required monitoring to an accuracy of not less than 0.5 percent of full scale, within one year prior to each required test. The date of the most recent calibration shall be noted on or near the gauge or meter. A copy of the calibration certificate shall be submitted to the Director in an electronic format with the report of the test. Pressure gauge resolution shall be no greater than five psi. Certain mechanical integrity and other testing may require greater accuracy and shall be identified in the procedure submitted to the Director prior to the test.

5. Loss of Mechanical Integrity

a. If the Permittee or the Director finds that the well fails to demonstrate mechanical integrity during a test, or fails to maintain mechanical integrity during operation, or that a loss of mechanical integrity as defined by A.A.C. R18-9-J664 is suspected during operation (such as a significant unexpected change in the annulus or injection pressure), the Permittee must:

i. Cease injection in accordance with Attachments G or K of this Permit;

ii. Take all steps reasonably necessary to determine whether there may have been a release of the injected CO2 stream or formation fluids into any unauthorized zone. If there is evidence of USDW endangerment, implement the Emergency and Remedial Response Plan (Attachment K of this Permit);

iii. Follow the reporting requirements as directed in Section H of this Permit;

iv. Restore and demonstrate mechanical integrity to the satisfaction of the Director and receive written approval from the Director prior to resuming injection; and

v. Notify the Director in an electronic format when injection can be expected to resume.

b. If a shutdown (i.e., down-hole or at the surface) is triggered, the Permittee must immediately investigate and identify as expeditiously as possible the cause of the shutdown. If, upon such investigation, the well appears to be lacking mechanical integrity, or if monitoring required indicates that the well may be lacking mechanical integrity, the Permittee must take the actions listed above in Section F(5)(a)(i) through (v).

c. If the well loses mechanical integrity prior to the next scheduled test date, then the well must either be plugged or repaired and retested within 30 days of losing mechanical integrity. The Permittee shall not resume injection until mechanical integrity is demonstrated and the Director gives written approval to recommence injection in cases where the well has lost mechanical integrity.

6. Mechanical Integrity Testing on Request from Director

The Permittee shall demonstrate mechanical integrity at any time upon written notice from the Director.

G. TESTING AND MONITORING

1. Testing and Monitoring Plan

a. The Permittee shall maintain and comply with the approved Testing and Monitoring Plan (Attachment G of this Permit) and with the requirements in A.A.C. R18-9-D635, A.A.C. R18-9-J663, and A.A.C. R18-9-J665. The Testing and Monitoring Plan is an enforceable condition of this Permit. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. Procedures for all testing and monitoring under this Permit must be submitted to the Director in an electronic format for approval at least 30 days prior to the test. In performing all testing and monitoring under this Permit, the Permittee must follow the procedures approved by the Director. If the Permittee is unable to follow the ADEQ approved procedures, then, the Permittee must contact the Director at least 30 days prior to testing to discuss options, if any are feasible. When the test report is submitted, a full explanation must be provided as to why any approved procedures were not followed. If the approved procedures were not followed, ADEQ may take an appropriate action, including but not limited to, requiring the Permittee to re-run the test.

b. The Permittee must update the Testing and Monitoring Plan as required at A.A.C. R18-9-J665 to incorporate monitoring and operational data and in response to AOR reevaluations required under Section D of this Permit or demonstrate to the Director that no update is needed. The amended Testing and Monitoring Plan or demonstration shall be submitted to the Director in an electronic format within one year of an AOR reevaluation; following any significant changes to the facility such as addition of monitoring wells or newly permitted injection wells within the AOR; or when required by the Director.

c. Following each update of the Testing and Monitoring Plan or a demonstration that no update is needed, the Permittee shall submit the resultant information in an electronic format to the Director for review and approval of the results. Once approved by the Director, the revised Testing and Monitoring Plan will become an enforceable condition of this Permit.

2. Carbon Dioxide Stream Analysis

The Permittee shall analyze the CO2 stream with sufficient frequency to yield data representative of its chemical and physical characteristics, as described in the Testing and Monitoring Plan and to meet the requirements of A.A.C. R18-9- J665(A)1.

3. Continuous Monitoring

The Permittee shall maintain continuous monitoring devices and use them to monitor injection pressure, flow rate, volume, the pressure on the annulus between the tubing and the long string of casing, annulus fluid level, and temperature. This monitoring shall be performed as described in the Testing and Monitoring Plan to meet the requirements of A.A.C. R18-9-J665(A)2. The Permittee shall maintain for ADEQ's inspection at the facility an appropriately scaled, continuous record of these monitoring results as well as original files of any digitally recorded information pertaining to these operations.

4. Corrosion Monitoring

The Permittee shall perform corrosion monitoring of the well materials for loss of mass, thickness, cracking, pitting, and other signs of corrosion on a quarterly basis using the procedures described in the Testing and Monitoring Plan and in accordance with A.A.C. R18-9-J665(A)3 to ensure that the well components meet the minimum standards for material strength and performance set forth in A.A.C. R18-9-J661.

5. Groundwater Quality Monitoring

The Permittee shall monitor ground water quality and geochemical changes above the confining zone(s) that may be a result of CO2 movement through the confining zone(s) or additional identified zones. This monitoring shall be performed for the parameters identified in the Testing and Monitoring Plan at the locations and depths, and at frequencies described in the Testing and Monitoring Plan to meet the requirements of A.A.C. R18-9-J665(A)4.

6. External Mechanical Integrity Testing

The Permittee shall demonstrate external mechanical integrity as described in the Testing and Monitoring Plan to meet the requirements of A.A.C. R18-9-J665(A)5.

7. Pressure Fall-Off Test

The Permittee shall conduct a pressure fall-off test at least once every five years unless more frequent testing is required by the Director based on site-specific information. The test shall be performed as described in the Testing and Monitoring Plan to meet the requirements of A.A.C. R18-9-J665(A)6.

8. Plume and Pressure Front Tracking

The Permittee shall track the extent of the CO2 plume and the presence or absence of elevated pressure (e.g., the pressure front) as described in the Testing and Monitoring Plan.

a. The Permittee shall use direct methods to track the position of the CO2 plume and the pressure front in the injection zone as described in the Testing and Monitoring Plan and to meet the requirements of A.A.C. R18-9-J665(A)7(a).

b. The Permittee shall use indirect methods to track the position of the CO2 plume and pressure front as described in the Testing and Monitoring Plan and to meet the requirements of A.A.C. R18-9-J665(A)7(b).

9. Surface Air and/or Soil Gas Monitoring

The Permittee shall conduct any surface air monitoring and/or soil gas monitoring required by the Director to detect movement of CO2 that could endanger a USDW at the frequency and locations described in the Testing and Monitoring Plan to meet the requirements of A.A.C. R18-9-J665.

10. Additional Monitoring

If required by the Director as provided in A.A.C. R18-9-J665, the Permittee shall perform any additional monitoring determined to be necessary to support, upgrade, and improve computational modeling of the AOR evaluation required under A.A.C. R18-9-J659 and to determine compliance with standards under A.A.C. R18-9-B608 or A.A.C. R18-9-J661. This monitoring shall be performed as described in a modification to the Testing and Monitoring Plan.

H. REPORTING AND RECORDKEEPING

1. Electronic Reporting

Electronic reports, submittals, notifications and records made and maintained by the Permittee under this Permit must be in an electronic format approved by ADEQ. The Permittee shall electronically submit all required reports to the Director.

2. Semi-Annual Reports

The Permittee shall submit semi-annual reports containing:

a. Any changes to the physical, chemical, and other relevant characteristics of the CO2 stream from the proposed operating data;

b. Monthly average, maximum, and minimum values for injection pressure, flow rate and daily volume, temperature, and annular pressure;

c. A description of any event that exceeds operating parameters for annulus pressure or injection pressure specified in the permit;

d. A description of any event which triggers the shut-off systems required in Section (E)(6) of this Permit pursuant to A.A.C. R18-9-J663(E) and the response taken;

e. The monthly volume and/or mass of the CO2 stream injected over the reporting period and the volume and/or mass injected cumulatively over the life of the project;

f. Monthly annulus fluid volume added; and

g. Results of the monitoring prescribed under A.A.C. R18-9-J665.

3. 24-Hour Reporting

The Permittee shall report to ADEQ any non-compliance which may endanger health or the environment and/or any events that require implementation of actions in the Emergency and Remedial Response Plan (Attachment K of this Permit). The following information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances.

a. Any evidence that the injected CO2 stream or associated pressure front may cause an endangerment to a USDW;

b. Any non-compliance with a permit condition, malfunction of the injection system, or loss of mechanical integrity, which may cause fluid migration into or between USDWs;

c. Any triggering of a shut-off system (i.e., down-hole or at the surface);

d. Any failure to maintain mechanical integrity; or

e. Pursuant to compliance with the requirement in A.A.C. R18-9-J665(A)8 for surface air/soil gas monitoring or other monitoring technologies, if required by ADEQ, any release of CO2 to the atmosphere or biosphere.

4. **Reports on Well Tests and Workovers**
   Report, within 30 days, the results of:

   a. Periodic tests of mechanical integrity;

   b. Any well workover, including simulation;

   c. Any other test of the injection well conducted by the Permittee if required by the Director; and

   d. Any test of any monitoring well required by this Permit.

5. **Records**

   a. The Permittee shall retain records and all monitoring information, including all calibration and maintenance records and all original chart recordings for continuous monitoring instrumentation and copies of all reports required by this Permit (including records from pre-injection, active injection, and post-injection phases) for a period of at least 10 years from collection. Monitoring records shall include: the date, exact place, and time of sampling or measurements; The name(s) of the individual(s) who performed the sampling or measurements; A precise description of both sampling methodology and the handling of samples; The date(s) analyses were performed; The name(s) of the individual(s) who performed the analyses; The analytical techniques or methods used; and the results of such analyses.

   b. All data collected under A.A.C. R18-9-J657 and any supplemental information (e.g. modeling inputs for AOR delineations and reevaluations, plan modifications) shall be maintained for a period of at least 10 years after site closure.

   c. The Permittee shall retain records concerning the nature and composition of all injected fluids until 10 years after site closure.

   d. Well plugging reports, post-injection site care data, including, if appropriate, data and information used to develop the demonstration of the alternative post- injection site care timeframe, and the site closure report collected pursuant to requirements at A.A.C. R18-9-J668(F) and (H) shall be retained for ten years after site closure.

   e. The retention periods specified in Section H(5)(a) through (d) of this Permit may be extended by request of the Director at any time. The Permittee shall continue to retain records after the retention period specified in Section H(5)(a) through (d) of this Permit or any requested extension thereof expires unless the Permittee delivers the records to the Director or obtains written approval from the Director to discard the records.

I. INJECTION WELL PLUGGING

1. Prior to Well Plugging

Prior to plugging, the owner or operator must flush each Class VI injection well with a buffer fluid, determine bottom hole pressure, and perform a final mechanical integrity test.

2. Well Plugging Plan

The Permittee shall maintain and comply with the approved Well Plugging Plan (Attachment H of this Permit) which is an enforceable condition of this Permit.

3. Revision of Well Plugging Plan

If the permittee finds it necessary to change the Well Plugging Plan, a revised plan shall be submitted in an electronic format to the Director for written approval. Any amendments to the Well Plugging Plan must be approved by the Director and must be incorporated into the permit, and are subject to the permit

4. Notice of Plugging

The Permittee must notify the Director in writing in an electronic format at least sixty (60) days before plugging of a well. At the discretion of the Director, a shorter notice period may be allowed.

5. Plugging and Abandonment Approval and Report

a. The permittee must receive written approval of the Director before plugging the well and shall plug and abandon the well in accordance with R18-9-667, as provided in the Well Plugging Plan (Attachment H of this permit).

b. Within sixty (60) days after plugging, the permittee must submit in an electronic format a plugging report to the Director. The report must be certified as accurate by the permittee and by the person who performed the plugging operation (if other than the permittee.) The permittee shall retain the well plugging report in an electronic format for 10 years following site closure. The report must include:

   i. A statement that the well was plugged in accordance with the Well Plugging Plan previously approved by the Director (Attachment H of this permit); or

   ii. If the actual plugging differed from the approved plan, a statement describing the actual plugging and an updated plan specifying the differences from the plan previously submitted and explaining why the Director should approve such deviation. If the Director determines that a deviation from the plan incorporated in this permit may

endanger underground sources of drinking water, the permittee shall replug the well as required by the Director.

6. **Temporary Abandonment**
In accordance with R18-9-D636, the permittee shall continue to comply with the conditions of this permit, including all monitoring and reporting requirements according to the frequencies outlined in the permit. The well shall also be tested to ensure that it maintains mechanical integrity, according to the requirements and frequency specified in Section F(2) of this permit.

J. POST-INJECTION SITE CARE AND CLOSURE

1. **Post-Injection Site Care and Site Closure Plan**
The Permittee shall maintain and comply with the Post-Injection Site Care and Site Closure Plan, found as Attachment E of this Permit. The permittee shall:

   a. Upon cessation of injection and in response to AoR reevaluations required under Section G(2) of this permit, either submit in an electronic format for the Director's approval an amended Post-Injection Site Care and Site Closure Plan or demonstrate through monitoring data and modeling results that no amendment to the plan is needed.

   b. At any time during the life of the project, the permittee may modify and resubmit in an electronic format the Post-Injection Site Care and Site Closure Plan for the Director's approval. The permittee may, as part of such modifications to the Plan, request a modification to the post-injection site care timeframe that includes documentation of the information pursuant to the requirements in A.A.C R18-9-J668(C)(1).

2. **Carbon Dioxide Plume and Pressure Front Monitoring**
The Permittee shall monitor the site following the cessation of injection to show the position of the CO2 plume and pressure front and demonstrate that USDWs are not being endangered, as specified in the Post-Injection Site Care and Site Closure Plan pursuant to the requirements in A.A.C. R18-9-J668(B). The Permittee shall continue to conduct post-injection site monitoring for at least 50 years or for the duration of any alternative timeframe approved by the Director, including:

   a. Ground water quality monitoring;

   b. Tracking the position of the carbon dioxide plume and pressure front including direct pressure monitoring and geochemical plume monitoring and the use of indirect methods;

   c. Internal and external MITs of wells used for post-injection monitoring;

d. Any other required monitoring, e.g., soil gas and/or surface air monitoring described in the Post-Injection Site Care and Site Closure Plan;

e. The permittee shall submit in an electronic format the results of all monitoring performed according to the schedule identified in the Post-Injection Site Care and Site Closure Plan; and

f. The permittee shall continue to conduct post-injection site monitoring for the duration of the alternative timeframe approved pursuant to A.A.C. R18-9-J668(C) and the Post-Injection Site Care and Site Closure Plan and until the Director has authorized site closure.

g. The post-injection monitoring must continue until the project no longer poses an endangerment to USDWs and the demonstration pursuant to A.A.C. R18-9-J668(B)(1) and is approved by the Director in accordance with A.A.C. R18-9-J668(B)(3).

Prior to authorization for site closure, the Permittee shall submit to the Director for review and approval a demonstration based on monitoring and other site-specific data, that no additional monitoring is needed to ensure the geologic sequestration project does not pose an endangerment to USDWs. The Director reserves the right to amend the post-injection site monitoring requirements (including extend the monitoring period) if the CO2 plume and the associated pressure front have not stabilized or there is a concern that USDWs are being endangered.

3. Notification and Well Plugging

The Permittee shall notify the Director in an electronic format at least 120 days before site closure. At this time, if any changes to the approved Post-Injection Site Care and Site Closure Plan in Attachment L of this Permit are proposed, the Permittee shall submit a revised plan.

After the Director has authorized site closure, the Permittee shall plug all monitoring in a manner which will not allow movement of injection or formation fluids that endangers a USDW. The Permittee shall also restore the site to its pre- injection condition.

4. Site Closure Report and Recordkeeping

The Permittee shall submit a site closure report in an electronic format to the Director within 90 days of site closure. The report must include the information specified in A.A.C. R18-9-J668(F).

The Permittee shall record a notation on the deed to the facility property or any other document that is normally examined during a title search that will in perpetuity provide any potential purchaser of the property the information listed A.A.C. R18-9-J668(G).

The Permittee shall retain for 10 years following site closure an electronic copy of the records collected during the post-injection site care period. The Permittee shall deliver the records in an electronic format to the Director at the conclusion of the retention period, and the records must thereafter be retained at a location designated by the Director for that purpose.

K. EMERGENCY AND REMEDIAL RESPONSE

The Emergency and Remedial Response Plan describes actions the Permittee must take to address movement of the injection or formation fluids that may cause an endangerment to a USDW during construction, operation, and post-injection site care periods. The Permittee shall maintain and comply with the approved Emergency and Remedial Response Plan (Attachment K of this Permit), which is an enforceable condition of this Permit.

If the Permittee obtains evidence that the injected CO2 and/or associated pressure front may cause endangerment to a USDW, the Permittee must:

1. Immediately cease injection;

2. Take all steps reasonably necessary to identify and characterize any release;

3. Notify the Director within 24 hours; and

4. Implement the Emergency and Remedial Response Plan.

At the frequency specified in the Area of Review and Corrective Action Plan, or more frequently when monitoring and operational conditions warrant, but not less often than once every five years, the Permittee shall review and update the Emergency and Remedial Response Plan or demonstrate to the Director that no update is needed. The amended Emergency and Remedial Response Plan or demonstration shall be submitted to the Director in an electronic format within one year of an AOR reevaluation; following any significant changes to the facility such as addition of injection wells; or when required by the Director.

L. FINANCIAL ASSURANCE REQUIREMENTS

1. Demonstration of Financial Responsibility

The Permittee shall maintain financial responsibility and resources to meet the conditions of this Permit and address endangerment of USDWs. Financial responsibility shall be maintained through all phases of the project using one or more of the qualifying instruments listed in A.A.C. R18-9-J660(A)1 and approved by the Director. The financial assurance mechanism is found in Attachment I of this Permit.

The financial instrument(s) must be sufficient to cover the cost of:

a. Corrective action under A.A.C. R18-9-J659;

b. Injection well plugging under A.A.C. R18-9-J667;

c. Post injection site care and site closure under A.A.C. R18-9-J668; and

d. Emergency and remedial response under A.A.C. R18-9-J669.

Authority to construct, inject, and operate the wells under the authority of this Permit will be granted only after the financial instrument has been secured and approved by the Director. The Permittee shall post an approved financial instrument in the amount of [SPECIFY $ AMOUNT] for all the phases of the geologic sequestration project prior to issue a Class VI permit.

2. Cost Estimate Updates

During the active life of the geologic sequestration project, the Permittee must adjust the cost estimate for inflation within sixty (60) days prior to the anniversary date of the establishment of the financial instrument(s) and provide this adjustment to the Director in an electronic format. The Permittee must also provide to the Director written updates of adjustments to the cost estimate within sixty (60) days of any amendments to the Area of Review and Corrective Action Plan, Injection Well Plugging Plan, Post-Injection Site Care and Site Closure Plan, and Emergency and Remedial Response Plan included in this Permit.

3. Notification

a. Whenever the current cost estimate increases to an amount greater than the face amount of a financial instrument currently in use, the Permittee, within sixty (60) days after the increase, must either cause the face amount to be increased to an amount at least equal to the current cost estimate and submit evidence of such increase to the Director, or obtain other financial responsibility instruments to cover the increase. Whenever the current cost estimate decreases, the face amount of the financial assurance instrument may be reduced to the amount of the current cost estimate only after the Permittee has received written approval from the Director.

b. The Permittee must notify the Director by certified mail and in an electronic format of adverse financial conditions such as bankruptcy that may affect the ability to carry out injection well plugging, post-injection site care and site closure, and any applicable ongoing actions under Corrective Action and/or Emergency and Remedial Response.

i. In the event that the Permittee or the third party provider of a financial responsibility instrument is going through a bankruptcy, the Permittee must notify the Director by certified mail and in an electronic format of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming the Permittee as debtor, within 10 days after commencement of the proceeding.

ii. A guarantor of a corporate guarantee must make such a notification if he or she is named as debtor, as required under the terms of the guarantee.

iii. A Permittee who fulfills the requirements of paragraph 1 of this section by obtaining a trust fund, surety bond, letter of credit, escrow account, or insurance policy will be deemed to be without the required financial assurance in the event of bankruptcy of the trustee or issuing institution, or a suspension or revocation of the authority of the trustee institution to act as trustee of the institution issuing the trust fund, surety bond, letter of credit, escrow account, or insurance policy.

4. Establishing Other Coverage

The Permittee must establish other financial assurance or liability coverage acceptable to the Director, within sixty (60) days of the occurrence of the events in Section L(2) or L(3) of this Permit.

M. DURATION OF PERMIT

This Permit and the authorization to inject are issued for a period of [SPECIFY DURATION] years unless terminated under the conditions set forth in Part III.B.1. or administratively extended under the conditions set forth in Part III.E.11.

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 other injection activity in a manner that allows the movement of fluid containing any contaminant (as defined by A.A.C. R18-9-A601) into USDWs (as defined A.A.C R18-9-A601).

Any underground injection activity not specifically authorized in this Permit is prohibited. The Permittee must comply with all applicable provisions of 18 A.A.C. 9, Article 6. 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 laws and regulations.

B. PERMIT ACTIONS

1. **Modification, Revocation and Reissuance, or Termination**
   ADEQ may, for cause or upon request from the Permittee, modify, revoke and reissue, or terminate this Permit in accordance with A.A.C. R18-9-C631, C632, and C634. The permit is also subject to minor modifications for causes as specified in A.A.C. R18-9-C633. 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. ADEQ 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. **Minor Modifications**
   Upon the consent of the permittee, the Director may modify a permit to make the corrections or allowances for minor changes in the permitted activity as listed in R18-9-C633. Any permit modification not processed as a minor modification under 40 CFR 144.41 R18-9-633 must be made for cause, and with a draft permit and public notice as required in R18-9-C632.

3. **Transfers**
   This Permit is not transferable to any person unless notice is first provided to ADEQ and the Permittee complies with requirements of A.A.C. R18-9-C630. ADEQ 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 A.A.C. R18-9-A603, any information submitted to ADEQ 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, ADEQ 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 A.R.S. § 49-205 (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

1. Duty to Comply

The Permittee shall comply with all applicable UIC Program regulations and 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 A.A.C. R18-9-C625. Any permit non-compliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for 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. Definitions

All terms used in this permit shall have the meaning set forth in A.A.C. R18-9-A601 and Underground Injection Control regulations specified at A.A.C., Title 18, Chapter 9, Article 6. Unless specifically stated otherwise, all references to “days” in this permit should be interpreted as calendar days.

3. **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. Any person who willfully violates permit conditions may be subject to criminal prosecution.

4. **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 to maintain compliance with the conditions of this Permit.

5. **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.

6. **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.

7. **Property Rights**
   This Permit does not convey any property rights of any sort, or any exclusive privilege.

8. **Duty to Provide Information**
   The Permittee shall furnish to ADEQ, within a time specified, any information which ADEQ 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 ADEQ, upon request, copies of records required to be kept by this Permit pursuant to A.A.C. R18-9- D635(A)8.

9. **Inspection and Entry**
   The Permittee shall allow ADEQ, or an authorized representative, upon the presentation of credentials and other documents as may be required pursuant to A.A.C. R18-9-D635(A)9 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.

10. Signatory Requirements

All applications, reports, or other information submitted to ADEQ shall be signed and certified by a responsible corporate officer or duly authorized representative according to A.A.C. R18-9-C617.

11. Additional Reporting Requirements

a. Planned Changes - The Permittee shall give notice to ADEQ as soon as possible of any planned physical alterations or additions to the permitted facility affecting any of the terms and conditions of the permit.

b. Anticipated non-compliance-The Permittee shall give advance notice to ADEQ 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 ADEQ no later than thirty (30) days following each schedule date.

d. A written submission of all non-compliance shall also be provided to ADEQ 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.

e. 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.

f. 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 ADEQ, the Permittee shall submit

such facts or information within two (2) weeks of the time such facts or information becomes known.

12. Continuation of Expiring Permit

a. Duty to Reapply - If ADEQ requires the Permittee to continue an activity regulated by this Permit past the expiration date of this Permit, the Permittee must submit a complete application for a new permit at least one hundred and eighty (180) 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. ADEQ, 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.