



UIC GUIDANCE – Geothermal FAQs

Note – these FAQs were updated to reflect changes to the Cooperative Agreement between NDEP and the Nevada Division of Minerals in early 2008

Section 1 - General Information

Is an UIC permit required even though I received an injection well permit from the Nevada Division of Minerals (NDOM) or Bureau of Land Management (BLM)?

Yes, each agency has regulations that require separate permits. Please contact those agencies for information on their permitting requirements depending on whether the activity will be on public or private land.

Is an UIC permit required to construct a geothermal injection well?

Yes, pursuant to NAC 445A.905, a permit is required. Under the Cooperative Agreement with NDOM, the Permit to Drill from NDOM now covers this requirement. **However, it is critical that you study the UIC requirements for injection approval to ensure any well drilled could meet these requirements and proper documentation is provided.**

(see: http://ndep.nv.gov/bwpc/docs/uic_guidance_requirements_geothermal_permit.pdf)

(NAC 445A.905 Construction prohibited without permit. The construction of an injection well for which a permit is required may not begin until the permit has been issued.)

Do I need an UIC permit for each geothermal injection well drilled at our project?

No – one Area Permit can be issued for as many injection wells within that project area. All geothermal UIC permits state the number of “permitted” injection wells that can be served by the permit, and specifies what sections the injection wells can be drilled in.

Duration of UIC permits and why do I need to renew the UIC permit?

Pursuant to Nevada Revised Statutes, UIC permits are issued for a five (5) year period. So every 5 years, your permit will need to be renewed. Renewal applications are due 180 days prior to the permits’ expiration date found on the cover page. If renewal application has been received, but the permit has not been renewed, Nevada law allows the permittee to continue to operate under the expired permit until such time as the permit can be renewed by NDEP.

Is location information required for geothermal injection wells?

Yes, the following location data is required to be submitted.

1. Section, Township and Range (application legal description) – pre-construction, on permit
2. Latitude and Longitude – post-construction

Is water quality data required for injection wells and projects overall under an UIC permit?

Yes, all injection wells shall have water quality data per UIC requirements from the zone of injection(s). All injection wells shall be drilled and developed so a good representative water

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sample can be collected. Injection wells will not be approved without water chemistry of injection zone.

For new projects, initial water quality sampling for metals will be for both dissolved and total.

Beginning of Project: production, injection and monitoring well data will be collected frequently to establish baseline data. Frequency of monitoring is reduced after baseline data is collected, however, frequency of monitoring is maintained to ensure water quality in the area is not being degraded.

Do chemicals used at the project site need UIC approval?

Yes, any chemical that either comes in contact with the injectate or is discharged to the environment with water discharge must be submitted and approved prior to use by NDEP UIC program. Examples of these chemicals are scale inhibitors, corrosion inhibitors, lube oil used in line shaft pumps, and cooling tower treatment chemicals such as biocides and algaecides.

You can find information on what you need to submit at:

<http://ndep.nv.gov/bwpc/fact01.htm#uic> .

The project's UIC permit will require chemical tracking and usage reporting.

Do tracers used at the project site need UIC approval?

Yes, any tracers injected into a well at the project site, or applied anywhere that could reach ground water, including geothermal water are required to be approved prior to use.

You can find information on what you need to submit at:

<http://ndep.nv.gov/bwpc/fact01.htm#uic> .

Section 2 –Applying for a UIC permit

Do I need a permit for a geothermal injection well?

Yes, pursuant to NRS 445A.465

What types of geothermal injection wells require a permit?

All types, including industrial, commercial, space heating, residential/domestic

What permit application forms do I need to complete for an UIC permit?

You must complete UIC forms U200 and U202. U200 must be signed by the owners or operator of the injection wells. Please see the application instructions for additional information on who is the owner and/or operator and who must sign the application (as well as who cannot sign the application).

What are the fees for geothermal UIC permits?

Required UIC permits fees are application, renewal and major modification fees. UIC fees for geothermal projects are based on 3 criteria:

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1. Type of geothermal project,
2. Size or flow rate of project, and
3. The number of injection wells which will be permitted at the project.

Fee schedule can be found at NAC 445A.860 or at <http://ndep.nv.gov/bwpc/uicfees.pdf>

Do I need to submit UIC documents with signatures for approval or per permit conditions?

Yes, pursuant to **NAC 445A.859 – Certification of documents submitted to Director**. All applications, reports or information submitted to the Director must be signed and certified to be correct and true by the owner or the operator.

Can I request confidentiality of information through the UIC Program at NDEP?

Yes, pursuant to NAC 445A.860, in accordance with NRS 445A. Please following the requirements below to ensure your request is process correctly.

What do I need to do to request confidentiality?

Per NAC 445A.860, the claim must be asserted at the time of submission by stamping or writing “confidential business information” on each page containing the information. (Note: stamping “confidential” is also acceptable) The Division requests you separate the pages marked confidential from the rest of the application for fast and safer processing.

It is important this done at time of submission to ensure it is process correctly

What records can be held confidential?

All well/resource logs (excluding non-sensitive integrity test logs),
Subsurface geologic,
Completion reports containing sensitive business information

Information that will not be held confidential: total depth of well, plugging report, APDs, and other non-sensitive business information

Section 3 - Well Construction Requirements and Guidelines

Are construction plans required to be submitted to NDEP prior to construction of an injection well?

No, all plans for construction of an injection well shall be submitted to the NDOM in accordance with their requirements. Operators are required to know the requirements for UIC approval which can be found at:

http://ndep.nv.gov/bwpc/docs/uic_guidance_requirements_geothermal_permit.pdf

What are the location, construction and testing requirements for a geothermal injection well under an UIC permit?

The following items must be met for an injection well:

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1. Situated on a well-drained site not subject to inundation by a flood with a recurrence interval of 100 years.
2. Sited in such a way it injects into a formation, which is separated from any underground source of drinking water by a confining zone, that is free of known open faults or fractures within the area of review.
3. Easily accessible for maintenance, repair, testing, or such other attention as may be necessary.
4. Separated by a minimum horizontal distance of 50 feet from any watertight conduit, such as a cast-iron pipe which carries sewage or other liquid wastes.
5. Separated by a minimum horizontal distance of 100 feet from any septic tank, drain field or other facility for the collection or disposal of other liquid waste.
6. Separated by a minimum horizontal distance of 10 feet from the boundary of any adjoining property.
7. Cased from the finished surface to the top of the zone for injection, or to a zone within the same formation or confining zone, and constructed so no contamination can occur as a result of conditions on the surface surrounding the well.
8. Cemented to prevent movement of fluid into or between underground sources of drinking water.
9. Designed and constructed with casing and cement which will endure the life expectancy of the well. (*cathodic protection*)
10. Deviation checks must be at sufficiently frequent intervals to ensure that vertical avenues for the movement of fluids in the form of diverging holes are not created during drilling.
11. All geothermal injection wells must be tested for mechanical integrity of the casing to show 1) absence of fluid movement behind casing and 2) absence of leaks in casing.
12. Designs for injection wells must include a description of cathodic protection from the wellhead to the lower most, cemented casing shoe.

Testing requirements during Construction of Injection Well authorized by UIC

All Injection wells will require the following testing at a minimum during construction (additional testing may be required and will be reviewed during technical review process):

1. Water chemistry of injection zone
Static temperature survey of entire hole
2. Pressure test on surface casing
3. Pressure test on intermediate or production/injection casing
4. Cement evaluation log (e.g. Cement Bond Log/VDL)

Wellhead Design and Site Location

Wellhead must be equipped above the ground or above cellar bottom with valves and gauges for the observation of pressure for each open annular space within the well, temperature and flow rate.

Wellhead shall have valves that are protected and operational during the life of the well.

Well Signage – all injection wells shall have at a minimum a sign with the well name/number, operator's name and phone, well location.

Corrosion Prevention (per NAC 445A.908.1.h)

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All injection wells are required to demonstrate corrosion prevention for the all casing strings at the surface and along the length of casing to the lower most casing shoe. Water chemistry and wellsite environment shall be assessed to determine potential for

NOTE: If the prevention details are not shown in a Completion Report for an injection well, the integrity requirements/frequency for the well may be increased.

Examples of corrosion prevention:

1. Higher grade casing,
2. Cathodic protection,
3. Main injection casing string protected at or near surface from standing water by the following methods:
 - a. Surface casing and/or conductor pipe shall be above ground level so dirt/soil is not in contact with injection string.
 - b. Well cellar shall have a drainage system to prevent surface and shallow ground water from accumulating in cellar or around conductor/casing subsurface.
 - c. Surface casing and intermediate/injection casing shall be sealed or designed to prevent water from accumulating between these two strings of casing.

Gas Leakage Prevention – the annular space between the surface casing and the intermediate/injection casing may need to be sealed to prevent gas leakage from migration within this annular space.

What do I need to do following construction of an injection well?

Following Completion of a Geothermal Injection Well

See the checklist for all required items at:

http://ndep.nv.gov/bwpc/docs/uic_%20form_checklist_class2_geothermal_injection_wells.pdf

Pursuant to NAC 445A.909

1. Within 30 calendar days after completion of a new injection well, the holder of a permit shall furnish the director with a **notice of completion** containing the following information:
 - a. Plans and drawings of the completed well as constructed.
 - b. Copies of appropriate logs and other tests conducted during construction of the well and a descriptive report interpreting the results of that portion of the logs and tests related specifically to the zone for injection and adjacent formations.
 - c. Chemical analysis of the fluid in the zone for injection.
 - d. Results of deviation checks conducted on a well, which is constructed by drilling a pilot hole and enlarging that hole by reaming or other methods.

Following submission of the above, the director shall review the information submitted pursuant to subsection 1 and NAC 445A.910, and shall notify the holder of the permit in writing within 30 days after receipt of that information whether:

1. **Approval is granted to initiate injection;**

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2. The information submitted differs substantially from previously submitted information and an additional 30 days for review is required before the director will make a decision; or
3. Permission to initiate injection is denied.

Can I convert an existing well to an injection well?

Conversion of Existing Well to Injection Well

Conversion of any existing well to an injection well shall be required to meet certain standards prior to approval. All existing requirements in the above sections shall be met where applicable.

Specific testing to show mechanical integrity shall be required. Testing requirements are as follows:

1. Cement evaluation log
2. Pressure test on existing casing string
3. Static temperature survey (for baseline purposes)
4. Other tests as may be required

Conversion of an Existing Injection Well to Other Type of Well

1. Submit request to NDEP to convert with an explanation why well is being converted
2. Document why injection well should not be plugged instead of converted?
3. UIC permit must reflect change of well type
4. Permittee shall submit conversion request to Division of Minerals and BLM (if applicable)
5. NDEP shall receive written confirmation from Division of Minerals and/or BLM that well has been converted in their records (operator is responsible to provide to NDEP)
6. Injection flow line shall be permanently disconnected from wellhead
7. A wellsite sign shall be posted with well type status and statement

Section 4 – Mechanical Integrity (MI) Requirements and Guidelines

Are geothermal injection wells required to have MIT tests?

Yes

Do I have to submit any requests prior to running a MIT test?

The holder of a permit shall notify the director at least 45 days before the date upon which a test for mechanical integrity is to be performed.

What do test methods have to demonstrate?

You must demonstrate 1) no leaks from casing or other casing components, 2) there is no movement of fluid/water behind the casing

1. Tests for MI: Methods for evaluating absence of leaks. (NAC 445A.917)
2. Tests for MI: Methods for determining absence of movement of fluid (NAC 445A.918)

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What do I do if my geothermal injection well fails an MIT test or fails mechanical integrity during operations?

NAC 445A.920 Loss of or failure to demonstrate mechanical integrity If the holder of a permit or the director finds that an injection well fails to demonstrate mechanical integrity during a test or a loss of mechanical integrity becomes evident during operation, the operation of the injection well must be stopped immediately and may not be resumed until approved by the director.

What are the mechanical integrity testing requirements for a geothermal injection well?

Geothermal injection wells shall be tested for integrity:

1. Following construction;
2. Following major workovers; and
3. At least once every five (5) years.

MI tests to be considered for demonstration of the two tests described below:

Internal Tests:

1. Casing Pressure Test
2. Video Survey of casing and wellbore
3. Ada Test (compressed air displacement test)
4. Casing Evaluation Tools (ultrasonic, Vertilog, etc)

External Tests:

1. Cement bond/evaluation log showing gamma ray, transit time, collar locator and VDL (Variable Density Log)
2. Radioactive Tracer Survey (RA or RTS)
3. Static Temperature Survey, such as 12/24-hour survey – time intervals dependent on purpose of test and conditions of well and formation
4. Noise Log

IMPORTANT NOTES:

1. **See Section 4 for Notification and Reporting requirements.**
2. **It is the responsibility of the applicant/permittee to determine the condition of a particular geothermal injection well and what MIT test would be most appropriate for internal and external evaluation.**
3. It is highly recommended to discuss with NDEP your specific test proposal during your planning and budgeting process to ensure acceptance of the proposed test.
4. Certain injection wells may require more frequent testing based on their conditions and history.

NAC 445A.916 Tests for mechanical integrity: Frequency. Tests to demonstrate mechanical integrity must be conducted at least once each 5 years for the life of an injection well. The director may require such tests more frequently if conditions of the operation so warrant. The holder of a permit shall notify the director at least 45 days before the date upon which a test for mechanical integrity is to be performed.

NAC 445A.917 Tests for mechanical integrity: Methods for evaluating absence of leaks. One of the following methods must be used in the test for mechanical integrity to evaluate the absence of significant leaks in the casing, tubing or packer:

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1. Monitoring the pressure on the annulus between the casing and tubing after an initial pressure test
2. A test for pressure with liquid
3. A survey using a radioactive tracer

NAC 445A.918 Tests for mechanical integrity: Methods for determining absence of movement of fluid One of the following methods must be used in the test for mechanical integrity to determine the absence of significant movement of fluid into an underground source of drinking water through a vertical channel adjacent to the well bore:

1. The results of a survey of the temperature or noise of a well
2. Records of cementing which demonstrate the presence of adequate cement behind the casing to prevent migration of fluid
3. In an appropriate hydrogeologic setting, a survey using a radioactive tracer, which must be used in conjunction with at least one of the other alternatives

What reports are required following a MIT test?

MIT Summary Report

Within 30 days after completion of MI testing, please compile and submit a Summary Report, which contains the following information:

1. Conditions of the injection well(s) prior to the test (e.g. static, injecting at ##### gpm, etc.);
2. Conditions of the well(s) during the test(s), such as, but not limited to, operating conditions of the well, water level, changes in status/conditions of the well during the test, anomalies witnessed prior to or during the test, gauge calibration and condition for any gauges used, etc.;
3. Interpretation and conclusions of the test results stating whether each well meets the internal and external regulatory requirements in UIC regulations. This part should be done in conjunction with the service company.

Submission of just the test results is not acceptable. The vendor running the test and the Permittee must provide interpretation and conclusions of the test results in a written report to NDEP. The report must discuss conditions of the well during the test(s) including water level, changes in status/conditions of the well during the test, anomalies witnessed prior to or during the test, gauge calibration and condition for any gauges used, as well as the interpretation and conclusions of the test results stating whether the well meets both of the regulatory requirements, and why or why not. If the MIT Summary Report is not received with the test result documents, the documents will be returned and MI requirement will not be met.

What do I need to do to plug a geothermal injection well under UIC regulations?

Plugging and Abandonment Plan

Submission of Plugging Plan at time of Application: The plan for plugging and abandoning an injection well must contain an estimate, based on the current and prevailing economy, of the cost of plugging each well for which the application for the permit is made. The applicant shall certify in the plan that the estimate of the cost will be reviewed annually during the life of the permit, and

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that the bond required pursuant to NAC 445A.871 will be increased when the review indicates that the cost of plugging is more than 10 percent greater than the original or most recent estimate of the cost.

The holder of a permit, or any person planning to abandon or close any injection well shall notify the director of the intent of the holder or person to abandon or close the injection well at least 30 days, or in the case of a newly drilled injection well at least 5 working days, before the abandonment or closure of the well.

Before abandonment, an injection well must be plugged with cement in a manner which will not allow the movement of fluids into or between underground sources of drinking water.

All cavities in the well bore not plugged with cement must be filled with heavy drilling fluids in a state of static equilibrium with the weight of the fluid equalized from top to bottom.

Upon completion of the procedure for the plugging and abandonment of an injection well, the holder of a permit shall certify to the director that the condition of the permit relating to plugging and abandonment has been satisfied.

NAC 445A.924 When well is deemed abandoned. An injection well with casing shall be deemed to be abandoned if its use has been discontinued for at least 1 year. An injection well in which a casing has not been run and for which drilling operations have ceased for at least 30 days shall also be deemed to be abandoned. Any other well shall be deemed abandoned if its use has been discontinued for at least one (1) year or if it is in such disrepair that it cannot be used for its intended purpose.

If the director determines a well is abandoned, he may order it to be plugged in accordance with the requirements of the approved plan for abandonment. If no plan for abandonment has been approved, the director may order the well plugged in a manner, which will prevent movement of, any injected fluid or fluid in the formation.

In the case of a temporarily idle injection well or an unfinished injection well, the director may not require that the well be plugged if the applicant or holder of the permit shows:

1. Good cause why it should not be deemed abandoned and plugged; and
2. That the injection well can be maintained in a manner so as to prevent any degradation of the waters of the state.