UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

UNDERGROUND INJECTION CONTROL PROGRAM

FINAL AREA PERMIT

CO52407-00000

East Cherry Creek Valley Water & Sanitation District
Class V Aquifer Storage and Recovery Wells
Arapahoe County, Colorado

Issued To

East Cherry Creek Valley Water & Sanitation District
6201 South Gun Club Road
Aurora, Colorado 80016

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PART I. AUTHORIZATION TO CONSTRUCT AND OPERATE

Under the authority of the Safe Drinking Water Act (SDWA) and Underground Injection Control (UIC) Program regulations of the U.S. Environmental Protection Agency (EPA) codified at Title 40 of the Code of Federal Regulations (40 CFR) parts 2, 124, 144, 146, and 147, and according to the terms of this permit (Permit),

East Cherry Creek Valley Water & Sanitation District
6201 South Gun Club Road
Aurora, Colorado 80016

hereinafter referred to as the "Permittee," is authorized to construct and to operate Class V Aquifer Storage and Recovery (ASR) injection wells according to the terms and conditions of this Permit underlying the East Cherry Creek Valley (ECCV) District located in Arapahoe County, Colorado.

Currently, only Well A-7R is authorized for construction and operation, including conversion from a recovery well to a recovery well and injection well, within the service field area for this ASR Project.

- ***Well A-7R***

  2260 feet from the north line and 620 feet from the east line
  SW ¼ NE ¼, Section 24, Township 5 South, Range 66 West
  Arapahoe County, Colorado

Well A-7R, constructed in 2001, is a replacement well for Well A-7, which was constructed in 1973.

The well is located wholly within the ECCV District service area permit boundary as shown in Figure 1, with the legal description identified in Table 1;

Figure 1. ECCV District Boundary Map with Existing Recovery Wells

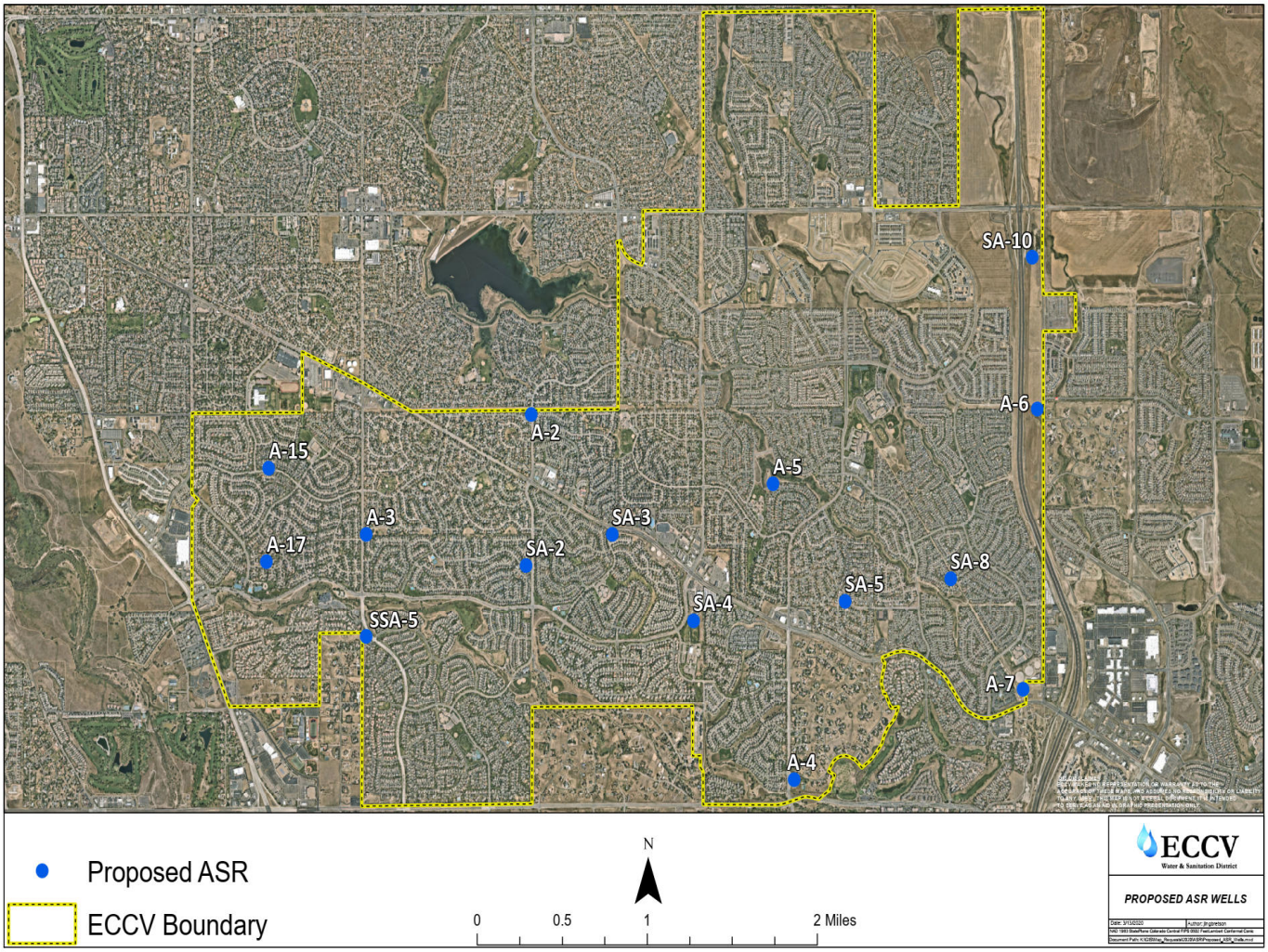

Table 1. Legal Description of ECCV District Service Area

ECCV DISTRICT SERVICE AREA
Township 5 South, Range 65 West, Section 7, ¼ of the SW NW/4, ½ of the NW SW/4
Township 5 South, Range 66 West, Section 1, E/2
Township 5 South, Range 66 West, Section 8, ¼ of SE/4
Township 5 South, Range 66 West, Section 9, ½ of SW SW/4
Township 5 South, Range 66 West, Section 10, ¾ of NE/4, SE/4
Township 5 South, Range 66 West, Section 11
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Township 5 South, Range 66 West, Section 20, ¾ of N/2
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Township 5 South, Range 66 West, Section 22, N/2, ¼ of the NW SW/4, ¼ of the NE & SW SE/4
Township 5 South, Range 66 West, Section 23, N/2, SW/4, ¾ of SE/4
Township 5 South, Range 66 West, Section 24, ¾ of N/2, ¼ of the NW SW/4, ¼ of the NE & SW SE/4

This Permit is based on representations made by the applicant and other information contained in the administrative record. Misrepresentation of information or failure to fully disclose all relevant information may be cause for termination, revocation and reissuance, or modification of this Permit and/or formal enforcement action. It is the Permittee's responsibility to read and understand all provisions of this Permit.

The Permittee is authorized to engage in underground injection in accordance with the conditions of this Permit. Any underground injection activity not authorized by this Permit or by rule is prohibited.

Compliance with the terms of this Permit does not constitute a defense to any enforcement action brought under the provisions of Section 1431 of the SDWA or any other law governing protection of public health or the environment, nor does it serve as a shield to the Permittee's independent obligation to comply with all UIC regulations. Nothing in this Permit relieves the Permittee of any duties under applicable regulations.

This Permit duration is for three (3) years from the Final Permit Effective Date, until it expires under the terms of the Permit, or unless modified, revoked and reissued, or terminated under 40 CFR §§ 124.5, 144.12, 144.39, 144.40 or 144.41.

Issue Date: December 15, 2020 Effective Date: January 14, 2021

12/15/2020

X Sarah Bahrman

Signed by: SARAH BAHRMAN

Sarah Bahrman, Chief*
Safe Drinking Water Branch
Water Division

* Throughout this Permit the term “Director” refers to the Safe Drinking Water Branch Chief or the Water Enforcement Branch Chief.

PART II. SPECIFIC PERMIT CONDITIONS

Section A. LIST OF WELLS (LW)

Injection wells regulated by EPA and subject to the terms and conditions of this Permit are listed below:

- ***Well A-7R***
  Permit No. CO52407-10773
  2260 feet from the north line and 620 feet from the east line
  SW ¼ NE ¼, Section 24, Township 5 South, Range 66 West
  Arapahoe County, Colorado

EPA Region 8 will maintain a LW that are added to this Permit. This list will be available to the Permittee and the public upon request. Injection wells regulated by EPA and subject to the terms and conditions of this Permit are listed in the LW with EPA Permit No. CO52407 and are assigned a unique well identification number by EPA.

Section B. WELL CONSTRUCTION REQUIREMENTS

The Permittee shall not convert recovery wells to injection wells or commence injection into wells until the Permittee has been approved to do so in accordance with the following procedures:

1. Requesting Authorization of Additional Injection Wells

Prior to converting any additional existing drinking water supply (i.e. recovery) wells to injection wells, the Permittee shall submit the following materials to the Director:

a) a cover letter requesting authorization to convert the well referencing Area UIC Permit CO52407-00000, the well name and Colorado Division of Water Resources (DWR) permit number;
b) a completed EPA 7520-6 (Class V) injection well application form with the applicable attachments;
c) evidence and/or written statement that water feed lines have been installed to the requested well(s);
d) a laboratory analysis, of formation water drawn from the subject well(s) proposed to be added, using Appendix G Parameters or a statement that the water sample will be obtained during well construction and submitted in accordance with Appendix A;
e) a topographic map extending to at least ¼ mile radius Area of Review (AOR) for the well;
f) a wellbore diagram;
g) pump rate test data results;
h) a listing of all wells penetrating the confining zone within the ¼ mile AOR, and cementing records and/or cement bond logs for all wells not previously submitted and evaluated by EPA (for both injection and AOR wells); and
i) a well location plat map for the requested injection well.

2. Authorization to Construct Additional Injection Wells

Once EPA has confirmed that the proposed well meets the Permit conditions, the Director will authorize construction and operation, including conversion from a recovery well to a recovery well and injection well by email or other written communication to the Permittee.

3. Casing and Cement

Casing and Cement requirements are specified in Appendix A.

4. Sampling and Monitoring Devices

The Permittee shall install and maintain in good operating condition:

a) a pressure actuated shut-off device attached to the injection flow line set to shut-off the injection pump when or before the Maximum Allowable Injection Pressure (MAIP) is reached at the wellhead;

b) one-half (1/2) inch female iron pipe fitting, isolated by shut-off valves and located at the wellhead at a conveniently accessible location, for the attachment of a pressure gauge capable of monitoring pressures ranging from normal operating pressures up to the MAIP described in Part II, Section C.4 on:
   i. the wellhead casing, and
   ii. the injection tubing string(s);

c) a sampling port such that samples shall be collected at a location that ensures they are representative of the injected fluid. For example, a fluid sampling point between the pump house or storage tanks and the injection well, isolated by shut-off valves, for sampling the injected fluid;

d) a flow meter capable of recording instantaneous flow rate and cumulative volume attached to the injection line; and continuous recording devices to monitor injection pressure, flow rate, and volume; and

e) an inflatable bladder system that will prevent further injection and/or the backflow of injectate from the injection zone once excessive pressures are observed.

5. Pre-Injection Logs and Tests

Well logging and testing requirements prior to receiving authorization to inject are found in Appendix B. Well logs and tests shall be performed according to current EPA-approved procedures, or alternate procedures approved by the Director. The Director may stipulate specific test methods and criteria best suited for a specific well construction and injection operation. Limited injection is permissible prior to receiving authorization to inject only for the purposes of conducting the initial well logs and tests required in Appendix B.

6. Postponement of Construction or Conversion to Injection Wells

a) For the A-7R well to be initially converted, or future wells added to this Area Permit for conversion to injection, the Permit shall expire if well conversion has not begun within two years of the Effective Date of the Permit.

b) The Permittee may request a one-time extension of the permit expiration date, not to exceed an additional six months, which must be made prior to expiration of the Permit. Notification shall be in writing and state the reasons for the delay, provide an estimated completion date, and list additional wells within the AOR that were not included in the initial permit application. For those newly completed AOR wells that penetrate the upper confining zone, a well construction diagram, cement records and/or cement bond logs are also required. Once the Permit has expired under this part, the Permittee will need to reapply for a UIC permit and restart the complete permit process, including opportunity for public comment, before injection can occur.

c) For future wells added to this Permit that have not been constructed, if authorization to inject has not been provided within two years of the spud date, the Permittee is subject to the conditions found in Part II, Section F.5.*Wells Not Actively Injecting* or may elect to convert the well to a non-UIC well found in Part III, Section B.2 *Conversion to Non-UIC Well*.

Section C. WELL OPERATION

1. Outermost Casing Injection Prohibition

Injection between the outermost casing protecting USDWs and the well bore is prohibited.

2. Requirements Prior to Receiving Authorization to Inject

Well injection may commence only after all well construction and pre-injection requirements have been met and a written authorization to commence injection has been obtained from the Director.

In order to obtain written authorization to inject, the following must be satisfied:

(a) The Permittee has:

(i). submitted a cover letter referencing Area UIC Permit CO52407-00000, the well name and Colorado Division of Water Resources Permit number of the constructed injection well;

(ii). submitted to the Director a notice of completion of construction and a completed EPA Form 7520-18 and required attachments. The Permittee shall also provide a revised well diagram and a description of the modification to the well construction;

(iii). conducted all applicable logging and testing requirements found in Appendix B and submitted required records to the Director. The logging and testing requirements include demonstration of mechanical integrity, in accordance with the conditions found in Part II, Section D of this Permit; and

(iv). satisfied requirements for corrective action in Appendix F, if applicable.

(b) The Director has received and reviewed the documentation associated with the requirements in Paragraph 2(a) of this section and finds it is in compliance with the conditions of the Permit.

(c) The Director has inspected the injection well and finds it is in compliance with the conditions of the Permit. If the Permittee has not received notice from the Director of his or her intent to inspect the injection well within 13 days of the date of the notice in Paragraph 2(a)(i) above, then prior inspection is waived.

3. Injection Zone and Fluid Movement

Injection zone means "a geological formation, group of formations, or part of a formation receiving fluids through a well."

Injection and perforations are permitted only within the approved injection zone specified in Appendix C. Injected fluids shall remain within the injection zone. If monitoring indicates the movement of fluids from the injection zone, the Permittee shall notify the Director within twenty-four (24) hours and submit a written report that documents circumstances that resulted in movement of fluids beyond the injection zone.

4. Injection Pressure Limitation

(a) Injection pressure at the wellhead shall not initiate new fractures or propagate existing fractures in

the confining or injection zones. In no case shall injection pressure cause the movement of injectate or formation fluids outside of the specified injection zone.

(b) Injection pressure shall not exceed the MAIP identified in Appendix C.

5. Injection Volume Limitation

Injection volume is limited to the total volume specified in Appendix C.

6. Injection Fluid Limitation

Injected fluids are limited to fluids from those public water systems sampled and submitted as part of the application. Sources of treated drinking water to be injected shall be obtained from Alluvium, Dawson, Denver, Arapahoe and Laramie-Fox Hills Aquifers from the following four (4) sources:

1) ECCV's Northern Treatment Plant (from Beebe Draw wells);
2) ECCV's In-District Groundwater Wells;
3) Denver Water's DIA Connection; and
4) Water, Infrastructure, Supply and Efficiency (WISE) Water.

The injectate will be treated to drinking water standards at numerous water treatment facilities, including the ECCV Northern Treatment Plant, Aurora Water treatment facilities, Denver Water treatment facilities, and WISE treatment facilities. These facilities and the associated infrastructure as to how they are connected to ECCV are shown in Figure 2 below. A layout of the ECCV Smoky Hill Facility is presented on Figure 3.

Figure 2. SMWSA and WISE General Infrastructure

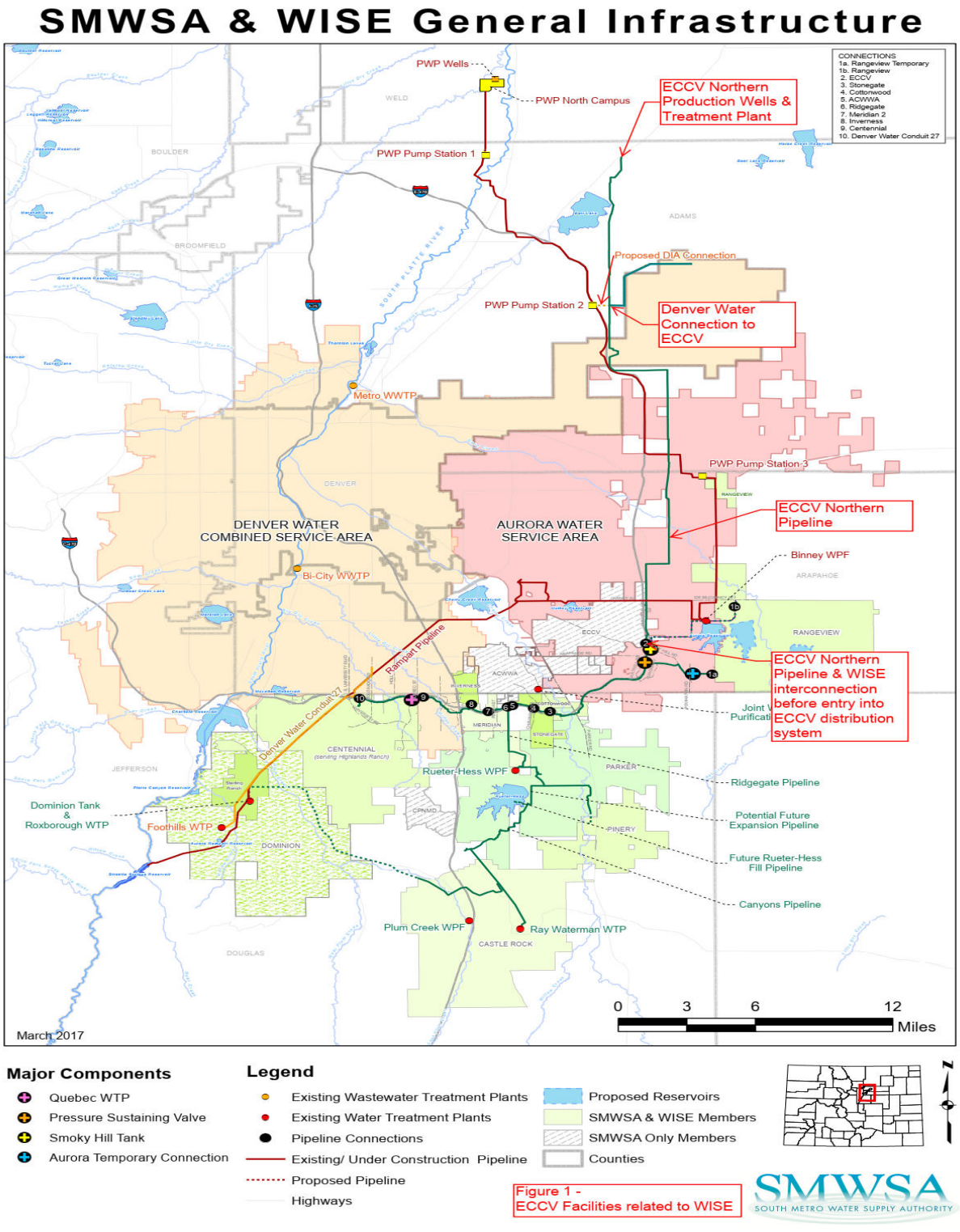
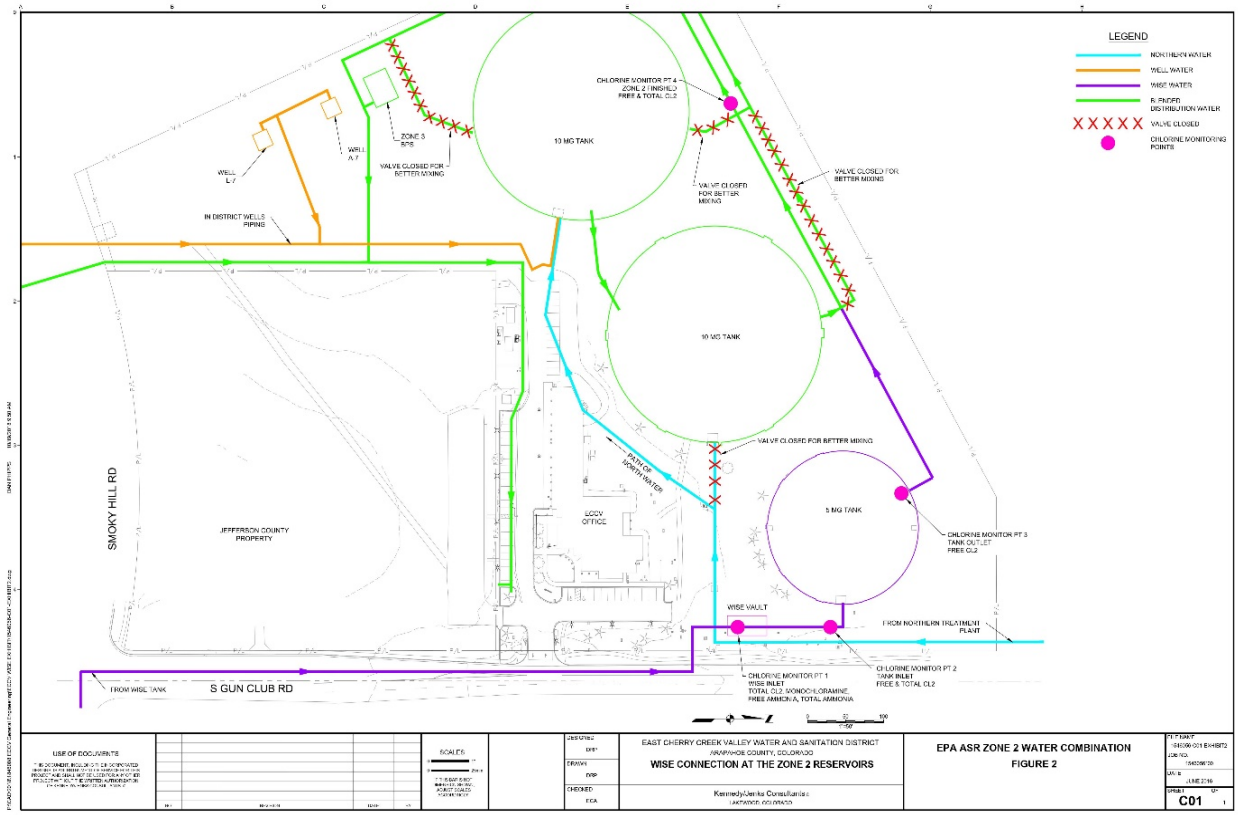


Figure 3. ECCV Smoky Hill Facility Layout



New water sources and/or the use of alternate treatment facilities may be added to the list of allowed injection fluid water sources in accordance with the procedures presented in Part II. Section C.7, *Addition of a New Water Source*, and in accordance with the procedures in 40 CFR § 144.41. The Permittee must obtain prior written approval from the Director before injecting fluids from a new source.

7. Addition of a New Water Source

It is anticipated that new raw water sources and other public water systems may be included in the future as part of this ASR project. Water from additional raw water sources, public water systems and/or water treatment plants not approved under Part II. Section C.6 would be considered new sources.

(a) Requirements for the addition of a new water source are as follows:

(i). Prior to the introduction of a new water source (e.g. additional raw water source, different public water system or treatment plant within that system), the Permittee shall provide notification to the Director;

(ii). The notification shall identify the new water source, describe the treatment process with a written narrative and diagram(s), and include a representative sample analysis of the new injection fluid collected using the baseline constituent list provided in Appendix G;

(iii). EPA will require the performance of additional tests, including testing in accordance with Appendix H, following review of the submittal; and

(iv). EPA may require the performance of additional tests, including testing in accordance with Appendix I, following review of the submittal;

(b) EPA will review the submission to ensure it meets permit conditions. Any additional authorizations to inject a new water source will be in the form of an email or other written communication to the Permittee; and

(c) The Permittee shall perform monitoring in accordance with Appendix D.

8. Alteration, Workover, and Well Stimulation

Alterations and workovers shall meet all conditions of the Permit. Alterations and workovers include any activity that physically changes the well construction or injection formation.

Prior to beginning any addition or physical alteration to an injection well's construction or injection formation, the Permittee shall give advanced notice to the Director. Substantial alterations or additions may be cause for modification to the Permit and may include additional testing or monitoring requirements.

The Permittee shall record all alterations and workovers on a Well Rework Record (EPA Form 7520-19) and submit a revised well construction diagram when the well construction has been modified. The Permittee shall provide this and any other record of well workover or test data to EPA within sixty (60) days of completion of the activity.

The Permittee shall complete any activity which affects the tubing or casing and provide demonstration of internal (Part I) MI within ninety (90) days of beginning the activity. If the Permittee is unable to complete work within the specified time period, the Permittee shall propose an alternative schedule and obtain Director's written approval. Injection operations shall not resume until the well has successfully demonstrated mechanical integrity. If the well lost mechanical integrity, the Permittee must receive written approval from the Director to recommence injection.

9. Well Logging and Testing

Well logging and testing requirements are found in Appendix B. The Permittee shall ensure the log and test requirements are performed within the time frames specified in Appendix B. Well logs and tests shall be performed according to current EPA-approved procedures. The Director may stipulate specific test methods and criteria best suited for a specific well construction and injection operation.

10. Exceedances of Permit Limits

If exceedance(s) of a permit limit listed in the Appendix G is observed in the injectate and/or recovered water during normal operations, the Permittee shall resample the fluid source within 14 days. Should a second exceedance be observed, the applicant must shut in the well until the problem is resolved to the Director' s satisfaction.

11. Reopening Permit for Modification or Revocation and Reissuance

(a) If concentrations of the nitrosamine N-nitrosodimethylamine (NDMA) in two quarterly (i.e. every 90 days, as required in Appendix D) samples of injectate and/or recovered water exceed seven (7) nanograms per Liter (ng/L) (i.e. the Integrated Information System (IRIS) based value for 10^{5} increased cancer risk), the Permittee shall commence monthly monitoring and agrees that the Director may open the Permit for modification or revocation and reissuance.

(b) If exceedance(s) as described above in Part II Section C.10 is observed, the Permittee agrees that the Director may open the Permit for modification or revocation and reissuance.

Section D. MECHANICAL INTEGRITY

1. Requirement to Maintain Mechanical Integrity

The Permittee is required to ensure the injection well maintains mechanical integrity (MI) at all times. Injecting into a well that lacks MI is prohibited.

An injection well has MI if:

(a) there is no significant leak in the casing (internal Part I); and

(b) there is no significant fluid movement into a USDW through vertical channels adjacent to the injection well bore (external Part II).

2. Demonstration of Mechanical Integrity

The conditions under which the Permittee shall conduct the MI testing (MIT) are as follows and detailed in Appendix B:

(a) Prior to receiving authorization to inject, as specified in Appendix B, the Permittee shall demonstrate internal Part I MI. Well-specific conditions dictate the methods and the frequency for demonstrating MI. The due date for completing the test is specified in Appendix B. The method that shall be used to demonstrate Part I MI is as follows:

Internal MI may be demonstrated by performing periodic visual inspections of the injection wells including the well casing. Specifically, the operator must submit documentation of all video logs previously run for each proposed injection well accompanied by a report(s) from a qualified professional analyst. Video logs shall be run in accordance with Appendix B conditions. Video logs shall be conducted within one (1) year of the effective permit date. All video logs must be run from the top to the total depth of each proposed injection well. Analytical reports should include a discussion of all findings related to mechanical integrity of the well, identification of any measures taken to resolve concerns and/or maintain the well, and any issues for which monitoring is needed on a routine basis. Video logs with an analyst report must be submitted to EPA prior to injection, following the repair of a well after the loss of mechanical integrity, and during routine maintenance which is expected to occur at least every 10 years.

(b) Part II MI shall be demonstrated by providing cement well records and/or a cement bond log (CBL).

(c) The Director may require additional or alternative tests if the results presented by the operator are not satisfactory to the Director to demonstrate there is no movement of fluid into or between USDWs resulting from the injection activity.

Results of any MIT required by this Permit shall be submitted to the Director as soon as possible but no later than thirty (30) calendar days after the test is complete.

3. Mechanical Integrity Test Methods and Criteria

EPA approved methods shall be used to demonstrate MI. The approved methods for this ASR project are described above, Page 12, Section D.2.

Current versions of these documents will also be available from EPA upon request. The Director may stipulate specific test methods and criteria best suited for a specific well construction and injection operation.

4. Notification Prior to Testing

The Permittee shall notify the Director at least thirty (30) calendar days prior to any MIT. The Director may allow a shorter notification period if it would be sufficient to enable EPA to witness the MIT or EPA declines to witness the test. Notification may be in the form of a yearly or quarterly schedule of planned MITs, or it may be on an individual basis.

5. Loss of Mechanical Integrity

If the well fails to demonstrate MI during a test or a loss of MI becomes evident during operation (i.e. water flowing at the surface, etc.), the Permittee shall notify the Director within twenty-four (24) hours (see Part III, Section D.11(e) of this Permit), cease injection and shut-in the well within forty-eight (48) hours unless the Director requires immediate shut-in.

Within five (5) calendar days, the Permittee shall submit a follow-up written report that documents circumstances that resulted in the MI loss and how it was addressed. If the MI loss has not been resolved, the Permittee shall provide a report with the proposed plan and schedule to reestablish MI. A demonstration of MI shall be reestablished within ninety (90) calendar days of any loss of MI unless written approval of an alternate time period has been given by the Director.

Injection operations shall not resume until after the MI loss has been resolved, the well has demonstrated MI pursuant to Part II, Section D.1 of this Permit, and the Director has provided written approval to resume injection.

Section E. MONITORING, RECORDKEEPING, AND REPORTING OF RESULTS

1. Monitoring Parameters and Frequency

Monitoring parameters are specified in Appendix D. The listed parameters are to be monitored, recorded and reported at the frequency indicated in Appendix D, even when the well is not operating. In the event the well has not injected or is no longer injecting, the monitoring report will reflect its status. Sampling data shall be submitted if the well has injected any time during the reporting period.

Records of monitoring information shall include:

(a) the date, exact place, and time of the observation, sampling, or measurements;
(b) the individual(s) who performed the observation, sampling, or measurements;
(c) the date(s) of analyses and individuals who performed the analyses;
(d) the analytical technique or method used; and
(e) the results of such analyses.

2. Monitoring Methods

Observations, measurements, and samples taken for the purpose of monitoring shall be representative of the monitored activity and include:

(a) Methods used to monitor the nature of the injected fluids must comply with analytical methods cited

and described in 40 CFR § 136.3 or by other methods that have been approved in writing by the Director;

(b) Injection rate, injected/recovered volume, cumulative injected/recovered volume, and wellhead pressure observed and recorded at the wellhead. All parameters shall be observed simultaneously to provide a clear depiction of well operation;

(c) Pressures are to be measured in pounds per square inch (psig);

(d) Fluid volumes are to be measured in gallons;

(e) Injection rates are to be measured in gallons per day.

3. Records Retention

The Permittee shall retain records of all monitoring information, including the following:

(a) Calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this Permit, and records of all data used to complete the application for this Permit, for a period of at least (3) years from the date of the sample, measurement, report, or application. This period may be extended any time prior to its expiration by request of the Director.

(b) Nature and composition of all injected fluids until three (3) years after the completion of any plugging and abandonment (P&A) procedures specified under 40 CFR § 144.52(a)(6). The Permittee shall continue to retain the records after the three-year (3) retention period unless the Permittee delivers the records to the Regional Administrator, or his/her authorized representative, or obtains written approval from the Regional Administrator, or his/her authorized representative, to discard the records.

4. Annual Reports

Regardless of whether the well is operating, the Permittee shall submit an Annual Report to the Director that:

(a) summarizes the results of the monitoring required in Part II, Sections D and E and Appendix D;

(b) includes a summary of any major changes in characteristics or sources of injected fluid. The report of fluids injected during the year must identify each new fluid source by water treatment plant and identify each well name and location, and the field name or facility name; and

(c) includes any additional wells within the area of review that have not previously been submitted. For those wells that penetrate the injection zone, a well construction diagram, cement records and/or cement bond log are also required.

The first Annual Report shall cover the period from the effective date of the Permit through December 31 of that year. Subsequent Annual Reports shall cover the period from January 1 through December 31 of the reporting year. Annual Reports shall be submitted by February 15 of the year following data collection. EPA Form 7520-8 or 7520-11 may be used or adapted to submit the Annual Report, however, the monitoring requirements specified in this Permit are mandatory even if the EPA form indicates otherwise. An electronic form may also be obtained from EPA to satisfy reporting requirements.

Section F. PLUGGING AND ABANDONMENT

1. Notification of Well Abandonment

The Permittee shall notify the Director in writing at least thirty (30) days prior to plugging and abandoning an injection well.

2. Well Plugging Requirements

Prior to abandonment, the injection well shall be plugged with cement in a manner which isolates the injection zone and will not allow the movement of fluids outside of the injection zone(s). Additional federal, state or local laws or regulations may also apply.

3. Approval of Plugging and Abandonment (P&A) Plan

The Permittee shall submit a proposed P & A Plan to the Director for approval that meets the requirements in Appendix E at least (sixty) 60 days prior to plugging and abandoning the injection well covered under this Area Permit.

4. Plugging and Abandonment Report

Within sixty (60) days after plugging a well, the Permittee shall submit a report (EPA Form 7520-19) to the Director or his/her authorized representative. The plugging report shall be certified as accurate by the person who performed the plugging operation. Such report shall consist of a statement that the well was plugged in accordance with current regulations.

5. Wells Not Actively Injecting

After any period of two (2) years during which there is no injection, the Permittee shall plug and abandon the well in accordance with the requirements in this Section and Appendix E of this Permit unless the Permittee:

(a) provides written notice to the Director or his/her authorized representative, prior to the two-year period;
(b) describes actions or procedures, satisfactory to the Director or his/her authorized representative, that the Permittee will take to ensure that the well will not endanger USDWs during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells, unless waived by the Director or his/her authorized representative;
(c) provides written notice to the Director or his/her authorized representative of the change in use of the well from recovery and injection to recovery only; and
(d) receives written notice by the Director or his/her authorized representative to temporarily waive plugging and abandonment requirements.

The Permittee of a well that has been temporarily abandoned shall notify the Director prior to resuming operation of the well.

PART III. CONDITIONS APPLICABLE TO ALL PERMITS

Section A. 40 CFR 144.12 REQUIREMENTS

Injection wells authorized under this Permit shall comply with the requirements of 40 CFR § 144.12.

1. Prohibition of movement of fluids into an underground source of drinking water

No owner or operator shall construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into USDWs, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR part 142 or may otherwise adversely affect the health of persons.

2. Identification of a Violation, 40 CFR l 44.l 2(c)

If at any time the Director learns that a Class V well may cause a violation, the Director may

(a) order the Permittee to take such actions (including where required, closure of the injection well) as may be necessary to prevent the violation, or

(b) take enforcement action.

3. Adversely Affect Human Health, 40 CFR 144.12(d)

Whenever the Director learns that a Class V well may be adversely affecting the health of persons, he or she may prescribe such actions as may be necessary to prevent the adverse effect, including any actions prescribed in Part III Section A.2.

Section B. CHANGES TO PERMIT CONDITIONS

1. Modification, Revocation and Reissuance, or Termination

The Director may, for cause, modify, revoke and reissue, or terminate this Permit in accordance with 40 CFR §§ 124.5, 144.12, 144.39, 144.40, and 144.41. The filing of a request for modification, revocation and reissuance, termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any condition of this Permit.

2. Conversion to Non-UIC Well

The Director may allow conversion of the well to a non-UIC well. Conversion may not proceed until the Permittee receives written approval from the Director, at which time this Permit will expire due to the end of operating life of the facility. Once expired under this part, the Permittee will need to reapply for a UIC permit and restart the complete permit process, including opportunity for public comment, before injection can occur.

Conditions of such conversion shall include approval of the proposed well rework, demonstration of mechanical integrity, and documentation that the well is authorized by another regulatory agency.

3. Transfer of Permit

Under 40 CFR § 144.38, this Permit may be transferred by the Permittee to a new owner or operator only if:

(a) the Permit has been modified or revoked and reissued (under 40 CFR § 144.39(b)(2)), or a minor modification made (under 40 CFR § 144.41(d)), to identify the new Permittee and incorporate such other requirements as may be necessary under the SDWA, or

(b) the Permittee provides written notification (EPA Form 7520-7) to the Director at least thirty (30) days in advance of the proposed transfer date and submits a written agreement between the existing and proposed new permittees containing a specific date for transfer or permit responsibility, coverage, and liability between them. If the Director does not notify the Permittee and the proposed new permittee of his or her intent to modify or revoke and reissue, or modify, the transfer is effective on the date specified in the written agreement. A modification under this paragraph may also be a minor modification under 40 CFR § 144.41.

4. Permittee Change of Address

Upon the Permittee's change of address, or whenever the operator changes the address where monitoring records are kept, the Permittee must provide written notice to the Director within thirty (30) days.

Section 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. Additionally, in a permit modification, only those conditions to be modified shall be reopened. All other aspects of the existing Permit shall remain in effect for the duration of the Permit.

Section D. CONFIDENTIALITY

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

- the name and address of the Permittee; and
- information which deals with the existence, absence or level of contaminants in drinking water.

Section E. ADDITIONAL PERMIT REQUIREMENTS

1. Duty to Comply

The Permittee must comply with all conditions of this Permit. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application; except that the Permittee need not comply with the provisions of this Permit to the extent and for the duration as such noncompliance is authorized in an emergency permit under 40 CFR § 144.34. All violations of the SDWA may subject the Permittee to penalties and/or criminal prosecution as specified in Section 1423 of the SDWA.

2. Need to Halt or Reduce Activity Not a Defense

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

3. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Permit.

4. 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 include 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.

5. Permit Actions

This Permit may be modified, revoked and reissued or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

6. Property and Private Rights; Other Laws

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 any other federal, state or local law or regulations.

7. Duty to Provide Information

The Permittee shall furnish to the Director, within a time specified, any information which the Director 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 the Director, upon request, copies of records required to be kept by this Permit.

8. Inspection and Entry

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

(a) enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;
(b) have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;
(c) inspect 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 the Regional Administrator or his/her authorized representative shall be signed and certified according to 40 CFR § 144.32. This section explains the requirements for persons duly authorized to sign documents and provides wording for required certification.

10. Continuation of Expiring Permits

(a) Duty to Reapply
If the Permittee wishes to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittee must submit a complete application for a new permit at least 180 days before this Permit expires.

(b) Permit Extension
The conditions of an expired permit continue in force 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 application which is a complete application for a new permit; and
(ii). the Director, 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.

(c) Enforcement
When the Permittee is not in compliance with the conditions of the expiring or expired permit, the Regional Administrator or his/her authorized representative may choose to do any or all of the following:
(i). Initiate enforcement action based upon the permit which has been continued.
(ii). Issue a notice of intent to deny the new permit. If the permit is denied, the owner or operator would then be required to cease the activities authorized by the continued permit or be subject to enforcement action for operating without a permit.
(iii). Issue a new permit under 40 CFR part 124 with appropriate conditions.
(iv). Take other actions authorized by these regulations.

11. Reporting Requirements

Copies of all reports and notifications required by this Permit shall be signed and certified in accordance with the requirements under Part III, E.9 of this Permit and shall be submitted to EPA:

UIC Enforcement, Mail Code: 8ENF-WSD
U.S. Environmental Protection Agency
1595 Wynkoop Street
Denver, Colorado 80202-1129

All correspondence should reference the well name and location and include EPA Permit number.

(a) *Monitoring Reports.* Monitoring results shall be reported at the intervals specified elsewhere in this Permit.
(b) *Planned changes.* The Permittee shall give notice to the Director as soon as possible of any planned changes, physical alterations or additions to the permitted well, and prior to commencing such changes.
(c) *Anticipated noncompliance.* The Permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with Permit requirements.
(d) *Compliance schedules.* Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Permit shall be submitted no later than thirty (30) calendar days following each schedule date.
(e) *Twenty-four-hour reporting.* The Permittee shall report to the Director any noncompliance which may endanger human health or the environment, including:
    (i). any monitoring or other information, which indicates that any contaminant may cause an endangerment to a USDW; or
    (ii). any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between USDWs.

Information shall be provided, either directly or by leaving a message, within twenty-four (24) hours from the time the Permittee becomes aware of the circumstances by telephoning (800) 227-8917 and requesting EPA Region 8 UIC Program SDWA Enforcement Supervisor, or by contacting EPA Region 8 Emergency Operations Center at (303) 293-1788.

In addition, a follow-up written report shall be provided to the Director within five (5) calendar days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance including exact dates and times, and if the noncompliance has not been corrected the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

(f) *Other Noncompliance.* The Permittee shall report all instances of noncompliance not reported under Paragraphs 11(a), 11(b), 11(d), or 11(e) of this Section at the time the monitoring reports are submitted. The reports shall contain the information listed in Paragraph 11(e) of this Section.
(g) *Other information.* Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Director, the Permittee shall submit such facts or information to the Director within thirty (30) days of discovery of failure.
(h) *Oil Spill and Chemical Release Reporting.* The Permittee shall comply with all reporting requirements related to the occurrence of oil spills and chemical releases by contacting the National Response Center (NRC) at (800) 424-8802 or NRC@uscg.mil.

Appendix A

WELL CONSTRUCTION REQUIREMENTS

These requirements represent the approved minimum construction standards for Well A-7R and all new well casing and cement well head configurations and injection tubing. Requirements for obtaining samples during or prior to well construction are described below. A description for the construction of Well A-7R is provided below.

Casing and Cement

The well or wells shall be cased and cemented to prevent the movement of fluids into or between USDWs and shall be in accordance with 40 CFR §147.305 and the Colorado Office of the State Engineer's Water Well Construction Rules. The Permittee must meet all applicable requirements in these Colorado Rules including Rule 10 entitled "Minimum Construction Standards for Water Wells." This Rule is designed to ensure that "…construction prevents harm to public health, will not impair water quality or cause contamination of shared groundwater resources, and will ensure the safety of groundwater resources for Colorado's existing and future populations." Rule 10 requirements include:

(a) Rule 10.1: "General - To assist in the orderly development of the groundwater resources of Colorado, to ensure the protection of the public health, and to prevent degradation of the groundwater resource, all wells constructed to withdraw or inject water must be constructed, maintained, or repaired in such a manner that will:
   (i). maintain existing natural protection against contamination of aquifers;
   (ii). prevent the entry of contaminants through the borehole;
   (iii). limit groundwater production to one aquifer unless otherwise permitted by the State Engineer; and
   (iv). prevent the intermingling of groundwater from different sources through the borehole."

(b) Rule 10.5: "Grout and Grout Placement – All wells must be grouted to prevent contaminants from entering the borehole, to separate groundwater in different aquifers, and to seal off water bearing zones known or suspected to contain contaminants".

These Rules can be found at: *Code of Colorado Regulations, Secretary of State, State of Colorado, Department of Natural Resources, Division of Water Resources, Rules and Regulations for Water Well Construction, Pump Installation, Cistern Installation, and Monitoring and Observation Hole/Well Construction, 2 CCR 402-2, Rule 10 Minimum Construction Standards for Water Wells.*

Well Construction Maintenance and Alterations

The well bore diagram shown below for Well A-7R is a general representation of the well's expected construction prior to injection. Routine maintenance and/or minor physical alterations to this constructed well are within the scope of this well's approved construction. Prior to beginning any addition or physical alteration to an injection well's construction or injection formation, the Permittee shall give advanced notice to the Director. Upon notification of such maintenance and/or alterations by the Permittee, the Director may impose additional requirements, if necessary, to ensure USDW protection. The Permittee must continue to report, cease operations, and repair the well in accordance

with conditions included in this Permit (See Part II, Sections C.8; Section D; and Part III, Sections A and E-11).

Collection of Water Samples

Upon request, water quality samples for new well requests will be collected during well construction in accordance with Part II.B.1.d of this Permit. A representative water sample from each discrete injection zone(s) shall be analyzed. After a minimum of three successive pore volumes, a representative sample shall be determined by stabilized specific conductivity.

The analysis shall be submitted to the Director within sixty (60) calendar days of completion of the logging or testing activity and shall include a report describing the methods used during logging or testing and an interpretation of the log or test results.

Well A-7R Well Construction

EPA UIC Permit Number CO52407-10773
2260 feet from the north line and 620 feet from the east line
SW ¼ NE ¼, Section 24, Township 5 South, Range 66 West
Arapahoe County, Colorado

Casing Type	Hole Size (in)	Type	Casing Size (in)	Interval (ft)	Cemented Interval (ft)	Screened Interval
Surface	36	Steel	24	0-40	0-40	N/A
Longstring	18.5	Steel	12.75	0-1960	0-1400	N/A
Gravel Pack	18.5	--	--	1440-2035	--	1454-1960

No well stimulation program is proposed during well completion. In the event the Permittee wishes to conduct well stimulation, the Permittee shall follow the requirements in Part II, Section B.8. *Alteration, Workover, and Well Stimulation*.

Well Number: A7-R

Permit Number: 17488-F-R

Date: February 2001

RECE
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WATER RESOUR
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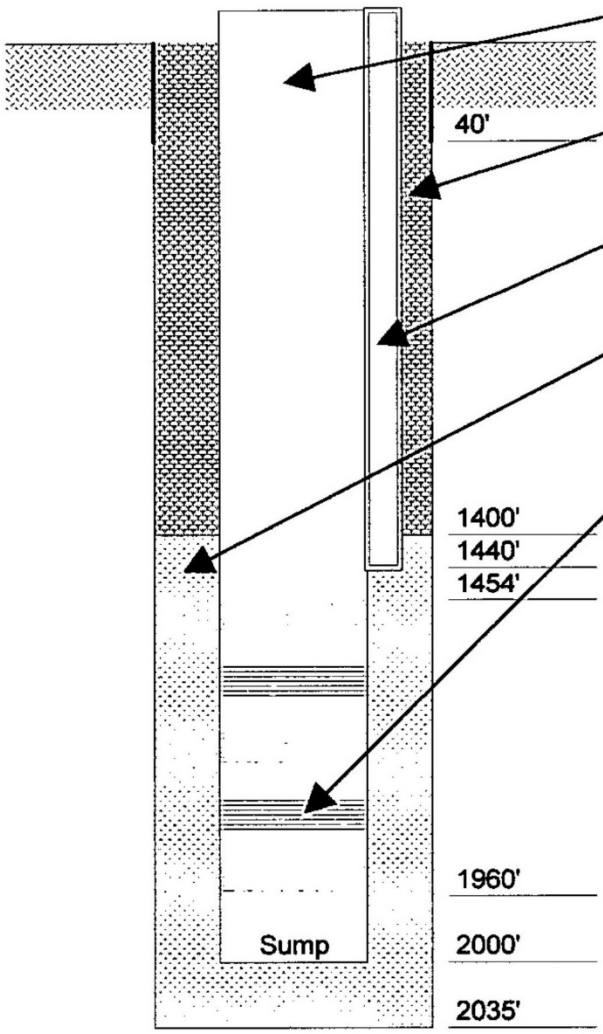

Casing
12-3/4" X .375 A53 Grade B Steel

Cement
(Lite) Portland Cement

Gravel Tube
2-3/8" A-53 B Steel

Gravel Pack
CSSI 10-16

Screen
12-3/4" 304 SS Wire Wrap .040"

Screen Placement

1454	-	1464
1470	-	1500
1521	-	1536
1544	-	1584
1606	-	1616
1678	-	1703
1748	-	1753
1776	-	1796
1940	-	1960
	-	
	-	
	-	
	-	
Total Screen Length =		175

Casing
Screen
Sand
Cement

Layne-Western,
a division of Layne Christensen Company

East Cherry Creek Valley Water and San. District
4343 S. Buckley Road, Suite 300
Aurora, CO 80115

Appendix B - LOGGING AND TESTING REQUIREMENTS

Well logging and tests shall be performed according to EPA approved procedures. It is the responsibility of the Permittee to obtain and use these procedures prior to conducting any well logging or test required as a condition of this Permit.

Well logs and test results shall be submitted to the Director within sixty (60) calendar days of completion of the logging or testing activity and shall include a report describing the methods used during logging or testing and an interpretation of the log or test results. When applicable, the report shall include a descriptive report prepared by a knowledgeable log analyst, interpreting the results of that portion of those logs and tests which specifically relate to: (1) a USDW and the confining zone adjacent to it, and (2) the injection zone and adjacent formations.

LOGS AND TESTS

TYPE OF LOG OR TEST	DATE DUE
Video Logs with Qualified Professional Analyst Report Part II Section D.2.a	Existing video logs shall be received by EPA prior to receiving authorization to inject. - Well A-7R - New well(s) The most recent video log for any proposed injection well shall be conducted within one year of the application submittal date. Run a video log following the repair of a loss of mechanical integrity and prior to authorization to recommence injection. All subsequent reports shall be submitted following routine maintenance activities or at least within ten years of the last video logging evaluation.
Baseline Water Analysis For the constituents found in Appendix G for new water sources proposed for injection (Part II Section C.7) and when wells are added to the Permit (Part II Section B.1(d))	Collect a representative fluid sample of proposed new injectate (treated water source) near the injection point and prior to receiving authorization to inject. Prior to receiving authorization to inject, collect a representative fluid sample of the formation water from the proposed new well(s) or a statement that the water sample will be obtained during well construction and submitted in accordance with Appendix A.

Cyanide	Collect a representative fluid sample and analyze for cyanide of the injectate prior to receiving authorization to inject.
Pipe analysis log or Caliper Log To check the condition of the casing of an existing well to be converted to an ASR well	Prior to receiving authorization to inject. Run during well conversion activities. - Well A-7R - New well(s)
Cement Records and/or Cement Bond Logs For injection and AOR wells not previously evaluated for Part II MI Demonstration (Part II Section E.2(b))	-When requesting authorization of additional wells, - When requesting an extension to construct a well, if not previously provided.
Bench Scale Water Chemistry Follow procedures in Appendix H (Part II Sections B and D.7 (a)(iii))	Perform tests following Authorization to Inject: - New well - New water source
Pilot Cycle Tests Follow procedures in Appendix I Analyze for constituents found in Appendix J (Part II Sections B and D.7 (a)(iii))	Perform tests following Authorization to Inject: - New well - New water source (upon request from the Director only)

Appendix C - OPERATING REQUIREMENTS

INJECTION ZONE:

Injection is permitted only within the approved injection zone listed below.

APPROVED INJECTION ZONE (GL, ft.)

WELL NAME	FORMATION NAME OR STRATIGRAPHIC UNIT	TOP (FT.) *	BOTTOM (FT.) *
A-7R	**ARAPAHOE**	**1454**	**1965**

*estimated top and bottom depths of formations

MAXIMUM INJECTION VOLUME:

There is no limitation on the fluid volume permitted to be injected into this well at this time. In no case shall injection pressure exceed the MAIP.

MAXIMUM INJECTION PRESSURE:

Maximum Allowable Injection Pressure (MAIP) as measured at the surface shall not exceed the pressure(s) listed below:

- Well Name: Well A-7R and all added wells
- MAIP: 133 psig or an alternate approved pressure by the Director.

Appendix D - MONITORING, AND REPORTING PARAMETERS

This is a listing of the parameters required to be observed, recorded, and reported. Refer to the Part II, Section D and F of the Permit, for detailed requirements for observing, recording, and reporting of these parameters once baseline samples have been taken for constituents in Appendix G. All water quality samples shall be taken from a sampling port location that ensures the samples are representative of the injected/recovered water.

EPA Form 7520-8 or 7520-11 may be used or adapted to submit the Annual Report, however, the monitoring requirements specified in this Permit are mandatory even if EPA Form 7520-11 indicates otherwise. An electronic form may also be obtained from EPA to satisfy reporting requirements.

OBSERVE WEEKLY AND RECORD MONTHLY
• Cumulative fluid volume injected (since injection began) in gallons • Cumulative fluid volume recovered (since injection began) in gallons • Injection Pressure (measured at the injection point or pump house) versus Wellhead Injection Pressure* • Injection Rate in gallons per minute (gpm) or gallons per day (gpd) Note: measured near the point of injection • Injection Volume in gallons • Injected and Recovery Volume in gallons • Recovery Rate in gpm or gpd Note: measured near the point of recovery at each recovery well • Wellhead Injection Pressure (psig)

*Note: Injection pressure is the pressure which is exerted at the pump house or location where fluids are stored (i.e. storage tanks) prior to reaching the well. Wellhead injection pressure is the pressure exerted on the wellhead to place fluids into the subsurface.

QUARTERLY SAMPLING & ANALYSIS	
NITROSAMINE EVALUATIONS	Obtain and analyze injectate and recovered water for nitrosamines on a quarterly (i.e., every 90 days) basis for the duration of this Permit. This analysis may be coordinated with other sampling requirements. Note: Obtain one of the samples for the injectate from the tap at the wellhead or the pump house, after blending has occurred, and analyze injectate for NDMA during the month where flows from surface water are at their maximum level. The peak month shall be determined by evaluating three years of monthly recovery rates at the supplying water systems.

ANNUAL SAMPLING & ANALYSIS	
INJECTATE	Obtain and analyze injectate on an annual basis using the parameter list in Appendix J.
RECOVERED WATER	Obtain and analyze recovered water on an annual basis using the parameter list in Appendix J.

QUARTERLY REPORTING	
CUMULATIVE FLUID VOLUME	Monthly cumulative injected and recovered fluid volume to date (in gallons)
INJECTION FLOW RATE	Monthly average, maximum, minimum values for injection flow rate measured near the wellhead (gpm or gpd)
INJECTION PRESSURE (measured from the Pump House)	Monthly average, maximum, minimum values for injection pressure measured at the pump house (psig)
INJECTION VOLUME	Monthly average, maximum, minimum values for injection volume measured near the wellhead (gallons)
RECOVERY VOLUME	Monthly average, maximum, minimum values for recovery volume measured near the wellhead (gallons)
SAMPLING RESULTS	The results of any quarterly (i.e., every 90 days) sampling analysis obtained for the injectate and/or recovered waters, including for NDMA, elevated constituents from new wells or water sources, and any other constituents required by the Director.
WELLHEAD PRESSURE (measured near the wellhead)	Monthly average, maximum, minimum values for injection pressure measured near the wellhead. (psig)

ANNUAL REPORTING	
FLUID ANALYSIS	Written results of annual injected fluid analysis.
IDENTIFICATION OF ALL SOURCES	Sources of all fluids injected during the year, including any wellfield and formation, noting any major changes in characteristics of injected fluid.

In addition to these items, additional logging and testing results may be required periodically. For a list of those items and their due dates, please refer to Appendix B – LOGGING AND TESTING REQUIREMENTS.

Appendix E - PLUGGING AND ABANDONMENT (P&A) REQUIREMENTS

All wells shall be plugged with cement in a manner which isolates the injection zone and will not allow the movement of fluids either into or between USDWs in accordance with 40 CFR § 146.10. Additional federal, state or local law or regulations may also apply.

Appendix F - CORRECTIVE ACTION PLAN

No corrective action is required at this time as EPA's evaluation did not identify migration pathways within the area of review.

Appendix G - ASR BASELINE CONSTITUENT LIST

Appendix G contains a list of constituents to be analyzed for baseline evaluations, and the Permit Limit for each contaminant. Injection activities will not be authorized if a contaminant exceeds a permit limit. This list shall also be used to analyze the injectate whenever a new water source is added and/or to analyze the formation water whenever a new well is authorized under this Permit. All analytical testing must be done in a state-certified laboratory.

AQUIFER AND STORAGE RECOVERY PROJECTS
List of constituents to be analyzed for baseline evaluations:

General

Parameter Name	Regulatory Limit (mg/L) or Specified Unit	Standard Type	Analytical Methods
pH	6.5 – 8.5	secondary	150.1
Electricity Conductivity			SM 2510B, 120.1
Total Dissolved Solids	500	secondary	
Total Organic Carbon			
Alkalinity, Total	mg/L as $CaCO_3$	0.006	

Metals

Parameter Name	Regulatory Limit (mg/L) or Specified Unit	Standard Type	Analytical Methods
Aluminum	200 ug/L		
Antimony	0.006	MCL	EPA 200.8, 200.9
Arsenic	0.01	MCL	EPA 200.7, 200.8, 200.9
Barium	2	MCL	EPA 200.7, 200.8
Beryllium	0.004	MCL	EPA 200.7, 200.8, 200.9
Boron	6	HA-Lifetime	EPA 200.7, 212.3
Cadmium	0.005	MCL	EPA 200.7, 200.8, 200.9
Calcium			
Chromium (total)	0.1	MCL	EPA 200.7, 200.8, 200.9
Copper	1.3	MCL-TT	EPA 200.7, 200.8, 200.9
Iron	5	Region 8 Permit Limit	EPA 200.7, 200.9
Lead	0.015	MCL-TT	EPA 200.8, 200.9
Manganese	0.3	HA-Lifetime	EPA 200.7, 200.8, 200.9
Magnesium			

Parameter Name	Regulatory Limit (mg/L) or Specified Unit	Standard Type	Analytical Methods
Mercury (inorganic)	0.002	MCL	EPA 245.1, 245.2, 200.8
Molybdenum	0.04	HA-Lifetime	EPA 200.7, 246.1, 246.2
Nickel	0.1	HA-Lifetime	EPA 200.7, 200.8, 200.9
Potassium			
Selenium	0.05	MCL	EPA 200.8, 200.9
Silver	0.1	HA-Lifetime	EPA 200.7, 200.8, 200.9
Sodium			
Strontium	4	HA-Lifetime	EPA 272.1, 272.2, 200.7
Thallium	0.002	MCL	EPA 200.8, 200.9
Zinc	2	HA-Lifetime	EPA 200.7, 200.8

Inorganics

Parameter Name	Regulatory Limit (mg/L) or Specified Unit	Standard Type	Analytical Methods
Ammonia	30 mg/L	HA-Lifetime	EPA 350.1, 350.2, 350.3
Asbestos (fibers/l>10µm in length)	7 million fibers/L	MCL	EPA 100.1,100.2
Bicarbonate			SM 2330B
Carbonate			SM 2330B
Chloride	250	secondary	
*Cyanide	0.2 mg/L	MCL	EPA 335.4
Fluoride	4 mg/L	MCL	EPA 300.0
Nitrate (as N)	10 mg/L	MCL	EPA 300.0
Nitrate-Nitrite (both as N)	10 mg/L	MCL	EPA 300.0
Nitrite (as N)	1 mg/L	MCL	EPA 300.0
Sulfate	250	secondary	

***** If cyanide is detected in the source water and not alkalized (pH less than 8.5), the Permittee must remove the cyanide from the source water prior to chloramination.

Radionuclides

Parameter Name	Regulatory Limit (mg/L) or specified unit	Standard Type	Analytical Methods
Radium 226 & 228 combined	5 pCi/L	MCL	Standard Method 304
Gross alpha particle activity (excluding Ra-226,radon, and uranium)	15 pCi/L	MCL	EPA 900.0
Uranium	0.03	MCL	EPA 908.0, 908.1

Volatile Organics using EPA Method 524.2 or 8260

Parameter Name	CAS No	Regulatory Limit (mg/L)	Standard Type
1,1,1,2-Tetrachloroethane	630-20-6	0.07	HA-Lifetime
1,1,1-Trichloroethane	71-55-6	0.2	MCL
1,1,2,2-Tetrachloroethane	79-34-5	0.04	Region 8 Permit Limit 10^{-4} Cancer Risk
1,1,2-Trichloroethane	79-00-5	0.005	MCL
1,1-Dichloroethylene	75-35-4	0.007	MCL
1,2-(cis)Dichloroethylene	156-59-2	0.07	MCL
1,2-(trans)Dichloroethylene	156-60-5	0.1	MCL
1,2,3-Trichloropropane	96-18-4	0.02	Region 8 Permit Limit
1,2,4-Trichlorobenzene	120-82-1	0.07	MCL
1,2-Dibromomethane (Ethylene Dibromide EDB)	106-93-4	0.00005	MCL
1,2-Dichlorobenzene o-	95-50-1	0.6	MCL
1,2-Dichloroethane	107-06-2	0.005	MCL
1,2-Dichloropropane	78-87-5	0.005	MCL
1,3-Dichlorobenzene m-	541-73-1	0.6	HA-Lifetime
1,4-Dichlorobenzene p-	106-46-7	0.075	MCL
2-Chlorotoluene (o-)	95-49-8	0.1	HA-Lifetime
4-Chlorotoluene (p-)	106-43-4	0.1	HA-Lifetime
Acetone	67-64-1	6	Region 8 Permit Limit
Acrylonitrile	107-13-1	0.006	Region 8 Permit Limit 10^{-4} Cancer Risk
Benzene	71-43-2	0.005	MCL
Bromobenzene	108-86-1	0.06	HA-Lifetime
Bromochloromethane	74-97-5	0.09	HA-Lifetime
Bromodichloromethane (THM)	75-27-4	0.02	Region 8 Permit Limit
Bromoform (THM)	75-25-2	0.2	Region 8 Permit Limit
Bromomethane	74-83-9	0.01	HA-Lifetime

Parameter Name	CAS No	Regulatory Limit (mg/L)	Standard Type
Carbon tetrachloride	56-23-5	0.005	MCL
Chlorobenzene (Monochlorobenzene)	108-90-7	0.1	MCL
Chlorodibromomethane (Dibromochloromethane)(THM)	124-48-1	0.06	HA-Lifetime
Chloroform (THM)	67-66-3	0.07	HA-Lifetime
Chloromethane	74-87-3	0.4	10-day HA for a 10 kg child
Dichlorodifluoromethane	75-71-8	1	HA-Lifetime
Dichloromethane (Methylene chloride)	75-09-2	0.005	MCL
Ethylbenzene	100-41-4	0.7	MCL
Hexachlorobutadiene	87-68-3	0.002	Region 8 Permit Limit
Hexachloroethane	67-72-1	0.001	HA-Lifetime
Isopropylbenzene (cumene)	98-82-8	0.8	Region 8 Permit Limit
Methyl Ethyl Ketone	78-93-3	4	HA-Lifetime
Naphthalene	91-20-3	0.1	HA-Lifetime
Perchloroethylene (PCE)(Tetrachloroethylene)	127-18-4	0.005	MCL
Styrene	100-42-5	0.1	MCL
Toluene	108-88-3	1	MCL
Total Trihalomethanes		0.08	MCL
Trichloroethylene (TCE)	79-01-6	0.005	MCL
Trichlorofluoromethane	75-69-4	2	HA-Lifetime
Vinyl chloride	75-01-4	0.002	MCL
Total Xylenes	1330-20-7	10	MCL

Semi-volatile Organics using EPA Method 525.2 or 8270

Parameter Name	CAS No	Regulatory Limit (mg/L) or Specified Unit	Standard Type
1,2,4-Trichlorobenzene	120-82-1	0.07	MCL
1,2-Dichlorobenzene	95-50-1	0.6	MCL
1,3-Dichlorobenzene	541-73-1	0.6	HAL
1,4-Dichlorobenzene	106-46-7	0.075	MCL
2,4,6-Trichlorophenol	88-06-2	0.002	Region 8 Permit Limit
2,4-Dichlorophenol	120-83-2	0.02	HA-Lifetime
2,4-Dinitrotoluene	121-14-2	0.005	Region 8 Permit Limit 10^{-4} Cancer Risk
2,6-Dinitrotoluene	606-20-2	0.005	Region 8 Permit Limit 10^{-4} Cancer Risk

Parameter Name	CAS No	Regulatory Limit (mg/L) or Specified Unit	Standard Type
2-Chlorophenol	95-57-8	0.04	HA-Lifetime
4-Nitrophenol	100-02-7	0.06	HA-Lifetime
Acenaphthene	83-32-9	0.4	Region 8 Permit Limit
Aldrin	309-00-2	0.0002	Region 8 Permit Limit 10^{-4} Cancer Risk
Anthracene	120-12-7	2	Region 8 Permit Limit
Benzo(a)pyrene	50-32-8	0.0002	MCL
bis(2-Ethylhexyl) phthalate	117-81-7	0.006	MCL
Butyl benzyl phthalate	85-68-7	1	Region 8 Permit Limit
Chlordane	57-74-9	0.002	MCL
Dieldrin	60-57-1	0.0002	Region 8 Permit Limit 10^{-4} Cancer Risk
Diethyl phthalate	84-66-2	6	Region 8 Permit Limit
Di-n-butyl phthalate	84-74-2	0.8	Region 8 Permit Limit
Endrin	72-20-8	0.002	MCL
Fluorene	86-73-7	0.2	Region 8 Permit Limit
Heptachlor	76-44-8	0.0004	MCL
Heptachlor epoxide	1024-57-3	0.0002	MCL
Hexachlorobenzene	118-74-1	0.001	MCL
Hexachlorobutadiene	87-68-3	0.002	Region 8 Permit Limit
Hexachlorocyclopentadiene	77-47-4	0.05	MCL
Hexachloroethane	67-72-1	0.001	HA-Lifetime
Isophorone	78-59-1	0.1	HA-Lifetime
Lindane	58-89-9	0.0002	MCL
Naphthalene	91-20-3	0.1	HA-Lifetime
Pentachlorophenol	87-86-5	0.001	MCL
Phenol	108-95-2	2	HA-Lifetime
Pyrene	129-00-0	0.2	Region 8 Permit Limit
Toxaphene	8001-35-2	0.003	MCL

Pesticides and Herbicides

Parameter Name	CAS No	Regulatory Limit (mg/L) or specified unit	Standard Type	Analytical Methods
Alachlor	15972-60-8	0.002	MCL	EPA 505, 507, 525
Aldicarb	116-06-03	0.003	MCL	EPA 531.1
Aldicarb sulfone	1646-87-4	0.002	MCL	EPA 531.1
Aldicarb sulfoxide	1646-87-3	0.004	MCL	EPA 531.1
Aldrin	309-00-2	0.0002	Region 8 Permit Limit 10^{-4} Cancer Risk	EPA 505, 508
Ametryn	834-12-8	0.06	HA-Lifetime	EPA 507
Atrazine	1912-24-9	0.003	MCL	EPA 505, 507
Bromacil	314-40-9	0.07	HA-Lifetime	EPA 507
Butylate	2008-41-5	0.4	HA-Lifetime	EPA 507
Carbaryl	63-25-2	0.08	Region 8 Permit Limit	EPA 531.1
Carbofuran	1563-66-2	0.04	MCL	EPA 531.1
Carboxin	5234-68-4	0.7	HA-Lifetime	EPA 507
Chlordane	57-74-9	0.002	MCL	EPA 505, 508, 525
Chlorothalonil	1897-45-6	0.1	Region 8 Permit Limit	EPA 508
DCPA (Dactyl)	1861-32-1	0.07	HA-Lifetime	EPA 508
Diazinon	333-41-5	0.001	HA-Lifetime	EPA 507
Dieldrin	60-57-1	0.0002	Region 8 Permit Limit 10^{-4} Cancer Risk	EPA 505, 508
Diphenamid	957-51-7	0.2	HA-Lifetime	EPA 507
Disulfoton	298-04-4	0.0007	HA-Lifetime	EPA 507
Endrin	72-20-8	0.002	MCL	EPA 505, 508, 525.1
Fenamiphos	22224-92-6	0.0007	HA-Lifetime	EPA 507
Heptachlor	76-44-8	0.0004	MCL	EPA 505, 508
Heptachlor epoxide	1024-57-3	0.0002	MCL	EPA 505, 508
Hexachlorobenzene	118-74-1	0.001	MCL	EPA 505, 508, 525.1
Hexachlorocyclopentadiene	77-47-4	0.05	MCL	EPA 505, 525.1
Hexazinone	51235-04-2	0.4	HA-Lifetime	EPA 507
Lindane	58-89-9	0.0002	MCL	EPA 505, 508
Methomyl	16752-77-5	0.2	HA-Lifetime	EPA 531.1
Methoxychlor	72-43-5	0.04	MCL	EPA 505, 508, 525
Metolachlor	51218-45-2	0.7	HA-Lifetime	EPA 507

Parameter Name	CAS No	Regulatory Limit (mg/L) or specified unit	Standard Type	Analytical Methods
Metribuzin	21087-64-9	0.07	HA-Lifetime	EPA 507
Oxamyl (Vydate)	23135-22-0	0.007	MCL	EPA 531.1
Prometon	1610-18-0	0.4	HA-Lifetime	EPA 507
Pronamide	23950-58-5	0.1	Region 8 Permit Limit 10^{-4} Cancer Risk	EPA 507
Propachlor	1918-16-7	0.1	Region 8 Permit Limit 10^{-4} Cancer Risk	EPA 508
Propazine	139-40-2	0.01	HA-Lifetime	EPA 507
Simazine	122-34-9	0.004	MCL	EPA 505, 507, 525.1
Tebuthiuron	34014-18-1	0.5	HA-Lifetime	EPA 507
Terbacil	5902-51-2	0.09	HA-Lifetime	EPA 507
Terbufos	13071-79-9	0.0004	HA-Lifetime	EPA 507
Trifluralin	1582-09-8	0.01	HA-Lifetime	EPA 508

Disinfectants and Disinfection Byproducts

Parameter Name	Regulatory Limit (mg/L) or specified unit	Standard Type	Analytical Method
Bromate	0.01	MCL	EPA 317.0, Revision 2 321.8, 326.0
Chloramine (as free chlorine)	4	MCL	
Chlorine (free chlorine, combined)	4	MCL	Standard Methods 20th edition: 4500-Cl D 4500-Cl F 4500-Cl G 4500-Cl H
Chlorine dioxide	0.8	MCL	EPA 327, Revision 1 Standard Method 20th edition: 4500-ClO_2 D 4500-CLO_2 E
Chlorite	1.0	MCL	EPA 300.0, 300.1
Total Haloacetic Acids (HAA5s) Bromoacetic acid Dibromoacetic acid	0.06	MCL	EPA 552.3

Parameter Name	Regulatory Limit (mg/L) or specified unit	Standard Type	Analytical Method
Dichloroacetic acid Monochloroacetic acid Trichloroacetic acid			
Total Trihalomethanes (TTHMs) Chloroform Bromodichloromethane Dibromocloromethane Bromoform	0.08	MCL	EPA 502.2, 524.2
N-nitroso-dimethylamine (NDMA)	NA		EPA 521
N-nitroso-diethylamine (NDEA)	NA		EPA 521
N-nitroso-di-n-butylamine (NDBA)	NA		EPA 521
N-nitroso-di-n-propylamine (NDPA)	NA		EPA 521
N-nitroso-methylethylamine (NMEA)	NA		EPA 521
N-nitroso-pyrrolidine (NPYR)	NA		EPA 521

MCL: Maximum Contaminant Level. The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLG as feasible using the best available analytical and treatment technologies and taking cost into consideration. MCLs are enforceable standards.

MCLG: Maximum Contaminant Level Goal. A non-enforceable health goal which is set at a level at which no known or anticipated adverse effect on the health of persons occurs and which allows an adequate margin of safety.

TT: Treatment Technique. A required process intended to reduce the level of a contaminant in drinking water.

HA: Health Advisory. An estimate of acceptable drinking water levels for a chemical substance based on health effects information; a Health Advisory is not a legally enforceable Federal standard, but serves as technical guidance to assist Federal, State, and local officials.

HA-Lifetime: The concentration of a chemical in drinking water that is not expected to cause any adverse non-carcinogenic effects for a lifetime of exposure. The Lifetime HA is based on exposure of a 70-kg adult consuming 2 liters of water per day. The Lifetime HA for Group C carcinogens includes an adjustment for possible carcinogenicity.

Region 8 Permit Limit: Permit limit calculated by Region 8 Drinking Water Toxicologist based on human health criteria.

10^{-4} Cancer Risk: The concentration of a chemical in drinking water corresponding to an excess estimated lifetime cancer risk of 1 in 10,000

HA-Ten Day: The concentration of a chemical in drinking water that is not expected to cause any adverse non-carcinogenic effects for up to ten days of exposure for a 10 kg child consuming 1 liter per day.

Appendix H - BENCH SCALE WATER CHEMISTRY TEST PROCEDURES FOR NITROSAMINES

This Appendix provides a procedure for implementing a bench scale water chemistry test for the Permittee's ASR Project. The Bench Scale Water Chemistry test will be used to help predict any changes that may occur in the injectate chemistry over time. The procedure will be performed for the Permittee's addition of wells that are authorized under this Permit. The Director also requires that this test be performed for a new water source. This test may be performed in parallel to pilot cycle testing and/or operational use of the well due to the potential duration of this test.

Samples for the test shall be obtained prior to performing the Pilot Cycle Test. Testing of water chemistry shall be performed on the injectate and recovered formation water. Prior to the start of a test, a detailed sampling protocol shall be obtained from the contract laboratory. This protocol shall include a written description of sampling methods for use by field personnel and for inclusion in reporting to the Colorado SEO and EPA. Sampling shall adhere to protocols as specified by the water quality testing laboratory for sampling methods, sample preservation, sample handling times, and chain-of-custody records.

Section A. Analysis of the Formation Water

The Permittee shall arrange for analytical data prepared by the laboratory to be submitted to them and EPA, simultaneously.

Prior to performing the Part I MI and Pilot Cycle Test, the Permittee shall collect four samples of sufficient size to meet the requirements for testing of the formation water from each of the proposed ASR wells. These samples shall be obtained using the volatile organic carbon (VOC) collection method and stored on a shelf at the temperature recorded for the recovered water until analyzed. The VOC collection method requires field staff to fill the bottle to the maximum level and exclude all air pockets to the extent possible. The laboratory will provide bottles without septa caps for sample collection according to the method and lab Standard Operating Procedure (S.O.P). According to lab protocol, air pockets in samples are acceptable if <6 mm.

1. These samples shall be "spiked" by the laboratory with a quantity of 10 ng/L of N-nitrosodimethylamine (NDMA) and 10 ng/L of N-nitroso-di-n-butylamine (NDBA). The purpose of this shelf test is to observe how NDMA and NDBA react with the native formation water. The sample bottles should be stored in a fashion that prevents light degradation.
2. Ninety (90) days following the collection of the formation samples, one sample bottle shall be analyzed for NDMA and NDBA. This analytical process shall be repeated for the next bottles on a quarterly (i.e., every 90 days) basis. The analytical results of NDMA and NDBA concentrations shall be reported to the Director within thirty (30) days.

Section B. Analysis of the Injectate Water

The Permittee shall arrange for analytical data prepared by the laboratory to be submitted to them and EPA, simultaneously.

1. Collect five samples of a volume needed to meet the requirements of the injectate testing on the same day within thirty (30) days following the start of the Pilot Cycle Test. These samples shall

be obtained using the VOC collection method and laboratory protocol as mentioned in Section A (above). Analyze the first sample for NDMA and NDBA.

Store the other four samples on a shelf at formation temperatures until analyzed. The sample bottles should be stored in a dark location away from light to prevent premature breakdown.

2. Ninety (90) days following the collection of the injectate samples, one sample bottle shall be analyzed for NDMA and NBDA. Repeat this analytical process for the next sampling bottles on a quarterly (i.e., every 90 days) basis. The analytical results of NDMA and NBDA concentrations shall be reported to the Director within thirty (30) days.

Appendix I - ASR PILOT CYCLE TEST PROCEDURES

This Appendix provides procedures for pilot cycle testing of the Permittee's addition of new wells for sampling and analysis of constituents listed below and in Appendix J. This test may also be used when adding a new water source upon receipt of written notification from the Director. The intent of this procedure is to be responsive to conditions existing at the time of the pilot testing. For example, while this protocol defines one of the test cycles as a 7-day cycle (7 days of recharge/7 days of recovery), a change in the Permittee's supply or demand during the cycle may require a delay in operations to achieve the minimum recharge or recovery time frame. This test will be used to predict any potential impacts which could occur as a result of injection activities.

Additionally, since recovery rates vary from injection rates, as required by the State of Colorado, these time periods will not be the same. If there are significant changes between successive sampling events, it may be appropriate to increase sampling frequency and/or parameters.

Sampling shall adhere to protocols as specified by the water quality testing laboratory for sampling methods, sample preservation, sample handling times, and chain-of-custody records.

Section A. Measurements, Instrumentation and Monitoring

The following conditions will be measured and recorded in advance of and during each round of cycle testing:

1. Static water levels (between cycles)
2. Water levels while pumping
3. Water levels while injecting or specify surface, if applicable
4. Flow rate and cumulative amount pumped while recovering, by cycle and total
5. Flow rate and cumulative amount stored while injecting, by cycle and total
6. Flow rate entering and exiting the system collected at the pump house
7. Pressure data collected at the wellhead
8. Inflation pressure on flow control valve (FCV), pressure data collected from the pump or in the pipeline.
9. Intermittent sampling as described in the application for measurement of total organic carbon and dissolved oxygen in injectate and recovered water
10. Start/stop times and elapsed time for cycles
11. Sampling dates and sample testing protocol

Measurements 1-10 listed above in Section A will be communicated via the Permittee's SCADA system to the control facility, where the data will be processed and archived. Measurements of wellhead pressure (item 7) will be made and recorded manually on a weekly schedule, depending on the consistency of line pressure.

The following measurements will be made and recorded after cycle testing:

1. Static water levels (between pumping periods)
2. Water levels while pumping
3. Flow rate and cumulative amount pumped while pumping and total
4. Flow rate entering and exiting the system collected at the pump house
5. Line pressure (at the wellhead)

6. Inflation pressure on FCV
7. Nitrogen tank pressure (if present)

Section B. Cycle Testing

The applicant shall obtain an injectate sample prior to starting cycle testing if there has been a change in the water chemistry from baseline sampling previously provided to EPA. Cycle testing will consist of progressively longer periods during which water is injected, stored, and then recovered. For purposes of this Permit, one cycle consists of one period of injection, followed by storage, followed by recovery.

The cycle testing will occur according to the following schedule:

Schedule for Cycle Testing				
Cycle No.	Injection Time (days)	Storage Time (days)	Recovery Time (days)	Comments
1	3	1	3	Optimization work to be performed during implementation of Cycle 1
2	7	7	7	
3	14	14	14	
4	21	21	21	
Alternate Cycle 4 (optional Cycle 4 test)	45	45 - 60	45	Alternative Cycle 4 test

1. Storage Time

The storage times presented above are the minimum durations that fluids must be maintained in storage. This time may be increased at Permittee's discretion.

2. Recovery Time

The recovery times presented above are estimates. This time shall be adjusted so that: 1) recovery continues until native source water is encountered; and 2) the volume previously injected is recovered considering recovery occurs at a higher rate than injection.

3. Additional cycles may be added as needed

(a) Analysis/or Cycle 1 for Recovered Water

Cycle 1 shall be performed to optimize the equipment for testing. Field measurements shall include temperature, pH, TDS, electrical conductivity, dissolved oxygen, and oxidation-reduction potential (ORP);

(b) Analysis for Cycles 2 through 4 for Recovered Water

(i). Collect data sets during Cycles 2 through 4 and any additional cycling events at the beginning, mid-stream, and end of recovery for each cycle to monitor and record the pH, TDS, dissolved oxygen, oxidation reduction potential, and electrical conductivity;

(ii). Evaluate indicator results in item (i) above to determine the potential timeframe (or recovered water volume point) in which the transition from injectate to native Formation water can be detected based on the water chemistry of injected fluids during each cycle; and

(iii). Collect a water sample after recovering between 80% - 90% of the injected volume for Cycles 2 – 4 and analyze for Appendix J parameters. Collect a sample of the injectate water ("bubble fringe") prior to the transition into the native water by considering the findings in item (ii) above.

4. Final Report

(a) Prepare a summary report for each cycle for the implementation and findings observed during the implementation of the Pilot Cycle Test. Include a copy of the analytical data collected during the Pilot Cycle Test in this report. This report shall summarize the analysis and discuss the potential for future injection activities to result in changes in groundwater chemistry.

(b) All submitted laboratory data shall include EPA' s regulatory limits (maximum contaminant levels, Region 8 limits, health advisory limits). All values which exceed the regulatory limits shall be highlighted.

(c) This report shall be submitted to the Director within thirty (30) calendar days from the completion of all test procedures and receipt of all analytical results from the last cycle conducted.

Appendix J - CONSTITUENT LIST FOR PILOT CYCLE TEST ANALYSIS & ONGOING MONITORING REQUIREMENTS

Appendix J lists the required constituents for Pilot Cycle Testing following the procedures in Appendix I. This constituent list shall also be used to collect water quality data for ongoing monitoring requirements presented in Appendix D. All analytical testing must be done in a state certified laboratory. However, other constituents may be added by written response from the Director through email or letter following the review of baseline data collected with the constituent list presented in Appendix G and/or if there is a need to evaluate a new constituent(s). Any new constituent added to the list of constituents in Appendix J shall be evaluated following the procedures in Appendix I and/or review of monitoring results in Appendix D.

Parameter Name	Regulatory Limit (mg/L) or Specified Unit	Detection Limit (mg/L) or Specified Unit	Standard Type	Analytical Methods
pH	6.5 - 8.5		Secondary	150.1
Specific Gravity				
Temperature				
Electricity Conductivity				SSM 2510B, 120.1
Total Dissolved Solids	500		Secondary	
ANIONS				
Carbonate				SM 2330B
Chloride	250		Secondary	
Nitrate (as N)	10		MCL	353.2
Nitrite (as N)	1		MCL	353.2
Nitrate-Nitrite				
Bicarbonate				SM 2330B
Sulfate	250		Secondary	
Fluoride	4		MCL	SM 4500-F C
CATIONS				
Calcium				
Magnesium				
Potassium				
Sodium				
METALS				
Antimony	0.006	0.003	MCL	200.8, 200.9
Arsenic	0.01	0.005	MCL	200.7, 200.8,200.9
Barium	2	1	MCL	200.7, 200.8
Beryllium	0.004	0.002	MCL	200.7,200.8, 200.9
Boron	6	0.7	HA-Lifetime	200.7, 212.3

Cadmium	0.005	0.0025	MCL	200.7, 200.8, 200.9
Chromium	0.1	0.05	MCL	200.7, 200.8, 200.9
Copper	1.3	0.65	MCL-TT	200.7, 200.8, 200.9
Total Iron	5	2.5	Region 8 Permit Limit	200.7, 200.9
Lead	0.015	0.0075	MCL-TT	200.8, 200.9
Manganese	0.3	0.4	HA-Lifetime	200.7, 200.8,200.9
Mercury (inorganic)	0.002	0.001	MCL	245.1, 245.2,200.8
Molybdenum	0.04	0.02	HA-Lifetime	200.7, 246.1,246.2
Nickel	0.1	0.05	HA-Lifetime	200.7, 200.8,200.9
Selenium	0.05	0.025	MCL	200.8, 200.9
Silver	0.1	0.05	HA-Lifetime	200.7, 200.8,200.9
Strontium	4	2	HA-Lifetime	272.1, 272.2,200.7
Thallium	0.002	0.001	MCL	200.8, 200.9
Zinc	2	1	HA-Lifetime	200.7, 200.8
Uranium	0.003			908.0, 908.1
Gross Alpha	15 pCi/L			900
Radium 226 & 228 combined	5 pCi/L			304
Aluminum	0.05 to 0.2		Secondary	
Total Trihalomethanes	0.08		MCL	502.2, 524.2
Turbidity	TT’			
Total Haloacetic acid (HAA5s)	0.06		MCL	552.2
Coliforms	5.0%+			
N-nitroso-dimethylamine (NDMA)		2 ng/L		521
N-nitroso-di-n-butylamine (NDBA)		6 ng/L		521