UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) UNDERGROUND INJECTION CONTROL PERMIT: CLASS V

Permit Number: MN-171-5R21-0002

Facility Name: Well #9

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

Joint Powers Water Board of Albertville, Hanover, and St. Michael, Minnesota

is hereby authorized to continue operation of an existing Class V Aquifer Storage and Recovery (ASR) injection well located in Wright County, Minnesota, at T120N, R24W, Section 26, NE 1/4, for injection into the Mt. Simon Sandstone, between the depths of 403 and 504 feet, upon the express condition that the permittee meet the restrictions set forth herein. Injection is limited to treated drinking water for aquifer storage and recovery. The designated confining zone for this injection well is the Eau Claire Formation.

All references to 40 CFR are to all regulations that are in effect on the date that this permit becomes effective. The following attachments are incorporated into this permit: A, B, C, and D.

This permit shall become effective on _____ and shall remain in full force and effect for ten years from the effective date of the original permit, unless the permit is withdrawn or otherwise revoked, terminated, modified or reissued as provided at 40 CFR Sections 144.39, 144.40 and 144.41. This permit shall also remain in effect upon delegation of primary enforcement responsibility to the State of Minnesota, if Minnesota chooses to adopt this permit as a State permit. This permit and the authorization to inject shall expire at midnight on _____, unless terminated prior to the expiration date.

Signed and dated:_____

DRAFT

Joan M. Tanaka
Acting Director, Water Division

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PART I
GENERAL PERMIT COMPLIANCE

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, otherwise authorized by this permit or rule, cannot allow the movement of fluid containing any contaminant into an underground source of drinking water, if the presence of that contaminant may cause a violation of any Primary Drinking Water Regulations under 40 CFR Part 141, other health-based standards, or may otherwise adversely affect the health of persons. Any underground injection activity not specifically authorized in this permit or otherwise authorized by permit or rule is prohibited. This permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under Sections 1411-1420 and 1431 of the Safe Drinking Water Act (SDWA), or any other law governing protection of public health or the environment.

B. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause pursuant to 40 CFR Sections 144.39, 144.40, and 144.41. The filing of a request for a permit 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 permit condition.

C. SEVERABILITY

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

D. CONFIDENTIALITY

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

1. The name and address of the permittee; and

2. Information that deals with the existence, absence or level of contaminants in drinking water.

E. DUTIES AND REQUIREMENTS

1. **Duty to Comply** – The permittee shall comply with all conditions of this permit, except to the extent and for the duration such non-compliance is authorized by an emergency permit pursuant to 40 CFR Section 144.34. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, denial of a permit renewal application, permit termination, revocation and reissuance or modification.

2. **Penalties for Violations of Permit Conditions** – Any person who operates this well in violation of permit conditions is subject to civil penalties, fines, and other enforcement action under the SDWA and may be subject to such actions under the Resource Conservation and Recovery Act. Any person who willfully violates a permit condition is subject to criminal prosecution.

3. **Continuation of Expiring Permits**

   (a) Duty to Re-apply – If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must submit a complete application for a new permit at least 30 calendar days before this permit expires.

   (b) Permit Extension – The conditions of an expired permit may continue in force as set forth in 5 United States Code (USC) 558(c) and 40 CFR Section 144.37.

   (c) Effect – Permits continued under 5 USC 558(c) and 40 CFR Section 144.37 remain fully effective and enforceable.

   (d) Enforcement – When the permittee is not in compliance with the conditions of the expiring or expired permit, the Director 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 to deny the new permit. If the permit application 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 operation without a permit;

      (iii) Issue a new permit under 40 CFR Part 124 with appropriate conditions; or

      (iv) Take other actions authorized by the UIC regulations.

4. **Need to Halt or Reduce Activity not a Defense** – It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

5. **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.

6. **Proper Operation and Maintenance** – The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance 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 the permit.

7. **Duty to Provide Information** – The permittee shall furnish to the Director, within 30 days, 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 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 are 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 substance or parameters at any location.

9. **Records**

   (a) The permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all records required by this permit, for a period of at least three years from the date of the sample, measurement or report. The permittee shall also maintain records of all data required to complete this permit application and any supplemental information submitted under 40 CFR Sections 144.31 and 144.51. These periods may be extended by request of the Director at any time by written notice to the permittee.

(b) The permittee shall retain records concerning the nature and composition of all injected fluids until three years after the completion of plugging and abandonment in accordance with the plugging and abandonment plan, contained in Part III(B) of this permit. The owner or operator shall continue to retain the records after the three-year retention period unless he delivers the records to the Regional Administrator or obtains written approval from the Regional Administrator to discard the records.

(c) Records of monitoring information shall include:

(i) The date, exact place, and the time of sampling or measurements;

(ii) The name(s) of the individual(s) who performed the sampling or measurements;

(iii) A precise description of both sampling methodology and the handling of samples;

(iv) The date(s) analyses were performed;

(v) The name(s) of the individual(s) who performed the analyses;

(vi) The analytical techniques or methods used; and

(vii) The results of such analyses.

10. **Notification Requirements**

(a) **Planned Changes** - The permittee shall notify and obtain the Director's approval at least 30 days prior to any planned physical alterations or additions to the permitted facility, or changes in the injection fluids. Within 10 days prior to injection, an analysis of new injection fluids shall be submitted to the Director for approval in accordance with Parts II(B)(2) and II(B)(3) of this permit.

(b) **Anticipated Noncompliance** - The permittee shall give at least 30 days advance notice to the Director for his/her approval of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(c) **Transfer of Permits** - This permit is not transferable to any person except after notice is sent to the Director at least 30 days prior to transfer and the requirements of 40 CFR Section 144.38 have been met. The Director may require modification or revocation of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the SDWA.

(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 to the Director no later than thirty (30) days following each schedule date.

(e) **Twenty-Four Hour Reporting**

(i) The permittee shall report to the Director any noncompliance, which may endanger health or the environment. This information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances, and shall include the following information:

a) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or

b) Any noncompliance with a permit condition or malfunction of the injection system that may cause fluid migration into or between underground sources of drinking water.

(ii) A written submission shall also be provided as soon as possible but no later than five days from 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 steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

(f) **Other Noncompliance** - All other instances of noncompliance shall also be reported by the permittee in accordance with Part I(E)(10)(e)(i) and (ii) of this permit.

(g) **Other Information** - If or when the permittee becomes aware that the permittee failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit such facts or corrected information in accordance with 40 CFR Section 144.51(l)(8).

(h) **Report on Permit Review** - Within 30 days of receipt of the final issued permit, the permittee shall report to the Director that the permittee has read and is personally familiar with all terms and conditions of this permit.

11. **Signatory Requirements** - All reports or other information requested by the Director shall be signed and certified according to 40 CFR Section 144.32.

12. **Notice of Plugging and Abandonment** - The permittee shall notify the Director at least 45 days before conversion or abandonment of the well.

13. **Plugging and Abandonment** - The permittee shall plug and abandon the well as provided in the plugging and abandonment plan contained in Part III(B) of this permit. Plugging shall occur as soon as practicable after operation ceases but not later than two years thereafter. During the period of non-operation, the well must

be tested to ensure that it maintains mechanical integrity, unless the permittee fulfills the other requirements under 40 CFR Section 144.52(a)(6), prior to expiration of the two-year period. The permittee shall notify the Director of plugging and abandonment in accordance with the reporting procedures in Part II(B)(3)(c) of this permit.

14. **Financial Responsibility** - The permittee shall maintain financial responsibility and resources to plug and abandon the underground injection well in accordance with 40 CFR Section 144.52(a)(7) as provided in Attachment R of the permit application in the administrative record corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. The permittee shall not substitute an alternative demonstration of financial responsibility from that which the Director has approved, unless the permittee has previously submitted evidence of that alternative demonstration to the Director and the Director has notified the permittee in writing that the alternative demonstration of financial responsibility is acceptable. The financial responsibility mechanism shall be updated periodically, upon request of the Director, except when Financial Statement Coverage is used as the financial mechanism, this coverage must be updated on an annual basis.

15. **Insolvency**

(a) In the event of the bankruptcy of the trustee or issuing institution of the financial mechanism, or a suspension or revocation of the authority of the trustee institution to act as trustee or the institution issuing the financial mechanism to issue such an instrument, the permittee must submit an alternative demonstration of financial responsibility acceptable to the Director within 60 days after such event. Failure to do so will result in the termination of this permit pursuant to 40 CFR Section 144.40(a)(1).

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

16. **Corrective Action**

The permittee shall shut in the injection well whenever he/she or EPA determines that operation thereof may be causing upward fluid migration through the well bore of any improperly plugged or unplugged well in the area of review and shall take such steps as he/she can to properly plug the offending well(s). Any operation of the well that may cause upward fluid migration from an improperly plugged or unplugged well will be considered a violation of this permit. If the permittee or EPA determines that the permitted well is not in compliance with 40 CFR Section 146.8, the permittee will immediately shut in the well until such time as appropriate repairs can be effected and written approval to resume injection is given by the Director. In addition, the permittee shall not commence injection until any and all corrective action has been taken in accordance with any plan

contained in Part III(C) of this permit.

17. **Mechanical Integrity**

(a) The permittee must establish (prior to receiving authorization to inject), and shall maintain mechanical integrity of this well, in accordance with 40 CFR Section 146.8.

(b) The Director may, by written notice, require the permittee to demonstrate mechanical integrity at any time.

(c) The permittee shall cause all gauges used in mechanical integrity demonstrations to be calibrated prior to the demonstration.

(d) The permittee shall cease injection if a loss of mechanical integrity occurs or is discovered during a test or a loss of mechanical integrity as defined by 40 CFR Section 146.8 becomes evident during operation. Operations shall not be resumed until the Director gives approval to recommence injection.

(e) The permittee shall notify the Director of the loss of mechanical integrity, in accordance with the reporting procedures in Parts II(B)(3)(c) and I(E)(10)(e) of this permit.

(f) The permittee shall report the result of a satisfactory mechanical integrity demonstration as provided in Part II(B)(3)(c) of this permit, except the first such result after Permit issuance, which shall be sent to the Permit Writer.

18. **Restriction on Injected Substances** - The permittee shall be restricted to the injection of treated drinking water for the purpose of storage and recovery. Further, no fluids other than those from sources noted in the administrative record for this permit and approved by the Director shall be injected.

PART II
WELL SPECIFIC CONDITIONS FOR UNDERGROUND INJECTION CONTROL PERMITS

A. OPERATING, MONITORING AND REPORTING REQUIREMENTS

1. Operating Requirements

(a) Beginning on the effective date of this permit, the permittee is authorized to operate the injection well, subject to the limitations and monitoring requirements set forth herein. The injection pressure and injected fluid shall be limited and monitored as specified in Part III(A) of this permit.

(b) Injection at a pressure that initiates fractures in the confining zone or causes the movement of injection or formation fluids between underground sources of drinking water is prohibited.

(c) Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.

2. Monitoring Requirements

(a) Samples and measurements, taken for the purpose of monitoring as required in Part II(B)(3), shall be representative of the monitored activity. Grab samples shall be used to obtain a representative sample of the fluid to be analyzed. Part III(A) and (D) of this permit describes the sampling location and required parameters for injection fluid analysis. The permittee shall identify the types of tests and methods used to generate the monitoring data. The monitoring program shall conform to the one described in Part III(A) and (D) of this permit.

(b) **Analytical Methods** - Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 CFR Section 136.3 or in Appendix III of 40 CFR Part 261 or by other methods that have been approved by the Director.

(c) **Injection Fluid Analysis** - The nature of the injection fluids shall be monitored as specified in Part III(A) and (D) of this permit. An initial analysis of the injection fluid is contained in Attachment H of the administrative record corresponding to this permit action, which is hereby incorporated by reference as if it appeared fully set forth herein. The Director may, by written notice, require the permittee to sample and analyze the injected fluid at any time.

(d) **Injection Pressure, Flow Rate and Cumulative Volume** - Injection pressure, flow rate and cumulative volume shall be recorded daily and shall be reported monthly as specified in Part III(A) of this permit. All gauges used in monitoring shall be calibrated in accordance with Part I(E)(17)(c) of this permit.

3. **Reporting Requirements** - Copies of the monitoring results and all other reports shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590
Attn: UIC Section, Permits Branch (WP-16J)

(a) **Monthly Reports** - Monitoring results obtained during each week shall be recorded on a form which has been signed and certified according to 40 CFR Section 144.32. The first report shall be postmarked no later than the 10th day of the month after authorization to inject has been granted. Thereafter, forms shall be submitted at the end of each month and shall be postmarked no later than the 10th day of the month following the reporting period. This report shall include the daily measurements of injection pressure, flow rate and cumulative volume as required in Parts II(B)(2)(d) and III(A) of this permit as well as the results of any sampling requirements listed in Part III (D) of this permit.

(b) **Annual Reports –** The permittee shall report the following at least every twelve months. Update of the plugging and abandonment cost estimate of ASR Well #9 as required by Part III(D)(7).

(c) **Reports on Well Tests, Workovers, and Plugging and Abandonment** - The applicant shall provide the Director with the following reports and test results within 60 days of completion of the activity:

(i) Mechanical integrity tests, except tests which the well fails, in which case twenty-four (24) hour reporting under Part I(E)(10)(e) is applicable;

(ii) Logging or other test data;

(iii) Well workovers (using EPA Form 7520-19); and

(iv) Plugging and abandonment.

(d) **Reports to Minnesota Department of Health**-The applicant shall provide the Director with copies of all reports sent to Minnesota Department of Health.

PART III
SPECIAL CONDITIONS

These special conditions include, but are not limited to plans for maintaining correct operating procedures, monitoring conditions and reporting, as required by 40 CFR Parts 144 and 146. These plans are described in detail in the permittee's application for a permit, and the permittee is required to adhere to these plans as approved by the Director, as follows:

A. OPERATING, MONITORING AND REPORTING REQUIREMENTS

B. PLUGGING AND ABANDONMENT PLAN

C. CORRECTIVE ACTION PLAN

D. GROUNDWATER MONITORING REQUIREMENTS

Attachment A
OPERATING, MONITORING AND REPORTING REQUIREMENTS

Characteristic	Limitation	Minimum Monitoring Requirements		Minimum Reporting Requirements[1]
		Frequency	Type	Frequency
Injection Pressure[2]	133 psig[3] (maximum)	daily		monthly
Flow Rate		daily		monthly
Cumulative Volume		daily		monthly
Chemical Composition of Fluid[4]		See table D-1,[4]	grab	monthly

Sample Location: The sample locations are at the wellhead.

[1] If any cycle is less than one month, the reporting for that cycle shall be included with the following monthly report.

[2] The limitation on wellhead pressure serves to prevent confining-formation fracturing. This limitation was calculated using the following formula: [{0.8 *psi/ft* - (0.433 *psi/ft*)(specific gravity)} x depth] - 14.7 *psi*. The maximum injection pressure is dependent upon depth and specific gravity of the injected fluid. The Mt. Simon Sandstone at 403 feet was used as the depth and a specific gravity of 1.00 was used for the injected fluid.

[3] pounds per square inch gauge

[4] Chemical composition analyses shall include, but is not limited to, constituents found in Table D-1of attachment D.

OMB No. 2040-0042 Approval Expires 12/31/2018

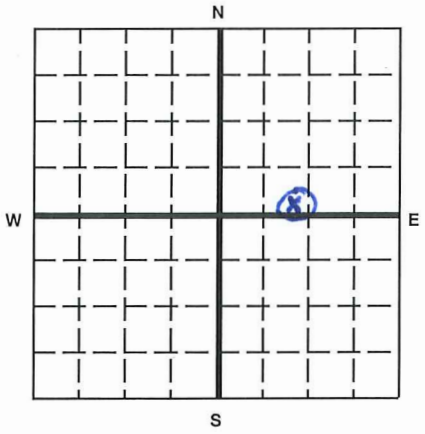
United States Environmental Protection Agency
Washington, DC 20460

EPA

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility	Name and Address of Owner/Operator
Joint Powers ASR Well 9 16090 15th St. NE, St. Michael, MN 55313	Joint Powers Water Board, 11100 50th St NE, Albertville, MN 55301

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
MN	Wright	MN-171-5R21-0002

Surface Location Description 120N 24W

SE 1/4 of SE 1/4 of Sw 1/4 of NE 1/4 of Section 26 Township 120 Range 24

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 1050 ft. frm (N/S) N Line of quarter section

and 50 ft. from (E/W) E Line of quarter section.

TYPE OF AUTHORIZATION
- [x] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

Lease Name

WELL ACTIVITY
- [ ] CLASS I
- [ ] CLASS II Class V
  - [ ] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Well Number 9

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
30			190 feet	30
24			440 feet	29

METHOD OF EMPLACEMENT OF CEMENT PLUGS
- [ ] The Balance Method
- [ ] The Dump Bailer Method
- [ ] The Two-Plug Method
- [x] Other

CEMENTING TO PLUG AND ABANDON DATA:	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inche	Blasted	24	24				
Depth to Bottom of Tubing or Drill Pipe (ft.	504	447	440				
Sacks of Cement To Be Used (each plug)							
Slurry Volume To Be Pumped (cu. ft.)							
Calculated Top of Plug (ft.)	447	440	7				
Measured Top of Plug (if tagged ft.)							
Slurry Wt. (Lb./Gal.)							
Type Cement or Other Material (Class III)	PeaRock	Sand	Grout				

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To
See schematic			

Estimated Cost to Plug Wells

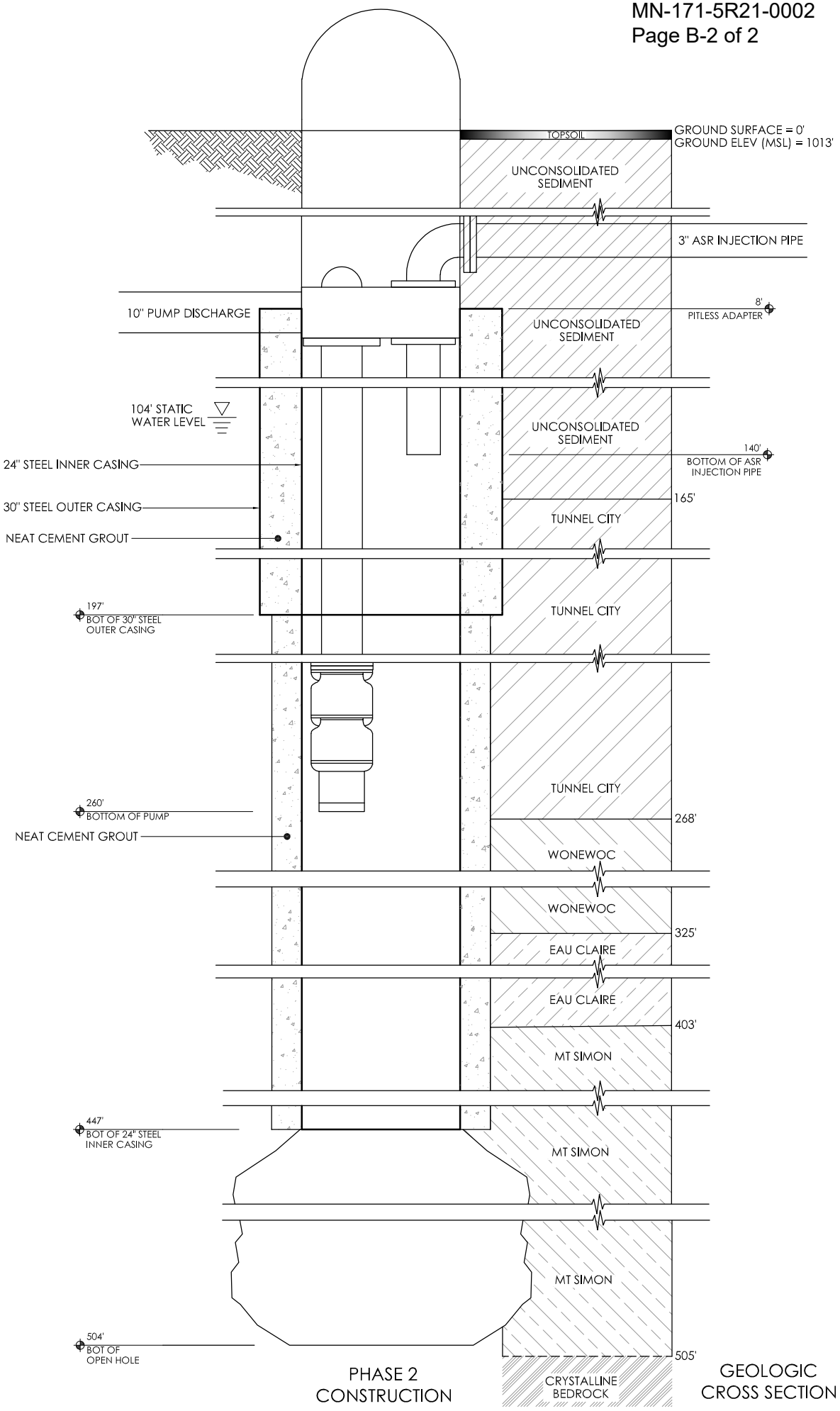
$63,000 - see attached estimate

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Christopher Larson, PE	Chris Larson	6/14/19

EPA Form 7520-14 (Rev. 12-11)



PHASE 2 CONSTRUCTION

GEOLOGIC CROSS SECTION

PLOTTED: 6-5-2019 1:48 PM
PLOT SCALE: 6" = 1'-0"

C:\Users\cvang\Desktop\Well Schematic.dwg 6/5/2019 1:48 PM cvang

3535 VADNAIS CENTER DR
ST PAUL, MN 55110
PHONE: 651.490.2000
FAX: 651.490.2150
WATTS: 800.325.2055
www.sehinc.com

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE 03-15-2019 REGISTRATION NO. _____

SANITARY DISTRICT #2
WELL NO. 2
PROPOSED WELL CONSTRUCTION

TOWN OF SHELBY, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO.	SHLBY 148692 -
CITY PROJECT NO.	
PROJECT STATUS	REPORT
ISSUE DATE	03-15-2019
DESIGNED BY	XX
DRAWN BY	XX

SHEET TITLE
WELL 9 SCHEMATIC

SHEET
P1

Attachment C
CORRECTIVE ACTION PLAN

No corrective action is needed at this time.

Attachment D
GROUNDWATER MONITORING REQUIREMENTS

1. Groundwater Monitoring Wells

Joint Powers Water Board shall maintain in good operating condition a groundwater monitoring well. The monitoring well shall monitor the Mt. Simon Sandstone at depths between 403 to 504 feet.

The purpose of the monitoring well is to provide assurance that the injection of treated water into the Mt. Simon Sandstone does not cause the contamination of this aquifer. Monitoring includes recording pressure measurements of the Mt. Simon Sandstone and collection of water samples from these aquifers for chemical analysis. The specific monitoring and reporting requirements for the monitoring well is described Table D-1.

If further information is needed to determine the impact of the injection well on public health and groundwater quality, EPA may require the construction of additional monitoring wells. If EPA requires additional monitoring wells Joint Powers Water Board will need to submit the following to EPA for approval:

- Location of each proposed monitoring well on a map that includes the proposed injection well and piezometric surface of the Franconia-Ironton-Galesville (FIG) aquifer.
- Design plans for each monitoring well including groundwater elevation at the monitoring well sites, casing type, screened intervals, and material used for the filter packs, seals, and surface completion.

2. Formation Water Sampling

At the periods specified in Table D-1, the permittee shall collect water from well #9 and TW-6 for the purpose of chemical analysis. The permittee shall analyze the water samples for all the parameters specified in Table D-1. During any sample collection event, EPA or its representatives will have an opportunity to obtain split samples.

a. Background Sampling

At least one background sample shall be collected from TW-6 before injection prior to the beginning of each cycle. The purpose of these samples is to establish a reliable chemical baseline in the Mt. Simon Sandstone that would include natural variation. This will then be used to determine what effect the operations at Well #9 are having on the Mt Simon Sandstone.

b. On-going monitoring

If any sample results exceed Maximum Contaminant Levels, the permittee may elect to either (1) engage in trend analysis to determine if the out-of-range value represents real change, or (2) re-sample the well to determine if the out-of-range result is reliable. For either method elected by the permittee to investigate an out-of-range value, the third consecutive value of any single parameter that is above the limits established shall be considered contamination of the underground source of drinking water. The permittee shall cease all injection activity if contamination occurs.

3. Reporting Water Analysis Results

The permittee shall report all results of water samples analyzed as specified in Part II(B)(3) of this permit. Each report shall include graphical illustration of the parameter values as a function of sample date, showing all samples taken during the life of the wells. Upon written request from the Director, the permittee shall provide laboratory records of analyses which may include electronic tapes with spectral files to independently verify the analytical results of samples taken for organic chemistry, or other standard laboratory records.

4. Pressure Sampling

The monitoring well shall maintain a capability to measure pressure within the Mt. Simon Sandstone. Formation pressure shall be continuously monitored and shall be recorded at least once every four hours. Formation pressure shall be measured by dedicated equipment capable of a precision of at least 0.1 pounds per square inch (psi). The permittee shall correct each recorded formation pressure value for changes in simultaneous barometric pressure values. To make this correction, the permittee may either directly measure the barometric pressure at TW-6, or obtain a barometric pressure value from a nearby source at the time of the Mt. Simon Sandstone pressure recordings.

The permittee shall calibrate all gauges in use for pressure measurements at the monitoring well at least annually. The calibration shall ensure that the precision value of 0.1 psi is maintained.

5. Reporting Pressure Data

The permittee shall report monitoring well pressure data each month or at the end of each cycle whichever comes first. Each report shall include a tabulation of the values for each month's pressure data. Each report shall include a graphical display showing the measured formation pressures, the barometric pressures, and the daily maximum injection pressure. The display of this information must be on a common graph, showing all three parameters for the month. This graph should have a separate scale for the formation pressure, which must be displayed at scale sensitive enough to observe fluctuations in the formation pressure.

6. TW-6 Well Workovers

The permittee shall submit any plan to workover the monitoring well to the Director for approval at least 30 days in advance of the scheduled date to commence the well workover. Reports of the workover shall be submitted to the Director within 60 days after the activity.

7. Plugging and Abandonment

Any plan to plug and abandon the monitoring well shall be submitted to the Director for approval at least 60 days prior to commencement of plugging activities. Final plugging of the well shall include installation of a permanent marker to identify the well. The permittee shall maintain an adequate financial mechanism to properly plug and abandon the monitoring wells, until the wells have been completely plugged and abandoned. The estimate of the cost to properly plug and abandon the monitoring wells shall be updated at least once every twelve months, and the financial mechanism to meet or exceed the estimated cost shall be adjusted as needed each year. The permittee shall, within 45 days of its completion, submit a report of the plugging and abandonment of the monitoring wells.

Table D- 1. Sampling plan for well #9 and for TW-6.

Cycle		Full Scale ASR					
Phase		Background	Recharge	Recovery			
Percent Volume			95%	5%	30%	60%	100%
Well Location		Well 9, TW-6	Well 9, TW-6	Well 9	Well 9	Well 9	Well 9, TW-6
Field Parameters							
Temperature	°C	Collect field parameters on day of sampling	Collect field parameters monthly from Well 9 during recovery and on the day of sampling from TW-6	Collect field parameters bi-weekly from Well 9 during recovery and on the day of sampling from TW-6			
pH							
Conductivity	uS/cm						
ORP	mV						
DO	mg/L						
Metals							
Aluminum	ug/L	X	X		X		X
Arsenic	ug/L	X	X		X		X
Calcium	ug/L	X	X		X		X
Iron	ug/L	X	X		X		X
Magnesium	ug/L	X	X		X		X
Manganese	ug/L	X	X		X		X
Potassium	ug/L	X	X		X		X
Sodium	ug/L	X	X		X		X
Other Inorganic Chemicals							
Hardness	ug/L	X	X		X		X
Alkalinity	mg/L	X	X		X		X
Chloride	mg/L	X	X		X		X
Nitrogen, Ammonia	mg/L	X	X		X		X
Phosphorus	mg/L	X	X		X		X
Reactive Silica, Total	mg/L	X	X		X		X
Sulfate	mg/L	X	X		X		X
Chlorine, Total Residual	mg/L	X	X		X		X
Nitrogen, Kjeldahl, Total	mg/L	X	X		X		X
Organics							
Total Organic Carbon	mg/L	X	X		X		X
Total Trihalomethanes	ug/L	X	X	X	X	X	X
Haloacetic Acids, HAA5	ug/L	X	X	X	X	X	X
Radionuclides							
Gross Alpha	pCi/L	X	X	X	X	X	X
RA-226	pCi/L	X	X	X	X	X	X
Ra-228	pCi/L	X	X	X	X	X	X
Ra-226 + Ra-228	pCi/L	X	X	X	X	X	X
Uranium	ug/L	X	X	X	X	X	X

Note:
X: sample once