



**Description of Required Actions Identified and Completed for VW#1 and VW#2 Pursuant to
Administrative Order on Consent, Docket No. SDWA-05-2025-0001, Paragraph 67(a)
September 12, 2025**

This document describes the Response Actions that have been identified and completed for VW#2 and VW#1, and their current monitoring capabilities, as required by Paragraph 67(a) of the Administrative Order on Consent.

VW#2 Response Actions

ADM has taken multiple steps to identify the cause and extent of the fluid migration that occurred from the Mount Simon formation into the Ironton-Galesville formation through VW#2, to repair the well, and to implement measures to prevent any future migration.

Approximately 2,670 to 3,940 metric tons of CO₂ and 18,990 to 39,300 Stock Tank Barrels of brine migrated from the Mt. Simon formation into the lower Ironton-Galesville between January 1, 2022, and November 3, 2023, through VW#2 (Migrated Fluids). Modeling indicates that the Migrated Fluids remain contained in the lower Ironton-Galesville, near the wellbore, and there will be little to no movement of the Migrated Fluids either vertically or horizontally over the next 100 years.

The cause of the migration was corrosion of VW#2's 13Cr tubing. In particular, VW#2's tubing was exposed to CO₂ saturated brine in the Mt. Simon formation resulting in corrosion that created holes sufficient to allow movement of Migrated Fluids into the tubing. Once inside the tubing, the Migrated Fluids travelled up VW#2 and exited existing perforations designed for conducting sampling above the confining zone in the lower Ironton-Galesville.

ADM repaired and recompleted VW#2 by the 2nd quarter of 2025 to avoid any future migration of fluids, which included:

- Removing existing 13Cr tubing above the dual isolation bridge plugs
- Installing 25Cr tubing and a nickel-coated packer for exclusive above confining zone monitoring
- Sealing the lower portion of the well with CO₂ resistant cement
- Sealing the existing perforations in the Ironton-Galesville with CO₂ resistant cement
- Logging VW#2 to verify mechanical integrity was restored following recompletion activities

VW#2 has verified mechanical integrity and is no longer a conduit through which fluids can migrate out of the injection zone.



VW#1 Response Actions

ADM has taken multiple steps to identify the cause and extent of the brine fluid migration that occurred from the Mount Simon formation into the Ironton-Galesville formation through VW#1 and implement corrective and preventive measures to prevent any future migration.

Less than 271 Stock Tank Barrels of brine migrated from the Mt. Simon formation into the Ironton-Galesville formation prior to October 11, 2024, through VW#1 (Brine Fluid). Sampling results indicate that the Brine Fluid has since been successfully purged from the Ironton-Galesville formation.

The probable cause of the migration was mechanical issues with the sliding sleeves. In particular, the sliding sleeves did not consistently seal as designed, allowing brine fluid from the Mt. Simon formation to move into the sliding sleeve located in the Mount Simon formation, travel up VW#1 through the tubing, and exit the sliding sleeve in the Ironton-Galesville formation.

ADM repaired and recompleted VW#1 by the 3rd quarter of 2025 to avoid any future migration of brine, which included:

- Isolating the Mount Simon formation from the Ironton-Galesville formation with a retrievable tubing plug and confirming no holes in the tubing
- Purging the Brine Fluid from the Ironton-Galesville formation during routine sampling
- Sampling the Ironton-Galesville formation after the purge, which confirmed a return to native fluid for that formation
- Removing the existing 13Cr tubing and completion with sliding sleeves
- Installing and cementing in place a new 3.5-inch Alloy G3 corrosion resistant liner inside the current 5.5-inch production casing to enhance well bore integrity
- Logging VW#1 to verify mechanical integrity was maintained following recompletion activities

VW#1 has verified mechanical integrity and is no longer a conduit through which fluids can migrate out of the injection zone.

Implementing the Updated Monitoring Plan and Other Monitoring Activities

ADM began implementing an Updated Monitoring Plan for CCS#2 pursuant to the Emergency and Remedial Response Plan and 40 C.F.R. § 146.94 comprised of four phases:

1. Temporary use of CCS#1 for in-zone monitoring and VW#1 for above confining zone monitoring while VW#2 undergoes repair and recompletion.
2. Restart injection of CO₂ into CCS#2 with temporary use of CCS#1 for in-zone monitoring and VW#2 for above confining zone monitoring while VW#1 undergoes recompletion.



3. Implement monitoring using the recompleted VW#1 for in-zone monitoring and VW#2 for above confining zone monitoring while new monitoring wells, VW#3-A and VW#3-B, are being designed and constructed.
4. Implement alternative monitoring plan using VW#1 and VW#3-B, once complete, for in-zone monitoring and VW#2 and VW#3-A, once complete, for above confining zone monitoring until a new Testing & Monitoring Plan is approved and implemented.

Monitoring has been conducted in accordance with the Updated Monitoring Plan since the plan's submission. Table 2 from the most recent Semi-Annual Report filed with EPA on July 31, 2025, summarizes the relevant monitoring activities conducted in the first half of 2025:

Table 2. Schedule and status for 2025 annual reservoir fluid sampling and MIT

Dates	Well	Activity	Status
Apr 07, 2025	CCS#2	T/P Calibration of DH Gauges	Completed
Mar 22 – Apr 1, 2025	CCS#2	MIT	Completed
Apr 24 – 28, 2025	G101, G102, G103, G104, 10LG, 11LG, 12LG, 13LG	Shallow groundwater sampling	Completed
Apr 03, 2025 ⁽¹⁾	VW#1	Sample Zone - 3 (Ironton Galesville)	Completed
Apr 09, 2025	VW#1	Sample Zones - 2 (Mt Simon B)	Completed
Mar 21, 2025	VW#2	Sample Zone - 5 (Ironton Galesville)	Completed
Suspended ⁽²⁾	VW#2	Sample Zone - 4 (Mt Simon E)	Suspended
Suspended ⁽²⁾	VW#2	Sample Zone - 3 (Mt Simon B)	Suspended
Suspended ⁽²⁾	VW#2	Sample Zone - 2 (Mt Simon A Upper)	Suspended
Mar 21, 2025	GM#2	Sample St Peter (Lowermost USDW)	Completed
Mar 12 - Mar 13, 2025	CCS#2	T/P/ Flow Calibration of Surface Gauges	Completed
Apr 09, 2025	CCS#2	Testing of the Automatic S/D System	Completed

(1) Reservoir fluids are produced until representative native fluids are produced (zone purging).

(2) In VW#2 well, only Zone 5 was available for sampling and the deeper zones have been plugged. ADM has recompleted VW#2 and is currently recompleting VW#1 as per the approved Alternative Monitoring Plan submitted to USEPA on April 22, 2025.



**Status Report Pursuant to Administrative Order on Consent,
Docket No. SDWA-05-2025-0001, Paragraph 67(b)
September 12, 2025**

This Status Report describes the actions taken by ADM to determine the cause and extent of failure of VW#2 and VW#1, and ADM's subsequent repairs to prevent fluid migration through VW#2 and VW#1. In addition, this Status Report explains why no other conduits exist through which injected fluid could migrate.

VW#2 Response Actions

ADM has taken multiple steps to identify the cause and extent of the fluid migration that occurred from the Mount Simon formation into the Ironton-Galesville formation through VW#2, to repair the well, and to implement measures to prevent any future migration.

Approximately 2,670 to 3,940 metric tons of CO₂ and 18,990 to 39,300 Stock Tank Barrels of brine migrated from the Mt. Simon formation into the lower Ironton-Galesville between January 1, 2022, and November 3, 2023, through VW#2 (Migrated Fluids). Modeling indicates that the Migrated Fluids remain contained in the lower Ironton-Galesville, near the wellbore, and there will be little to no movement of the Migrated Fluids either vertically or horizontally over the next 100 years.

The cause of the migration was corrosion of VW#2's 13Cr tubing. In particular, VW#2's tubing was exposed to CO₂ saturated brine in the Mt. Simon formation resulting in corrosion that created holes sufficient to allow movement of Migrated Fluids into the tubing. Once inside the tubing, the Migrated Fluids travelled up VW#2 and exited existing perforations designed for conducting sampling above the confining zone in the lower Ironton-Galesville.

ADM repaired and recompleted VW#2 by the 2nd quarter of 2025 to avoid any future migration of fluids, which included:

- Removing existing 13Cr tubing above the dual isolation bridge plugs
- Installing 25Cr tubing and a nickel-coated packer for exclusive above confining zone monitoring
- Sealing the lower portion of the well with CO₂ resistant cement
- Sealing the existing perforations in the Ironton-Galesville with CO₂ resistant cement
- Logging VW#2 to verify mechanical integrity was restored following recompletion activities

VW#2 has verified mechanical integrity and is no longer a conduit through which fluids can migrate out of the injection zone.



VW#1 Response Actions

ADM has taken multiple steps to identify the cause and extent of the brine fluid migration that occurred from the Mount Simon formation into the Ironton-Galesville formation through VW#1 and implement corrective and preventive measures to prevent any future migration.

Less than 271 Stock Tank Barrels of brine migrated from the Mt. Simon formation into the Ironton-Galesville formation prior to October 11, 2024, through VW#1 (Brine Fluid). Sampling results indicate that the Brine Fluid has since been successfully purged from the Ironton-Galesville formation.

The probable cause of the migration was mechanical issues with the sliding sleeves. In particular, the sliding sleeves did not consistently seal as designed, allowing brine fluid from the Mt. Simon formation to move into the sliding sleeve located in the Mount Simon formation, travel up VW#1 through the tubing, and exit the sliding sleeve in the Ironton-Galesville formation.

ADM repaired and recompleted VW#1 by the 3rd quarter of 2025 to avoid any future migration of brine, which included:

- Isolating the Mount Simon formation from the Ironton-Galesville formation with a retrievable tubing plug and confirming no holes in the tubing
- Purging the Brine Fluid from the Ironton-Galesville formation during routine sampling
- Sampling the Ironton-Galesville formation after the purge, which confirmed a return to native fluid for that formation
- Removing the existing 13Cr tubing and completion with sliding sleeves
- Installing and cementing in place a new 3.5-inch Alloy G3 corrosion resistant liner inside the current 5.5-inch production casing to enhance well bore integrity
- Logging VW#1 to verify mechanical integrity was maintained following recompletion activities

VW#1 has verified mechanical integrity and is no longer a conduit through which fluids can migrate out of the injection zone.

Well Conduit Analysis

The only penetrations with sufficient depth that penetrate confining layers into the Mt. Simon formation within the permitted area of review are VW#1, VW#2, CCS#1, and CCS#2.

CCS#1 and CCS#2 have consistently maintained mechanical integrity and there is no data indicating that either injection well is, or could be, a conduit through which injected fluids could migrate out of the injection zone.

Furthermore, CCS#1, CCS#1, and VW#1 are not, and will not be in the next 100 years, within the horizontal area of review of the Migrated Fluids contained near VW#2. VW#2 also cannot be a conduit



for the Migrated Fluids because, as recompleted, access to the injected fluids has been eliminated by sealing off those portions of the well.

Additionally, as described above, VW#2 and VW#1 have recently been repaired and recompleted, after which mechanical integrity has been established. Notably, both verification wells are now single zone wells, with VW#2 no longer extending below the confining zone and VW#1 no longer constructed with any perforations above the confining zone. Consequently, there are no longer conduits through which fluids can migrate through those wells.

Finally, ADM will continue to adhere to all required monitoring and reporting obligations.



**Migration Assessment Report and Corrective Action Plan Pursuant to Administrative Order
on Consent, Docket No. SDWA-05-2025-0001, Paragraphs 67(c), (d), (e), and (f)
September 12, 2025**

Migration Assessment Report Under Paragraph 67(c) and (d)

ADM assessed and determined the area of review and extent of fluid migration from the Mount Simon formation into the Ironton-Galesville formation outside the authorized injection zone from and through VW#2 (Migrated Fluids).

ADM's migration assessment included the following elements:

- Computational modeling conducted to account for the physical and chemical properties of all phases of the Migrated Fluids;
- The method for delineating the area of review for the Migrated Fluids that meets the requirements of 40 C.F.R. § 146.84(c), including the model used, assumptions made, and the site characterization data on which the model was based;
- The prediction, using existing site characterization, monitoring and operational data, and computational modeling, of the projected lateral and vertical migration of the Migrated Fluids plume in the subsurface until the plume movement ceases, or until pressure differentials sufficient to cause the movement of the Migrated Fluids into an underground source of drinking water (USDW) are no longer present, and until the end of a fixed 100-year period;
- Modeling inputs, assumptions and data used in preparation of the assessment;
- Detailed geologic data collected to characterize the injection zone, confining zone, Ironton-Galesville formation, and relevant formations between the Ironton-Galesville and the St. Peter formation (lowermost USDW);
- Anticipated operations over the proposed life of the geologic sequestration project;
- Any geologic heterogeneities, other discontinuities, data quality, and their possible impact on model predictions;
- Potential migration through faults, fractures, and artificial penetrations;
- Crossflow and critical pressure evaluation, which provides input details for the assessment's calculations; and
- Fluid migration timeline assessment.

Based on ADM's assessment, approximately 2,670 to 3,940 metric tons of CO₂ and 18,990 to 39,300 Stock Tank Barrels of brine migrated from the Mt. Simon formation into the lower Ironton-Galesville between January 1, 2022, and November 3, 2023, through VW#2. Modeling indicates that the Migrated Fluids remain contained in the lower Ironton-Galesville, near the wellbore, and there will be little to no movement of the Migrated Fluids either vertically or horizontally over the next 100 years. Modeling also indicates that any critical pressure area from the Migrated Fluids already dissipated by



January 1, 2024. Additionally, the modeling shows that the Migrated Fluids have no discernible impact on the area of review for the CO₂ injected into the Mt. Simon at CCS#2.

Corrective Action Plan Under 67(e) and (f)

ADM's migration assessment relies upon prior determinations that no penetrations, including active wells, abandoned wells, or underground mines, penetrate the area of review for the Migrated Fluids, other than VW#2. However, ADM repaired and recompleted VW#2 by the 2nd quarter of 2025 to avoid any future migration of fluids, which included:

- Removing existing 13Cr tubing above the dual isolation bridge plugs
- Installing 25Cr tubing and a nickel-coated packer for exclusive above confining zone monitoring
- Sealing the lower portion of the well with CO₂ resistant cement
- Sealing the existing perforations in the Ironton-Galesville with CO₂ resistant cement
- Logging VW#2 to verify mechanical integrity was restored following recompletion activities

As a result of ADM's efforts, mechanical integrity has been verified for the VW#2 and that well is no longer a conduit through which fluids can migrate out of the injection zone. In particular, VW#2 no longer extends below the confining zone and, as recompleted, access to the injected fluids has been eliminated by sealing off those portions of the well. Consequently, there are no penetrations within the area of review for the Migrated Fluids that warrant further action.



**Remedial Action Plan Pursuant to Administrative Order on Consent,
Docket No. SDWA-05-2025-0001, Paragraph 67(g)(i)
September 12, 2025**

ADM evaluated two remedial action alternatives to address the fluids that migrated from the Mount Simon formation into the Ironton-Galesville formation outside of the authorized injection zone from and through VW#2 (Migrated Fluids).

The evaluation of each remedial action alternative considered the following ten (10) factors:

- a) effectiveness in preventing endangerment to any underground source of drinking water (USDW);
- b) long-term effectiveness;
- c) degree to which the Migrated Fluids would be removed;
- d) degree to which the Migrated Fluids would be restrained from any further migration;
- e) testing and monitoring procedures used to confirm the effectiveness to address the Migrated Fluids;
- f) the technical feasibility;
- g) any potential adverse environmental impacts;
- h) any appropriate interim actions;
- i) detailed schedule and milestones; and
- j) estimated costs.

The first alternative is called the “Sequestration Alternative.” This alternative involves the continued sequestering of the Migrated Fluids in the Ironton-Galesville formation. Implementation includes confirming the containment of the Migrated Fluids, remediating conduits through which the Migrated Fluids might migrate vertically, modeling the horizontal and vertical long-term fate of the Migrated Fluids, confirming the effectiveness of the confining layers above the Migrated Fluids to ensure containment, and utilizing robust monitoring to verify the Migrated Fluids will remain contained long term. The evaluation of the Sequestration Alternative revealed the following noteworthy results:

- Full containment of all Migrated Fluids;
- Verifiably effective in the long term;
- Poses no threat to endangerment of a USDW, to human health, or to the environment; and
- Can be implemented immediately.

The second alternative is called the “Removal Alternative.” This alternative involves producing the Migrated Fluids from the Ironton-Galesville formation with pumps and transporting it for off-site disposal into a similar deep geological formation through a separate underground injection well, or at another permitted disposal facility. The evaluation of the Removal Alternative revealed the following noteworthy results:



- Produced fluids would flow into a separator, where almost all of the previously contained CO₂ would be released as a gas into the atmosphere, which presents a number of environmental and safety impacts and risks;
- Requires a large freight transportation effort and large volumes of produced fluid injected into an off-site disposal well or disposed at another permitted facility;
- Removes only approximately 50% of the currently sequestered CO₂ before a substantial number of technical and practical feasibility issues and impediments arise;
- Would take an estimated three (3) years to remove only approximately 50% of the CO₂ in the Migrated Fluids.

Based on the evaluation, including consideration of the costs, benefits, and risks of both alternatives, ADM concluded that the Sequestration Alternative is more protective of human health and the environment, ensures complete Migrated Fluids containment, and carries significantly less risk of an adverse impact from implementation. Accordingly, ADM selected the Sequestration Alternative to address the Migrated Fluids.