

Draft Class VI Well Permit, Marquis Carbon Injection, LLC

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Thank you for providing the opportunity to submit comments on the draft permit for Marquis Carbon Injection's Class VI well proposal. Comments that follow focus on natural and triggered earthquakes and the J&L pickle liquor well.

SEISMIC ANALYSIS

Seismic activity on or near the Peru monocline

Eco-Justice Collaborative has many questions and comments related to seismicity in the region of the proposed project. On page 20, Section 10.46, Seismic Events of the draft permit, Region V notes that the Marquis BioCarbon Project "is in a seismically stable region." However, this statement does not appear to be based on any analysis of seismic activity that was provided on page 41 of the Project Narrative, submitted February 2025 as part of the application process.

In its project narrative, Marquis calls out the 1972, 1991, 1999, and 2004 earthquakes that occurred on or near the Peru monocline and attributes the more recent 2023 fourth earthquake to the Sandwich fault. However, there is evidence that this 2023 earthquake also may be associated with the Peru monocline, since that geologic structure is located just a few miles to the east, and the Sandwich Sandwich Fault Zone is at least 40 miles to the northeast. Further, geologist Robert Bauer, Illinois State Geological Survey, told the public that this earthquake [had occurred on a fold, rather than a fault.](#)

The Peru Monocline is a strata fold over a deeper unnamed fault that starts in far northwest Livingston County and runs north by northwest into central Lee County. The Peru Monocline is one of two large monoclines that are major elements in the La Salle Anticlinorium, the other being the Charleston Monocline in the south. According to the [Illinois State Geological Survey](#), it is a significant geological structure, approximately 65 miles (105 km) long with a relief of up to 1,600 feet (400 m). Both the Peru Monocline and the nearby Sandwich Fault Zone are thought to have formed around the same time, with the crustal block between them rising as part of the overall deformation of the La Salle system.

There has been a great deal of interest in and research carried out that is related to the Peru monocline, given the number of earthquakes that have been recorded along this geologic feature. Among them are:

Heigold, Paul (1972). Notes on the earthquake of September 15, 1972, in northern Illinois. Illinois State Geological Survey. <https://www.ideals.illinois.edu/items/80246>

Larson, T. H. (2002). The earthquake of 2 September 1999 in Northern Illinois: Intensities and possible neotectonism. *Seismological Research Letters*, 73(5), 732-738. <https://doi.org/10.1785/gssrl.73.5.732>

Russell L. Wheeler, Dhananjay Ravat; Introduction: Seismicity, Quaternary Faulting, and Seismic Hazard. *Seismological Research Letters* 2002; 73 (5): 590-596. doi: <https://doi.org/10.1785/gssrl.73.5.590>

Huysken, K. & Fujita, K.. (2008). A Reevaluation of the Intensities of the Northern Illinois Earthquake of 1909. *Bulletin of the Seismological Society of America*. 103. 2810-2823.

10.1785/0120130003. https://www.researchgate.net/publication/310458147_A_Re-evaluation_of_the_Aurora_Illinois_Earthquake_of_1909

Carpenter, Philip. Seismicity of Northern Illinois: Insights from recent earthquakes and a new review of historical sources. GSA Annual meeting and exposition, October 2011. <https://gsa.confex.com/gsa/2011AM/webprogram/Paper195793.html#:~:text=The epicenter for the strongest,which should be investigated further>

Seismic Hazards Report for the Exelon Generation Company, LLC Early Site Permit Site Safety Analysis Report Appendix B. Prepared for the Nuclear Regulatory Commission. <https://www.nrc.gov/docs/ML0327/ML032730612.pdf>

As shown on this exhibit, prepared by Marquis Carbon Injection, LLC the Peru Monocline runs through the eastern edge of the project's AoR.

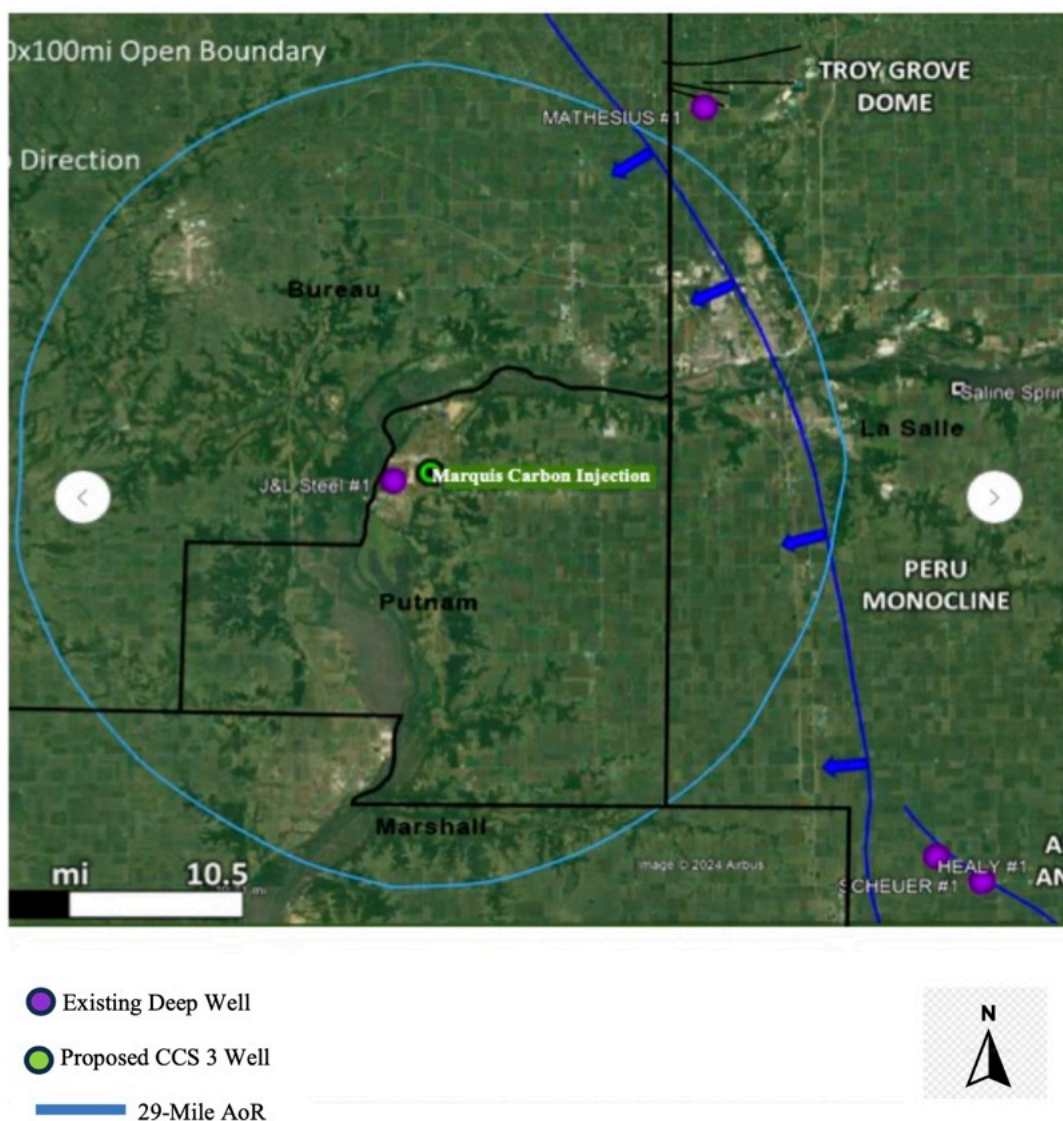
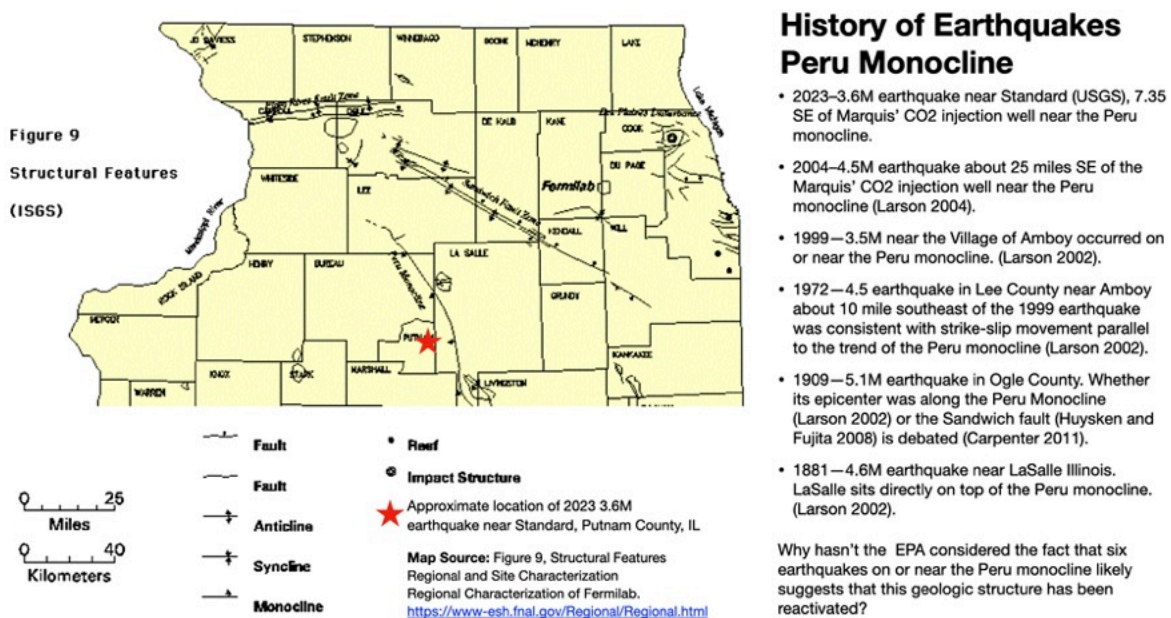


Figure 2-105: Map showing the 29-mile AoR, and existing and proposed project deep wells that penetrate the confining layer within the AoR. Well data is summarized in Table 2-18.

Timothy Larson, geologist at the Illinois State Geologic Survey has studied this geological structure, and has commented on the three earthquakes that have occurred along this monocline in 1881, 1972, and 1999. In [Larson 2002](#), he states “Although one earthquake epicenter near the Peru monocline might be considered coincidental, taken together, these three earthquakes may suggest the possible reactivation of a Paleozoic structure within the North American midcontinent.” Since that time, there have been two additional earthquakes, and one identified that took place in 1909 may have been associated with the Peru monocline. All six were greater than 3.5M and five of the six occurred near or on the Peru monocline (see EJC figure 1, below). The epicenter of the 1909 5.1M earthquake is still being debated.

Data provided in Marquis’ project narrative omits conclusions reached by Timothy Larson, ISGS, and others: the Peru monocline that passes through the AoR may have been reactivated.



EJC Figure 1. History of Earthquakes, Peru Monocline

Natural earthquakes can cause existing fractures to widen or new ones to form in the rocks above and around the storage formation. This fracturing can create or open pathways for the CO₂ to migrate through the caprock or damage the wellbore. Either could allow CO₂ to move into a USDW or closer to the surface, where it could be released into the atmosphere. But the CO₂ stored by Marquis Energy must be sequestered until it has become inert. In a saline aquifer like the Mount Simon, that can take hundreds or even thousands of years ([Lindeberg and Bermo 2003](#)). If this area has been reactivated, the storage site could be exposed to natural earthquakes within or near the AoR, which will be under significant pressure (see more on triggered earthquakes below).

One of the most important steps is to minimize risk by avoiding the construction of CO₂ storage facilities in seismically active areas.

1. Why didn’t Region V take into consideration that the Peru monocline may have been reactivated and could cause future earthquakes that could affect the confinement of CO₂?

2. Isn't the analysis by geologists regarding the reactivation of the Peru monocline a reason to require the injection well to be relocated and/or additional studies identified in the Class VI guidance related to seismic history, modeling, and fault stability analysis to be carried out (see pages 4 and 5, below)?

Induced Seismicity

Increased pressure can reactivate geologic structures. As liquid CO₂ is injected, it takes up space in the saline aquifer's pore network (in this case, the Mount Simon Formation). This action forces the existing brine out of the way, pushing it to other parts of the aquifer or into overlying/underlying formations. The injection of a large volume of a new fluid compresses the existing, largely incompressible, brine within the aquifer, which then increases the overall pressure. Under high pressure it can escape, pushing open faults. This makes it easier for faults to slip and rocks to fail and is especially concerning for this project due to the proximity of the Peru monocline. The pressure changes from the injection of CO₂ are what cause earthquakes ("induced seismicity"), which can damage both wellbores and cap rock integrity ([Harvey 2025](#)).

Furthermore, when CO₂ is injected, it increases pressure far beyond the plume of CO₂ itself (e.g., [Birkholzer and Zhou, 2009](#); [Bandila et al, 2012](#)). However, the U.S. EPA defines the AoR as the modeled extent of the plume of CO₂. Therefore, the Class VI well permitting process does not require detailed structural analysis in regions that will be impacted by the increased pressure resulting from CO₂ injection. However, [Birkholzer and Zhou, 2009](#) said the following in their paper "Our results suggest that the area that needs to be characterized in a permitting process may comprise a very large region within the basin if reservoir pressurization is considered." This statement underscores the fact that Region V needs to look beyond the area of review and take into consideration the potential impact of a reactivated Peru monocline that not only passes through but also extends beyond the AoR.

Avoiding seismically active areas is one of the most important steps to take to minimize risk by avoiding the construction of CO₂ storage facilities. The [U.S. EPA Guidance for Class VI projects](#) for Program Directors identifies the importance of site characterization to avoid potential seismic activity in order to avoid damage to the wellbore or the caprock, potentially releasing CO₂ into an underground USDW or back into the atmosphere. Specifically, the guidance requires the U.S. EPA to:

1. Confirm that the applicant used such reliable sources to compile seismic history data. Verify that the research covers the AoR of the Class VI project over an appropriate historical time period and includes sufficient information on the magnitudes and hypocenters of previous seismic events. If the data are inconclusive or there have been earthquakes in the past, consider asking the applicant to model or otherwise determine, using documented methods, that seismic activity from identified sources will not endanger USDWs.
2. Consider coordinating with the AoR delineation modeling reviewer to evaluate the extent of pressure increase due to injection and whether such an increase could possibly reach any faults or impact fault stability. This evaluation may also include an assessment of potential fluid migration rates if a transmissive fault were intersected by the plume and/or the area affected by the pressure increase.
3. Require a fault stability analysis, as needed to demonstrate that seismic activity will not compromise subsurface containment. If any of the geologic or seismic data indicate a substantial likelihood of seismic activity. If there is the potential for seismic activity that may reactivate faults that transect the confining zone(s) and compromise containment, consider whether operational changes can be made and/or passive seismic monitoring can be incorporated into the Testing and Monitoring Plan to manage the risk.

[Section 10.46 Attachment F](#) of the draft permit, the Emergency and Remedial Response plan, notes that the Marquis BioCarbon Project is “in a seismically stable region.” Earthquakes in Northern Illinois are relatively infrequent, yet there have been six in the region surrounding the Marquis Carbon Injection Project since 1881, and four have occurred since 1972. Why does Region V consider this region to be seismically stable?

4. Has Region V asked the applicant to conduct the studies called out in the U.S. EPA Guidance presented as items #1 through #3 above to:
 - (a) Verify seismic history data?
 - (b) Coordinate with the AoR modeling review to determine the impact of CO₂ injection on the Peru monocline or any other geologic structures that may be identified when looking more closely at seismic history?
 - (c) Require a fault stability analysis to verify pressure increase will not reach any faults or affect fault stability?
3. If not, why not?

CO₂ injection into saline aquifers is similar to disposing of saltwater co-produced from the oil and gas industry

According to [Zoback and Hennings 2025](#), injecting supercritical CO₂ into saline aquifers is an analogous process to the disposal of large volumes of saltwater co-produced with oil and gas (SWD). In their article “*Implications of earthquakes triggered by massive injection of produced water in saline aquifers for large-scale geologic storage of CO₂*,” the authors note the following:

1. Since 2010, nearly 4 billion m³ of produced water has been injected into sedimentary layers that are in hydraulic communication with seismogenic geologic basement in Oklahoma and Texas alone, triggering earthquakes as large as magnitude 5.8 and more than 200 $M \geq 4.0$ earthquakes that were widely felt.
2. Every case of large-scale SWD in the mid-continent in deep saline aquifers in hydrologic communication with the basement has caused significant induced seismicity. If CO₂ storage projects are associated with induced seismicity, they could be perceived by the public as a hazardous activity, which should not be allowed to continue, generally regardless of the magnitudes of the induced events. Among many challenges (operational, geologic, and economic) that large-scale CCS projects will face, they also will need to minimize the occurrence of injection-induced seismicity.

Zoback and Hennings further note:

- Small pressure changes of ~ 1 MP have triggered earthquakes in crystalline basements.
*NOTE: MP refers to a **megapascal**, which is a unit of pressure and stress used primarily in science and engineering that is equal to one million pascals.*
- All triggered earthquakes larger than $M 4$ occur in crystalline basements.
- Cumulative injected volume better predicts M_{max} than the pressure increase.
*NOTE: M_{max} **stands for maximum magnitude** and refers to the largest possible earthquake magnitude that could occur in a specific geographic area*
- Small-scale pilot projects do not test the feasibility of large-scale injection.
- Weak sediments and depleted oil and gas reservoirs could store large volumes of CO₂. The potential to induce seismicity by injecting CO₂ into saline aquifers like the Mount Simon Formation was identified over a decade ago in “*Earthquake triggering and large-scale geologic*

storage of carbon dioxide” by [Zoback and Gorelick \(2012\)](#). In this publication, the authors emphasized the threat of relatively large earthquakes to the seal capacity of potential reservoirs. The M 5.7 and M 5.8 earthquakes that have been triggered by produced water injection in Oklahoma (and multiple earthquakes exceeding M 5 in the Permian Basin) are large enough to cause concern about seal integrity.

Zoback and Hennings define *triggering* as “a process by which a small perturbation (such as an increase in fluid pressure) reduces frictional resistance to faulting and accelerates the time occurrence of natural earthquakes which could have occurred in the geologic future.” In other words, the stress released in triggered earthquakes is already in the earth. They further note that the word “*induced*” is used interchangeably in their paper and reflects the definition of triggered earthquakes as previously defined.

The report is detailed and lengthy, and the authors show why injection-triggered earthquakes in basement-rooted faults are especially problematic. They provide commentary on two relevant small-scale CO₂ injection projects; one is Quest in Alberta and the other is in Decatur, Illinois. They show how SWD-triggered earthquakes have occurred on basement faults in response to very small pressure changes.

From the report.

“CO₂ injection into the basal Mt. Simon formation at Decatur, Illinois, began in 2011. The first phase of injection ended in 2014. A second phase of injection began in 2017 ([Williams-Stroud et al., 2020](#)). In total about 1.3 million m³ has been injected to date. The first phase of injection was in the lower Mt. Simon close to the basement. As illustrated in [Fig. 17](#), this resulted in numerous small earthquakes (all M ≤1) on well-defined near-vertical faults extending down into the basement and trending northeast-southwest, as expected for strike-slip faults, as SHmaxAz is close to E-W in the Illinois Basin ([Lund Snee and Zoback, 2022](#)).

The second phase of injection was at a shallower depth with several shale baffles (discontinuous shale layers) separating the injection interval from underlying basement. This resulted in a reduced rate of seismicity, but the events continued to occur along the same faults activated during the first phase of injection ([Williams-Stroud et al., 2020](#)). Consistent with many of the other cases we have discussed here for triggered seismicity in basement, pressure increases in the injection zone were about 1 MPa. As is the case at Quest, a number of companies have proposed large-scale CO₂ injection into the Mt. Simon sandstone in the vicinity surrounding the Decatur project.”

It is important to call out the fact that ADM Decatur is a commercial **demonstration** project with integrated CCS in a saline reservoir ([Will et al., 2016](#); [Freiburg et al., 2022](#)). It is the ONLY operating U.S. EPA Class VI-approved project in the country. This shows how new permanent storage of CO₂ is and why new findings presented in these comments need to be taken into consideration. ADM’s injection of CO₂ at its first well (CCS#1) caused nearly 20,000 microseisms within the basement during fluid diffusion, with magnitudes ranging from –2.1 to 1.2 ([Williams-Stroud et al., 2020](#)). Given that structural and stratigraphic trapping is active for initial CO₂ storage ([Gholami et al., 2021](#)), the geomechanical response of a fault may determine its reactivation potential ([Zhang et. Al, 2025](#)).

Currently, ADM has stored a total of about 4.5 MMT of CO₂ from both the CCS#1 pilot and CCS#2, Illinois Basin Decatur Project (IBDP) demonstration wells. However, CCS#1 injected about 333,000 tons of CO₂ over the life of its three-year pilot, which is extremely small when compared to other projects under review by Region V in Illinois. See EJC Figure 2, below.

Marquis Carbon Injection is proposing to inject 1.5 MMT each year, or **4.5 times** that of CCS#1. Marquis' project is **3 times** the size of ADM's larger IBDP (CCS #2), which currently injects less than 500,000 tons of CO₂ into the Mount Simon each year. This is just half of what was approved by Region V (1 MMT CO₂ storage each year). Could this decision to inject far less CO₂ than approved by Region V be related to concerns over pressure?

US EPA Class VI Permit Schedule, Illinois (9-12-25)

Project	County	Wells	MT Total CO2 Stored	Years in Operation	MT CO2 Stored each year	Draft Permit	End Public Comment Period	Final Permit
Marquis	Putnam	1	9.00	6	1.50	* 9/8/2025	11/3/25	2/1/26
Heartland Compass	DeWitt	2	62.50	25	2.50	12/30/25	1/29/26	4/29/26
Heartland Vervain	Logan & McLean	2	62.50	25	2.50	12/30/25	1/29/26	4/29/26
One Earth Sequestration	Ford & McLean	3	90.00	20	4.50	2/28/26	3/30/26	6/28/26
Heartland Greenway	Christian	6	180.00	30	6.00	12/30/25	1/29/26	4/29/26
ADM Maroa	Macon	3	39.60	12	3.30	3/1/26	3/31/26	6/29/26
ADM Decatur CCS #3	Macon	1	14.30	12	1.19	3/1/26	3/31/26	6/29/26
Vault Dragon	Tazewell	1	??	??	??	10/27/26	11/26/26	2/24/27
CHS Patriot	Henry	1	??	??	??	??	??	??
Proposed Projects								
<i>Total Proposed</i>			448.90		19.99			
Permitted Decatur Projects								
ADM Decatur CCS #1	Macon	1	1.00	3	0.33			
ADM Decatur CCS #2 paused	Macon	1	3.50	8	0.44			
ADM Decatur CCS #2 resumed	Macon	-	2.00	??				
<i>Total Permitted</i>			6.50					
Total Planned Storage			455.40					
* before date means actual								



EJC Figure 2 illustrates the proposed storage of CO₂ associated with Class VI projects under review by the U.S. EPA.

Also see:

Figure 17 a) Map shows seismicity trends in the Decatur area triggered by CO₂ injection into the Mt. Simon sandstone ([Goertz-Allmann et al., 2017](#)). b) 3-D representation of earthquake hypocenters demonstrates the earthquakes are occurring on faults extending into the basement (courtesy of Bettina Goertz-Allman, pers. comm.).

YouTube Video, "[EMinar 2.27: Mark Zoback-Geomechanical Issues Affecting Long-Term Storage of CO₂](#)", where Professor Zoback explains the analysis and conclusions reached in [Zoback and Gorelick \(2012\)](#). Zoback describes his analysis of CO₂ injection into the Mount Simon Sandstone at minute 38.5, where he raises concerns that the injection of CO₂ at this project is extremely small and still shows seismic activity and emphasizes the importance of site characterization to ensure CO₂ storage is safe and triggered earthquakes are small enough to avoid felt earthquakes, which could, due to public perception, shut them down.

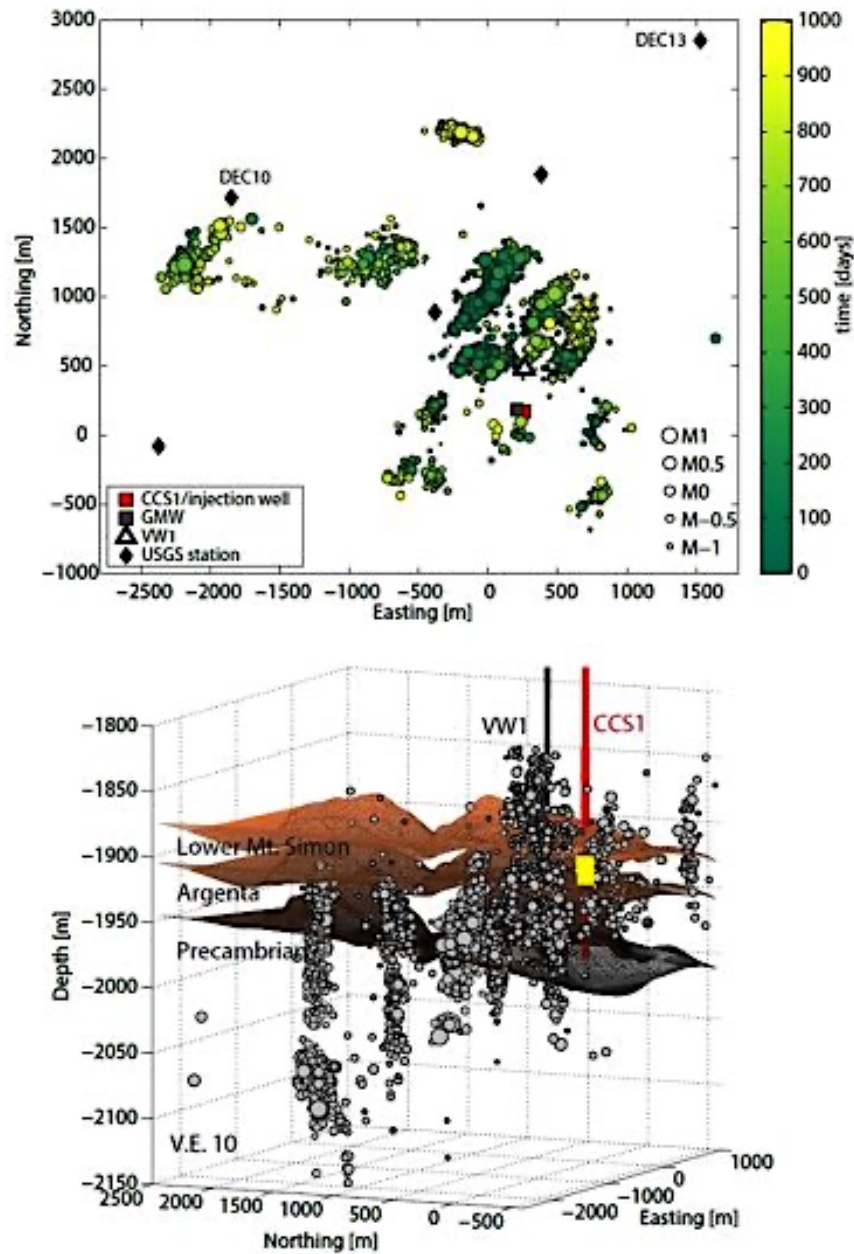


Figure 17. Zoback and Hennings 2025.

This study recognizes the relationship between the magnitude of triggered seismicity and that even with relatively small-scale CO₂ storage projects, such as ADM's Decatur CCS#1 and CCS #2 projects, have not yet been tested. What could happen if larger volumes of CO₂ are injected into the Mount Simon? Will there be adequate hydrologic barriers separating the injection zone from the basement? This question applies to the Marquis Carbon Injection project, which, like ADM Decatur's CCS#2, would maintain barriers separating the injection zone from the basement. Other questions that need to be addressed include:

1. If the Peru Monocline can cause earthquakes that range from 3.5M to 5.1M, could the injection of 1.5 MMT CO₂ trigger earthquakes at the same magnitude—or perhaps even

larger? M refers to **magnitude**, which is a measure of the energy released at the source of an earthquake. Magnitude is determined from measurements on seismographs.

2. Will Region V consider [Zoback and Hennings 2025](#) findings in their analysis of seismic activity and the potential to trigger earthquakes that could be large enough to damage the well or fracture the cap?
3. If not, why not?
4. Does the scale of injection proposed in Illinois raise concerns for Region V (see EJC Figure 2, above)? Shouldn't the potential for additional storage in the area surrounding Marquis Carbon Injection's first CO₂ storage project be considered, particularly in light of the fact they are considering injecting on properties located to the west? See evidence of Marquis' proposed expansion in [SB1550, introduced by Senator Sue Rezin](#) in 2023.

Zoback and Hennings clearly show the geology of the Illinois Basin is conducive to induced seismicity. This induced seismicity can damage both a cap rock's ability to contain CO₂ and well integrity. The fact that the potentially reactivated Peru monocline passes through the eastern part of the AoR should cause Region V to require more studies and analysis of Marquis Carbon Injection's project to determine its ability to safely—and permanently—sequester CO₂.

Predictions are based on unreliable modeling

Relying on models to define the boundary of concern risks underestimating the area where groundwater contamination can occur. The rationale behind this statement is specified on page 3 of [Harvey 2025](#), who uses ADM Decatur's project as an example:

“In 2013, researchers at ADM partner Schlumberger reported results of their pre-injection reservoir modeling for the Decatur sites. They stated, “Over the lifespan of simulations plume stayed below the middle Mount Simon which is 250 m below the primary seal Eau Claire with at least 90% confidence” (Senel and Chugunov, 2013).

However, when Bukar et al. (2025) reported on their seismic imaging of the CO₂ plume from ADM's injection well CCS1, in January, they identified evidence that CO₂ has already migrated upward along faults to reach the primary seal (i.e., the Eau Claire Shale).”

We know geologic structures that exist in the Illinois basin are not limited to the Wabash Valley and New Madrid Seismic Zones. This includes the Peru monocline that passes through the eastern part of the AoR and extends both to the north and south which may have been reactivated ([Larson 2002](#)). [Buker et. al 2025's](#) use of time-lapse seismic surveys at the Illinois Basin—Decatur Project reviewed by Harvey showed that the CO₂ plume migrated along major faults very soon after injection began, entering upper units of the reservoir and moving laterally in response to injection at a neighboring site. In fact, they show that the CO₂ must have migrated rapidly from the injection interval up the faults to the Upper Mt. Simon, covering a vertical distance of about 350 m in 4 months or less. This puts the vertical migration speed at a minimum of 3 m per day!

These observations emphasize the importance of considering faults associated with Marquis's project as potential flow pathways, as well as the impact of pressure from their planned injection sites on the west side of the Illinois River on plume dynamics. This work underscores the need for more rigorous modeling of the potential influence CO₂ injection will have on plume dynamic behavior in the area of known faults.

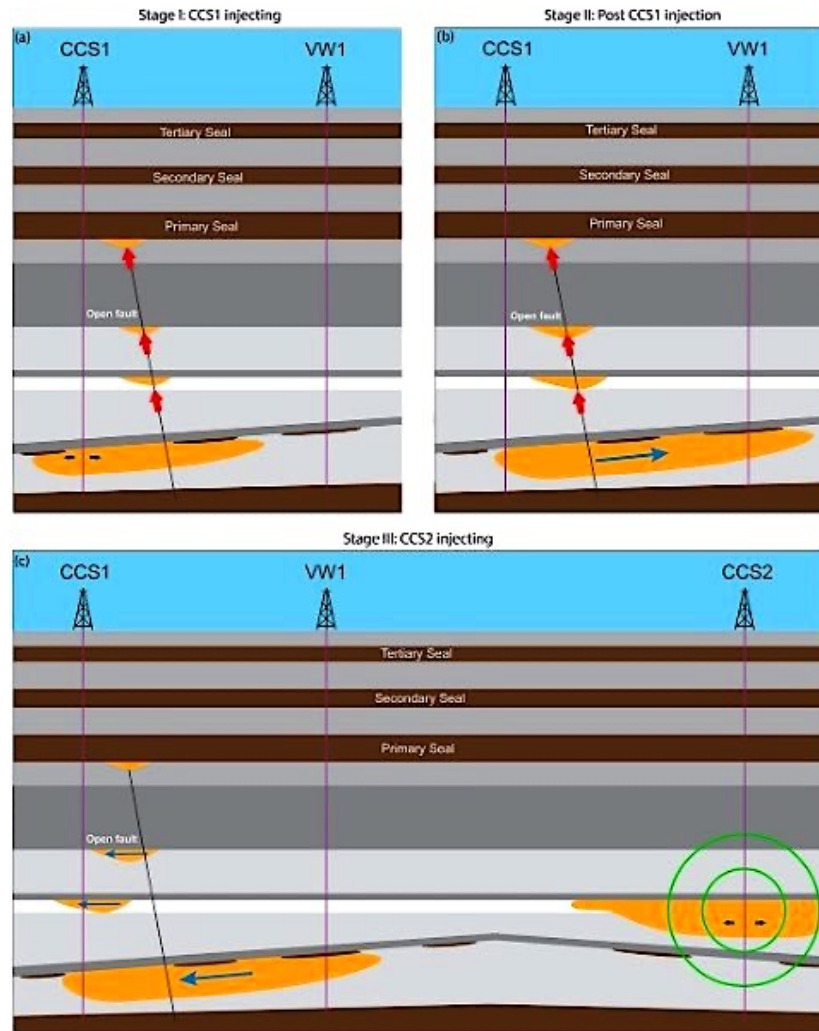


Figure 4 ([Buker et. al 2025](#)). Carbon dioxide migration along faults at the Illinois Basin—Decatur project revealed using time shift analysis of monitoring data. Open access
This is a conceptual schematic summarizing the overall plume behavior during (a) CCS injection, (b) post CCS#1 injection, and (c) CCS#2 injection. Reservoir quality is indicated in grayscale with darker tones representing tight zones. Green circles represent pressure waves from active injection at CCS#2 well.

Scale. Most CO₂ storage projects have injection rates below the commercial scale of 1 Mt/yr, which likely minimizes the risk of fault reactivation and induced seismicity. Marquis intends to inject 9 million metric tons (MT) of CO₂ over a 6-year period (1.5 MMT CO₂ each year). This amount of CO₂ has never been injected into the Illinois Basin. It is at least three times that being injected by ADM Decatur's CCS#2 well each year (less than 500,000 tons per year) and will store twice as much CO₂ as ADM Decatur's CCS#1 and CCS#2 projects have stored to date.

CO₂ injection permits under consideration at the EPA today are associated with volumes that total at least 100 times the volume of CO₂ that has been injected in the Illinois Basin to date. (See **EJC Figure 2**, above). If approved, the Class VI permits in the queue will result in more than 4 billion barrels (>600 million m³) of supercritical CO₂ injected into the Illinois Basin ([Harvey 2025](#)) and over 455 MMT. Because pressures will continue to rise as long as CO₂ is injected, the subsurface will be exposed to more risks of induced fracturing and seismicity.

For these reasons, EJC recommends REGION V conduct supplemental studies of the potential impacts of the Marquis Carbon Injection project, and take into account recent studies by [Zoback and Hennings 2025](#) and [Buker et. al 2025](#).

J&L PICKLE LIQUOR WELL

Given the unpredictable behavior of CO₂ the potential for natural or triggered seismicity, and the proximity of the J&L pickle liquor waste well to the modeled CO₂ plume, EJC believes that the proposed project greatly endangers a USDW. This is because a seismic event could affect containment of the pickle liquor well waste in addition to the confinement and permanent storage of CO₂; and the CO₂ and the highly toxic pickle liquor waste could intersect, creating a highly toxic environment that could degrade the existing J&L injection well and the planned CO₂ injection well.

The lack of a deep monitoring well between these two wells, which are separated by just 1.3 miles also is a concern. The nearest deep monitoring well is 1.6 miles from the J&L well and 0.3 miles east of the proposed CO₂ injection well. There is no plan to continue monitoring the J&L well, despite the fact that the modeled CO₂ plume appears to intersect with the J&L pickle liquor waste well plume, which has a two-mile radius (see Figure 1-4 from Marquis' Project Narrative and the AoR of the J&L well, below.

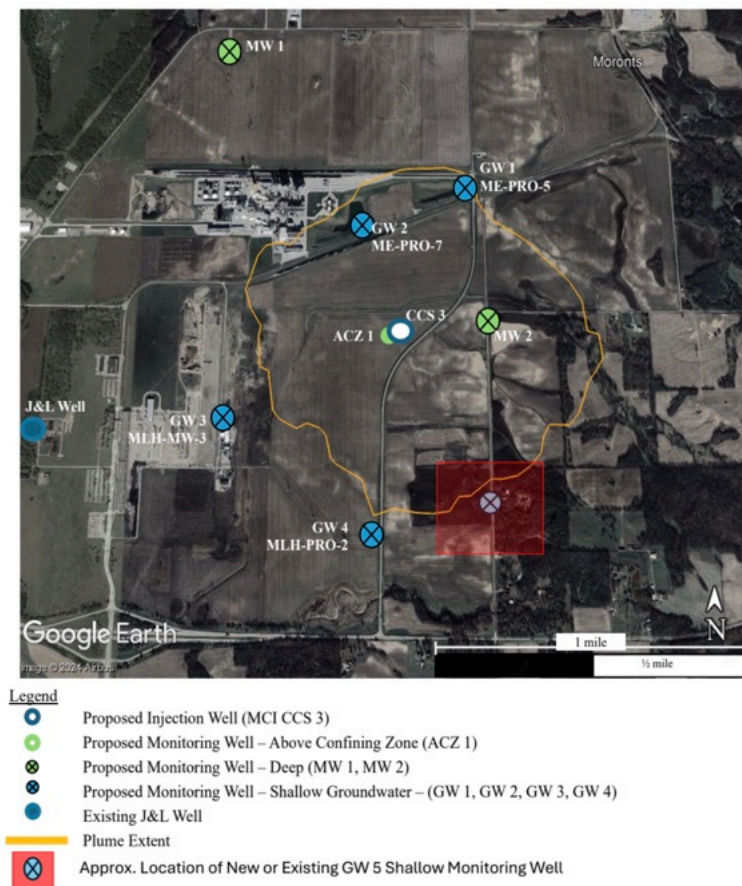
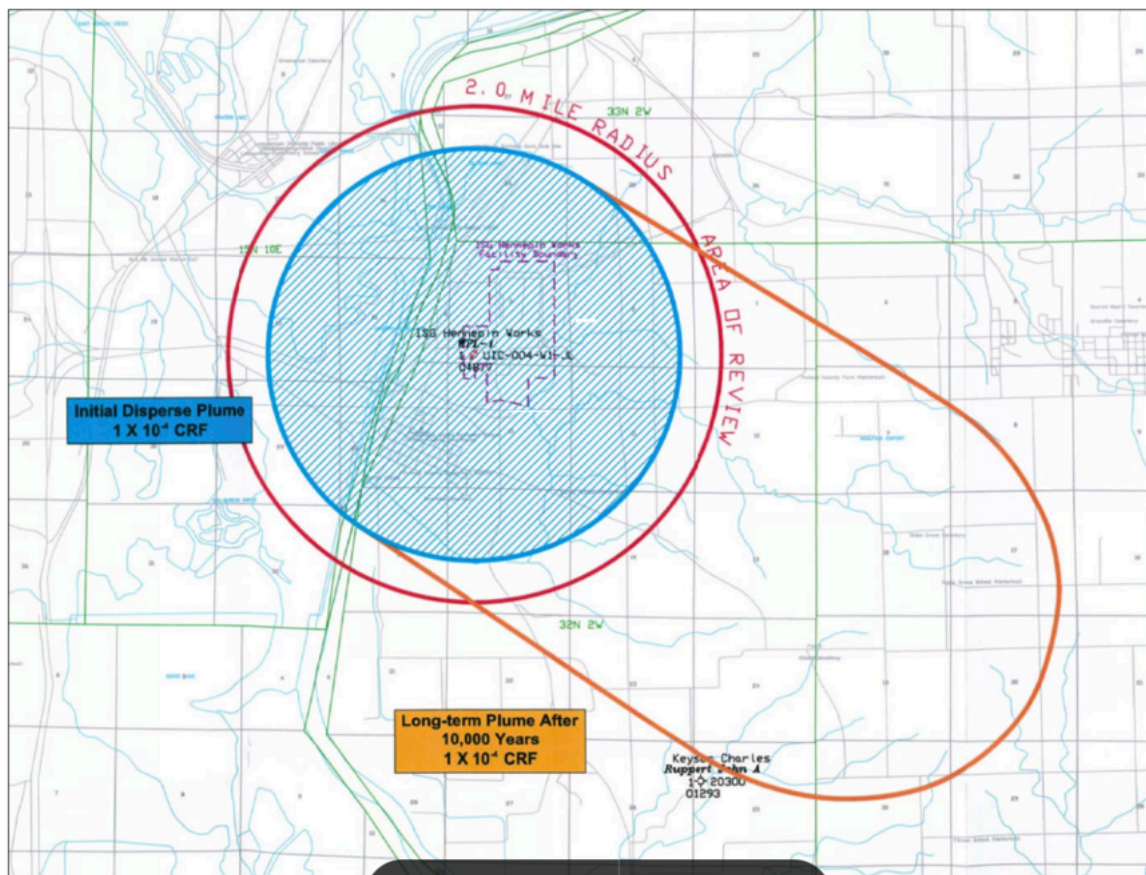


Figure 1-4 from Marquis Carbon Injection, LLC February 2025 Project Narrative: Map showing the modeled CO₂ plume footprint, and existing and proposed project.

US EPA ARCHIVE DOCUMENT



EJC Figure 4. Operational and 10,000-year plume track of the pickle-liquor plume in the Mt. Simon Sandstone. Source: [Proposal to reissue an exemption to ArcelorMittal-Hennepin works for the continued injection of hazardous waste](#). November 24, 2008.

We have a series of questions related to the J&L well that we believe should be addressed by REGION V before issuing a final permit for this project:

1. Who is responsible for the J&L well? Is there an ongoing monitoring plan to ensure the long-term integrity of the confinement zone and the well?
2. We are aware that the well has been plugged with cement, according to best practices. However, it is well documented that concrete can degrade when exposed to CO₂. What is the effect of hydrochloric acid, sulfuric acid, and chromium on cement and steel? We are concerned that, over time, this “toxic soup” is likely to degrade both cement and steel, but there is no monitoring mechanism proposed to detect the potential movement of these toxic chemicals along the well casing and up

through the cap where it could contaminate a USDW or laterally, where it could intersect with the CO₂ plume:

- (a) The EPA should consider the impacts of what took place in 2016 an employee of People's Gas discovered its injection well in the Mount Simon Formation near Fisher, Illinois was leaking. Evidence of corrosion was known by Peoples Gas in 1995, but no corrective action was taken. The leaking methane contaminated residents water supplies and resulted in a lawsuit by the state, and another by nearby residents.
 - (b) While residents are being provided with filters and supplied with water today, ten years later they have not been connected to a new water supply, due to cost. See the [complaint filed by the Illinois Attorney General against Peoples Gas](#) and the [complaint filed by residents against Peoples Gas](#).
3. Why hasn't REGION V required a monitoring well to be located between the two injection wells? This is the only way to identify, in a timely fashion, leaks that might occur from corrosion or the possible intersection of the two plumes that might occur from outside forces. This could include seismicity, or movement of the CO₂ plume due to pressure, or anything else that might occur to affect confinement of these toxins. A deep monitoring well located over a mile from the J&L pickle well is insufficient to detect changes that might affect confinement of either waste.
 4. How would sulfuric acid, hydrochloric acid, and chromium react if mixed with CO₂? How would 25Chromium steel respond to a mixture of these chemicals, if this were to take place? What studies does Region V have to show that 25Chromium steel would withstand such coercive forces?

All of these questions relate to EPA's ability to protect, long-term, the drinking water that residents in this region depend upon.

Post-Closure Site Care

Given the risks associated with this project to a USDW, it is imperative that REGION V revise its support for a 12-year post-closure site care period (PISC). The default is 50 years. The potential for seismicity and the unpredictable behavior of CO₂ when pressurized in an area that contains storage of such hazardous waste mandates longer-term review. The Illinois General Assembly, through its adoption of the [SAFE CCS Act](#), has made it clear that projects of this nature should NOT become the responsibility of the state. Yet, REGION V staff indicated at the October 15, 2025 "availability session" that Marquis' project WOULD become Illinois' responsibility after the PISC and all other requirements by REGION V were met. That is tantamount to agreeing to approve a project with great risk and then being willing to walk away from it, leaving it to others to deal with future problems.

CONCLUSION

Given the seismic concerns of region that may include reactivated faults that pass through the AoR; the documented inability to accurately predict modeled CO₂ plume behavior; the potential for triggered seismicity in a region know for its brittle, crystalline

rock basement; the evidence presented that CO₂ can rapidly move up towards the cap along existing faults, thereby escaping containment should the cap fail; the potential for cement and steel associated with the pickle liquor waste well to be compromised by the toxic chemicals stored near the CO₂ plume; the lack of a well-laced deep monitoring well between the two injection wells to track to changes that might compromise a USD; and the proposed 12-year PISC that could potentially leave Illinois liable for a project with great risk, **Eco-Justice Collaborative recommends denial of this permit.**

Please do not hesitate to contact me if you have questions.

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