



Illinois Environmental Protection Agency

2520 West Iles Avenue • P.O. Box 19276 • Springfield, Illinois • 62794-9276 • 217-782-3397

JB Pritzker, Governor

James Jennings, Acting Director

Docket No. EPA-R05-OW-2025-1612

Please accept these comments of the Illinois Environmental Protection Agency (Illinois EPA) on Marquis Carbon Injection LLC's (Marquis Carbon Injection) Class VI Underground Injection Control (UIC) Injection Well Draft Permit (IL-155-6A-0001) for its proposed Marquis Biocarbon Project (Project). The Illinois EPA appreciates the opportunity to provide comment. As set forth below, the Illinois EPA previously permitted a Class I UIC well that disposed of 276,266,119 gallons of hazardous waste 1.25 miles from the proposed Class VI well. The impacts of the proposed well to the disposed hazardous waste, including potential impacts to groundwater, should be fully evaluated.

I. Site Background

Marquis Carbon Injection seeks authority to inject and sequester more than one million metric tons per year of pure biogenic carbon dioxide (CO₂) in the Mt. Simon Sandstone formation beneath the Marquis Industrial Complex in the Village of Hennepin, Putnam County, Illinois. The Mt. Simon Sandstone Formation is the same geologic formation historically used for hazardous waste injection at a neighboring property owned by ArcelorMittal¹, which operated a Class I UIC well (WPL-1) disposing of 276,266,119 gallons of spent pickle liquor (K062 – a listed hazardous waste) between its startup in the 1960s and its 2009 cessation. The waste was injected between approximately 3,100 to 4,870 feet below ground surface. The Eau Claire Formation, an approximately 400-foot-thick confining layer located above the injection zone, contains the upward migration of injected hazardous waste from the injection zone into shallower formations. A groundwater monitoring well (Galesville Monitor Well) was installed near Well WPL-1 to monitor the pressure and quality of groundwater within the Galesville Formation, the first permeable zone above the Eau Claire Formation. This monitoring well was intended to detect any pressure or chemical changes that might indicate migration of fluids upward from the injection zone within the Mt. Simon Formation, allowing early detection before any impact could reach the lowermost Underground Sources of Drinking Water (USDW). Since both the formerly permitted Class I UIC well and its associated groundwater monitoring well were plugged and abandoned in 2013, no active monitoring infrastructure remains to detect changes in pressure or chemistry within the confining zone.

¹ ArcelorMittal Hennepin, Inc., ILD000781591, Permit No. UIC-004-W1-JL

Marquis Carbon Injection refers to the ArcelorMittal Class I UIC well, which is approximately 1.25 miles away, as the J&L well. Marquis Carbon Injection's October 14, 2025, Area of Review (AoR) and Corrective Action Plan document posted on U.S. EPA's website² does not fully consider the operations of the Class I UIC well, including the possible movement of the hazardous waste injected into the Mt. Simon Sandstone Formation. The AoR document acknowledges at Section 2.5 (p. 170-173) that the Class I UIC well existed, but concludes that, because the well was closed, the well itself should not be a pathway for CO₂ to escape.

II. Impacts to the Historically Disposed Hazardous Waste Should Be Evaluated

The potential re-pressurization, displacement, and movement of the disposed hazardous waste needs to be fully evaluated.

The Class VI Rule at 40 C.F.R. § 146.82(a)(3) requires the applicant to provide information on the geologic structure and hydrogeologic properties of the proposed storage site and overlying formation. Additionally, 40 C.F.R. § 146.84(c) requires, in addition to information about the injection zone and movement of carbon dioxide, that the applicant predict the lateral and vertical migration of formation fluids based on geological data in the confining zone in order to delineate the area of review. The applicant must determine which abandoned wells in the AoR have been plugged in a manner that prevents the movement of CO₂ or other formation fluids that may endanger USDWs.

The U.S. EPA previously approved an exemption from the land disposal restrictions of hazardous waste for ArcelorMittal under a no migration petition. In its petition, ArcelorMittal demonstrated through modeling, well construction, regional and local geology, seismic activity and penetrations of the confining zone, that the geologic setting at the site, as well as the construction and operation of the well, were adequate to prevent fluid migration out of the injection zone for 10,000 years as required under 40 C.F.R. § 148.20. The AoR evaluated for the Class I UIC no migration petition encompassed a two-mile radius around the Class I UIC well. The petition was granted based on this evaluation, which demonstrated that within that two-mile radius there were no other wells that penetrated the injection zone, thereby ensuring confinement of the injected hazardous waste.

The newly proposed Class VI UIC well is approximately 1.25 miles from the former Class I UIC well, well within the original two-mile no migration boundary, and will inject into the same

² See U.S. EPA's UIC Class VI Data Repository webpage for the Marquis Carbon Project at:

https://udr.epa.gov/ords/uicdr/r/uicdr_ext/uicdr-pub/repository-1-details?p15_project_id=140&clear=15.

The title of this PDF document is "2.AoR.Correct Action Plan (August 2024)_10-14-2025.pdf".

formation that currently contains the disposed hazardous waste. The proposed Class VI well therefore would alter the fundamental conditions under which ArcelorMittal was allowed to dispose of hazardous waste by underground injection. On May 30, 2013, the Illinois EPA approved the determination that groundwater monitoring for the former Class I UIC well was no longer necessary because the pressure in the injection zone had decayed to the point where the injection well's cone of influence no longer intersected the base of the USDW. Introducing a new injection pressure source, such as the proposed Class VI UIC well, within the same formation would be expected to re-pressurize the formation, potentially mobilizing the hazardous waste to locations outside the predicted limits of maximum horizontal and vertical movement. It does not appear that this effect has been fully modeled or considered.

The AoR considered for Marquis Carbon Injection's Class VI UIC well for CO₂ sequestration has a 29-mile diameter. Injection of CO₂, approximately 1.25 miles from the former Class I UIC well, and into the same geologic formation that contains the hazardous waste from the former Class I UIC well, would introduce new and elevated pressure conditions, increasing the risk of the hazardous waste migrating from its original deposition vertically, horizontally, or both, thereby increasing the potential for groundwater contamination. For comparison, the maximum injection pressure on the waste injection cycle at the wellhead of the Class I UIC well was not to exceed 110 psi, whereas the average injection pressure at the surface of the proposed Class VI UIC well is 1,370 psi, with a maximum bottom-hole pressure of approximately 2,102 psi. The applicant's modeling predicts that pressures will return to within 1 percent of baseline approximately 12 years after cessation of injection; however, no analysis was provided to evaluate whether that pressure decline would re-stabilize the hazardous waste associated with the former Class I UIC well.

The K062 waste as permitted had the following maximum limits defined:

Waste pickle liquor	Hazardous Waste Code #K062
Chlorides	288,000 mg/l
Sulfate	47,100 mg/l
Zinc	75 mg/l
Nickel	35 mg/l
Iron	167,000 mg/l
Chromium	1,200 mg/l
Specific gravity	1.26

In addition to increased pressure, the effects that the changes in geochemistry caused by the CO₂ injection would have on the placement and stability of the hazardous waste disposed by the Class I UIC well also warrants evaluation. A demonstration that the temperature and chemistry of the injected CO₂ will not mobilize the hazardous waste, cause a chemical interaction that compromises confinement, or have any otherwise adverse effect should be

provided. Additionally, the applicant's contingency/emergency plan should account for potential displacement and adverse reaction of the hazardous waste previously disposed in the event there is a failure of the well or unexpected operation.

Of note, the former ArcelorMittal property is located along the Illinois River. Additionally, the Village of Hennepin, just to the southwest of the property, maintains community water wells screened at depths of approximately 100 feet below ground surface. Although these wells draw from different, much shallower geologic formations, the risk of any increase in formation pressure or potential for vertical migration—in particular, migration of any hazardous waste—underscores the need for careful review and modeling of pressure and geochemical effects.

III. Conclusion

In summary, there are aspects of the Marquis Carbon Injection Well evaluation that remain incomplete. The AoR and Corrective Action Plan identifies the former J&L well as properly plugged and abandoned but does not consider the presence or characteristics of the legacy hazardous waste the well injected into the Mt. Simon Formation. The modeling parameters appear to assume an undisturbed saline reservoir, without accounting for the dense, high chloride, and acidic fluid present within the injection interval. As a result, the pressure and plume modeling results do not reflect potential hydraulic or geochemical effects that may arise from that pre-existing hazardous waste injection.