

Minnesota Reformer

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ENERGY & ENVIRONMENT

Enbridge Line 3 drilling fluid spills: What we know so far

BY: **RILYN EISCHENS** - AUGUST 16, 2021 6:00 AM





📷 An Enbridge sign in St. Ignace, Michigan. The company is building the Line 3 pipeline in Minnesota. (Photo by Susan J. Demas/Michigan Advance)

Enbridge is done drilling under rivers to build its Line 3 oil pipeline, but scrutiny over potential permit violations in the process isn't likely to fade away anytime soon.

Enbridge spilled drilling fluid 28 times at 12 river crossings this summer, the Minnesota Pollution Control Agency announced last week. The news alarmed pipeline opponents – including some lawmakers – who had been demanding information about possible “frac-outs” along the route for weeks.

The MPCA released the information partly as a response to a group of 32 DFL lawmakers, who wrote

the agency a letter in late July asking for information about the releases and urging the suspension of a key project permit until investigations were completed.

Because the MPCA is investigating the spills, details about the incidents are classified as private under state law. The agency decided to release summaries to “dispel persistent misinformation circulating on social media,” an MPCA spokesperson told the *Reformer*.

Sen. Mary Kunesch, DFL-New Brighton, was one of the lawmakers who signed the letter. She said she felt the update validated their concerns – and left her with more questions.

“It just really, really concerns me,” Kunesch said. “We’d been assured and reassured this (drilling process) was safe. We’ll just have to keep a closer watch.”

Here’s what we know so far about the drilling fluid spills and what to watch for in the coming months.

What is drilling fluid?

Drilling fluid is a mix of mud and chemicals used as lubrication for drilling under rivers.

In Line 3 construction, Enbridge is using bentonite clay – a fine, absorbent powder common in drilling fluid – with additives in some cases. The additives involved in reported spills include:

- Power Pac-L: A [carbohydrate powder](#) used as a stabilizer
- Sandmaster: A [stabilizing powder](#) made of xanthan gum, which is commonly used as a food additive

- Power Soda Ash: A powder used to raise the pH of water
- EZ Mud Gold: A powder used as a stabilizer in clay and shale

Where have the Line 3 spills happened, and how big were they?

Of the 28 spills, one was in a river, 13 were in wetlands and 14 were on land, according to the MPCA. They happened between June 8 and Aug. 5.

The amount of drilling fluid spilled ranged from 10 gallons to up to 9,000 gallons. Seven involved at least 100 gallons. The largest was a release of 6,000-9,000 gallons in a wetland near the Mississippi River.

To put that in context, a kiddie pool that measures 5 feet across and 2 feet deep contains about 230 gallons of water. So the largest release was between 26 and 40 kiddie pools.

Drilling fluid releases during Line 3 construction

This table shows information published by the Minnesota Pollution Control Agency about spills of drilling fluid during Line 3 construction. Click the arrow at the bottom to see the full list.

Date	HDD Name (MP)	Volume of Release	Distance to Nearest Surface Water
6/8/21	Snake River (MP 843.2)	20 gallons	560 feet from wetland (w-155n46w12-b; W-176.0)
6/16/21	Straight River (MP 974.2)	Not estimated; flowed back into the drilling mud pit	1,850 feet from Straight River
6/25/21	Mississippi River HDD (MP 1069.7)	6,000-9,000 gallons	Occurred within wetland (w-51n24w27-d; W-1540.0)
6/25/21	Red River HDD (MP 801.8)	50 gallons	Occurred within wetland (w-160n50w9-a; W-39.0)
6/28/21	Red River HDD (MP 801.8)	400 gallons	Occurred within wetland (w-160n50w9-a; W-39.0)
7/6/21	Willow River HDD (MP 1066.5)	80 gallons	Occurred on western bank of Willow River (s-51n24w31-b; S-265.0)
7/15/21	East Savanna River HDD (MP 1085.9)	15-25 gallons	Occurred within wetland (w-51n21w20-a; W-1751.0)
7/16/21	Middle River (MP 836.0)	15 gallons	150 feet from wetland (w-156n46w7-c; W-124.0)
7/16/21	Middle River (MP 836.0)	50 gallons	100 feet from wetland (w-156n46w7-c; W-124.0)
7/16/21	Red Lake River HDD (MP 864.3)	80 gallons	375 feet from wetland (w-153n43w32-aa; W-305.0)
7/17/21	Willow River HDD (MP 1066.5)	40 gallons	250 feet from wetland (w-51n24w31-a; W-1527.0)
7/17/21	East Savanna River HDD (MP 1085.9)	10-15 gallons	Occurred within wetland (w-51n21w20-a; W-1751.0)
7/18/21	Clearwater River HDD (MP 875.4)	20 gallons	400 feet from wetland (w-151n42w4-a; W-355.0)
7/18/21	Clearwater River HDD (MP 875.4)	20-30 gallons	150 feet from wetland (w-151n42w9-e; W-359.0)

 A Flourish data visualization

Pipeline opponents raised the alarm on social media about the [spill in the Willow River](#) in early July, sparking widespread concerns about other potential spills and timelines for cleanup.

According to MPCA records, Enbridge had started containment and cleanup efforts before activists arrived. The spill had “no impacts to any aquifers nor were there downstream impacts because environmental control measures were installed at the location,” Enbridge spokesperson Juli Kellner wrote in an email to the *Reformer*.

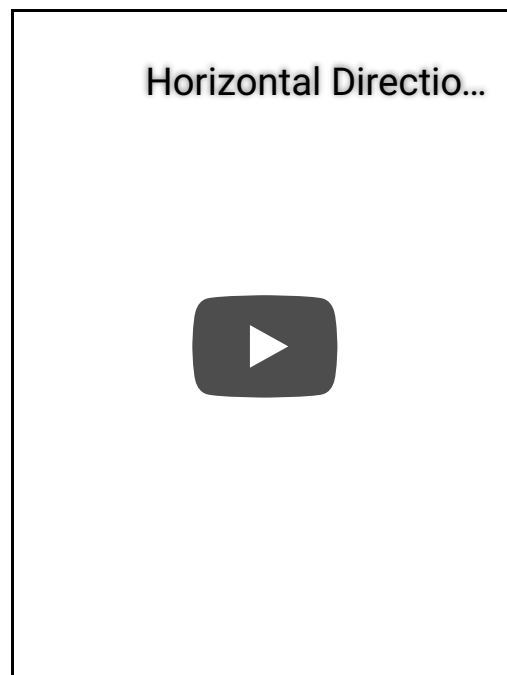
How do these spills happen?

To understand drilling fluid spills, you have to know a bit about horizontal directional drilling (HDD).

Pipelines are typically built by digging deep trenches, but that’s not a good option at rivers, busy roads or railroad tracks, for example. HDD is regarded as the least destructive method for laying pipes through these areas.

In HDD, drilling fluid is pushed through the head of the drill bit as it creates a hole underground. The mix of bentonite clay, water and chemicals cools and lubricates the bit as it flows back toward the entry point, carrying drilling debris with it.

Spills are “not uncommon” near the drill entry and exit points on land, according to the MPCA. They also happen when the drill path crosses



existing fractures in the ground, allowing fluid to flow to the surface.

The MPCA required soil structure analyses at each proposed HDD crossing to check for potential issues before approval. Still, “the risk of inadvertent release was not, and has never been represented as, zero,” MPCA Commissioner Peter Tester wrote in a letter to legislators in August.

Are the spills harmful to the environment?

That depends. The amount of fluid released, length of cleanup and water conditions can all influence how much spills affect the environment. A 10-gallon spill in a fast-moving river likely wouldn’t have much of an impact, but massive spills in other parts of the country – far larger than those reported in Minnesota – have [polluted wetlands](#) and [contaminated drinking water](#).

Enbridge says drilling mud is nontoxic, and drilling operations are immediately shut down when spills are identified. Crews follow the containment and cleanup procedures outlined in project permits, and trained inspectors and third-party monitors supervise the process, the company says.

MPCA Line 3 response to legislators - Aug. 9,



August 9, 2021

Dear Honorable Senators and Representatives:

Thank you for your letter dated July 27, 2021, regarding the inadvertent occurred along the Line 3 Replacement Pipeline project. This letter and t provide responses to your July 27 letter.

Throughout the Line 3 permitting process, the Minnesota Pollution Cont committed to ensuring the 401 Water Quality Certification provided rob protections to Minnesota's waters and followed all permitting requirem explained below and in Attachment A, the agency is closely monitoring E violations occur or there are concerns that the company is not complying are investigating and taking appropriate enforcement action.

I want to be clear that the MPCA's 401 Water Quality Certification does i drilling fluid to any wetland, river or other surface water. As a result, all i waters are under active enforcement investigation.

As you may know, the horizontal directional drilling (HDD) crossing meth require physical modification of a stream bed or banks, so is generally a l method. HDD uses pressurized drilling mud (potentially mixed with addi drill bit and return cuttings from the bore hole to the surface to clear the operations. "Inadvertent releases," where the drilling fluid escapes the b fractures in the soil/substrate to the surface, are a known risk associated

For this reason, the MPCA (and DNR) required geotechnical analyses of a crossing in order to ensure that the crossing method was appropriate for with such analyses, however, the risk of inadvertent release was not, and as, zero. In fact, the Antidegradation Assessment submitted as part of th Certification stated,

"Specifically, the risk of inadvertent release is low (calculated fac the portion of the drill that underlies the waterbody. In some ins safety drop below 1.0, indicating a higher risk of inadvertent reti beyond the banks of the waterbody, as the drill nears the exit po returns near the exit point of HDDs are common and anticipated surface..."



Laura Triplett, a geology and environmental studies professor at Gustavus Adolphus College, said she's still concerned about potential affects on the river and wetland ecosystems because fine-grained bentonite can affect aquatic life; for example, by clogging the gills of freshwater mussels. Bentonite mud can also suffocate fish and insects, [experts say](#).

Triplett said spills could contribute to the long-term degradation of wetlands, especially given the stress of the ongoing drought. Many people think of wetlands as “swamps, or a bunch of cattails, just something that’s not important,” she said. However, they perform vital roles like regulating river levels and filtering pollutants – as evidenced by the poor water quality across much of southern Minnesota, caused in part by the loss of the majority of the region’s wetlands, [according to the MPCA](#).

How are spills cleaned up?

In response to inquiries about containment and cleanup of reported spills, Enbridge referred the *Reformer* to plans outlined in permitting documents.

For wetland spills, workers use lightweight barriers like straw bales, sand bags and fencing to contain drilling fluid, then remove it with shovels or pumps. If there’s not enough fluid to physically remove it without causing damage, “with approval from both Enbridge Environment and Construction Management, the drilling fluid may be diluted with clean water and/or the fluid will be allowed to dry and dissipate naturally,”

according to permitting documents.

In rivers, workers contain the fluid with sandbags, turbidity curtains and plastic sheeting, depending on water conditions, then remove it with pumps.

Within 30 days of completing work at HDD crossings, Enbridge is [required](#) to submit a summary to the MPCA describing these efforts, if a spill took place.

What happens next?

MPCA permits for the Line 3 replacement project bar Enbridge from releasing drilling fluid into wetlands or rivers, so 14 spills are under investigation as potential permit violations. The MPCA hopes to complete those investigations “later this fall,” according to an MPCA spokesperson.

In the meantime, construction on Line 3 is continuing. The pipeline is more than 80% complete and expected to carry oil by the end of the year.

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**RILYN
EISCHENS**



Rilyn Eischens is a data reporter with the Reformer. Rilyn is a Minnesota native and has worked in newsrooms in the Twin Cities, Iowa, Texas and most recently Virginia, where she covered education for The Staunton News Leader. She's an alumna of the Dow Jones News Fund data journalism program and the Minnesota Daily. When Rilyn isn't in the newsroom, she likes to read, add to her plant collection and try new recipes.

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September 16, 2021

VIA EMAIL TO LEO.GOLDEN@ENBRIDGE.COM ON SEPT. 16, 2021
VIA CERTIFIED MAIL, RETURN RECEIPT REQUESTED ON SEPT. 17, 2021

Leo Golden
Vice President, Major Projects
Enbridge Energy, LLP
26 East Superior Street
Suite 125
Duluth, Minnesota 55802

RE: Administrative Penalty Order
Line 3 Replacement Project

Dear Mr. Golden:

The Department of Natural Resources ("DNR") is issuing the enclosed Administrative Penalty Order (APO) to Enbridge Energy, Limited Partnership for violations of Minnesota's natural resource laws. Please read the APO carefully. You must take action within 30 days after you receive this letter. **You must take corrective action and document your corrective action to the DNR, or you must pay the invoiced amount, however, failure to take the required corrective action may result in the issuance of additional penalties. If DNR determines your corrective action is not sufficient, you must pay the invoiced amount within 20 days of receipt of the non-sufficiency notice from the DNR.**

You have a right to formally dispute this action within 30 days after receiving the APO. Instructions are in the RIGHT TO REVIEW section of the APO.

If you have questions or need assistance, contact me by phone at (651) 259-5119 or by email at ann.pierce@state.mn.us.

Sincerely,

Ann Pierce
Deputy Division Director
Ecological and Water Resources

Enclosure: Administrative Penalty Order

cc: Sherry Enzler, General Counsel
Jill Nguyen, Senior Staff Attorney

STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

ADMINISTRATIVE PENALTY ORDER

Enbridge Energy, Limited Partnership
26 East Superior Street
Suite 125
Duluth, Minnesota 55802

APO-001

Line 3 Replacement Project

This Administrative Penalty Order (APO) is issued by the Department of Natural Resources (DNR) Commissioner pursuant to Minn. Stat. § 103G.299 for the violations listed below. This APO requires Enbridge Energy, Limited Partnership (Enbridge) or (Regulated Party) to take action to correct the violations.

* * * * *

VIOLATIONS

1. 103G.271 APPROPRIATION AND USE OF WATERS.

Subdivision 1. **Permit required.** (a) Except as provided in paragraph (b), the state, a person, partnership, or association, private or public corporation, county, municipality, or other political subdivision of the state may not appropriate or use waters of the state without a water-use permit from the commissioner.

Subd. 4. Minimum-use exemption and local approval of low-use permits.

(a) Except for local permits under section 103B.211, subdivision 4, a water-use permit is not required for the appropriation and use of less than 10,000 gallons per day and totaling no more than 1,000,000 gallons per year, except as required by the commissioner under section 103G.287, subdivision 4, paragraph (b).

103G.287 GROUNDWATER APPROPRIATIONS.

Subd. 5. **Sustainability standard.** The commissioner may issue water-use permits for appropriation from groundwater only if the commissioner determines that the groundwater use is sustainable to supply the needs of future generations and the proposed use will not harm ecosystems, degrade water, or reduce water levels beyond the reach of public water supply and private domestic wells constructed according to Minnesota Rules, chapter 4725.

Beginning on about January 21, 2021, and continuing through the date of this APO, Enbridge has violated Minn. Stat. § 103G.271 and Minn. Stat. § 103G.287 Subd. 5 by the ongoing appropriation or use of 10,000 or more gallons per day or more than one million gallons per year of waters of the state without a water appropriation permit. By breaching the confining layer of an artesian aquifer, Enbridge caused an uncontrolled release of groundwater (uncontrolled flow) during the construction of the Line 3 Pipeline Replacement Project ("Project") at or near the Clearbrook Terminal, in Clearwater County Minnesota. This uncontrolled flow is not authorized by any of Enbridge's water appropriation permits for the Project and Enbridge failed to notify the DNR that the breach of the aquifer had occurred. The estimated volume of the uncontrolled flow is 24.2 million gallons through September 5, 2021.

The unpermitted appropriation of groundwater is a waste of Minnesota's water resources and threatens to harm or degrade the Leon 33 calcareous fen (Steenerson and Deep Lake Fens) and two public waters, Deep Lake (ID15009000) and Steenerson Lake (ID15008900).

2. 103G.223 CALCAREOUS FENS.

(a) Calcareous fens, as identified by the commissioner by written order published in the State Register, may not be filled, drained, or otherwise degraded, wholly or partially, by any activity, unless the commissioner, under an approved management plan, decides some alteration is necessary or as provided in paragraph (b). Identifications made by the commissioner are not subject to the rulemaking provisions of chapter 14 and section 14.386 does not apply.

(b) The commissioner may allow water appropriations that result in temporary reductions in groundwater resources on a seasonal basis under an approved calcareous fen management plan.

Beginning on about January 21, 2021, and continuing through the date of this APO, Enbridge has violated Minn. Stat. § 103G.223 by causing reductions in groundwater resources available to the Leon 33 calcareous fen (Steenerson and Deep Lake Fens) (calcareous fens) without an approved calcareous fen management plan. In 2020, Enbridge informed DNR, in its request for a no effect concurrence, that its construction activities were unlikely to negatively impact the nearby calcareous fens because Enbridge intended to excavate about an eight foot deep trench. Instead, when Enbridge constructed the pipeline at or near the Clearbrook Terminal, Enbridge excavated an eighteen foot deep trench and installed sheet piling to a depth of 28 feet. Because Enbridge deviated from its plans, Enbridge breached an artesian aquifer, causing uncontrolled flow of groundwater. The uncontrolled flow affects the same aquifer that upwells into the Leon 33 calcareous fen (Steenerson and Deep Lake Fens) and is located approximately 4,800 feet northwest of the calcareous fens. Enbridge failed to submit a calcareous fen management plan for DNR approval prior conducting an activity that may drain, or otherwise degrade, wholly or partially, a calcareous fen.

* * * * *

CORRECTIVE ACTION REQUIRED

Pursuant to Minn. Stat. § 103G.299, Subd. 4, the Regulated Party is required to correct all the violations listed in this APO. The Regulated Party must document to the Commissioner, within 30 days after receipt of this APO and in writing that the Regulated Party has taken the corrective actions listed below, unless the Regulated Party seeks review of this APO as described below (Right to Review).

1. Complete all restoration work according to the DNR approved Remedial Action Plan dated August 18, 2021 to stop the uncontrolled flow. If this plan does not succeed in stopping the uncontrolled flow, additional measures will be required to address conditions at the site.
2. Enbridge must contact the DNR Director of Ecological and Water Resources within 24 hours of successfully completing the work to stop the uncontrolled flow.

3. Enbridge shall;

- a. Provide the DNR with a revised estimate of water loss from March 19, 2021, to the date of this APO. This estimate must be within +/- 10 percent of actual loss.
- b. Submit to the DNR documentation of the ongoing measurement of discharge rates required under the Remedial Action Plan. These measurements must include the current flow rate and any changes in flow rates. These measurements must continue until the uncontrolled flow is stopped. Documentation of the method of measurement must also be submitted to DNR. These measurements must be within +/- 10 percent of actual flow rates.
- c. Submit for DNR's approval a plan to continue to monitor groundwater for a 12-month period following cessation of the uncontrolled flow. The plan shall include all pertinent methodological information and a schedule for reporting results to the DNR. The duration of required groundwater monitoring may be extended at the DNR's sole discretion.

Submit for DNR's approval a plan to conduct visual monitoring for break-through groundwater discharges for a 12-month period following cessation of the uncontrolled flow. The plan shall include all pertinent methodological information and a schedule for reporting results to the DNR. The duration of required visual monitoring may be extended at the DNR's sole discretion.

4. Enbridge must submit a draft Calcareous Fen Management Plan (CFMP) for DNR review and approval. This plan must include a description of ongoing monitoring of water levels and the plant communities that will occur to determine if the loss of water has impacted the nearby Leon 33 calcareous fen (Steenerson and Deep Lake Fens). The plan must provide site access for the DNR and/or its contractors to conduct and observe onsite fen monitoring activities. The plan must also provide access for Tribal monitors to observe fen monitoring activities if they choose to participate. The results of monitoring after implementation of the Remedial Action Plan and Calcareous Fen Management Plan may result in additional requirements, restoration and/or mitigation as directed by the DNR.

If the Enbridge has any questions about the corrective actions required, please contact the DNR staff person identified below for assistance.

* * * * *

PENALTY: \$ 20,000.00

The Regulated Party is hereby assessed a penalty of \$20,000.00 for the violations cited above. In determining the amount of the penalty, the Commissioner considered whether Regulated Party gained economic benefit as a result of the violation, whether there is a history of past violations, the number of violations, and the gravity of the violations, including the potential harm caused by the violation, the deviation from compliance, the potential damage to the public interest, the potential damage to natural resources of the state and other factors as justice may require. The DNR determined that these violations represent a severe potential for harm because the ongoing and unpermitted appropriation has caused a reduction in groundwater resources available to calcareous fen, which are rare natural resource, as well as other nearby public waters and because Enbridge failed to report the incident and take timely action to stop the uncontrolled flow.

* * * * *

Pursuant to Minn. Stat. § 103G.299, Subd. 5, if the Regulated Party performs and documents all the corrective action requirements listed above to the satisfaction of the Commissioner, within 30 days after the receipt of the APO the penalty shall be:

FORGIVABLE: \$20,000.00

If the Regulated Party fails to perform and document all of the corrective action requirements listed above to the satisfaction of the Commissioner, within 30 days after receipt of the APO, the \$20,000 penalty plus shall be immediately due and payable in accordance with the requirements of Minn. Stat. § 103G.299, Subd. 5. Interest, at the rate established in section 549.09, begins to accrue on penalties on the 31st day after the order with the penalty was received. Payment shall be made by check payable to the Minnesota Department of Natural Resources within 31 days after receipt of the APO unless the Regulated Party seeks review of this APO. The check should be mailed to the attention of Randall Doneen, Supervisor Conservation Assistance and Regulation, Minnesota Department of Natural Resources, 500 LaFayette Road, St. Paul, MN 55155. Mailed payments will be deemed to have been remitted on the 31st day after receipt of the APO if they are postmarked on the 31st day after receipt of the APO.

* * * * *

RIGHT TO REVIEW

Pursuant to Minn. Stat. § 103G.299, subds. 6 and 7, the Regulated Party has a right to seek review of this APO. The following description is intended only to aid the Regulated Party's understanding of the review process and does not constitute legal advice. The Commissioner strongly advises the Regulated Party to review the law itself carefully before proceeding. A decision by Enbridge to contest this APO will not be deemed to have stayed or relieved Enbridge of any other obligations or corrective actions issued by the DNR pursuant to Minn. Stat. §§ 103G.2372, 103G.251, and 103G.141.

The Regulated Party has a right to have an expedited hearing before an administrative law judge to contest this APO or the Commissioner's determination that the Regulated Party's corrective action was unsatisfactory.

EXPEDITED HEARING (Administrative Law Judge Hearing) - To obtain an expedited hearing, the following steps must be taken in a timely manner:

- the Regulated Party must request review within 30 days after receipt of this APO or within 20 days after receipt of the Commissioner's determination that the Regulated Party's corrective action is unsatisfactory. The Regulated Party must ensure that any review request is received by the DNR before 4:30 p.m. on the last day of the 30-day period if the Regulated Party is contesting the issuance of the APO and before 4:30 on the last day of the 20-day period if the Regulated Party is contesting a determination that the corrective action was unsatisfactory. The 30-day period begins the first calendar day after the Regulated Party receives the APO. The 20 day period begins the first calendar day after the Regulated Party receives the corrective action determination. If the appeal period ends on a weekend or holiday, the appeal period is extended to 4:30 p.m. on the next day the DNR is open for business;
- the request must be in writing;
- the request may be sent by U.S. mail;

- the request must identify the APO or the corrective action determination that the Regulated Party wants to contest and must specifically state the reasons why the Regulated Party wants the APO to be reviewed, including any facts upon which the Regulated Party relies;
- the Regulated Party must send or deliver the request to the DNR at the following address: General Counsel, Minnesota Department of Natural Resources, 500 Lafayette Road North, St. Paul, Minnesota 55155.; and
- to ensure expeditious processing of the request, please send or deliver copies of the request to: Randall Doneen, Supervisor Conservation Assistance and Regulation, Minnesota Department of Natural Resources, 500 Lafayette Road, St. Paul, Minnesota, 55155 and to Oliver Larson, Manager, Natural Resources Division, Attorney General's Office, Bremer Tower, 445 Minnesota Street, Suite 900, St. Paul, Minnesota, 55101-2127.

The DNR will schedule an expedited hearing at the Office of Administrative Hearings if the above steps are completed in the time frames indicated.

In the case of an expedited hearing, if the Regulated Party's request is found to be frivolous or filed solely for the purpose of delay, the Regulated Party may be required to pay the cost of the administrative hearing in addition to the administrative penalty.

This APO becomes a final order after 30 days unless the Regulated Party requests a hearing as provided above. If the Regulated Party fails to comply with the APO when it is a final order, the DNR may collect the penalty in any manner provided by law for the collection of a debt.

**STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES**

September 16, 2021

Date signed

Ann Pierce
Deputy Division Director
Ecological and Water Resources

Address questions and submittals requested above to:

Randall Doneen Minnesota Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155
651-259-5156
randall.doneen@state.mn.us

<https://www.ecowatch.com/sacred-sites-standing-rock-2103468697.html#toggle-gdpr>

Why Sacred Sites Were Destroyed for the Dakota Access Pipeline

[The Conversation](#)

Nov. 26, 2016 12:39PM EST [ENERGY](#)



By Chip Colwell

This summer, Tim Mentz Sr. [told the world](#) via a YouTube video, which has now been [removed](#) by the user, about the destruction of his cultural heritage. A former tribal historic preservation officer of the Standing Rock Sioux, Mentz wore a baseball cap, rimless glasses and two thin braids of graying hair. He was upset and spoke rapidly about the area behind him, an expanse of the Great Plains cut by a new 150-foot-wide road.



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The scene on Sept. 3 as sacred sites and artifacts were bulldozed by workers for the Dakota Access Pipeline in locations pinpointed by the Standing Rock Sioux Tribe in court papers filed the day before. *Red Warrior Camp / Facebook*

Two days before, [Mentz had testified](#) to the DC District Court to report the area that lay in the path of the controversial [Dakota Access Pipeline](#) (DAPL) corridor holds 82 cultural features and 27 graves. By the next day, DAPL construction workers [graded the area](#). Behind where Mentz stood in the video was a place known as the Strong Heart Society Staff, where a sacred rattle or staff was placed within stone rings. Here members of the elite warrior society would come to make pledges. Mentz explained the site is tangible evidence that Strong Heart members followed a "spiritual path."

As an anthropologist who has worked with Native Americans for more than a decade to document their sacred places in the paths of new power plants, power lines, water pipelines and more, [the battle in North Dakota](#) is all too familiar.

I have seen how the legal process behind environmental and archaeological reviews for energy projects, such as DAPL, work—and often don't work. The tragedy in North Dakota for cultural heritage—and the [violence against protesters](#) that has resulted—comes in part from a failure of the U.S. legal system. Consultation with tribes too often breaks down

because federal agencies are unwilling to consider how Native Americans view their own heritage.

"Archaeologists—they don't see these," Mentz said in the video of features, including graves, within the Strong Heart Society site. "The [archaeological] firm that came through here walked over these. They do not have a connection that we have to our spiritual walk of life."

Irreplaceable Heritage

If completed, the [Dakota Access Pipeline](#) would run from North Dakota to Illinois for nearly 1,200 miles, carrying up to 570,000 barrels of crude oil per day. DAPL would meander across the landscape, through farms, around cities, buried underground and across more than 200 waterways. The passage of the pipeline over and under waterways requires permits from the U.S. Army Corps of Engineers. This federal authorization in turns requires compliance with the [National Historic Preservation Act](#) (NHPA).

Passed into law in 1966, the NHPA arrived in the churning wake of WWII, when America's waiting future was threatening its irreplaceable past. The expansion of American infrastructure—highways, dams, electrical grids—was swiftly destroying ancient archaeological sites, cemeteries and historic buildings. With the NHPA, Congress declared that preservation of America's shared heritage is in the public interest.



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The stand-off between Native Americans in North Dakota and an oil pipeline project developer and police forces has inspired protests across the country. *Paulann Egelhoff / Flickr*

When considering a new undertaking, a number of effects on historic properties must be considered: direct (like physical destruction), indirect (like spoiling a viewshed), short-term, long-term or cumulative (like how one pipeline may not harm a site, but perhaps a dozen of them will). The NHPA does not guarantee preservation. But it requires that decision-makers balance America's interest in development with the need to honor its history.

For many years, Native Americans would have had little input on a project such as DAPL. But in 1992, Congress amended the NHPA to formally include [traditional cultural properties](#). These are places that, because of their association with Native American cultural practices

or beliefs of a living community, "are rooted in that community's history" and "are important in maintaining the continuing cultural identity of the community."

The amendments directed federal agencies, in carrying out their responsibilities under the NHPA, to consult with Indian tribes that attach religious and cultural significance to these sacred places.

Beyond Consultation

In North Dakota, federal and state review and compliance measures for DAPL were combined. Archaeologists walked the pipeline's 357 miles in North Dakota, locating 149 sites potentially eligible for the National Register of Historic Places. Engineers rerouted DAPL to [avoid all but nine sites](#).

Archaeologists serve an important role in documenting historic properties. But they tend to view the world through the lens of science and history. They search out buried villages, pottery shards, bones, broken stone tools. Yet in my experience, they rarely have the expertise and knowledge to identify traditional cultural properties, which are grounded in identity, culture, spirituality and the land's living memory.

Traditional cultural properties in the U.S. can often be archaeological sites, artifacts that ancestors once touched and places that mark ancestral homes. But just as often they can be a mountain where spirits dwell or a spring where water is gathered for ceremonies. They can be a traditional area for collecting plants or animals that sustain and heal communities. They can be origin places where ancestors emerged onto the earth or named places recalled in ancient tongues.



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Zuni elders Octavius Seowtewa and John Bowannie, and archaeologist Sarah Herr, look at a shrine archaeologists misidentified. *Chip Colwell*

This is why documenting traditional cultural properties requires not the work of archaeologists but Native Americans as well. On one project I conducted with the Hopi tribe to detail cultural resources along a 470-mile power line, we needed weeks of research to identify more than 200 plant species that the tribe uses in its traditional religious and healing practices.

On another project I conducted with the Zuni tribe, I watched as elders explained to the archaeologists excavating a site in the path of a new Arizona highway that they had placed a survey flag in a semicircle of rocks – which was likely a shrine used to bless and protect the ancient village. When it comes to traditional practices, Native Americans see what archaeologists overlook.

Tribal Surveys

For DAPL, a tribal survey was not undertaken. In North Dakota the U.S. Army Corps of Engineers tried to engage in consultation dozens of times, but the Standing Rock Sioux largely refused because the federal agency only wanted to consult on a narrow corridor at water crossings instead of the entire pipeline.

Once, though, consultation did occur at Lake Oahe on March 8. Current designs call for the pipeline to [go under](#) this now controversial waterway, which the Sioux want protected. There Standing Rock representatives showed U.S. Army Corps of Engineers staff important cultural resources—a cemetery, ancient village and sacred stone. The U.S. Army Corps of Engineers [officials admitted](#) they were unaware of some of these sites.



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Hopi elder Harold Polingyumptewa digs up a sööyöpi root, used for healing.*Chip Colwell*

On Sept. 21 and then again on Oct. 20, according to an email I received from the North Dakota State Historic Preservation Office, delegations that included law enforcement, Standing Rock Sioux officials and tribal and state archaeologists went to the areas that Mentz suggested contained 82 sites and 27 burials.

They found on closer inspection—tribal archaeologists hadn't been allowed on private land—that none of the features were disturbed by the 150-foot corridor, with the exception of four rocks that might have been displaced. Two bones were recovered, but analysis showed them to be from a horse, cow or [bison](#). It would seem that the main sites Mentz agonized over had escaped physical destruction. However, tribal input would be needed to determine if the sites, so close to the corridor, could still suffer from indirect and cumulative impacts.

Not Too Late

Because consultation broke down and so little of the pipeline has received tribal survey, we must wonder how much has been missed. Even worse, we'll likely never know. [Nearly 90 percent](#) of the pipeline has already been completed.

This is an unfortunate but common occurrence. Last month I went out with traditional leaders of the Zuni tribe in New Mexico to identify traditional cultural properties under the NHPA in the path of a massive network of water pipelines. When we arrived, we found dozens of construction workers busily laying the new pipe. An archaeological survey was already completed; the construction had begun with the consent of the federal agency. We were too late.

Given that [the U.S. Army Corps of Engineers is now saying](#) it [needs more information](#) before making a decision about DAPL, let's hope in North Dakota there's still time to finally listen to the tribe.

Chip Colwell is senior curator of anthropology at the Denver Museum of Nature & Science and lecturer on anthropology at the University of Colorado in Denver. Reposted with permission from our media associate [The Conversation](#).

Navigator Approved To Proceed With Development and Construction of Heartland Greenway System in Midwest



Successful initial binding open season of Midwest carbon capture and sequestration project complete; pipeline project will benefit agricultural, liquid fuels and other industrial emission sources

NEWS PROVIDED BY
Navigator CO2 Ventures LLC →
Oct 14, 2021, 07:00 ET

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SOURCE Navigator CO2 Ventures LLC



DOZENS OF ETHANOL PLANTS REMAIN IDLE IN EARLY 2021

WEAKER DEMAND IS THE MAIN FACTOR NOW, THE \$5 CORN MARKET COULD DELAY THE INDUSTRY'S RECOVERY.

By

[Jerry Perkins](#)

1/14/2021

Higher corn prices are roiling the U.S. ethanol industry, but the full impact of the corn price spike might not be felt for weeks.

The Renewable Fuels Association (RFA) recently estimated that about two dozen of the 200 ethanol plants in the U.S. are idled and another two dozen have reduced their production rates.

Additionally, Scott Richman, chief economist for the RFA, noted, "The corn market started moving higher a month ago and has spiked over the past couple of days." With the higher prices of corn and the worsening impact of the pandemic on fuel consumption, ethanol plant margins turned negative in early December, he said, and had recently started to return to break-even levels when the most recent corn price spike hit. "This latest move in the corn rally will likely have a negative impact on margins," he stated.

Higher corn prices from the most recent rally and their expected negative impact on ethanol industry margins in the New Year are coming on the heels of the ethanol industry's deep downturn in 2020, Richman said. The RFA estimates that the ethanol industry had \$4 billion in foregone revenues from March through November because of the coronavirus.

"The ethanol industry is quite resilient, but financial losses were substantial," he noted.

Richman said that it's a little early to know how ethanol plants are going to react to the recent spike in corn prices. Some plants try to price their corn in advance, he stated, but eventually the higher corn prices are going to work their way through the ethanol processing system and raise feedstock

prices. The winter months are also a time when margins for ethanol plants are a little bit weaker because of lower fuel consumption.

The most recent statistics from the Energy Information Agency show that ethanol production increased slightly during the week ended January 8 as did ethanol stocks. Ethanol usage is still fairly weak, Richman said, as the increase in coronavirus cases continues to cause a cut back in transportation and gasoline consumption.

“We are hopeful that with vaccines being rolled out, gas consumption will return to more normal levels in late spring or over the summer,” Richman said. “But we probably won’t see fuel consumption approach prepandemic levels until late summer and early fall. It’s fair to say that higher corn prices will be negative for the industry given current market conditions. It will take a little time to work itself out.”

Kelly Nieuwenheius, chairman of the board at Siouxland Energy Cooperative in Sioux Center, Iowa, said the plant has the capacity to produce at 70 million gallons a year (MGY) but has cut back to 50 MGY.

Nieuwenheius, who farms in O’Brien County with two brothers, said the higher corn prices haven’t been as negative on ethanol margins as the Small Refinery Exemptions granted by the Trump Administration’s Environmental Protection Agency and as the cutback in Chinese ethanol imports brought on by the trade war with China.

As a farmer, Nieuwenheius said, “I enjoy the higher corn prices. We needed a shot in the arm after these past five years when we’ve had down commodity prices. There hasn’t been a lot of profit in agriculture lately, and this will help. Farmers need the biofuels industry and we need to keep it moving.

“Farmers are optimists,” Nieuwenheius stated. “I always say my glass is half full, and we’ll figure out ways to move forward. It’s another hiccup in the road. It’s either feast or famine for the ethanol industry but we survived \$8 corn in 2012 and we can work our way through this. The biggest key will be to get the economy rolling.”

Nieuwenheius said he thought that higher corn prices might ripple through the ethanol industry and cause more plants to idle production but, he noted, ethanol prices tend to follow corn prices. Ethanol is a high-octane

fuel, he stated, and its ability to enhance octane levels when blended with gasoline also helps drive ethanol prices.

Agriculture and biofuels also will be part of the discussion on ways to reduce carbon and green house gas emissions, he added.

POET, the world's largest ethanol producer with two billion gallons of annual ethanol production capacity, said that not all of its 27 ethanol plants have returned to full production. The company said it does not release its production statistics to the public. In April, POET said it had idled production at three plants and the startup of a new plant was delayed. In 2019, POET processed approximately 5% of the U.S. corn crop.

Doug Berven, vice president of corporate affairs at POET, said in an email statement that the company "is supportive of healthy grain prices and we encourage a stronger domestic market for grain through increasing access to higher blends of biofuels for all Americans. Biofuels are the catalyst for successful agriculture, and successful agriculture is the key to solving some of the world's most pressing issues such as climate change, hunger, poverty, and disease."

The email from POET noted that a factor in the higher corn prices is the severe weather conditions that have occurred around the world, including the derecho that swept through parts of Iowa and other Midwestern states last summer wiping out significant amounts of grain production.

While the higher prices of corn are a near-term benefit for farmers who are still holding grain, biofuels and agricultural producers would prefer to see the value of grain be reflective of a healthy, consistent domestic market rather than fluctuations due to uncontrollable circumstances, according to the email statement POET released to Successful Farming. "The current decline in ethanol production is due to decreased fuel demand," the statement continued, "as the country continues to grapple with the ongoing effects of COVID-19, not due to rising grain prices."

Dave Sovereign, chairman of the board for Golden Grain Energy in Mason City, Iowa, said the plant is still producing at full capacity, which is 120 MGY.

Higher corn prices have affected Golden Grain's margins negatively, said Sovereign, and the higher prices certainly could affect ethanol production

in the future. Plants that aren't as efficient or that are located in areas where corn production wasn't as good last year have had to slow down production, he noted.

"As we get into February, that's usually a slow market for ethanol anyway," Sovereign explained, because the demand for gasoline seasonally declines. That could mean that ethanol plant profit margins could be lean in February and March, he added.

"We're in a position where we can hold our own," Sovereign said. Sales of ethanol co-products such as dried distillers' grains and corn oil have helped ethanol margins, he added.

The ethanol industry is very dependent on government policy, Sovereign said, and is closely connected with other segments of agriculture, including crop and livestock production. "Corn growers go the way of the ethanol industry," Sovereign said. "We've spent a lot of time educating everyone on how intertwined everything else is with the ethanol industry, such as the cattle and hog markets."

Sovereign noted that he raises corn in Howard County and also is the partner in a hog-feeding operation, so his view of high corn prices, "depends on which hat I'm wearing."



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Corn Facts

DID YOU KNOW?

- Iowa has approximately 86,900 farms. More than 97 percent of those farms are owned by farm families.
- Iowa ranks number one in producing corn, soybeans, hogs, eggs, ethanol and Dry Distillers Grain Solubles (DDGS) which serve as a premium source of protein for livestock. It also ranks fourth in beef cattle.
- In 2019, Iowa farmers produced around 2.58 billion bushels of corn for grain and harvested 13.1 million acres according to the U.S. Department of Agricultural Statistics Service.

SWEET CORN VS. FIELD CORN

- Only one percent of corn planted in the United States is sweet corn.
- 99 percent of corn grown in Iowa is “Field Corn”. When Iowa’s corn farmers deliver corn from the field, it’s “Field Corn”. Not the delicious sweet corn you might enjoy on the cob or in a can.
- Field corn is the classic big ears of yellow dented corn you see dried and harvested in the fall. It’s called “dent corn” because of the distinctive dent that forms on the kernel as the corn dries.
- While a small portion of “Field Corn” is processed for use as corn cereal, corn starch, corn oil and corn syrup for human consumption, it is primarily used for livestock feed, ethanol production and manufactured goods. It’s considered a grain.
- Sweet corn is what people purchase fresh, frozen or canned for eating. It’s consumed as a vegetable. Unlike “Field Corn”, which is harvested when the kernels are dry and fully mature, sweet corn is picked when immature.

WHAT IS IT USED FOR?

- Iowa leads the nation in ethanol production, with 57 percent (1.5 billion bushels) of the corn grown in Iowa going to create nearly 27 percent of all American ethanol.
- 4.709 billion bushels or 33 percent of Iowa Corn went directly into livestock feed. In livestock feeding, one bushel of corn converts to about 8 pounds of beef, 15.6 pounds of pork, or 21.6 pounds of chicken. [Learn more.](#)
- One bushel of corn produces 17 pounds of DDGS as well as 2.8 gallons of ethanol. [Learn more.](#)
- 1.494 billion bushels of Iowa corn in the 2018/19 marketing year went into corn processing used in the wet mill industry for food and industrial use. [Learn more.](#)
- 14 percent or 2.065 billion bushels of Iowa corn was exported out of the state in the 2018/19 marketing year. In an average year, Iowa produces more corn than most countries. [Learn more.](#)
- Corn is in more than 4,000 grocery store items a few examples include: shampoo, toothpaste, chewing gum, marshmallows, crayons and paper. [Learn more.](#)

DEBUNKING FOOD & DUEL MYTHS

- Many products depend on corn as well, from paper goods and cardboard packaging, to all the meat, milk, eggs, poultry and other protein products that come from corn-fed animals.
- Farmers and ranchers that provide our meat, milk and eggs depend on genetically enhanced crops as critical components in production of their animals' feed. Livestock in the U.S. have been fed genetically modified crops since they were first introduced in 1996.
- Humans have also been consuming genetically modified (GMO) foods since 1996 also. Hundreds of scientific studies have confirmed the safety of these biotechnology products. In fact in the United States, alone, 9 billion food-producing animals are produced annually, with 95 percent of them consuming feed that contains genetically engineered ingredients meaning consumers come in contact with GMO's on a daily basis.
- Oil, not corn, has been driving up global food prices. The World Bank conducted research determining crude oil as the number one determinant of global food prices. The cost of energy from oil is integral to so much of the 84 percent of what makes up grocery costs. When the price of oil goes up, so does food prices.
- The great thing about corn is that it provides:
 - A renewable, environmentally-friendly fuel source (Ethanol)
 - Animal feed for livestock which is important to our food supply
 - Exports supplying the world with corn and corn products which boosts our economy
 - Food ingredients necessary for preparing many of our favorite meals
 - Bio-based, renewable materials for industrial uses such as bioplastics

OTHER FUN CORN FACTS

- Corn can be produced in various colors including blackish, bluish-gray, purple, green, red and white but the most common color grown is yellow
- There is one silk for every kernel that grows in an ear of corn
- The number of kernels per ear can vary from 500 to about 1,200, but a typical ear would have 800 kernels in 16 rows
- Corn is grown in every continent except Antarctica
- One acre of corn is about the size of a football field
- A bushel of corn is 56 pounds, about the weight of a large bag of dog food.
- A single corn bushel can sweeten about 400 cans of soda pop. [Learn more.](#)

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SOURCE Navigator CO2 Ventures LLC



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CONSULTING

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CONSULTING: Enhanced Recovery

Our firm has expertise in the technologies, markets, environmental and regulatory issues, and economics of CO₂ enhanced oil recovery (CO₂-EOR) in depleted oil as well as shale oil reservoirs. Also, ARI is a leading researcher in the use of N₂ and CO₂ to improve natural gas recovery from coal seam and shale gas systems.

Advanced Resources' Experience in Enhanced Oil Recovery (EOR):

Global Perspective

- **IEAGHG/DECC/UNIDO: Global Assessments of CO₂-EOR Potential and Associated CO₂ Requirements: International.** ARI prepared reports for the International Energy Agency Greenhouse Gas Research Programme (IEAGHG), UK Department of Energy and Climate Change (DECC) and UNIDO that reviewed the major CO₂-EOR operations underway around the world to better understand the factors that facilitated or hindered their implementation, and developed a high-level, first-order assessment of the CO₂-EOR oil recovery and CO₂ storage capacity potential in the largest 54 oil basins of the world, using the U.S. experience as analogue. Also assessed were both traditional approaches for CO₂-EOR, along with alternative approaches that optimize both oil production and CO₂ storage. Existing CO₂-EOR operations are described, highlighting those projects pursuing or considering the co-benefits of CO₂ storage and incremental oil production. Expanding on previous work, the world-wide incremental oil production and CO₂ storage potential from CO₂-EOR is assessed assuming a set of "next generation" CO₂-EOR technologies. Other approaches to increase CO₂ storage in conjunction with CO₂-EOR are also identified and evaluated. Finally, life-cycle analyses are presented of the greenhouse gas emissions (GHG) associated with various alternatives for CO₂-EOR development.

Regional Perspective

- **"Technical Oil Recovery Potential From Residual Oil Zones: Permian Basin"** report prepared by Advanced Resources International for U.S. Department of Energy, Office of Fossil Energy, Office of Oil and Natural Gas, February 2006. This report provided a first of its kind, in-depth documentation of the in-place and recoverable ROZ potential in the Permian Basin. The study was carried out by demonstrating the evidence and origin of ROZs in the Basin, identifying those oil fields that lie above ROZs and using simulation methods to estimate the recovery of this vast resource. Several completion tactics were reviewed to optimize ROZ recovery, which included partially completing the ROZ to target the high oil saturation zones and flooding the ROZ with the main pay zone to make gains in flood efficiency. Overall, the work identified a potential recovery of almost 12 billion barrels of oil could be possible from a current oil endowment of approximately 31 billion barrels of oil beneath Permian Basin oilfields.

Project Perspective

- **Using "Next Generation" CO₂-EOR Technologies To Optimize The Residual Oil Zone CO₂ Flood At The Goldsmith Landreth Unit, Ector County, Texas** prepared for the University of Texas, Permian Basin (UTPB). The project will use

A Survey of U.S. CO₂ Enhanced Oil Recovery Projects – Updated to EOY 2020

This survey provides an update of incremental oil production from CO₂ EOR in the U.S. for 2020.

Total projects: 142

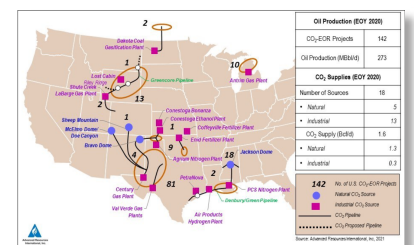
Total operators: 23

Total CO₂ EOR oil prod.: 273,000 bbl/d

- **Permian Basin (TX, NM):** 185,000 bbl/d
- **SE Gulf Coast (MS,LA,TX):** 39,000 bbl/d
- **Mid-Continent (OK, KS):** 10,000 bbl/d
- **Rockies (CO,UT,WY,MT):** 37,000 bbl/d
- **Michigan:** 500 bbl/d

Total CO₂ Supply: 1.6 Bcf/d

- **"Natural" CO₂:** 1.3 Bcf/d
- **"Industrial" CO₂:** 0.3 Bcf/d



[Click here for PDF copy of the Report](#)

The Next Phase of the "Shale Oil Revolution": Storing CO₂ with Shale EOR", ARI's report completed for U.S. DOE via

real-time data acquisition and diagnostic tools to monitor CO₂ flood performance (using conformance surveys and chemical tracers to establish CO₂ flow paths and sweep efficiency). The real-time data will be linked with laboratory and bench-scale work and reservoir simulation to control and modify the CO₂ flood on a continuing basis. Incorporation of "next generation" data acquisition and control technology will help overcome the number one challenge facing CO₂ flooding - - achieving improved reservoir conformance and with it more optimum use of injected CO₂ for oil recovery.

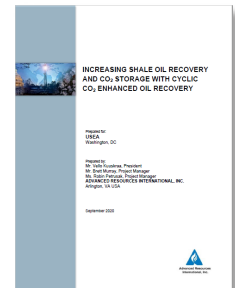
For Advanced Resources' Enhanced Recovery Project Portfolio, [click here](#).

For a partial list of clients, [click here](#).

For more information about Advanced Resources International Inc. and our services, please contact us via e-mail at info@adv-res.com.

the U.S. Energy Association. This report addresses:

- How large is the shale resource in place?
- How much of this large resource is recoverable with current practices?
- How much would the use of CO₂ injection (Shale EOR) improve shale oil recovery efficiency?
- How much CO₂ could be stored in shale oil formations with CO₂ EOR?



[Click here for PDF copy of the Report](#)



WYOMING
ENERGY (<https://wyoenergy.org/home/>)
AUTHORITY

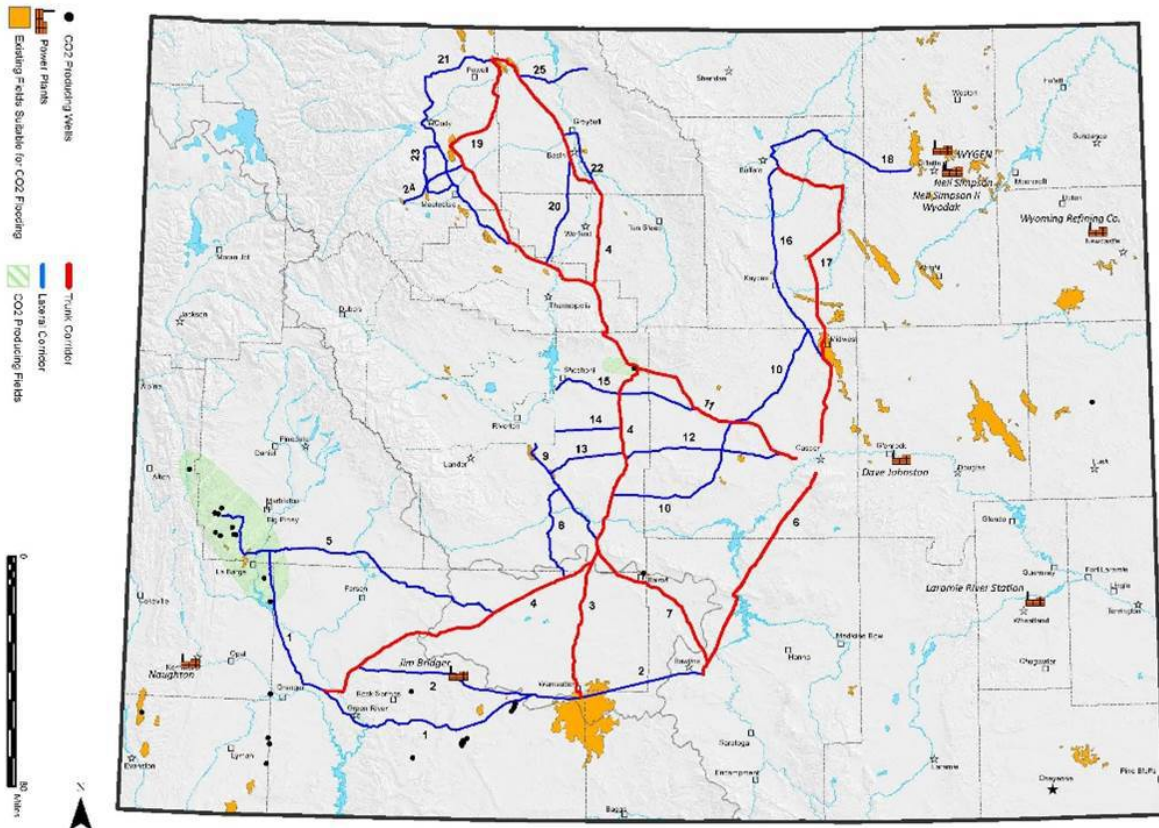


Wyoming Pipeline Corridor Initiative

The Wyoming Pipeline Corridor Initiative (WPCI) aims to establish corridors on public lands dedicated for future use of pipelines associated with carbon capture, utilization and storage (CCUS), enhanced oil recovery (EOR) and delivery of associated petroleum products.

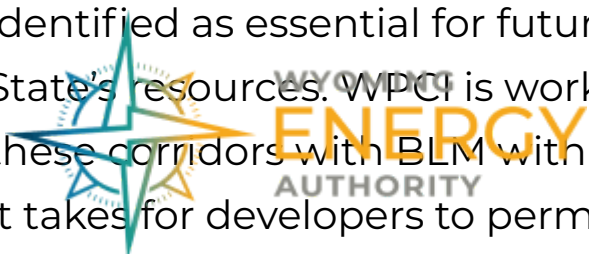


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Overview

In coordination with researchers, industry representatives and state organizations, approximately 2,000 miles of pipeline corridors throughout central and western regions of Wyoming have been

The logo for the Wyoming Energy Authority is positioned in the upper left of the text block. It features a stylized star with multiple points in blue and orange, and the text 'WYOMING ENERGY AUTHORITY' in blue and orange. A URL '(https://wyoenergy.org/home/)' is visible in the background of the text.

identified as essential for future production and distribution of the State's resources. WPCI is working through the process of authorizing these corridors with BLM with the goal of reducing the time and cost it takes for developers to permit these large infrastructure projects, while also balancing the environmental concerns associated with these lands by reducing the disturbance footprint.

The Details

WPCI consists of 25 segments, covering BLM, private and state land. However, the current WPCI effort will only apply to BLM administered lands. The WPCI project is compatible with additional uses, like broadband infrastructure, which could be acceptable at the outer boundaries of the approved corridors.

Timeline

The Wyoming Pipeline Corridor Initiative was initially proposed in 2012 as part of Governor Mead's energy strategy. The public comment period on the Bureau of Land Management's draft environmental

impact statement (EIS) closed in July 2020 after a 90-day comment period. And the record of decision (ROD) was granted by BLM in January 2021. [\(https://wyoenergy.org/home/\)](https://wyoenergy.org/home/)



Want more information?

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