STATE OF MICHIGAN
IN THE SUPREME COURT

In re APPLICATION OF ENBRIDGE ENERGY TO REPLACE & RELOCATE LINE 5

FOR LOVE OF WATER,

Appellant,

v

ENBRIDGE ENERGY LIMITED PARTNERSHIP, MICHIGAN PUBLIC SERVICE COMMISSION, MACKINAC STRAITS CORRIDOR AUTHORITY, MICHIGAN PROPANE GAS ASSOCIATION, NATIONAL PROPANE GAS ASSOCIATION, and MICHIGAN LABORERS' DISTRICT COUNCIL,

Appellees.
_____/

Supreme Court No. 168346

Court of Appeals No. 369163

MPSC Case No. U-20763

APPENDIX TO APPELLANT FOR LOVE OF WATER'S REPLY BRIEF

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Dated: January 23, 2026

Respectfully submitted,

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TESTIMONY OF JOSEPH L. SAX*
BEFORE THE COMMITTEE ON CONSERVATION AND RECREATION,
HOUSE OF REPRESENTATIVES OF MICHIGAN, ON H.B. 3055
JANUARY 21, 1970

SUMMARY

Authorizes the Attorney General, local governments and private citizens to go to court and challenge activities which infringe the right of the public to a clean, healthy and attractive environment. Courts are empowered to take evidence in such cases and to enter orders prohibiting or modifying conduct that is shown to impair or threaten the quality of the environment.

AN ENVIRONMENTAL COMMON LAW FOR MICHIGAN

Legislative efforts in the area of environmental quality have thus far been essentially limited to setting out standards for particular problems, and creating some administrative machinery for enforcement. Such legislation is vital, but it is not sufficient. Every problem cannot be foreseen in advance; a means must be provided for coping with unanticipated or neglected matters.

Let me illustrate the point with a single, but striking, example. Today everyone is aware of the pesticide problem. But only two years ago, when an effort was made to call to attention in this state the burgeoning pesticide problem, our pesticides statutes were at essentially the level of the following law:

> "Whenever there may exist within this state any scourge, or threatened scourge, of grasshoppers or other similar pests, the board of supervisors of any county is hereby authorized to appropriate money for the purchase of poison and to provide such other means as may to them seem best, for the extermination of such pests."

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*Professor of Law, University of Michigan, on research leave 1969-70. In 1969 the Western Michigan Environmental Action Council retained Professor Sax to draft a model environmental quality bill. H.B. 3055 incorporates the provisions of that model bill.

To the best of my knowledge that statute is still on the books. I don't say this critically of the legislature. It is difficult enough to deal with today's most visible and pressing problems, without having prescience about tomorrow's and the next day's.

The old way is to wait for a disaster and then legislate. But that is a luxury we can ill afford in coping with the problems of the environment.

Use of the courts will add a weapon to the arsenal of the public interest: the ability to meet problems as they arise, formulating a solution appropriate to the occasion, flexible, innovative, responsive. In short, the inventiveness of the common law system should be brought to the environmental crisis. We need to develop a common law for the environment; H.B. 3055 opens the door that makes this vitally needed development possible.

Our failure thus far to open the way to the development of a common law in this area has been very damaging. In a number of cases, judges have been deeply troubled by complaints put before them, which raised serious environmental problems; but they have felt duty bound to dismiss the cases because they felt the legislature had given them no mandate to cope with environmental problems. This is wrong and should not be countenanced. At the other extreme, concerned judges have reached out for legal straws to prevent a destructive act from going forward--as in one recent case where the parties dredged up a forgotten statute regulating "dikes" because it permitted a dubious project to be sent back for needed reconsideration, a result that breeds contempt for the dignity of the law and produces erratic and unpredictable results. Had there been no dike--a mere fortuity--there would have been no case. We must do better than this!

But--it will be said--we have administrative agencies to protect us. So we do, and I hope I will not be thought unkind if I suggest that our administrative agencies at times leave something to be desired.

Official agencies which are created to promote and protect the public interest sometimes become too single-minded. In the past few years, a number of cases have brought home the degree to which important regulatory agencies failed to take into account all the information and all the perspectives which a proper regard for the public interest required. One recent opinion written by the new Chief Justice of the United States said of traditional, unquestioning reliance on administrative agencies:

> The theory that the Commission can always effectively represent the [public] interests . . . without the aid and participation of legitimate [citizen] representatives fulfilling the role of private attorneys general is one of those assumptions we collectively try to work

> with so long as they are reasonably adequate. When it becomes clear, as it does to us now, that it is no longer a valid assumption which stands up under the realities of actual experience, neither we nor the Commission can continue to rely on it.
>
> . . .
>
> We cannot fail to note that the long history of complaints . . . had left the Commission virtually unmoved . . . and it seems not unlikely that the . . . application might well have been routinely granted except for the determined and sustained efforts of Appelants at no small expense to themselves.

I ask the committee to recall that when the agency in this state principally charged with agricultural pesticide regulation was asked to help restrain the use of hard pesticides their response was vigorously to defend--with the taxpayers' money--the use of dieldrin. And that was a mere two years ago. So the notion that some private citizen initiative may be needed is not just an invention of Mr. Chief Justice Burger and me. An agency ought not to be embarrassed to have it pointed out from time to time that it is not infallible, and if the citizens of the state, in whose interest the state's resources are to be maintained, do not have a legitimate interest in such vigilant regard for their own interest, who does?

THE NEED FOR THIS LEGISLATION

A memorandum filed on April 29, 1969 by the Attorney General, in commenting on this bill, suggests that we have all the remedies we now need for dealing with environmental problems. A careful reading of that memorandum makes clear just how limited the citizen's right is today. He says that present statutes provide a means for citizens "to file complaints with state agencies." So they may, but I assume that even in the days of the monarchy citizens were perfectly entitled to file complaints with the king. Notably the law does not provide any general requirement that the agencies undertake a proceeding in response to such complaints, however meritorious, nor does it give citizens a right to challenge agency decisions in court. In essence it simply allows a citizen to tell an agency that he thinks it is wrong; and it allows the agency to say "oh no, we were right."

The Attorney General's memorandum also refers to the Water Resources Commission Act. Passing over the limitation in the law to the traditionally narrow category of "aggrieved" persons, and the limited judicial review permitted, the important thing to note is how many environmental problems exist outside the structure of even this modest kind of opportunity for remedial action by private citizens. The problems of noise, of odor, of airport and road construction, of pesticide use, and a dozen others at least, leave the citizen essentially without redress beyond the opportunity to plead with some public agency. Moreover, the Attorney General has omitted completely the environmental problems created by private enterprise;

to take but a single example, that of utility companies with their extensive right of eminent domain--a power which has created many serious environmental problems throughout the nation. Rather than dealing in generalities, however, let us look at some specific examples of problems which have arisen in the State of Michigan, for which the Attorney General's memorandum supplies no answers.

Case No. 1

A city hired a contractor to install water and sewer lines. During the construction there was considerable dumping of pollutants into the river. Of course a state agency has jurisdiction over such matters, and I am informed that decisive action could have prevented serious damage. Our regulatory agency did not act decisively, however; only afterwards did remedial action get under way--after the fact, and after the damage was done. Concerned citizens might have provided that needed impetus for decisive action; but the law does not provide any clear right of action.

Indeed, a recent case in the Muskegon circuit court raised the very question whether private citizens could attack pollution alleged to have been inadequately dealt with by the state agency charged with that function. The judge allowed suit only by those who could qualify as property owners--but not by other plaintiffs without that traditional property interest. Even this decision as to property owners--still in dispute in the courts--is by no means clearly allowed by our law; and, of course, the scope of legitimate interest in environmental problems is by no means limited to those who hold adjacent property, as the next example demonstrates.

Case No. 2

A Michigan city has road building plans for construction within the city. The plans were made a long time ago, and many well informed persons believe they are unwise and ill-considered. They implement all the worst elements of the old "shortest, straightest, cheapest" philosophy of highway building--and the devil take anything that happens to be in the bulldozer's path. Among other problems with the present plan, it is said unnecessarily to destroy valuable parkland and scarce riverfront vistas. Citizens want very much that alternate routes--which they claim are feasible and practicable--be considered. But city officials won't be persuaded. Perhaps they think they are correct; perhaps they balk at having their authority challenged; perhaps they are too eager to save a little money; or too lazy to reconsider a job that was once done. Troubled citizens today have no place to turn once the city rejects their pleas.

Case No. 3

A real estate developer bought a choice piece of land at the top of a hill, overlooking a fine tract of city owned land which serves as a

nature preserve and outdoor conservation laboratory for school children. The developer moved in quickly with bulldozers and denuded his hill; it sat that way for a year, with the usual consequences when the cover is stripped off a piece of land. Erosion had serious adverse impact on the land below. To save a few dollars pending the start of construction, a valuable public resource suffered serious environmental damage. No-one did anything about it. Many members of the community were outraged, but to the best of my knowledge they had no legal standing to act on behalf of the public interest. Public officials might have acted, but they did not. Perhaps they were busy with other things; perhaps they were afraid of controversy; perhaps they were simply unimaginative. The fact is they did not act--and concerned citizens did not have the legal wherewithal.

Case No. 4

Last I come to a case which is widely known, involving the leasing of public lands for oil and gas operations. I understand that public concern has led to amelioration of some of the problems, and that additional state agencies have been brought into this area of operations at least in an advisory capacity. The situation is an important one, for the process of disposition and leasing of public lands is one prolific source of environmental problems everywhere, and it is typically an area of government in which no regularized means is provided for citizen participation.

The committee might ask state officials to explain what the situation is if, for example, public land is proposed for leasing to a private company for mineral exploration and concerned citizens believe they have sound and powerful evidence which would cast serious doubt on the proposal--evidence which the state agency fails adequately to consider. The issue is by no means a fanciful one, for it is traditional for many agencies to view citizen interest, and a desire for citizen participation, as a nuisance. It may give a little perspective on this attitude to recall that before the federal leases were granted at Santa Barbara, California, local citizens wanted to have a forum to raise some questions and objections. But the lease-granting agency refused, assuring them that "maximum protection has been made for the local environment". Privately, a memorandum was circulated in the Interior Department arguing against holding public hearings because the Department "preferred not to stir the natives up any more than [necessary]". Of course the "natives" eventually got very stirred up, when oil began covering their beaches. Will anyone say, "it can't happen here."

* * *

The foregoing cases are, of course, only a few examples of situations where the opportunity for some initiative outside the official channels of agencies which are supposed to be protecting the public interest

might be quite useful. Anyone can compile his own list by simply walking around the state looking and smelling; we have lots of laws and lots of agencies which are charged with their enforcement, but we also have a lot of environmental problems. I am sure the committee has heard more examples than I of pollution clean-up orders which have been outstanding for years, unfulfilled and for some reason unenforced; of towns where pollution of the air is heavy and odors atrocious. A little private initiative by members of the community who are the daily victims of these problems might do wonders.

In citing these cases, I do not assert that in each instance the city, or the state agency, is wrong and the objecting citizen right. I only say that the questions sought to be raised are substantial--and that concerned and affected members of the public are entitled to have a forum in which such questions can be raised and considered.

Note too that opening a public right is not merely designed to challenge an agency which is ill-informed or willfully wrong. Public intervention may help to strengthen the resolve of an agency which is under pressure from interested parties, or it may encourage an agency to reconsider a problem it has ignored or held too long in abeyance. In short, we can sometimes help to liberate public agencies to do what they ought to be doing. I have spoken harshly of the pesticide problem in Michigan, but it is important to note that the lawsuits which were filed--though aborted because no adequate law existed upon which to base them--made enough of an impression by their presence that they helped advance and promote needed reexamination of the DDT problem.

We ought not to forget how useful it can be--indeed how essential--to ventilate important issues of policy outside the often confining traditional channels of the bureaucracy; particularly is this so when a bill like H.B. 3055 is under attack on the ground that it might shake up the well established formal channels of government a little bit. It might--and it should.

THE ADMINISTRATIVE PROCEDURES ACT DOES NOT FILL THE NEED

Our new Administrative Procedures Act, for all its virtues, is not adequate to deal with the range of environmental problems now facing us. It governs only a limited class of public decisions which meet the definition of "contested cases"--a category which excludes much private conduct, dispositions of the kind which raise problems about the protection of the public trust, and most project building; it is essentially limited to "rate making, price-fixing and licensing" and only to limited examples of even that conduct. Moreover, it is at best ambiguous about the right of members of the public to seek redress in the courts, with its rather circular definition of a party as someone

> named or admitted, or properly seeking and entitled of right to be admitted as a party in a contested case.

And of that uncertain group, only those "aggrieved" may seek judicial review. To limit the public to that source of redress--with all its ambiguity--is only to invite endless controversy and bickering over legalistic

and procedural questions, filling the courts with technical squabbles when their time and energy could be better spent in dealing with substantial matters.

WHY DOES THE BILL PROVIDE FOR CITIZEN INITIATED LAWSUITS?

The idea of citizens suing to protect the public interest is not a novelty at all. Michigan itself has long permitted citizens to sue "in the name of the State of Michigan" on behalf of the public to enjoin certain kinds of public nuisances like houses of prostitution and gambling dens. The principle of the public suit is well established and it might be asked whether that principle might not more needfully be applied to the conservation of our resources than to prostitutes and gamblers.

Indeed, such suits are permitted to be brought to enjoin a wide range of improper conduct in many states. At least a dozen states have statutes like ours, and Wisconsin (W.S.A. 280.02) and Florida (60.05) permit private citizens to sue on behalf of the public to enjoin public nuisances--itself a rather broad concept--generally.

The right of citizens to sue on behalf of the general public has been recognized in a wide range of situations and the concept is receiving new approval with greatly increasing frequency. In Massachusetts citizens have been allowed to sue to protect Walden Pond, parks, reservations and natural areas against highways, parking lots and other destructive commercial encroachments. The Supreme Judicial Court of Massachusetts said they had standing"toenforce a public duty of interest to citizens generally".

In the 1950's citizen groups were allowed to challenge--and did so successfully--a proposed hydro-electric development on the Namekagon River in Wisconsin. More recently a similar challenge has been allowed as to a proposed hydro development and expressway on the Hudson River in New York. Citizens have been allowed to sue in New York to implement their state's constitutional natural resource protection provision. Very recently suits by private citizens challenging misuse of natural resources have been permitted in Tennessee, Minnesota, California, Colorado and New York.

That the citizens' suit is no novelty is clear enough. But is it necessary, when we have public officials who have authority to bring such suits? The answer to this question is clearly "yes". In a recent case citizens sought to enjoin a program proposed by one state department on the ground that it would seriously impair environmental quality. The Attorney General or another state agency could, in theory, have challenged that proposal. But it was determined in the governor's office that it would be unseemly for two equal state agencies to fight out a public question in the courts; and that it would have been improper for the Attorney

General, who must defend state agencies in court, to be lawyer for both plaintiff and defendant in a single suit. Whatever the merits of such views, they are facts of life which tell us that without citizen participation important issues will sometimes go unexamined and unchallenged.

Moreover, citizen prodding may be required to encourage an agency, busy with its routine work, to take a careful look at all the implications of a program which it is promoting or regulating. In a recent roadway dispute in New York, citizen groups urged that a proposed location was improper. At first, both the state and federal agencies disagreed. But the citizens persisted, and after promoting a careful study and analysis of all the alternatives, the state officials reversed themselves and sided with the protesters.

ARE THE COURTS COMPETENT TO CONSIDER AND EVALUATE ENVIRONMENTAL QUALITY QUESTIONS

This is perhaps the most commonly asked question whenever it is suggested that the judiciary has a role to play in promoting the public interest in natural resource protection. This is a matter of great importance. A recent New Jersey case--Texas Eastern Transmission Corp v. Wildlife Preserves--speaks impressively in response to this concern; it deserves the attention of every person who asks this question. Citizens sued to block a gas pipeline project on the ground that it would have severe adverse effects on the environment. The state Supreme Court held that a trial should be held on the question. A careful examination of the stenographic transcript demonstrates beyond doubt that the judge, an ordinary trial court magistrate like thousands of others across the nation, could and did do a perfectly competent and knowledgeable job of evaluating and sifting the evidence offered by each party. His experience at problem solving served him well in the pipeline case and he found a solution which was a compromise between the proposals of both parties, but which minimized environmental damage without preventing the pipeline company from getting its job done.

It should not be surprising that courts can work effectively in these cases, which are no more or less technical or obscure than a wide range of matters that routinely come before judges, ranging from the need to determine negligence in running an atomic power plant to railroad re-organizations, stock swindles and patent applications.

No doubt this committee will be told that these matters cannot be tried practically. But the simple fact is they can be, and are. The New Jersey case is but a single example. This month a case will go to trial involving the environmental impacts of public land management in Colorado--a case set down for trial by an experienced trial judge against the repeated

bleating of government lawyers that it couldn't and shouldn't be done. The judge became so annoyed at this that he told to the government lawyers they always paraded the horribles, but the horribles never came to pass except in their minds.

In the January issue of the Michigan Law Review--now at the printer--I detail case after case of environmental litigation, for nearly 100 printed pages. Don't let anyone tell you such litigation is impractical or unmanageable.

For lack of a statute like that now pending before you, judicial cognizance of such cases has been irregular and uncertain. But historically, in toto, there have been enough such cases to make clear their practicality and feasibility.

THE PROPOSED BILL WILL NOT PREVENT NEEDED DEVELOPMENT

Section 3 of the bill has been carefully designed to steer a middle course between unthinking exploitation and unyielding preservation. Those who wish to object to any proposed project or activity must first bear the burden of showing that there is a reasonable likelihood that there will be some significant adverse effect on the state's resources. Only then is it incumbent upon the party who is proposing to act to show that his conduct is reasonable; that is, that what he wants to do is consistent with the public welfare and that no feasible or prudent alternatives exist for getting the job done. This section of the statute, in talking about alternatives, assures that the forum in which such controversies are worked out will not be mired down in abstract consideration of benefits and detriments, but will have before it solid and substantial proposals and alternatives to weigh and evaluate comparatively.

The language of feasible and prudent alternatives already appears in statute law, including the federal Transportation and Highway acts.

Moreover, to put the burden of establishing alternatives on the proponent of action is a simple matter of common sense, for we expect the proponent of any activity to have considered all reasonable alternative and to have chosen the best of those available; to ask him to support his decision is merely to ask that he reveal the process which he must--if he operates rationally and with the public interest in mind--already have undertaken. Indeed, Michigan law itself imports even a stronger version of this approach in a number of statutes; the air pollution law, for example, requires that in judicial review of its orders the "commission shall have the burden of proving the correctness of its order or determination". (MCLA 336.23).

WILL THE COURTS BE FLOODED WITH LITIGATION

This has been the historical complaint whenever a new or expanded legal right was recognized; it has been raised with monotonous predictability as an objection to every new idea that has ever been advanced in the law. It is simply a version of the argument that nothing new should ever be done because it is either unnecessary or dangerous.

For those who are inclined to worry, the statute contains two safeguards against unwarranted litigation. First, unless the plaintiffs can make out a prima facie case, they cannot succeed; thus frivolous cases can be disposed of at an early stage. In addition, the provision in section 3, permitting the court to allocate costs of litigation to the parties, gives the court authority to impose economic burdens associated with the case upon those who unreasonably impose upon the court. Finally, for better or worse, the economics of instituting litigation have always acted as a substantial deterrent to those who do not have a case with any reasonable prospect of success.

This initial requirement on the plaintiffs also puts to rest the fear of so-called crank cases. Unable to meet the initial burden of substantiality, such cases can be quickly and decisively dismissed by the court.

Enbridge
425 W. Superior Street
Suite 1100
Duluth, MN 55802

June 30, 2025

Line 5 Tunnel EIS
16501 Shady Grove Road
P.O. Box 10178
Gaithersburg, MD 20898

Re: Enbridge Comments on DEIS

Dear Detroit District,

Thank you for providing Enbridge Energy, Limited Partnership (Enbridge) with the opportunity to submit comments on the *Enbridge Line 5 Tunnel Project Draft Environmental Impact Statement* dated May 2025 (DEIS). The DEIS, in full adherence with the National Environmental Policy Act (NEPA), provides an exhaustive review of the environmental impacts for the Great Lakes Tunnel Project (Project). Enbridge urges the U.S. Army Corps of Engineers (USACE) to proceed to issue the Final Environmental Impact Statement and Record of Decision.

Enclosed please find a matrix that provides Enbridge's specific comments on the DEIS.

If you have questions or comments on the information provided, please feel free to contact me at the phone number or email address in the signature below. You may also contact Jeff Benefiel at Stantec (jeff.benefiel@stantec.com or 980-213-7730).

Sincerely,

Joe McGaver
Manager Environment, US Projects
Joe.McGaver@enbridge.com
(218) 390-9254

Attachments:
1. Enbridge DEIS Comment Matrix

COMMENT NO.	COMMENTER	PAGE NO.	SECTION NO.	COMMENT
1	Enbridge	ES-12	Table ES-1	Table ES-1 should be revised to be consistent with Table 4.2-3. Table 4.2-3 says no impacts on Hiawatha National Forest.
2	Enbridge	1-1	1.1	The tunnel is approximately 3.9 miles long (correct length is in App F).
3	Enbridge	3-5	3.2.2	Consider clarifying that a small piece of land owned by Cloverland Electric Cooperative will also be used for preferred alternative workspace.
4	Enbridge	3-20 through 3-22	3.2.4.2 Land Recreation Figure 3.2-10	The following recreational properties are within the extent of this figure and Section 3.2.4.2: - A second roadside park on US Hwy 2, west of St. Ignace - Mackinac Straits Roadside Park - St. Ignace Golf and Country Club - French Farm Lake Wildlife Management Area - Municipal parks and publicly maintained beaches (e.g., Bridge View Park, which is mentioned in later sections but not identified in this section; Mackinaw City's public beach on Wilderness Park Dr; etc.)
5	Enbridge	3-67	Table 3.5-4.	Correct acreage to state "0.8 acre of suitable summer habitat"
6	Enbridge	3-75	3.6	Consider clarifying that one of the three NRHP historic districts is an archaeological district (Fort Michilimackinac)
7	Enbridge	3-76	3.6.2	Consider clarifying that Stantec surveyed the above ground resources in the Permit area whereas Zeoli and Pickard surveyed the dual pipelines.

8	Enbridge	3-80 through 3-81	Table 3.6-2.	1. "Gros Cap Cemetery" rather than "Gros Camp Cemetery" 2. Consider changing heading of "As an Individual Resource" to "NRHP Status" for clarity 3. Fort Michilimackinac is an archaeological resource 4. Consider changing "United States Coast Guard Cutter Mackniaw" to "United States Coast Guard Cutter Mackinaw and Mackinaw City Railroad Dock" 6. Consider grouping 800, 803, and 804 Lakeside Drive together on one line since they were determined to be eligible as a district 7. Consider spelling out Mackinaw City in "1411 W Central Avenue, M City" for clarity 8. Mackinac Bridge Authority Complex - consider removing from table for clarity as it is the only one determined not eligible
9	Enbridge	3-81	3.6.4	Consider clarifying that Fort Michilimackinac is an archaeological resource or move from Section 3.6.4 to Section 3.6.3
10	Enbridge	3-87	3.8.2	The WSP reference does not include the size of the cavities that formed from dissolved layers of the Pointe Aux Chenes Formation. It may be worth noting that the cavities/collapse occured in the middle Devonian geologic period, i.e. approximately 375 to 349 million years ago
11	Enbridge	3-88	3.8.2	The use of "sand" in "(sand that can be easily compacted)" is misleading as sandy dolomite is rock, not sand.
12	Enbridge	3-102	3.9.4	Please note that there will be disturbance within the Mackinaw Station for connection of pipes.
13	Enbridge	3-116	3.10.3.2	The statement that “Current vessel traffic management measures in the Straits include (USCG 2019):” lists radar; however, the U.S. Coast Guard does not use radar to monitor vessel traffic in the Straits of Mackinac.

14	Enbridge	3-117	3.10.3.2	Please note that patrol boat operations began in October 2019 and ceased on August 16, 2021. All on-water operations ended on April 11, 2022. Since then, the Enbridge Straits Maritime Operations Center (ESMOC) has assumed responsibility for anchor strike mitigation and marine traffic monitoring. The following bullet list reflects the current and accurate safety measures: • Sentinel Proactive System (identifies approaching vessels and issues “no anchor zone” alerts) • Radio contact with every monitored vessel to confirm anchor status • High-resolution radars for target detection and tracking • Strategically placed high-definition cameras throughout the Straits • Weather monitoring tools for wind speed and wave height tracking Note: The bullet list on page 3-117 contains several inaccuracies: • The phrase “as needed” is incorrectly included regarding radio contact; we contact every vessel we monitor • Radars are not listed • Camera placement is incorrectly described as being only at both ends of the Straits
15	Enbridge	3-122	3.12-1	The text "identification of representative sensitive receptors" should read "identification of worst-case representative sensitive receptors"

16	Enbridge	3-127	Figure 3.12-3	1. The house on Enbridge property (west of Headlands Road) is not occupied and will be demolished so it is not a sensitive receptor (residential structure) as labeled in figure. 2. The structure on property formerly owned by the County (west fo Headland Roads) is a garage, not a house, so is not a sensitive receptor (residential structure) as labeled in figure.
17	Enbridge	3-128	Figure 3.12-4	There are residential structures on the east end of Boulevard Drive along the coast, south of Densmore that are not shown on the figure.
18	Enbridge	3-152	Table 3.14-1	"(rate per 100 workers)" in column 2 and 3 headings should be "(rate per 100 workers per year)"
19	Enbridge	3-153	3.14.1.1	For clarity when reading later sections, it would be useful to describe the different types of TBMs here (closed [pressurized] mode, open [non-pressurized], or partial pressure mode, because the type of TBM has a significant impact on many of the risks describe. In later sections, the type of TBM is mentioned but these types are never described in the document.
20	Enbridge	3-154	3.14.1.2.1	The BLS study has a subcategory under the confined spaces category that is specifically for mines and tunnels, which is more applicable to the proposed Project. When looking at the mines and tunnels subcategory, the number of fatalities falls to 58 with the most frequent event is being struck by a falling object or equipment.
21	Enbridge	3-154	3.14.1.2.1	Note that last recorded incident in the Belle and Foulstone (2015) paper occurred in 1993 and that most of the incidents recorded were in 1970s. This study is not applicable to modern tunneling with closed face TBMs.

22	Enbridge	3-155	3.14.1.2.2	Please note rockbursts are not applicable to this project because they are a phenomenon where excavations release high tectonic stresses in geologic formations that are essentially intact (i.e., do not have inherent structural defects such as cracks or fissures). These conditions do not exist in the Line 5 tunnel geologic formations.
23	Enbridge	3-156	3.14.1.3	More recent, subaqueous tunnel examples that would be more relevant to the proposed Project are available. E.G., Cheasapeake Bay Bridge Tunnel and Hampton Road Bridge Tunnel, both of which have robust websites.
24	Enbridge	3-157	Table 3.14-2	"(rate per 100 workers)" in column 2 and 3 headings should be "(rate per 100 workers per year)"
25	Enbridge	3-160	3.14.3	The Garmin's automatic guardian system is no longer in use and has been replaced by the Sentinel Proactive System.

26	Enbridge	4-3 through 4-4	4.1.4	These comments apply to the entirety of Section 4.1.4, including Table 4.1-3. With respect to data gaps for the subsurface alignment, Enbridge has sufficient information for design as the data collected to date for the proposed alternative, is within the range of past comparable projects with similar challenges for boring access, and overall tunnel depth. - The amount of data collected for this project is sufficient and comparable to other tunnel projects as outlined in the McMillen Jacobs Associates 2021 memo on geotechnical investigation. - Clarify the statement related to geometry as it's stated as data gap from the investigation. The statement is perhaps meant to say geology. - Presence of explosive/toxic gases was not identified as a data gap in McMillen Jacobs Associates 2021a or 2021c. - The DEIS text highlights the probing capability of the TBM as the main approach to dealing with data gaps. Instead, the primary mitigation for any data gaps on the Great Lakes Tunnel is the selection of a closed mode (pressurized) TBM, with probing as a back up measure. In addition to the ground stabilization noted from closed face operation, if any hazardous gases did occur they would be kept within the sealed slurry system and outside the tunnel lining.
27	Enbridge	4-7	Table 4.2-1	Castle Rock is outside the APE (also not discussed in Section 3.2. or shown on Figure 3.2-10)
28	Enbridge	4-7	Table 4.2-1	Table 4.2-1 should be revised to be consistent with Table 4.2-3. Table 4.2-3 says no impacts on Hiawatha National Forest, but Table 4.2-1 says that Hiawatha National Forest may experience direct, detrimental impacts from construction.
29	Enbridge	4-9	4.2.3.1.1	With regard to "would secure the necessary temporary easements required" Enbridge also acquired a temporary easement from Cloverland on the north side of the Straits.

30	Enbridge	4-11	Table 4.2-3	Castle Rock is outside the APE (also not discussed in Section 3.2. or shown on Figure 3.2-10)
31	Sam Arnold	4-11	Table 4.2-3	Consider clarifying that blasting noise, if blasting is employed, may be audible on Mackinac Island but that construction noise will be inaudible/insignificant.
32	Enbridge	4-18	Table 4.2-4	Castle Rock is outside the APE (also not discussed in Section 3.2. or shown on Figure 3.2-10)
33	Enbridge	4-29	Figure 4.3-5	Replace "during construction" rendering of excavated material at S1 with new rendering attached to these comments.
34	Enbridge	4-34	Figure 4.3-12	Replace "operations" rendering of excavated material at S1 with new rendering attached to these comments.
35	Enbridge	4-39	Table 4.4-1	A release of drilling fluids is extremely unlikely during TBM use. Throughout the tunneling process, the TBM imparts a low volume of drilling or slurry fluid at the rock/cutterhead interface. The slurry pressure at the face is closely monitored to maintain it at target levels which counterbalance but do not exceed the ground and groundwater pressures as the TBM advances. These slurry pressures will be closely controlled and automated fail-safe mechanisms will be in place to avoid pressure spikes and this pressure control avoids and inadvertent return of drilling or slurry fluid. In addition to the low volume of slurry fluid and the fail-safe mechanisms, there are other measures that help eliminate an inadvertent return during tunnel. These include the installation of the precast tunnel lining and the annulus grouting as tunneling progresses. These also include the transportation of the mixture of rock cuttings and slurry fluid being pumped within a closed system to the surface where the slurry fluid is separated, recycled, and reused.

36	Enbridge	4-44	4.4.3.1.1	With respect to inflows into the tunnel during construction: - The TBM is proposed to use pressurized slurry face support rather than pressurized slurry walls. - The calculation inflow rates assume an unsealed 55-foot length of tunnel without the watertightness provided by the pressurized TBM and the gasketed lining, which would reduce any infiltration significantly.
37	Enbridge	4-44	4.4.3.1.1	Regarding "in combination with dewatering wellpoints," clarify that wells will only be present at the entry portal and exit shaft, not within the tunnel.
38	Enbridge	4-44	4.4.3.1.1	A release of drilling fluids is extremely unlikely during TBM use. Throughout the tunneling process, the TBM imparts a low volume of drilling or slurry fluid at the rock/cutterhead interface. The slurry pressure at the face is closely monitored to maintain it at target levels which counterbalance but do not exceed the ground and groundwater pressures as the TBM advances. These slurry pressures will be closely controlled and automated fail-safe mechanisms will be in place to avoid pressure spikes and this pressure control avoids and inadvertent return of drilling or slurry fluid. In addition to the low volume of slurry fluid and the fail-safe mechanisms, there are other measures that help eliminate an inadvertent return during tunnel. These include the installation of the precast tunnel lining and the annulus grouting as tunneling progresses. These also include the transportation of the mixture of rock cuttings and slurry fluid being pumped within a closed system to the surface where the slurry fluid is separated, recycled, and reused.
39	Enbridge	4-47	4.4.3.1.2	The turbidity curtain will be installed around the HDD exit point only, not from the shore to the exit point.
40	Enbridge	4-48	4.4.3.1.2	Hydrostatic test water will not be discharged intermittently. Hydrostatic test water will be discharged once from the North Site NPDES outfall.

41	Enbridge	4-49	4.4.3.1.3	Enbridge will not use wetland seed mix in landscaped portions of the north LOD post-construction.
42	Enbridge	4-52	4.4.3.1.4	Please note that, when the JPA was submitted to EGLE on March 3, 2025 within the resource and activity type section of the JPA, Enbridge included that the proposed project will involve working within 100-year floodplain and we provided all information within the floodplain portion of the JPA. In EGLE's correction request they provided the following "EGLE does not regulate any floodplains of the Great Lakes, only floodplains of streams with a drainage area greater than 2 square miles. Please remove the 100-year floodplain as an impacted resource," given that, at the request of EGLE, information regarding the floodplain has been removed from the JPA.
43	Enbridge	4-54	4.4.3.2.1	To maintain consistency with other sections of the DEIS, which use 7,000 gdp for groundwater seepage into the tunnel, it should be noted that all of these inflow estimates include a factor of three to provide some contingency allowance.
44	Enbridge	4-75	4.5.3.1.3	With regard to "could occur over a 24-day period near the south shore and a 14-day period near the north shore." it should be clarified that this is the the culmulative time over the full 1,200 feet; in any one location the effect would be for less than 2 days.
45	Enbridge	4-76	4.5.3.1.3	There will be no release of additives such as lubricants (besides bentonite) and/or grease.

46	Enbridge	4-81	4.5.3.1.4	1. The applicant will coordinate with USFWS to ensure compliance with the Bald and Golden Eagle Protection Act. 2. Blasting will not be done within 0.5-miles of an active bald eagle nest. Certain construction activities cannot occur within 660 feet of an active bald eagle nest.
47	Enbridge	4-86	4.5.6	The LODs will all be completely cleared of vegetation and stripped of topsoil. No stumps will be left that require herbicidal treatment.
48	Enbridge	4-86	4.5.6	Enbridge will not encourage re-establishment of DLI or HG within the north LOD.
49	Enbridge	4-93	4.8.1	The DEIS references potential shifts in geology in several different sections. It would be useful to provide clarity on what it meant by this term, as we are not aware of what “shifts in geology” means.
50	Enbridge	4-93	Table 4.8-1	"TBM vibrations of seismic..." should read "TBM vibrations or seismic…"
51	Enbridge	4-94	4.8.3.1	Updated BCY of excavated material were provided to USACE with Enbridge's comment on Appendix F dated March 20, 2025. The correct amounts are: 515,000 BCY will be transported to S1 and 17,000 BCY will be transported to N1.

52	Enbridge	4-95	4.8.3.1	Regarding "there is a very small probability of damaging earthquake effects," it should be noted that the tunnel has been designed to avoid damage resulting from an earthquake. To be more specific, the design seismic parameters have been developed in accordance with the recommendations in the LRFD Road Tunnel Design and Construction Guide Specifications (AASHTO, 2017), which defines a two-level target performance criterion for seismic design consisting of a Safety Evaluation Earthquake (SEE) and a Functionality Evaluation Earthquake (FEE). Based on the guidance in AASHTO (2017), a 2,475-year return and a 475-year return period were selected for the SEE and FEE, respectively. Parameters were determined using the United States Geologic Survey Unified Hazard Tool. For the SEE the peak ground acceleration (PGA) used in design was 0.008g, and the PGA for the FEE was 0.022g.
53	Enbridge	4-95	4.8.3.1	With regard to the sentence "Rock that is fractured and more permeable is likely to contain higher quantities of groundwater than stable rock, which may infiltrate the Tunnel during construction, displacing water in the aquifer itself and resulting in a lowering of groundwater levels (i.e., groundwater drawdown)," groundwater infiltration of the type discussed here does not occur when the tunnel is under a lake.
54	Enbridge	4-97	4.8.6.1	Not only are karst features not known or mapped in the area of analysis, but karst features were also not encountered during geotechnical work for the Project.
55	Enbridge	4-101	4.9.3.1.1	Topography of north LOD within the operational footprint will be changed; one to five feet of fill will be added to raise the elevation.
56	Enbridge	4-102	4.9.3.1.1	Clarify that there will be disturbance within Station for connection of pipes.

57	Enbridge	4-103	4.9.3.1.2	Lubricants and greases are used in drilling machinery but are not water-soluble and are not mixed with drilling fluids for viscosity.
58	Enbridge	4-108	4.9.6.1	Topsoil may also be stockpiled at laydown areas.
59	Enbridge	4-120	4.10.3.1.2	The statement "while the minimum depth of cover over the Tunnel is at least 10 feet below the top of rock" is inaccurate. The Tunnel will always be a minimum of 25 ft below the top of rock.
60	Enbridge	4-149	Figure 4.12-1	1. The house on Enbridge property (west of Headlands Road) is not occupied inhabitable and will be demolished so is not a sensitive receptor (residential structure) as labeled in figure. 2. The structure on property formerly owned by the County (west of Headlands Road) is a garage, not a house, so is not a sensitive receptor (residential structure) as labeled in figure.
61	Enbridge	4-153	Table 4.12-3	It should be one residence within dBA more than 65: two residences shown west of Headlands should be removed.
62	Enbridge	4-163	4.12.3.1.2	"with a diameter of 24 feet," should read "with a diameter of approximately 24 feet."
63	Enbridge	4-190	4.14.3.1.1	Clarify that the flooding at the Lake Meade project did not happen during TBM excavation and is not applicable to the GTLP.
64	Enbridge	4-190	4.14.3.1.1	With regard to "would counter the high atmospheric pressure." This text should read "high groundwater pressure;" atmospheric pressure does not change.

65	Enbridge	4-191	4.14.3.1.1	Insert "very" before unlikely in the following text "potential spill in the existing pipelines is unlikely."
66	Enbridge	4-192	4.14.3.1.1	Clarify that the Detroit River Outfall #2 was excavated with an open TBM which is not the same approach as for the GLTP where a pressurized TBM will be used.
67	Enbridge	4-192	4.14.3.1.1	Regarding the text "The main source of toxic gases would be from groundwater inflows into the Tunnel" it should be noted that the GLTP tunnel lining is sealed with a double gasket system to stop groundwater inflows, and excavated materials are kept fully enclosed in the slurry pipes, so water or gas inflows will be extremely limited.
68	Enbridge	4-192	4.14.3.1.1	The text "except for emergency ventilation emergency lighting and life safety support systems when concentrations of hazardous" should read "except for emergency ventilation emergency lighting and life safety support systems if concentrations of hazardous"
69	Enbridge	4-193	4.14.3.1.3	It should be mentioned that ground movements caused by tunneling at the pipeline locations will be negligible due to the lenght of rock between them.
70	Enbridge	4-194	4.14.3.2.1	State that geotechnical investigations for the GLTP found no evidence of gas.
71	Enbridge	4-194	4.14.3.2.1	The high pressures come from overburden and ground water pressure, not atmospheric pressure.
72	Enbridge	4-197	4.14.3.2.1	It is recommended to define what a bar is in relation to psi.1bar = 14.5psi

73	Enbridge	4-198	4.14.3.2.2	The DEIS incorrectly references 49 C.F.R. 192, and 49 C.F.R. 192.615. These PHMSA regulations apply to response planning for natural gas pipeline facilities. Line 5, including the Line 5 replacement segment located in the tunnel, is regulated by PHMSA as a hazardous liquids pipeline, and not a natural gas pipeline. The emergency response planning requirements under 49 C.F.R. 194 apply to Line 5. The requirements under 49 C.F.R 192 do not apply to Line 5.
74	Enbridge	4-205	4.14.6.2	The primary mitigation for potential collapse risks on GLTP is the selection of a closed mode (pressurized) TBM, with the tunnel lining and injected grout mixture sealing off the tunnel from potential groundwater inflows. For clarity, this could be listed as the first bullet point, with the other bullets providing secondary mitigations.
75	Enbridge	4-205	4.14.6.3	The ventilation system is required under OSHA regulations.
76	Enbridge	5-4	4.5.6	The part of the north LOD where Boulevard Drive will be raised is within 50-feet of the shoreline.
77	Enbridge	5-8	5.1	Reference to 49 C.F.R. 192.615 should be stricken and replaced with 49 C.F.R. 194. Part 192 applies to natural gas pipelines. Line 5, including the Line 5 replacement segment located in the tunnel, is regulated by PHMSA as a hazardous liquids pipeline, and not a natural gas pipeline. The emergency response planning requirements under 49 C.F.R. 194 apply to Line 5. The requirements under 49 C.F.R 192 do not apply to Line 5.
78	Enbridge	A-4	Table A-1	Footnotes associated with EGLE PA 451 Part 303 and 325 permit should be applied to EGLE NPDES permit.

79	Enbridge	A-4	Table A-1	New footnotes should be added to EGLE PA 451 Part 303 and 325 permit indicating a new application was submitted on March 3, 2025.
80	Enbridge	E-10	Table E-1	Enbridge notes that the DEIS, at Appendix E, E-10, indicates that an HDD installation was “[e]liminated from detailed analysis as not reasonable and practicable,” with a reference to “Enbridge 2018a.” To ensure the accuracy and completeness of USACE’s EIS, Enbridge notes that, in its September 15, 2023 response to PHE ID #20, Enbridge provided information supplementing its Report to the State of Michigan, Alternatives for Replacing Enbridge’s Dual Line 5 Pipelines Crossing the Straits of Mackinac (referenced in the DEIS as “Enbridge 2018a”). Enbridge’s response to PHE ID#20, which was based on HDD technological advancements since the Enbridge 2018a was completed, identifies “[a]n alternative to [the] HDD presented in [the Enbridge 2018a that would] drill the HDD crossing beneath the Straits from the north and south shores of the Straits using an intersect methodology.” The HDD method identified in Enbridge’s response to PHE ID #20 differs from the HDD method studied in the Enbridge 2018a in that the use of a coffer dam to complete the HDD is no longer required due to HDD technological advancements. Further, on June 24, 2025, Enbridge responded to EGLE’s June 13, 2025 Correction Request no. 3 concerning the Joint Permit Application filed with EGLE on March 3, 2025 that seeks a renewed Part 303 permit for the Great Lakes Tunnel Project. Question 1.a of EGLE’s correction request no. 3 requested additional information concerning alternatives to the GLTP. Enbridge’s June 24 response provides additional alternatives information that was generated in response to data requests by the U.S. Army Corps of Engineers, including PHE ID #20.

81	Enbridge	F-19	F1.2.1.3	Construction systems would be installed as tunnel advances. Permanent systems would be installed once tunnel excavation is complete, not as the tunnel advances.
82	Enbridge	F-22	F1.2.4	Updated BCY of excavated material were provided to USACE with Enbridge's comment on Appendix F dated March 20, 2025. The correct amounts are: 515,000 BCY will be transported to S1 and 17,000 BCY will be transported to N1. Correct throughout the DEIS (e.g., inaccurate BCY are also found in Section F1.2.4.1 on page F-26).
83	Enbridge	G-79	G3.4.1.1	The calculated inflow rates assume an unsealed 55-feet lenght of tunnel without the watertightness provided by the pressurized TBM and the gasketed lining, which would reduce any infiltration significantly. This subject is also addressed in a more detail in MacMillan Jacobs (2021e)
84	Enbridge	G-79	G3.4.1.1 (should be G3.4.1.2)	Contaminant Infiltration to Bedrock/Groundwater - Operations Calculations -The calculation in uses a higher pressure outside the tunnel than on the inside, so any flow would be into the tunnel. It would not be physically possible to have contaminant escape from the tunnel against the higher external pressure. -In addition, the inputs used in the calculation appear to be a mix of US customary and metric units -In addition, the assumed crack size overly conservative. Any cracks greater than 0.008" would be sealed in accordance with standard maintenance procedures for concrete, such as ACI 244.
85	Enbridge	G-80	G3.4.2	It should be noted that most of the water extracted from the lake will be treated and returned to the lake.

US Army Corps of Engineers
Detroit District

U.S. Army Corps of Engineers

ENBRIDGE LINE 5 TUNNEL PROJECT

Draft
Environmental Impact Statement

Executive Summary

May 2025





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Table of Contents

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1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

The United States (U.S.) Army Corps of Engineers (USACE), Detroit District, is evaluating the environmental impacts associated with Enbridge Energy, Limited Partnership's (the Applicant) proposal to construct a 3.6-mile tunnel (Tunnel or Project) under the lakebed of the Straits of Mackinac (the Straits), a waterbody that connects Lake Michigan and Lake Huron, which would house a replacement segment of the Applicant's Line 5 pipeline. The Line 5 Dual Pipeline segment (Dual Pipelines) currently consists of two 20-inch diameter pipes that are buried in sediment near shore and rest on, or are anchored to, the lakebed of the Straits. The proposed Tunnel would cross under the lakebed of the Straits, connecting Point La Barbe in Michigan's Upper Peninsula to McGulpin Point in Michigan's Lower Peninsula, in Mackinac and Emmet counties, respectively (see Figure ES-1 for Project location).

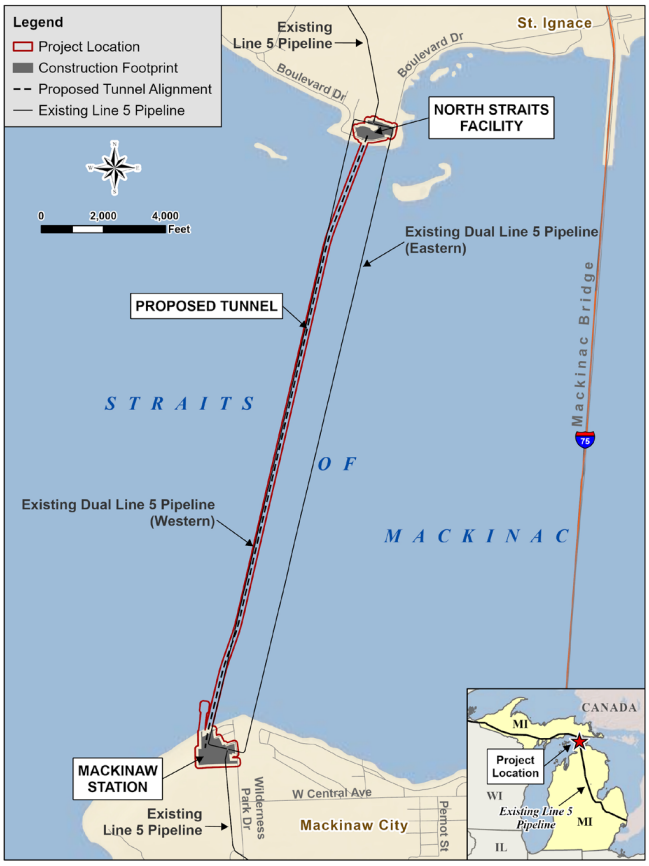


Figure ES-1. Project Location

The Project involves a federal action (Department of the Army (DA) authorization), which requires compliance with the National Environmental Policy Act of 1969 (NEPA) (Title 42 United States Code [U.S.C.] § 4321 *et seq*.). DA authorization for Projects that affect navigable waters of the U.S. (NWOTUS) is required pursuant to Section 10 of the Rivers and Harbors Act of 1899 (Title 33 U.S.C. Section 403). Discharges of dredged or fill material into waters of the U.S. (WOTUS), including wetlands, require DA authorization pursuant to Section 404 of the Clean Water Act (CWA) (Title 33 U.S.C. Section 1344). Decision options available to the USACE District Engineer are to issue the permit, issue with modifications or conditions, or deny the permit (33 Code of Federal Regulations [C.F.R.] Part 325, Appendix B Subparagraph 9(b)(5)). The DA permit review file number for the Project is LRE–2010–00463–56–A19.

Based in part on initial public input (inset at right), USACE determined that the proposed Project could significantly affect the quality of the human environment, and that the DA permit decision is a major federal action requiring preparation of an Environmental Impact Statement (EIS). The EIS identifies and assesses a reasonable range of alternatives, as well as the direct, indirect, and cumulative environmental consequences of those alternatives, in order to identify options to avoid and minimize detrimental effects on the quality of the human environment.

Early Public Notices & Reviews

Initial Public Notice
May 15 to July 14, 2020

Public Hearing Written Comment Period
November 7 to December 17, 2020

Public Hearing
December 7, 2020

1.2 PURPOSE OF THE EIS & PUBLIC INPUT

The EIS will inform USACE's permit decision, but it is not a decision document. USACE will issue a Record of Decision (ROD) at the conclusion of the NEPA process (See Figure ES-2). The ROD will document USACE's permit decision, including USACE's public interest review (Title 33 C.F.R. § 320.4) and determination of whether the proposed Project complies with the U.S. Environmental Protection Agency's (USEPA's) Section 404(b)(1) Guidelines (40 C.F.R. § 230). The ROD will also summarize the USACE's NEPA analysis and will include the findings of the USACE's treaty rights analysis and its review under Section 106 of the National Historic Preservation Act (NHPA).

To proceed with Project construction, the Applicant must receive authorization from USACE, as well as approvals from other federal, state, and local agencies. Appendix A of the EIS contains a summary and status of required permits.

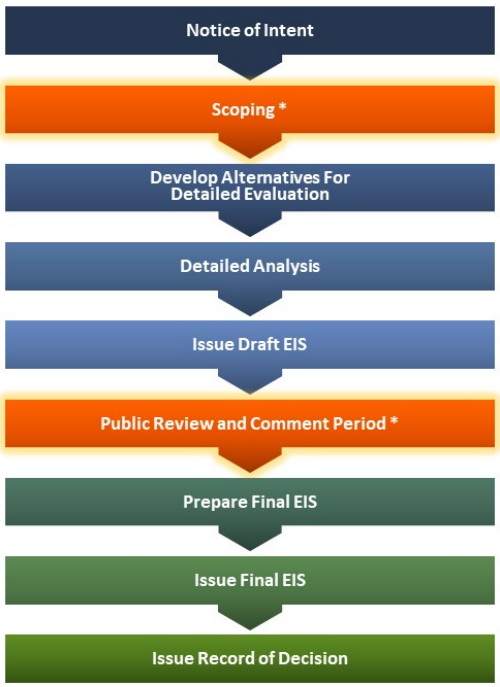


Figure ES-2. NEPA Process and Opportunities for Public Involvement

The EIS process starts with a public scoping process (inset below). The Scoping Report in Appendix B provides details regarding the scoping period and the nature of comments received.

EIS Public Scoping

Notice of Intent to Prepare an EIS
August 15, 2022

Public Scoping
August 15 to October 14, 2022
(17,788 comments)

Scoping Meetings
September 1 and October 6, 2022 (virtual)
September 8, 2022 (in-person in Saint Ignace, MI)

www.Line5TunnelEIS.com

Tribal Nations and federal, state, and local resource agencies (agencies) were notified of public comment opportunities and invited to attend scheduled public meetings. USACE held Tribal consultation meetings and additional meetings with Tribal Nations and other agencies, including NHPA Section 106 Consulting Parties, as needed throughout development of the EIS. Tribal Nations and federal, state, and local resource agencies (agencies) were notified of public comment opportunities and invited to attend scheduled public meetings. Additional meetings with Tribal Nations and other agencies, including National Historic Preservation Act Section 106 Consulting Parties, were held as needed throughout development of the EIS.

USACE also invited Tribal Nations and federal and state agencies to participate as Cooperating Agencies[1]. Cooperating Agencies contributed to the Draft EIS development by providing information, participating in technical teams, and reviewing draft documents. During Draft EIS development, the Tribal Nations withdrew from Cooperating Agency status in March of 2025.

[1] A cooperating agency is any federal agency, other than a lead agency, which has jurisdiction by law or special expertise with respect to Project environmental impacts or alternatives. Tribes, state or local agency of similar qualifications, may, by agreement with the lead agencies, also become a cooperating agency.

Although the Tribal Nations are no longer participating in the development of the EIS as Cooperating Agencies, they will still have the opportunity to comment on the Draft EIS during the public comment period.

The Advisory Council on Historic Preservation (ACHP), Bureau of Indian Affairs, Pipeline and Hazardous Materials Safety Administration (PHMSA), and U.S. Fish and Wildlife Service (USFWS) all declined to be Cooperating Agencies. Cooperating Agencies for this Project include the USEPA Region 5; U.S. Coast Guard, Ninth District; and Michigan State Historic Preservation Office.

1.3 SCOPE OF ANALYSIS

The USACE's scope of analysis is defined based on its regulatory authorities and the activities where there is sufficient federal control and responsibility to warrant federal review. The activities within USACE's scope of analysis include:

- Construction of the proposed Tunnel between the tunnel-boring machine (TBM) entry and exit portals
- Associated construction activities, equipment use, and materials staging within the Project construction footprints, including site restoration
- Transport and disposal of spoils material
- Select operation and maintenance activities related to the Tunnel and structures within it
- Decommissioning of the existing Dual Pipelines as proposed by the Applicant

Not all activities or potential impacts described in this EIS fall within USACE authority, or the authority of other federal agencies. Section 1.5 and Appendix D of the EIS provides information regarding the scope of analysis and regulatory authorities for the proposed Tunnel and pipeline construction and operations, respectively.

1.4 PROJECT PURPOSE AND NEED

The Purpose and Need statement is what USACE is responding to and provides the framework in which ‘‘reasonable alternatives’’ are identified. Before defining the Project purpose, the Project need must be established. The USACE independently defines the project purpose and need for its analysis, while considering the Applicant's input and the public interest perspective (33 C.F.R. Part 325, Appendix B). The USACE relies on its defined project purpose and need in identifying "reasonable alternatives" to the Applicant's proposal for evaluation. USACE's public interest review will be developed with information contained in this EIS and will be documented in the ROD.

1.4.1 Project Need

1.4.1.1 Tunnel Agreement

The State of Michigan and the Applicant entered into an agreement on December 19, 2018 requiring the Applicant to design, construct, operate, and maintain a Tunnel to replace the existing Dual Pipelines in the Straits. The State entered the agreement to "eliminate the risk of a potential release from Line 5 at the Straits…. And in furtherance of the public's interest in the protection of waters, waterways, or bottomlands held in public trust by the State of Michigan." The Agreement requires the Applicant to comply with past agreements and the 1953 easement[2], including financial assurances, inspection of pipeline coatings and visual inspections (State of Michigan and Enbridge 2018).

USACE was not a party to the State of Michigan's negotiations or agreements with the Applicant. These agreements and the State's legislation do not obligate USACE to take any particular course of action.

1.4.1.2 Continued Product Transport

The Applicant states that the Straits crossing, which currently transports approximately 540,000 barrels per day (bpd) of light crude oil and natural gas liquids (NGLs) to markets in the U.S. and Canada, is needed to (Enbridge 2023a):

- Receive petroleum products from the existing northern segment of Line 5 extending from Superior to the Line 5 North Straits Facility (located north of the Straits)
- Transport those petroleum products to the existing Line 5 Mackinaw Station (located south of the Straits) to allow for further delivery on the existing southern segment of Line 5 extending to Sarnia

The Applicant states that the northern and southern segments of the pipeline cannot operate independently due to engineering and business reasons, including existing connections and delivery destinations. The pipeline delivers petroleum products to refineries in Michigan, Ohio, Pennsylvania, Ontario, and Quebec. Market demand for these products in the Eastern North Central region of the U.S., which consumes much of the commodities transported by Line 5, remains steady or slightly increases through 2050, according to the U.S. Energy Information Administration (EIA 2025). Furthermore, these projections were calculated prior to the Executive Office of the President revoking and replacing previously established energy policies as part of its directive to encourage domestic energy exploration and production (DOE 2025). The USACE determined the current needs for transport of the pipeline products are supported by their existing use, and the need for the pipeline products in the foreseeable future is supported.

[2] In the December 19, 2018 agreement itself, the definition of "1953 Easement" means "Straits of Mackinac Pipe Line Easement [granted by] Conservation Commission of the State of Michigan to Lakehead Pipe Line Company, Inc. (Lakehead) executed April 23, 1953." Lakehead was an American subsidiary to Interprovincial Pipe Line Company, Inc (now Enbridge Energy, Limited Partnership).

1.4.1.3 Minimize Environmental Risks

The Applicant has stated that the Project would enhance protection of the Great Lakes by providing secondary containment for a new replacement segment for the existing Dual Pipelines, minimizing the environmental risks of a potential release from Line 5 in the Straits. In the 2018 Tunnel Agreement referenced above, the State indicated that the proposed Tunnel would address this need.

For the purposes of this review, "Minimizing environmental risks" means reducing the risk of physical strikes (e.g., vessel anchor) and/or providing secondary containment for existing or proposed pipelines transporting petroleum products across the Straits.

Comments received during the scoping process assert that the Applicant's Preferred Alternative would not provide secondary containment because there is a risk that potential methane in the substrate or a leak from the new pipeline could result in an explosion that would destabilize the proposed Tunnel. The Applicant has asserted that methane is not present in the Straits at a concentration to present an explosion risk and that there is virtually no risk of explosion in the Tunnel from operations of the Line 5 Replacement Segment. USACE's analysis will assume that the Applicant would comply with all laws, regulations, and conditions of issued permits. The screening of alternatives is based on a qualitative analysis of available information. In light of conflicting statements regarding the risk of explosion and potential for loss of secondary containment, the determination whether it is reasonably foreseeable that the Tunnel may lose secondary containment due to explosion is considered in Chapter 4 of the EIS.

1.4.2 Project Purpose

The Applicant's stated Project purpose is to fulfill its contractual obligations to the State of Michigan (i.e., the Tunnel Agreement) and to enhance protection of the Great Lakes by providing secondary containment.

Title 33 C.F.R. Part 325, Appendix B, paragraph 9(b)(4) states that, "If the scope of analysis for the NEPA document (see paragraph 7b) covers only the proposed specific activity requiring a Department of the Army permit, then the underlying purpose and need for that specific activity should be stated." Based on USACE's authority and scope of analysis, the purpose and need statement focuses on the waterway crossing itself, including the activities that would occur between two logical termini on either end of the waterway crossing. As an existing pipeline, the existing products, capacity, and infrastructure on the north and south shores of the Straits are primary considerations in USACE's definition of the Project purpose and need. Safety improvements appear to be the underlying need addressed in the State of Michigan's negotiations and agreements with the Applicant, and USACE will evaluate the opportunity for safer transport of the pipeline products.

USACE determined that the purpose for the Project is to *provide safe transportation of light crude oil, light synthetic crude oil, light sweet crude oil, and NGLs between the Applicant's existing North Straits Facility and Mackinaw Station, and to approximately maintain the existing capacity of the Line 5 pipeline while minimizing environmental risks*.

2 ALTERNATIVES

NEPA requires evaluation of a reasonable range of alternatives that would accomplish a project's underlying purpose and need, and to inform decision-makers of the consequences of the Proposed Action. Reasonable alternatives include the No Action Alternative, the Applicant's Preferred Alternative, and other reasonable alternatives. Rationale for eliminating alternatives from detailed study is provided in the EIS.

Title 33 C.F.R. Part 325, Appendix B, USACE's Procedures for Implementing NEPA, Paragraph 9(b)(5), Alternatives, establishes that the "Corps is neither an opponent nor a proponent of the applicant's proposal"; therefore, the Applicant's final proposal will be identified as the 'Applicant's Preferred Alternative'.

2.1 CWA REQUIREMENTS

The USACE federal permit program requires all applicants for a DA permit under Section 404 of the Clean Water Act to avoid and minimize impacts to WOTUS. The substantive criteria used to evaluate permit alternatives are the Section 404(b)(1) Guidelines (40 C.F.R. Part 230). The Guidelines require the evaluation of "practicable alternatives," and are used to identify the Least Environmentally Damaging Practicable Alternative to ensure that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences" (40 C.F.R. § 230.10(a)). The Guidelines define an alternative as practicable "if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the Applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered" (40 C.F.R. § 230.10 (a)(2)).

2.2 USACE PUBLIC INTEREST REVIEW

USACE's decision on whether to issue a permit is also based on an evaluation of the probable impacts, including cumulative impacts, of the Project and its intended use on public interest (Title 33 C.F.R. § 320.4(a)(2)(ii)). As part of this process, USACE considers the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed work where there are unresolved conflicts as to resource use.

2.3 DEVELOPMENT OF ALTERNATIVES

USACE evaluated numerous alternatives against the screening criteria described below to identify alternatives to carry forward for detailed analysis in the EIS. USACE considered a variety of sources in its initial identification of a wide range of alternatives for screening, including public, Tribal Nation, and Cooperating Agency input, State-commissioned analyses, Applicant-provided information, and industry studies and evaluations (including opposition).

2.3.1 Screening Criteria

The USACE evaluated and screened alternatives while considering both the NEPA requirements and the Section 404(b)(1) Guideline requirements. The alternatives analysis in the EIS satisfies both NEPA and Section 404(b)(1) requirements. USACE examined the full scope of possible alternatives and components and systematically screened each alternative using the sequential three-tiered approach described below. If an alternative failed to meet a screening criterion, USACE did not screen the alternative against subsequent screening criteria. Only those alternatives (with the exception of the No Action Alternative, which is a NEPA requirement) meeting all three criteria were carried forward for detailed analysis in the EIS.

Criterion 1. Does the alternative meet the purpose and need? Relevant considerations include:

- Does the alternative provide for transport of pipeline products between the Applicant's existing North Straits and Mackinaw Station facilities?
- Does the alternative approximately maintain Line 5's existing capacity (annual average of approximately 540,000 bpd)?
- Does the alternative minimize environmental risks and provide for safe transport?

Criterion 2. Are the alternative(s) that meet Criterion 1 reasonable and practicable? Relevant considerations included:

- Is the alternative technically and economically feasible?
- Is the alternative available and capable of being implemented after taking into consideration cost, existing technology, and logistics?

Criterion 3. Might the alternative(s) that meet both Criteria 1 and 2 have less environmental impacts than the Applicant's Preferred Alternative? Relevant considerations included:

- The Project footprints and best available information to characterize natural and cultural resources within each alternative.
- Alternatives or sub-alternatives that had apparent equal or greater environmental impacts than the Applicant's Preferred Alternative were removed from detailed consideration.

2.3.2 Results of Alternative Screening

Appendix E in the EIS summarizes the results of applying USACE's screening criteria, which resulted in the following alternatives being carried forward for detailed analysis (see Appendix F for additional details on the alternatives and Figure ES-3 for general locations):

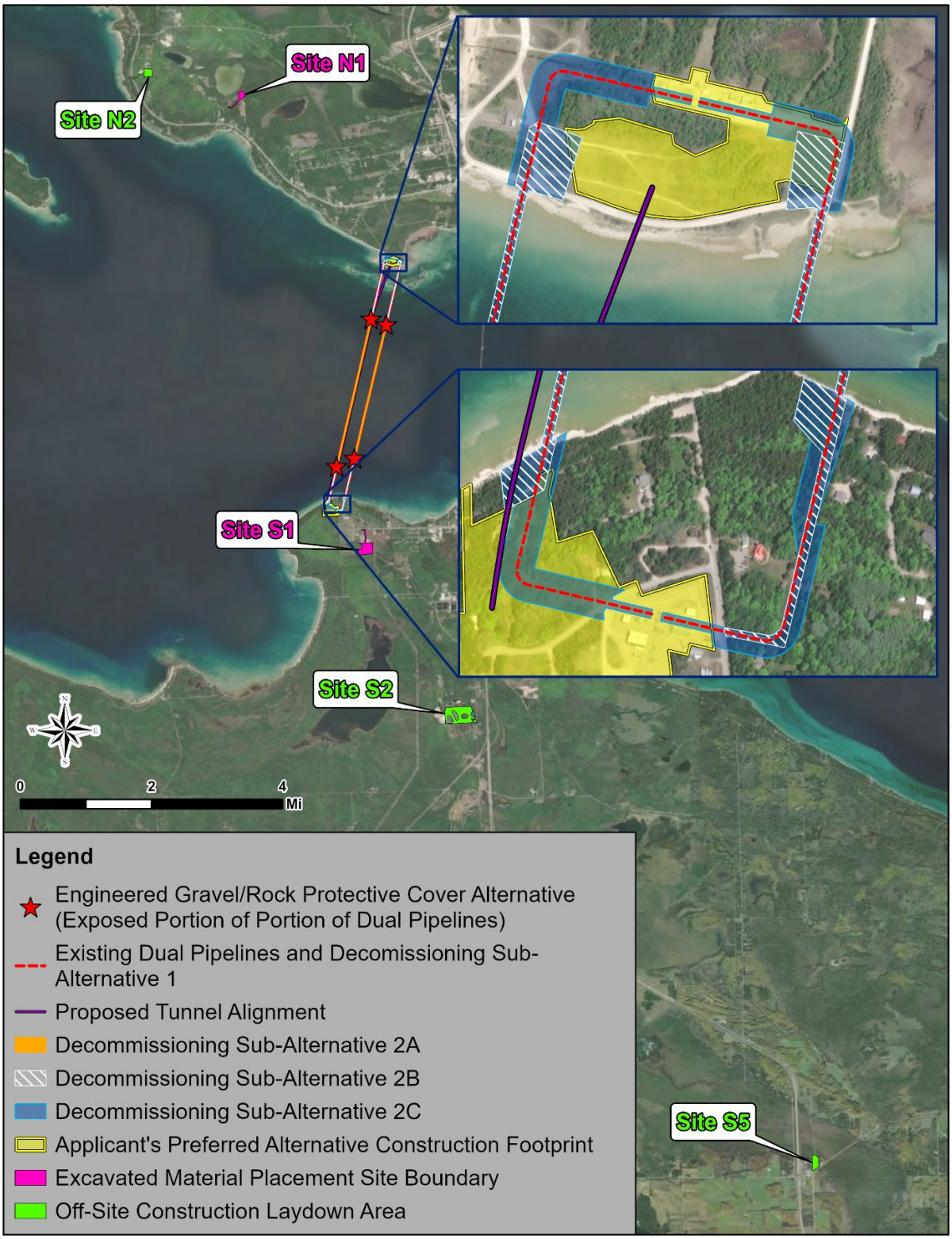
***No Action Alternative*:** USACE permit denial and continued operation of the existing Dual Pipelines. The No Action Alternative is required by NEPA as a baseline condition for comparing environmental effects.

***Applicant's Preferred Alternative*:** As noted, this involves construction of a Tunnel under the Straits and includes two excavated material placement sites (EMPS) S1 and N1 ('S' designates south of the Straits and 'N' designates north of the Straits), and three off-site laydown areas S2, S5, and N2 (see Figure ES-3). Other EMPS and off-site laydown area locations were screened and removed from detailed analysis (see Appendix E in the EIS).

***Engineered Gravel/Rock Protective Cover Alternative*:** Placement of an engineered gravel/rock protective cover over the exposed portions of the existing Dual Pipelines as an alternative to the Applicant's Preferred Alternative.

Sub-Alternatives

USACE considered a number of sub-alternatives that do not constitute a complete project on their own. Rather, they must be combined with one or more alternatives to make a complete project. USACE considered sub-alternatives to the proposed designs/layouts of the Applicant's Preferred Alternative (e.g., location and type of Tunnel entrance, location of EMPS and associated haul routes). USACE also considered decommissioning sub-alternatives, which must be combined with the Applicant's Preferred Alternative to make a complete project. These sub-alternatives are carried through the EIS for detailed analysis.



*Note: The Engineered Gravel/Rock Alternative involves only exposed portions of the existing Dual Pipelines along the lakebed. Its footprint (not shown due to scale) would include an approximately 72-foot wide disturbance along each of the Dual Pipelines (36 feet along either side of each existing pipeline's centerline).

Figure ES-3. Alternatives Analyzed in the EIS

***Decommissioning Sub-Alternative 1*:** Decommissioning the Dual Pipelines and abandon in-place, after cleaning and plugging. Note that Decommissioning Sub-Alternative 1 as shown on Figure ES-3 is the same as the "Dual Pipelines" shown on the figure.

***Decommissioning Sub-Alternative 2a*:** Decommission the Dual Pipelines, partially in-place, removing exposed portions of the pipeline segments along the lakebed. Similar to Sub-Alternative 1, this would include cleaning of the entire line and plugging the remaining segments.

***Decommissioning Sub-Alternative 2b*:** Decommission the Dual Pipelines, partially in-place, removing pipeline segments within the lake between the ordinary high water marks. Similar to Sub-Alternative 2a, this would include cleaning of the entire line and plugging the remaining segments.

***Decommissioning Sub-Alternative 2c*:** Decommission and fully remove the Dual Pipelines, including buried, onshore segments. Similar to Sub-Alternative 1, this would include cleaning of the entire line prior to removal.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The Affected Environment (EIS Chapter 3) provides the context to understand the Environmental Consequences (EIS Chapter 4) of the Project alternatives and sub-alternatives. Where possible, USACE has incorporated consideration of Indigenous Knowledge and Traditional Ecological Knowledge into resource descriptions and evaluation of consequences. Table ES-1 summarizes the resources and consequences discussed in the EIS. Consequences are characterized using the terminology provided in the inset at the right and using the *Legend* that follows Table ES-1.

Terminology	
Effects	**Definition**
Direct	Caused by the Project at the same time and place.
Indirect	Caused by Project but occurring later in time or farther removed in distance.
Cumulative	The incremental impact of a Project when added to the effects of other past, present, and reasonably foreseeable future actions (see Appendix H of the EIS).
Short-Term	Impacts generally occurring during construction that resolve upon construction completion.
Long-Term	Permanent, long-term impacts that do not resolve after construction.
Beneficial	A positive change in resource conditions when compared to the No Action Alternative.
Detrimental	A negative change in resource conditions when compared to the No Action Alternative.

The EIS also considers the context of potential impacts, such as the likelihood of the impact (unlikely, possible, or probable) and the geographic scope of the effect or size of the population affected (e.g., localized or regional). In addition, magnitude or intensity are considered, which is measured in terms of change or degree of change in a resource condition (e.g., acres of impact, number of units of change, differences in levels of use compared to existing conditions, etc.). Appendix G of the EIS includes calculations related to determinations of magnitude or degree of impact. As applicable, the impact discussions also summarize USACE review compliance under 33 C.F.R. Part 320 as it relates to the DA authorization.

Table ES-1. High-Level Summary of Impacts

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
Land Use and Recreation						
Land Ownership and Land Use						
No impact	Change of land ownership may occur at EMPS/off-site laydown areas as the Applicant may purchase land within the sites or acquire temporary and/or permanent easements. Direct, long-term/permanent, detrimental impacts associated with a change from undeveloped forest land to developed industrial land, and from permanent alteration of geology along the proposed Tunnel alignment.	Authorization from the State of Michigan would be required for installation of the cover on State-managed Straits bottomlands. Direct, permanent, detrimental impacts to Straits bottomlands/lakebed due to a change from a natural to an armored state.	No impact.	State authorization required for work on Straits bottomlands.	State authorization required for work on Straits bottomlands.	State authorization required for work on Straits bottomlands.
Recreation – Land Based						
Current maintenance and surveillance practices would result in occasional ground disturbing activities, resulting in direct, short-term, detrimental impacts to land-based recreation	Direct, detrimental impacts to nearby recreationists due to noise and aesthetic effects of construction. Impacts would end when construction is complete. Impacts associated with blasting would occur during initial shaft excavation only. Headlands International Dark Sky Park, McGulpin Lighthouse, Mackinaw Area Historic Society Heritage Village, Colonial Michilimackinac Historic State Park, Castle Rock, the Straits	Direct, detrimental impacts to nearby recreationists due to noise and aesthetic effects of construction. Impacts would end when construction is complete. McGulpin Lighthouse, Colonial Michilimackinac Historic State Park, and the Straits of Mackinac may experience direct, detrimental impacts from construction noise and aesthetic changes. Impacts would end when construction is complete. No operations impacts expected.	Passive recreationists (e.g., birders and shoreline walkers) could experience direct, short-term, detrimental impacts from increased vehicle use/activity in the vicinity of existing onshore facilities.	Increased noise and the visual effects of decommissioning activities would result in direct, short-term, detrimental impacts to passive recreationists along the shoreline.	Direct, short- and long-term, detrimental impacts to land recreation due to required onshore workspace. Nearby recreationists (including those at McGulpin Point Lighthouse) may experience construction noise/visual effects.	Ground disturbance and increased land requirements for temporary workspace would result in greater direct and indirect detrimental impacts to recreationists along Straits shorelines than described for Sub-Alt 2b. Impacts would end when decommissioning activities are complete, with the exception of long-term impacts

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
occurring nearby.	of Mackinac, and Hiawatha National Forest may experience direct, detrimental impacts from construction noise and aesthetic changes. Impacts would end when construction is complete. During construction, there would be direct, detrimental impacts to the Headlands International Dark Sky Park due to lighting increases. Impacts would end when construction is complete. During operations, there would be no impacts to night sky tourism.	Vessels would be lit for navigational purposes during nighttime construction; however, lighting would not extend to the park. There would be no impacts to the Headlands International Dark Sky Park.				associated with tree clearing.
Recreation – Water Based						
Current maintenance and surveillance practices would result in occasional temporary closures to nearby water-based recreation, resulting in direct, short-term, detrimental impacts.	Direct, short-term, detrimental impacts to recreationists near the shoreline (including along the Straits Area Blueway Water Trail) or water intake structure/pipe primarily due to aesthetic effects, although access to the area where the intake structure/pipe would be installed would be limited. Impacts would end when construction is complete. During operations, there would be indirect, long-term, beneficial impacts as there would be no need for future inspections or maintenance of the Dual Pipelines requiring	Direct, short-term, detrimental impacts as recreational vessels would have to avoid the paths and anchored locations of construction vessels. Recreationists may experience aesthetic impacts that could change recreational experience. Construction-related impacts would end when construction is complete. Direct, long-term, intermittent, detrimental impacts when repairs to the cover are required. Monitoring and maintenance of the cover/pipelines would be similar to current operations.	Indirect, long-term, beneficial impacts to water recreation due to the elimination of monitoring or maintenance of the Dual Pipelines.	Direct, short-term, detrimental impacts to water recreation as vessels would have to avoid the paths and anchored locations of construction vessels. Increased noise and the visual effects of decommissioning activities would result in direct, short-term, detrimental impacts to water recreationists. Beneficial impacts	Direct, short-term, detrimental impacts to water recreation similar to Sub-Alt 2a but over a longer duration and within a larger area. Due to removal of nearshore pipe, the Straits Area Blueway Water Trail would be affected. Beneficial impacts would be the same as Sub-Alt 1. Temporary closures of the public launch	Direct, short-term, detrimental impacts to water recreation would be the same as described under Sub-Alt 2b. Beneficial impacts would be the same as Sub-Alt 1.

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
	localized closures within the Straits. The existing RNA would stay in place due to the presence of other nearby utilities.	The existing RNA over the Dual Pipelines would remain in place with no modifications.		would be the same as Sub-Alt 1.	at Headlands Road may occur.	
Aesthetics						
Temporary changes to aesthetics could occur as a result of maintenance activities requiring minor ground disturbance, resulting in detrimental, short-term impacts.	Direct, short-term, detrimental impacts to local visual resources could result from the presence and use of construction equipment, staging and laydown areas, and barges. Cranes (up to 434 feet tall) extending above the tree line would be visible, specifically in open areas not screened by trees or structures. The crane would appear smaller and less dominant in the viewscape with increasing distance. Direct, long-term, detrimental impacts to visual resources during operations from the establishment of permanent facilities, which could be visible from some shorelines. Direct, detrimental impacts to the localized soundscape would be probable for the duration of construction, ending following construction.	Direct, short-term, detrimental impacts during construction could result from the presence and use of construction equipment and barges, which would be visible in open areas not screened by trees. Comparatively, less visual resources would be impacted by activities under this alternative due to the lower vertical profile of equipment. There would be no impacts during operations. Direct, short-term, detrimental impacts to the soundscape would be localized and would be substantially lower than those identified under the Applicant's Preferred Alternative. Impacts would occur within the 1,500-foot buffer and would result from barge and construction equipment usage. Impacts would be comparatively lesser under this alternative.	Direct, short-term, detrimental impacts to local visual resources could result from the use of construction equipment and/or vehicles in addition to increased employee commuting. Impacts would end once decommissioning activities are complete. Direct, short-term, detrimental impacts to the local soundscape due to construction equipment usage and/or vehicles in addition to increased employee commuting. Impacts would end following decommissioning activities.	Direct, short-term, detrimental impacts during decommissioning could result from the presence and use of construction equipment, staging and laydown areas, and barges. Barge activity would be visible from points along the Straits not screened by trees. Impacts would end once decommissioning activities are complete. Direct, short-term, detrimental impacts to the local soundscape could result due to equipment/barge usage. Impacts would end once decommissioning activities are complete.	Impacts would be similar to Sub-Alt 2a, although impacts would last longer. Impacts would end once decommissioning activities are complete.	Impacts would be similar to Sub-Alt 2a, although impacts may last longer. Additionally, full removal of onshore portions of the Dual Pipelines would cause direct, temporary, detrimental visual impacts within the existing Line 5 ROW extending from the shoreline to the North Straits and Mackinaw Station facilities. Tree and vegetation clearing would be required along both the south and north shorelines to accommodate necessary on-shore workspace which would create a long-term detrimental visual impact until vegetation is restored to existing conditions.

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
Water Resources						
Groundwater						
No Impact	Direct, detrimental impacts would occur for the duration of shaft/portal construction (6/8 months, respectively) and during TBM operations. Maximum drawdown during shaft/portal construction would be 2 feet within a 360-foot radius. Aquifer testing along the Tunnel alignment indicated that the aquifer would recover within a few days of TBM operations in a given location. Potential for direct, detrimental impacts to groundwater quality, due to a potential release of drilling fluids during HDD/TBM use, a potential release of contaminants associated with onshore material storage, and use of heavy equipment/vehicles. The associated impacts would end following construction. The construction contractor would adhere to the Spill Plan, and monitoring of onsite and nearby wells would be conducted during construction and for 2 years after.	No Impact	No Impact	No Impact	Potential direct, detrimental impact if excavation equipment interacts with shallow groundwater.	Potential direct, detrimental impact if excavation equipment interacts with shallow groundwater.
Surface Water						
Continued maintenance	Direct, detrimental impacts associated with disturbance in	Permanent disturbance would occur along the Straits	No Impact	Direct, detrimental impact associated	Direct, detrimental impact associated	Potential for direct, detrimental impacts to

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	Applicant's Preferred Alternative	Engineered Gravel / Rock Protective Cover	1	2a	2b	2c
activities could require occasional, temporary ground disturbance activities onshore, resulting in direct, detrimental impacts associated with erosion and sedimentation.	the Straits of approximately 800 sf during installation of water intake structure/pipe. Approximately 20,000 gallons of drilling fluid (water and bentonite) would be released. Both features would be removed post-construction. During structure/pipe installation, effects of turbidity and sedimentation would be limited to the work area (contained by turbidity curtains). In-water work would last approximately 1 week. Approximately 31.4 acres total ground disturbance would occur within proposed construction footprints, which could result in direct, detrimental impacts to surface waters adjacent to construction footprints due to erosion and sedimentation. Adherence to the SESC plan and required permits (including NPDES) would mitigate this. Long-term increases in stormwater associated with impervious surface increase would be managed by the permanent stormwater system. During construction, there would be potential for direct, detrimental impacts associated with unintended release of	lakebed from placement of gravel/rock. This would result in direct, detrimental impact to approximately 38 acres of lake bottom, converting natural habitat from pebbles, sands, and silts to armored gravel/rock. Potential for direct, detrimental impacts associated with release of contaminants due to vessel fueling and use of material storage barges (see EIS for mitigation measures). Impact would occur during construction only.		with disturbance in the Straits/coastal zone along the Dual Pipelines where exposed along the lakebed (approximately 12,200 feet along the western pipeline and 11,100 feet along the eastern pipeline). Turbidity would be localized to the immediate area where work is occurring and would dissipate when work is completed in that location. Potential for direct, detrimental impacts to the Straits/coastal zone due to potential release of contaminants associated with use of material barges and onshore material storage/use of heavy equipment/vehicles. Impact would occur during construction only.	with disturbance in the Straits/coastal zone/CBRS along the Dual Pipelines between the OHWM (approximately 19,473 feet along western pipeline and 19,154 feet along eastern pipeline). Excavation of buried pipeline in Straits would result in disturbance to 566,160 sf. Turbidity would be localized to the immediate area where work is occurring and would dissipate when work is completed in that location. Potential for direct, detrimental impacts to the Straits/coastal zone/CBRS due to potential release of contaminants, as described for Sub-Alt 2a, but over a greater time period and larger area within the Straits. Impact would occur	the Straits/ coastal zone/CBRS would be the same as Sub-Alt 2b. Direct, detrimental impacts to onshore surface waters/wetlands due to ground disturbance and equipment use. Impact would cease post-construction. Onshore ground disturbance associated with removal of buried, onshore pipeline segments would result in direct, detrimental impact to up to 500 linear feet of Stream 01 and approximately 4.17 acres of wetlands. Disturbed areas would be restored post-construction.

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
	contaminants, such as equipment fuel (see EIS for mitigation measures).				during construction only.	
Wetlands						
Continued maintenance activities could require occasional, temporary ground disturbance activities onshore, resulting in direct, detrimental impacts associated with erosion and sedimentation.	Direct, detrimental impact to wetlands due to permanent wetland losses (1.53 acres within North Side construction footprint and 2.79 acres at EMPS/off-site laydown areas). Indirect, detrimental impact due to fragmentation of wetland systems, and/or if loss of hydrology results in unanticipated additional permanent wetland losses. Erosion and sedimentation impacts to wetlands outside the construction footprint would be mitigated by implementing the SESC plan and complying with permits (including NPDES). See EIS for mitigation measures related to the risk of contaminant exposure during construction.	No Impact	No Impact	No Impact	Vegetation clearing (and potentially material storage) would occur within 0.47 acre of wetland.	Onshore ground disturbance associated with removal of buried, onshore pipeline segments would result in direct, detrimental impact to approximately 4.17 acres of wetlands.
Biological Resources						
Terrestrial Habitat						
Maintenance activities would continue to require occasional, temporary ground	Direct, short- and long-term, detrimental impacts to existing local natural communities would occur due to vegetation removal. Construction of new facilities and infrastructure would require ground	No Impact	No Impact	No Impact	Required onshore workspace would have a direct, temporary, detrimental impact to approximately 6	Required onshore workspace would have a direct, temporary, detrimental impact to up to 15.5 acres of terrestrial communities and wildlife habitat due

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
disturbance, resulting in direct, detrimental impacts to natural communities and habitat within the Dual Pipelines ROW.	disturbance and removal of up to 19 acres of existing vegetation, of which approximately 5.2 acres are forested. Potential for direct, detrimental impacts to wildlife due to noise caused by HDD/TBM and associated blasting activities during site preparation, as well as from the use of construction equipment and presence of workers for the duration of construction. Impacts would end following completion of the respective construction phases.				acres of terrestrial natural communities and wildlife habitat. These areas would be restored post-construction; however, impacts to forested areas would be long-term.	to removal of onshore portions of the Dual Pipeline. Potential for terrestrial contamination release due to presence of construction equipment and ground disturbance (up to 15.5 acres) during removal of onshore portions of the Dual Pipelines. Impacts would end when decommissioning activities are complete.
Aquatic Habitat						
No Impact	Construction could result in vibrations along portions of the lakebed, resulting in direct, detrimental impacts during construction activities. Potential for direct, detrimental impacts to aquatic species due to noise and vibration caused by HDD/TBM and associated blasting activities during site preparation, as well as from the use of construction equipment and presence of workers for the duration of construction. Impacts would end following completion of the	Direct, short- and long-term, detrimental effects to approximately 38 acres of the lakebed from placement of rocks and gravel. Addition of gravel/rock could result in direct, detrimental impacts to aquatic organisms within the substrate; however, addition of gravel/rock could benefit certain species of fish that prefer rocky substrates. Potential for detrimental impacts to aquatic organisms resulting from underwater noise. However, noise levels generated under this	No Impact	Detrimental disturbance to aquatic habitat in the Straits would occur along exposed portions of the Dual Pipelines (approximately 12,200 feet along the western pipeline and 11,100 feet along the eastern pipeline). Direct, temporary, detrimental impacts localized to the immediate area	Detrimental disturbance to aquatic habitat in the Straits would occur along the Dual Pipelines between the OHWM (approximately 19,473 feet along the western pipeline and 19,154 feet along the eastern pipeline). Direct, temporary, detrimental impacts localized to the immediate area	Detrimental disturbance to aquatic habitat in the Straits would be the same as under Sub-Alt 2b. Impacts from turbidity in the Straits would be the same as described for Sub-Alt 2b. Potential for contaminant release from material barges similar to Sub-Alt 2b. Impacts would end when decommissioning activities are complete.

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
	respective construction phases. Detrimental impacts associated with turbidity and sedimentation would be localized to HDD work area (contained by turbidity curtains), ending following HDD installation (in-water work to take approximately 1 week). Release of drilling fluids (approximately 20,000 gallons) into the Straits during HDD and potential release of contaminants associated with onshore material storage and use of heavy equipment/ vehicles.	alternative would be lower and shorter duration than those resulting from implementation of the Applicant's Preferred Alternative. Temporary and detrimental impacts of extensive turbidity associated with placement of gravel/rock along the entire length of the Dual Pipelines exposed along the lakebed for the duration of construction, which would end following construction. Turbidity would be localized to the area of work at any given time. Potential release of contaminants due to vessel fueling and use of material storage barges.		where work is occurring. Turbidity would dissipate when work is completed in that location. Potential detrimental release of contaminants associated with use of material barges during construction. Impacts would end when decommissioning activities are complete.	where work is occurring. Turbidity would dissipate when work is completed in that location. Potential for contaminant release from material barges similar to Sub-Alt 2a, but a greater potential area for detrimental impacts through release of contaminants associated with onshore workspaces. Impacts would end when decommissioning activities are complete.	
Protected Species						
No Impact	Loss of approximately 7.7[1] acres of suitable summer habitat for northern long-eared bat and tricolored bat, including a total of 287 potential roost trees. The Applicant has committed to tree clearing outside the pup season (June/July). Approximately 7.95 acres of habitat with known DLI and HG populations	A search of USFWS IPaC did not identify federally-protected aquatic species in the vicinity of the Dual Pipelines. If the Applicant were to pursue this alternative, further study and/or coordination with USFWS may be required.	No Impact	No Impact	Due to nearby documented occurrences of protected species (see column for Applicant's Preferred Alternative), it is possible that impacts could occur. If the Applicant were	Due to nearby documented occurrences of protected species (see column for Applicant's Preferred Alternative), it is possible that impacts could occur. If the Applicant were to pursue this sub-alt,

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
	would be cleared. Coordination with USFWS and MDNR regarding plant mitigation is ongoing.				to pursue this sub-alt, coordination would be required.	coordination would be required.
Cultural Resources						
Ground disturbance during maintenance activities could affect archaeological resources, depending on the location of the disturbance.	Construction and operation would result in adverse effects to archaeological sites and an archaeological district, a TCL, and potentially nearby architectural resources. Activities such as site grading, excavation, fill, and use of construction equipment during the duration of construction activities would remove or destroy archaeological resources within the construction footprints. USACE continues consultation with Consulting Parties and will prepare detailed documentation on identification and evaluation of impacts to historic properties under Section 106 separately from the EIS, and its findings will be incorporated in the ROD.	Construction could affect resources of cultural importance to Tribal Nations. This could include temporary turbidity, noise, and disruption of fish spawning; however, the placement of rock cover might improve fish habitat, thereby constituting a long-term beneficial impact to fish. The presence of construction equipment (e.g., barges and cranes) within the Straits could also produce noise and visual intrusion that might temporarily lessen the attractiveness of lands and waters in the vicinity for the exercise of ceremonial practices and other Tribal traditional cultural activities associated with the TCL.	No Impact	The removal of pipe would introduce vessels and personnel into the TCL, possibly lessening the available area for traditional ceremonial practices. In-water construction activities and associated turbidity due to the removal of pipe would also disturb fish and their habitat, which contribute to the significance and integrity of the TCL. These effects to fish and habitat would end following construction.	Similar to Sub-Alt 2a, with greater segment removal resulting in greater disturbance to fish habitat. Additional impacts to terrestrial habitat due to temporary onshore workspaces along the shoreline which would result in disturbance to archaeological sites and loss of plants and wildlife of Tribal importance in the construction workspaces.	Similar to Sub-Alt 2b but with greater terrestrial impacts.
Treaty Rights						
To Be Determined in the Record of Decision						

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
Geology						
No Impact	Approximately 416,000 BCYs of rock would be excavated and permanently removed. While no known karst features are mapped within the area of analysis, there is potential for karst features to develop. Vibrations given off by the TBM during excavation activities have the potential to cause shifts in the geology, specifically in areas surrounding the installed precast concrete tunnel lining (see EIS for planned mitigation measures).	Approximately 47,600 metric tons of 1- to 5-inch gravel/rock aggregate from existing nearby quarries would be required. These quarries include existing marine loading dock facilities that would continue to be in use regardless of the alternatives.	No Impact	No Impact	No Impact	No Impact
Soil Resources						
Continued maintenance activities would be expected to result in occasional, temporary ground disturbances within the existing Dual Pipelines ROW.	Approximately 31.4 acres of ground disturbance within proposed construction footprints. Impacts to soils in these locations would occur in previously disturbed areas where natural soil horizons are less likely to occur. Adherence to the SESC plan and required permits (including NPDES) would limit erosion and sedimentation. Potential ground disturbance at EMPS/off-site laydown areas would vary – minor grading may be required in some areas. Soil quality within	Disturbance to Straits sediments would occur within a 72-foot-wide corridor along each Dual Pipeline alignment. Permanent placement of rock within the Straits would occur over a total of 38 acres. Accretion of Straits sediments would occur during gravel/rock placement; impacts would not be long-term, as sediments would be expected to rapidly disperse with Straits currents (see EIS for supporting studies). Lakebed sediments could be affected by spills/leaks from	Minimal increases in erosion possible due to temporary increases in truck use/equipment. Soil quality could be affected by spills/leaks from trucks/equipment (see EIS for mitigation measures).	Activity within the Straits would displace and suspend sediments along the Dual Pipelines where exposed along the lakebed (approximately 12,200 feet along the western pipeline and 11,100 feet along the eastern pipeline). Sediment accretion would occur; however, sediments would be	Similar impacts as described for Sub-Alt 2a but over a larger area and longer period of time. Excavation of pipeline buried beneath the lakebed would result in approximately 566,160 sf of sediment disturbance. Impacts associated with sediment accretion would be	Impacts to Straits sediments would be the same as Sub-Alt 2b. Approximately 15.5 acres of onshore ground disturbance would be required to remove onshore, buried pipeline segments. Soil quality could be affected by spills/leaks from construction equipment (see EIS for mitigation measures).

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
	construction footprints could be affected by contaminants – see EIS for mitigation measures related to spills. Potential disturbance to Straits sediments would be limited to the location of the proposed water intake structure/pipe (approximately 800 sf). Turbidity would be limited to the work area (isolated by turbidity curtains). Once removed, accumulated sediments would disperse rapidly with Straits currents (see EIS for supporting studies).	construction equipment and material storage barges (see EIS for mitigation measures).		expected to rapidly disperse with Straits currents (see EIS for supporting studies). Minimal increases in erosion possible due to heavy equipment use. Soil quality could be affected by spills/leaks from construction equipment (see EIS for mitigation measures).	the same as under Sub-Alt 2a. Minimal increases in erosion possible due to onshore vegetation removal (6 acres) and use of heavy equipment. Soil quality could be affected by spills/leaks from construction equipment (see EIS for mitigation measures).	
Transportation and Navigation						
			Transportation			
No Impact	Up to 162 (South Side) and 120 (North Side) daily truck roundtrips would increase traffic safety risks and degrade LOS on public roadways. Direct, detrimental effects are probable and would occur throughout construction period (approximately 6 years) which would end following construction. Up to 200 (South Side) and 155 (North Side) workers would increase traffic safety risks and degrade LOS on public roadways, especially	Direct, detrimental effects to surface transportation unlikely as truck transport to barge loading facilities associated with the transport of equipment would be limited to the beginning and end of the construction phase (one construction season). Up to 50 workers would result in direct, short-term, detrimental effects due to increase in traffic safety risks on public roadways; however, magnitude and extent would be substantially lower than	Direct, temporary, detrimental effects probable from 200 truck deliveries increasing traffic safety risks over 3 to 4 months. Direct, temporary, detrimental effects probable from up to 20 workers increasing traffic safety risks over 3 to 4 months.	Direct, temporary, detrimental effects probable from 264 trucks increasing traffic safety risks over 2 to 3 years. Direct, temporary, detrimental effects probable from 75 to 85 workers increasing traffic safety risks on public roads over 2 to 3 years.	Direct, temporary, detrimental effects probable from 307 trucks increasing traffic safety risks over 3 to 4 years. Same direct, temporary, detrimental effects as Sub-Alt 2a due to similar number of workers but would occur over 3 to 4 years.	Same direct, temporary, detrimental effects as Sub-Alt 2b, but with an increased number of trucks (320 trucks). Same direct, temporary, detrimental effects as Sub-Alt 2b but with an additional 40 workers occurring over 3 to 4 years.

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	Applicant's Preferred Alternative	Engineered Gravel / Rock Protective Cover	1	2a	2b	2c
	during the peak commuting hours and peak recreational seasons and holidays. Direct, detrimental effects are probable and would occur throughout the construction period (approximately 6 years) which would end following construction.	under the Applicant's Preferred Alternative due to a shorter construction period (one construction season) and lower number of construction workers.				
Navigation						
Direct, long-term, detrimental effect would remain as navigational restrictions in the RNA would be in-place. In the event of an oil spill from the pipelines, direct, short-term, detrimental effects on navigation would occur. This risk is minimized by both the RNA and implementation of the Applicant's ESMOC.	Detrimental effects on navigable capacity from construction and use of temporary water intake structure unlikely, as obstruction to navigation would be limited to the area adjacent to the shoreline, away from the main navigation channel. Dual Pipelines would be decommissioned either in-place or removed. Therefore, effects on navigation would be dependent on the decommissioning sub-alternative chosen (see columns to the right). Detrimental effects on navigable capacity from excavation of Tunnel unlikely as Tunnel failure would not be considered a reasonably foreseeable event. Construction activities would not pose a credible risk to	Direct, temporary, detrimental effects probable due to a work area of approximately 230 acres within the Straits (including 1,500-foot work safety zone buffers), resulting in a temporary obstruction to navigation and reduction of navigable capacity over one construction season. Additional marine traffic (500 total barge roundtrips) would temporarily increase risk of vessel collisions on the Straits. The activity of placing rock on top of the existing Dual Pipelines could increase the potential for an oil spill compared to the No Action Alternative. A spill would result in direct, short-term, detrimental effects on navigation due to cleanup activities, including marine traffic disruption and delays	Long-term, detrimental effect probable on navigation as risk of anchor entanglement would continue. The RNA would remain in place, prohibiting anchoring in the area without U.S. Coast Guard authorization. Direct, long-term, beneficial effect on navigation probable as limited maintenance closures and inspection activities would no longer be required.	Direct, temporary, detrimental effect on navigable capacity probable from 230-acre work area in Straits obstructing navigation over 2 to 3 years. Direct, long-term, beneficial effect on navigation probable as limited maintenance closures and inspection activities would no longer be required. Additional direct, long-term, beneficial effect probable on navigation from eliminating risks of anchor entanglement. The RNA would remain in place, prohibiting	Generally, the same effects as Sub-Alt 2a but over a longer period of time near shorelines, over 3 to 4 years. Same direct, long-term, beneficial effect as Sub-Alt 2a.	Generally, the same effects as Sub-Alt 2b but over a longer period of time near shorelines, over 3 to 4 years. Same direct, long-term, beneficial effect as Sub-Alt 2a.

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
Temporary occurrences of obstruction to navigation from continuing maintenance and inspection activities would continue.	existing Dual Pipelines and, therefore, potential impacts to navigation from an oil spill due to construction activities are not analyzed in the EIS.	and possible closures on the channel. The Cover would reduce the risk of a vessel anchor strike to the pipelines, thereby decreasing the risk of an oil spill, compared to baseline conditions. Reduction of navigable capacity from reduced effective water depth over the cover would be unlikely, as clearance would be maintained to prevent vessel grounding. Long-term, detrimental effect associated with maintenance and inspection activities would remain.		anchoring in the area without U.S. Coast Guard authorization.		
Air Quality						
No Impact	Construction equipment, generator sets, employee commuting, deliveries, and excavated materials create direct and indirect, short-term, detrimental impacts to local air quality emissions for the duration of construction which would end following construction. Grading, site preparation, and motor vehicle movement would cause PM10 and PM2.5 emissions. Blasting would not generate emissions beyond the construction footprint. There would be short-term local detrimental impacts	Construction activities would result in direct and indirect, short-term, detrimental impacts to local air quality. Emissions would result from construction barges, other construction vessels, and employee commuting. Impacts would mainly be limited to the Project site and immediate surrounding areas and would not exceed the AQCR boundary.	Short-term, local, detrimental impacts to air quality probable. Emissions would result from employee commuting and construction equipment usage.	Short-term and detrimental impacts to air quality. Emissions would result from employee commuting, and construction vessels removing and hauling pipeline. Impacts would mainly be limited to the Project site and immediate surrounding areas and would not	Impacts would be similar to Sub-Alt 2a but may be higher due to the increased amount of pipeline removed requiring longer construction duration.	Impacts would be similar to Sub-Alt 2b but may be higher due to the increased amount of pipeline removed, requiring a longer construction duration, and also including onshore disturbance. Impacts under this alternative would be comparatively the highest of all the sub-alternatives.

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
	to HAPs as a result of gasoline or diesel equipment and vehicles. Impacts would mainly be limited to the Project site and immediate surrounding areas and would not exceed the AQCR boundary. Emissions as a result of the Applicant's Preferred Alternative would be comparatively higher than the Gravel/Rock Protective Cover Alternative.			exceed the AQCR boundary.		
Noise and Vibration						
			Noise			
No Impact	Direct, local detrimental effects from construction noise probable over duration of construction period. Projected general construction noise levels at approximately 45 residences near the South Side and visitors at northern portion of Headlands International Dark Sky Park and shorelines (South Side and North Side) could exceed noise impact thresholds. Use of HDD during construction of water intake and tie-in activities could temporarily exceed noise impact thresholds at approximately 6 residences (nighttime threshold) at the South Side, Dark Sky Park and	Temporary, direct, local detrimental effects possible. Projected noise levels could exceed nighttime noise impact threshold at 13 residences at the south end of the pipelines but would be temporary, occurring over one construction season (5 to 6 months). Proposed number of cars and trucks would be substantially lower than the Applicant's Preferred Alternative (no projected routine daily trucks expected); therefore, no detrimental traffic noise effects on roadways would occur.	Temporary, direct, localized detrimental effects possible. Projected noise levels could exceed daytime noise impact threshold at 5 residences located near south end of pipelines but would be short-term, occurring over 3 to 4 months. Minimal projected truck volumes (200 trucks total); therefore, no detrimental effects from traffic noise	Temporary, direct, localized detrimental effects possible. Projected noise levels would exceed nighttime noise impact threshold at 13 residences located near south end of the pipelines, but would be short-term, occurring over one construction season (5 to 6 months). Minimal projected truck volumes (64 trucks total), therefore, no detrimental traffic	Temporary, direct, localized detrimental effects probable. Projected noise levels would exceed nighttime noise impact threshold at approximately 76 residences located near south and north ends of pipelines; noise disturbances to visitors at McGulpin Rock, McGulpin Point Lighthouse, and Headlands International Dark Sky Park could occur. Potential	Temporary, direct, localized detrimental effects probable. Projected noise levels would exceed nighttime noise impact threshold at approximately 81 residences located near south and north ends of the pipelines; noise disturbances to visitors at McGulpin Rock, McGulpin Point Lighthouse, and Headlands International Dark Sky Park could occur. Potential detrimental noise effects would occur

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	Applicant's Preferred Alternative	Engineered Gravel / Rock Protective Cover	1	2a	2b	2c
	shorelines (South Side and North Side). During access road improvements at S1 and N1, approximately 11 residences near S1 and 3 residences near N1 could experience temporary, intermittent exceedances over daytime noise impact thresholds. Direct, temporary, localized detrimental effects from intermittent blasting would be probable. Approximately 47 and 10 residences near the South Side and North Side, respectively, and visitors at the McGulpin Point Lighthouse and Headlands International Dark Sky Park could experience temporary noise disturbances but levels would be below established daytime noise thresholds. Projected noise levels on Headlands Road and Densmore Avenue would exceed the established traffic noise impact threshold. Potentially impacted receptors include McGulpin Point Lighthouse and residences located on Headlands Drive, Densmore Avenue, Martin Lake Road, and Martin Lake Road East.	Temporary, local, direct detrimental effects could occur for recreational users on Straits of Mackinac from material barge transport noise. Direct, short- and long-term, detrimental impacts to aquatic organisms is possible.	expected along public roads.	noise expected along public roads. Direct, detrimental, localized effects to recreational users on Straits from barge transport of extracted pipeline possible but temporary and intermittent.	detrimental noise effects would occur over two to three construction seasons. Projected truck volumes (107 trucks total) are minimal, therefore, no detrimental traffic noise expected along public roads. Same detrimental noise effects as Sub-Alt 2a on recreational users on Straits.	over two to three construction seasons. Similar number of truck volumes as Sub-Alt 2b (120 trucks total), therefore, no detrimental traffic noise expected along public roads. Same detrimental noise effects as Sub-Alt 2a on recreational users on Straits.

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
	Proposed ventilation fans at the South Side and North Side would be a new source of noise and contribute to increases in noise levels but would be intermittent and only occur during maintenance and testing. No exceedance of noise impact thresholds for human receptors or outdoor recreational areas would occur. Detrimental impacts from vibration during construction activities to wildlife and aquatic species are possible.					
Vibration						
No Impact	Projected continuous vibration levels from general construction, including HDD use and access road improvements at S1 and N1, are not expected to exceed established impact thresholds associated with human disturbance or structural damage. Vibration levels are not expected to exceed established impact thresholds associated with human disturbance or structural damage. TBM-induced vibration levels are below established impact thresholds and no detrimental	Only on-shore vibration source would be from traffic, with detrimental effects unlikely. Proposed number of cars and trucks would be substantially lower than the Applicant's Preferred Alternative. Though material transport on Straits would occur; no detrimental vibration effects to structures or human receptors from surface or water transport would occur. However, direct, short- and long-term, detrimental impacts to aquatic organisms is possible.	No Impact	No Impact	No Impact	Temporary, direct, localized detrimental effect possible. Projected vibration levels at three residential properties would be at or approach impact threshold for fragile structures but not for non-fragile structures.

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
	effects to human receptors or structures expected. However, detrimental impacts from vibration during construction activities to wildlife and aquatic species are possible. Vibrations from trucks are not expected to exceed established vibration impact thresholds.					
Socioeconomics						
Population, Housing, Community Services, Unemployment, Income, Taxes, and Tourism						
No Impact	Up to 204 workers would be required for peak periods of construction, many of which would relocate to the area of analysis. This would have direct, detrimental impacts on population, housing, community services, and tourism and direct, beneficial impacts on unemployment, income, and taxes for the duration of construction. Impacts would end following construction.	Up to 50 workers would be required for construction in addition to 14 personnel supporting diving spread operations. Impacts would be similar to those described for the Applicant's Preferred Alternative, but with a shorter duration and smaller impact.	Up to 10 workers would be required to clean and cap the pipeline. Impacts would be similar to those described for the Applicant's Preferred Alternative, but with a shorter duration and smaller impact.	Up to 85 construction workers would be required for construction. This would have impacts similar to those described for Sub-Alt 1 but with a greater impact, as more construction workers would be present in the area and the length of construction would be longer. Impacts would not be as great as those described for the construction of the Applicant's Preferred Alternative.	Construction personnel and their impacts would be similar to those described for Sub-Alt 2a, but with a longer duration.	Up to 85 construction workers would be required for construction in addition to a crew of approximately 20 people on each side of the Straits to support the removal of the onshore pipeline. Impacts from construction personnel would be similar to those described for Sub-Alt 2b but with a slightly greater impact, as more construction workers would be present in the area.

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
Supply Chain and Economy						
No Impact	50 percent of Project materials would be sourced from regional and state-sourced supply chains providing a direct, beneficial impact to the regional and state economy, with indirect, beneficial job creation by the construction firm making purchases from local vendors.	Approximately 100 percent of rock materials are anticipated to come from local quarries providing a direct, beneficial impact to the regional economy, with indirect, beneficial job creation by the construction firm making purchases from local vendors	No Impact	No Impact	No Impact	No Impact
Energy Demand						
No Impact	Construction of the Tunnel would require an estimated 17,638.3 MWh of energy per year, while operation of the Tunnel would require an estimated 404.1 MWh of energy per year. To meet this demand, transformers and temporary truck-mounted power plants would be installed, in addition to several existing power poles being relocated. There would be no impact on the local energy grid's ability to meet demand. An estimated 4,588,825 gallons of fuel would be used by commuting construction workers, truck hauling, and construction equipment. There would be no impact to commodities transported by Line 5, as the annual average	An estimated 1,243,589 gallons of fuel would be used by commuting construction workers and vessels utilized for the placement of the protective cover. There would be no impact to commodities transported by Line 5, as the annual average capacity of the pipeline would not change from the existing 540,000 bpd of NGLs and light crude oil.	No Impact	An estimated 112,875 gallons of fuel would be used by commuting construction workers and vessels utilized for pipeline removal.	Fuel usage numbers would be similar to those described for Sub-Alt 2a.	Fuel usage numbers would be similar to those described for Sub-Alt 2a.

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
	capacity of the pipeline would not change from the existing 540,000 bpd of NGLs and light crude oil.					
Reliability and Safety						
Worker Injury or Illness						
No Impact	Approximately 6.3 recordable injuries or illnesses may be expected during Tunnel construction, and approximately 1.9 recordable injuries or illnesses may occur during pipeline construction.	Approximately 0.6 recordable injuries or illnesses may be expected during construction.	Approximately 0.05 recordable injury or illness may be anticipated.	Approximately 5.1 recordable injuries or illnesses could be anticipated during removal of the exposed portions of the Dual Pipelines along the lakebed, in addition to the 0.05 recordable injury or illness that may occur during decommissioning.	Approximately 6.8 recordable injuries or illnesses may occur during construction activities, in addition to the 0.05 recordable injury or illness that may occur during decommissioning.	Similar to Sub-Alt 2b.
Construction Risk						
No Impact	Potential to encounter unstable geology during drilling. The TBM would be equipped with sensors to monitor pressure and with the ability to inject grout to stabilize the geology. Potential to encounter hazardous gases that could pose a risk of explosion or asphyxiation. The Applicant would mitigate this risk through ventilation and air monitoring.	Potential for rock and gravel to damage the existing Dual Pipelines. The Applicant would reduce potential effects by placing gravel/rock/gravel via a fall-pipe that could control material placement. In addition, the Applicant would perform an ROV survey to ensure the pipelines are fully covered and assess stress on the pipelines.	No Impact	No Impact	No Impact	No Impact
Secondary Containment						

Main Action Alternatives Impacts			Decommissioning Sub Alternatives Impacts			
No Action	**Applicant's Preferred Alternative**	**Engineered Gravel / Rock Protective Cover**	**1**	**2a**	**2b**	**2c**
This alternative would not provide secondary containment.	The Tunnel would provide secondary containment for NGLs and oil product in the event of a release.	This alternative would not provide secondary containment.	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Anchor Stike Probability						
Operation of the Applicant's EMP3 system would continue; combined risk of intentional or unintentional anchor strike is approximately once every 1,300 years.	The relocation of the pipeline in the Tunnel would eliminate the risk of anchor strike.	The potential failure rate of the engineered gravel/rock cover due to anchor strike is estimated at approximately once every 128,000 years.	Not Applicable	Not Applicable	Not Applicable	Not Applicable

[1]The Revised Biological Assessment (Stantec 2025) identifies the Action Area as the areas directly and indirectly affected by the Project (Applicant's Preferred Alternative), to include all Project components plus a 100-foot buffer. Therefore, the 7.7 acres shown in the table, based off the Biological Assessment, is greater than the 5.2 acres of forested habitat anticipated to be removed during construction within the construction footprint. The Applicant's Biological Assessment does not account for construction/operation footprints or elements associated with alternatives/sub-alternatives to the Applicant's Preferred Alternative.

AQCR = Air Quality Control Region; BCY = bank cubic yards; bpd = barrels per day; CBRS = Coastal Barrier Resources System; DLI = dwarf leaf iris; EIS = Environmental Impact Statement; EMPS = excavated material placement site; ESMOC = Enbridge Straits Maritime Operations Center; HAP = hazardous air pollutant; HDD = horizontal direction drilling; HG = Houghton's goldenrod; IPaC = Information for Planning and Consultation; MDNR = Michigan Department of Natural Resources; NGL = natural gas liquid; NPDES = National Pollutant Discharge Elimination System; OHWM = ordinary high water mark; PM = particulate matter; RNA = Regulated Navigation Area; ROD = Record of Decision; ROV = remote-operated vehicle; ROW = right-of-way; SESC = Soil Erosion and Sedimentation Control; sf = square feet; TBM = tunnel-boring machine; Sub-Alt = Sub-Alternative; TCL = Traditional Cultural Landscape; USACE = United States Army Corps of Engineers; USFWS = United States Fish and Wildlife Service

3.1 ENVIRONMENTAL CONSEQUENCES KEY POINTS

Long-term detrimental effects include vegetation removal and ground disturbance. The Applicant's Preferred Alternative would have the greatest amount of vegetation removal and ground disturbance. It is anticipated that vegetation removal would primarily occur on Applicant owned land and no change in land ownership is anticipated. While vegetation would be restored to the extent possible following construction, some change in land use (conversion from vegetation to industrial use), permanent wetland loss, vegetation loss, and increased impervious area (due to new structures/buildings) would result, creating impacts that would remain following construction of the Applicant's Preferred Alternative. Ground disturbance under this alternative and Decommissioning Sub-Alternative 2c would also have an adverse impact to cultural resources, including to a National Register of Historic Places (NRHP)-eligible Traditional Cultural Landscape which includes and extends beyond all the alternatives, as well as impacts to an NRHP-eligible archaeological historic district. The Engineered Gravel/Rock Protective Cover Alternative would result in a permanent change in lakebed substrate due to introduction of gravel and rock fill.

Most other environmental consequences would be short-term with the effects resolving once construction is completed. Construction-related consequences primarily involve increased traffic due to construction vehicles, construction-related noise, disruption to terrestrial and aquatic life, sedimentation to receiving waters, localized changes to surface hydrology, disruptions in the waterway due to construction activities, disruption to shoreline and water-based recreation, and construction-related lighting impacts. Construction induced vibration levels, whether from the TBM or other construction activities, are predicted to be below impact thresholds for human disturbance and structural damage (fragile and non-fragile structures, including the existing Dual Pipelines). Decommissioning Sub-Alternative 2c is the only alternative that may result in vibration levels at or approaching the vibration impact threshold for fragile structures. MSCA has an oversight role to monitor construction activities and assure adherence to safety standards. With proper construction techniques, in accordance with established Mackinac Straits Corridor Authority (MSCA) requirements, failure of the Tunnel whether via a collapse or explosion during construction is not reasonably foreseeable.

Short-term beneficial effects would result from increased demand for local services and supplies during construction. Long-term beneficial effects of the Applicant's Preferred Alternative would generally be related to a reduced need for in-water maintenance activities related to the existing Dual Pipelines and/or Engineered Rock/Gravel Cover. An additional long-term benefit of implementation of the Applicant's Preferred Alternative is that the Tunnel would serve as secondary containment in the event of a leak from the pipeline, helping to prevent water-based contamination. Under the Engineered Gravel/Rock Protective Cover Alternative, the rock fill over the pipelines would reduce the potential for a vessel anchor strike that could damage the pipeline.

When reviewing Table ES-1, it is important to note that consequences from the decommissioning sub-alternatives would only occur if the Applicant's Preferred Alternative is selected and would be in addition to the consequences identified under implementation of the Applicant's Preferred Alternative. Effects related to the decommissioning sub-alternatives generally increase in severity from Sub-Alternative 1 through Sub-Alternative 2c due to the amount of construction work that would be necessary to either decommission in-place, partially or fully remove the pipelines.

The No Action Alternative would result in no change in the current condition of the Line 5 Dual Pipelines. Maintenance activities would continue to occur. As the pipelines age, it is anticipated that additional deterioration could result in some release of metals into the surface water. In addition, the potential for vessel anchor strikes would remain.

Cumulative impacts would occur for any Project consequences that are projected to be long-term. Short-term impacts would resolve upon completion of construction and therefore would not be cumulative. The Project's long-term effects would combine with the effects of past actions that have resulted in the current environment, as well as impacts from ongoing and reasonably foreseeable future projects to have an incremental impact on certain resources. No specific ongoing or reasonably foreseeable future projects were identified within the project action area (see Appendix H of the EIS). Detrimental cumulative effects from the Applicant's Preferred Alternative would be anticipated to land use due to loss of vegetation and increased impervious area, which would result in aesthetic changes and increased runoff potential. The Applicant's Preferred Alternative would also contribute to a cumulative effect on wetlands. The decommissioning sub-alternatives would, to varying degrees, contribute to cumulative land use and detrimental aesthetic changes. Decommissioning Sub-Alternative 2c would also contribute to detrimental cumulative effects to wetlands and Stream 01. The Applicant's Preferred Alternative would have a beneficial cumulative effect on reduced risks of a petroleum leak in the Straits and, when combined with one of the decommissioning sub-alternatives, improvements to water-based recreation. The Engineered Gravel/Rock Protective Cover Alternative would have similar detrimental cumulative effects as the Applicant's Preferred Alternative but to a lesser extent. This alternative would have the beneficial cumulative effect of reducing the risk of a vessel anchor strike on the Dual Pipelines.

4 SUMMARY OF MITIGATION MEASURES

Chapter 5 of the EIS documents mitigation measures, project elements, or other environmental protections that are proposed to reduce or avoid impacts. Chapter 5 also discusses compensatory mitigation under the CWA and Endangered Species Act. Any mitigation required for cultural resources and/or treaty rights will be documented under separate processes and presented in the ROD.

The Applicant would comply with applicable design and safety standards and procedures related to all project elements, for any alternative or sub-alternative implemented. This would minimize the potential for any construction-related failures.

In general, mitigation and minimization measures are proposed to reduce short-term, construction-related effects through containment measures (erosion and sedimentation controls, stormwater controls, dust control), spill and leak prevention measures and fast response procedures, and use of well-maintained, quieter (if possible) construction equipment, along with limiting the noisiest activities to daytime hours. Revegetation of disturbed areas would be completed where possible following construction using native seed mixes and plant species. Construction activities would be completed during specific times of year to avoid impacts on biological species (i.e., tree clearing to avoid impacts on protected bat species). Additional studies would be conducted as required (such as geotechnical testing under the Applicant's Preferred Alternative) prior to construction to best inform final design and construction activities. Any TBM activities proposed under implementation of the Applicant's Preferred Alternative would include proven and tested construction monitoring methods and technologies. Construction activities under any implemented alternative would be conducted in accordance with federal, state, and local requirements, laws, and regulations. In addition, the Applicant has committed to minimizing construction impacts on private property and transportation facilities to the extent possible. Compensatory mitigation for wetland and protected species impacts would be commensurate with the amount and type of impact and may be achieved by purchasing credits through mitigation banks or in-lieu fee programs, by permittee-responsible mitigation, or by a combination of the three. The Applicant would obtain any required permits prior to construction and would implement and comply with permit requirements throughout construction activities.

Enbridge Energy
11 E. Superior Street
Suite 125
Duluth, MN 55802

April 7, 2020

Teresa Seidel
Director, Water Resources Division
Michigan Department of Environment, Great Lakes, and Energy
525 W. Allegan Street
PO Box 30458
Lansing, MI 48909

Re: Enbridge Joint Permit Application for Great Lakes Tunnel Project

Dear Ms. Seidel:

This letter is to inform you that Enbridge Energy, Limited Partnership ("Enbridge") has submitted via the MiWaters website its Joint Permit Application ("JPA") to seek permits from the U.S. Army Corps of Engineers and Michigan Department of Environment, Great Lakes, and Energy ("EGLE") to construct the Great Lakes Tunnel Project through the subsurface lands beneath the Straits of Mackinac ("Straits").

Based on pre-application consultations with EGLE, Enbridge's JPA includes a request to obtain a Great Lakes Submerged Lands Act, Part 325 disturbance permit from EGLE pursuant to MCL 324.32513. While Enbridge is requesting that Part 325 disturbance permit from EGLE out of an abundance of caution, it respectfully does not believe that Part 325 is applicable to the construction of the Great Lakes Tunnel Project. The purpose of Part 325 is to authorize activities that could impact the public's use or interest in navigable waters, including "hunting, fishing, swimming, pleasure boating, or navigation …" in such navigable waters. MCL 324.32502. The Great Lakes Tunnel Project, however, will be constructed well beneath the lakebed of the Straits, and have no potential to disturb or impact the public's interest in the navigable waters of the Straits. Enbridge is thus of the view that a Part 325 disturbance permit (or any other authorization under Part 325) is not required before construction of the Great Lakes Tunnel Project may commence.

Should EGLE determine based on its review of the Great Lakes Tunnel Project that a Part 325 disturbance permit is in fact not required, Enbridge would be pleased to submit a letter retracting the request made in its JPA that a Part 325 disturbance permit be issued by EGLE.

Please let me know if you have any questions.

Sincerely,

Paul Turner
Environmental Specialist, US Projects

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
WATER RESOURCES DIVISION

PHILLIP D. ROOS
DIRECTOR

December 22, 2025

VIA EMAIL

Gina Lee
Enbridge
425 West Superior Street
Suite 1100
Duluth, Minnesota 55802

Dear Gina Lee:

SUBJECT: Response to Comments
Submission Number: HQ3-8BYB-N9DT1

This letter is regarding your permit application, Submission Number HQ3-8BYB-N9DT1, which was submitted to the Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division (WRD), on March 3, 2025. The application proposes impacts on Great Lakes bottomlands and wetlands for the stated purpose of constructing an underground tunnel beneath the Straits of Mackinac (Straits) in accordance with the Tunnel Agreement. Upon receipt, the application was not administratively complete. EGLE first notified Enbridge of the required correction requests on March 13, 2025. After several iterations of incomplete application submittals, EGLE determined the application to be administratively complete on July 16, 2025. A public hearing was held on August 19, 2025. Throughout the application review process, EGLE has received over approximately 75,000 public comments. As a result of the public notice comments, and EGLE's own review, we sent Enbridge several questions to be contemplated and addressed on September 30, 2025. EGLE received a response to that communication on November 19, 2025.

Thank you for your latest communication. EGLE has reviewed it and per previous communications has additional comments and questions.

EGLE understands that Enbridge entered into an agreement with the State of Michigan for the purposes of designing, constructing, and operating a tunnel to accommodate the Straits Line 5 Replacement Segment, which will replace the existing dual pipelines and provide secondary containment. In pursuing the Straits tunnel project, it is Enbridge’s responsibility to ensure that the tunnel design and construction comply with applicable environmental rules and regulations, both state and federal. EGLE intends to continue to work with Enbridge towards a plan that meets the project objectives while also meeting applicable statutory criteria. As with every application EGLE reviews, a permit can only be issued once the statutory criteria under the applicable statutes have been met.

At this time, and in consideration of Enbridge's latest communication, Enbridge has not fully demonstrated that the proposed project meets the statutory criteria for permitting under Part 303, Wetlands Protection, and Part 325, Great Lakes Submerged Lands, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. In general, the following points have not been adequately addressed:

- Enbridge has not fully demonstrated that the proposed tunnel cannot be constructed using alternate methods, or in alternate locations, that would avoid and minimize impacts.
- Enbridge has not fully demonstrated that the proposed tunnel construction will not create unreasonable risks to the environment during construction and/or during the life of the tunnel.
- Enbridge has not fully demonstrated that the proposed tunnel construction avoids and minimizes impacts to the maximum extent practicable.

It is Enbridge's responsibility to fully demonstrate that their proposed construction plan avoids and minimizes impacts. Because the project affects such a broad range of resources (e.g., environmental and cultural), Enbridge has a commensurate obligation to demonstrate responsible planning that protects these interests.

Below, EGLE has detailed additional questions and information that must be provided and explored before a permitting decision can be made. Given the current permit processing deadline, EGLE is concerned that there is not adequate time remaining to review the application. As such, we invite continued conversation about the items detailed below, in addition to a discussion on the permit processing period moving forward.

Cultural Resources

To sufficiently provide required information, provide any and all documentation you are able to. We acknowledge that you may need to provide partially redacted information to address the items below.

1. Provide a figure and/or description of the entire area that was surveyed for cultural resources including archeological surveys, human remains detection dogs, LiDAR, or other methods.
   a. Additionally, describe any plans and the timeframe for completing a more refined survey to accurately identify all resources in the limits of disturbance and alternative analysis locations.
2. EGLE's September 30, 2025, email requested that Enbridge discuss the alternative of moving the portals further north and south and include a comparison of the cultural resource impacts associated with those alternatives. Enbridge's November 19, 2025, response did not discuss or identify cultural resource impacts. Compare the known or suspected impacts to cultural resources associated with the discussed alternatives (e.g., whether greater or fewer impacts are expected).

3. Provide the current plans to address the cultural resources impacted by the project, as well as an Inadvertent Discovery Plan and the plan for handling unconfirmed and/or unidentifiable remains. More fully, describe how impacts to remains and other cultural resources have been avoided and minimized.
4. Provide a comprehensive mitigation proposal for impacts on the Traditional Cultural Property, treaty rights, and all cultural resources during and post construction.

Wetlands and Great Lakes

1. EGLE's September 30, 2025, email requested that Enbridge discuss the alternative of using other lines to transport the product currently transported in Line 5, including using Line 78. Enbridge's response explained that Line 78 has spare capacity but is not designed to and is incapable of transporting the Natural Gas Liquids (NGL) currently transported by Line 5. The response also explained that the lines currently transporting the product to Line 78 do not have spare capacity, so the spare capacity in Line 78 cannot be used and it is not an alternative to Line 5. Please expand on this and describe the approximate timeframe and cost to upgrade Line 78 to transport NGLs. Also describe the approximate timeframe and cost to upgrade or otherwise increase flow in the lines currently transporting the product to Line 78 to provide additional capacity or add an additional line to provide that additional capacity. Compare these costs with the costs associated with the proposed tunnel project.
2. Describe the process and timeline for completing additional exploratory borings that reach the tunnel invert.
3. Provide a more thorough description of all alternatives considered that achieve secondary containment and/or protect Line 5 from anchor strikes. Please also compare the amount of time necessary to implement these alternatives.
4. Provide a figure/diagram showing the anticipated area affected by the groundwater drawdown cone of depression to its maximum extent during the construction of the portals on the north and south sides of the Straits. Show all wetlands located within the cone of depression and discuss whether they will be drawn down. Provide any supporting models or data.

Other

1. In follow-up to our previous requests during our application review and coordination with other agencies and tribes, provide EGLE a copy of the Geotechnical Baseline Report.
2. Given the alternatives outlined in the U.S. Army Corps of Engineers Draft Line 5 Tunnel EIS, please provide a more detailed description of the preferred decommissioning scope and timeline.

We appreciate your consideration of the above items. These items do not necessarily represent an exhaustive or complete representation of the remaining questions and concerns that will need to be worked through during the application review process. Please respond with the additionally requested information at your earliest convenience. Similarly, if you would like to meet to discuss our continued review of the application, please let us know.

If you have any questions, contact me at WaltJ@Michigan.gov; 989-619-6283; or EGLE, GDO-WRD, P.O. Box 30458, Lansing, Michigan 48909-7958.

Sincerely,

Jonathan Walt
Field Operations Section
Water Resources Division

cc: Joe McGaver, Enbridge
Christina Svoboda, Stantec
Katie Lambeth, EGLE
Amy Lounds, EGLE
Anne Garwood, EGLE
Kyle Alexander, EGLE
Joseph Haas, EGLE

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STRAITS OF MACKINAC PIPE LINE EASEMENT

CONSERVATION COMMISSION OF THE STATE OF MICHIGAN

TO

LAKEHEAD PIPE LINE COMPANY, INC.

THIS EASEMENT, executed this twenty-third day of April, A. D. 1953, by the State of Michigan by the Conservation Commission, by Wayland Osgood, Deputy Director, acting under and pursuant to a resolution adopted by the Conservation Commission at its meeting held on February 13, 1953, and by virtue of the authority conferred by Act No. 10, P. A. 1953, hereinafter referred to as Grantor, to Lakehead Pipe Line Company, Inc., a Delaware corporation, of 510 22nd Avenue East, Superior, Wisconsin, hereinafter referred to as Grantee,

W I T N E S S E T H:

WHEREAS, application has been made by Grantee for an easement authorizing it to construct, lay and maintain pipe lines over, through, under and upon certain lake bottom lands belonging to the State of Michigan, and under the jurisdiction of the Department of Conservation, located in the Straits of Mackinac, Michigan, for the purpose of transporting petroleum and other products; and

WHEREAS, the Conservation Commission is of the opinion that the proposed pipe line system will be of benefit to all of the people of the State of Michigan and in furtherance of the public welfare; and

WHEREAS, the Conservation Commission duly considered the application of Grantee and at its meeting held on the 13th day of February, A. D. 1953, approved the conveyance of an easement.

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NOW, THEREFORE, for and in consideration of the sum of Two Thousand Four Hundred Fifty Dollars ($2,450.00), the receipt of which is hereby acknowledged, and for and in consideration of the undertakings of Grantee and subject to the terms and conditions set forth herein, Grantor hereby conveys and quit claims, without warranty express or implied, to Grantee an easement to construct, lay, maintain, use and operate two (2) pipe lines, one to be located within each of the two parcels of bottom lands hereinafter described, and each to consist of twenty inch (20") O D pipe, together with anchors and other necessary appurtenances and fixtures, for the purpose of transporting any material or substance which can be conveyed through a pipe line, over, through, under and upon the portion of the bottom lands of the Straits of Mackinac in the State of Michigan, together with the right to enter upon said bottom lands, described as follows:

> All bottom lands of the Straits of Mackinac, in the State of Michigan, lying within an area of fifty (50) feet on each side of the following two center lines:
>
> (1) Easterly Center Line: Beginning at a point on the northerly shore line of the Straits of Mackinac on a bearing of South twenty-four degrees, no minutes and thirty-six seconds East (S 24° 00' 36" E) and distant one thousand seven hundred and twelve and eight-tenths feet (1,712.8') from United States Lake Survey Triangulation Station "Green" (United States Lake Survey, Latitude 45° 50' 00", Longitude 84° 44' 58"), said point of beginning being the intersection of the center line of a twenty inch (20") pipe line and the said northerly shore line; thence, on a bearing of South fourteen degrees thirty-seven minutes and fourteen seconds West (S 14° 37' 14" W) a distance of nineteen thousand one hundred and forty-six and no tenths feet (19,146.0') to a point on the southerly shore line of the Straits of Mackinac which point is the intersection of the said center line of the twenty inch (20") pipe line and the said southerly shore line; and is distant seven hundred and seventy-four and seven tenths feet (774.7') and on a bearing of South thirty-six degrees, eighteen minutes and forty-five seconds West (S 36° 18' 45" W) from United States Lake Survey Triangulation Station "A. Mackinac West Base" (United States

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Lake Survey, Latitude 45° 47' 14", Longitude 84° 46' 22").

(2) Westerly Center Line: Beginning at a point on the northerly shore line of the Straits of Mackinac on a bearing of South forty-nine degrees, twenty-five minutes and forty-seven seconds East (S 49° 25' 47" E) and distant two thousand six hundred and thirty-four and nine tenths feet (2,634.9') from United States Triangulation Station "Green" (United States Lake Survey, Latitude 45° 50' 00", Longitude 84° 44' 58") said point of beginning being the intersection of the center line of a twenty inch (20") pipe line and the said northerly shore line; thence on a bearing of South fourteen degrees, thirty-seven minutes and fourteen seconds West (S 14° 37' 14" W), a distance of nineteen thousand four hundred and sixty-five and no tenths feet (19,465.0') to a point on the southerly shore line of the Straits of Mackinac which point is the intersection of the said center line of the twenty inch (20") pipe line and the said southerly shore line and is distant one thousand no hundred and thirty-six and four tenths feet (1,036.4') on a bearing of South sixty-three degrees, twenty minutes and fifty-four seconds East (S 63° 20' 54" E) from United States Lake Survey Triangulation Station "A. Mackinac West Base" (United States Lake Survey, Latitude 45° 47' 14", Longitude 84° 46' 22").

TO HAVE AND TO HOLD the said easement unto said Grantee, its successors and assigns, subject to the terms and conditions herein set forth, until terminated as hereinafter provided.

This easement is granted subject to the following terms and conditions:

A. Grantee in its exercise of rights under this easement, including its designing, constructing, testing, operating, maintaining, and, in the event of the termination of this easement, its abandoning of said pipe lines, shall follow the usual, necessary and proper procedures for the type of operation involved, and at all times shall exercise the due care of a reasonably prudent person for the safety and welfare

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of all persons and of all public and private property, shall comply with all laws of the State of Michigan and of the Federal Government, unless Grantee shall be contesting the same in good faith by appropriate proceedings, and, in addition, Grantee shall comply with the following minimum specifications, conditions and requirements, unless compliance therewith is waived or the specifications or conditions modified in writing by Grantor:

(1) All pipe line laid in water up to fifty (50) feet in depth shall be laid in a ditch with not less than fifteen (15) feet of cover. The cover shall taper off to zero (0) feet at an approximate depth of sixty-five (65) feet. Should it be discovered that the bottom material is hard rock, the ditch may be of lesser depth, but still deep enough to protect the pipe lines against ice and anchor damage.

(2) Minimum testing specifications of the twenty inch (20") OD pipe lines shall be not less than the following:

Shop Test----------1,700 pounds per square inch gauge
Assembly Test------1,500 pounds per square inch gauge
Installation Test--1,200 pounds per square inch gauge
Operating Pressure- 600 pounds per square inch gauge

(3) All welded joints shall be tested by X-Ray.

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(4) The minimum curvature of any section of pipe shall be no less than two thousand and fifty (2,050) feet radius.

(5) Automatic gas-operated shut-off valves shall be installed and maintained on the north end of each line.

(6) Automatic check valves shall be installed and maintained on the south end of each line.

(7) The empty pipe shall have a negative buoyancy of thirty (30) or more pounds per linear foot.

(8) Cathodic protection shall be installed to prevent deterioration of pipe.

(9) All pipe shall be protected by asphalt primer coat, by inner wrap and outer wrap composed of glass fiber fabric material and one inch by four inch (1" x 4") slats, prior to installation.

(10) The maximum span or length of pipe unsupported shall not exceed seventy-five (75) feet.

(11) The pipe weight shall not be less than one hundred sixty (160) pounds per linear foot.

(12) The maximum carbon content of the steel, from which the pipe is manufactured, shall not be in excess of .247 per cent.

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(13) In locations where fill is used, the top of the fill shall be no less than fifty (50) feet wide.

(14) In respect to other specifications, the line shall be constructed in conformance with the detailed plans and specifications heretofore filed by Grantee with Lands Division, Department of Conservation of the State of Michigan.

B. Grantee shall give timely notice to the Grantor in writing:

(1) Of the time and place for the commencement of construction over, through, under or upon the bottom lands covered by this easement, said notice to be given at least five (5) days in advance thereof;

(2) Of compliance with any and all requirements of the United States Coast Guard for marking the location of said pipe lines;

(3) Of the filling of said pipe lines with oil or any other substance being transported commerially;

(4) Of any breaks or leaks discovered by Grantee in said pipe lines, said notice to be given by telephone promptly upon discovery and thereafter confirmed by registered mail;

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(5) Of the completion of any repairs of said pipe lines, and time of testing thereof, said notice to be given in sufficient time to permit Grantor's authorized representatives to be present at the inspection and testing of the pipe lines after said repairs; and

(6) Of any plan or intention of Grantee to abandon said pipe lines, said notice to be given at least sixty (60) days prior to commencement of abandonment operations.

C. The easement herein conveyed may be terminated by Grantor:

(1) If, after being notified in writing by Grantor of any specified breach of the terms and conditions of this easement, Grantee shall fail to correct said breach within ninety (90) days, or, having commenced remedial action within such ninety (90) day period, such later time as it is reasonably possible for the Grantee to correct said breach by appropriate action and the exercise of due diligence in the correction thereof; or

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(2) If Grantee fails to start construction of the pipe lines authorized herein within two years from date of execution of this instrument; or

(3) If Grantee fails for any consecutive three-year period to make substantial use of said pipe lines commercially and also fails to maintain said pipe lines during said period in such condition as to be available to commercial use within thirty (30) days.

D. Construction of the pipe lines contemplated by this instrument shall not be commenced until all necessary authorization and assent of the Corps of Engineers, United States Army, so far as concerns the public rights of navigation, shall have been obtained.

E. In the event of any relocation, replacement, major repair, or abandonment of either of the pipe lines authorized by this easement, Grantee shall obtain Grantor's written approval of procedures, methods and materials to be followed or used prior to commencement thereof.

F. The maximum operating pressure of either of said pipe lines shall not exceed six hundred (600) pounds per square inch gauge.

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If there is a break or leak or an apparent break or leak in either of said pipe lines, or if Grantor notifies Grantee that it has good and sufficient evidence that there is or may be a break or leak therein, Grantee shall immediately and completely shut down the pipe line involved and said pipe line shall not be placed in operation until Grantee has conducted a shut-in two (2) hour pressure test of six hundred (600) pounds per square inch gauge showing that no substance is escaping from a break or leak in said pipe line.

G. If oil or other substance escapes from a break or leak in the said pipe lines, Grantee shall immediately take all usual, necessary and proper measures to eliminate any oil or other substance which may escape.

H. In the event the easement herein conveyed is terminated with respect to either or both of said pipe lines, or if any part or portion of a pipe line is abandoned, Grantee shall take all of the usual, necessary and proper abandonment procedures as required and approved by Grantor. Said abandonment operations shall be completed to the satisfaction of Grantor within one year after any abandonment of any part or portion of a pipe line; or in event of termination of this easement, within one year thereafter. After the expiration of one year following the termination of this easement, Grantee

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shall at the option of Grantor quit claim to the State of Michigan all of its right, title and interest in or to any pipe line, appurtenances or fixtures remaining over, through, under or upon the bottom lands covered by this easement. Abandonment procedures as used herein include all operations that may be reasonably necessary to protect life and property from subsequent injury.

I. Grantee shall permit Grantor to inspect at reasonable times and places its records of oil or any other substance being transported in said pipe lines and shall, on request, submit to Grantor inspection reports covering the automatic shut-off and check valves and metering stations used in connection with the Straits of Mackinac crossing.

J. (1) Grantee shall indemnify and hold harmless the State of Michigan from all damage or losses caused to property (including property belonging to or held in trust by the State of Michigan), or persons due to or arising out of the operations or actions of Grantee, its employees, servants and agents hereunder. Grantee shall place in effect prior to the construction of the pipe lines authorized by this easement and shall maintain in full force and effect during the life of this easement, and until Grantor has approved completion of abandonment operations, a Comprehensive Bodily Injury and Property Damage Liability policy, bond or surety, in form and substance acceptable to Grantor in the sum of at least One Million Dollars ($1,000,000.00), covering the liability herein imposed upon Grantee.

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(2) Grantee, prior to commencing construction of the pipe lines authorized by this easement, shall provide the State of Michigan with a surety bond in the penal sum of One Hundred Thousand Dollars ($100,000.00) in form and substance acceptable to Grantor, and surety or sureties approved by Grantor, to well, truly and faithfully perform the terms, conditions and requirements of this easement. Said bond shall be maintained in full force and effect during the life of this easement and until Grantor has approved completion of Grantee's abandonment operations. Said bond shall not be reduced in amount except with the written consent of Grantor.

K. Grantee shall within sixty (60) days thereafter notify Grantor in writing of any assignment of this easement.

L. The terms and conditions of this easement shall be binding upon and inure to the benefit of the respective successors and assigns of Grantor and Grantee.

M. All rights not specifically conveyed herein are reserved to the State of Michigan.

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N. Grantee shall not improvise, construct or maintain ship-to-shore or ship-to-pipe line loading or unloading facilities over, through, under or upon any of the bottom lands herein described for the purpose of removing material from or injecting material into said pipe lines.

O. Grantor shall have the right at all reasonable times and places to inspect the pipe lines, appurtenances and fixtures authorized by this easement.

P. It shall not be a breach of the terms and conditions of this easement if for operating or maintenance reasons Grantee shall make use of only one of said pipe lines at a time.

Q. Where provision is made herein that Grantee shall obtain the authorization, approval or consent of Grantor, Grantor agrees that it will not unreasonably withhold the same.

IN WITNESS WHEREOF, the State of Michigan by the Conservation Commission, by Wayland Osgood, Deputy Director, acting pursuant to authority specifically conferred upon him, has caused this instrument to be executed this twenty-third day of April, A.D. 1953.

Signed, Sealed and Delivered in the Presence of:

/s/ Jane Bower
Jane Bower

/s/ Elizabeth Soule
Elizabeth Soule

STATE OF MICHIGAN
BY THE CONSERVATION COMMISSION

By /s/ Wayland Osgood
Wayland Osgood, Deputy Director, pursuant to resolutions of the Conservation Commission dated February 13, 1953 and July 10, 1951

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STATE OF MICHIGAN)
) ss.
COUNTY OF INGHAM)

On this twenty-third day of April, A.D. 1953, before me, a Notary Public, in and for said county, personally appeared Wayland Osgood, Deputy Director, known by me to be the person who executed the within instrument and who, being duly sworn, deposes and says that he is the duly appointed deputy director of the Conservation Commission and that he executed the within easement under authority specifically conferred upon him by law and by the Conservation Commission at its meetings held on February 13, 1953 and July 10, 1951, and who acknowledged the same to be his free act and deed and the free act and deed of the State of Michigan by the Conservation Commission, in whose behalf he acts.

/s/ C. R. Humphrys
C. R. Humphrys, Notary Public, Ingham County, Michigan
My Commission expires September 20, 1954

Examined and approved 4/23/53
as to legal form and effect:

/s/ R. Glen Dunn
Assistant Attorney General