



Protecting the Common Waters of the Great Lakes Basin  
Through Public Trust Solutions

August 4, 2017

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VIA ELECTRONIC SUBMISSION

**FLOW (FOR LOVE OF WATER) SUPPLEMENTAL PUBLIC COMMENTS AND REPORT ON THE JOINT APPLICATION OF ENBRIDGE ENERGY TO OCCUPY GREAT LAKES BOTTOMLANDS FOR ANCHORING SUPPORT STRUCTURES AND IMPROVEMENTS FOR LINE 5 PIPELINES IN THE STRAITS OF MACKINAC AND LAKE MICHIGAN [2RD-DFDK-Y35G]**

Dear Michigan Department of Environmental Quality Director Grether; GLSL Unit Chief Milne; and GLSL Unit Specialist Graf; Acting Chief Fish; Analyst Rasmusson; other State Officials; and staffs:

For Love of Water (FLOW) submitted formal comments, together with technical reports and other attachments, during the public comment period on the above matter ending June 29, 2017. Those comments and reports, together with previous reports, are incorporated by reference as part of the public record. As a result of a large number of requests by interested persons and organizations, the Michigan Department of Environmental Quality (“DEQ”) noticed and scheduled a public hearing and extended public comment pursuant to Section 32504 of the Great Lakes Submerged Lands Act (“GLSLA”), MCL 324.32514(1). FLOW submits the following Supplemental Legal and Technical Comments, together with attached supplemental technical reports and information, as part of the public record, and in support of its comments at the public hearing.

## I. SUPPLEMENTAL LEGAL AND TECHNICAL COMMENTS

### A. The 1953 “Easement” by Its Nature Is Revocable

As previously concluded, the nature of the 1953 Easement authorized by Act 10<sup>1</sup> is only a license or easement-in-gross; that is, the easement is personal property.<sup>2</sup> The Easement is revocable because of the nature of the easement and the legal conclusion that it is subordinate to the paramount public trust interest in the Great Lakes and the state’s perpetual duty to protect the public trust. This inherent state power to revoke the easement because of harm or unacceptable risk to the public trust is separate from and in addition to the rights of the state to terminate under the terms of the Easement.<sup>3</sup>

Further, while Act 10 delegated the authority to the Department of Conservation to grant an “easement” on public trust bottomlands, it did not and could not waive the due recorded findings required of the Department to comply with the narrow exception to the prohibition of grants of occupancy or use of the bottomlands and waters of the public trust directed by *Illinois Central Railroad v Illinois*.<sup>4</sup> “The control over public trust bottomlands and waters can never be lost” except where (1) such parcels are to be used to promote the public interest in the lands and water remaining (i.e., a public trust interest or protected use), or (2) such interest can be granted that will “impair or substantially interfere” with the public trust interests and uses in such land and waters.<sup>5</sup> To date, the state has never made any “due finding” that comply with these exceptions to authorize the Easement under *Illinois Central Railroad*, the Great Lakes Submerged Lands Act (“GLSLA”) of 1955, and the Michigan Supreme Court decision in *Obrecht v National Gypsum Company*.<sup>6</sup>

The 1953 Easement was and is subject to the public trust, which continues and is binding on the state and any party dealing with the state under public trust law. The public trust in these waters and bottomlands is reserved to the State of Michigan, and the state can exercise this continuing power to protect the public trust by modifying, revoking, or terminating the 1953 Easement. Specifically, the state reserved “all rights no specifically conveyed.”<sup>7</sup> Moreover, the Easement” was granted “without warranty express or implied,”<sup>8</sup> was “subject to the terms and conditions herein set forth,” and the Easement is confined to and limited by

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<sup>1</sup> Public Act 10, 1953.

<sup>2</sup> E.g. Some of Enbridge’s pipeline easements are recorded as “personal” in the register of deeds office, Mackinac County. It is not known whether Enbridge has paid taxes on the Easement to State or to the local taxing authorities. See e.g. Section 32508, GLSLA, MCL 324.32508.

<sup>3</sup> 1953 Easement, Sec. C. at pp. 7-8. The Easement is subject to the contractual covenant by Lakehead Pipe Line Company (Enbridge) “at all times to exercise the due care of a reasonably prudent person” to protect public property (like public trust and public drinking water interests) and private riparian property and businesses from harm or injury constitute a basis for termination or revocation. Easement, Sec. A., pp. 3-4.

<sup>4</sup> 146 US 387, 453 (1892).

<sup>5</sup> *Id.*; Great Lakes Submerged Lands Act, MCL 324.32502 and 32503; *Obrecht v. National Gypsum*, 361 Mich 399 (1960). The Michigan Supreme court affirmed the common law standards in *Illinois Central* and the standards contained in the Great Lakes Submerged Lands Act, and found the agreement for use of Lake Huron bottomlands for a commercial dock lacked the “due findings” of the public trust standards of the GLSLA and *Illinois Central*.

<sup>6</sup> *Id.* *Obrecht*, 361 Mich at 415-416.

<sup>7</sup> “All rights not specifically conveyed herein are reserved to the State of Michigan.” 1953 Easement, Section M, p. 11.

<sup>8</sup> *Id.*, p. 2.

the “detailed plans and specifications” filed with the Department.<sup>9</sup> Further, there is no provision authorizing an amendment or modification of the Easement.<sup>10</sup>

**B. A Plain Reading of the Great Lakes Submerged Lands Act Requires Enbridge to Obtain a Permit for Conveyance or Occupancy Agreement for Structures and Improvements, Including the New Anchor and Pipeline Supports Design and Specifications That Are Not Part of the Specifications and Design Approved in 1953.**

As noted above, the state reserved and granted the Easement subject to public trust doctrine and authorized the use of bottomlands for the twin pipelines only as specified and designed and approved by the Department. The design and specifications required the pipeline to anchor or rest on the bottomland with the limitation that no length of the pipeline or span could be unsupported by bottomlands that exceeded 75 feet.<sup>11</sup> The recent addition of the new screw-anchor and bracket design structures for the pipeline was not contemplated or authorized by the 1953 Easement. Rather this new or modified pipeline design is directly connected to the failure in design and specifications of the pipeline that has resulted in constant erosion of bottomlands beneath the lines, causing bending, peeling, and compromise of the lines integrity, and consequently serious risks of rupture or leak. This new or change in design for screw anchor brackets along the lines is also related to the increase in the flow rates of crude oil or NGL-- 300,000 barrels per day (“bbl”) as originally approved to 490,000, and in the last few years from 490,000 bbl to 540,000 bbl.

Section 32502 of the Great Lakes Submerged Lands Act states in part:

This part shall be *construed so as ... to provide for the sale, lease, exchange, or other disposition of unpatented lands and to permit the filling in* of patented submerged lands whenever lands and waters...<sup>12</sup>

Section 32503(1) states in part:

... [T]he department, after finding that the public trust will not be impaired or substantially affected, *may enter into agreements pertaining to waters over and the filling in* of submerged patented lands, or to lease or deed unpatented lands, after approval of state administrative board.<sup>13</sup>

Section 32505(2) states:

The department may *permit by lease or agreement, the filling in and permanent improvements and structures*, after finding that the public trust will not be impaired or substantially injured.<sup>14</sup>

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<sup>9</sup> *Id.*, pp. 4, 6.

<sup>10</sup> While the “Easement” allows for subsequent modifications, it can only be done by written approval by the State. *Id.*, p. 4. Any such approval involving improvements or structures would require authorization in full compliance with Sections 32503 and 32505 and other parts of the GLSLA and its rules.

<sup>11</sup> Easement, C. (10), p. 5.

<sup>12</sup> MCL 324.32502.

<sup>13</sup> MCL 324.32503(1).

<sup>14</sup> MCL 324.32505(2).

Read together, Sections 32502, 32503, and 32505 plainly require agreements for conveyances or occupancy agreements for the *filling in* and *improvements* and *structures* on or in bottomlands and waters.

Enbridge has never obtained any agreement or other disposition for this new and/or modified design and expanded use of the pipelines in the Straits as the Great Lakes Submerged Lands Act. Accordingly, the state must require Enbridge to obtain authorization for occupancy and use of the bottomlands and waters of the Straits for the pipeline with this new screw-anchor and bracketed pipeline structure.

**C. Enbridge Must Obtain an Agreement Authorizing Occupancy of These New “Structures” and “Filling in” and an “Activities” Permit.**

**1. Sections 32502, 32503(1), and 32505(2) Require Authorization and an Agreement for “Improvements,” “Structures,” and “Filling in.”**

Enbridge’s significant modifications of its pipelines and screw-anchor support system constitute permanent “improvements,” “structures” and “filling in” of bottomlands.

The GLSLA brought Michigan into compliance with the narrow exceptions for allowing private use of public trust waters and bottomlands set forth in *Illinois Central*.<sup>15</sup> Section 32502 through 32505(2) make it clear that the GLSLA is intended to require *leases or agreements to permit any new filling-in and improvements or structures*. The 22 screw-anchor supports are undisputedly new improvements and structures for the pipeline on bottomlands. They are necessary to shore up an unstable pipeline caused by mismanagement, neglect, and changing conditions that have increased the risk of excessive impairment or harm to the public trust, health, and safety. Enbridge’s twin-pipelines in the open waters of the Straits are necessary and related to the increase to 540,000 bbl. of Line 5’s entire flow rate of crude oil. The 1953 Easement and plans did not intend or contemplate screw-anchor supports.

Accordingly, in addition to the current request for an activity permit for placing spoils or other materials on bottomland under Section 32512(1)(c), Enbridge must apply for authorization for the screw-anchor and pipeline design structures and improvements. To date, Enbridge has not done so. As a result, Enbridge is in violation of the GLSLA, and is not in compliance with the standards for authorizing such improvements and structures within the narrow exceptions of the GLSLA, *Obrecht*, and *Illinois Central*.

Therefore, the Enbridge application for a permit under Section 32512(1) and Rule 1015 must also demonstrate that it is entitled to occupancy or other use agreement for authorization of these improvements, structures and/or filling in by this new or modified pipeline and screw-anchor support system.

**2. Enbridge Must Also Obtain a Permit for Its Activity to Construct These Improvements, Structures, and Filling in as Required by Section 32512(1) (c) of the GLSLA.**

Section 32512(1) prohibits certain construction activities, such as canals, connecting waterways, dredging or placing spoils, and marinas unless the activity is permitted under Section 32512(1)(c) states:

“Unless a permit has been granted.... a person shall not do any of the following:

(c) Dredge or place spoil *or other materials* on bottomland.”<sup>16</sup>

<sup>15</sup> *Illinois Central R.R.* 146 US 387 (1892); *Obrecht v. Nat’l Gypsum*, 361 Mich at 412-414 (1961).

<sup>16</sup> MCL 324.32512(1) (c).

The activities covered by Section 32512(1)(c) involve dredging or placement of materials such as spoils from dredging on bottomlands. However, in the 1980s, the Department adopted a definition of “materials” in Rule 1001(k) that added the word “structures.” As a result, structures that require authorization or an agreement or conveyance permitting them to occupy bottomlands and waters must also comply with the activities permit required by Section 32512(1)(c). The inclusion of “structures” in the meaning of “other materials” in Section 32512 cannot be read to and does not replace or supplant the requirement for authorization of structures and improvements under Sections 32503 and 32505. The only way these sections can be reconciled is to read them together; that is, there is a requirement for both authorization by an occupancy agreement or conveyance under Sections 32503 and 32505 and for the activity of actually placing the structure under Section 32512(1)(c).

Therefore, the current application for a permit for construction activity to “place spoils or other materials” under Rule 1008 and 1015 does not satisfy this additional mandatory requirement for a lease or agreement to permit improvements and structures. For the reasons stated in FLOW’s previous June 29, 2017 comments and these supplemental comments, the application requirements and standards for authorization of conveyance (or occupancy) for the screw-anchor brackets and pipelines improvements or structures and the activity of placing these “structures” on bottomlands have not been satisfied.

Parenthetically, it should be noted that this does not mean the state cannot take interim or permanent measures to halt the flow of crude oil within a reasonable period of time under the Easement or the GLSLA application, pending additional filings to comply with the requirements of the Act. The FLOW technical team has raised a number of risks concerning the current pipeline and the proposed screw-anchors in previously filed reports, as well as the attached supplemental reports by Ed Timm, Ph.D.<sup>17</sup> and by Rick Kane,<sup>18</sup> a hazardous risk expert.

**D. Enbridge Has Not Submitted a Comprehensive Environmental Assessment or Alternatives Study Showing the Full Potential Adverse Environmental Effects, No Impairment of the Public Trust, and That There Exists No Feasible and Prudent Alternative as Required by Sections 32502, 32503, 32505, and 32512 of the GLSLA and Rule 1015 and 1015(a), Section 1705(2) of the Michigan Environmental Protection Act (“MEPA”), *Vanderkloot*, and the Duty to Consider Impacts Under Public Trust Law.**

As established above, Enbridge must submit a full, comprehensive environmental assessment of the overall threatened risks and potential adverse impacts and impairment to the public trust required by the GLSLA, and its Rules 1015, 105(a). Moreover, Michigan Constitution Art 4, Sec. 52 and the MEPA require a full and sufficient environmental evaluation or impact statement for the state to consider and determine likely effects on the state’s paramount interests in the water, aquatic resources, such as fish and fish habitat, and the public trust in those resources.

As demonstrated by FLOW’s June 29, 2017 comments, Enbridge’s application does not address potential adverse impacts or demonstrate no impairment. Moreover, it fails to prove that there are no feasible and prudent alternatives to the high risk, failures, and lack of approvals for the continued use of these lines in the Straits, including the increases in flow rate of crude to 540,000 bbl as part of Enbridge’s massive \$2.6

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<sup>17</sup> Ed Timm, Ph.D., Technical Note: *An Analysis of Errors and Omissions in the Dynamic Risk Inc. Line 5 Alternative Analysis Option 5*, July 24, 2017, attached as Appendix A.

<sup>18</sup> Rick Kane, *Defining a Worst-Case Release Scenario for the Enbridge Crude Oil Pipelines Crossing the Straits of Mackinac*, Aug. 2, 2017, attached as Appendix B.

billion expansion of its overall Lakehead System into and through the Great Lakes, including Line 6b (now Line78) across southern Michigan.<sup>19</sup>

Apparently, it is the position of Enbridge, and possibly the DEQ, that Enbridge needs only to submit a bare-bones application for placement of “structures” as “other materials” under Section 32512(1) (c) and Rule 1015. Reportedly, in a tribal consultation meeting on July 14, 2017, state DEQ officials stated that they would confine the assessment of potential adverse impacts and any alternatives study and review to the small area of bottomlands surrounding the footprint of each screw-anchor pipeline support.<sup>20</sup>

This position is untenable and calculated to evade the law and facts that call for full impact and alternative analysis and review. The anchor supports are necessarily and related to the entire Straits pipelines segments to shore up these pipelines risks, failures, and the stress and bending that have compromised the integrity of these lines. As a matter of law, the DEQ has a legal duty to require Enbridge to prove no adverse impacts or impairment, and a legal duty to consider and determine the potential of such likely impacts under the GLSLA, public trust law, and MEPA. The plain meaning of the GLSLA and Rules 1015 and 1015(a) requires Enbridge to submit and demonstrate by a full environmental assessment of all “existing and potential adverse effects” that impacts will have only minimal likely adverse effects or impairment of the public trust applies to “any permit.” Moreover, permits for the anchor structures to occupy bottomlands of the state are required in addition to the construction activity itself under Rule 1015. The DEQ, and presumably Attorney General’s narrow interpretation of the scope of the assessment is contrary to law.

Further, for the reasons described in Sections A through C above, Enbridge must obtain authorization for any “structure” or “improvement” under Sections 32503 and 32505. The plain meaning of Section 32512(1)(c) and Rule 1015 prohibit any permit without a report on potential adverse impacts and a showing that there will be no impairment or interference, and that there exists no alternative to the screw-anchor bracket “improvement” or “structure” to the pipelines. Because these anchor supports are new, fall outside the Easement and its requirements, and are inseparable from the pipeline for its to operate, Enbridge must submit a full, comprehensive environmental assessment of the overall threatened risks and potential adverse impacts and impairment to the public trust required by the GLSLA and Rules 1015, 1015(a). Finally, as discussed above and in previous reports, Enbridge must submit a comprehensive report showing that there exists no alternative.

After consideration of the twin lines in the Straits, the Michigan Petroleum Pipeline Task Force and the Request for Proposal signed by the consultant with the state in the Pipeline Advisory Process identified the specific lack of and need for a comprehensive “ independent assessment of risks and impacts” and alternatives.<sup>21</sup> Moreover, the Michigan Constitution Art 4, Sec. 52 and MEPA require a full and sufficient environmental evaluation or impact statement for the state to consider and determine likely effects on the state’s paramount interests in the water, aquatic resources, such as fish and fish habitat, and the public trust in those resources.<sup>22</sup>

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<sup>19</sup> E.g. Enbridge Line 3 Replacement Underway in Wisconsin.

<http://www.superiortelegram.com/news/superior/4305512-enbridges-line-3-replacement-underway>. Like it did before the MPSC and DEQ here in Michigan, Enbridge continues to segment this massive expansion project by pawning these segments as “maintenance” or “repair.”

<sup>20</sup> See also July 20, 2017 letter to Director Grether, DEQ, from William Rastetter, Tribal Attorney, Grand Traverse Band of Ottawa and Chippewa Indians, at p. 2.

<sup>21</sup> Michigan Petroleum Pipeline Task Force Report, pp. 46-47; Independent Risk Analysis for Straits Pipeline, Draft Scope of Work, Michigan Pipeline Safety Advisory Board, Oct. 28, 2015, p. 1.

<sup>22</sup> See FLOW June 29, 2017 Comments, Sec. D., p. 11, footnotes 36-39, and accompanying text.

## **1. The Need for a Comprehensive Environmental Assessment Showing Potential Adverse Impacts, Magnitude of Harm and Risks, and No Impairment Is Even Greater.**

FLOW's public comments filed June 29, 2017 established the requirement for and lack of a comprehensive environmental assessment of impacts. Since that time, the state scrapped the Det Norske Veritas Inc. ("DNV") draft risk report because of a conflict of interest created by Enbridge and the consultant who had contracted with the state. Moreover, the Dynamic Risk ("DR") "Draft Alternatives Analysis for the Straits Pipeline" acknowledges that DR's risk assessments of various threats to alternatives it considered "are not intended to represent a 'worst-case spill.'"<sup>23</sup> The lack of risk report creates a substantial void, which makes it difficult for the DEQ to consider or determine potential adverse impacts associated with the continued operation of Line 5 in the Straits with the screw-anchor support design and structures. As a result, there is no credible risk report showing the magnitude of potential impacts, harm and probability of failure, and there is no report showing that there will be no or only minor impairment or interference with the waters and related biota, public trust and riparian uses. High risk is a function of both likelihood and harm; the higher the magnitude of harm, the lower the corresponding threshold for establishing a probability or likelihood of such harm or impairment.<sup>24</sup>

Without the state's risk report, Enbridge has failed to show through a comprehensive environmental and risk assessment that it has satisfied the standards and requirements of the GLSLA and its rules, the MEPA, as well as the duty to protect and preserve the public trust and specific public trust rights and uses, such as swimming, boating, fishing, and drinking water under the public trust doctrine.<sup>25</sup>

In order to address the lack of a credible risk assessment and better identify risks of potential adverse impacts, FLOW's technical experts have continued to evaluate magnitude of harm and risks since FLOW's June 29, 2017 comments. These assessments provide the Department and state officials with additional information on the compromised integrity and uncertain dangers of the Straits pipelines, and a credible worst-case scenario of impacts and harm.

- (a) Dr. Ed Timm has submitted a supplemental technical report to the state.<sup>26</sup> This report, along with his previous analyses and documents filed with the state by Enbridge, shows that the integrity of the pipeline has been seriously compromised, the line is damaged, and the risk of a pipeline failure and serious harm and impairment to the Straits, environment, and public trust is high.

Dr. Timm's recent supplemental report on the DR Draft Alternatives Analysis for the Line 5 pipelines in the Straits concludes that the DR report is flawed and not credible.<sup>27</sup> However, in order to properly evaluate the DR Analysis, Dr. Timm conducted a careful examination of the

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<sup>23</sup> Dynamic Risk Draft Alternatives Analysis, June 27, 2017, p. 60 ("DR Draft Alternatives Report").

<sup>24</sup> E.g. *Ethyl Corp v. EPA*, 541 F2d 1, 18-20 (D.C. Cir. 1976)

<sup>25</sup> GLSLA Sections 23102-32505, 32512, GLSLA Rule 322.1001(m) ("public trust" means the perpetual duty of the state to secure to its people the prevention of pollution, impairment or destruction of its natural resources, and rights of navigation, fishing, hunting, and use of its lands and waters for other public purposes."). *Collins v Gerhardt*, 236 Mich 38 (1926); *Glass v Goeckel*, 473 Mich667, 694 (2005).

<sup>26</sup> Ed Timm, Ph.D., Technical Note: *An Analysis of Errors and Omissions in the Dynamic Risk Inc. Line 5 Alternative Analysis Option 5*, July 24, 2017, attached as Appendix A ("Timm July 24 Analysis of Errors and Omissions Report"), Risks, at pp. 1-8, Unsupported Spans, pp. 9-14, Span History of West (W 11) Line Dating from 2005, at pp. 19., Evidence of Damage to Line 5 under the Straits, at pp. 15-19, Other Pipeline Integrity Concerns, pp. 19-21.

<sup>27</sup> *Id.*, Appendix A, p. 23.

risk analysis for these twin pipelines, including evidence of their damaged condition. The operating condition and risk of these twin-lines are constantly threatened from ship anchors, errors in operations, vortex-induced vibration, and spanning stress.<sup>28</sup> Currents, turbulence and gravity cause vibrations and bending, scouring and erosion underneath these lines where they were placed along the bottom of the Straits; this demonstrates a significant risk of failure; these currents and gravity have in turn caused erosion and resulted in long spans (as much as 286 feet)<sup>29</sup> of the pipeline that are unsupported by these bottomlands. Recently disclosed evidence from the Kiefner report documented long unsupported spans of pipeline and calculations about these structures.

Dr. Timm determined that these spans which have been a continuing problem over the years have compromised the integrity of these twin-lines from bending or plastic deformation beyond elastic limits.<sup>30</sup> Knowledge of “peak currents” is essential to determine the degree of deformation and bending, as well as scouring and erosion. This requires proper calculations in inputs into probability distributions, which is a function of fluid mechanics. The DR analysis failed to take current velocities and the effect on erosion and bending or deformation, and on closer examination Dr. Timm observed that the longer spans are affected by velocities that exceed the pipelines’ original design velocity (2.25 mpg).<sup>31</sup> This means the pipeline’s integrity has been compromised, and more importantly, that the original design of placing the lines along the bottom was compromised because of these higher-end velocities. In addition, DR notes its analysis that these stresses overtime increased the probability of failure; yet DR started its Monte Carlo probability analysis in the year 2018 (next year), not 1953 when these stresses actually began to occur and cause erosion, long unsupported spans, and likely deformation or bending.<sup>32</sup> In effect, DR ignored over 60 years of historical conditions and stresses of the underwater pipeline. Dr. Timm chronicles Enbridge’s five historical periods of unsupported spans from currents and turbulence.<sup>33</sup>

When Dr. Timm sought to correct the errors in the DR report, he found that the DR model underpredicted most currents because it was based on data taken from periods of moderate weather. Moreover, it did not predict peak currents during severe weather combined with long unsupported spans of pipelines (despite Enbridge’s efforts to reduce the spans by filling clay under and around the lines). Enbridge more recently has added screw-anchor supports with brackets, a completely new design for the pipeline that has never been tested.<sup>34</sup> The current Enbridge application for 22 more screw-anchor supports with brackets around the lines shows a continuing problem and risk of failure, and an admittedly new, significantly modified design from the one approved and constructed in 1953. This reality and numerous flaws in DR’s probabilistic risk evaluation demands a full and careful reanalysis of these twin-lines in the Great Lakes, because of the increased, although unknown, probability of pipeline failure or rupture.<sup>35</sup>

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<sup>28</sup> Appendix A, p. 1.

<sup>29</sup> Appendix A, Tables 2 and 3, p. 11.

<sup>30</sup> Appendix A, pp. 2-3.

<sup>31</sup> Appendix A, p. 3.

<sup>32</sup> Appendix A p. 3. See also Fig. 3, p. 6.

<sup>33</sup> Appendix A, Table 4, p. 12.

<sup>34</sup> Appendix A, Table 4.

<sup>35</sup> Appendix A, pp. 5-7.

Given the evidence of these stresses, forces, unsupported spans and bending, pipeline fatigue risks, the current application must be treated as a new, increased and significantly modified design that requires full evaluation as the law requires.

Moreover, when DR performed its Monte Carlo probability analysis, it looked at and calculated a result for each span location separately over time, and not both lines and all spans simultaneously, which represents more accurately real world conditions; as a result, DR made a mathematical error.<sup>36</sup> If the Straits sections of Line 5 are treated as a typical buried pipeline, Dr. Timm calculated the probability of pipeline failure in 2017 at 46.4 percent, and in 2053 at 72.5 percent.<sup>37</sup> As noted by Dr. Timm, quoting from DR's own report, "In a dynamic environment, characterized by changing water currents, span lengths and gap ratios, there is potential for maximum combined effective stress to vary with time... Under such conditions, the potential for plasticity (bending) creates potential for fatigue, under which conditions, progression to failure can occur after relatively few cycles."<sup>38</sup>

It is not surprising that there is documented evidence of damage to Line 5, including bends 10 and 11, east leg pipeline, and bends 9 through 13 along the west leg line.<sup>39</sup>

Dr. Timm also identified problems with girth welds and welding practices, coating integrity and compromised cathodic protection, thermal expansion and pipeline movement.

In short, the conditions of the Straits lines are already compromised, and the gravitational forces and currents will continue to cause damage. Moreover, in its application for a new and modified design, Enbridge has provided the DEQ no evaluation of the condition of the pipeline and the potential risks to environment, public health and safety, or the public trust in the Great Lakes. Critically, there is a high probability that this line will fail, this year or during the next few years. Even the erroneous 1:60 probability of failure in the DR analysis by 2053 is serious when combined with the high degree or magnitude of harm and damage.

- (b) Rick Kane, hazardous risk management expert, has submitted technical reports showing that Enbridge and the consultants for the state as part of the Pipeline Safety Advisory Board ("PSAB") process have not submitted a valid or credible worst-case scenario.<sup>40</sup> Identifying the worst-case scenario is the starting point for risk assessment. To assist the DEQ, Mr. Kane in consultation with Gary Street analyzed and identified the proper approaches for a worst-case scenario and risks assessment, including identifying the potential or likely magnitude of harm in the event of a rupture, release, or slow, undetected leak from a failure of one or both of the lines in the Straits.<sup>41</sup>

The size of a spill is crucial to identifying risk, including magnitude of harm. To calculate a valid worst-case scenario, only "passive controls" should be considered. Passive controls are such things as secondary containment, but do not include sensors, shut-down or other mechanical and

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<sup>36</sup> Appendix A, pp. 13, Fig. 6.

<sup>37</sup> Appendix A, pp. 14-15.

<sup>38</sup> Appendix A, p. 15; DR Alternative Analysis Report, Ref1, p. TS-13.

<sup>39</sup> Id., p. 16-17, text and Fig. 7. Fig. 8 on page 18 shows significant deformation and bending from 1979 to 2016.

<sup>40</sup> Rick Kane, *Defining a Worst-Case Release Scenario for the Enbridge Crude Oil Pipelines Crossing the Straits of Mackinac*, Aug. 2, 2017, attached as Appendix B ("Kane Worst-Case Scenario Report").

<sup>41</sup> See Appendix B, Appendix D.

electrical and control systems, or procedures and emergency response actions. These active controls can be used for alternative scenarios, but they are not worst-case.

Under PHMSA worst-case scenario regulations, the pipeline operator need only calculate the size of a spill based on the understanding that the size of the spill would not exceed the largest release that the company's emergency response plan filed with PHMSA.<sup>42</sup> For Line 5, DR only analyzed the various threats and likelihood that such threats would occur, and as noted above did not conduct a worst-case scenario analysis. DR then evaluated a rupture from a 3-inch diameter hole in one of the 20-inch lines, releasing 2,600 barrels during a 10-minute detection by sensors, 30 seconds for shut-down detection, and 3 minutes for valve closure and response time ranging from 1.8 to 5.8 hours. DR calculated that a "reasonable" scenario would impact 20 miles of shoreline, with a 1:60 probability of occurrence within the next 35 years.<sup>43</sup> This is similar to Enbridge's assumptions in filing its "worst-case discharge" based on its "operator's best estimate" as "adjusted for any subsequent corrective or preventive action taken."<sup>44</sup> In both instances, the worst-case represents an estimate with adjusted discharge determined by the operator Enbridge.

Enbridge's actual emergency response plan filed with PHMSA is not available because it is claimed to be protected from disclosure based on a sensitive security matter. However, enough of the response plan is available through public record channels, that the Enbridge worst-case discharge scenario can be understood. Enbridge assumes a release of 4,500 barrels (189,000 gallons) from a cut to one of its lines, with 10-minute response time, 3-minute valve closure, or 13 minutes from discovery to shut-down. Further, the amount of crude oil released was reduced because of the water pressure related to the specific gravity of crude oil (lighter) would keep oil in the ruptured line; the crew would then insert a tube and pump the oil out of the pipeline.<sup>45</sup>

In short, the DR and Enbridge worst-case approaches are closer to all things working as planned, which is closer to an ideal or optimal case. Other Enbridge pipeline ruptures like Line 6B have taken many hours or days for response and shut-down of the release, and years to clean up.<sup>46</sup> By contrast, other federal agencies, including EPA, OSHA, Homeland Security and NRC, demand worst-case scenario determinations.<sup>47</sup> For example, the federal Council of Environmental Quality requires worst-case scenarios as part of the environmental impact statement process imposed on agencies by NEPA.<sup>48</sup>

As previously established and incorporated into FLOW's reports on file in this matter, under Michigan public trust law, the GLSLA and its Rules, and the MEPA, the state has a duty to protect public trust lands and waters, aquatic habitat and species, and public trust uses such as fishing, boating, drinking water, sustenance, and swimming or other recreation. This also includes a duty to prevent and minimize likely environmental degradation, and a duty to fully

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<sup>42</sup> 49 CFR 194.105.

<sup>43</sup> DR Draft Alternatives Report, pp. MS-2 and TS-10.

<sup>44</sup> 49 CFR 105(b)(1).

<sup>45</sup> Appendix B, p. 8.

<sup>46</sup> Appendix B, pp. 8-9.

<sup>47</sup> Appendix B, p. 6.

<sup>48</sup> 40 CFR 15022.22; NEPA, 42 U.S.C. 4332(C); *Sierra Club v Sigler*, 695 F.2d 957, 967-974 (Just because probability of a threat is considered low, doesn't mean a worst-case scenario can be ignored as part of ascertaining uncertain risks of fairly or reasonably certain harm if a large release occurs).

consider effects and alternatives.<sup>49</sup> The failure of Enbridge to submit or demonstrate potential environmental impacts and no impairment through an environmental assessment, including a credible and proper worst-case scenario violates the GLSLA, its Rules, MEPA and the public trust duties and standards.<sup>50</sup>

Mr. Kane, in consultation with technical advisor Gary Street, concluded that the DR and Enbridge worst-case approach is not a true worst-case. He then followed a proper approach for worst-case scenario to calculate a credible worst-case scenario for a spill, release, and slow leak from the Strait's pipelines. To do so, he removed the active controls and optimal response times, and applied standard industrial and hazardous materials approaches for determining worst-case scenario.

In hazardous risk management, RISK is a function of CONSEQUENCE times PROBABILITY. Risk is a measure of the degree of human injury, environmental damage or economic loss in terms of likelihood (probability) and the magnitude of loss or injury, which is consequence. Probability is a function of vulnerability and threat.<sup>51</sup> Vulnerability is any weakness in a system that can be affected by accidental, natural or man-made causes resulting in harm. Threat is any indication, circumstance, or event with the potential to cause the loss of or damage to a system or asset or person, also of man-made or natural origin. As a result, actual conditions of the twin pipelines in the Straits, the range of potential threats and vulnerabilities to the pipeline, including those that have already been identified in the Enbridge system and elsewhere, must be considered. Moreover, given these vulnerabilities and threats, the range of size and magnitude of the harm or consequence from a release or leak must be considered. Where the magnitude of harm is massive or high, RISK remains high because the higher the degree of harm the less important is probability; in other words, high vulnerability and threats that result in a high degree of harm are likely in the context of avoiding or preventing unacceptable risk.

Based on this approach, Kane and Street calculated a credible worst-case scenario for the pipelines in the Straits. Assuming operation capacity of 540,000 bbl, major breach or rupture with a 2-hour release would release 45,000 barrels of oil; if two lines ruptured at or about the same time, it could be as high as 61,000 barrels of oil.<sup>52</sup> While the exact numbers can be debated, the factual conclusion is that the worst-case scenario for these pipelines are as much as 10 times the optimal worst-case discharge for Enbridge's emergency response plan.

An undetected, slow leak could actually be much worse. A leak could go undetected for a week. In winter months, with agglomeration of particulates and dispersions, it could go undetected for a much longer time period, or be more difficult to ever clean up or remediate.<sup>53</sup> The worst-case calculated by dispersion modeling done by Dr. David Schwab at the University of Michigan concluded a spill would release 25,000 barrels (1,050,000 gallons) If you consider the "Black Swan" or "perfect storm" scenario (think Fukushima and human-error design assumptions), a

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<sup>49</sup> MCL 324.1705; *Ray v Mason Co Drain Comm'r*, 393 Mich 294; 224 NW2d 883 (1975); *State Hwy Comm'n v Vanderkloot*, 392 Mich 159; 220 NW2d 416 (1974).

<sup>50</sup> The failure to submit a proper "worst-case scenario" also undermines the reliability of any evaluation in an alternative analysis. See Section D, 2, below.

<sup>51</sup> See references at end of Appendix B, including Fidler, et al., Crowl, et al., Center for Chemical Process Safety, and US EPA, "Risk Management Program Guidance for Offsite Consequence Analysis."

<sup>52</sup> Appendix B, p. 9.

<sup>53</sup> Appendix B, p. 10.

spill and damage would be higher and more widespread than these catastrophic worst-case scenarios.<sup>54</sup>

In summary, the pipelines under the Straits have been compromised by erosion, currents, and other forces, which will continue. The screw-anchor supports design implemented more recently has not been evaluated and some anchors have been pulled from the bottomland. The risk is high and imminent; according to Dr. Timm, the probability is as high as 46 percent at this time. Even the DR prediction of 1:60 is high and probable given the estimated high degree of harm and damage.

There are two credible worst-case scenarios: (1) rupture and release of oil from 45,000 barrels to 61,000 barrels; (2) slow or undetected leak for a week or months, from 23,450 barrels to far more than that. In either case, the disruption and permanent irreparable losses and damages would be monumental, covering hundreds of miles of shoreline, loss of wildlife, fishery, recreation, drinking water, boating services, tourism, private property and regional economy. In addition, because of this magnitude of harm, there is likely impairment of the public trust and water and natural resources of the state, contrary to the GLSLA, its Rules, common law public trust, and MEPA.

## **2. Enbridge Has Not Submitted a Reliable Comprehensive Alternatives Report That Demonstrates That There Is No Feasible and Prudent Alternative to the Screw-Anchor Support Structures and Pipelines.**

Enbridge's application does not address or demonstrate that "there is no feasible and prudent alternative" to the anchor support structures or the construction activity necessary to shore up the twin lines under in the Straits. Moreover, as described in detail in previous reports, the anchor supports are part of a new or modification and systematic upgrade of Line 5 to increase design or operating capacity from 300,000 bbl to 540,000 bbl.<sup>55</sup> Neither the MPSC nor the DEQ, nor any other office of the state to date has independently considered and/or determined the question of whether "feasible and prudent alternatives" to the lines in the Straits directly related anchor supports exist.<sup>56</sup> In addition, Enbridge must submit a comprehensive alternatives report that demonstrates that there is no feasible and prudent alternative to the Straits Pipelines consistent with the requirements of the public health, safety and welfare.<sup>57</sup> Enbridge has not done so.

The recently released "Draft Alternatives Report" by DR for the state on the pipelines under the Straits was contracted for by the state in conjunction with the PSAB voluntary process. While the DR report purports to evaluate six (6) alternatives identified by the state and the PSAB, the draft report is not reliable or credible because of serious flaws, described by Dr. Timm in his supplemental Technical

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<sup>54</sup> Appendix B, p. 10.

<sup>55</sup> FLOW June 29 2017 Comments, Sec. II, at pp. 12-13, Sec. III, at pp. 13-15 <http://flowforwater.org/wp-content/uploads/2017/06/FINAL-2017-06-29-17-Comments-to-DEQ-USCOE-Joint-App-Enbridge-for-Supports.pdf>; FLOW Alternatives Report to Michigan Pipeline Safety Advisory Board: Eliminating the Line 5 Oil Pipelines' Unacceptable Risk to the Great Lakes Through A Comprehensive Alternatives Analysis and Systems Approach, December 14, 2015 <http://flowforwater.org/wp-content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf> ; FLOW Report, September 7, 2015, Appendix A and Appendix B, 2-3.

<sup>56</sup> FLOW June 29, 2017 Comments, Sec. D., p. 11, footnotes 36-39, and accompanying text.

<sup>57</sup> See FLOW Alternatives Report to Michigan Pipeline Safety Advisory Board: Eliminating the Line 5 Oil Pipelines' Unacceptable Risk to the Great Lakes Through A Comprehensive Alternatives Analysis and Systems Approach, Part I, pp. 7-12. December 14, 2015 <http://flowforwater.org/wp-content/uploads/2015/12/FLOW-Composite-Report-12-14-15-FINAL-1.pdf>.

Report discussed above,<sup>58</sup> and by experts Rick Kane and Gary Street in their supplemental reports attached to this Legal and Technical Supplemental Comment, discussed immediately below.<sup>59</sup> These flaws and errors include a myopic view of the reports objective, false assumptions, skewing the application of models by erroneous inputs, a failure to evaluate the risks of the six (6) alternatives based on a credible worst-case scenario, failure to accurately address the risk and relative costs and damages or impairment to fishing rights, public trust rights and interests in the Straits; they also fail to adequately incorporate the age, evident damage, bends or deformations, and historically and long spans unsupported by bottomlands.

Technical experts, Rick Kane and Gary Street, have continued to investigate the existence of alternatives to Line 5, including the twin-lines under the Straits. They previously concluded that Line 5 is not essential and can be eliminated based on a comprehensive alternative adjustment of existing pipelines within the Lakehead System.<sup>60</sup> Their supplemental conclusions are: (1) there exists a combination of existing alternative pipeline infrastructure and capacity, or easily modified infrastructure and capacity, that can handle all of the light crude oil now transported by Line 5 and meet all Canadian and Michigan needs; (2) such infrastructure and capacity would be less costly than other alternatives, and would be part of Enbridge's continuing \$2.6 billion expansion of its Lakehead System; (3) the NGLs for Enbridge's propane customers in the UP, should they stay with Enbridge and not buy from the supplier in Sault Ste. Marie, is overstated, and NGLs can be transported through a 4-inch replacement Line within the Line 5 easement to Rapid River; this would remove the risk of continuing failures and releases from the 64-year old Line 5; (4) the continuation of Line 5 in the Straits would pose continued high risks, because of indisputably powerful currents, and constant erosion of bottomlands support and anchor supports; (5) the consideration of a tunnel option or alternative is unrealistic and imprudent because the cost would be prohibitive compared to existing pipeline infrastructure alternatives.<sup>61</sup>

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<sup>58</sup> See Appendix A.

<sup>59</sup> See Appendices B, C, and D.

<sup>60</sup> FLOW Line 5 Comprehensive Alternatives and Systems Report.

<sup>61</sup> It should also be noted that a tunnel option would be most likely infeasible, because it would have to obtain approvals under the GLSLA and public trust; most everyone agrees, including Attorney General William Schuette, that any new crude oil pipelines and related design infrastructure would not be authorized today.

## **II. Supplemental Comment on DEQ Action on the Application and Immediate Measures and Conditions**

Based on FLOW's comments and appendices submitted to the Department on June 29, 2017 and the foregoing supplemental comment and attached appendices, the Department is requested to take the following immediate actions and measures:

1. Continue this proceeding and maintain jurisdiction to assure protection of the public trust and compliance with the requirements and standards of the Great Lakes Submerged Lands Act ("GLSLA") and its Rules, the common law of public trust, and the MEPA and Michigan Constitution 1963, art. 4, sec. 52;
2. Require Enbridge to submit an application on the 22 proposed screw-anchor and brackets occupying the bottomlands in accordance with the GLSLA and its Rules and public trust for "structures" and "improvements under GLSLA Sections 32503, 352505(2), 32512 and its Rules, MEPA, Michigan Constitution 1963, art. 4, sec. 52, and public trust law;
3. Require Enbridge to submit a comprehensive environmental assessment on the entire lines in the Straits with a determination of the "existing and potential adverse effects," including a credible worst-case scenario;
4. Require Enbridge to submit a comprehensive alternative analysis that demonstrates that there are no feasible and prudent alternatives; including but not limited to a decommissioning Line 5 in the Straits and elsewhere because of its age, condition, and risks;
5. Make available the supplemental application and additionally required information submitted pursuant to the above to the public and interested persons and organizations;
6. Provide a reasonable new time period for the public, interested persons, and organizations to comment and schedule an additional public hearing;

This supplement comment also provides critical supplemental technical evaluations and conclusions from Dr. Timm and Kane and Street that document (a) the compromised integrity and evidence of historical damage of the twin-lines in the Straits, (b) the significant probability of imminent danger and harm to the public trust waters, bottomlands, aquatic resources, environment, and public trust uses, and health, safety and welfare from a rupture, failure or release of or from one or both lines, and in relation to (c) the high degree and magnitude of harm and damage to the environment, public trust, waters, biota, public and private property, and public health and safety. Because of this, the Department is requested to take the following immediate and interim measure and action:

Temporarily order Enbridge to halt the flow of crude oil and other petroleum products through the Straits pipelines pending implementation of the previously stated recommendations.

Once more FLOW appreciates every effort moving forward the state makes to assure to the highest duties and standards to comply with the laws and public trust duties and principles that apply to this matter. Should you have any questions or desire further information, we are willing to meet with you and technical experts to discuss the above.

Thank you.

Sincerely yours,



James Olson  
President



Elizabeth R. Kirkwood  
Executive Director

CC: Charles Simon, Chief, Regulatory Office, Corps Detroit District  
Kerrie Kuhn, Chief, Permits, Corps Detroit District  
Michigan Governor Rick Snyder Michigan  
Attorney General Bill Schuette  
MDNR Director Keith Creagh  
U.S. Senator and Hon. Gary Peters  
U.S. Senator and Hon. Debbie Stabenow