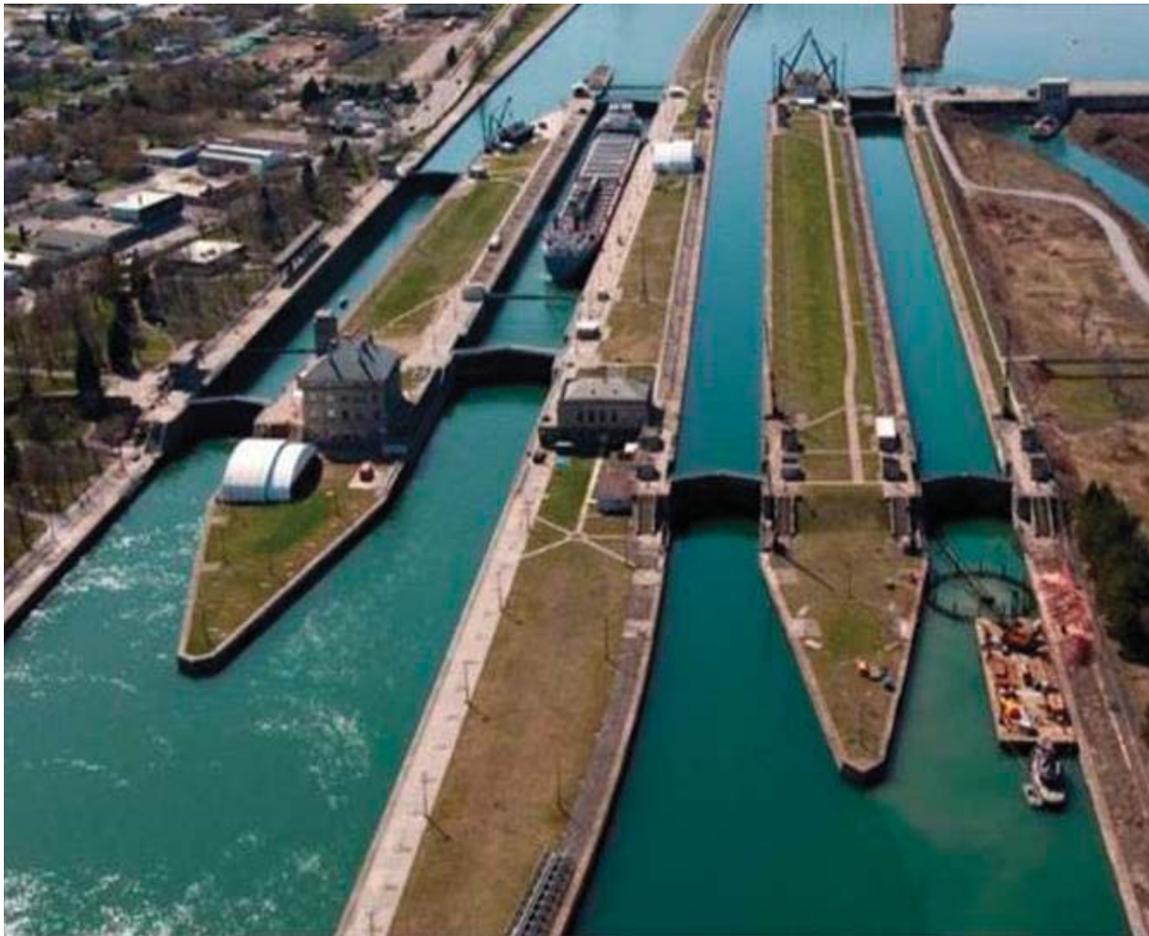


# SOO LOCKS ST. MARYS RIVER SAULT STE. MARIE, MICHIGAN

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## New Soo Lock Economic Validation Study

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U.S. Army Corps  
Of Engineers®  
Detroit District

June 2018

**SOO LOCKS  
ST. MARYS RIVER  
SAULT STE. MARIE, MICHIGAN**

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**NEW SOO LOCK ECONOMIC VALIDATION STUDY REPORT**

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**EXECUTIVE SUMMARY**

The Soo Locks complex is considered the lynch pin of the Great Lakes Navigation System and are National Critical Infrastructure due to their national economic importance and impact on national security. Ten out of eleven integrated steel mills in the Great Lakes region depend primarily on taconite that must transit the Soo Locks. The largest lock at the complex, the Poe Lock, is vital to the U.S. iron ore (shipped in the form of taconite pellets), steel, and automobile manufacturing supply chain. U.S. integrated steel mills produce high strength steel critical to the U.S. automobile manufacturing sector. In 2017, the Poe Lock handled 89% of the total tonnage that transited the Soo Locks complex.

The need for an additional, Poe-sized lock was first identified in the 1986 U.S. Army Corps of Engineers (USACE) Feasibility Study, *Great Lakes and Connecting Channels and Harbors* and authorized by Congress in Water Resources Development Act (WRDA) of 1986. The most recent authorizing language in WRDA 2007 calls for the construction, at full federal expense, of “a second lock....adjacent to the existing lock...” The Detroit District seeks an updated authorization to construct a new lock at the Soo Locks complex. This Validation Study is an economic update of the construction of a new Poe-sized lock.

The conceptual basis for the economic benefit of a navigation project is the reduction in the value of resources required to transport commodities. To measure the benefit, the current cost of lake transportation is compared to the least-cost alternative mode of transportation (typically rail or truck). A challenge in updating the economics of a new lock at Soo is the lack of overland alternative modes to the delivery of taconite through Poe Lock to the steel mills. When overland transportation markets for existing water transportation do not exist, alternative transportation market costs need to be approximated. In the case of taconite shipped through the Poe Lock, alternative proxy costs were developed to estimate transportation cost savings or benefits.

Three alternative taconite delivery markets were developed: stockpiling at the mill, conveyance at the Soo Locks, and expanding the Port of Escanaba, MI. These alternative modes/costs were developed to accommodate expected unmet taconite demand due to Poe Lock closures. They are utilized according to least-cost first – stockpiling, conveyance, Escanaba until capacity is reached. The capital investment costs and operations and maintenance costs are used to develop the “proxy” market cost to move the diverted taconite.

The economic model used in the analysis, the Soo-REM, identifies and costs tonnage affected by service disruptions at the locks. Given a lock closure, Soo-REM calculates tonnage that can be accommodated and diverts the remaining tonnage to alternative modes either existing or constructed.

This economic update analyzed a number of scenarios through different sensitivities. The benefit-to-cost ratios (BCR) for the sensitivity analyses range from 0.97 to 6.89. A USACE

decision was made to calibrate to a minimum Escanaba floor cost. The Escanaba floor scenario includes a minimum floor cost of \$2.8 billion to provide a throughput capacity of 8.7 million tons of taconite. USACE believes the floor sensitivity is appropriate for recommendation. All three proxy transportation modes (stockpiling, conveyance, and expanded Escanaba) have a minimum capital expenditure. The table below displays the economic results of the Escanaba floor analysis. Annual project cost is based on a current \$922.4 million cost estimate. The fully funded cost estimate which considers inflation through the mid-point of construction is approximately \$1 billion. The new lock is expected to provide annual benefits of \$77.4 million and a BCR of 2.42 at the current Federal discount rate (2.75%). At the OMB 7.0% discount rate, the BCR is 2.32.

**Benefit-to-Cost (BCR) Evaluation, 2020-2076 (Oct '18 (FY19) Dollars)**

Cash Flow Category	New Poe-Size Lock (fixed Escanaba floor cost)	
	2.75% Discount Rate	7.0% Discount Rate
Total Average Annual Project Costs	\$32,708,888	\$69,480,408
Total Average Annual Project Benefits	\$77,437,864	\$157,962,038
<b>BASE NET BENEFITS</b>	\$44,728,975	\$88,481,630
<b>BENEFIT-TO-COST RATIO (BCR)</b>	<b>2.37</b>	<b>2.27</b>
Base Net Benefits	\$44,728,975	\$88,481,630
Allowable Labor Resource Benefits	\$1,607,854	\$3,145,301
<b>NET BENEFITS</b>	\$46,336,829	\$91,626,931
<b>BENEFIT-TO-COST RATIO (BCR)</b>	<b>2.42</b>	<b>2.32</b>

The current cost estimate exceeds the Section 902 of WRDA 1986 limit and triggers the need for a post authorization change report (PACR) and change control board review. The PACR report is submitted in conjunction with this Validation Study. The change control board at USACE headquarters approved the project in April 2018.