

EMPIRE BAY AND SWAN CREEK, MICHIGAN.

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LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

*A report of the survey of Empire Bay and Swan Creek, Michigan.*

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FEBRUARY 11, 1881.—Referred to the Committee on Commerce and ordered to be printed.

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WAR DEPARTMENT,  
Washington City, February 9, 1881.

The Secretary of War has the honor to transmit to the House of Representatives, to comply with the provisions of the river and harbor act of June 14, 1880, letter from the Chief of Engineers, dated the 8th instant, and accompanying copies of reports from Maj. F. Harwood, Corps of Engineers, of the results of examinations made under his direction of Empire Bay, Leelenaw County, Michigan, and of Swan Creek, Lake Saint Clair, Michigan, with the view to improvement.

ALEX. RAMSEY,  
*Secretary of War.*

The SPEAKER  
*Of the House of Representatives.*

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OFFICE OF THE CHIEF OF ENGINEERS,  
UNITED STATES ARMY,  
Washington, D. C., February 8, 1881.

SIR: To comply with provisions of the river and harbor act of June 14, 1880, I have the honor to submit herewith copies of reports to this office from Maj. F. Harwood, Corps of Engineers, of the results of examinations made under his direction of Empire Bay, Leelenaw County, Michigan, and of Swan Creek, Lake Saint Clair, Michigan, with the view to improvement.

Very respectfully, your obedient servant,

H. G. WRIGHT,

*Chief of Engineers, Brig. and Bvt. Maj. Gen.*

Hon. ALEXANDER RAMSEY,  
*Secretary of War.*

## EXAMINATION OF EMPIRE BAY, LEELENAW COUNTY, MICHIGAN.

UNITED STATES ENGINEER OFFICE,  
*Detroit, Mich., January 13, 1881.*

GENERAL: Among the examinations or surveys provided for by the river and harbor act approved June 14, 1880, and intrusted to my charge, was one for Empire Bay, Lelanawau (commonly spelt and known as Leelenaw) County, Michigan.

Empire Bay, a bight of navigable water, about 10 miles across, is situated about 20 miles due south of South Manitou Island, and is formed by shoals jutting out in a westerly direction from Sleeping Bear Point, as a northern limit, and Empire Bluffs, as a southern limit. (See lake survey chart of north end of Lake Michigan, 1867.)

It is formed entirely by these outjutting shoals, and there is no indentation in the shore line to indicate its existence, neither is it named upon the charts.

It is none the less dangerous, however, to vessels wending northward with too much easting in a gale of wind, and the beach is annually strewed with the wreckage of such unfortunates who caught in this bight with no harbor to leeward and unable to clear the shoals off Sleeping Bear Point, are compelled to throw overboard their deck load in order to make to weather, and in some instances are forced upon the beach.

Taken with reference to the general commerce of Lake Michigan, these are, however, exceptional cases, and the manifest remedy is to keep well to the westward, in passing this dangerous stretch of coast.

The Manitous, only a few miles further north, afford in a southerly gale of wind an excellent harbor of refuge to all, excepting a stray vessel now and then which may be so unfortunate as to happen into this dangerous bight.

There is nothing in the wording of the appropriation act to guide as to what character of improvement is desired or contemplated at Empire Bay; but, if a harbor of refuge is in view, I have but to point to the Manitous, in the immediate vicinity, as affording a natural harbor, all-sufficient in ordinary cases. To build an artificial harbor in the bay, by interposing against the southerly gales of wind a breakwater 4,000 feet long, standing in 20-feet soundings, would cost about \$500,000.

I do not understand any such expensive project to be necessary nor contemplated.

Passing, then, to a consideration of local necessities, I find in the immediate vicinity of Empire Bluffs two small lakes, adjacent to the shore of Lake Michigan, and separated from it only by a narrow strip of sand. They are known in local parlance as North Bar and South Bar lakes.

North Bar Lake is in plan a very flat oval, a mere canal, with its longer axis parallel to the shore line of Lake Michigan, from which it is separated by high and well-wooded sand hills, excepting at its northerly limit, where the beach shingle bars an incipient outlet. In cross-sections it is V-shaped, with abrupt banks dropping off from a marshy border, and attains as great a depth as 34 feet at its axis.

For a distance of about 2,500 feet to the southward from its natural outlet, 15 feet of water exist, for a width varying slightly in either direction from 200 feet, as a mean. The difference of level between the water of this lake and that of Lake Michigan, at the time of the examination, was about 2 feet.

If, therefore, a canal were cut from Lake Michigan into this lake,

and the entrance protected by parallel piers, a somewhat contracted but completely land-locked harbor of 15 feet depth of water, would result. The available area of anchorage for this depth would be about 12 acres, but, on account of its restricted width, mooring at piles along the border would alone be practicable.

South Bar Lake is about half a mile further south, and separated from North Bar Lake by an undulating belt of marsh and sand hillocks, covered with undergrowth. It is larger, broader, and shallower than North Bar Lake, and its level is about half a foot higher above that of Lake Michigan, from which it is separated for about half its length by a narrow strip of sand beach, its northerly half, which is shallow, and not convertible into harbor room, being shut in by a range of sand bluffs well wooded. By cutting into this lake at the southerly limit of these bluffs, and protecting the canal by parallel piers, an elliptical-shaped anchorage, of about  $2\frac{1}{4}$  acres, with 10-feet soundings, can be obtained, having its longer axis, about 700 feet in length, parallel to the Lake Michigan shore line, and its mean width not exceeding 150 feet.

A much larger and more commodious area would, however, be available for vessels not exceeding 6 feet in draught, such as cord-wood droghers and scows, which could also find ample room for anchorage, while vessels of greater draught must necessarily make fast to mooring piles, within the restricted area of 10-feet soundings.

At the southern extremity of this lake is now concentrated the pioneer enterprise of this sparsely populated region, the hamlet of empire, consisting of a steam saw-mill, on the lake border; a wood-dock, built out into Lake Michigan; a country store, and two or three homesteads, at one of which is the post-office. The country road, trending northward, touches South Bar Lake, but leaves its vicinity, and passes about a quarter of a mile to the eastward of North Bar Lake, which is now completely isolated and buried in the natural forest. By this road, and striking from it a quarter of a mile through the forest, over low marshy ground interspersed with sand hillocks, North Bar Lake is distant from South Bar Lake  $2\frac{1}{2}$  miles, while measured along the beach the distance would be  $1\frac{3}{4}$  miles.

South Bar Lake is therefore settled at its south end, and accessible by a good country road, while North Bar Lake can only be opened to settlement by building a branch road a quarter of a mile to it, over low marshy ground, and for shipping purposes the greater portion of its border would have to be filled out, or wharfed over, for a distance of about 200 feet before the deep channel heretofore described could be reached. At the junction with the beach of Lake Michigan the border is, however, suitable for settlement and shipping purposes.

With all these drawbacks, however, a harbor constructed at this point would be a harbor of refuge for vessels of the deepest draught navigating the lakes so unfortunate as to be caught in the bight of Empire Bay in a southwest gale of wind, and would also be an excellent harbor for commercial purposes for all time, and under all contingencies of future development of this wild region.

There are the natural facilities here for securing as good a harbor as there is anywhere along the east coast of Lake Michigan, and a far better one than the larger proportion of those now in existence, while at South Bar Lake it is only practicable to obtain a shallow harbor of exceedingly cramped dimensions, and of no value to general commerce, the construction of which would be purely a measure of relief to the infant industries now concentrated at its site, without holding forth any great inducement for the general development of the back country, or

such attraction to external enterprise as a deep-draught harbor would extend.

As regards the comparative cost of construction of the two harbors above projected, the difference in expense is not so great as might be expected from the difference in the proposed depth. The beach of Lake Michigan dropping off suddenly from 12-feet soundings, the pier lengths necessary in either case do not greatly vary, neither is there so great a difference in the amount of dredging required as might be anticipated.

The cheapest pier construction in this densely-wooded district would be of piling, filled in between with brush fascines, weighted down, and top-dressed with stone. This construction would also be sufficiently substantial for pioneer purposes, and might be supplemented with crib or other square timber construction, whenever the development of commerce at this point should warrant more elaborate building.

I estimate as follows :

For a harbor at North Bar Lake, with channel of entrance 200 feet wide, with depth of 15 feet, 1,800 linear feet pile and brush piering, 24 feet wide, including all contingencies of interior revetment, at \$20 per linear foot..... \$36,000  
80,000 cubic yards dredging, sand and gravel, at 25 cents per cubic yard..... 20,000

Total..... 56,000

Or, including all contingencies, the construction of such a harbor as I propose at this point, expending upon it only so much money as is necessary to make the deep water in North Bar Lake accessible in all weathers, and to secure the entrance, would cost about \$60,000.

For a harbor at South Bar Lake, with channel of entrance 200 feet wide, with depth of 10 feet, 1,400 linear feet pile and brush piering, 20 feet wide, including all contingencies of interior revetment, at \$15 per linear foot..... \$21,000  
54,000 cubic yards dredging, sand and gravel, at 25 cents per cubic yard..... 13,500

Total..... 34,000

Or, including all contingencies, as in the case of North Bar Lake, for securing a harbor to vessels of not greater draught than 9 feet, \$40,000.

Notwithstanding the greater expense attending the construction of a harbor at North Bar Lake, and the inconvenience of its situation to the pioneers who have already settled at the other location in question, the greater natural advantages and facilities for improvement at this site, together with the fact that here only it is practicable to construct a deep-draught harbor, accessible in all weathers to vessels of every class, are circumstances which clearly indicate that North Bar Lake is the proper location for a harbor designed to accommodate the general commerce of Lake Michigan.

The true and complete solution of all difficulties and reconciliation of all interests could best be attained by first building the harbor at North Bar Lake, and then connecting that lake with South Bar Lake, by a canal 10 feet in depth, which latter undertaking is perfectly practicable, but hardly to be comprised in a pioneer project.

The degree to which the general commerce of the country would be benefited, and new industries developed, by the construction of a harbor at Empire Bay, can best be estimated from consideration of the statements of Mr. George Aylsworth, the principal settler and owner of the saw-mill, wood-dock, and country store at Empire post-office. Mr. Aylsworth is one of the original pioneers in this region, is thoroughly identified with its interests and conversant with its necessities. He states that he ships annually from his pier about 1,000 cords of wood, and could ship 10,000 if there were a harbor at this point, but that, under existing circumstances, it is impossible to induce a vessel to come to his pier after the 1st of September, for fear of being caught there in a gale

of wind, when wreck would be inevitable. He states that several years ago he did get out 10,000 cords, more than half of which rotted on his hands for lack of shipping facilities. He further proceeds to call attention to the fact that in the territory back of and adjacent to Empire Bay, independent of the farming land, there are 50,000 acres of timber suitable for cutting into cord-wood, or working up into square timber, or lumber, railroad ties, and cedar posts, all of which could find a ready market from a suitable harbor. He further proceeds to state that a harbor at Empire Bay would encourage the settlement of the back country for agricultural purposes, inasmuch as heretofore several farms have been abandoned, the settlers not being able to afford the sacrifice of the timber in clearing, losing their time, and obtaining no revenue, whereas if a harbor were available for shipment all this timber would command a price in the market.

Mr. Aylsworth further states that all the wheat grown on the slope descending toward Lake Michigan at Empire Bay now seeks a market by wagon over the divide to Traverse City, where it commands from 15 to 30 cents a bushel less than Chicago prices, which could be more nearly approximated by shipment from Empire Bay. Finally Mr. Aylsworth gives statistics of casualties to vessels unfortunately caught in the bight of Empire Bay in stormy weather, footing up a total of twenty-seven wrecks, according to the recollection of the oldest inhabitants.

The settlement at Empire Bay being of recent date, there are no further commercial statistics to be offered in its behalf.

A harbor at this point, excepting as a harbor of refuge, would be purely a pioneer project, and an aid to pioneer effort.

Empire Bay is within the limits of the Michigan collection district, Michigan. The nearest port of entry is Grand Haven, Mich. The nearest light-station is at South Manitou Island; the nearest fort is Fort Mankinac.

The only shipments are those made from Mr. Aylsworth's pier, about 1,000 cords of wood annually.

I am, general, very respectfully, your obedient servant,

F. HARWOOD,  
*Major of Engineers.*

To the CHIEF OF ENGINEERS, U. S. A.

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#### EXAMINATION OF SWAN CREEK, LAKE SAINT CLAIR, MICHIGAN.

UNITED STATES ENGINEER OFFICE,  
*Detroit, Mich., January 31, 1881.*

**GENERAL:** Under the provisions of the river and harbor act approved June 14, 1880, and by your assignment, I am required to examine Swan Creek, Lake Saint Clair, Michigan, and report a project with estimates of cost of improvement at that point. Swan Creek empties into Lake Saint Clair at its head, about 5 miles east of the town of New Baltimore, Macomb County, Michigan. It is a sluggish stream with little or no current, and, for the reaches near its mouth now under consideration, has a general course from northwest to southeast, with a sharp bend at right angles to the northward and eastward just as it debouches into Lake Saint Clair. The general width between banks is about 75 feet, but an average width of 20 feet with  $8\frac{1}{2}$  feet soundings is the only available water-way. Its course for the reaches under consideration is through alluvial swamp land until it is met at its mouth by the sand of Lake Saint Clair. The natural accretions at the mouth, which is entirely unprotected, and in the short abnormal reach immediately suc-

ceeding, have barred navigation, and it is relief from this impediment, and protection in the future, that is now sought. The necessity for immediate relief has been so great that without waiting for national aid the local shippers have, during the past summer, at an expense of \$800, dredged a temporary channel through the reach, which had become barred; but the dredgings of marsh mud, being simply thrown over into shoal water at the side of the channel, will return in course of a very short time and the channel will be again unnavigable. There are two methods by which permanent relief may be given to navigation at this point and a good channel of 9 feet depth secured from the mouth of Swan Creek to the Fair Haven Bridge, which is the center of local industry. One method is to dredge the existing channel where needed and secure the lower reach and the debouch into Lake Saint Clair by plank beam revetment ending at 9 feet soundings in the lake. The other method is to cut off the objectionable sudden curve at the mouth, through the extent of which are amassed at present the greatest obstacles to navigation, and prolong the main channel of the creek by a canal terminating in deep water in Lake Saint Clair. In deciding as to which of the measures of amelioration is preferable it is well to notice the general action of nature at this point. As I have before stated, the mouth of this creek is situated at the extreme northerly border of Lake Saint Clair, and has been exposed, unprotected heretofore, to the prevailing southerly gales. As a natural consequence the mouth of the creek has been driven to the northward of its natural position and is covered to the southward by Swan Creek Point, which is a strip of low marsh supplemented by an outjutting sand shoal. This Swan Creek Point forms the southerly bank of the abnormal bend of the creek to the northward and eastward heretofore noticed, the locus of the major impediments to navigation. The 12-foot curve of soundings in Lake Saint Clair comes boldly up to Swan Creek Point, but does not pass it to the northward, and the best water that can be attained at the present mouth of the creek, within any reasonable margin of expenditure, is 9 feet. This mouth, even in an improved condition, would be continually subject to shoaling by the northerly drift from Swan Creek Shoal under the influence of southerly gales of wind, while by cutting off Swan Creek Point by a canal in prolongation of the general direction of the creek a new mouth would be secured in a natural location with 12 feet soundings in front and all about it and no such exposure to shoaling from drift of adjacent deposits. If, therefore, this last project can be effected at any reasonable expense at all approaching the cost of improving the existing mouth, it is far better to abandon that entrance and connect the lake with the creek by a canal in natural prolongation of the course of the latter, thus effecting a new entrance alike convenient and secure. The relative expense of the two projects will be as follows:

FOR IMPROVING SWAN CREEK FROM THE FAIR HAVEN BRIDGE TO ITS PRESENT OUTLET INTO LAKE SAINT CLAIR AND SECURING THAT OUTLET.

Dredging in channel, to give 9 feet depth of water from the bridge to the elbow near the mouth, 3,650 cubic yards silt and sand, at 20 cents per cubic yard.....	\$730
Dredging in channel from the elbow to 9 feet soundings in Lake Saint Clair, to give 50 feet clear width, with 9 feet depth, 8,800 cubic yards silt and sand, at 20 cents per cubic yard.....	1,760
1,600 linear feet plank beam revetment, at \$4.50 per linear foot.....	7,200
 Total .....	9,690
Add 10 per cent. for contingencies .....	969
 10,659	

It probably could be done for \$10,000.

FOR IMPROVING SWAN CREEK FROM THE FAIR HAVEN BRIDGE TO THE ELBOW NEAR ITS OUTLET, THENCE CONSTRUCTING A STRAIGHT CANAL FIFTY FEET WIDE, WITH NINE FEET DEPTH, TO TEN FEET SOUNDINGS IN LAKE SAINT CLAIR.

Dredging in channel to give 9 feet depth of water from the bridge to the elbow, 3,650 cubic yards silt and sand, at 20 cents per cubic yard .....	\$730
Dredging canal from elbow to Lake Saint Clair, as above specified, 15,200 cubic yards silt and sand, at 20 cents per cubic yard .....	3,040
2,600 linear feet plank beam revetment, at \$4.50 per linear foot .....	11,700
Total .....	15,470
Add 10 per cent. for contingencies .....	1,547
Or estimate .....	17,017
	17,000

In all these estimates I have placed the dredging at high rates, providing for fluctuation in prices; but as, in this instance, the digging will be in easy excavation with full face, nearly all of the dredgings to be thrown over, and what little is to be scowled away situated not far from the dumping-ground, I think it probable that this latter project can be executed at a cost not to exceed \$15,000. If executed, it would give to Swan Creek an entrance alike convenient and permanent, while any improvement that can be made to the present tortuous embouchure will not render it convenient of access, and will inevitably deteriorate in a very short time from the same causes which now make this entrance practically useless.

As regards any commercial claim for national aid at this point, the situation is readily stated. The principal and perhaps the only settlement which has any particular interest in the improvement of the mouth of Swan Creek is at the Fair Haven Bridge, about a mile above. Still further up about a half mile is a brick-yard, the interests of which are practically identical with those of the settlement at the bridge, and whose business necessitates no improvement of the channel beyond the limit within which I have estimated. The principal property owner and shipper at this point is Mr. Henry C. Schnoor, who states the necessities of the case so concisely and fully that I cannot do better than quote his language. He says:

The inhabitants of the townships of Ira, Casco, and part of Cottrellville and Clay make this point their market for grain and farm products of all kinds. Heretofore, on account of the shallow water at the mouth of Swan Creek, all the grain, &c., shipped from this point has been handled at a great disadvantage, and much extra expense. We are compelled to bag all the grain and lighter it down the creek into Lake Saint Clair, where we transfer it to larger vessels. By the proposed improvement we could bring large vessels into the creek and alongside our docks and elevator, where the grain could be loaded directly from the elevator, which would enable us to pay producers the highest market prices. The same may be said with regard to cord-wood, of which we ship from 3,000 to 5,000 cords annually. Also brick, which is manufactured here, and shipped east and west. Ship-building has been carried on here quite extensively for many years. Heretofore only the smaller class of boats was built, on account of the obstruction mentioned, but once removed, ships of the larger class would be constructed here, which would benefit our workmen. Our facilities for handling pine lumber, of which from 1,000,000 to 2,000,000 are yearly disposed of here, have been very disadvantageous. This lumber is brought from Lake Huron by large vessels, which we must unload outside the bar, and convey up the creek on flat-boats. Besides the extra expense of handling, vessels are often detained by heavy weather, as they cannot discharge cargoes when heavy seas are running. All this would be overcome by the removal of the bar, giving us 9 feet of water.

In addition to the lumber brought into the creek, we handle, annually, from \$50,000 to \$75,000 worth of general merchandise. We ship from here (omitting brick, wood, and lumber) about 300 car loads of staves, heading, and grain during the season of navigation.

Mr. John M. Robertson, deputy collector of customs at Algonac, the office at which the shipments from Swan Creek are reckoned, through the kindness of Mr. John P. Sanborn, collector of the Huron district, furnishes me with the following additional statistics:

From July 1, 1879, to June 30, 1880, inclusive, there have been eighty-one arrivals and clearances from Swan Creek and vicinity, and from July 1, 1880, to November 30, 1880, inclusive, sixty-four. Said boats consisted of small steamers and scows, having a draught of water of from 4 to 7 feet, and a tonnage ranging from twelve to fifty-two tons. There have been imported, at same place, from July 1, 1879, to June 30, 1880, inclusive, 471,000 feet of round timber, and 1,046 cords of elm and basswood bolts; from July 1, 1880, to November 30, 1880, inclusive, 592,000 feet of round timber, and 1,637 cords of elm and basswood bolts. There have been shipped from same place from July 1, 1879, to June 30, 1880, inclusive, 85,000 bundles of staves, 7,690 barrels of headings, and 368,472 pounds of barley; from July 1, 1880, to November 30, 1880, inclusive, 1,969,500 staves, and 4,088 barrels headings.

Swan Creek is in the Huron collection district, Michigan.

The nearest port of entry is Port Huron; the nearest light-houses, the Saint Clair Flats Beacons. The nearest fort is Fort Wayne, Detroit, Mich.

I am, general, very respectfully, your obedient servant,

F. HARWOOD,  
*Major of Engineers.*

To the CHIEF OF ENGINEERS, U. S. A.

