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UNITED STATES ENGINEER OFFICE,

#1637 Indiana Ave., Chicago, Ills.

April 24th, 1899.

Brig. Gen. John M. Wilson,  
Chief of Engineers, U.S.A.  
Washington, D.C.

General:

I have the honor to report as follows on the application of the Trustees of the Sanitary District of Chicago for authority to open their Drainage Canal. It is a strange fact that this city has expended, or will expend, over \$30,000,000 with the intention of diverting an apparently unlimited amount of water from the Great Lakes to the Mississippi drainage area for sanitary purposes without finding out whether such diversion would be allowed by the great interests of the United States and the Colonies of Great Britain along the chain of Great Lakes in the navigation of the rivers and harbors of the Great Lakes. Now they ask the authority of an executive officer of the United States to open a channel that will to some unknown extent lower the levels of all the Great Lakes below Lake Superior and of their outlets, introduce a current also unknown and not to be ascertained otherwise than by actual experiment, in Chicago River, the most important navigable river of its length on the Globe, but which is already obstructed by bridges, masses of masonry and bends, and of difficult navigation at best.

The possible effects of this diversion are not known, further than that to some unknown degree they will be injurious. Whether the amount of this injury will be so small as to be accepted by the interests affected in view of the manifest advantages to and



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apparent necessities of their neighbors, cannot be determined by other than the interests themselves.

It is clear to me that I am not competent to make a recommendation as to what should <sup>ultimately and definitely</sup> be done.

The matter of what effect the opening of this channel would have on the levels of the Great Lakes has been heretofore submitted to a Board of Engineers. That Board reported that the Great Lakes would be lowered, but that there was not sufficient data to determine the exact effects of the proposed discharge, and recommended extended investigations, which it is believed are being carried on now by the Deep Waterways Commission, or Board. They have not reported. In my opinion the abstraction of from 300,000 to 600,000 cubic feet per minute will <sup>permanently</sup> lower Michigan, Huron and Erie from 3 to 8 inches; not more than 8 nor less than 3 inches, corresponding to a reduction of from ~~200~~<sup>160</sup> to ~~300~~<sup>460</sup> tons in carrying capacity of the large vessels of the Lakes, and that it will take from three to four years for this full effect to be attained. But the State law is unlimited in its requirements. 20,000 cubic feet per minute must be taken from Lake Michigan for each 100,000 population of the district; already nearly 400,000 c. ft. must be taken, and at the same ratio of increase for a few decades, in a very short time there must be taken 1,000,000 c.ft. per minute under this indefinite law. The amount should be limited and the injurious effect stopped somewhere.

The mean current to be introduced in Chicago River upon the opening of the canal is estimated by the Engineers of the Drainage Board at one and one-fourth miles per hour or 110 ft.



per minute. This is simply an assumption that with such velocity in an unobstructed river, the amount of 300,000 cubic feet per minute can be discharged through Chicago River-- but I have seen this River so jammed with vessels, drawing all the water that is in it, that by leaping from deck to deck I could cross the river. What the velocity would be in such conditions with Lake Michigan on one side and a great fall on the other side of such vessels, no one knows. But it is a simple mathematical problem to determine the effect on steel-plate vessels of from 2,000 to 4,000 tons mass drifting upon or striking stone piers with a velocity of near two feet a second. They will go to the bottom.

Individually I have to say that I am in entire sympathy with this people in their effort to purify their water supply. I have lost my only son from Typhoid fever, produced I believe from drinking water polluted by defective drainage at Chicago, which this channel will correct. In every proper way I have aided the officers of the Drainage district. I would like further to aid them, but I believe this question to be entirely out of my sphere, and too great and important for me even to venture an opinion or make a recommendation about. Yet I may venture to suggest that the entire subject be referred to Congress for final solution, and that a conditional permit or authority be granted to the authorities of the Chicago Sanitary District by the War Department, awaiting action by Congress, to open their channel, and under the following conditions:



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1st: That if, at any time, it become apparent that the current created by such drainage works in the South and Main Branches of Chicago River, be unreasonably obstructive to navigation or injurious to property, the Secretary of War reserves the right to close said discharge through said channel or to modify it to such extent as may be demanded by navigation and property interests along said Chicago River and its South Branch.

2nd: That the Sanitary District of Chicago must assume all responsibility for damages to property and navigation interests by reason of the introduction of a current in Chicago River.

With 300,000 cubic feet per minute discharge it will take one year to lower the level of Lake Michigan and Huron one-tenth of a foot, and several years to reach the maximum permanent effect of this discharge, which will not probably <sup>much</sup> exceed three inches, so that the main injury to navigation <sup>if any</sup> that can be expected before action by Congress, will be in Chicago River, and that can be at once abated.

All the changes made by the Sanitary District of Chicago, taken by themselves, have been such as to increase the navigable capacity of Chicago River. Taken in connection with the current to be introduced I am not able to say that the river will be as navigable as it was before these changes were made. The changes materially lessen the probable injury to navigation of this current, at the points where the changes have been or will be made.

I believe their channel will be entirely under control and that if the discharge be injurious it can be at once and at any