

COLUMBIA RIVER, CARROLLS TO STELLA, WASH., AND
COWLITZ RIVER BELOW OSTRANDER, WASH.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, REPORT ON
PRELIMINARY EXAMINATION OF COLUMBIA RIVER BETWEEN
CARROLLS AND STELLA, WASH., AND THE COWLITZ RIVER
BELOW OSTRANDER, WASH.

DECEMBER 16, 1918.—Referred to the Committee on Rivers and Harbors and
ordered to be printed, with illustration.

WAR DEPARTMENT,
Washington, December 14, 1918.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

Sir: I have the honor to transmit herewith a letter from the Chief
of Engineers, United States Army, of 9th instant, together with re-
port of Col. Geo. A. Zinn, Corps of Engineers, dated June 8, 1918,
with map, on a preliminary examination of Columbia River between
Carrolls, Wash., and Stella, Wash., and the Cowlitz River below
Ostrander, Wash., authorized by the river and harbor act approved
August 8, 1917.

Very respectfully,

NEWTON D. BAKER,
Secretary of War.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS
Washington, December 9, 1918.

From: The Chief of Engineers, United States Army.

To: The Secretary of War.

Subject: Preliminary examination of Columbia and Cowlitz Rivers,
Wash.

1. There is submitted herewith for transmission to Congress re-
port dated June 8, 1918, with map, by Col. Geo. A. Zinn, Corps of
Engineers on preliminary examination authorized by the river and

harbor act approved August 8, 1917, of Columbia River between Carrolls, Wash., and Stella, Wash., and the Cowlitz River below Ostrander, Wash., "with a view to devising plans for bank protection, including consideration of any proposition for cooperation on the part of local or State interests."

2. The portion of the Columbia River referred to in the act is about 15 miles long and includes the right bank between 54 and 69 miles above its mouth. This part of the river is included in the project for improvement of the Columbia and Lower Willamette Rivers below Portland which provides for a channel 30 feet deep and 300 feet wide. The investigation also includes both banks of the Cowlitz River below Ostrander. This stream is being improved under a project providing for a channel 50 feet wide and 4 feet deep from the mouth to Ostrander (9 miles) and 50 feet wide and $2\frac{1}{2}$ feet deep thence to Castle Rock (10 miles) by dredging and snagging, and a channel 40 feet wide and $2\frac{1}{2}$ feet deep from Castle Rock to Toledo (18 miles) by snagging, dredging, and regulating works. In the section under consideration some dikes (levees) have been constructed by local interests, and others are contemplated for the purpose of reclaiming the adjacent rich land. There has been some erosion of the river banks in this vicinity, and the improvement desired is the protection of the banks to insure the safety of the levees. One of the diking districts has offered to share equally with the United States in the cost, but no offer of cooperation has been made by any other parties. The district engineer, who is also the division engineer, states that this work would have no effect upon the commerce of the Columbia and Cowlitz Rivers, except so far as it would aid in increasing the production of the area as a result of the land reclamation. In his opinion it is not advisable for the United States to undertake the improvement of this locality at the present time in any other manner than as now provided for by the approved projects for the improvement of these rivers.

3. This report has been referred, as required by law, to the Board of Engineers for Rivers and Harbors, and attention is invited to its report herewith, dated July 24, 1918, concurring in the views of the district engineer.

4. After due consideration of the above-mentioned reports, I concur in the views of the district engineer and the Board of Engineers for Rivers and Harbors, and therefore report that the improvement by the United States of Columbia River between Carrolls, Wash., and Stella, Wash., and the Cowlitz River below Ostrander, Wash., is not deemed advisable at the present time to a greater extent than is now authorized.

W. M. BLACK, *Major General.*

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS.

[Second indorsement.]

THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
July 24, 1918.

To THE CHIEF OF ENGINEERS, UNITED STATES ARMY:
1. The following is in review of the district engineer's report authorized by the river and harbor act approved August 8, 1917, on

preliminary examination of Columbia River between Carrolls, Wash., and Stella, Wash., and the Cowlitz River below Ostrander, Wash., with a view to devising plans for bank protection, including consideration of any proposition for cooperation on the part of local or State interests.

2. The stretch of the Columbia River under consideration lies between 54 and 69 miles above its mouth. The Cowlitz River empties into the Columbia at a point about $65\frac{1}{2}$ miles above the mouth between Carrolls and Stella. The banks to be protected extend from Ostrander down the left bank of the Cowlitz and up the right bank of the Columbia to Carrolls, a distance of 11 miles, and from Ostrander down the right bank of the Cowlitz and the right bank of the Columbia to Stella, a distance of 20 miles. The Cowlitz River is under improvement by the general Government, the project providing for a channel 50 feet wide and 4 feet deep from the mouth to Ostrander, 9 miles, and for a lesser depth above to Toledo. The lower Columbia is also being improved under a project which provides for a channel 30 feet deep and 300 feet wide. No bank protection has been found necessary in this reach for the maintenance of the channel.

3. The locality is subject to freshets and the low-lands are at times overflowed, except where diked. Large areas on the Washington side between Carrolls and Stella are being protected from overflow by the construction of earth dikes (levees) which lie along the river banks. These banks are subject to erosion which endangers the safety of the dikes, and the improvement now desired is the revetment or riprapping of the banks. One diking district offers to share equally with the United States in the expense of the work along its border. No other offer of cooperation has been made. This work would have no effect upon the commerce of the Columbia and Cowlitz Rivers except so far as it might aid in increasing the tonnage as a result of land reclamation. It would have no effect upon the river channel. The district engineer, who is also the division engineer, is of opinion that it is not advisable at the present time for the United States to undertake the improvement of this locality in any other manner than is now provided for by approved projects.

4. Interested parties were informed of the tenor of the district engineer's report and given an opportunity of submitting their views, but no communications on the subject have been received. 5. Considerable low-lying land in this vicinity has been protected from overflow by the construction of earth dikes or levees located along the river banks, which are subject to some erosion. The improvement now desired is the prevention of this erosion by riprap revetment in order to protect the levees. This work, while of value to the locality, would have no material effect upon commerce or navigation and is not considered essential for these interests. The board therefore concurs in the opinion of the district engineer that it is not advisable at this time for the United States to undertake the improvement of the Columbia and Cowlitz Rivers in this vicinity to a greater extent than is authorized by existing projects.

6. In compliance with law, the board reports that there are no questions of terminal facilities, waterpower or other related subjects which could be coordinated with the suggested improvement in such

manner as to render the work advisable in the interests of commerce and navigation.
For the board:

PETER C. HAINS,
Major General, United States Army, Retired,
Senior Member of the Board.

PRELIMINARY EXAMINATION OF COLUMBIA AND COWLITZ RIVERS,
WASH.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE, SECOND DISTRICT,
Portland, Oreg., June 8, 1918.

From: The District Engineer.

To: The Chief of Engineers, United States Army.

Subject: Preliminary examination of the Columbia River between Carrolls and Stella, Wash., and Cowlitz River below Ostrander, Wash.

1. In compliance with instructions contained in letter from your office dated September 1, 1917, the following report is submitted of a preliminary examination of the Columbia River between Carrolls, Wash., and Stella, Wash., and the Cowlitz River below Ostrander, Wash., with a view to devising plans for bank protection, including consideration of any proposition for cooperation on the part of local or State interests, an item contained in section 4 of the river and harbor act approved August 8, 1917.

2. The waterways referred to in the above mentioned item are shown on the accompanying tracing, and it appears from the wording of the act that the banks for which protection plans are to be devised, are the right bank of the Columbia River between Carrolls, Wash., and Stella, Wash., and both banks of the Cowlitz River between Ostrander, Wash., and the mouth of the Cowlitz River. The Cowlitz River empties into the Columbia River between Carrolls and Stella, and the banks to be protected are therefore, in effect, continuous lines between Ostrander and Carrolls down the left bank of the Cowlitz and up the right bank of the Columbia 11 miles, and between Ostrander and Stella down the right bank of the Cowlitz and down the right bank of the Columbia 20 miles. The stretch of the Columbia River under consideration lies between 54 and 69 miles above its mouth.

3. No previous examinations or surveys of these sections of the Cowlitz and Columbia Rivers with a view to bank protection have been made. The Cowlitz River is now under improvement by the General Government, the project having been adopted by the river and harbor act of June 25, 1910, in accordance with the report published in House Document No. 1167, Sixtieth Congress, second session, and House Document No. 404, Sixty-first Congress, second session. The latest published map is in House Document No. 1167, above mentioned. The project provides for securing a channel 50 feet wide and 4 feet deep from the mouth to Ostrander (9 miles) and 50 feet wide and 2½ feet deep thence to Castle Rock (10 miles) by dredging and snagging, and a channel 40 feet wide and 2½ feet deep from Castle Rock to Toledo (18 miles) by snagging, dredging, and regulating works. Bank protection is not provided for. The Columbia

River is also under improvement by the General Government, the project having been adopted (for this section of the river) by the river and harbor act approved July 25, 1912, in accordance with the report published in House Document No. 1278, Sixty-first Congress, third session. Maps of this section of the Columbia River are printed in Document No. 1278, above mentioned. The project provides for a channel 30 feet deep and 300 feet wide to be secured by dredging and dike construction. No bank protection at this locality was considered necessary for a proper maintenance of the channel.

4. Descriptions of the Columbia and Cowlitz Rivers will be found in the Annual Report of the Chief of Engineers for 1917, pages 1719 and 1739, covering their improvement. Inasmuch as the item providing for this examination states the character of improvement desired, it does not appear to be necessary to repeat here any part of the descriptions except that which has a direct bearing on the bank protection of the section of waterway under consideration.

5. The right bank of the Cowlitz River below Ostrander is composed generally of clay and loam with an outcropping of rock about 1½ miles below Ostrander. The elevation of the bank ranges from 8 to 24 feet above low water. The left bank from Ostrander for a distance of about 7½ miles is similar to the right bank, and thence to the mouth of the river flattens out over a sand spit which is about 5 feet above low water. The banks at different points have been partly riprapped by the property owners. The width of the river between its high-water banks below Ostrander varies from 250 feet to 1,100 feet. The stream is tidal to Ostrander and is subject to the freshets in the Columbia and Cowlitz Rivers during the summer and winter months respectively, when an average stage of 12 to 14 feet above low water is reached. During the freshet of January, 1918, on account of unusual weather conditions the river rose to a height of about 20 feet. During the summer freshet, the lowlands adjacent to the river are overflowed and the current is slight. The winter freshets are caused by local precipitation. At this time the Columbia River is generally at a low stage, and the Cowlitz rises and falls rapidly accompanied by a swift current. During the low stages of the two rivers, September to January, the variation in water level at the mouth of the Cowlitz River due to tides, is about 4 feet. The controlling depth at low water between Ostrander and the mouth of the Cowlitz is about 3 feet.

6. The banks along the Washington side of the Columbia River over the entire distance covered by this examination (except for an outcropping of rock for about 1,100 feet at Mount Coffin) are composed of clay and sandy loam, and vary in height from 12 to 16 feet above low water. The ground elevations at points back from the river vary from 7 to 8 feet above low water. The lowland lying along the river varies in width from 1 to 2 miles, and where it is not too low is used for grazing and agriculture. Considerable areas are covered with brush, cottonwoods, and willows. Some of it is protected from overflow by dikes. The annual freshets in the Columbia River occur during the period from May to August and reach an average height of about 14 feet in this vicinity, overflowing most of the adjacent land except where it has been diked.

7. Current velocities in the channel of the Columbia between Rainier and Mount Coffin as determined by long submerged floats

during freshet stages vary from 3 to 5.7 feet per second. Velocities near the shore have not been measured, but they are undoubtedly much less than in the channel. The width between main banks of the Columbia River through this reach varies from 3,000 to 6,600 feet. At the wider places there are islands of considerable area dividing the river into two channels, one of which is under improvement in connection with the existing project.

8. The bed of the river is composed of coarse sand which is apparently moved only during freshet stages. Some material is carried in suspension, brought in from tributary streams and erosion of the main banks but the quantity is not great. During low stages the river water is comparatively clear.

9. An inspection of the river banks under consideration shows that a small amount of erosion is taking place at several points, but the only part which shows any considerable erosion lies between Mount Coffin and Barlow Point. Surveys show that between May, 1917, and March, 1918, the top bank had receded an average distance of about 5 feet, the greatest distance at any point being 24 feet. This erosion occurred during two freshets, one in June, 1917, and the other in January, 1918, the latter being an abnormal winter freshet. Since 1900, a total erosion of the top bank of about 100 feet has occurred in this vicinity. (See U. S. Coast and Geodetic Survey chart No. 6152 and map herewith.)

10. The commerce of the Cowlitz River is carried on by stern-wheel steamers of the usual type, and consists principally of agricultural implements and products, building materials, household goods, live stock, flour, mill feed, potatoes, and timber products. The commerce of the Columbia is both local and foreign, carried by river steamers, towboats, and deep-draft vessels. It amounts annually to about four million tons of local traffic, and three million tons of deep-water traffic. The section of waterway under consideration produces very little traffic at the present time. When all of the land is diked, it can be cultivated, and will, because of its rich soil, produce large quantities of the usual farm products, which will find a market at distant points.

11. Small private wharves are constructed at Carrolls, Slaughters, Bushes, and La Du landings, where river steamers land to load and discharge freight in small quantities and some passengers. Carrolls on the Columbia River and Kelso and Ostrander on the Cowlitz River, are the only points at which a railroad touches the stretches of rivers under consideration. There is practically no transfer of freight between rail and water or vice versa. The facilities are considered adequate for the present needs.

There is no water power or collateral subject which could be considered in connection with the desired improvement.

12. A large part of the lowlands along the Washington side of the Columbia River between Carrolls and Stella are being protected from overflow by the construction of earth dikes. Diking districts have been organized for this purpose under State laws and considerable work has been done. The diking districts are shown on the map herewith.

13. Correspondence with parties known to have an interest in the bank protection covered by this examination shows that the improve-

ment desired consists in the protection of the right bank of the Cowlitz and Columbia Rivers from a point near Freerport on the Cowlitz to Barlow Point on the Columbia. Mr. G. I. Poysky, civil engineer of Kelso, Wash., engineer for diking district No. 4, states in a letter dated October 25, 1917:

* * * The ultimate success of these diking units will depend upon protecting about 41,000 feet of river bank * * * but the immediate requirement would call for protecting about 11,000 feet of bank along diking district No. 4; 4,700 feet along Charles Kleich and 5,000 feet along W. J. Marchette. * * * It has been the experience in this locality that riprapping consisting of medium-sized rock and using about 1 cubic yard or more to the linear foot provides the most satisfactory and permanent bank protection."

The object of the desired bank protection is to save the land dikes, located at some distance from the banks, from being undermined by the erosion of the banks, and also the protection of lands which may not be diked for a number of years.

14. In reply to a request as to what extent local interests would cooperate with the United States, Mr. Poysky states that "Diking district No. 4 would share equally with the United States in any work of bank protection along their border." No offer of cooperation has been made by any other parties.

15. The work desired to be done by the United States is the protection of river banks for the purpose of aiding in land reclamation. The proposed work would have no effect upon the commerce of the Cowlitz and Columbia Rivers, except so far as it would aid in increasing the tonnage of traffic as a result of land reclamation. Bank protection alone would have no effect upon the river channel. If a distinct tendency to erosion existed in this locality, it might become advisable to prevent it by bank protection or by dikes in order to hold the channel in place or to maintain the required depth. Similar works of improvement have been constructed in the Cowlitz River at other places, but none are required at the present time along the banks in question. The erosion referred to in paragraph 8 above is due to freshets and not to any work of improvement which has been done in the Columbia River.

16. It is my opinion that it is not advisable for the United States to undertake the improvement of the Columbia River between Carrolls, Wash., and Stella, Wash., and the Cowlitz River below Ostrander, at the present time in any other manner than as now provided for by the approved projects for the improvement of those rivers.

GEO. A. ZINN,
Colonel, Corps of Engineers.

[For report of the Board of Engineers for Rivers and Harbors, see p. 2.]

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