

AN HISTORICAL CONSIDERATION
OF
TIDAL FLOW
IN THE
HACKENSACK MEADOWLANDS

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Saw-mill creek and Kingsland creek and a tide bank along the Hackensack. The railroad embankment seems to be depended upon to exclude the tides from the northeast, but it does so only imperfectly. The result of this improvement has been to dry the marsh to a considerable extent, and it has shrunk so that it will be seen by elevations on the map to be about one foot lower than mean high-water near the Hackensack river and about three feet lower near the upland. In consequence of this shrinkage the satisfactory improvement of this district can only be accomplished by pumping. It will be necessary to repair slightly and extend the bank along Saw-mill creek, also to strengthen the bank along the Hackensack and extend it northerly to and up Berry's creek. Three thousand two hundred feet of cross-bank from Berry's creek to the upland will be common to both this and the Berry's creek district. The work will therefore consist of moderate repairs of 15,000 feet of cross-bank and of 4,500 feet of main bank, and the building of 12,000 feet of additional main dyke along the Hackensack and Bergen creek. The pumping plant must also be installed immediately and the sluices at Saw-mill and Kingsland creeks may be closed up and the tides permanently excluded. The area of catchment, including the marsh area, amounts to 3,300 acres, so that we must provide for the removal of an average of 5,300,000 gallons daily, and 109,000,000 gallons daily during heavy storms. The map shows the original depth of mud in this district to be 7 or 8 feet near the edge of the upland, and from 14 to 23 feet near the Hackensack river. These depths are at present reduced by shrinkage of the marsh to the extent of about 3 feet near the upland and 1 foot near the Hackensack.

Kearney District.—This includes the marsh in Kearney township between the Passaic and Hackensack rivers, embracing an area of 4,520 acres. It is most advantageously situated, having a frontage of 28,000 feet on the Hackensack river, and about 15,000 feet on the Passaic. It has the growing towns of Kearney and Harrison immediately adjacent to the west, and lies directly in the path of travel between Newark and Jersey City. It is crossed by the Pennsylvania; Delaware, Lackawana and Western; Paterson, Newark and New York; and Greenwood Lake railroads; and also, at its southern extremity, by the Newark branch of the Central Railroad of New Jersey. It is also crossed by the highways leading from Jersey City to Newark, both of which are traversed by electric railways. The

facilities for communication are therefore the best. The district is interesting, because of the attempt made to reclaim it by the New Jersey Land Reclamation Company about 1869. The operations of this company seem to have been interfered with by a decision of courts that they could not exercise powers of condemnation. The work on this district was quite vigorously prosecuted, and the whole was enclosed with substantial dykes furnished with sluices. A considerable part was immediately brought under cultivation, but since that time the whole marsh area has steadily deteriorated and is now in a saturated condition. The banks are kept in fair repair, so that water is usually held about three feet lower than mean high water in the river. The marsh, however, has itself shrunk over three feet, and is now only two or three inches above the ordinary level of the water in the ditches. While it would appear that the water might be kept somewhat lower with more ample sluice area, it is nevertheless perfectly clear that satisfactory drainage of this district can now only be accomplished by pumping. The dyking and ditching seems to have been well done, and a moderate expenditure would put the embankments in good order. The ditches also need to be extended into the northern part of the district. The outlay now required on embankments and ditches is comparatively a small one, but a pumping plant should be installed immediately, and by this means the marsh could be brought under cultivation to improve its sanitary condition. As soon as this is accomplished the portions along the water-front and along the railway lines would rapidly come into the market for manufacturing and commercial purposes. The water-front should ultimately be filled up to the level of the top of the dykes in the manner which we have outlined as the proper one for this whole improvement. Including the upland draining into this marsh, we have 5,200 acres of catchment, which gives us an average of 8,400,000 gallons daily to be pumped. The maximum during heavy storms will be 170,000,000 gallons daily.

The depth of the mud was originally 7 to 9 feet north, and 9 to 17 feet south of the Pennsylvania railroad. The map shows the original depth. The shrinkage of the marsh has now reduced this depth to an average of 3 feet. About three-fourths of the area is an old cedar-swamp bottom, and the balance mainly along the rivers is blue mud more or less mixed with peat.