

**REPORT OF THE STATE
BOARD OF HEALTH UPON
THE DISCHARGE OF SEWAGE
INTO BOSTON HARBOR**

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Report of the State Board of Health Upon the Discharge of Sewage Into Boston Harbor by
Various

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Mass. State Board of Health

REPORT

OF THE

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UPON THE

DISCHARGE OF SEWAGE

INTO

BOSTON HARBOR.

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Commonwealth of Massachusetts.

OFFICE OF STATE BOARD OF HEALTH,
STATE HOUSE, BOSTON, April 30, 1900.

To the General Court of Massachusetts.

I have the honor to transmit to the Legislature the report required by the provisions of chapter 65 of the Resolves of 1899, entitled "A resolve directing the State Board of Health to report upon the general subject of the discharge of sewage into Boston harbor."

By order of the State Board of Health,

SAML. W. ABBOTT,
Secretary.

134902

REPORT OF THE STATE BOARD OF HEALTH UPON THE
GENERAL SUBJECT OF THE DISCHARGE OF
SEWAGE INTO BOSTON HARBOR.

To the General Court of Massachusetts.

By chapter 65 of the Resolves of the General Court of Massachusetts of 1899, the State Board of Health is directed to consider the general subject of the discharge of sewage into Boston harbor and the disposal of sewage for the Metropolitan districts of the Commonwealth, and to report a plan for an outlet for a high-level, gravity or other sewer for the relief of the Charles and Neponset River valleys.

Sewage is now discharged into Boston harbor at two points,* one being at the northern limit of the outlet of the harbor near Deer Island Beacon and the other in a more central position nearer the main land on the north side of Moon Island.

At the outlet near Deer Island Beacon, which is four and two-thirds miles from Long Wharf in Boston, and in the northerly edge of the main ship channel, sewage from the North Metropolitan district is allowed to discharge as it comes at all stages of the tide. The quantity of sewage discharged in twenty-four hours now reaches about 50,000,000 gallons; and this quantity, while distinctly visible along the northerly edge of the channel for a half mile toward the city on the incoming tide and toward the sea on the outgoing tide, gradually becomes less distinct at greater distances from the outlet, and disappears entirely within a distance of one and a quarter miles.

With the increase of population in the North Metropolitan district the amount of sewage discharged will increase and will spread over a somewhat larger area; but the Board sees no reason to anticipate any trouble from this for many years in the future upon any inhabitable shores, and believes that the only objection that can be raised to the continual discharge of sewage here will be by those sailing through or near to the stream of sewage within a mile of the outlet.

* See plan opposite title page.

At Moon Island is now discharged sewage from the main drainage works of Boston, including that from the lower valley of Charles River and from a part of Neponset River valley, amounting to a maximum of about 100,000,000 gallons a day.

This outlet is about one and three-quarters miles farther west than the outlet at Deer Island Beacon, and much nearer the main land, and so situated that if sewage were allowed to discharge upon the incoming tide it would be brought to habitable shores and become a nuisance; for this reason the sewage is conveyed to reservoirs on Moon Island during the incoming tide and discharged only during certain hours of outgoing tide, when the currents are most favorable for conveying the sewage-laden water toward the sea through channels which render its passage the least objectionable.

By storing sewage in reservoirs, even for the hours between tides, it becomes more offensive; and the large amount which must be discharged in the short time of favorable outgoing currents renders the locality of the outlet and the surrounding area of a half mile radius much more objectionable than the steady discharge of fresh sewage at Deer Island Beacon. These conditions limit the amount of sewage that may be concentrated at this point without creating a nuisance.

The tunnel connecting Old Harbor Point and Squantum in the line of the Boston main drainage system has a maximum capacity for conveying about 150,000,000 gallons of sewage per day; and this is about the amount of sewage that may be expected forty years hence from the low-level area of Boston for which these works were designed. This amount will be about fifty per cent. more than the present maximum discharge, and in the opinion of the Board this should be regarded as about the maximum amount that can be concentrated at Moon Island outlet without giving unreasonable offence.

We think the Metropolitan Sewerage Commissioners have done well in seeking another outlet for the South Metropolitan system, with the view of ultimately removing from the Moon Island outlet all of the areas now drained which were not contemplated in the original design for the low-lying area of Boston. With the limitation above indicated, we regard the outlet at Moon Island a suitable point of discharge for the sewage of the low-lying portion of Boston.

From a careful study of the channels and currents of the harbor

and of the whole area which may in future be included in the South Metropolitan system, we conclude that the Metropolitan Sewerage Commissioners, in their report upon a high-level gravity sewer, of Feb. 11, 1899, have designated the channel in the harbor best suited to receive the sewage of the South Metropolitan system, viz., the channel along the north-westerly side of Peddock's Island; but after an extended study of the locality we would advise moving the outlets they propose about 2,000 feet further north, so that both will be one mile from Nut Island, one directly north from the middle thereof and the other 1,500 feet more easterly, as indicated upon the plan. Here the sewage will be discharged about 30 feet below the surface at low tide into a strong and deep current, by which it will be kept well away from inhabited shores until it disappears by commingling with enormous quantities of ever-changing salt water.

The paths that will be taken by the sewage discharged at these points with their limitations upon varying conditions of wind and tide are shown upon the maps of the accompanying report of the chief engineer of the Board; and, from a study of the actual conditions existing at the present outlets, we conclude that the sewage of the South Metropolitan system can be discharged at these points continuously without offence except to those who are sailing in the stream of mingled sewage and water, or near its leeward side within a mile of the outlets, and that they are the most suitable points for the discharge of the sewage of the South Metropolitan system.

The plan of outlet designated on pages 77 and 78 of the report of the Metropolitan Sewerage Commissioners of Feb. 11, 1899, to the General Court, with the change of position herein presented, is recommended for adoption by this Board.

In considering the general subject of the disposal of sewage for the Metropolitan districts of the Commonwealth, as required by the resolve, question has arisen as to what areas were intended to be included in this study.

There are areas north and north-east from the North Metropolitan sewerage system which are nearer to Boston than some of the areas which have been considered; but, as the question of discharge of sewage into Boston harbor from these territories is not likely to arise, except for some small areas which may become adjuncts to the North Metropolitan system, for which provision is made under existing laws, no consideration is given to these areas in this report;

but examination has been made of all territory in regard to which may arise question as to whether its sewage had better be discharged into Boston harbor.

After a very complete study of all of the towns of the upper Charles and Neponset River valleys, a brief statement of which is given in the accompanying report of the chief engineer of the Board, it was found that, with few exceptions, to be mentioned, it will be more economical to dispose of the sewage of these towns (which are not designated by law as belonging to one of the Metropolitan districts) by filtration upon land in each town, or by a combination of two or more towns, than by conveying it to Boston harbor.

The exceptions are areas of small extent in the towns of Wellesley, Needham and Weston, lying near to Charles River, the sewage from which can be conveyed across the river and into the Newton main sewer and thence to the Charles River valley sewer of the Metropolitan system.

These are the only additions that it may be well to make in this direction to the South Metropolitan system.

South from Quincy and east from Canton are the towns of Randolph, Holbrook, Braintree, Weymouth and Hingham, whose natural drainage is into Boston harbor. Randolph and Holbrook, when they need to dispose of sewage, can do so economically upon land within their respective territories; but Braintree, Weymouth and Hingham can best discharge their sewage into the sea through the outlets of the high-level sewer. Plans by which this may be accomplished are presented in the report of the chief engineer of the Board.

The change of the outlet herein recommended does not require the presentation of a bill for action by the General Court, because chapter 424 of the Acts of 1899, section 1, provides that no part of said proposed outlet shall be constructed until plans of said outlet shall be further considered by the Metropolitan Sewerage Commissioners and adopted and approved by the State Board of Health.

It is further provided, by section 2 of the same act, after describing the limits of the South Metropolitan system, that "nothing herein shall be construed to vest any rights which cannot be extended to cities and towns or parts thereof other than those herein named, upon such terms and conditions as may hereafter be imposed by legislative enactment," and, as the sections of the towns