

WATER REPORT.

MAY 14, 1910

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Agreeably to a resolution contained in a Resolution of the Common Council, passed February 19th 1907...

Although the more elevated portions of the city of Albany have for years, severally, felt the want of a supply of water not only for ordinary use...

Several plans have been urged upon the attention of the Board three of which have been examined in reports, heretofore made to the Common Council.

On the 27th November 1841, Wm Mc Cleghon, C. E., reported the cost of supplying 1,000,000 gallons a day from the Mohawk river...

D. B. Douglas, C. E. in a report made March 18th, 1846 estimated the total investment to cover cost of delivering at present 2,000,000 imp gals with power to increase to 6,000,000 gallons \$211,597...

In a report by S. F. Claxton, C. E. February 5th 1847 he estimated a supply of 2,000,000 imp gals per day from the Hudson delivered 2 1/2 feet above tide to cost \$231,111 and a supply of 5,000,000 gallons from the creek \$467,885...

Occupying two places, one upon the margin of the river and the other about 250 feet above tide with wide ravines intervening, a large portion of the supply must be furnished through the intervention of elevating power...

If the Patroon creek be selected, the price of the water added to a sum required to raise a portion of it to the upper plane makes the plan an expensive one...

Under the most favorable circumstances it is extremely difficult to determine with exactness the population of a city at any one period especially if its growth has been fluctuating...

In a report made March 12th 1846 by D. B. Douglas, C. E. it appears that the ratio of increase from 1790 to 1840 was as follows:

In a report of S. F. Claxton already referred to the amount to be supplied is predicated upon this ratio of increase, and provision made for supplying a population of 400,000 fifty years hence in 1920.

In theory these several amounts may be correct, but to place implicit reliance upon them in practice is unwise and impolitic.

It may be said without the fear of contradiction that this city will never contain three million inhabitants—that its inland position and relative location to Boston and New York forbid it...

The experience of other cities is no sure criterion, true, it may afford a maximum and minimum quantity but which of these will prove the safer guide...

In a report of the President of the Croton Aqueduct Board in 1876 it is stated that it is admitted that only one half the quantity that passed from the distributing reservoir was in fact consumed...

When the supply much exceeds the demand, as it must for many years in the city of New York, a large wastage is the necessary consequence.

But there are evils also of an opposite character, requiring careful examination, that the quantity supplied and the power employed, be not too limited to meet the wants and reasonable expectations of the citizens.

It is not within the range of probabilities, that any city can be found precisely similar in location to Albany, and whose inhabitants are engaged in the same pursuits...

Under such circumstances, it is highly proper and judicious to examine the quantities supplied in other cities but to be implicitly guided by them in estimating for Albany is an error to be avoided.

In determining the population quantity that should be pumped into the respective reservoirs it is assumed that while at present not more than one fourth of the whole amount will be consumed...

When the population shall have increased to 5,000,000 two millions of gallons daily will be necessary which divided in the proportion of 13 to 7 will give 1,500,000 gallons to the lower and 3,500,000 gallons to the upper reservoir.

It is under ordinary circumstances 2 gallons per individual be a sufficient daily allowance therefore with the great number of wells and private cisterns now used a larger quantity will not be required.

Having thus discussed with freedom, and with as much conscientiousness as the nature of the subject permitted the two most important propositions connected with supplying a city with water by an elevated power it will be improper to examine in a summary manner the principal parts of the plan.

STEAM ENGINE AND PUMPS.—The engine is to be low pressure, beam with a forty eight inch cylinder and 12 inch stroke and to be worked at 100 lbs.

The engine is to drive two double acting force pumps of 14 inches in diameter. The velocity of the engine is to be 240 feet per minute, of the pumps 100 feet per minute.

Each of the double stroke of the pumps will discharge into the force tube 17 1/2 cubic feet equal to about 13-2100 N. Y. gallons.

The engine working agreeably to the above estimate will deliver the whole amount (2,100,000 gallons) into the force reservoir in 24 hours and only about one third this amount will be required upon the upper plane it can be divided at a diminished velocity, at a greater part of the time.

From the well the water is pumped into and passes through a 2 feet force tube to the Reservoirs one upon the South East corner of Park and Patroon streets, and one upon the block bounded by Patroon, Elk, Perry and Robin streets.

The surface of water in the upper Reservoir being 2 1/2 feet above the River, the pressure in the force tube will be very unequal, requiring if transmitted a corresponding difference in the thickness of the pipe.

As the cost of the three tube forms are considerable part of the whole expense, it will be supported by many, that with pipes much less in thickness all necessary security might be obtained...

It is in the field of experiment, fortunes are not infrequently lost, the proper usually employ the best of all other materials, and seldom, indeed is it that which endures the most.

In elevating water from the River Mohawk to supply the city of New York steam power is employed, and in the first projection of the works some pipes were used for mains.

Cast-iron pipes of small diameter have been used in a limited extent, but their introduction is of no recent date to prove their inferiority, while the interests involved in supplying a city

with water are too important to warrant their adoption.

This large amount of power be not expended upon an uncorresponding benefit, two Reservoirs are recommended, one upon the South-east corner of Park and Patroon streets, distant 4351 feet from the Basin, and 155 feet above low water...

The lower Reservoir will supply that portion of the city lying below the plane of the Capitol Hill, affording at the intersection of Fagle and Washington streets at the head of water in the Dutch Market be elevated 15 feet above the Albany and Schenectady Turnpike at Robin street, the highest ground in that section of the city.

The height of the upper reservoir is much below that heretofore recommended. Mr. Cushman has estimated upon a head of 30 feet, about 47 feet above the side walk, immediately adjoining the point where on the east Mr. Claxton also reported in favor of 30 feet while Major Douglas assumed 20 feet as the proper height...

The Reservoirs are to be formed 2 feet horizontal to 1 foot perpendicular, and the depth of the water to be fifteen feet. The top surface of the embankment is to be protected by a common stone pavement.

It is designed to have the water pumped into the western division and pass thence into the eastern, always using the upper stratum. The arrangements for supply are such, that either an artesian can be used as a district reservoir, thus affording facilities for cleansing water necessary, without interfering in the least, with the distribution in the city.

This Reservoir, containing 4,000,000 gallons, will supply for 14 days 25 gallons per diem, per individual to 33750 inhabitants, that being the assumed present population upon the lower plane, via three fourths of 45,000.

The great importance of having at all times a large supply of water ready for emergencies, is conceded by all and while the capacity of the lower Reservoir is sufficiently large for the present it may in a few years, by some misfortune, be rendered inadequate.

By depositing the earth in view of this arrangement, the embankment can be constructed in the most economical and substantial manner, and be ready for use long before it will be required.

UPPER RESERVOIR.—This, containing 7,000,000 gallons is made in embankment, with an interior slope of 2 feet horizontal to one foot vertical, and an exterior slope of one and a half horizontal to one vertical.

To free the water from impurities, necessarily held in solution during freshets, this reservoir will also consist of two apartments, separated by a division bank.

The western division will be used as a receiving reservoir, from which the water will flow into the eastern division, and thence pass through the distributing pipes into the city.

This reservoir is located upon the table land, of the large ravine, and commands Arbor Hill, the highest point in the city.

By examining the dimensions of the lower and upper reservoirs, it will be perceived that while the latter is designed to supply only about one-third of the whole population, it is nevertheless much the larger.

It has been recommended, because at the present, property in this vicinity can be purchased at a reasonable price, and the material to be used in embankment procured without difficulty, while the improvements now in progress must soon very materially enhance the value of the lots.

The same economy, therefore, that would construct the lower reservoir of small dimensions, would require the upper one to cover a large area.

Annual expense of working the engine, including wear and tear, two engineers, two firemen, \$725, which, at 6 per cent is equivalent to \$154,250.

Ad to insure for contingencies, engineering, &c 66-00