

SEWAGE AND
INDUSTRIAL
WASTES

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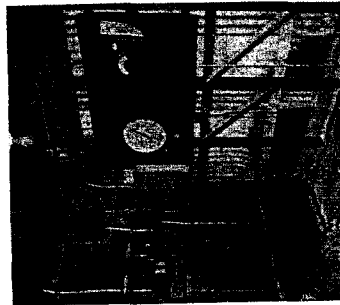


FIGURE 5.—Interior of control house showing pH recorders and chemical storage.

chemical is soda ash, fed by a dry feeder. The rate of feed is controlled by an electronic pH controller with glass pH electrode; the feed system is activated by compressed air. A sheet metal building was constructed to house the feeder and pH equipment controls (including a continuous pH recorder) and also to provide room for storage of chemicals. The installation was completed in the fall of 1951 at a cost of approximately \$5,000. This included the building and reaction chamber and all necessary equipment, and also the work of rearranging sewer connections.

Evaluation of Performance

The system has now been operating for six months, long enough to indicate the efficiency of the design. Over this period the pH of the effluent discharged to the sewer has been continuously recorded, and a review of the record charts indicates that the system as designed is producing a satisfactory effluent essentially all of the time. There have been, however, a few instances when the effluent pH decreased

to values less than that desired for short periods, corresponding to times of very heavy acid discharge. These few exceptions are not believed to represent any significant corrosion hazard to the municipal system, considering the additional smoothing-out or buffering obtained when the treated industrial waste becomes diluted with the normal sewage flow.

The study of the pH records indicated that a reaction chamber of approximately double the size of the existing chamber, or, better, two units of the existing type operating in series, would be needed if it were required to provide absolute insurance against any lowering of the effluent pH below 6.0 and that such a design would scarcely be economically justifiable. One practicable measure that could be taken would be to install a limestone-chip type trap in the line from that area of the plant where heavy acid discharges are produced. Such a trap would take the "edge" off the heavy acid discharges, and hence would assist appreciably in smoothing out the acidity before the wastes reach the reaction chamber. Since limestone chips are cheaper than soda ash, the over-all cost of chemicals would not be increased. The principal difficulty is the initial cost of construction.

Accumulated operating experience to date has indicated a few other conclusions of value, as follows:

1. The point of chemical feed preferably should be located at the influent discharge to the reaction chamber to take advantage of this opportunity for mixing.
2. The mixer propeller should be of non-clogging design if necessary; in this case the waste, although previously subjected to gravity trapping, contains occasional stringy materials, which tend to become fouled in the propeller and disturb its dynamic balance.

3. The design should provide for ready removal of the mixer, in the event maintenance is required.

4. The automatic controls should provide for complete shut-off of the feeder when the influent pH is at or near the desired effluent pH.

5. A coarse-mesh wire basket should be placed over the feeder hopper to prevent pieces of paper and other mis-

cellaneous materials from entering the feeder mechanism.

6. The glass electrode needs to be periodically inspected (every two or three days) to remove accumulated slum.

7. The over-all maintenance required by the system can be readily provided by one of the regular plant personnel.

INDUSTRIAL WASTE INVENTORY PROGRESS REPORT

In a progress report covering the 18-month period ending June, 1951, the Interstate Sanitation Commission has covered the activity and findings of its Industrial Waste Inventory in the area served by the Commission. This area includes New York Harbor and the adjacent waters of Long Island Sound, the Hudson River, and the Atlantic Ocean, with a total waste contributing population of about 11,000,000. The report contains 36 pages, plus 19 figures, 10 tables, and a detailed appendix on contributed wastes, by waterways.

Of the approximately 1,500 plants visited, 306 dispose of their waterborne wastes directly to District waters. The remainder either do not produce contaminating wastes, or dispose of them through public sewers. The heaviest concentration of plants contributing contamination directly is along the relatively short coastline of western Long Island. Other areas of concentration border Bridgeport (Conn.) Harbor and the waters around Staten Island.

Approximately 515 m.g.d. of contaminated water are discharged di-

rectly by the 306 plants. Some degree of treatment before discharge is provided by 138 plants for 433 m.g.d. Union County, N. J., alone discharges more than 40 per cent of the total volume. No direct industrial waste discharges are generated in New York County (Manhattan). Of the 515 m.g.d., approximately 65 per cent is discharged by the petroleum industry, 14 per cent by utilities, and 10 per cent by chemical industries.

In addition, 1,160 m.g.d. of uncontaminated flow are discharged directly to District waters. More than 90 per cent of the 1,675-m.g.d. total discharged to these waters is salt water obtained from the same source.

The survey results indicate that the food, utilities, chemical, and petroleum industries are the major sources of oxygen depleting wastes. Maximum potential loadings on District waters include 358,000 lb. of suspended solids, 10 tons of nonferrous metals, 18 tons of ferrous metals, 48 tons of acids, 3,600 lb. of cyanides, and 6,000 lb. of phenolic compounds. In addition, about 50 tons of fats, grease, and oils may be discharged daily.