

works has been constructed and is now in operation on the banks of the Pennypack Creek, which empties into the Delaware River 2,000 ft. from the Torresdale water filters. Into this creek there was formerly discharged the sewage of the village of Holmesburg and the large municipal institutions located nearby. Intercepting sewers have been built along the creek, and they conduct the sewage to a pumping station, where it is coarse-screened and passed through a grit chamber and then forced to the treatment works, one-third of a mile distant. The plant is designed ultimately to treat 2,000,000 gal. per day and at the present time it is receiving approximately 1,000,000 gal. daily.

The sewage first enters two Emscher tanks, which are of the radial flow type, 30 ft. in diameter and $32\frac{1}{2}$ ft. deep, and having a normal retention period of $2\frac{1}{2}$ hrs. The sludge is withdrawn from the bottom of these tanks through a pipe line, and is discharged by gravity upon a sludge-drying bed composed of layers of sand placed upon broken stone and under-drained by agricultural tile. Instead of the usual method of collecting the effluent of the Emscher tank into a dosing tank from which it would be discharged by a siphon upon the percolating filter, an equalizing tank has been constructed into which the effluent flows. The bottom of this tank is connected by a 24-in. cast-iron pipe with the distributing system of the percolating filter, and in this line between the equalizing tank and the percolating filter is placed a butterfly valve. The opening and closing of the butterfly valve is controlled by a cam, which is operated through gearing by a water-wheel driven by a small flow of Emscher tank effluent.

The shape of this cam was designed experimentally so as to make the spray from the fixed nozzles alternately move back and forth from the nozzle to a line which produces about six inches overlap of the sprays, and by this means a distribution has been obtained practically equal to that from a mechanical distributor.

To meet the variation in flow, due to the daily fluctuation and to storms, the equalizing tank is electrically connected to the operating machine so that when the flow decreases and the level of the sewage in the tank falls to a predetermined elevation, the machine shuts down and the percolating filter is thrown out of service. When the flow increases and the water rises in the tank, a different cam from that generally in service is automatically thrown in, which causes a longer period of display of the nozzles and cares for the increased flow.

The percolating filter is one acre in area, and is divided into five bays, each having its own main distributor. Taylor square nozzles are used, spaced 10.8 ft. apart. The medium is 6 ft. of crushed trap rock, from 1 in. to 3 in. in size. Semi-circular vitrified clay under-drains are laid on a concrete floor, which slopes to the main effluent collectors.

As the function of this plant is the protection of the water of the Delaware River in the immediate vicinity of the intake of the Torresdale water filters, the state department of health required the disinfection of the effluent of the percolating filters, and a plant for this purpose was installed on the line connecting the percolating filters with the final settling basin, consisting of a mixing tank, which rests on the floor of the house and from which the bleach cream is forced by a centrifugal pump to either one of the two solution tanks. Before the bleach solution is added to the sewage it is diluted by a stream of water, and the very dilute solution flows through a lead pipe, perforated with a large number of small holes, and which lies horizontally in the channel carrying the effluent from the percolating filters. In this way a

complete admixture of the disinfectant with the sewage is accomplished, and with only about 25 lbs. of dry bleach per day, which represents one part per million available chlorine, an almost sterile effluent has been produced. The records show that over a period of nineteen weeks only upon one occasion were *B. coli* found in the final effluent. After the sewage has been disinfected it is retained for about two hours in a shallow final settling basin and is then discharged into the creek.

The sewage as received at the treatment works is both fresh and dilute, and by keeping clean the surfaces with which it comes in contact, and by passing it through each of the processes as rapidly as possible, the plant is operated without any odor.

The grounds around the works have been made attractive by the maintenance of well-trimmed grass areas and by planting shrubs and flowering plants.

The sludge withdrawn has been low in moisture, generally about 75 per cent., has contained a considerable amount of gas, and each time it was withdrawn it has been found to be blacker and more granular, showing that the ripening period has been passed and that typical sludge has been obtained.

The final effluent as discharged into the creek has invariably been free from an appreciable amount of suspended matter, perfectly stable and nearly sterilized.

The work so far accomplished has demonstrated the feasibility of the methods suggested for the comprehensive treatment of the sewage of the city. The state board of health having been in touch with the work so far completed, it is anticipated that the plans to be recommended will meet with its approval; and it is hoped that funds will soon be available to commence the work on the larger installations.

AUCTION OF PULP LIMITS IN ABITIBI AND LAKE ST. JOHN.

Announcement has been made that the Quebec Government has decided to open new districts to lumber and pulp industries and will auction off limits in the Abitibi and Lake St. John districts during the months of August and October. In the Lake St. John region the territory to be opened is north of the lake and in basin of the Mistassini and Rat Rivers. In the Abitibi it is situated south of the Transcontinental, but on the north slope in the basin which empties in James Bay. This tract is traversed by the Poisson Blanc, Harricana and Belle Rivers. Both limits have been most carefully surveyed by the Forestry Service.

These concessions will call for the development of the water powers in the districts and will carry the obligation to construct pulp mills of a specified capacity within three years. The delay between now and August is to allow opportunity for exploration and permit of advertising the proposed auction, not only in Canada, but also in the United States, Great Britain and France, as the Government wishes to attract the attention of foreign capitalists to the great natural resources of the province.

The Government has appointed five official guides to further the interests of colonization in the Abitibi district and show settlers what that district has to offer.

A \$2,000,000 corporation to provide electric power and lighting facilities for the Santa Ynez valley, the northern end of the county and all of San Luis Obispo county, has filed articles of incorporation at Santa Barbara, Cal., being the Midlands Counties Public Service Corporation. The present place of business is in Los Angeles. The company has acquired the power plants at Santa Maria, San Luis Obispo, Lompoc and other points, and plans for immediate extensions are being made. The new company is a subsidiary of the San Joaquin Light and Power Co. and power will doubtless be supplied by the immense plants of the San Joaquin company in the Sierra Mountains.