



MONMOUTH CONSOLIDATED WATER COMPANY.

Elevations given in feet above mean sea level.

ORGANIZATION: The Monmouth Consolidated Water Company is a subsidiary of the American Water Works & Electric Company, Inc., and operates under the close supervision of the parent company. The operating company is well organized with a competent resident manager, a general foreman in charge of distribution, a chief engineer in charge of pumping stations, a chemist in charge of purification and a well-organized operating board. The resident manager exercises general supervision and has been in charge since 1925. Records of hydrant and valve locations are generally good except in older section of the system formerly served by the Tintern Manor Water Company. These are now being brought up to date. Detailed plans of supply works and pumping stations are complete. Operating records are well maintained. The main office is located in Long Branch and the branch office for the southern territory is located in Asbury Park. Meter shop at Whitesville; stocks of large pipe kept at Whitesville and West End Pumping Stations. Fire alarms are not sounded in company quarters, but company employees with trucks and emergency equipment are available on short notice.

GENERAL OPERATIONS: Water is obtained from four stations—the Newman Springs Station in Middletown Township, the West End Station in Long Branch and the Jumping Brook and Whitesville Stations in Neptune Township. In addition there is one booster station supplying high areas in Middletown Township, adjacent to Highlands. The Newman Springs Pumping Station is in continuous operation. It is operated during the summer by steam and during the remainder of the year by gasoline and electricity. The West End Pumping Station is operated during the summer and is used as a standby station during the remainder of the year. When pressures in this station drop below 50 pounds a siren is automatically operated notifying station engineers, and gasoline pumps are immediately started. The Jumping Brook Pumping Station is operated during the summer for about 16 to 20 hours a day. The Whitesville Pumping Station is operated only during the summer.

TERRITORY SERVED: The company owns and operates the supply works, distribution system and appurtenances supplying water for domestic and fire protection purposes to Long Branch, Fair Haven, Sea Bright, Monmouth Beach, Eatontown, West Long Branch, Deal, Oceanport, Ocean Township, Bradley Beach, Neptune City, Neptune Township, Little Silver, Shrewsbury, Interlaken, Ocean Grove, Rumson, Middletown Township, sections of Asbury Park west of the railroad and sections of Shrewsbury Township adjacent to Shrewsbury Borough. In addition to this there is a 4-inch metered connection to the Belmar distribution system and an 8-inch closed emergency connection to the Red Bank distribution system and two 6-inch metered connections to the Asbury Park distribution system. **Services:** Water is supplied from two services as follows: **Low Service:** The major portion of the distribution system is supplied by this service. **Water Witch High Service:** This service is supplied from the low service and serves a high area in Middletown Township known as Water Witch Park.

SUPPLY WORKS—Newman Springs Station: Located on the west bank of the Swimming River, about $\frac{1}{2}$ -mile from Red Bank. Supply is obtained from the Swimming River Reservoir which was constructed about 1903. A concrete dam across the Swimming River at a point about 3 miles above Newman Springs impounds about 170 million gallons. Elevation of crest of dam is 13.02 feet. Above this reservoir is a watershed of about 48 square miles with a minimum stream flow of about 11 m.g.d. and an average of about 56.5 m.g.d. Experience has shown on one occasion a six weeks' period of practically no flow, but otherwise it is reported to have exceeded requirements at all times. From this reservoir water flows through three 36-inch cast iron gravity lines to the brick gate house located a short distance below the dam, from which it flows through one 36-inch line about 11,000 feet long to low lift pumps. The low lift pumps are supplied under a head of about 5 feet and discharge to a 3-million-gallon concrete sedimentation basin from which the supply flows by gravity through filters into a clear water basin. Independent suction lines connect the clear water basin with high lift pumps which discharge at 95 to 100 pounds into distribution system. **West End Station:** Located close to Lake Takanasee along the right-of-way of the New York & Long Branch Railroad. Supply is obtained from Cranberry and Whale Pond Brooks and is impounded in a

series of natural ponds terminating in the Takanasee Reservoir in the south end of the City of Long Branch. The total storage capacity of this impounding system amounts to 43.45 million gallons. The two brooks drain an area of about 4.9 square miles and have an average daily flow of about 10.0 million gallons and a minimum daily flow of about 3.00 million gallons. The storage capacity of the reservoir when water submerges only land owned by the company is 2.25 million gallons. When the reservoir fills and inundates adjoining land its capacity is about 7.25 million gallons. A short open concrete flume 5 feet by 3 feet 9 inches, a 16-inch iron pipe and an 18-inch cast iron pipe connect the Takanasee Reservoir with an 80,000-gallon concrete suction basin. Low lift pumps take suction from the latter and discharge through gravity filters to a concrete clear water basin from which the high lift pumps take suction and discharge at 90 pounds to distribution system. **Jumping Brook Station:** Located at Hillcrest Mills in Neptune Township, about 2.5 miles west of Bradley Beach. Water is obtained from an impounding reservoir formed by the construction of a stone and timber dam across Jumping Brook. Reservoir covers an area of about 3 acres and has an estimated capacity of about 2.5 million gallons with a watershed of 6 square miles. From the reservoir water flows by gravity through a 16-inch line to a coagulant mixing tank, then through a 16-inch line to a 1.0 million gallon settling basin and on through a 10-inch line and 12-inch line to suction well from which the high lift pumps take suction and discharge direct through four pressure filters into distribution system. There is also one 10-inch well 1,085 feet deep with a total safe yield of about 0.25 m.g.d. This well discharges directly into coagulating tank. Provision is made for supplying the Jumping Brook Reservoir directly from the Shark River which has a watershed of 9.75 square miles. A high lift pump takes suction in the Shark River and discharges directly through two 8-inch mains about 0.5-mile long into the Jumping Brook Reservoir. **Whitesville Station:** Supply from this station is obtained from two wells, one 18 inches in diameter and about 981 feet deep, and the other 16 inches in diameter and about 610 feet deep. One well discharges directly into distribution system while other discharges through 3 gravity filters to a suction well from which water is pumped into distribution system. Well capacity is estimated to be about 1.5 m.g.d.

PUMPING STATIONS—Newman Springs Pumping Station: Located in Middletown Township with supply works described above and shown on accompanying map and fire zone map No. 400. Station built in 1903, consists of a group of one-story brick buildings housing pumps and filters with slate and composition covering on frame roof. All buildings adjoin and communicate through unprotected openings. Steam heat, electric lights and telephone. Exposures negligible. Housekeeping good. Hand protection consists of 100 feet of 1 $\frac{1}{2}$ -inch hose attached to two of five standpipe connections, 8 hand chemical extinguishers and 4 nearby fire hydrants. Elevation of pump room floor 12.32 feet. Station is operated in three shifts and personnel consists of three operating engineers, three filter operators, two firemen in summer when steam plant is in operation, one assistant chief engineer, one relief engineer, one helper and one janitor. An operating engineer and filter operator are on duty at all times. Electric power is transmitted at 4,600 volts from South Amboy for normal operations and in addition there is a standby system of 2,300 volts from Lakewood which ordinarily carries no load. At station there is an automatic switch between the two services which operates on the breaking of the service in use. Power lines for the services are carried on separate poles and are about 4.5 miles in length. Steam boilers are operated only during the summer, but in emergency could be placed in operation in about five hours. There is about 150 tons of coal stored at pumping station. **Equipment—Low Lift Pumps:** One 7.0-m.g.d. Lawrence centrifugal pump driven by a Lawrence Vertical Simplex steam engine installed in 1905. One 12.0-m.g.d. De Laval centrifugal pump driven by a 100-h.p. Westinghouse electric motor installed in 1929. This pump can also be used as a high lift pump with capacity of 2.0 m.g.d. One 9.0-m.g.d. De Laval centrifugal pump driven by either a 50-h.p. Allis Chalmers electric motor or by a 72-h.p. Buda gasoline motor installed in 1926. One 6.3-m.g.d. De Laval centrifugal pump driven by a 20-h.p. Westinghouse electric motor installed in 1926. **High Lift Pumps:** One 8.0-m.g.d. Worthington cross-compound crank and flywheel steam pump installed in 1926. Two 6.0-m.g.d. Worthington cross-

MONMOUTH CONSOLIDATED WATER COMPANY.

Continued.

compound steam pumps installed respectively in 1903 and 1905. One 4.0-m.g.d. Worthington centrifugal pump driven by either a 200-h.p. Westinghouse electric motor or by a 229-h.p. Buffalo gasoline motor installed in 1929. One 2.0-m.g.d. De Laval centrifugal pump driven by a 100-h.p. Westinghouse electric motor installed in 1929. One 1.0-m.g.d. De Laval centrifugal pump driven by a 75-h.p. Westinghouse electric motor installed in 1931. One 1.0-m.g.d. Worthington centrifugal pump driven by a 50-h.p. G. E. electric motor installed in 1929. One 98-c.f.m. Nash Hytor vacuum pump driven by a 7.5-h.p. G. E. electric motor installed in 1929. One 23-c.f.m. Hytor vacuum pump driven by a 3-h.p. Nova gasoline engine installed in 1929. **Boilers:** Four Ames Iron Works 150-h.p. boilers installed in 1903. Both are horizontal return tube type well set. **Filters:** There are 20 Continental Jewel tub filters with an aggregate capacity of 13 m.g.d. Filters capable of a 25% overload, but can not be by-passed. **Clear Water Basin:** Concrete, in two sections, one 65 feet by 124 feet 10 inches by 6 feet and one 62 feet by 5 feet by 6 feet built in 1903 and located under filter house. Total capacity 375,000 gallons. **West End Pumping Station:** Located in the West End section of Long Branch with the supply works described above and shown on accompanying map and fire zone map No. 314. Station built in 1882 and later enlarged. It consists of a small group of 1-story brick buildings with slate roofs and concrete floors housing pumps and filters. All buildings adjoin and communicate through unprotected openings. Steam heat, electric lights and telephone. Exposures negligible. Wiring in conduit. Housekeeping good. Hand protection consists of one 1½-inch inside standpipe with 50 feet of 1½-inch linen hose with a nozzle located in the pump room and an adjacent hydrant. Elevation of pump room floor about 12.83. Station is operated in the summer in three shifts with an operating engineer and fireman on duty at all times and in two shifts during the winter with an operating engineer on duty at all times. Boilers are fired only during the summer. Gasoline pumps are operated monthly. **Equipment—Low Lift Pumps:** One 6.0-m.g.d. American centrifugal pump driven by an American Blower vertical single cylinder steam engine installed in 1928. One 5.6-m.g.d. American centrifugal pump driven by a 56-h.p. Buda gasoline engine installed in 1929. **High Lift Pumps:** One 6.0-m.g.d. Holly-Gaskill compound duplex crank and fly-wheel steam pump installed in 1898. One 5.0-m.g.d. American centrifugal pump driven by a 300-h.p. Sterling gasoline engine installed in 1929. One 23-c.f.m. Nash Hytor vacuum pump driven by a 3-h.p. Nova gasoline engine installed in 1929. One 100-h.p. Hedges-Walsh Weldner boiler and one 125-h.p. McCabe boiler installed respectively in 1930 and 1931. Both are horizontal return tube type well set. **Filters:** Four 0.648-m.g.d. Jewel tub filters, eight 0.226-m.g.d. Hyatt filters and two 0.403-m.g.d. Jewel filters. All of the rapid sand type and capable of a 25% overload but can not be by-passed. **Clear Water Basin:** Concrete, 30 x 30 x 8 feet, capacity 54,000 gallons. **Whitesville Pumping Station:** Located in Neptune Township with supply works described above and shown on accompanying map and fire zone map No. 221. Station built in 1900. Building is a moderately large brick structure divided into two sections by a frame partition and having a slate roof, concrete floor, coal stove for heat, electric lights and telephone and used principally as a meter shop and warehouse. Housekeeping good. Exposures negligible. Hand protection consists of three hand extinguishers. Wiring in conduit. Elevation of pump room floor 14.21 feet. Electric power is transmitted to station over a single feeder from Asbury Avenue. This station is operated only during the summer by two station engineers who are on duty from 8 to 10 hours a day. Deep well pumps located adjacent to this pumping station are housed in small area brick structures with concrete floor and roof and electric lights. **Equipment—Low Lift Pumps:** One 1.296-m.g.d. Layne deep well pump driven by a 40-h.p. G. E. electric motor installed in 1924. **High Lift Pumps:** One 0.432-m.g.d. Layne deep well pump driven by a 60-h.p. G. E. electric motor installed in 1924. One 0.684-m.g.d. American centrifugal pump driven by a 60-h.p. G. E. electric motor installed in 1924. **Filters:** Three 0.515-m.g.d. rapid sand filters capable of 25% overload. They can not be by-passed. **Jumping Brook Pumping Station:** Located in Neptune Township with supply works described above and shown on accompanying map and fire zone map No. 221. Station built in 1905. Building is a 1-story brick structure divided by unprotected communications into a filter room and a pump

room with a slate roof on wood rafters and steel trusses. Steam heat, electric lights and telephone. Exposures negligible. Housekeeping good. Hand protection consists of 150 feet of 1½-inch hose with 3 nozzles, 3 hand extinguishers and an adjacent fire hydrant. Wiring in conduit. Elevation of pump room floor about 21. Station is operated by two station engineers during the summer in two shifts 16 to 20 hours a day. **Equipment—Low Lift Pumps:** One 1.5-m.g.d. Worthington centrifugal pump driven by a 75-h.p. Allis Chalmers electric motor installed in 1930. One 0.8-m.g.d. American centrifugal deep well pump driven by a 34-h.p. Buda gasoline motor installed in 1931. **High Lift Pumps:** One 1.85-m.g.d. De Laval centrifugal pump driven by a 75-h.p. G. E. electric motor installed in 1934. One 1.15-m.g.d. De Laval centrifugal pump driven by a 50-h.p. G. E. electric motor installed in 1934. One 2.75-m.g.d. De Laval centrifugal pump driven by a 150-h.p. Buffalo gasoline motor installed in 1934. **Filters:** There are 4 horizontal pressure filters with a capacity of 0.5 m.g.d. each which can not be by-passed and are capable of delivering a 25% overload. **Filter Wash Standpipe:** Steel, 25 feet by 40 feet, capacity 140,000 gallons, located adjacent to pumping station. This is supplied from transmission main and is used for filter wash purposes entirely. Electric power is transmitted to station over a single feeder. **Booster Pumping Station—Water Witch Park Booster Station:** Built in 1938. Located at Navesink and Van Kirk Avenues in Middletown Township. Pumps are located below grade in a concrete pit and operate automatically when pressure drops below 96 pounds. **Equipment:** Two 50-g.p.m. De Laval centrifugal pumps driven by two 5-h.p. G. E. electric motors.

DISTRIBUTION SYSTEM: See map and description above. The Newman Springs Pumping Station discharges through a single 36-inch main to the southern part of the territory served and through one 8- and one 12-inch main to the northern section of the distribution system comprising Middletown Township. The 36-inch main extends from this station to Long Branch where it ties in with the Long Branch distribution system. The West End Pumping Station discharges through a 20- to 16-inch main directly to the Long Branch distribution system and through another 16-inch main extending south of this pumping station and supplying the territory south of Long Branch. The Whitesville Pumping Station discharges directly through a single 10-inch main to the distribution system in Neptune Township. The Jumping Brook Pumping Station discharges through a single 16-inch line which extends east down Corlies Avenue to the Corlies Avenue standpipe and the southeast section of the territory served.

MAINS: Practically all supply and distribution mains are Class "B" cast iron, tar coated, bell and spigot joint, laid with a 3½-foot minimum cover. About 50% are cement lined. The 16-inch supply line from the Jumping Brook Pumping Station is part cement pipe. No serious experience from frozen mains or electrolysis and railroad and stream crossings are well protected.

STANDPIPE: Located at Corlies Avenue and Neptune Highway in Neptune Township. Built in 1922, steel, 35 x 130, elevation of base 24, elevation of overflow 154, capacity 930,000 gallons. Standpipe is connected to distribution system through a pressure regulating valve set to operate when pressure drops below 50 pounds.

CONSUMPTION: The average and maximum daily pumpage during 1938 on the entire system was 7.921 and 11.536 m.g.d. The average and maximum daily pumpage for each station during the same period was respectively as follows: Newman Springs—5.063 and 6.403 m.g.d.; West End—1.937 and 3.300 m.g.d.; Jumping Brook—.771 and 1.589 m.g.d.; Whitesville—.150 and .244 m.g.d. On December 31, 1938, there were 23,414 services, of which 20,180 were metered.

PRESSURES: Recording pressure gauge is maintained at the main office in Long Branch. Pressures are fairly well maintained at 95 to 100 pounds at the Newman Springs Pumping Station, 85 to 90 pounds at the West End Pumping Station, 65 to 75 pounds at the Jumping Brook Pumping Station and 55 to 60 pounds at the Whitesville Pumping Station. Typical readings taken at well distributed hydrants showed pressures to range from 37 to 95 with an average of 75 pounds.

POPULATION SERVED: Population in the territory served is estimated to be 78,250 permanent and 178,000 summer.