Forest Park is equipped with special treatment processes that effectively prevent objectionable tastes and odors from persisting through the process and eventually reaching the customer's tap. The aesthetic quality of the water is enhanced by ozonation followed by flow through Granular Activated Carbon (GAC) media resulting in naturally occurring organic compounds being destroyed by ozone oxidation and removed by carbon adsorption. Other benefits of this two-stage treatment include; chemical pollutant removal/destruction, reduction of undesirable disinfection byproducts, manganese removal, and improved clarity.

A single Plant Operator controls the facility and remote sites through the aid of a sophisticated microprocessor-based network that performs countless functions in response to operator commands and custom programming. The operator interface to the control network occurs through a computer-based system (SCADA) which allows the operator to view all real-time data, select numerous setpoints, initiate various commands to equipment and processes, and receive automatically generated alerts.

Our Dedicated People

Undoubtedly, our most valuable attribute is the dedicated team of professionals entrusted with the responsibility of providing a continuous supply of purified water to the customers.

The operations staff is highly trained and experienced in water treatment and plant operation. The responsibilities require a special blend of technical expertise and mechanical aptitude. Each operator maintains a Pennsylvania Waterworks Operator License of the highest classification. Equally important are the specialized skills provided by our mechanical and electrical/controls staff. The reliable operation of the facility depends on their ability to maintain a tremendous amount of highly diversified equipment and respond appropriately to inevitable equipment failures.

Our management and administrative responsibilities are also unique due to the partnership between the water authorities. Unlike most water treatment plants, areas such as accounting, human resources, and organizational management are handled by the Forest Park staff.

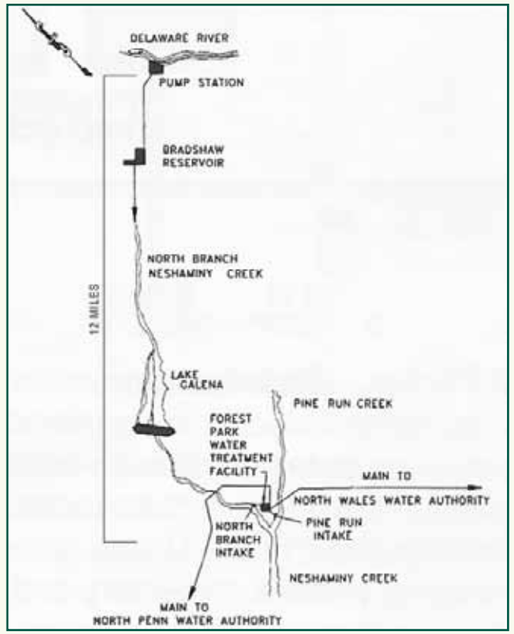
Simply stated, the success of Forest Park is ultimately attributable to the dedicated efforts and foresight of the people at Forest Park and each water authority.

Forest Park Water is..."Clearly the Finest"

Lake Galena

Where The Water Comes From...

Forest Park purifies water taken from the North Branch Neshaminy Creek (NBNC) just downstream of Lake Galena located in Bucks County. Since natural flows are insufficient to meet the demands of the facility, the supply is supplemented by Delaware River water pumped from the Point Pleasant Pump Station and discharged into the NBNC (See drawing). The FPW Operator efficiently manages the source water supply by remotely controlling the Delaware River pump station and the water release gates at Lake Galena.



Forest Park Water

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Forest Park Water

"Clearly the Finest"

A Partnership of
The North Penn and North Wales Water Authorities

NPWA NORTH PENN WATER AUTHORITY

NWWA North Wales Water Authority

Welcome to Forest Park Water

Forest Park Water (FPW) is an advanced drinking water treatment facility jointly owned and operated by the North Penn and North Wales Water Authorities. The non-profit municipal water authorities formed their unique partnership for the purpose of working together to obtain a reliable water supply to meet the current and future demands of their customers. Their vision became reality with the completion of the Forest Park Water facility in 1994.

In 2007, the Authorities completed a plant expansion project which increased the capacity to 40 million gallons per day, incorporated advanced membrane filtration into the treatment process, and added an emergency power generation system to keep the plant operating during prolonged power outages. Putting into perspective the 40 MGD capacity, we could fill the Rose Bowl to the rim in about two days. The improvements ensure that for the foreseeable future Forest Park will continue to provide an adequate supply of high quality water that surpasses increasingly more stringent regulations while also satisfying the rising expectations of our customers.

Forest Park supplies approximately 85% of the water delivered to Authority customers located in Montgomery and Bucks Counties. Each Authority supplements the Forest Park supply with groundwater sources.

A Unique Facility

Forest Park Water is among the finest "state-of-the-art" facilities in the U.S. Its most notable feature is our "microfiltration" process using membranes, which is the filtration technology of the future. In 2007 Forest Park became one of the first and largest plants to complete a complex conversion from traditional media filters (anthracite/sand) to technologically advanced membrane filtration. Membranes provide a more effective barrier against the passage of potentially harmful pathogens (i.e. cryptosporidium and giardia) by achieving greater removal efficiencies of microscopic particles. Furthermore, membrane performance is unaffected by certain conditions that might otherwise negatively affect the quality of water produced by traditional filtration.

In addition to the robust physical barrier provided by membranes, ozone has been used since 1994 to provide a potent disinfection barrier. Although the use of ozone has become more prevalent in the U.S., it remains an advanced treatment tool benefiting only a small percentage of public water suppliers.

While the production of safe water is our highest priority, we are equally committed to producing water that is pleasing to the senses.

Purification Process

Raw Water Intake and Pumping

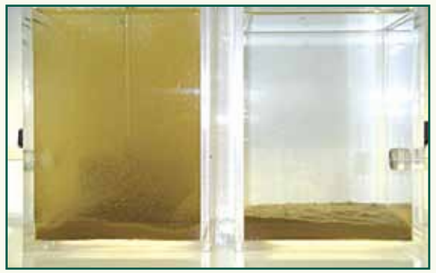
The raw water originates from the North Branch Neshaminy Creek. The intake system, comprising of an inflatable rubber dam, a bar rack intake, and traveling screens, conveys debris-free water to the raw water pump sump where the pumps then transfer the water to the treatment plant and maintain flow through all stages prior to filtration.

Raw water intake and inflatable dam

Pre-treatment Stage

Pre-treatment is a term used to describe treatment that occurs prior to filtration. Our main objective is to remove most of the particulate and organic matter prior to filtration. Aluminum Sulfate (Alum) is skillfully dosed to effectively neutralize the electrical charges of impurities in the water. This action promotes the clumping together of particles in a process called coagulation.

The coagulated water then enters a gentle mixing stage called flocculation where the tiny particle masses combine to form visible voluminous masses called “floc”. The objective is to achieve a floc density conducive to settling.



Settling Floc **Clarified water**

The floc-laden water enters sedimentation basins where the majority of the solids settle. Specially designed inclined settling plates affixed in each basin are vital to achieving proper settling. Water exiting the sedimentation basins is called clarified water.

Sedimentation basin with inclined plates

Membrane Filtration

The clarified water flows to an advanced microfiltration stage where microscopic particulate is filtered out by submerged membranes. The “membranes” consist of approximately 45 million hollow-tube fibers contained in modules which are attached to submerged racks.

Clockwise: module rack, cut fibers, submerged membranes

Filtration occurs as pump suction applied to the inside of the tube pulls water through the wall of the fiber. The fiber wall rejects impurities larger than 0.1micron while allowing the filtered water to enter the tiny tube. The filtered water from inside each fiber flows into a common pipe leading to a filtrate pump. The pump controls the rate of flow through the membranes and transfers the filtered water to the next stage. The membranes require frequent reverse flushing to remove trapped particulate.

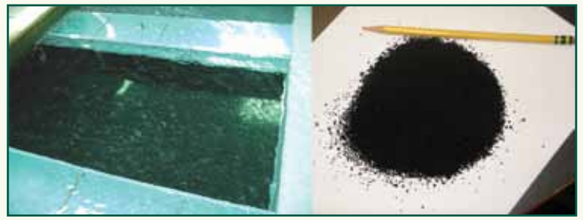
Ozone Treatment

Ozone is dosed to the filtered water to achieve powerful disinfection and destruction of objectionable organic compounds. Ozone gas is short-lived so it must be generated on-site and applied immediately. The gas is bubbled up through the filtered water as it flows through sealed contact basins. Residual ozone is quenched by a reducing agent prior to the water flowing to the next stage.

Ozone Generators

Carbon Treatment

The ozonated water gets pumped to Granular Activated Carbon (GAC) contactors where a variety of undesirable organic and chemical compounds are removed by adsorption and beneficial microbial activity. This occurs as the water flows down through a deep bed of carbon media.



Carbon Contactor **Granular Carbon Media**

Final Treatment

Chlorine is dosed to ensure that an adequate residual concentration persists throughout the piping systems of the North Penn and North Wales Water Authorities. Chlorine used at Forest Park is a liquid solution generated by a sophisticated on-site system, thus eliminating the need to handle and store large volumes of dangerous chlorine gas. Also, sodium hydroxide is added to adjust the pH of the finished water.

Delivery to the Customer

Finished water is collected in the plant Clearwell which is a 2 million gallon below ground reservoir. Massive pumps deliver the water to each Authority’s distribution system where a complex network of piping, pump stations, and storage tanks deliver high quality water to the customers, while also providing fire protection for the surrounding communities.

Pumps delivering water to Authority systems

Water Quality Assurance

Excellent water quality is assured through operational proficiency and diligent monitoring. We perform continuous monitoring using on-line instruments, routine process lab analysis by the Operator, and analysis by state certified laboratories. Forest Park water consistently surpasses all state and federal regulatory standards. Therefore, our customers enjoy with confidence the refreshing water flowing from their taps.

On-line Water Quality Instruments

Main Control Room