WATER TREATMENT PLANT, BLUESTONE LAKE
TRUE, WEST VIRGINIA

OWNER
American Water Works Service Company
1025 Laurel Oak Road
Voorhees, New Jersey 08043
Contact: Hans Tuneblom
Telephone: 609-346-8279

ARCHITECT-ENGINEER
Hazen and Sawyer, P.C.
4011 Westchase Boulevard
Raleigh, North Carolina 27607
Contact: John Nemcik, P.E..
Telephone: 919-833-7152

% SELF PERFORMED: 75%

PROJECT
This project consisted of four separate areas, which are discussed in more detail below.

The Bluestone Intake included submerged wedge-wire screens and intake piping consisting of approximately 400' of 24" microtunnelled concrete pipe and approximately 1,200' of 24" restrained joint ductile iron pipe in the lake bottom.

The Bluestone Raw Water Intake Pump Station included a 150' deep by 12' diameter vertical pump wetwell in solid rock and superstructure. The superstructure houses three Vertical Turbine pumps with an emergency generator outside the building and a hydropneumatic surge tank inside the building.

The Intermediate Pump Station included three vertical can-type pumps with a standby generator located outside the building and one hydropneumatic surge tank inside the building. VFD's with bypass starters were installed for each pump. An access road was constructed from the Raw Water Intake Pump Station to the Intermediate Pump Station.

The Bluestone Water Treatment Plant was designed for a 5 MGD capacity, expandable to 15 MGD. It contains: two static mixers, three flocculation basins with vertical turbine mixers with variable speed drives (used to achieve flocculation), one bypass train, lamella plate settlers (for settling flocculated water), conventional concrete box filters with dual sand and GAC media, a below ground concrete clearwell (with adequate baffling), three vertical can-type distribution pumps with VFD's and bypass starters and two backwash pumps (located in the Pump Room). The filters utilize flow rate controllers with level control override to maintain constant flow rate. Settled solids from the plate settlers and filter backwash operations discharge to two residual lagoons. Supernatant from the lagoons is recycled to the head of the Plant with recycle pumps. Chemical feed systems including alum and polyaluminum chloride, coagulant aid polymer, powder activated carbon, caustic soda, chlorine, filter aid polymer, zinc orthophosphate, hydrofluosilicic acid and ammonia are located in the Treatment Plant, as well as Administration/Maintenance and Distribution offices. A complete instrumentation and control system was provided to permit automated control of the Pump Station and process equipment.

CONTRACT AMOUNT

Bid Price:	$21,782,000
Final Price:	$17,781,000

CHANGE ORDER WORK

Owner Generated:	None
Contractor Generated:	-$4,000,000 (Savings)

3D and Hazen and Sawyer jointly re-engineered the type of processes, construction materials and construction methods to reduce the construction cost by $4 million while providing the original treatment plant capacity, facility space and same land uses.

HAZEN AND SAWYER
Environmental Engineers & Scientists

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MEMORANDUM DATE: January 12, 1998

FOR: 3D Enterprises

FROM: Robert S. DiFiore, P.E., Z. Michael Wang, P.E.

SUBJECT: Recommendation

This memorandum serves as a letter of recommendation for 3D Enterprises Company.

Hazen and Sawyer has worked closely with 3D Enterprises Construction and Management for the last three years on two major projects for the West Virginia-American Water Company (WVAWC). The projects involve the construction of two new water treatment facilities. The Bluestone Water Treatment Plant in the Southern District of WVAWC is a five (5) million gallon per day (MGD) facility, expandable up to 15 MGD. The facility includes a raw water pump station and an intermediate pump station to convey the water more than 1,000 ft. up to the treatment plant, where the water is treated using conventional process in conjunction with biological activated carbon (BAC) filters. The plant is automated in process controls. The Weston Water Treatment Plant in the Northern District is a two (2) MGD facility, expandable to four (4) MGD. The facility is one of the first plants in the United States that employs the PulsaPak® modules for water treatment. The plant also serves as a regional sludge handling facility. Similar to the Bluestone Water Treatment Plant, the Weston plant is automated in process controls.

3D is the general contractor and construction manager for both treatment plants, and is one of the most qualified contractors with whom we have worked. As mentioned previously, the Bluestone Water Treatment Plant required two pump stations because the elevations between the intake and the treatment plant are more than 1,000 ft., which presented difficulties in both schedule coordination and constructability of the project. During construction, 3D was well organized, and illustrated their responsiveness and professionalism. The Bluestone project started producing high quality drinking water on schedule. The Weston Water Treatment Plant is currently under construction, which is being efficiently coordinated between the Engineer, the Owner and the contractors, and well managed by 3D Construction Management.

We would highly recommend 3D Enterprises for construction projects, especially for water and wastewater treatment facilities, and are confident of their performance. We would enjoy working with 3D again should the opportunity arise in the future.

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