NAME:
Sequim Water Reclamation Facility

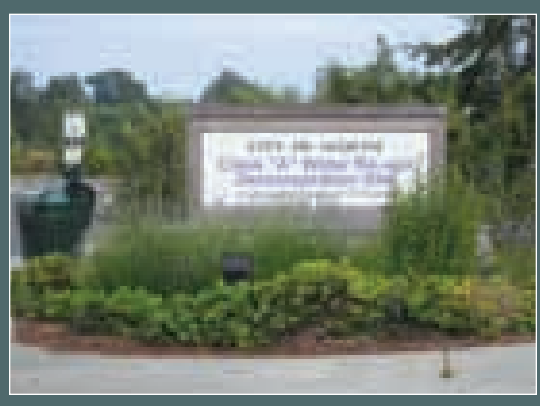
LOCATION:
Sequim, Wash.

PLANT SIZE:
1.67 mgd (maximum monthly capacity)

INFRASTRUCTURE:
Aeration blowers; clarifiers; coagulation equipment; filters; UV disinfection facilities; PLC; remote alarm system; and generators

Sequim WRF's recent expansion included the installation of new aeration blowers.

Workers constructed new clarifiers, too, as part of the expansion project.



The city's Class A Reclaimed Water 100% Upland Reuse Plan resulted in the development of three primary sites, including this demonstration site.

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By Caitlin Cunningham

Growing on the Olympic Peninsula

An expanded Washington state WRF discovers improved reliability and pathogen removal

Situated on Washington state's Olympic Peninsula, the city of Sequim (pronounced "skwim") has seen its population climb in recent years, with a current head count of about 5,400. In a notoriously soggy and cloud-covered region, the city's dry, mild climate—the nearby Olympic Mountains have a notable storm-blocking effect—continues to draw in new residents. Adding to its allure, Sequim abuts several water bodies renowned for their beauty, recreational opportunities and shellfish harvesting.

Water, Historically

The Sequim Water Reclamation Facility (WRF) was first constructed in 1966. Fast forward 32 years, and the city found itself up against not only rapid population growth but also deteriorating surface water quality, an insufficient water supply and new shellfish restrictions. To help remedy these difficulties, in 1998 the city adopted the Class A Reclaimed Water 100% Upland Reuse Plan, an amendment to its Comprehensive Wastewater Facilities Plan. The reuse plan called for three primary reuse sites, all of which were implemented by 2000.

Another major part of the plan involved upgrading Sequim WRF to a Class A-level facility. In order to produce the highest-quality class of reclaimed water per Washington state's water reclamation and reuse standards, the city added chemical coagulation, anthracite media filtration, ultraviolet (UV) disinfection and bypass structures, and it expanded influent screening, grit removal, biological treatment in an oxidation ditch, secondary settling and circular clarifiers. In 2001, the Class A WRF was upgraded once more to produce Class A biosolids with simultaneous lime treatment and pasteurization with an FKC screw press.

Water, Today

Even with these advancements, Sequim found itself struggling to keep pace with the various and intertwined challenges stemming from four main issues: its growing population; dwindling water supplies; increasing irrigation demands; and increasing requirements for pathogen reduction to meet water reuse and shellfish protection standards.

In 2007, officials teamed with Gray & Osborne, Inc.—a long-time city engineering consultant—to launch a major WRF expansion project that, in conjunction with complementary city and partner reuse efforts, is intended to improve area habitats and the quality and reliability of reclaimed water generation. The first phase of the expansion boosted the facility's maximum monthly design flow from 0.79 million gal per day (mgd) to 1.67 mgd, or from a design population of 6,900 to that of 15,710. It also converted the oxidation ditch facility into a conventional activated sludge facility that uses the Modified Ludzack-Ettinger process with PLC controls to remove nitrogen.

Other project components included the installation of aeration blowers, clarifiers, coagulation equipment, filters, UV disinfection facilities and a remote alarm system, with all treatment process power backed up by generators. The expansion was designed to meet National Water Research Institute-developed criteria for pathogen inactivation to produce safe recycled water.

Coordinating the interests of various stakeholder agencies proved to be the project's most significant challenge, according to Chad Newton, an environmental engineer with Gray & Osborne.

"The Department of Ecology was concerned about the adequacy of the wastewater treatment process, the reclaimed water staff at the Department of Health were concerned about the public health impact of reclaimed water use in the community, the Department of Health Office of Shellfish and Water Protection was concerned about reducing pathogens in shellfish and the Department of Fish & Wildlife focused on the quality and quantity of reclaimed water and its effect on Bell Creek," Newton said. "After a number of meetings, consensus was reached on the components of the project that best met all four of these objectives."

The Washington State Department of Health, for one, has taken notice of Sequim WRF's improved reliability and pathogen removal. Although the facility almost doubled its flow capacity, the department determined that it did not need to expand its existing 300-yd-radius shellfish closure zone.

Water, Looking Ahead

Sequim and Gray & Osborne have developed plans for a second phase of WRF expansion, which in its present form would allow the plant to support a design population of 21,330 by handling a design flow of up to 2.23 mgd.

"Phase II of the Sequim WRF expansion is scheduled for implementation in 2019, and the actual construction date will be adjusted based on the city's population growth rate and trends in wastewater production over the next 10 years," Newton said. WWD

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