Electrifying Bonners Ferry
Harnessing water for power

Electricity and fast-flowing rivers are inseparable in the Pacific Northwest. In the early 1900s, harnessing the power of water to supply Bonners Ferry’s ever-increasing demand for electricity was challenging. Low river flows and winter ice often brought power production to a halt. Electrical power in the city’s early years, was sporadic, at best!

Private ventures light up the village

The area’s first power plants were small private ventures. In 1902, local pharmacist, J.F. Cook, installed a turbine on the Moyie River, but never completed the project. The Newport Electric Light Company on Myrtle Creek provided the city’s first electricity in 1905. In 1907, a new owner made improvements to the plant, added domestic water service, and renamed the business the Bonner Water & Light Company. One of these improvements was a Pelton wheel which generated electricity from 1906–1921.

By 1917, the power plant was over-taxed. The continual demand for more reliable electricity led to the city’s 1921 purchase of the Myrtle Creek plant and formation of the Bonners Ferry Water and Light Department, marking the transition from private to public power.

In with the new…

Between 1900 and 1920, the town’s population grew from 349 to 1,236. Technological advances ranging from water pumps to electric irons created new uses for electricity in homes and businesses. Pumping floodwater out of farmlands and electrifying sawmills created enormous new industrial energy demands.

…but not quite out with the old!

When electricity was in short supply, each section of town had power just a few hours a day. Residents kept candles and kerosene lamps on hand for backup when the lights went out.

Pumping the city’s water from the Kootenai River to storage tanks above town also required electricity. During power outages, people reverted to using rain barrels and carrying water from the river in buckets.

Pelton’s powerful wheel

A new twist on an old idea

The Pelton wheel, invented in the 1870s, extracts energy from moving water, as opposed to water’s dead weight like traditional overshot water wheels. A high-speed jet of water shoots into cup-shaped buckets, turning the Pelton wheel. The wheel extracts almost all of the water’s “impulse energy,” transferring energy to the wheel and then to a turbine which generates electricity.
Solving Power Problems

During the 1920s, the Bonners Ferry Water and Light Department made multiple improvements to the Moyie River and Myrtle Creek power plants, but relying on hydroelectric power alone had its drawbacks. Generating electricity depended on river flows, which along with other problems, closed plants for extended periods, leaving the community without power.

The city's solution to its perpetual power problem can be seen through these windows. In 1931, after deciding not to buy the failed Eileen Dam and power plant, Bonners Ferry purchased a 360 horsepower (HP) Fairbanks Morse diesel generator, capable of providing as much power as the Moyie River plant. It would help carry peak loads and provide backup when needed. The city also upgraded the Moyie and Myrtle Creek plants to increase production.

By 1938, however, the “backup” diesel generator was running almost continually, and the Moyie plant was operating at full capacity. Once again, upgrades were needed. The city developed plans for a new 92-foot Moyie dam with two 1500 HP generators. Unfortunately, World War II delayed dam construction and one generator was redesigned for use with the old dam. The powerhouse and generator #1 were completed in 1941. The new dam was finally completed and the second generator added in 1950, bringing the plant's capacity to 3000 HP.

In October 1953, Bonners Ferry contracted with the Bonneville Power Administration (BPA), becoming part of the Pacific Northwest regional power system and eliminating the need for the diesel generator. Now, when the city has a surplus of electricity it is fed into the BPA system, earning the city kilowatt hour credits. When the city is using more electricity than it is producing, power is supplied by generator #1. This combination of local and BPA power provides the people of Bonners Ferry with some of the lowest-priced electricity in the country.

Conserving the “juice”

In 1929, when the Moyie plant was closed for repairs, the uninstalled Myrtle Creek plant cost the local utility H.M. Bardot a fortune. The city's electricity was supplied by the BPA, which did not have a conventional power plant. But the Moyie River had a backup plan.

"Users of electricity are asked to cooperate with the city light and power department in conserving power during this period." Bardot told the Bonners Ferry Herald in 1929. "The Moyie Creek plant is such a small unit...will be enough for all local needs if the load is distributed over a 24-hour day," he said.

"Early morning or daylight use of power for household work will equalize the consumption sufficiently to insure the continued operation of all services in Bonners Ferry."

"The Saddle sawmill at Moyie Springs...will be kept in operation at night to help supply power for the community from the Moyie River plant."

Bardot, Bonners Ferry Herald, October 18, 1929

Fairbanks Morse Generator

The 51,000-pound generator (above) was shipped to Bonners Ferry by railcar from Beloit, Wisconsin. Upon arrival, it was transformed to a concrete pad on this site, and the brick building was constructed around it. The 1925 Model 32 Style YA, 6-cylinder, generator produced 230 kilowatts of electricity—nearly equal to the Moyie plant.

The generator's only moving parts are the pistons, rods, oil pumps, fuel pumps, flywheel and governor. It has no shock or exhaust valves, as it is compressed by the piston and burnt gases expelled under the concrete floor through large pipes (right).

Backup Plan

This new diesel plant can be operated separately or synchronously with the Moyie plant and will be ready to start up at a moment's notice. It will be available in any hour that the city is asked to furnish additional power to industrial concerns.

H.M. Bardot
Bonneville Power Administration

The Northwest's Clean Power

Efficient run-of-the-river (ROR) hydroelectric plants generate electricity with no waste or carbon dioxide emissions. Plants vary in size and design, but generally have the components shown below.

ROR plants make use of the river's available flow and natural elevation drop. This system requires little or no water storage so there is no reservoir flooding, major landscape change, or displacement of wildlife.

- Water is channeled into the intake and through the penstock to the turbine and shaft unit, where the generator's copper coils rotate, producing a steady flow of electricity.
- The water passes into the tailrace and back into the river system.

The Moyie River Hydroelectric Project

Bonners Ferry is one of the few Idaho cities with a municipally-owned hydropower source. The Moyie River Hydroelectric Project includes three powerhouses, a combination penstock-pressure tunnel system, a substation, and transmission line. While the majority of the city's electricity now comes from the Bonneville Power Administration, the Moyie plant still generates a significant amount.

Above: The Moyie Project's intake race starts downstream from Moyie Falls.
Left: The Moyie River hydroelectric plants shown above Moyie Falls.

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Above: Three powerhouses were built about 1500 feet downstream from the dam in 1921, 1941, and 1982. Their combined output totals over four megawatts.