



Dry Fork Station: Up and running

By Tracie Bettenhausen

The Dry Fork Station is six miles north of Gillette, WY.

When you look at a power plant, the things that stand out to you depend on who you are and what you do. If you've never seen a power plant before, you might first notice the chimney or stack. Or maybe the color.

If you know your way around a power plant, you might see that this one uses an air-cooled condenser rather than a cooling tower. And, maybe you'll notice the color.

But just looking at a power plant, you don't actually see the thing that matters most.

The Dry Fork Station, Basin Electric's first coal-based power plant to begin operation in 25 years, generates enough electricity to power about 300,000 homes as a baseload resource – 24 hours a day, seven days a week.

The ability to generate electricity like that isn't common today. But when Basin Electric's board of directors approved the new power plant in 2004, the cooperative membership needed an additional constant stream of electricity they could count on.

The Dry Fork Station, near Gillette, WY, fueled by sub-bituminous coal from the Powder River Basin's Dry Fork Mine, cost about \$1.35 billion to build. But its benefit to the membership will be a legacy felt for decades.

From need to speed

Every two years, Basin Electric completes a load forecast to identify how much electricity the membership may need over the next ten years. "We saw a very elevated need for generation beginning in 2008. About 300 megawatts," says Ron Harper, Basin Electric CEO and general manager. The load growth was commercial and residential. "It drove us to start looking at generation development and how best to do it."

According to a story published in the March-April 2005 issue of Basin Today, by the time the Basin Electric board came to its decision to build the Dry Fork Station, staff had been studying the project for four years, evaluating options for transmission access, air permitting, water availability and fuel supply.

The location for the plant was chosen to implement the mine-mouth model of operation. “We felt that what we were going through with respect to rail transportation, we were better suited to look at a mine-mouth operation. It’s worked extremely well for us in North Dakota, and it brings a tremendous value to what it costs for a kilowatt-hour once it’s produced,” Harper says.

Also, Basin Electric is part owner of the Dry Fork Mine. “Therefore those reserves were of obvious interest to us, since we had the ability to control the operating costs of that mine. So we ultimately selected our own mine, the cooperative mine, to be the long-term coal supplier.”

Construction began Oct. 17, 2007. During the groundbreaking ceremony on Nov. 2, scrapers ran across the plant site, eventually moving more than 1.5 million cubic yards of soil. Harper said during the event, “You don’t build stuff very easily today, and you don’t think you can do it overnight. It takes tremendous planning. It takes a great deal of dedication by a great team of people.”

Now retired, Vice President of Coal-Based Resources Clyde Bush said, “There’s been a lot of sweat equity from a lot of good people.”

One of the cleanest in the country

The perspiration didn’t stop once ground was broken. The team, made up of not only Basin Electric staff, but a massive contractor force as well, continued construction and commissioning for more than three years. The plant site reached a peak construction work force of more than 1,300 construction workers, ranging from basic labor to skilled tradesmen, in September 2009. The men and women who built the plant came from more than 40 states.

The work force was building one of the cleanest coal-based power plants in the country. More than \$336 million has been invested for environmental controls, and about \$5 million will be spent every year to operate those controls.

One of those is the reflux circulating fluid bed dry scrubber, which removes sulfur dioxide emissions. It’s designed by Graf Wulff, a German company, and is the largest of its type in the nation. “This air quality control system is state of the art for plants of this type in the United States,” says Mike Massey, Dry Fork Station project manager.

“Basin Electric, from the very beginning of the organization, has always kept a strong commitment to the local area in which it operates. It’s kind of the way we do business.”

“We think we have advanced the ball past what has been done frankly anywhere else in the world with the selection of the scrubber,” Bush says. “That scrubber showed very favorable results for a mine-mouth operation. What we were interested in was securing what we called the ‘Porsche’ of a scrubber, which was a scrubber that could respond to the immediate

change in coal quality.

Since this is a mine-mouth plant, there is no stockpile or significant blending capabilities. What is mined in the middle of the night will get burned later that same day.”

Clyde Bush, Basin Electric

The amount of water used is important in a dry climate. The air-cooled

condenser is the first application of this technology in Basin Electric’s generating fleet. Plant Manager Tom Stalcup says other plants use cooling towers, which cool steam using evaporation. “The Dry Fork Station needs to use water very efficiently. We have to use deep wells for our water. We don’t have rivers or lakes, or a source of water other than deep wells.” A plant with an air-cooled condenser uses one-tenth of the water used at plants which use other methods for cooling. (Learn more about the air-cooled condenser, and other plant highlights, on pages 8-9.)

Other environmental controls at the plant include selective catalytic reduction, over-fire air and low-NOx burners to control emissions of oxides of nitrogen, activated carbon injection to remove mercury emissions, and a baghouse to remove fly ash.

Small thumbprint

The permitting process was rigorous, according to Bush. “In regards to the air permit, we modeled the emissions projected from the plant, and looked at potential impact in all directions,” Bush says. “The Wyoming Department of Environmental Quality did extensive review of our application and modeling and approved the permit for the plant in October 2007.”

Project planners also worked to alleviate the impact on the local community. Housing, health care and education in the area were studied. “Securing adequate, affordable housing for the influx of the construction work force was the primary concern,” Bush says.

Continued ▶



The power plant was built near the Dry Fork Mine to implement the mine-mouth model of operation. The coal is delivered from the mine to the power plant via a conveyor less than one mile in length.

Staff worked with a neighboring coal mine to refurbish a retired mobile home park for workers bringing their personal RVs to Gillette. The park provided 175 RV spaces. An apartment developer agreed to support the project's worker housing needs by offering a number of apartments on a take-or-pay basis, which helped facilitate better financing. Also, staff negotiated with regional motels to put into place long-term rental agreements. "Basin Electric, from the very beginning of the organization, has always kept a strong commitment to the local area in which it operates. It's kind of the way we do business," Bush says.

Today, as the plant becomes operational, the impact continues, but it's all positive. "We have 83 full-time employees that use all the services in Gillette, in Campbell County, and the region. With 83 employees, they buy groceries, they shop retail, they have kids that play sports, they're in the local school system," Stalcup says. "Dry Fork Station provides a steady stream for the economy."

Wyoming Municipal Power Agency has a 7.1-percent ownership share of the plant. Larry LaMaack, executive

director of WMPA, says the agency's share of the output will be combined with other projects, like Laramie River Station in Wheatland, WY, to meet the needs of eight member cities and towns. "It truly is a source of pride for us. It's an opportunity to participate in a project where we're using Wyoming resources and developing them for the people of the state of Wyoming."

*Larry LaMaack,
Wyoming Municipal Power Agency*

Whether you're getting your first look at Dry Fork Station, or you've been following its progress for years, one thing rings true. It's a stable energy resource for Basin Electric's membership. It was built under strong cooperative ideals and will operate with the highest standards and best technology available.

And, if you do happen to notice the color, you'll see Dry Fork Station is a lovely shade of blue, Basin blue.

Editor's note: Basin blue was the vision of Eleanor Grahl, wife of the late Jim Grahl, Basin Electric's first general manager, so the cooperative's coal-based plants would blend with the sky.

For your **vision**, your **passion** and your **dedication**,
thank you to everyone

who helped make Dry Fork Station
a **reality**.

For your **integrity**, your **diligence** and your **cooperation**, thank you to
the community of **Gillette, Campbell County** and the state of **Wyoming**.

The story of the Dry Fork Station is one of perseverance. We built a coal-based generation facility, meeting the highest standards in the industry, and we did it safely. Everyone involved in this project went home in the same condition they came to work: safe. We're so proud of that.

Thank you again to each and every one of you.

We couldn't have done it without you.



Cliff G. Gjellstad
Basin Electric president



Ron Harper
CEO and general manager