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TOP STORY

Power play: Lebanon fourth-graders tour hydroelectric plant

JENNIFER MOODY Albany Democrat-Herald Jun 24, 2018



Hamilton Creek fourth-grader Emma Davis, 11, tries the skateboard that crews used to slide into the penstock and co-joints during a tour of the the Falls Creek Hydroelectric Project east of Cascadia.

Mark Ylen, Mid-Valley Sunday



YUKWAH CAMPGROUND — Roughly 25 miles east of Sweet Home is the most powerful hydroelectric project you've never heard of.

Hikers don't know it's there. The slim corridor cut 34 years ago to accommodate the underground pipe known as the penstock is all but invisible in the greenery of the Willamette National Forest.

Campers don't know it's there. The cheerful downhill tumble of the tailrace, where the water diverted from Falls Creek rejoins the Santiam River, looks just like any other creek. Most visitors never notice the nondescript green building just above, the hum of its power masked by the rushing water.

About the only people who know of the existence of the Falls Creek Hydroelectric Project, besides the four full-timers and 15 to 20 part-time and business partners who work there, are fourth-graders from Hamilton Creek School east of Lebanon, who tour the facility each year.

The students have been coming for at least the past 25 years, said Suzanne Wallace, the Hamilton Creek teacher and reading specialist who coordinates the trip each spring. They come to learn about how electricity works, how natural resources can be used to create it, and a little about the area in which they live.

Gary Marcus, who developed the Falls Creek Project in 1984 and remains the owner of it, takes on the lion's share of leading the tours.

"I want them to be interested in science and the world around them," he said. "I want them to understand that it is other people who work to make electricity that helps their lives be better. I want them to grow up and find creative ways to use their talents to lead satisfying lives and help others as well."

That's lot riding on one field trip, but you never know the type of fire one spark might light, Marcus added. Plus, it's a great way to get outside for a little while.

"It's the most important day of the year for me, and for all of us who work at the plant," he said. "It brings home emotionally why we are doing what we do. We are all proud of the Falls Creek plant, and by explaining it to the kids we explain it to ourselves as well."

Visiting students are separated into three groups for the field trip. They visit the inside and outside of the power plant and explore part of the Santiam Wagon Trail, learning a little about the pioneers and Native Americans that once lived and traveled in the area.

At the plant, they take turns learning about the facility from Marcus and doing small experiments to learn how electricity works.

They see the skateboard crews used to slide into the penstock and paint the joints of the pipe. They get to take a turn at twiddling the dials inside the plant to push power production up and down.

At one station, Marcus invites visitors to sling signs around their necks bearing pictures of lightbulbs, refrigerators and computers. Then he has them line up, starting with the ones that use the most power. Spoiler: the electric heater always wins, followed closely by the water heater and then the fridge.

"If you wanted to save electricity, what do you do?" he'll ask the tour-goers. "You could make your house tighter so the heat wouldn't escape."

At another station, young visitors race to see who can get to a certain point and back while carrying a load of water: some in bottles, some in jugs.

It's a lot easier to make the run holding a bottle rather than a jug, Marcus points out, so it would be helpful to be able to "transform" jugs into bottles. And that's exactly the job of a transformer: to take electricity and repackage it from big units to smaller.

It was Marcus' idea to create the hydro power plant, back when the nation was suffering through the fuel shortages of the 1970s energy crisis.

It took Marcus six months to find a site and more than two years more to complete the vision: pulling water from the drainage area for Falls Creek down a 2,400-foot drop down to the bank of the South Santiam River. It's one of the highest drops in the continental United States, and it gets the job done: By the time the diverted water hits the plant, it's providing 1,000 pounds of pressure, enough to power roughly 1,500 homes.

It doesn't take a lot of water to generate the necessary force, Marcus points out, which is a good thing, especially this particular spring.

During last year's tour, the spring had been so rainy and so much snowmelt was available that the plant was operating at its peak capacity, at about 4,900 kW.

When students visited this year, however, the plant was at its lowest capacity, just 200 kW. A few days later, the water dropped so low that plant operators had to shut it down for the season, more than a month earlier than usual.

"We have never seen water so low," Marcus said, shaking his head at the tiny pond that fills the tailrace; only about the size of two bathtubs. "We are running on fumes."

It's enough to keep the power going, however, Marcus said, and the impact on the environment is basically zero because it doesn't affect a stream with fish in it.

Here's how it works: The water for the plant is diverted from Falls Creek, but it's only a portion that would normally join up with the South Santiam River anyway, and it comes right back about a mile away. "This actually benefits the South Santiam River for that one-mile stretch by putting a little more water into it at a colder temperature," Marcus explained.

The big issue with most hydro plants is fish, but not at Falls Creek, because studies have shown it has very few, Marcus went on. That's due to a number of factors: Heavy tree cover, which keeps off most sunlight; very few minerals, which keeps fly larvae down; and the namesake of Falls Creek itself, a series of drops and shallow pools where only a few fish are able to live.

"The only place fish can live is in those shallow pools, so we release enough water year-round to keep those pools filled so the few fish that are in Falls Creek have virtually the same habitat," Marcus said.

The Falls Creek Hydroelectric Project received the Oregon Governor's Energy Award in 1986. In 2002, it became the first hydropower facility in Oregon, and just the fourth in the nation, to earn Low Impact Hydropower certification.

Marcus engineered the plant to last at least 100 years, a fact that made his visiting fourth-graders' eyes bulge as they thought about the implications. "I'll be dead by then," one cracked.

Marcus allowed as how he probably would be as well.

However, he added, "There will still be people alive, and they'll still need electricity. And they can get it from this plant, and it will still be green."



Gallery: Hamilton Creek tours Falls Creek Hydroelectric Plant
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THE FALLS CREEK VISION

Gary Marcus had the idea to create the Falls Creek Hydroelectric Project back when the nation was suffering through the fuel shortages of the 1970s energy crisis.

Marcus had worked as a legislative assistant to Oregon State Sen. George Wingard in the 1977 session and stayed involved in environmental conservation and businesses ever since.

"During that session we passed bills that became the basis of building codes to insulate homes and businesses in Oregon," he said. "As a result, Oregon has probably conserved enough energy over the past 40 years to displace a 1,000 megawatt power plant."

In 1981, Marcus founded a company, Frontier Technology, Inc., whose mission was to conserve resources through infrastructure projects. That same year, a friend asked him to look at the Lcomb Irrigation District's proposed small-scale hydroelectric project, then not yet built.

"As part of that review, I hired Jim Fuller, an engineer from CH2M Hill in Corvallis, to review the project, during which time he explained to me the basic physics of hydroelectric power production," Marcus said. "Based on that information in 1982, I wrote my own computer program in BASIC because there were no canned computer programs to buy at that time. That program allowed me to take information from the USGS water gauges all over Oregon and model power plants from any waterway."

Marcus searched throughout western Oregon using maps to find hydro sites, looking to site his own power plant. After six months of looking, he started to become discouraged.

"When I came across Falls Creek in the field after my map work, I couldn't believe it," he said. "It was Memorial Day in 1982 and I stood at the small bridge on the Forest Service road where Falls Creek was about to enter the South Santiam River. I knew from the map I had with me how high the head could be at Falls Creek."

Marcus knew a site like Falls Creek would have almost no environmental impact and was impressed by the amount of water available, more than any other he'd seen.

"It's hard to put this into words, but I could actually see in my mind how this concept could become a reality," he said. "That's when the hard work began."