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### ABOUT WATER TRAIN

Water Train specializes in the bulk delivery of water by railroad tank cars to regions where existing water supplies are low.

# Water shortages in U.S. West likelier than previously thought

Models suggest looming shortages in the reservoirs where Colorado River water is stored could jeopardize the water that more than 40 million people rely on.

A bathtub ring of light minerals shows the high water mark of the reservoir which has shrunk to its lowest point on the Colorado River, as seen from the Hoover Dam, Ariz., on March 26, 2019. Richard Vogel / AP file

Sept. 16, 2020, 8:00 AM CDT / Updated Sept. 16, 2020, 8:01 AM CDT

By Associated Press

CARSON CITY, Nev. — There's a chance water levels in the two largest man-made reservoirs in the United States could dip to critically low levels by 2025, jeopardizing the steady flow of Colorado River water that more than 40 million people rely on in the American West.

After a relatively dry summer, the U.S. Bureau of Reclamation released models on Tuesday suggesting looming shortages in Lake Powell and Lake Mead — the reservoirs where Colorado River water is stored — are more likely than previously projected.

Compared with an average year, only 55 percent of Colorado River water is flowing from the Rocky Mountains down to Lake Powell on the Utah-Arizona line. Due to the below-average runoff, government scientists say the reservoirs are 12 percent more likely to fall to critically low levels by 2025 than they projected in the spring.

"This is a pretty significant increase over what was projected in April due to the declining runoff this year," hydrologist Carly Jerla said.

The forecast could complicate already-fraught negotiations between Arizona, California, Colorado, New Mexico, Nevada, Utah, Wyoming and Mexico over future shares of the river that supplies their cities and farms. Those talks will draw up new agreements by 2026 over use of the river that's under siege from climate change and prolonged drought.

Some of urban and agricultural water users have been forced to conserve water to secure the river long term, but it remains overtapped. And as cities like Phoenix and Las Vegas keep growing, the region is only getting thirstier.

"We know that warmer temperatures have contributed to the drought of the last 21 years, and we know that they have exacerbated it," Bureau of Reclamation Commissioner Brenda Burman said.

Unlike the 24-month projections that the agency uses to allocate water to the seven states and Mexico, the models released Tuesday simulate various weather and usage patterns to help water users prepare for different scenarios.

Scientists use what's called the Colorado River Simulation System to project future levels of the two reservoirs. They employed "stress testing" techniques based on river flows since 1988 to determine potential shortages if drought conditions persist.

Arizona, Nevada and Mexico agreed to cuts for the first time under a drought contingency plan signed last year. The water level in Lake Mead sits at 1,083 feet. When projections drop below 1,075 feet (328 meters), Nevada and Arizona will face deeper cuts mandated by the plan.

Stress test models suggest a 32 percent chance that Lake Mead will fall below 1,075 feet by 2022 and a 77 percent chance by 2025. The model's median estimates indicate Lake Mead will drop by 35 feet by 2026.

The water level in Lake Powell is at 3,598 feet, and estimates suggest it could drop by 50 feet by 2026.

Burman said the models provide valuable information to cities and farms preparing for the future as drought persists and average temperatures trend upward. She said drought contingency plans are an effective mechanism to address the projected shortages — for now.

"I think what the projections are showing us is we have greater uncertainty than we did last year," she said.

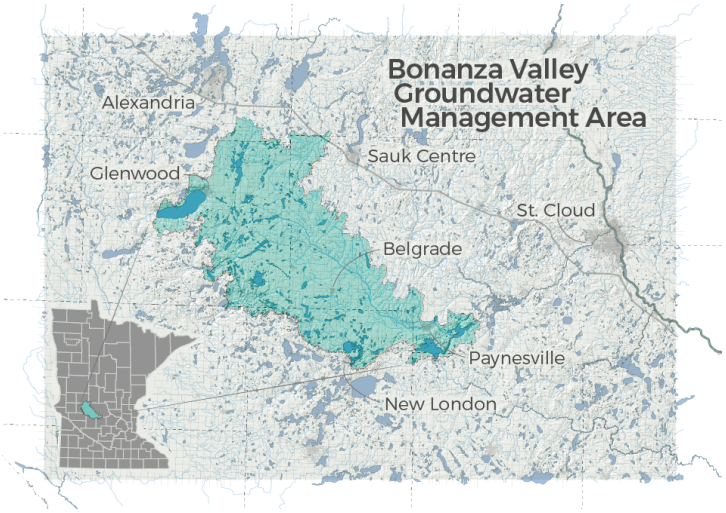
# In Minnesota's Bonanza Valley, DNR gauges water use as farmers watch

**Kirsti Marohn**
Belgrade, Minn.
September 4, 2018 4:00 p.m.

**Listen** *In Minnesota's Bonanza Valley, DNR gauges water use as farmers watch*

DNR hydrologist Erynn Jenzen stands at the edge of the North Fork Crow River near Belgrade, where the DNR is measuring stream flows as part of the Bonanza Valley groundwater management area project.
Kirsti Marohn | MPR News

Far below the soil in central Minnesota's Bonanza Valley lies the groundwater that has helped make this sandy plain live up to its name, with endless rows of corn and scattered dairy farms.




Bonanza Valley Groundwater Management Area

William Lager | MPR News

The region, which stretches northwest from Paynesville in central Minnesota almost to Alexandria, is one of three areas in Minnesota where growing demand for water is a concern — and where the state's Department of Natural Resources is taking steps to better manage its use.

Researchers have been collecting extensive data in the Bonanza Valley to track the area's groundwater supply, so they can make sure there's plenty available for future generations.

"It's because these resources are so important for families, for communities, for livestock producers, for drinking that DNR wants to continue to make water available for those purposes," said Mark Hauck, the DNR's manager on the project. "And the way we do that is to make sure it's sustainable."

Mark Hauck, project manager with the Minnesota Department of Natural Resources, stands near the North Fork of the Crow River near Belgrade.

Kirsti Marohn | MPR News

Throughout rural Minnesota, many people depend on groundwater: Cities and homeowners with private wells pump it for drinking. Businesses and industries use it for manufacturing and golf courses use it to keep the grass green.

In the Bonanza Valley, the biggest users of groundwater are farmers irrigating their fields. Over the past 25 years, groundwater use here has risen about five times faster than the state average.

The DNR has been studying the area in an effort to better understand whether the level of use is depleting the underground aquifer faster than it

can be replenished. Staff hydrologists are also collecting data on whether groundwater use is affecting area rivers, streams and wetlands.

"We need to have a better understanding of the hydrologic cycle," said Greg Kruse, water monitoring and surveying supervisor for the DNR. "When it rains, what happens to that water when it hits the ground? It runs off into the streams, runs into the wetlands, it soaks into the soils and it replenishes the aquifers."

To gather that information in the Bonanza Valley, the DNR has 72 observation wells — small cylinders that extend 40 feet or more underground. The wells have electronic loggers that send hourly updates of the water level.

Hydrologists also can hand-check the levels by dropping down the tube an electronic tape measure with a sensor that beeps when it hits the water's surface.

DNR hydrologist Erynn Jenzen uses an electronic tape measure to check the water level in one of 72 monitoring wells in the Bonanza Valley.

Kirsti Marohn | MPR News

To gauge the impact on rivers and streams, the DNR installed solar-powered stainless steel boxes at about 15 locations in the region. The boxes contain equipment to monitor the volume of water flowing, temperature, precipitation and other information. Hydrologists visit the sites every four to six weeks, year round, to check the measurements.

The DNR has been collecting this data for about nine years. Officials say it will help them figure out just how much groundwater can be used without causing long-term harm.

Farmers in the region, who depend on irrigation for their livelihood, are watching the project closely. Anyone who pumps large volumes of groundwater — more than 10,000 gallons a day — needs a permit from the DNR.

DNR officials say they need at least 10 years of data before they can start to draw conclusions. Depending on what the data show, it's possible the agency could eventually decide to issue fewer permits or limit how much water permit holders can use.

DNR hydrologists Erynn Jenzen, left, and Brenda Stauffer explain how they check the levels in one of 72 monitoring wells in the Bonanza Valley.

Kirsti Marohn | MPR News

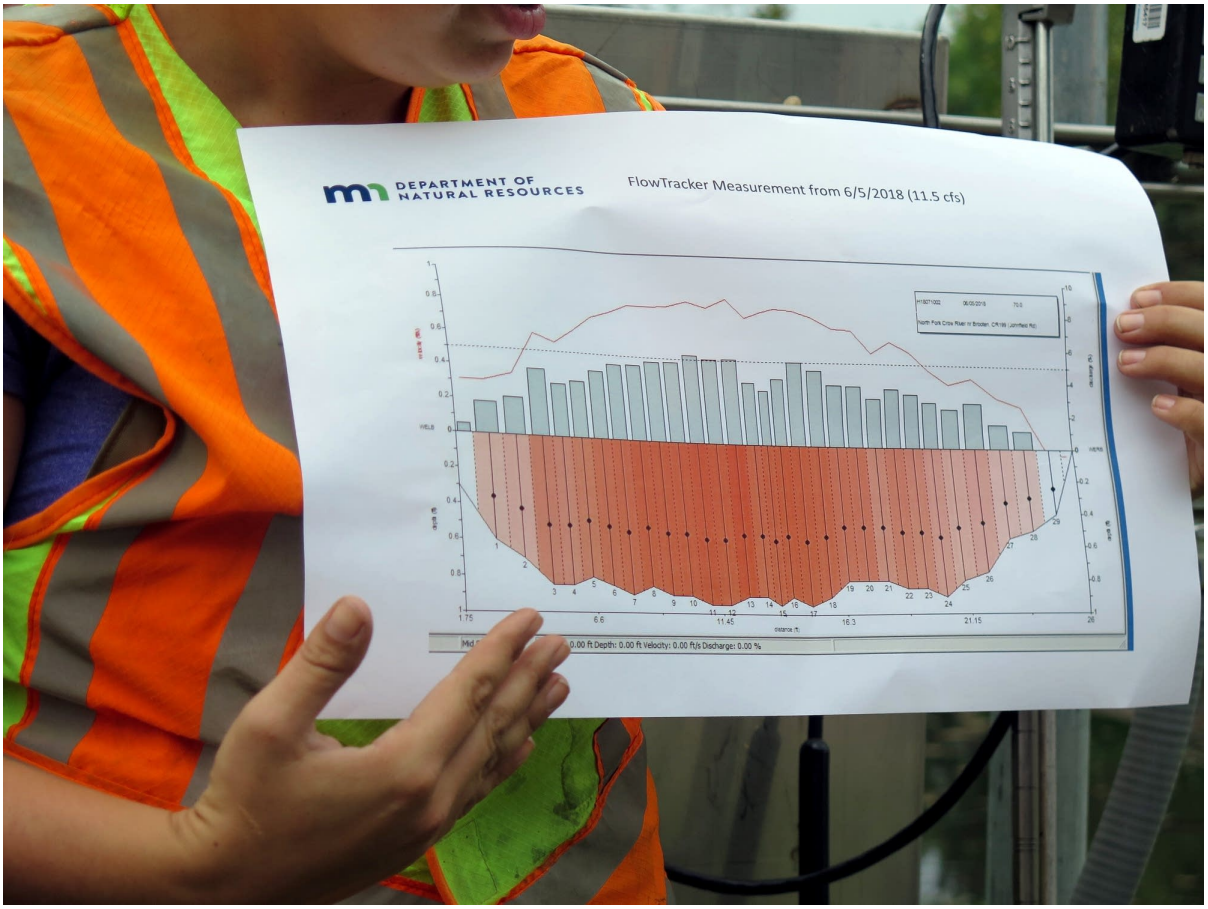
That would affect farmers like Grant Anderson, who farms between Belgrade and Brooten, Minn., with his father and two brothers. They raise corn, soybeans, sugar beets and kidney beans, as well as hogs and cattle.

"We're just as concerned with the sustainability of the aquifer and the groundwater as anybody is, because it's our lifeblood," Anderson said. "It's what is able to support and sustain our farm."

Anderson said farmers are already taking steps to use less water — from planting cover crops that help prevent erosion and conserve moisture to using technology to adjust their irrigation systems based on the weather.

Anderson said many of his irrigation pivots have a cell phone attached to them, "so if we get rain in the middle of the night I can turn them off instantly from my pillow."

The DNR's effort to better understand what's happening with groundwater in critical regions of the state also has the support of environmental groups. The other management areas are in the northern and eastern sections of the Twin Cities metro area and the Straight River near Park Rapids.




DNR hydrologist Erynn Jenzen points to a graph showing the water levels of the North Fork Crow River.

Kirsti Marohn | MPR News

"In the metro area and even in southeast Minnesota, we have a pretty good understanding of aquifers, how they're connected and how pumping affects them," said Carrie Jennings, research and policy director for the nonprofit Freshwater Society. "Out there, [in central Minnesota], we just don't know."

Minnesota is already seeing consequences of overtapping groundwater, Jennings said. The level of White Bear Lake in the northeast Twin Cities metro area has dropped due to too much groundwater pumping.

That's the kind of scenario DNR officials hope to avoid in the Bonanza Valley, where groundwater is critical to the local economy, agriculture and citizens, Hauck said.

"So it's also vital for us to assure there are sustainable supplies of this water," he said.

# Deep aquifers, deep questions

**Mark Steil**
**Mankato, Minn.**
**July 29, 2008 8:36 p.m.**

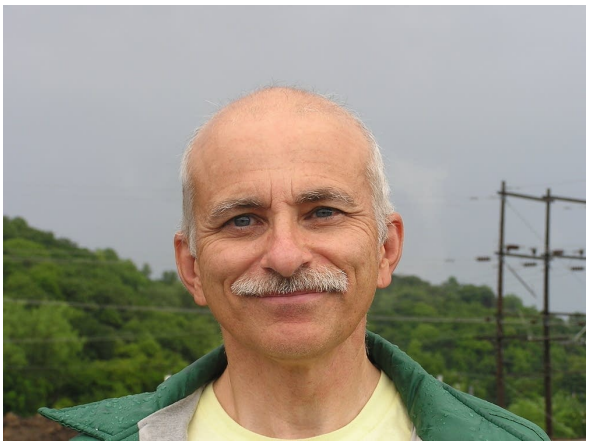

*An employee of a well drilling company works on sealing a Mankato city well near the Minnesota River. Monitoring equipment will be sealed inside the casing to help monitor the health of the Mt. Simon aquifer.*

MPR Photo/Mark Steil

One of the deepest and oldest aquifers is the state lies under the farmland of south central Minnesota and extends into the Twin Cities metropolitan area.

Hundreds of thousands of people rely on the Mt. Simon aquifer for water. It's basically saturated sandstone, anywhere from 600 to more than a 1,000 feet underground. Tests shows some of the aquifer's water is 30,000 years old, but there are isolated problems of supply in the formation. Research is underway to determine the health of the Mt. Simon aquifer.

In Mankato, near the Minnesota River, a worker is shoveling sand and concrete into an old city well to seal it up. Before it's completely closed, the defunct well is also being loaded with monitoring equipment. The devices at the bottom of the old well casing will keep track of water levels in the Mt. Simon aquifer long after the well is sealed.



*Leo Getsfried works for the Minnesota Department of Natural Resources Waters Division in the Mankato area.*

MPR Photo/Mark Steil

Standing nearby, Leo Getsfried with the Minnesota Department of Natural Resources, said the Mt. Simon aquifer is the most productive underground water source the region has. He said to insure its long term health, the amount of groundwater reaching the aquifer must match what's being drawn out.

"We know that there's approximately 3.2 billion gallons per year that's being pumped out of the aquifer in this Mankato vicinity," Getsfried said.

"What we don't know is whether the recharge, or the infiltration into this aquifer from up above, is occuring at a rate comparable to that 3.2 billion."

It's common to think of an aquifer as an underground lake, but that's inaccurate. Think instead of sand soaked with water. The water doesn't flow, but rather trickles slowly down between the grains of sand. Pump too much water out of an aquifer and it may take years for a similar quantity of water to return.

In the Mount Simon aquifer there are so-called 'cones of depression' where excessive pumping has left dry spots. Getsfried said Mankato-area city and industrial users -- which depend on the Mt. Simon aquifer -- are paying for the monitoring site. Eventually, they hope to have three monitoring locations.

Getsfried said if the monitors show water is being pumped too fast, some drastic steps might be taken.

"It's a very complicated system."

"If it looks like it's continuing on a pretty steady, longer-term basis that will obligate us to probably look at some means of reducing that level of withdrawal from the aquifer," Getsfried said.

The Mankato-area monitoring is just one part of an effort to learn more about the Mt. Simon aquifer. Last spring the state legislature approved more than a $1.5 million for another Mt. Simon monitoring effort to start later this summer. The Legislative-Citizen Commission on Minnesota Resources, the LCCMR, will oversee the three year project.

Geologist Jeff Broberg serves on the commission. He said monitoring wells will go in at 21 locations. He said besides measuring water levels, the study

will also test the age of the water. Broberg said there's rarely a uniform age for the moisture held in an aquifer.

"It's a very complicated system because of the landscape and the flow of the water and the ability of the water to percolate down through the various types of rocks with their various porosities," he said.

Broberg said neighboring pockets of water in an aquifer may differ in how old they are by thousands of years. He said age is an indicator of supply because it demonstrate how fast water is reaching the aquifer.

"Is it sitting there for tens of thousands of years, is it sitting there for 50 years, or is it in there for a day or two?" Broberg said.

Water planners in the Twin Cities are also interested in what the monitoring efforts turn up.

After a drought 20 years ago the state legislature became so concerned about the Mt. Simon aquifer that they banned industrial pumping from the formation in the seven-county metro area.

Household use of the aquifer there is allowed only if it's the sole practical option. Metropolitan Council water supply planning manager Chris Elvrum says the demands on the aquifer are likely to grow, especially in the west and north metro.

"In parts of those areas the choices they have are the Mt. Simon or one or two other aquifers that are often less productive," Elvrum said. "So, those communities as they develop would probably be most interested in using Mt. Simon water."

Before that happens it's likely there will be several years of study. Part one are the monitoring wells. They'll be out there every day, digging deep, scooping up important information, filling in the deep gaps of knowledge about the Mt. Simon aquifer.


*An employee of a well drilling company works on sealing a Mankato city well near the Minnesota River. Monitoring equipment will be sealed inside the casing to help monitor the health of the Mt. Simon aquifer.*
**MPR Photo/Mark Steil**

# Statement from DNR Commissioner Sarah Strommen about proposed out-of-state water transfer

November 1, 2019

The DNR is aware of a proposal by Empire Builder Investments to supply groundwater from Minnesota to the western United States by railcar. The company has not yet submitted a water appropriation permit application, but has requested a preliminary well assessment. A preliminary well assessment, required under state law, is an early stage review designed to identify potential issues before a proposer invests in equipment or well drilling.

Under Minnesota law, the DNR regulates the use of both groundwater and surface water. The agency must manage public water resources for the benefit of the State of Minnesota, including future generations. We must ensure that water appropriations are reasonable, practical, and adequately protect public safety and promote the public welfare.

Based on our initial review of the Empire Builder request, we are notifying the company today that we see virtually no scenario where the DNR would grant a water appropriation permit for the project, as it does not appear it could meet applicable statutory requirements, including significant restrictions on use of the Mt. Simon aquifer.

MINNEAPOLIS/ST. PAUL BUSINESS JOURNAL

# Railroad wants to send Minnesota's water to Southwest U.S.

By Mark Reilly – Managing Editor, Minneapolis / St. Paul Business Journal
Nov 1, 2019, 6:59am CDT

A Twin Cities-based railroad is making plans to drill new wells in Dakota County that could produce 500 million gallons of water annually — and then ship it all out of state to water the dry southwestern U.S.

The Star Tribune reports on filings by Empire Building Investments, an affiliate of Lakeville-based Progressive Rail Inc., which is asking the Minnesota Department of Natural Resources for approval to drill the wells. The wells would produce as much as 6,000 gallons of water per minute — on an annual basis, that's twice the amount of water used by area farmers and residents with current wells.

According to local officials, Progressive would then partner with an Oregon company called Water Train to ship the water to agricultural buyers in Colorado.

There's no comment from Water Train and Progressive Rail, but county officials and environmental advocates had plenty to say. Critics argued that the wells would strain existing aquifers and disrupt business planning here. Dakota County Commissioner Mike Slavik told the paper, “There’s going to be a point where our water’s more valuable than oil.”

StarTribune

# Southwestern states, keep your hands off Dakota County water

The County Board and the DNR said "no" to the request, but more applications are coming.

By Joe Atkins and Mike Slavik | DECEMBER 13, 2019 — 11:47AM

ISTOCK

Exporting water from Dakota County is a bad idea, the writers argue.

There are few resources more critical to the well-being of Dakota County and its residents both now and in the future than the county's drinking water supply.

Yet it was this very water supply that was threatened by a recent request to pump and ship hundreds of millions of gallons of groundwater from Dakota County to southwestern states like Arizona.

Empire Builder Investments, the real estate arm of Progressive Rail, sought approval in October from the Minnesota Department of Natural Resources to install two pumps on 6 acres in southern Dakota County. Under the scheme, the pumps would have tapped our deepest aquifer, extracted up to 500 million gallons of groundwater annually, and then shipped it by rail using Water Train, an Oregon-based company currently providing water to agencies in Colorado, Utah and Arizona.

This request to export groundwater is unprecedented in Minnesota history.

The Dakota County Board of Commissioners voted unanimously to oppose this exportation of water for several reasons, not the least of which is that Dakota County may face water issues of our own over the next two decades.

We appreciate that the request to export our groundwater was met with a similarly icy reception at the DNR, which makes the final decision. Thank you to DNR Commissioner Sarah Strommen in particular, for issuing a statement stating the DNR saw "virtually no scenario" under which the agency would grant a water appropriation permit for this sort of project.

This being said, it is our understanding that another, modified application is in the works that will again seek to export groundwater from Dakota County to southwestern states.

With about 90% of Dakota County residents relying on groundwater as their primary drinking water source, whether from municipal or private wells, this has us deeply concerned.

Dakota County's population is expected to grow by more than 12% to nearly 500,000 residents by 2030, with greater demand placed on a limited resource, particularly in the most populated areas of the county. At heightened risk of water depletion, according to our groundwater studies, are cities such as Inver Grove Heights, Eagan and Apple Valley, as well as rural parts of Dakota County — areas and residents we represent on the County Board.

Thus, our holiday wish list this year includes three requests.

First, to the DNR, please continue to oppose these shortsighted schemes to export groundwater.

Next, to legislators, please update state laws to provide more local control over groundwater-tapping schemes like this, in light of the potentially dire consequences for local communities and their residents.

Finally, to Empire Builder Investments, Water Train and Arizona, you can have all the snow from our driveways you want, just keep your hands off our groundwater.

*Joe Atkins, of Inver Grove Heights, and Mike Slavik, of Hastings, serve on the Dakota County Board of Commissioners.*