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WATER BILL: $3 BILLION STUDY CALLS FOR AN INITIAL $1 BILLION TO BE SPENT BY 2010 ON PIPELINES, RESERVOIRS AND TREATMENT PLANTS

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ROCKY MOUNTAIN NEWS

A plan by 11 south metro water districts to avoid looming water woes comes with a $3 billion price tag, according to a secret draft report obtained Tuesday by the Rocky Mountain News.

But that's a relative bargain, considering that the alternative - simply drilling more wells - would cost $4 billion by 2050, the report said.

In addition to cost, the plan faces political, environmental, legal and technical hurdles, according to lawyers hired by the districts to study the plan and experts interviewed by the News.

The report, dated August 2003, was written for a subcommittee of the Douglas County Water Resource Authority that has been studying the water needs of Douglas County and parts of Arapahoe County.

Authority members and consultants had previously revealed only that the cost would exceed $1 billion but would not provide specifics. The much-delayed report is scheduled for release in late

December or early January. Douglas County, the fastest growing county in the nation in the 1990s, has been rapidly draining the underground sources that have supplied most of its water. These aquifers formed deep in the earth millions of years ago, and once they are used up, they are essentially gone.

Wells in western areas of the county are already going dry and losing pressure, and some experts say more populated portions of Douglas and Arapahoe counties could face serious water problems in 10 to 20 years - sooner in some places.

The well declines are troubling, and dramatic increases in population promise to make the problem even worse, the report said.

"The South Metro Area is already reaching the point where continued development of available water supplies to meet increased demands is difficult. At the same time, the population of the area is expected to triple over the next 50 years," the report said.

The report notes that there are serious scientific disputes over how quickly water levels will drop in the future. Some scientific models theorized that well declines would basically stabilize when water levels reached the top of the aquifers, the point where the water no longer is pushed toward the surface by natural pressure.

But the report says the complicated geology of the aquifers, with their many layers of clay, makes precise predictions difficult. Some experts have told the News that they expect water levels to continue their rapid drop or slow down by only 50 percent when they reach the top of the aquifer.

The draft report analyzes five plans to secure adequate water until 2050 - three involve drilling more wells and two involve both drilling wells and sharing Denver water.

The study recommends a plan that would allow the south metro area to borrow water from Denver in winter months, store some of it in reservoirs and inject some of it underground to recharge the aquifers. Douglas County, in turn, would send water pumped from its wells to Denver in dry years.

Denver Water, a pivotal player in the plan, is not sure it can embrace a deal that allows the south metro area to borrow water because Denver isn't sure the water would be repaid, said Denver Water manager Chips Barry.

Nonetheless, Pat Mulhern, the study director, is optimistic an agreement can be worked out. And he said the price tag isn't unreasonable given the 50-year time frame.

"If you take any big entity, like Denver Water, and look at their costs over 50 years, the dollars are going to be enormous," Mulhern said Tuesday.

To pay for any project, tap fees on new homes would rise, and fees for water service at existing homes would increase, as well. The report estimates, for instance, that tap fees on new homes would need to be $14,800 per residence to pay for the water-sharing plan, up from $2,500 to $7,000 routinely charged in Douglas County today. Just drilling more municipal wells would require tap fees of more than $20,000 per home, the draft report said.

In the end, many believe that only new surface storage (read:

reservoirs) can give the south metro area the answer to its dwindling water supplies.

But if reservoirs are the answer, they bring their own bucket of problems. The last major Front Range surface storage plan - the proposed 1.1 million acre-foot Two Forks project near Deckers - was spiked due to environmental concerns more than a decade ago.

By focusing on the water-sharing plan, the south metro study hoped to neatly sidestep the environmental bullet. As outlined in the report, the favored plan envisions receiving an average of 26,000 acre-feet of water via Denver's system when it has more than it can use because of heavy rain and snow runoff.

“We were looking for a strategy that would be the least environmentally damaging,” said Mulhern.

“Any place you go for additional surface water is going to create problems. To the extent that we can minimize the impact by only taking water in the wet years is a real plus.”

Not so easy

The plan might sound simple, but it isn't.

The first hurdle the water group must get past is sticker shock.

Although the $3 billion would be financed over 50 years, about $1 billion would need to be spent by 2010 to build pipelines, reservoirs and treatment plants, the report said.

But the capital costs of drilling more wells - 1,364 new wells by

2050 - would be $2.3 billion in 2003 dollars. Operation and maintenance costs would bring the total to $4 billion, the report said.

One of the optimists is John Hendrick, head of the Centennial Water and Sanitation District that supplies water to Highlands Ranch, the only community in Douglas County that has bought enough surface water to reduce its reliance on groundwater to as little as 30 percent in wet years.

The price might be high, Hendrick says, but not insurmountable.

“It's no more a problem than T-REX,” Hendrick said, referring to the $1.72 billion project to reshape the southeast metro corridor with new highway lanes and light rail along Interstates 25 and 225. “T-REX has problems. But it's being built. You do it.”

The study, which began in 2000, was due to come out in the spring, then the summer, then this fall.

The problem has been getting all the water districts to sign off. For some, it's easier and less expensive in the short term to keep drilling wells.

One key district - Parker - ditched the project entirely. Officials there said the study seemed headed for conclusions that were far too optimistic.

Besides cost, the water-sharing plan raises other questions.

First, is there really water to share?

Douglas County Commissioner Jim Sullivan, head of the group

that authorized the study, said most of the wet-year water would come from the South Platte River.

But a legal issue could cloud Denver's ability to send South Platte water to Douglas County: Denver's water rights on the South Platte River require that once the water is used, much of it is supposed to return via treatment plants back to the South Platte for downstream use by farmers and small towns.

But if the water is put in an aquifer, it is taken out of the loop, or, in water parlance, it's "used to extinction."

To use South Platte water to extinction, therefore, Denver or Douglas County would need new water rights. And that's dicey.

"Existing South Platte water rights couldn't be used to recharge those wells," said Denver Water official David Little.

He said either Denver or Douglas County water districts would have to go to court to obtain new junior South Platte rights that would allow water to go to Douglas County. The extra water would come during abundant spring runoffs - a time when the South Platte becomes a "free river," meaning enough water is flowing to satisfy all water rights with some to spare.

Consulting lawyers for the South Metro Water Supply Board - composed of those Douglas County districts working on the plan - warned of this problem in January.

"Denver Water's South Platte rights are not decreed for conjunctive use (injecting water into the aquifer) in the south metro area," the lawyers said in a memo. "Therefore, a water court change case is necessary to use these rights for the South

Metro Project.”

Western Slope water

Could water that Denver receives from the Western Slope be used in the water-sharing plan?

On the surface, the answer is yes.

Denver's water in Dillon Reservoir can be used to extinction under the law.

But that would involve Western Slope-Front Range politics. Denver Water has been trying to navigate a policy of peaceful coexistence with the Western Slope for years.

Barry, Denver Water's manager, says he would rather not use Dillon water to supply Douglas County, though pressures might force him to do so.

However, this is his attitude:

“If the choice is between p---ing off Douglas County or p---ing off the Western Slope, I'll p--- off Douglas County.”

And what of Denver's residents themselves?

The south metro lawyers sound a further alarm in the January memo. Denverites will not be pleased to help rocketing growth in Douglas County, the memo says.

The Denver Water Board, said the Douglas County water lawyers, faces “public perceptions regarding fostering Douglas County

growth at the expense of Denver residents, imposing potable reuse on Denver customers while South Metro receives mountain water, and the lack of direct benefits in the proposed project.”

The same issues surround Aurora, another possible source of water-sharing. And its utilities director, Peter Binney, is much less politically correct than Barry.

Aurora will turn a colder shoulder to Douglas County.

“We don't have a responsibility to solve their problems,” said Binney. “Don't play the moral card with me. Why should the citizens of Aurora subsidize growth in Douglas County?”

Finally, come the technical issues. Hendrick is certain the water-sharing plan will work.

Centennial has had a relatively small program that sends surface water into its wells for several years. Hendrick says it provides proof that it is possible.

There are skeptics. Binney notes that the sandstone aquifers in the Denver Basin make it distinct from places where aquifers have been recharged.

“The concept of recharge is well-established in limestone aquifers in places like Texas and Florida,” said Binney. “But I think there's a question about these very deep sandstone aquifers - just how conducive are they to aquifer storage and recovery? It's untested.”

The South Metro Water Supply Board's own lawyers said technical issues might stand in the way of the water-sharing plan. The

lawyers spelled it out in a memo:

“First, the capacity of Denver Water's Foothills Treatment Plant may be insufficient to serve a 300 (cubic feet per second) conjunctive use (water-sharing) project. Second, a 300 cfs distribution pipeline may not be economic. Third, although there is substantial experience with conjunctive use on a smaller scale in the Denver Basin, large-scale conjunctive use may run into problems related to water chemistry and bio-fouling.”

Basic problem with plan

John Halepaska, a water consultant working with Parker, said he sees a fundamental issue with the water-sharing plan.

“The problem is, you have to give water back when Denver wants it,” he said. “Denver will want it back when there's a drought. But that's when you can't give it back.”

The reason: During a drought, demand is up, but the supply from groundwater is not. It can only be pumped so fast.

Barry, whose Denver Water Board would have to approve any water-sharing plan, favors surface storage for Douglas County.

Injecting water into an aquifer is problematic, he says. “You treat it first, and then you put it down under pressure. Then you've got to pump it up and treat it again because you don't know what it's mixed with. The economics of that get to be pretty pricey.”

Surface storage will also play a role in any water-sharing plan. The report suggests that the Rueter-Hess Reservoir planned by Parker could be expanded or other surface storage sites located.

But all parties agree that switching to a surface storage plan is no easy solution, either.

To get a reservoir permit is a daunting - and uncertain - process. Just ask those who supported the Two Forks dam and reservoir.

The Environmental Protection Agency vetoed the massive project in 1990 after years of planning. Most of the metro area communities not served by Denver Water were betting on the project as the long-term answer.

Even winning approval for a small dam can be difficult. Parker's 16,000 acre-foot Rueter-Hess Reservoir has been on the drawing board for 18 years and has yet to win permission to begin construction.

Some of the same problems facing aquifer recharge affect surface storage - namely, treated water would have to be piped to dozens of special districts throughout the county.

Those special districts are not currently connected.

“We can't deal with 80 different little entities who want their own little deal,” said Barry.

The ultimate solution? It won't be easy, he said. “There are four things that have to come together. More wells, conservation, conjunctive use and more traditional water storage projects,” he said. “But probably nothing as big as Two Forks. They're going to have to do all four of those.”

Most experts think recycling water should be a major piece of the answer, though that would require building expensive recycling

plants.

“Water districts could significantly extend the life of the aquifers if they could work together on when and how hard to pump water to help stabilize the aquifers,” Mulhern said.

Solutions that can take care of water needs for the long haul all will take time, said water attorney David Robbins. And time is not on Douglas County's side, if the experts are right.

“You're done for today. We can put Band-Aids on it, but the reality is you're looking 10 to 15 years down the road,” Robbins said.

“I guess we could decide to live without trees or grass, but that doesn't work.”

INFOBOX
The language of water
* Acre-foot An acre of water a foot deep, which is about 326,000 gallons, enough for one or two families for a year.
* Aquifer A body of underground water that is part of a river system. Under the South Platte River, for instance, the Ogallala aquifer spreads out in eastern Colorado and western Nebraska. Other aquifers, such as those under Douglas County and much of the metro area, consist of ancient water trapped deep underground.
* Aquifer recharge A process in which water is injected into an aquifer to store it for re-use later.
* Artesian pressure Water trapped underground will often rise above the top of an aquifer if it is tapped by a well. The force driving the water upward is called artesian pressure.
* Denver Basin A system of four aquifers covering 6,700 square

miles from south of Colorado Springs to Greeley and from the foothills eastward to near Limon.
* Groundwater Water found underground. It may come from a deep aquifer such as those in the Denver Basin, or it may be water that has spread underground from a surface river system.

How water sharing and recharging the aquifers would work.

A study by 11 south metro cities and water districts concludes that a project to share water with Denver would cost $3 billion through 2050 to pay for storage, treatment plants and pipelines to connect the various water districts in Douglas County and parts of Arapahoe County. The water-sharing plan would involve Denver sending surplus river water to the south metro area - every year in one option, or only in years with lots of rain or snow in another option. Some of the water from Denver would be injected into the sandstone formations called aquifers from which Douglas County draws most of its water. In return, Douglas County would send well water to Denver in dry or drought years. Other options considered in the study include drilling more wells, drilling more wells and adding storage, and drilling more wells and heavy re-use of water.

Challenges of the proposed plan

Cost: More than $3 billion
Coordination: The 11 cities and water districts must agree on how to create the pipelines and treatment plants required for the plan and how to divvy up the costs fairly.
Legal hurdles: Denver Water is legally required to send its used South Platte River water, via treatment plant, to farms and cities downstream. That means Denver can't legally inject it back into the aquifers in Douglas County, unless the water court grants

rights to allow such a transfer. Mountain water in Dillon Reservoir is not subject to the same restrictions.
Technical hurdles: Recharging aquifers by injecting water underground has been done largely in other places with different geology. The Highlands Ranch community has successfully recharged the aquifer on a small scale.
Timing issues: Heavy pumping of groundwater wells in drought years can dramatically lower the aquifers and put stress on water supplies, yet that could be the time south metro water districts would need to pump more water to share with Denver.

Five scenarios for solving water woes
1. Rely on wells
Cost: $4 billion
Tap fee on new homes beginning 2005: $20,684.

2. Rely on wells and add local storage
Cost: $2.7 billion
Tap fee on new homes beginning 2005: $12,504.

3. Rely on wells and make maximum use of recycled water
Cost: $2.3 billion
Tap fee on new homes beginning 2005: $9,768.

4. Share water with Denver, borrowing in winter and repaying in spring
Cost: $3 billion
Tap fee on new homes beginning 2005: $14,818.

5. Claim excess river water in wet years and store it
Cost: $2.97 billion
Tap fee on new homes beginning 2005: $14,932 The costs per district The draft report spells out the estimated cost for each

district for the five scenarios through 2050.

In $ millions City or Water District
1. Drilling new wells
2. Drilling new wells and creating storage
3. Drilling new wells and heavy re-use of water
4. Water sharing with Denver in winter, spring
5. Water sharing with Denver in wet years

Arapahoe County Water and Wastewater Authority
1. 604
2. 278
3. 260
4. 331
5. 325

Castle Pines North Metro District
1. 92
2. 43
3. 40
4. 67
5. 53

Castle Rock
1. 1,283
2. 805
3. 640
4. 810
5. 837

Centennial Water and Sanitation District (Highlands Ranch)
1. 494
2. 494

3. 442
4. 544
5. 548

Cottonwood Water and Sanitation District
1. 94
2. 77
3. 83
4. 97
5. 113

East Cherry Creek Valley Water and Sanitation District
1. 783
2. 424
3. 290
4. 526
5. 458

Inverness Water and Sanitation District
1. 31
2. 26
3. 20
4. 45
5. 40

Meridian Metropolitan District
1. 201
2. 178
3. 142
4. 186
5. 192

Denver Southeast Suburban Water and Santitation (Pinery)

1. 29
2. 50
3. 51
4. 71
5. 65

Roxborough Park Metropolitan District
1. 112
2. 101
3. 92
4. 130
5. 119

Stonegate Village Metropolitan District
1. 312
2. 225
3. 193
4. 192
5. 221

These seven water districts belong to the Douglas County Water Resource Authority, a group that also includes the 11 districts that conducted the water needs study. Though these seven did not contribute to the $1.2 million cost of the study, they are expected to benefit from any solutions that take pressure off the depleting aquifers in Douglas County.
Castle Pines Metro District
Castleton Water & Sanitation District
City of Lone Tree
Douglas County
Franktown Business Area Metro District
North Douglas County Water & Sanitation District
Parker Water & Sanitation District

Sources: Douglas County Water Resource Authority; draft report by authority's study group; Rocky Mountain News research

Other remedies on the horizon

Besides the long-term solutions considered in a study of south metro water needs, other partial solutions to Douglas County's water woes are in the works or have been suggested by experts and water officials.

1 South Platte Reservoir: A proposed reservoir north of Chatfield Reservoir on the Arapahoe/Jefferson County border. When complete, the reservoir could hold 6,500 acre-feet of water for Highlands Ranch.

2 14-mile pipeline: A recently completed water pipeline by the East Cherry Creek Valley Water and Sanitation District connects a pump station at South Quebec Street and C-470 to the district's water tanks near South Gun Club and Smoky Hill roads in Arapahoe County. It could be incorporated into a water distribution plan to bring Denver water to Douglas County.

3 Rueter-Hess Reservoir: This proposed $103 million project, to be built by the Parker Water and Sanitation District, would provide 16,200 acre-feet of storage for Parker. The reservoir would be filled using a combination of water from Cherry Creek, groundwater and eventually some agricultural water. It could be completed by 2006 or 2007.

4 Greenland Ranch: The 27,600-acre ranch along a 12-mile stretch of Interstate 25 in southern Douglas County has been preserved as open space. However, the rights to the water

underneath the ranch are privately owned and could be sold to Douglas County water providers.

Recycled water: Most experts think recycling water should be a component of any long-term plan to keep Douglas County residents afloat. Recycled water treatment plants, however, are expensive to build.

The Cottonwood and Arapahoe water districts, for instance, are planning a joint recycled water plant that would cost $30 million and process 12 million gallons of water a day. Coordinated groundwater management: Studies in the past five years indicate that water levels in the aquifers can drop drastically if super-deep municipal wells are pumped too hard. Ron Redd, Castle Rock's director of utilities, and Pat Mulhern, a civil engineer helping coordinate the south metro study of water needs, think all county water districts must agree to pump their wells at lower, sustained rates to protect existing underground water levels. Establishing a countywide groundwater management authority would help stabilize the aquifers and keep them producing longer.