

SDS DEIS Issues Paper

Evaluation of the Downstream Intake Alternative

The Bureau of Reclamation (Reclamation), as a part of its National Environmental Policy Act (NEPA) process for the Southern Delivery System (SDS) Project, included the Downstream Intake Alternative (Alternative 6) to address issues expressed by some residents of Pueblo and downstream users. The Downstream Intake Alternative diverts water downstream of the confluence of Fountain Creek and the Arkansas River instead of from Pueblo Reservoir. Although the Downstream Intake Alternative failed Reclamation's initial cost-screening criteria, it was included in Reclamation's final seven alternatives evaluated in the Draft Environmental Impact Statement (DEIS) due to public interest.

Key DEIS Finding: The Downstream Intake Alternative (Alternative 6) would cost more than \$700 million more to construct, operate and maintain, and would have more adverse environmental and potential public health impacts than the Preferred Alternative – the Proposed Action Alternative (Alternative 2).

Differences in Project Components and Participation between Alternatives 2 and 6

- The Proposed Action Alternative (Alternative 2) has a raw-water intake location that uses the existing Municipal Outlet Works at Pueblo Reservoir. A new raw-water intake off the Arkansas River just downstream of the confluence of Fountain Creek and the Arkansas River would need to be built for the Downstream Intake Alternative (Alternative 6).
- The Downstream Intake Alternative (Alternative 6) requires one more raw water pump station (i.e., four instead of three pump stations) than the Proposed Action Alternative (Alternative 2) because the intake location is lower in elevation than Pueblo Reservoir.
- The Downstream Intake Alternative (Alternative 6) would require reverse-osmosis advanced water treatment to reduce salinity (i.e., naturally occurring dissolved salt in the water) to acceptable levels. None of the other Alternatives analyzed in the DEIS required advanced water treatment.
- Pueblo West would participate in SDS under the Proposed Action Alternative (Alternative 2) and would not under the Downstream Intake Alternative (Alternative 6).

Cost

The Downstream Intake Alternative (Alternative 6) would cost about \$700 million more than the Proposed Action Alternative (Alternative 2). The additional costs for the Downstream Intake Alternative are:

- Approximately \$16 million to construct the additional raw water pump station.
- Approximately \$200 million to construct the advanced water treatment facilities.
- Approximately \$20 million to operate the additional raw water pump station.
- Approximately \$490 million to operate the advanced water treatment facilities.

Environmental Issues

For the Downstream Intake Alternative (Alternative 6), advanced water treatment would be required by reverse osmosis – a separation process that uses pressure to force water through a membrane (large filter). Salts and other dissolved impurities are filtered out of the waste by the membrane. This technology is very effective, but also very expensive to build and operate because of the high pressures required to force the water through the membranes and the additional need to recover the resulting brine (salt). The Downstream Intake Alternative (Alternative 6) would use at least twice as much electrical power (i.e., 1,419 versus 683 megawatt hours per day – enough to power more than 25,000 households) to deliver the same amount of water as the Proposed Action Alternative (Alternative 2). Therefore, the Downstream Intake Alternative (Alternative 6) would generate a much larger carbon footprint than the Proposed Action Alternative (Alternative 2).

The reverse osmosis process creates waste products that are mostly salts and are about 1.5 percent of the original raw water volume. The resulting dry salt, amounting to about 7,500 cubic yards annually or two truckloads per day, would need to be disposed of in a permitted landfill.

Public Health

Best practice continues to dictate that the best available quality water source should be used for potable (i.e., suitable for drinking) applications, until it is, to the extent practical, exhausted (*Issues in Potable Reuse*, National Research Council, 1998). The water quality in Pueblo Reservoir is superior to the water quality available in the Arkansas River downstream of its confluence with Fountain Creek. For example, Arkansas River salinity levels, the amount of dissolved salt in the water, are more than double between the Reservoir and below the confluence of Fountain Creek. Because the higher water quality source is cheaper and less environmentally damaging, prudent public health planning would dictate the use of the higher water quality source.