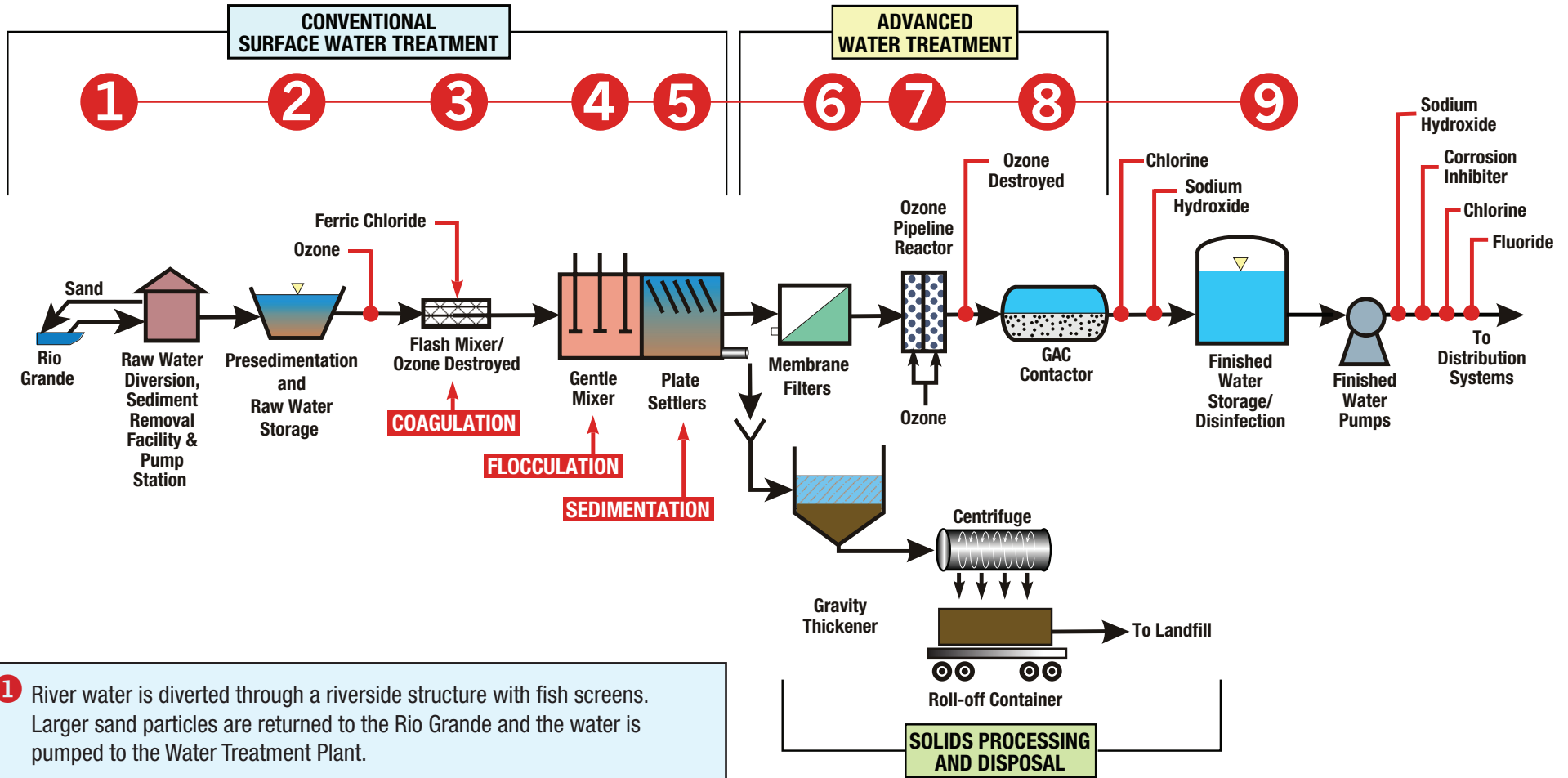




Buckman Direct Diversion Project

# BDD Water Treatment Processes

The BDD Water Treatment Plant includes a series of conventional and advanced water treatment processes. The conventional processes remove the vast majority of contaminants. The advanced processes provide additional treatment and polishing of the finished drinking water. Conventional treatment processes include coagulation, flocculation, sedimentation and disinfection. Raw water ozonation improves the effectiveness of conventional treatment. Advanced treatment is provided by membrane filters, ozone and granular activated carbon contactors. Disinfection is accomplished with lower amounts of chlorine because the high-quality water does not need as much chlorine.



- 1 River water is diverted through a riverside structure with fish screens. Larger sand particles are returned to the Rio Grande and the water is pumped to the Water Treatment Plant.
- 2 Three presedimentation and raw water storage basins allow remaining larger particles to settle to the bottom for removal.
- 3 Ozone is added to oxidize organic material. Water is mixed with a coagulant, ferric chloride, which causes even the finest particles to clump together.
- 4 Flocculation provides gentle mixing. The tiny individual particles collide, stick together, and become larger and heavier. Contaminants and impurities are swept up into the flocculated particles.

- 5 Plate settlers provide very still conditions to separate the heavier floc particles from the water by gravity. The settled solids, called sludge, is concentrated, dewatered in a centrifuge, and hauled to the Caja del Rio landfill.
- 6 The clarified water is filtered under high pressure through membranes with extremely small pore size, 0.1 microns. This membrane filtration removes essentially all of the particulate matter, including particles that are much smaller than the pore size.

*(Continued from front)*

- 7** Ozone is again applied to the clean water. It oxidizes any dissolved organic material not previously removed and kills microbes. Organic compounds that may cause bad tastes or odors are oxidized (broken down), as are PPCPs (pharmaceuticals and personal care products) and EDCs (endocrine disruptors). Residual ozone is then destroyed.
- 8** The water passes through GAC (granular activated carbon) contactors. The oxidized organics are removed by the biologically active carbon, which also works as a “polishing” process.

- 9** Small amounts of chlorine and sodium hydroxide are added to disinfect the water and to correct the pH of the treated water. The finished drinking water is stored in a four-million-gallon tank. Two pump stations pump the treated water north and south to BDD Project drinking water transmission line connections to the City and County public drinking water distribution systems. Chlorine is added as necessary to have a very small amount of residual chlorine in the finished drinking water. This protects against any contamination that might occur downstream. Fluoride is also added for dental health. A corrosion inhibitor helps control lead and copper release.

## BDD Water Will Be Excellent Quality

The BDD Project asked UNM Civil Engineering Professor Kerry Howe to prepare an independent assessment of the effectiveness of the Water Treatment Plant in producing drinking water that complies with all safe drinking water standards. His study found the Water Treatment Plant would be capable of producing high-quality drinking water. The quality of the BDD drinking water is based on four facts:



*Three-dimensional view of BDD Water Treatment Plant from behind the Operations Building.*

- 1. The quality of the Rio Grande** – The Rio Grande’s contamination concentrations are nearly always below existing and proposed regulated drinking water levels, except when storm runoff is eroding sediments that contain contaminants originating from Los Alamos National Laboratory (LANL).
- 2. Reduction of pollution in storm water** – The BDD Board and Staff are successfully working with the U.S. Department of Energy (DOE) and LANL and with regulatory agencies to reduce pollution carried by storm water. By this action, they can reduce the migration of LANL-legacy contaminants into the Los Alamos and Pueblo canyons during runoff events to prevent pollution and these type of contaminants from reaching the Rio Grande.

- 3. Early notification system to stop diversions** – Water containing sediments that could be contaminated will not enter the BDD treatment plant due to the early notification system that LANL has committed to provide. The early warning system will reliably inform the BDD that Los Alamos Canyon has storm water runoff at its confluence with the Rio Grande. Diversion of water from the river will stop when contamination may be flowing from Los Alamos Canyon into the Rio Grande.

- 4. Effective water treatment** – The BDD Water Treatment Plant will use the most effective processes available for removing contaminated sediments.



*Aerial view of the construction area of the BDD Water Treatment Plant as of July 1, 2009.*

**For more information, visit [www.bddproject.org](http://www.bddproject.org) or call Rick Carpenter, BDD Project Manager, at (505) 955-4206, Lynn Komer at (505) 660-7682 or Patti Watson at 1-800-687-3417, ext. 3134.**