

IRVINE RANCH WATER DISTRICT
POTABLE WATER SUPPLY RELIABILITY POLICY

Revised: November 10, 2014

Issue Summary:

Providing for a reliable and safe water supply is the primary mission of Irvine Ranch Water District (IRWD). IRWD must be able to provide sufficient water to its service area in order to meet customer water demands under reasonably foreseeable hydrological and system outage conditions. As water demand increases with new development, the ability for the District to continue to reliably meet water demands with existing supplies under extreme circumstances could be compromised. Threats to water supply reliability include potential system outages, environmental flow curtailments, earthquakes, severe drought and climate change.

Overall water supply reliability is accomplished by developing projects that improve both system and supply reliability. System reliability refers to the security and integrity of IRWD facilities that are treating and delivering water inside of IRWD. Supply reliability refers to the availability, security and integrity of supply sources and facilities not owned by IRWD that are relied on to deliver water to IRWD. IRWD should develop specific targets for both system and supply reliability. These targets should be periodically reviewed and adjusted based on new information and changing conditions. These targets will result in the selection of water supply capital projects that efficiently satisfy the reliability needs of the District.

Background:

In January 2008, the Board authorized the preparation of a Water Supply Reliability Study. The preliminary findings of the study were presented to the Board at a workshop on April 28, 2008. A report was prepared based on comments received from the Board. The Board received and filed the Water Supply Reliability Study on July 28, 2008. The intent of the study was to assist the District in defining appropriate levels of potable water reliability under different water supply and demand scenarios consistent with the Board's and IRWD customers' expectations. The study included analyses of how imported water supply shortages, climate change, facility outages and emergencies could affect demands, supplies, and major conveyance facilities. The study provided the technical basis for the August 8, 2008 Potable Water Supply Reliability Policy Position paper.

The Water Supply Reliability Study will be periodically updated and brought to the Board as assumptions change over time or as alternative potable water supply capital projects are developed. Recently, staff issued a request for proposals for an update and an enhanced approach to the study. Concurrently, the Municipal Water District of Orange County (MWDOC) has awarded a contract to perform a county-wide study of water supply and system reliability that will be performed with the participation of the Orange County retail and wholesale water agencies. In preparing to update the District's Water Supply Reliability Study and to guide staff's participation in the county-wide collaborative effort, staff has updated the District's Potable Water Supply Reliability Policy Principles paper.

Overview of Water Supply Reliability Study:

Outages of key supply facilities can result from a variety of reasons, including earthquakes, terrorist acts, or unplanned facility failures. The 2008 Water Supply Reliability Study assumed that facility shutdowns at the Diemer Water Treatment Plant (Diemer WTP) would last for one month. This is consistent with the documented outage duration for a single complex event in MWD's Infrastructure Reliability and Protection Plan (IRPP). It was assumed that a failure of the Dyer Road Well Field (DRWF) pipeline would last up to 15 days. Because of the emergency nature of catastrophic events, it is expected that some levels of extraordinary conservation (or demand restrictions) would take place. Even with such emergency conservation, the analysis showed that there would be maximum day shortages of over 60 cfs for a Diemer WTP outage and over 30 cfs for a DRWF pipeline outage.

Supply reliability results are based on probability distributions of demands and supplies under different weather, hydrological and environmental restriction scenarios. The Water Supply Reliability Study indicated that there is an approximately equal impact to IRWD's reliability as a result of environmental flow restrictions on the State Water Project (SWP) and climate change impacts on system demand and total imported water supply. When both of these constraints are considered and no new projects are implemented, shortfalls in the IRWD system would occur almost 90% of the time, averaging approximately 12,000 AFY, and ranging from zero up to 25,000 AFY. The 2008 study concluded that a minimum of 25,000 AFY of additional water supply should be developed to meet projected build-out demands under potential environmental flow restrictions in the Bay-Delta and/or climate change impacts on the SWP and Colorado River Aqueduct imported supplies.

Considerations for Reliability Study Update:

The District's Wells 21 and 22 Treatment Plant and the Baker Potable Water Treatment Plant Projects as well as IRWD's water banking projects in Kern County will result in a significant reduction in the need for development of additional supplies that were identified in the 2008 study. However, there are other factors that were not considered in the 2008 Water Supply Reliability Study that could offset the benefits of these projects with additional risk and uncertainty to IRWD's water supplies. These other factors include:

- Uncertainty in whether the alternative conveyance for the Bay Delta Conservation Plan (BDCP) will ever be permitted and constructed;
- Potential for long-term drought on the Colorado River;
- The risk of San Joaquin River Delta levee failures during a significant earthquake;
- Failure of the Edmonston Pumping Plant that is located near the south end of the California Aqueduct which lifts water 1,926 feet (600 m) to cross the Tehachapi Mountains; and
- Potential reductions in flows available for recharge in the Orange County basin.

Policy Principles:

Based on the 2008 Water Supply Reliability Study and the additional risk and uncertainty issues that could affect IRWD's water supplies as described above, staff has developed principles that will define the District's policy for potable water supply reliability and will also guide updating and enhancement of the District's Water Supply Reliability Study and staff participation in a county wide study of water supply and system reliability. The District's policy will also provide guidance in the development of future water supply projects. The policy principles are as follows:

- Water supply and system reliability studies should take into consideration the frequencies, magnitudes, probabilities, timing and durations associated with events that could affect reliability.
- Evaluation of IRWD water supplies and related system reliability should separately and in combination (where appropriate) take into consideration factors such as long term drought on the Colorado River, difficulties in approving and constructing an alternate conveyance to bypass flows around the Delta, the risk of Delta levee failures, local and regional earthquakes, SWP and Colorado River facility failures, long-term climate change and reductions in water available for recharge in to the Orange County basin.
- Forecasts of supply and system reliability should take into consideration the benefits of IRWD's existing Strand Ranch Integrated Banking Project, the proposed Stockdale Integrated Banking Project, any reasonably foreseeable expansion of these projects and related partnership, exchange and wheeling programs in offsetting potential future impacts to IRWD's import water supplies.
- Future water demands should be estimated using reasonable duty factors tied to ultimate land use categories using a multi-parameter regression analysis which accounts for variations in weather. The duty factors should account for increased conservation and the continued expansion of recycled water.
- The combination of existing and future water supply projects should meet 80% of maximum day demands at build-out 95% of the time using the worst case and reasonably foreseeable system outage scenarios.
- IRWD's system capacity should meet estimated maximum day demands at build-out 95% of the time using reasonably foreseeable outage scenarios.
- Projects should be selected on the basis of meeting specific reliability criteria and should demonstrate that they are cost effective. Projects that provide shared supply and system benefits to IRWD and other agencies in Orange County, in a cost effective way, should be considered in the selection process.
- System and supply reliability projects should be geographically and functionally diverse and should draw from diverse supply sources to maximize system reliability. Additional

wells, expansion of water banking projects, surface and groundwater storage, local surface water treatment plants, desalination treatment, new imported supply sources and improved imported water transmission facilities should be considered to meet the system reliability target. Participation in projects that are developed on a regional basis should be available to agencies on an optional basis.

- Cost effective projects that provide both system and supply reliability should be given the highest priority for implementation. Consideration should also be given to cost effective projects that provide shared benefits to other agencies in Orange County.
- System and supply reliability projects should be given the highest priority. Projects required to meet the minimum system and supply reliability targets, taking into consideration all foreseeable factors that could affect IRWD's reliability and its ability to manage demands, should be operational by 2020.
- Local base loaded supply projects that exceed the cost of import water from Metropolitan Water District of Southern California (MWD) over extended time horizons should not be considered when import water is available from MWD. Such projects would disproportionately benefit other agencies over IRWD.
- Maintaining the minimum levels of system and supply reliability at build out requires the development of additional capital projects. Incremental future development creates the need for these additional system and supply reliability projects through increases in water demand. Reliability projects should therefore be financed from bond proceeds to be paid back through property taxes and connection fees on new development.
- County wide evaluations and studies of water supply and system reliability should occur through the collaborations of all retail and wholesale agencies in the county. Such collaborative studies should be conducted in a manner that is consistent with the roles, responsibilities and policies of participating agencies and should not direct the actions of any agency. The studies should not over-reach into IRWD roles and responsibilities.
- Development of non-potable water supply projects and water use efficiency and conservation can offset potable water demand and reduce demand pressure on existing facilities. Non-potable water supply projects, such as the expansion of recycled water, should be evaluated as part of efforts to expand countywide water supply and system reliability.