

Problem	Description	Solution
Looping	Redundant pumping of the same water. Can occur when water descends through a PRV into a lower zone and then is boosted back into the original zone.	Use model to identify. Modify PRV settings to keep water in desired zone. Determine if pumps are appropriately sized.
Leaping	Boosting water to a higher zone than necessary and using PRVs to supply a lower zone.	Install pipeline or other facility to bypass higher zone; supply target zone directly.
Losing head	Breaking pressure prematurely, e.g., at a spring or wholesale delivery point, when it could be used beneficially.	Configure system to maintain and/or reroute pressure.
Loading	Intermittent pump operation—spikes for short durations. Can occur when a facility is oversized for the current demand or when equalization storage is not used efficiently.	Implement controls to pump more consistently, install jockey pump, and/or use storage rather to meet peak demand.
Leaking	Water loss through aged pipes, loose equipment, and unmetered use. Water loss is also energy loss and revenue loss.	Invest in leak-detection equipment. Start leak-detection program and fix leaks. Use model to identify hotspots.
Poor storage utilization	Little or no fluctuation in tank levels; sources peak with demand.	Keep sources as constant as possible and use storage to balance supply and demand.
Poor source prioritization	Water sources are dispatched without considering their energy requirements. Some sources may be much more efficient than others.	Prepare an energy map that determines the energy use for each source. Prioritize and dispatch sources accordingly.
Oversized pumps	Pumps are designed for build-out or peak-day demand and operate inefficiently under existing typical conditions (off the pump curve).	Redesign pumps, install VFDs, and/or install jockey pump for everyday demand.
Inconsistent operation	Operation is mostly manual and inconsistent.	Optimize and automate operations for storage, sources, valves, etc.
Excessive pressures	High pressures waste energy and water, including through leaks.	Manage pressures responsibly. Lower pump heads or implement new pressure zone.
Poor maintenance	Poor maintenance wastes water and energy, e.g., worn motors, clogged pipes, malfunctioning controls.	Implement pipeline replacement and facility maintenance schedule.
Lack of awareness	Utility staff unaware of energy issues, including policy, costs, and implications. Little or no organizational commitment.	Educate staff, develop energy policy, and commit entire organization to energy efficiency.