

Sustainability: *The Las Vegas Approach*

Richard B. Holmes, Director of Environmental Resources, Southern Nevada Water Authority

The Southern Nevada Water Authority (SNWA) and its member agencies are working together for a sustainable Nevada. The SNWA's commitment is evidenced in its Sustainability Strategic Plan which is split into four sections: water; energy; public education, outreach and partnerships; and organizational and individual behavior.

Water

The SNWA has developed and administers one of the country's most comprehensive water efficiency programs. These efforts have enabled the region to decrease its water use by 15 percent between 2002 and 2007, despite the addition of 400,000 new residents during that span and 40 million annual visitors.

The Southern Nevada Water Authority has become a model agency for sustainable water development in the urban southwest. Its efforts were recognized in 2006 when the SNWA received the U.S. Environmental Protection Agency's first annual Water Efficiency Leader Award for the Utilities/Water Districts category.

The SNWA's Water Smart Landscapes program, which pays existing residents to replace lawn with drought-tolerant plants has encouraged approximately 30,000 Southern Nevada residents to replace more than 11 million square-meters of lawn, saving the community 25 billion litres of water each year. The removed turf represents the equivalent of a 45-cm roll of sod that could wrap half way around the Earth. Additional water efficiency programs include pool cover incentives, water smart car washes and indoor retrofit kits.

In October 2008, the SNWA hosted the inaugural international WaterSmart Innovations Conference and Exposition in partnership with the U.S. Environmental Protection Agency's WaterSense program. The annual conference will serve to broaden the knowledge of innovations in urban water efficiency and water conservation including products, programs and outreach. It is the first, largest and most comprehensive conference of its kind.

Energy

The organization intends to operate a 100 percent alternative-fueled vehicle fleet by 2015. Today, 79 percent of company vehicles are powered by alternative fuels, including biodiesel, compressed natural gas and hybrid. In 2007, construction was completed on a solar-driven hydrogen refueling station. This effort was coordinated in partnership with the University of Nevada, Las Vegas (UNLV) Research Foundation.

The SNWA holds a 25 percent interest in the Silverhawk Power Generation Facility, a 570-megawatt power plant. The power plant operates using "dry cooling," a technology that produces electricity using one-tenth of the water consumed by traditional "wet-cooled" power plants.

Recently, the Las Vegas Valley Water District, a SNWA member agency, completed its first Distributed Solar Array project that consists of solar panels at six storage and distribution sites. The 3.1 megawatt sites will collectively produce about 5.3 million kWh (kilowatt hours) per year of clean electricity without generating emissions or consuming any water.

SNWA is currently designing 450 kW of solar photovoltaic systems to provide solar power to the region's two water treatment facilities. Combined, these projects will generate approximately 920,000 kWh (kilowatt hours) per year—the equivalent energy usage of more than 60 Las Vegas households.

Under contracts from the Colorado River Commission (CRC), approximately 10 percent of the Authority's annual power supply comes from Hoover Dam hydropower.

SNWA has developed hydropower projects at three Rate of Flow Control Stations (ROFCS) in Las Vegas and Henderson. Combined, more than two megawatts of electricity can be generated from these systems at anytime.

The Groundwater Development Project is being designed with the potential for half of its power requirements to be generated by in-line turbines (more than 30 megawatts). SNWA is also committed to fulfilling the remainder of the project's power requirements through renewable energy sources, such as solar, wind and geothermal.

Environmental Stewardship

The SNWA has worked diligently to protect and preserve the Las Vegas Wash, a tributary to the Las Vegas valley's primary water supply. During the past nine years, SNWA and its member agencies have constructed 11 erosion control structures, reducing total suspended solids by more than 50 percent; stabilized more than 8.8 km of the Wash's banks; removed more than 225,000 Kg of trash from adjacent areas; and revegetated more than 80 hectares with trees, shrubs and emergents.

In support of the Groundwater Development Project, the SNWA is developing a highly sophisticated ground and surface water monitoring network to gain an understanding of the complex groundwater system. Several locations are equipped with real-time data collection to enable hourly monitoring of system conditions.

In addition, the SNWA has installed six evapotranspiration stations to measure precipitation and the amount of water consumed by various plants in different areas of the valley. In total, the SNWA will have more than 180 groundwater and surface water monitoring locations that will alert the agency to any unforeseen impacts.

The SNWA's biologic team is partnering with other outside organizations, including the Smithsonian Institute, to create a baseline biological record of the region associated with its Groundwater Development Project. The organization and its partners are conducting pedestrian surveys covering the 640 km of proposed and alternative alignments for the pipeline from northern Spring Valley to Las Vegas. In addition to surveys covering every square-meter of the alignment, regional studies are being conducted to gather detailed information on all other areas of potential impact.

Sustainability: The Las Vegas Approach

In the future, managers must consider future impacts of natural resource development and the long-term sustainability of those resources. In addition, successful development of natural resources will require proactive management, monitoring and mitigation of environmental impacts.

SOUTHERN NEVADA WATER AUTHORITY



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Richard B. Holmes,
Director of Environmental Resources

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Mission, Vision and Values

Mission

- Partner to provide reliable, quality water, ensuring the **sustainability** of our desert community and serving our customers responsibly.

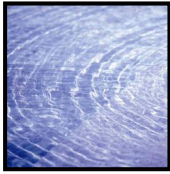
Vision: "People Leading the Way"

- Partnering with our diverse community in **sustaining** water resources
- Partnering to provide quality service that exceeds expectations
- Partnering to be **stewards of resources for future generations**

Values

- Respect for People
- Integrity
- Service
- Excellence
- **Sustainability**

Sustainability Strategic Plan



Water



Energy



Public education, outreach and partnerships



Organizational and individual behavior

Southern Nevada

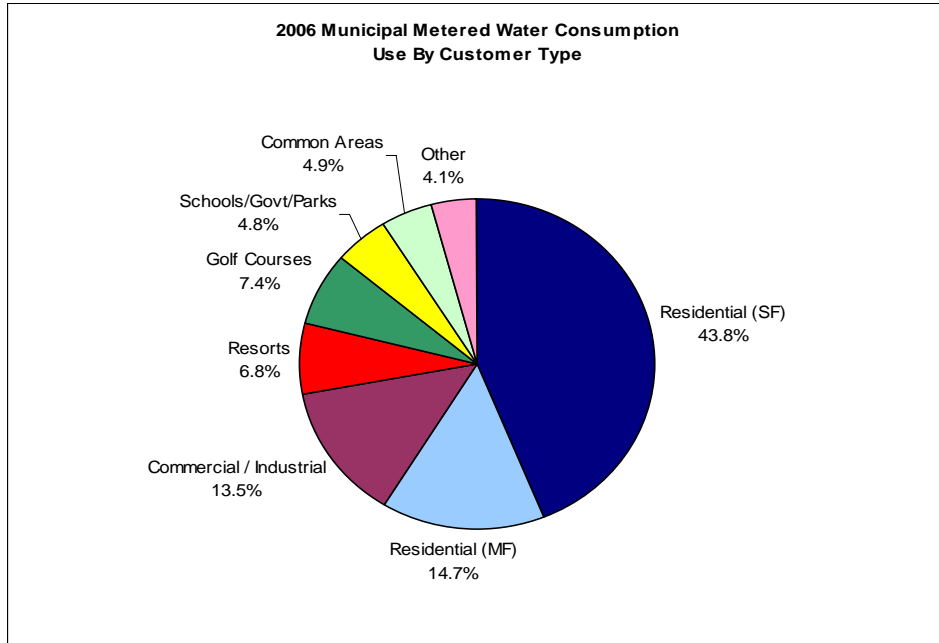


Desert Environment

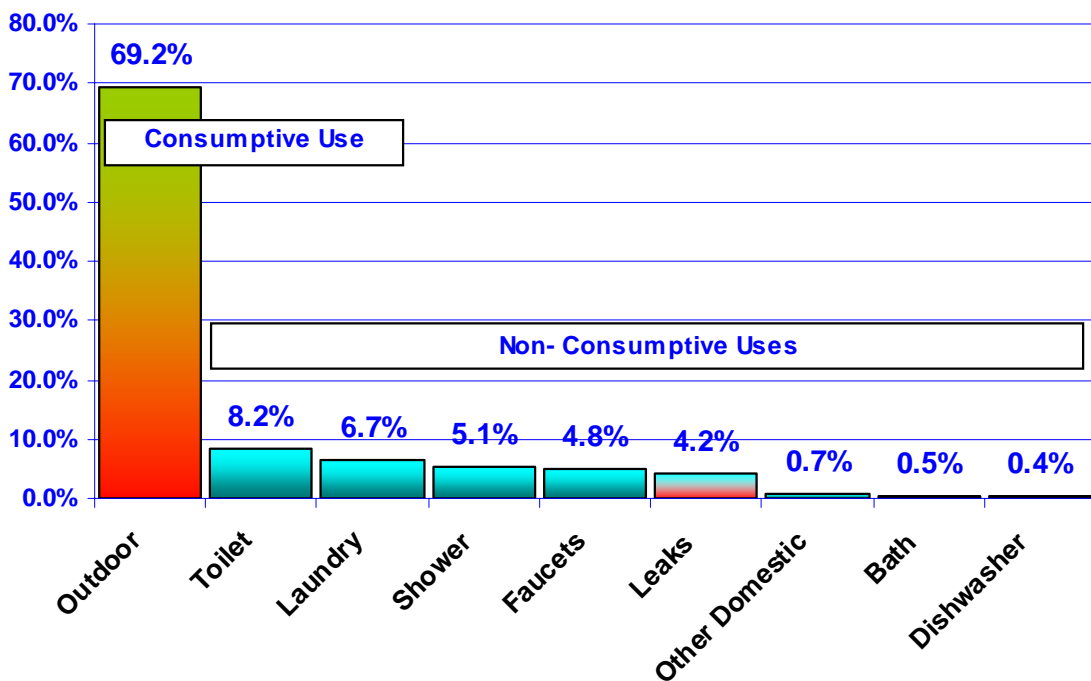
- Average rainfall of 4.5”
- Peak temps of 110+
- 13 rain events annually
- 250 new residents daily
- 40 million visitors yearly

Metered Water Consumption

2006 SNWA Service Area Municipal Metered Water Consumption



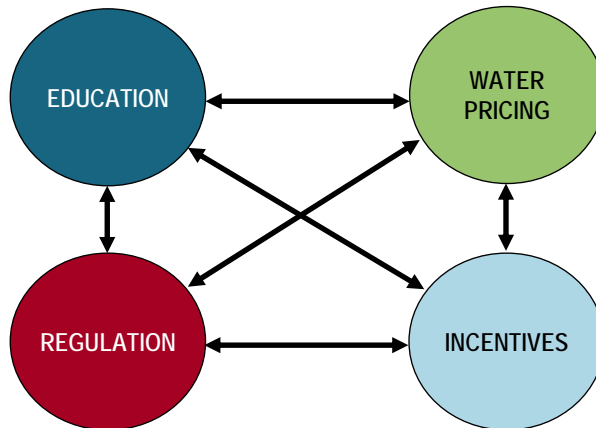
Single Family Household Water Use



Water Conservation

The SNWA's aggressive mix of incentives, regulations, education and pricing has created one of the most recognized conservation programs in the nation.

Conservation Toolbox



Water Conservation

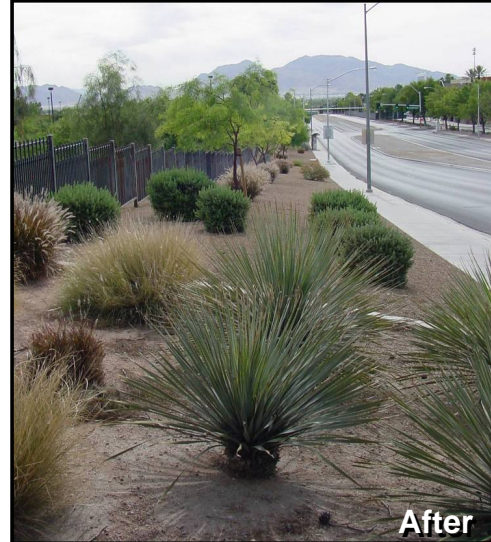


Key Policies

- Seasonally-restricted watering schedules
- Turf conversion & restrictions
- Golf course water budgets
- Incentive programs
- Water waste enforcement
- Rates to encourage conservation

Water Conservation

The Water Smart Landscape Program provides a cash incentive to commercial and residential customers to convert grass to water efficient landscaping.



Water Conservation

From inception of SNWA Water Smart Landscape program in 1999:

- More than **11 million square meters** of turf has been removed
- More than **25 billion litres** of water saved annually

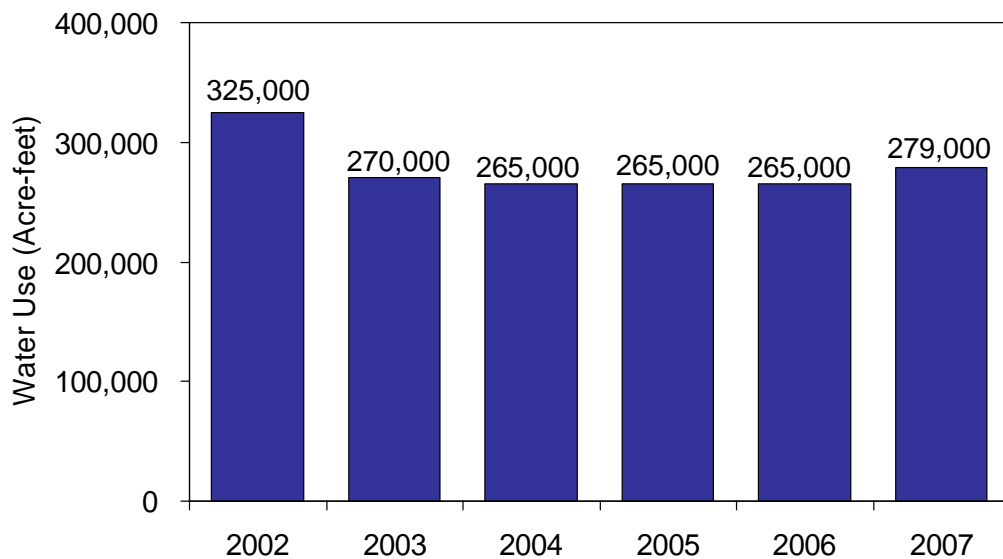


Water Conservation

The SNWA's conservation programs have demonstrated **real** results.

There has been a **cultural change** in the way Southern Nevadans use water.

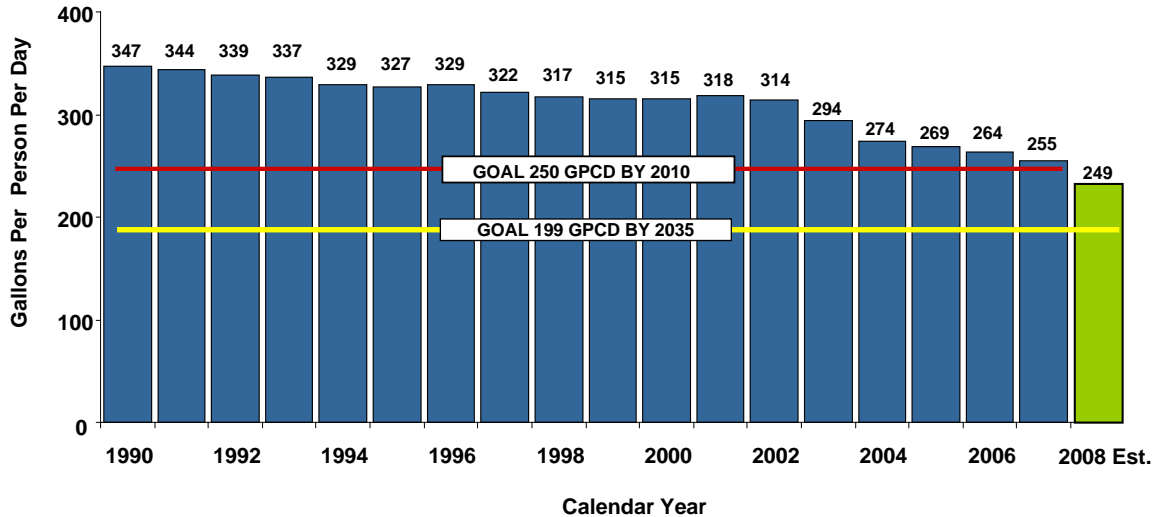
Conservation Achievements



Southern Nevada's consumptive water use declined approximately **15 percent** between 2002 and 2007, despite the fact that there were nearly 400,000 new residents and nearly 40 million annual visitors.

Conservation Achievements

1990 - 2008 Gallons Per Capita Per Day (GPCD) Water Usage



WaterSmart Innovations Conference

- First-of-its-kind event held annually
- World's largest conference on urban water management and efficiency
- More than 1,300 participants
- Attendees from 17 different nations
- More than 160 professional sessions
- More than 140 exhibits



Energy - Fleet

Goal: 100 percent alternative-fueled vehicle fleet by 2015

- Currently, **79 percent** alternative-fueled fleet
 - Biodiesel
 - Compressed natural gas
 - Hybrid
- 2008 Alternative Fuel Vehicle Institute (AFVI) Green Ribbon Award
- Named the seventh best “green” fleet in North America by *Government Fleet Magazine*
- In 2007, completed construction of a solar-driven hydrogen refueling station



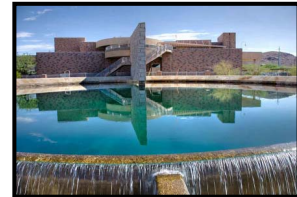
Energy – Power Supply



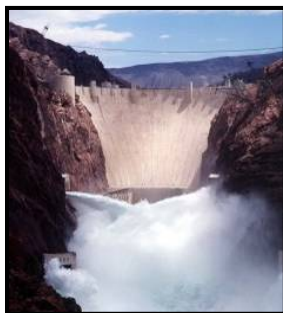
- Silverhawk Power Generation Facility
- SNWA holds 25 percent interest
- 570-megawatt power plant
- “Dry cooled” power plant that produces electricity using one-tenth of the water consumed by traditional “wet-cooled” power plants

Energy – Power Supply

- LVVWD Distributed Solar Array project
 - Solar panels at six LVVWD storage and distribution sites
 - 3.1 megawatt sites will collectively produce about 5.3 million kWh (kilowatt hours) per year
- SNWA designing 450 kW of solar photovoltaic systems to power two water treatment facilities
 - Combined, will generate approximately 920,000 kWh (kilowatt hours) per year
 - Equivalent energy usage of more than 60 Las Vegas households



Energy – Power Supply



- Approximately 10 percent of SNWA's annual power supply comes from Hoover Dam hydropower
- SNWA has developed hydropower projects at three Rate of Flow Control Stations (ROFCS)
 - Generate more than 2 megawatts combined
- Groundwater Project
 - Potential for half of power requirements to be generated by in-line turbines (more than 30 megawatts)
 - Remainder of power requirements to be provided from renewable energy sources (solar, wind, geothermal)

Environmental Stewardship

Development of new resources can not come at the expense of the surrounding environment.

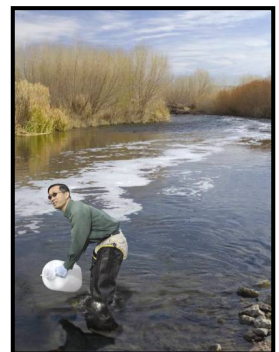
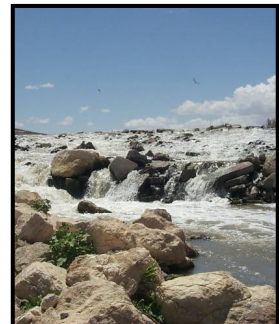
The SNWA is proactively engaged in a number of efforts to safeguard Nevada and protect the environment.

Examples:

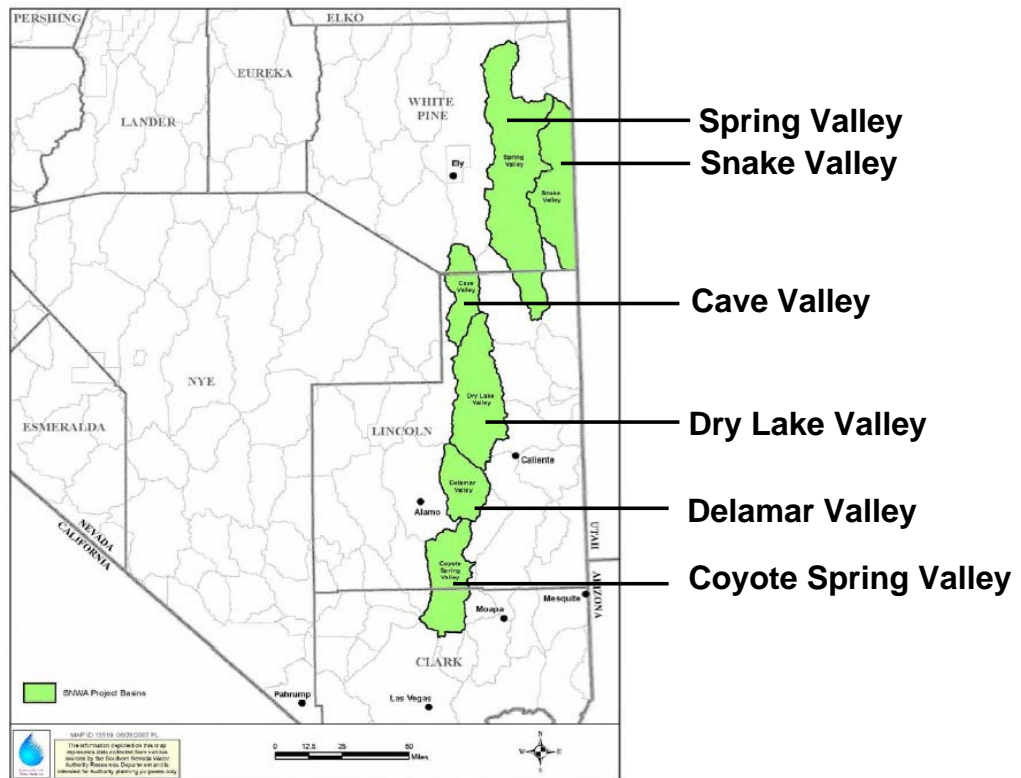
- Las Vegas Wash
- Development of in-state groundwater resources

Las Vegas Wash

- Primary discharge point for treated wastewater flows
- Critical in protecting the region's primary water supply
- \$165 million effort among local, state and federal agencies
- Revegetated nearly 80 hectares of wetlands habitat
- Constructed 11 erosion control structures
- Stabilized more than 8.8 km of embankment
- Removed more than 225,000 Kg of trash
- 50 percent decrease in total suspended solids
- Significant reductions in other contaminants
- Increased habitat for bird, fish, mammal and reptilian species



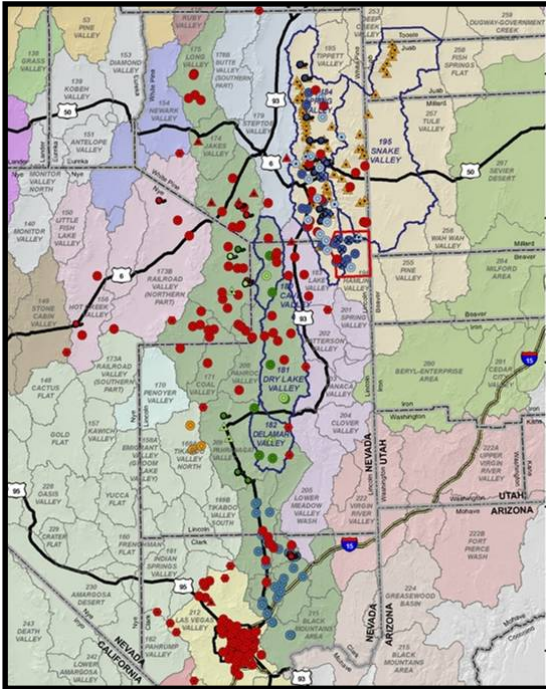
Groundwater Development Project



Groundwater Development Project

- When granting applications, the State Engineer considers:
 - Is there water available from the proposed source (perennial yield of groundwater basin)?
 - Will the application conflict with existing rights?
 - Will granting the applications be in the public interest?
 - Will it interfere with domestic wells?

Groundwater Development Project



Hydrological Monitoring

- Developing highly sophisticated ground and surface water monitoring network
- Installed real-time data collection at various sites
- Installed evapotranspiration stations

Groundwater Development Project



Hydrological Monitoring

- Partnered with USGS and Desert Research Institute
- Developing comprehensive groundwater model characterizing aquifer

SNWA will have more than 180 groundwater and surface water monitoring locations, providing an early warning system to avoid adverse impacts.

Groundwater Development Project

Biological Monitoring

- Conducted pedestrian surveys of 400 miles of proposed alignment and alternatives
- Logged each sensitive plant species within the proposed alignment (GPS)
- Documented all flora and fauna within the proposed alignment
- Conducted regional studies of areas outside the alignment to better understand the characteristics of the basins



Groundwater Development Project

Biological Monitoring

- Conducted extensive bird, reptile and small mammal surveys
- Conducted a comprehensive invasive weed survey of 23,000 acres
- Partnered with the Smithsonian Institute to study spring snails
- Characterized ecological conditions of over 100 springs in project area



The SNWA hired expert botanists in the region to assist with the gathering of sensitive plant species information

Sustainability – The Las Vegas Approach



Water
- Conservation



Energy
- Fleet
- Power Supply



Environmental Stewardship
- Las Vegas Wash
- Groundwater Development Project

