

### **Assessment of IRWM Projects' Potential to Meet Water Quality Management Objectives**

As detailed in Section 3, the Region has a number of water quality concerns regarding the quality of groundwater, local surface water and stormwater runoff, recycled water, and imported water. Section 4 presented objectives and planning targets identified by the Stakeholder group in order to address these concerns. The projects, shown in Table 6-3, will help the Region to address these concerns.

The objectives and planning targets identified for water quality management are:

*Water Quality Objective 1. Provide drinking water that meets regulatory requirements and customer expectations.*

- *Target: Continue to meet Federal and State water quality standards as well as customer standards for taste and aesthetics throughout the planning period.*

Table 6-3: Projects with Water Quality Management Benefits

Project	Status
Antelope Valley Water Bank	Complete
Aquifer Storage and Recovery Project: Additional Storage Capacity	Complete
Aquifer Storage and Recovery Project: Injection Well Development	Complete
Lancaster WRP Effluent Management Sites	Complete
Lancaster WRP Stage V	Complete
North Los Angeles/Kern County Regional Recycled Water Project – Division Street Corridor	Complete
North Los Angeles/Kern County Regional Recycled Water Project – Phase 1b	Complete
North Los Angeles/Kern County Regional Recycled Water Project – Phase 2	Complete
Palmdale WRP Effluent Management Sites	Complete
Palmdale WRP Stage V	Complete
Partial Well Abandonment of Groundwater Wells for Arsenic Mitigation	Complete
Water Supply Stabilization Project – Westside Project (WSSP-2)	Complete
AVEK Strategic Plan	Implementation
BCSD Arsenic Management Feasibility Study and Well Design	Implementation
Division Street and Avenue H-8 Recycled Water Tank	Implementation
Eastside Banking & Blending Project	Implementation
Littlerock Creek Groundwater Recharge and Recovery Project	Implementation
Littlerock Dam Sediment Removal	Implementation
RCSD Arsenic Consolidation Project	Implementation
South Antelope Valley Intertie Project	Implementation
Water Supply Stabilization Project (WSSP) – Westside Expansion	Implementation
42 <sup>nd</sup> Street East, Sewer Installation	Conceptual
45 <sup>th</sup> Street East Groundwater Recharge and Flood Control Basin	Conceptual
Antelope Valley Watershed Surface Flow Study	Conceptual
Avenue Q and 20 <sup>th</sup> Street East Groundwater and Flood Control Basin (Q-West Basin)	Conceptual
Avenue R and Division Street Groundwater Recharge and Flood Control Basin	Conceptual
Barrel Springs Groundwater Recharge and Flood Control Basin	Conceptual
BCSD Arsenic Removal Treatment Plant (Construction)	Conceptual
Ecosystem and Riparian Habitat Restoration of Amargosa Creek Ave J to Ave H	Conceptual
Hunt Canyon Groundwater Recharge and Flood Control Basin	Conceptual
KC & LAC Interconnection Pipeline	Conceptual
Lower Amargosa Creek Recharge Project	Conceptual
Multi-use/Wildlife Habitat Restoration Project	Conceptual
New PWD Treatment Plant	Conceptual
North Los Angeles/Kern County Regional Recycled Water Project – Phase 3	Conceptual
North Los Angeles/Kern County Regional Recycled Water Project – Phase 4	Conceptual
Palmdale Power Plant Project	Conceptual
Place Valves and Turnouts on Reclaimed Water Pipeline	Conceptual
QHWD Partial Well Abandonment	Conceptual
RCSD Wastewater Pipeline	Conceptual
Stormwater Harvesting	Conceptual
Tertiary Treated Recycled Water Conveyance and Incidental Groundwater Recharge of Amargosa Creek Avenue M to Avenue H	Conceptual

Projects that would help to meet this first water quality objective include many of the projects shown in Table 6-3. Projects that recharge the Region’s aquifers, such as the Littlerock Creek Groundwater Recharge and Recovery Project and Eastside Banking and Blending Project, will provide soil aquifer treatment and some degree of blending with other groundwater sources. This can support improvements to the quality of drinking water. Other projects may directly treat groundwater to meet drinking water standards, such as the Boron CSD Arsenic Removal Treatment Plant Project.

*Water Quality Objective 2. Protect and maintain aquifers.*

- *Target:* Prevent unacceptable degradation of aquifer according to the Basin Plan throughout the planning period.
- *Target:* Map contaminated sites and monitor contaminant movement by 2017.
- *Target:* Identify contaminated portions of aquifer and prevent migration of contaminants by 2017.

As with the 2<sup>nd</sup> water supply objective mentioned above, many of the projects proposed by the stakeholders are groundwater recharge projects and water banking programs. These projects and programs will require monitoring to identify which regions of the aquifer are best suited, and they will require continued monitoring to ensure they are operating effectively. Monitoring and data collection are the first steps in protecting the aquifer from contamination. Additional projects submitted that will help to meet these objectives are the Boron CSD Arsenic Management Feasibility Study and Well Design Project, and the Boron CSD Arsenic Removal Treatment Plant Project, both of which will reduce arsenic concentrations in the local aquifer. Another project that will support water quality objectives is the City of Palmdale 42<sup>nd</sup> Street East Sewer Installation Project which will reduce groundwater pollution by eliminating septic tanks currently in use by homes in the vicinity of 42<sup>nd</sup> Street East.

*Water Quality Objective 3. Protect natural streams and recharge areas from contamination.*

- *Target:* Prevent unacceptable degradation of natural streams and recharge areas according to the Basin Plan throughout the planning period.

Projects proposed by the stakeholders to address this objective include groundwater recharge projects, retention and detention basin projects, and flood control projects. These projects and programs will require monitoring to identify which locations best suited and will require continued monitoring to ensure they are operating effectively. Monitoring and data collection are the first steps in protecting the natural streams and recharge areas from contamination. Examples of these projects include the City of Lancaster’s Ecosystem and Riparian Habitat Restoration of Amargosa Creek Ave J to Ave H Project and the Lower Amargosa Creek Recharge Project, both of which will restore riparian habitat along Amargosa Creek (a natural stream and known recharge area).

*Water Quality Objective 4. Maximize beneficial use of recycled water.*

- *Target:* Increase infrastructure and establish policies to use 33% of recycled water to help meet expected demand by 2015, 66 percent by 2025, and 100 percent by 2035.

Currently, the Region uses a small amount (82 AFY) of the available 20,000 AFY of recycled water to meet non-potable customer demands. These numbers do not include recycled water currently used for environmental maintenance. A number of the proposed projects in the IRWM Plan involve enhancements to treatment facilities. Additionally, a number of the stakeholder-identified projects specify the use of recycled water for irrigation, effluent management, and recharge projects; many of which benefit not only water quality objectives, but also water supply and land use management

objectives. There are a number of opportunities for integration between water quality projects, including proposed recharge basins that use effluent from the Palmdale or Lancaster WRPs as a source of recharge water.

#### **Future Planning Efforts and Actions to Fill the Identified Water Quality Management Gaps**

Future efforts are needed to protect the groundwater aquifer from contamination, which includes identifying and mapping the contaminated portions of the aquifer and identifying potential future sources of contamination. The following future planning efforts and actions are suggested to better meet the objectives identified for this strategy.

**Identify Contaminated Portions of the Aquifer.** The planning target, which is provided in order to gauge success on meeting the water quality management objectives, is to identify and prevent migration of contaminated portions of the aquifer. The SNMP for the Antelope Valley, prepared concurrently with this IRWM Plan update, identified and analyzed various constituents found in the Region's aquifer. Additional monitoring and evaluation efforts may be necessary to further study those contaminants that jeopardize the Region's water quality objectives. Refer to the SNMP for information about the Region's groundwater quality.

**Map Contaminated Portions of Aquifer.** The planning target is to map the contaminated portions of the aquifer and monitor contaminant movement. The SNMP mapped the concentrations for select constituents. Additional monitoring, evaluation and mapping efforts may be necessary to better understand the Region's groundwater issues. Refer to the SNMP for available contaminant concentration maps.

**Establish a Well Abandonment Ordinance.** Abandoned wells in the Antelope Valley Region present water quality problems in that they act as conduits for surface and subsurface pollutants. The establishment of a well abandonment ordinance would provide the policing authority to enforce the timely destruction of abandoned wells. The ordinance could provide the authority to require well destruction or rehabilitation as a condition upon sale of property, change of ownership or change of use. The ordinance could also require that new well applications be processed only after the applicant has demonstrated that all existing wells on all property they own are not in violation of the well ordinance.

**Develop and Implement a Regional Groundwater Wellhead Protection Program.** A Wellhead Protection Program (WPP) is a pollution prevention and management program used to protect underground sources of drinking water. A national WPP was established in 1986 by the Federal Safe Drinking Water Act. Some of the elements of these types of programs include the identification of recharge areas, zones of influence, groundwater flow directions, and potential contamination sources. This information is then compiled into a management plan, based on the assessment of alternatives for addressing potential sources of contamination, describing the local ordinances, zoning requirements, monitoring program and other local initiatives. The development of a regional WPP could additionally promote smart land use practices, including prohibiting new industrial, commercial and residential development in areas of sensitive groundwater recharge.

**Develop Management Program for Nitrate and TDS.** TDS and nitrate are of particular concern with regard to water quality in the Antelope Valley Region. TDS is concentrated in the groundwater when SWP water is imported and used for irrigation purposes, especially since the Antelope Valley Region is a closed basin. Nitrates are also present from historical irrigation practices and effluent management. Suggested management measures for these constituents include:

- TDS management measures:

- Reducing the amount of salts imported into the sub-basins – imported water treatment/processes
- Reducing the amount of salts added to groundwater via source water - wastewater treatment, modified processes such as increased retention time, or blending prior to use for irrigation or basin recharge
- Reducing the amount of salts added to water via anthropogenic sources – BMPs, public outreach, land management guidelines
- Natural treatment such as wetland systems
- Transporting and exporting salts to a landfill
- Disposing of salts via brine sales or deep well injection
- Water softener ban
- Nitrate management measures:
  - Developing BMPs such as limiting excess fertilizing (set realistic goals for maximum crop yield) and eliminating over-irrigation to curtail the leaching transport process
  - Developing nutrient management programs and crop-specific nutrient application rates to improve crop fertilizer efficiency (decrease the total residual mass of nitrogen in the soil by using nitrification inhibitors or delayed-release forms of nitrogen)
  - Evaluating activities such as animal operations, food operations, and septic system discharges

Development of a management program and projects for these pollutants of concern, as well as for other emerging contaminants as they are identified, would contribute to meeting the objective of protecting the aquifer from contamination. Additionally, the SNMP for the Antelope Valley found that, based on the Antelope Valley Groundwater Basin’s baseline water quality and project source water quality, managing salt and nutrient loadings on a sustainable basis is feasible with a minimal number of implementation measures.

**Expand the Water Quality Monitoring Program.** Monitoring activities in the Antelope Valley Region include groundwater levels, groundwater quality, land surface subsidence, aquifer compaction, and stream flow. According to the DWR Bulletin 118 (2004), the USGS actively monitors 262 wells for groundwater levels, 10 wells for miscellaneous water quality, and the Department of Health Services monitors 248 wells in the Antelope Valley Region for Title 22 water quality compliance. Expansion of the existing water quality monitoring efforts would allow for more current data collection to better assess the state of the Antelope Valley Region’s water quality and other groundwater parameters. These groundwater quality monitoring programs need to be continued in order to capture the effects of changes in management practices. As Phillips states in his 1993 USGS report, “the need for an ongoing monitoring program transcends the importance of the selection of management alternatives.” Further, in order for a water quality monitoring program to be successful in the Antelope Valley Region, the information collected needs to be shared regionally (i.e., by establishing a clearinghouse) in order to integrate and synthesize the data.

The SNMP includes a monitoring component to ensure the groundwater quality is consistent with applicable SNMP water quality objectives. Select drinking water wells, near projects that may impact groundwater quality (such as recharge projects), will be used as monitoring locations. Refer to the SNMP for monitoring and reporting details.

## 6.3 Flood Management

### Progress to Date and Revisions to Regional Objectives

Flood management issues in the Antelope Valley Region generally relate to management of stormwater flows of variable water quality and the management of nuisance water that ponds after a storm event and eventually evaporates. As part of this IRWM Plan Update, the Region has evaluated its flood management needs in order to update its objectives. The Region recognized that stormwater flow has beneficial uses that may be impacted by upstream flood control, and therefore added a second objective to protect, restore and improve the stewardship of aquatic, riparian and watershed resources in the Region.

Though an integrated flood management summary document was developed in conjunction with this 2013 IRWM Plan Update (see Appendix F), the target set to coordinate a regional flood management plan and policy mechanism by 2010 was not met. The Region revised the target to extend out the goal year to 2017.

### Assessment of IRWM Projects' Potential to Meet Water Quality Management Objectives

The objectives and planning targets identified for flood management include:

*Flood Management Objective 1: Reduce negative impacts of stormwater, urban runoff, and nuisance water.*

*Flood Management Objective 2: Optimize the balance between protecting existing beneficial uses of stormwater and capturing stormwater for new uses.*

- *Target: Coordinate a regional flood management plan and policy mechanism by the year 2017 and incorporate adaptive management strategies for climate change.*

Current integrated flood management practices include the identification of infrastructure improvement projects necessary to reduce localized flooding, mitigate poor water quality and/or to enhance localized recharge. Projects proposed as part of this IRWM Plan that will have flood benefits are shown in Table 6-4.

### Future Planning Efforts and Actions to Fill the Identified Flood Management Gaps

The small scale view typically taken in flood management has a tendency to move projects forward prematurely or to ignore other benefits a project may provide if operated or designed with multi-benefits in mind. Examples of the two tendencies include:

- **Example 1:** Concurrent water supply retention and flood control projects that could each meet the same objectives if combined and designed in an integrated fashion.
- **Example 2:** Concurrent groundwater recharge and flood control projects that could each meet the same objectives if combined and designed in an integrated fashion.

Table 6-4: Projects with Flood Management Benefits

Project	Status
Quartz Hill Storm Drain	Complete
Littlerock Dam Sediment Removal	Implementation
45 <sup>th</sup> Street East Groundwater Recharge and Flood Control Basin	Conceptual
Amargosa Creek Pathways Project	Conceptual
Antelope Valley Watershed Surface Flow Study	Conceptual
Avenue Q and 20 <sup>th</sup> Street East Groundwater and Flood Control Basin (Q-West Basin)	Conceptual
Avenue R and Division Street East Groundwater and Flood Control Basin	Conceptual
Barrel Springs Groundwater Recharge and Flood Control Basin	Conceptual
Big Rock Creek In-River Spreading Grounds	Conceptual
Build a bridge at the existing dip crossing of Mt. Emma Road @ Littlerock Creek	Conceptual
ET Based Controller Program	Conceptual
Flooding Issues Avenue P-8 between 160 <sup>th</sup> and 170 <sup>th</sup> Street East	Conceptual
Flooding Issues Avenue W. near 133 <sup>rd</sup> Street East	Conceptual
Hunt Canyon Groundwater Recharge and Flood Control Basin	Conceptual
Implement ET Controller Program	Conceptual
Littlerock Creek In-River Spreading Grounds	Conceptual
Precision Irrigation Control System	Conceptual
Stormwater Harvesting	Conceptual

These examples illustrate just a few of the concepts that provide support for regional planning. Regional planning begins with stakeholders getting together and formulating a plan to develop a regional plan from flood control, water quality and water supply perspectives, mixing all the components together to optimize the benefits of the program. Typical components of an Integrated Flood Management Plan include:

**Beneficial Use Identification.** In-stream and downstream beneficial uses need to be identified so that the uses can be protected during the Flood Mitigation component. In-stream and downstream beneficial uses would include:

- Diversions for agriculture and stock watering.
- Diversions to percolation ponds.
- Flood flows to maintain the “biological crust: and resurfacing of Rosamond Dry Lake at EAFB.
- Flood flows overbank for riparian habitat.
- Dust control

**Existing Flood Hazard Mapping.** Existing flood hazards need to be well understood and mapped to inform policy and zoning guidelines and identify locations of potential flood mitigation projects. The flood hazards would be developed through hydrologic and hydraulic modeling to create base maps that show flood extents and hazard ratings based on depth and velocity predictions. Potential stakeholders that may contribute financing to the effort would be FEMA and/or the U.S. Army Corps of Engineers (USACE).

**Development Policy.** Standard policy for the Region would need to be enacted for new development projects. The policy would be based on the Existing Flood Hazard Mapping component and would specify criteria for eliminating increased peak flow and volume due to new

impervious surfaces and present guidelines for techniques such as Low Impact Development (LID), source control and BMP designed to improve water quality and decrease runoff volume and peak flow. The policy would also address building within the floodplain by setting finished floor elevation criteria with respect to flood event water surface and upstream and downstream impact criteria associated with floodplain encroachment.

**Flood Mitigation.** Areas prone to flooding that were built prior to the Development Policy component would need to be protected through flood mitigation. Flood mitigation techniques include capacity, detention and diversion techniques such as levees, flood walls, detention basins and upsized infrastructure to increase conveyance capacity. The mitigation options would be tested using the existing hydrologic and hydraulic models developed for the Existing Flood Hazard Mapping component. The design and operation of the infrastructure improvements would be conducted to insure beneficial uses and to optimize the other integrated components of water quality improvements and increases in water supply through groundwater recharge.

## 6.4 Environmental Resource Management

### Progress to Date and Revisions to Regional Objectives

Since the 2007 IRWM Plan was completed, the entities in the Region have worked to preserve open space and natural habitat. For example, the Antelope Valley Conservancy preserved 40 acres of wetlands in 2011 near the community of Pearblossom, in addition to ensuring hundreds of miles of recreational trail preservation. Despite this, as of the 2013 IRWM Plan Updates, the Region was unable to meet its target of preserving an additional 2,000 acres of open space and natural habitat. The Region updated the target goal date from 2015 to 2017.

### Assessment of IRWM Projects' Potential to Meet Environmental Resource Management Objectives

The main issues of concern regarding environmental resource management in the Antelope Valley Region are protection and preservation of open space and protection of endangered species. The following objectives and planning targets were identified to address these concerns:

*Environmental Resource Objective 1.* Preserve open space and natural habitats that protect and enhance water resources and species in the Antelope Valley Region.

- *Target:* Contribute to the preservation of an additional 2,000 acres of open space and natural habitat to integrate and maximize surface and groundwater management by 2017.

A number of proposed projects, shown in Table 6-5, will help the Region to meet its environmental resource management objective. A number of the projects include components to restore habitat. In addition, projects that will recharge the aquifer using spreading grounds will have the secondary benefit of preserving open space. In total, the projects propose to conserve over 2,000 acres of open space and habitat, which exceeds the Region's target.

### Future Planning Efforts and Actions to Fill the Identified Environmental Resource Management Gaps

To better meet the objectives identified for this strategy, the following future planning efforts and actions are suggested.

**Develop a Habitat Conservation Plan for the Antelope Valley Region.** HCPs are developed to outline what steps must be taken to minimize and mitigate the impact of a permitted "take" on a threatened or endangered species. Many HCPs designate open space or habitat as mitigations of "take." Therefore, an HCP is a tool that could be used in the Antelope Valley Region for preserving and protecting open space and habitat.



Table 6-5: Projects with Environmental Resource Management Benefits

Project	Open Space and Habitat Conserved	Status
Antelope-Fremont Watershed Assessment Plan	2,000 acres	Plan/Study
Antelope Valley Regional Conservation Project	5 acres	Implementation
Littlerock Dam Sediment Removal	Not quantified	Implementation
Upper Amargosa Creek Flood Control, Recharge, and Habitat Restoration Project	15 acres	Implementation
45th Street East Groundwater Recharge and Flood Control Basin	208 acres	Conceptual
Amargosa Creek Pathways Project	Not quantified	Conceptual
Antelope Valley Watershed Surface Flow Study	Not quantified	Conceptual
Avenue Q and 20th Street East Groundwater and Flood Control Basin (Q-West Basin)	161 acres	Conceptual
Avenue R and Division Street Groundwater Recharge and Flood Control Basin	93 acres	Conceptual
Barrel Springs Groundwater Recharge and Flood Control Basin	40 acres	Conceptual
Ecosystem and Riparian Habitat Restoration of Amargosa Creek Ave J to Ave H	100 acres	Conceptual
Hunt Canyon Groundwater Recharge and Flood Control Basin	300 acres	Conceptual
Multi-use/Wildlife Habitat Restoration Project	Not quantified	Conceptual
Tropico Park Pipeline Project	Not quantified	Conceptual

**Promote Land Conservation Projects that Enhance Flood Control, Aquifer Recharge, and Watershed and Open Space Preservation.** Though a number of agencies are pursuing groundwater recharge projects, additional promotion of conservation projects could be accomplished through the adoption of a MOU with municipalities in the Antelope Valley Region to elicit and promote compliance with plans approved for the Antelope Valley Region including the area General Plans and the Mojave HCP.

## 6.5 Land Use Planning/Management

### Progress to Date and Revisions to Regional Objectives

Since the 2007 IRWM Plan was developed, the Region has had little growth due to the economic downturn, limiting the Region's ability to meet its land use objectives and targets. The Region has maintained the same objectives and targets, extending out the target date for developing a regional land use management plan to 2017.

### Assessment of IRWM Projects' Potential to Meet Environmental Resource Management Objectives

The main issues of concern regarding land use management in the Antelope Valley Region relate to the preservation of agricultural land, which includes a recognition of the historical relationship to the land and a support of a right to farm as well as the private property rights of all owners to economic benefits from their property, and the ability to provide recreational opportunities for a growing population. The following objectives and planning targets were identified to address these concerns:

*Land Use Management Objective 1. Maintain agricultural land use within the Antelope Valley Region.*

- *Target: Preserve 100,000 acres of farmland in rotation through 2035.*

*Land Use Management Objective 2. Meet growing demand for recreational space.*

- *Target: Contribute to local and regional General Planning documents to provide 5,000 acres of recreational space by 2035.*

*Land Use Management Objective 3. Improve integrated land use planning to support water management.*

- *Target: Coordinate a regional land use management plan by the year 2017 and incorporate adaptive management strategies for climate change.*

Several projects were submitted for inclusion in the AV IRWM Plan that provide direct benefits associated with land use management. Projects such as the Multi-use/Wildlife Habitat Restoration Project will directly create recreational area. Projects that recharge groundwater and expand recycled water availability will help to preserve agricultural lands by continuing to provide a reliable water source. These types of projects indirectly benefit land use management, but do not directly meet the objectives identified for the Antelope Valley Region. Employing land use planning as a strategy provides a way to better manage and protect local water supplies. Programs can be developed to assist in water conservation, protect and improve water quality, address stormwater capture and flooding, protect and enhance environmental habitat areas and recreational opportunities. Thus, implementing land use planning strategies can assist in achieving not only the land use management objectives, but also the overall AV IRWM Plan objectives. The projects shown in Table 6-6 will help the Region to meet its land use planning/management objectives.

**Table 6-6: Projects with Land Use Planning/Management Benefits**

Project	Status
Antelope Valley Water Bank	Complete
Antelope Valley Regional Conservation Project	Implementation
AVEK Strategic Plan	Implementation
Eastside Banking & Blending Project	Implementation
South Antelope Valley Intertie Project	Implementation
Water Supply Stabilization Project – Westside Project (WSSP-2)	Implementation
Water Supply Stabilization Project (WSSP) – Westside Expansion	Implementation
Amargosa Creek Pathways Project	Implementation
Lancaster National Soccer Center Recycled Water Conversion	Implementation
Pierre Bain Park Recycled Water Conversion	Implementation
Whit Carter Park Recycled Water Conversion	Implementation
Upper Amargosa Creek Flood Control, Recharge, and Habitat Restoration Project	Implementation
Palmdale Power Plant Project	Conceptual
Big Rock Creek In-River Spreading Grounds	Conceptual
Multi-use/Wildlife Habitat Restoration Project	Conceptual
North Los Angeles/Kern County Regional Recycled Water Project - Phase 2	Conceptual
North Los Angeles/Kern County Regional Recycled Water Project - Phase 3	Conceptual
North Los Angeles/Kern County Regional Recycled Water Project - Phase 4	Conceptual
North Los Angeles/Kern County Regional Recycled Water Project - Division Street Corridor	Conceptual
North Los Angeles/Kern County Regional Recycled Water Project - Phase 1b	Conceptual
Palmdale Recycled Water Authority – Phase 2 Distribution System	Conceptual

### Future Planning Efforts and Actions to Fill the Identified Land Use Management Gaps

Below are additional future planning efforts and actions that have been identified in order to better meet the land use management objectives.

**Preserve Farmland.** The planning target, which is provided in order to gauge success in meeting the land use management objectives, is to preserve 100,000 acres of farmland in rotation through 2035. At any given time, approximately 19,000 acres of farmland are actively being farmed in the Antelope Valley Region. While some of the proposed projects include farmland as a component that would contribute to this target, it is still being suggested as a future planning effort for the Antelope Valley Region because the planning target was not entirely met.

**Build Public Parks and Recreational Amenities.** The planning target, which is provided in order to gauge success in meeting the land use management objectives, is to increase public parks and recreational amenities by providing 5,000 acres of recreational space by 2035. As this planning target was not met by the projects proposed in this IRWM Plan, it is being suggested as a future planning effort for the Antelope Valley Region. As part of this planning effort, an Antelope Valley Region-wide inventory of existing water-related recreational opportunities could be developed that would aid in providing a needs assessment for future opportunities. Implementation of LID techniques where feasible are recommended.

**Create a Watershed Management Plan.** There is currently no watershed management plan for the Antelope Valley Region. Watershed management plans are similar to this IRWM Plan in that they bring together a wide range of stakeholders, including city and county staff, resource managers and policy officials, and community organizations to protect and restore the aesthetic and function of the watershed where needed. Watershed management plans focus on the ‘function’ of a watershed, and thereby assess the health and value of watershed components.

**Create Incentives for Landowners to Protect/Restore/Preserve Open Space.** Land use agencies have the ability to create incentives and/or eliminate disincentives for landowners to protect and restore open spaces and habitat on their property. Technical assistance and financial incentives have proven effective in protecting and restoring privately held natural areas, which in turn helps to meet regional water quality, flood management and environmental management objectives. Implementation of LID techniques where feasible are recommended.

**Coordinate a Regional Land Use Management Plan.** Traditionally, cities and counties have the responsibility for land use planning, much of which is continued in the local and regional General Plans. These planning documents to some extent address water and environmental resources in the context of land use planning. However, through the coordination of a regional land use plan, these efforts can be combined to better manage and protect local water supplies, improve water quality, reduce flooding, restore habitats and ecosystems, and provide recreational, educational, and access opportunities to the public for a potentially greater regional benefit.

## 6.6 Climate Change Mitigation

### Progress to Date and Revisions to Regional Objective

The Region did not include a climate change mitigation objective as part of its 2007 IRWM Plan. As part of this Plan Update, the Region considered climate change throughout the various Plan sections, including the addition of a climate change mitigation target in Section 4.

**Assessment of IRWM Projects’ Potential to Meet Environmental Resource Management Objectives**

The objective and planning target identified for climate change mitigation include:

*Objective 1: Mitigate against Climate Change*

- Target 1: Implement “no regret” mitigation strategies, when possible, that decrease GHGs or are GHG neutral

The projects shown in Table 6-7 will help the Region to decrease GHG emissions caused by water resources management projects or will help the Region to become GHG neutral. Some projects will directly reduce GHG emissions, such as the Solar Power System at K-8 Division which will reduce GHG emissions caused by power generation. Projects that restore habitat will produce carbon sequestration benefits through the introduction of plants to the area. Projects that offset imported water supply will indirectly reduce GHG emissions by reducing the amount of energy required to move water south from the Delta.

**Table 6-7: Projects with Climate Change Mitigation Benefits**

Project	Status
Antelope Valley Water Bank	Complete
Solar Power System at K-8 Division	Complete
Water Supply Stabilization Project – Westside Project (WSSP-2)	Complete
Antelope Valley Recycled Water Master Plan	Implementation
Antelope Valley Regional Conservation Project	Implementation
AVEK Strategic Plan	Implementation
BCSD Arsenic Management Feasibility Study and Well Design	Implementation
Division Street and Avenue H-8 Recycled Water Tank	Implementation
Eastside Banking & Blending Project	Implementation
Lancaster National Soccer Center Recycled Water Conversion	Implementation
Littlerock Creek Groundwater Recharge and Recovery Project	Implementation
Littlerock Dam Sediment Removal	Implementation
Pierre Bain Park Recycled Water Conversion	Implementation
RCSD Arsenic Consolidation Project	Implementation
Water Supply Stabilization Project (WSSP) – Westside Expansion	Implementation
Whit Carter Park Recycled Water Conversion	Implementation
45th Street East Groundwater Recharge and Flood Control Basin	Conceptual
Avenue Q and 20th Street East Groundwater and Flood Control Basin (Q-West Basin)	Conceptual
Avenue R and Division Street Groundwater Recharge and Flood Control Basin	Conceptual
Barrel Springs Groundwater Recharge and Flood Control Basin	Conceptual
BCSD Arsenic Removal Treatment Plant	Conceptual
Big Rock Creek In-River Spreading Grounds	Conceptual
ET Based Controller Program	Conceptual
Hunt Canyon Groundwater Recharge and Flood Control Basin	Conceptual
Implement ET Controller Program	Conceptual
KC & LAC Interconnection Pipeline	Conceptual
Little Rock Creek In-River Spreading Grounds	Conceptual
Lower Amargosa Creek Recharge Project	Conceptual
Multi-use/Wildlife Habitat Restoration Project	Conceptual
North Los Angeles/Kern County Regional Recycled Water Project - Division Street Corridor	Conceptual
North Los Angeles/Kern County Regional Recycled Water Project - Phase 2	Conceptual

Project	Status
North Los Angeles/Kern County Regional Recycled Water Project - Phase 3	Conceptual
North Los Angeles/Kern County Regional Recycled Water Project - Phase 4	Conceptual
North Los Angeles/Kern County Regional Recycled Water Project - Phase 1b	Conceptual
Palmdale Power Plant Project	Conceptual
Palmdale Recycled Water Authority – Phase 2 Distribution System	Conceptual
Partial Well Abandonment of Groundwater Wells for Arsenic Mitigation	Conceptual
Place Values and Turnouts on Reclaimed Water Pipeline	Conceptual
Precision Irrigation Control System	Conceptual
Pressure Reducing Turbine Electric Generation System (Hydropower)	Conceptual
QHWD Partial Well Abandonment	Conceptual
RCSD Wastewater Pipeline	Conceptual
Stormwater Harvesting	Conceptual
Tertiary Treated Water Conveyance and Incidental Groundwater Recharge of Amargosa Creek Avenue M to Avenue H	Conceptual
Tropico Park Pipeline Project	Conceptual
Ultra-Low Flush Toilet Change-out Program	Conceptual
Waste Water Ordinance	Conceptual
Water Conservation School Education Program	Conceptual

#### Future Planning Efforts and Actions to Fill the Identified Land Use Management Gaps

Below are additional future planning efforts and actions that have been identified in order to better meet the climate change mitigation objective.

**Create or Update Climate Action Plans.** Climate Action Plans are used by municipalities to define how municipal operations can reduce energy and greenhouse gas emissions. The Region's municipalities may consider creating a climate action plan or continuing to update their Climate Action Plans, particularly focusing on how water operations impact the climate.

**Implement Additional Projects to reduce GHG emissions.** The projects proposed will help the Region to reduce its GHG emissions. It may be possible to further reduce GHG emissions or become GHG neutral through the implementation of strategies that are not considered no-regret strategies.