

Proposed Groundwater Management Plan Basin Management Objectives

The Same as Mojave Integrated Regional Water Management Plan Objectives

Summary of Mojave IRWM Plan Objectives

Summary of Objective	Importance^(a)	Urgency^(b)
1. Balance average annual future water demands with available future supplies to ensure sustainability throughout the Region between now and the 2035 planning horizon and beyond.	High	High
2. Continue improving regional water use efficiency by implementing a portfolio of conservation actions that are regionally cost-effective.	High	Medium
3. Maintain stability in previously overdrafted groundwater basins and reduce overdraft in groundwater basins experiencing ongoing water table declines.	High	High
4. Address the State policy goal of reducing reliance on the Delta by meeting water demands with alternative sources of supply during times when State Water Project (SWP) supplies are reduced or unavailable due to droughts, outages, environmental and regulatory restrictions, or other reasons.	High	Medium
5. Optimize the use of the Region's water related assets to maximize available supplies to meet projected demands while mitigating against risks. Water related assets to be optimized include financial resources, groundwater storage programs, available imported water supplies, transfer and exchange opportunities, available physical infrastructure, and management policies.	High	Medium
6. Prevent land subsidence throughout the Region.	Low	Low
7. Provide support and assistance to disadvantaged communities and help facilitate projects and programs that benefit those communities.	High	High
8. Improve environmental stewardship related to waterways and water management in the Region.	High	Medium
9. Improve floodplain management throughout the Plan area.	High	Medium
10. Preserve water quality as it relates to local beneficial uses of water supplied by each source, including groundwater, stormwater, surface water, imported water, and recycled water.	High	Medium

Summary of Objective	Importance^(a)	Urgency^(b)
11. Obtain financial assistance from outside sources to help implement this Plan across a range of project sizes during the planning horizon.	High	Medium
12. Improve public awareness of water supply, conservation, water quality, and environmental stewardship challenges and opportunities throughout the planning horizon.	High	Medium
13. Identify and establish reliable funding sources to maintain, modernize and improve water infrastructure to ensure a high quality, resilient and reliable water supply.	Medium	Medium
14. Increase the use of recycled water in the Region while maintaining compliance with the Mojave Basin Area Judgment as applicable.	Medium	Medium

Schedule of Important Events to Complete Mojave IRWM Plan and Companion Documents

Mojave Integrated Regional Water Management Plan

January

A public notice was posted on January 17, 2014 announcing a public hearing to discuss MWA’s plans to adopt a Resolution of Intention to update its Groundwater Management Plan (GWMP). The public hearing will be held on Thursday, February 13 at 4:30 p.m. during the regular Board meeting of the MWA.

February

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
27	28	29	30 Post material for Stakeholder Meeting #7 to website along with new Draft IRWM Plan sections for review (Sections 5-8).	31	1	2
3	4	5	6 Mojave IRWM Stakeholder Meeting #7	7	8	9
10	11	12	13 MWA Board Mtg <i>Public Hearing to discuss MWA’s Resolution of Intention to update its GWMP.</i>	14 Comments due from Stakeholder Meeting #7 and IRWM Plan Sections 5-8.	15	16
17	18	19	20	21	22	23
24	25	26	27 MWA Board Mtg	28	1	2

March

Project Team will continue work on:

- Updates to Sections 9-12 of the IRWM Plan Update
- The Salt Nutrient Management Plan
- The Groundwater Management Plan

April

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
31 Post draft IRWM Plan Sections 9-11 and Climate Change Section to website for review.	1	2	3	4	5	6
7	8	9	10	11 Comments due for draft IRWM Plan Sections 9-11 and Climate Change	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30 Present Salt & Nutrient Management Plan (SNMP) Draft to Project Team for review	1	2	3	4

May

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
28	29	30	1	2	3	4
5	6	7 Post <i>Salt & Nutrient Management Plan (SNMP) Public Review Draft</i> to website	8	9	10	11
12 Post <i>IRWM Plan Public Review Draft</i> and Material for Stakeholder Meeting #8 to website	13	14	15	16	17	18
19 Proposed Stakeholder Meeting #8 – Present and Discuss Public Review Drafts of <i>IRWM Plan</i> and <i>SNMP</i> Discuss topics for <i>GWMP</i> if needed	20	21	22	23	24	25
26	27	28	29	30	31	1

June

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
26	27	28	29	30	31	1
2 Comments Due for Public Review Drafts of <i>IRWM Plan</i> & <i>SNMP</i>	3	4	5	6	7	8
9 Issue Public Notice for NOI to Adopt <i>IRWM Plan</i> Issue Public Notice for NOI to Adopt <i>SNMP</i>	10	11	12	13	14	15
16 Post Final <i>IRWM Plan</i> & <i>SNMP</i>	17	14	15	16	17	18
23 Proposed Stakeholder Meeting #9 — Present Final <i>IRWM Plan</i> & <i>SNMP</i> Discuss draft GWMP if needed	24 Ask Regional Water Management Group Members and Project Proponents to adopt Mojave IRWM Plan at their earliest convenience	25	26	27	28	29
30	1	2	3	4	5	6

Summary of Project Selection and Prioritization Process

Mojave Integrated Regional Water Management Plan

Screening Criteria¹

In order to be included in the Mojave IRWM Plan, the proposed project needs to:

1. Contribute toward meeting one or more Plan objectives
2. Appear to be technically feasible
3. Appear to be economically feasible
4. Not cause significant unmitigated negative impacts
5. Have a committed project proponent that has the capacity to implement the project

Project Review and Prioritization

The projects that pass the screening criteria will be reviewed according to the following factors based on information provided by the project proponents:

1. How the project contributes to the Mojave IRWM Plan Objectives (projects with larger contributions and that address multiple objectives are preferred)
2. How the project is related to resource management strategies (projects that diversify the water management portfolio are preferred)
3. Technical feasibility of the project (projects with more definitive demonstration of technical feasibility are preferred)
4. Specific benefits to critical DAC water issues (projects that help address critical water supply and water quality needs of DACs are encouraged)
5. Specific benefits to critical water issues for Native American tribal communities (projects that help address critical water supply and water quality needs of Native American tribal communities are encouraged)
6. Environmental Justice Considerations (projects that can reduce inequitable distribution of environmental burdens (i.e. pollution, industrial facilities) and access to environmental goods (i.e. clean water and air, parks, recreation, nutritious foods, etc.) are preferred)
7. Project Costs and Financing (projects with well-defined costs and identified funding sources are preferred)
8. Economic Feasibility (projects shown to be either cost-effective or to have a positive benefit-cost ratio are preferred)
9. Project Status (readiness to proceed may influence the priority given)

¹ As presented in Handout 2 for Stakeholder Meeting #5, 11/5/13

10. Strategic considerations for IRWM Plan implementation (projects with clear analyses related to the proposed implementation approach and Plan objectives are preferred)
11. Contribution of the project in adapting to the effects of climate change (projects that contribute to adaptations that can lessen the negative impacts of climate change are encouraged)
12. Contribution of the project in reducing GHG emissions as compared to project alternatives (projects that help reduce the GHG emissions in the Region are preferred)

The projects that pass the screening criteria and are reviewed will be assigned a rating for importance and urgency and then placed into up to four tiers of projects as shown in Figure 1. The projects will be assigned a rating for importance and urgency after considering the priority of the objectives that they contribute to and the other factors listed above.

These recommendations for inclusion and priority will be discussed with the Stakeholders to reach broad agreement.

Get Real Ranking²

The “Get Real Rank” was assigned by the Project Team and is defined as a holistic view of the project's readiness to proceed with respect to financial backing and level of support with:

- A rank of "1" represents "Yes, the project will proceed."
- A rank of "2" represents "Maybe the project will proceed. There is momentum and interest in the project."
- A rank of "3" represents "Not sure if the project will go forward yet."

² As described in Handout 3c for Stakeholder Meeting #5, 11/5/13

Mojave Region IRWM Plan Potential Projects (Project Summary)

Project No.	Original Project No.	Project Category	Project Title	Lead Agency/ Organization	Project Description	Project Type	Estimated Project Cost	Project Benefits
12		Water Supply / Recharge	Cadiz Valley Water Conservation, Recovery, and Storage Project	Cadiz Inc.	The project will implement a comprehensive, long-term groundwater management program for the groundwater basin underlying the Cadiz property. The project would produce 50,000 acre-feet per year of conserved water.	Design/Construction	Not provided	Create a reliable water supply for Region.
130		Individual or Small System Improvements	Sewer Lift Station Nos. 1 and 3 Improvements	Running Springs Water District	The Running Springs Water District's Sewer Lift Station Nos. 1 and 3 are more than 40 years old and in need of significant improvements to increase reliability and reduce the potential for sanitary sewer overflows into the Deep Creek watershed. The improved reliability to these critical sewer lift stations will increase the water quality impacts to the headwaters of the Mojave watershed.	Implementable	\$1.2M-\$1.5M	Wastewater pollution prevention.

Updated Projects Arranged by Proposed Priority

Tier 2 (L,H)	Tier 1 (M,H)	Tier 1 (H,H)
		<p style="text-align: center;">GRI = 1</p> <p>18R – Commercial / Industrial / Multi-Family Cash for Grass Program</p> <p>60R – Reorganization between 2 Small Water Agencies (BDVWA and CSA 70 Zone W-1 [Landers])</p> <p>92R – Wastewater Reclamation Project (Hi-Desert WD)</p> <p>93 – Apple Valley & Hesperia Subregional Water Reclamation Facilities - VVWRA</p> <p>1011 – Antelope Valley Wash / Rancho Basin Recharge Ponds</p> <p style="text-align: center;">GRI = 2</p> <p>19 – Conceptual Planning for Hinkley’s Community Drinking Water System</p> <p>32 – Helendale CSD Tertiary Treatment Upgrade</p> <p>95 – Adelanto Pearmain Relief Sewer Line</p> <p>106 – Sheep Creek Recharge Basin & Two Wells</p> <p>116 – Replacement Water Supply for Perchlorate / Nitrate Affected GW – Barstow Area</p> <p>1003 – Assistance Program for Small Drinking Water Systems</p> <p>1004 – Baja Sustainability Initiative #1 (Ag Water Conservation & Base Annual Production Right Acquisition Program)</p> <p>1012 – Cedar Street / Bandicoot Detention Basin (City of Hesperia)</p>
Tier 4 (L,M)	Tier 3 (M,M)	Tier 2 (H,M)
	<p style="text-align: center;">GR=2</p> <p>57 – Recycled Water Distribution System (City of Hesperia)</p>	<p style="text-align: center;">GRI=1</p> <p>13R – Camp Cady: Tamarisk Removal & Riparian Restoration Program</p> <p>118 – Weather Based Irrigation / Completion of Demonstration Garden Project (Barstow CC)</p> <p>1001 – Sewer Lift Station or Reverse Osmosis Treatment Plant (City of Victorville)</p> <p>1006 – Capital Water Main Replacement Program (Hi-Desert WD)</p> <p style="text-align: center;">GRI=2</p> <p>21 – Dairy Nitrate Reduction</p> <p>34 – Hydroelectric Facility at Deep Creek for R3 Wells</p> <p>49 – Mojave River Walk Trail</p>

		<p>65 – State Water Project Utilization & Efficiency Strategy 72 – Twentynine Palms Fluoride Treatment Plant Expansion 1009 – Baja Sustainability Initiative #3 (Channel Dredging, Flood Control, Riparian Protection & Vegetation Removal) 1010 – Joshua Basin WD CUWCC Compliance 1014 – Water University 1015 – SB County Integrated Flood Projects 128 – Transition Zone Water Quality Study 129 - Well Abandonment 130 - Sewer Lift Station Nos. 1 and 3 Improvements</p>
<p>Tier 4 (L,L)</p>	<p>Tier 4 (M,L)</p> <p>GR=3 31 – Helendale CSD – WWTP Effluent Distribution System</p>	<p>Tier 3 (H,L)</p> <p>GR=3 from (H,H) 3R – Ames/Reche GW Storage & Recovery Program – Phase II Expansion 12 - Cadiz Valley Water Conservation, Recovery, and Storage Project 22 – Deep Creek Off-River Recharge and Storage Basins 29 – Forks Dam Storm Water Detention 35 – Indian Cove Stormwater Capture & Recharge 42R – Johnson Valley Pressurized Water System 54 – Oro Grande Wash GW Recharge Project 56R – Alto Subarea Regional Aquifer Storage & Restoration (ASR2) 62R – Water Conservation Ordinance 66R – State Water Project Water Treatment Plant with R3 73 – Twentynine Palms GW Protection Plan Septic System Mgmt. Element (SSME) 74R – Water Infrastructure Restoration Program: Pipeline Installation / Replacement (Bighorn-Desert View) 94R – Fluoride and Arsenic Treatment (City of Adelanto) 101 – Cushenbury Flood Detention Basin 102 – Local Wastewater Treatment Plant (Lucerne) 103 – Lucerne Valley Recharge Ponds 1002 – Policies Requiring Mods to the Mojave Basin Area Judgment 1007 – Baja Sustainability Initiative #2 (Baja Major Storm Diversion Network) 1013 – Baja Sustainability Initiative #4 (Well Assistance Program)</p> <p>GRI = 3 from (H,M) 27 – Dry Well Installation Program (Town of Apple Valley) 36R – Infrastructure Improvement Projects (Joshua Basin)</p>

		<p>38R – Joshua Basin WD Central WW Treatment Plant</p> <p>40R – Joshua Basin WD Graywater & Rainwater Harvesting</p> <p>41R – Joshua Basin WD Stormwater Recovery</p> <p>58 – Regional Aquifer Recharge Capacity</p> <p>59 – Regional Flood Control / Flood Management Plan</p> <p>63 – Sheep Creek Wash Storm Water</p> <p>64 – Silver Lakes Assoc. Stormwater Debris Retention Basin</p> <p>68R – Storm Water Retention and Percolation in Hondo Wash Ruby Wash</p> <p>82 – Wrightwood Imported Water</p> <p>86 – Alta Loma Reservoir Replacement</p> <p>97 – Adelanto Reclaimed Water Delivery Infrastructure</p> <p>98R – Rehabilitation of Sewage Lift Station (City of Adelanto)</p> <p>105 – Wrightwood Sewer Plan</p> <p>115 – Land & Water Rights Acquisition (California Dept. of Fish & Wildlife)</p> <p>117 – Water Supply and Quality (San Bernardino County Special Districts Dept.)</p> <p>121 – Rehabilitate pre-1960 Pipelines (Lake Arrowhead CSD)</p> <p>122 – Effluent Outfall Replacement Project (Lake Arrowhead CSD)</p> <p>125 – Gage Tributary MWA Washes</p> <p>126 – Community Park and Demo Garden</p> <p>127 - Water Well No. 10</p> <p>1005 – Regional Demonstration Garden Program – Multiple Locations</p> <p>1008 – R-Cubed Enhanced Purveyor Supply System</p>
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Highlighted Projects have changed ranking/been added since the December 16, 2013 Stakeholder Meeting.

Updated Plan Performance Monitoring Objectives for the Mojave IRWM Plan

Mojave Integrated Regional Water Management Plan

Summary of Objective	Quantitative Measurement	Target	Approach	Comments
1. Balance average annual future water demands with available future supplies to ensure sustainability throughout the Region between now and the 2035 planning horizon and beyond.	Measured by forecasted average annual demand (adjusted by expected levels of conservation) at different times through the planning period compared with forecasted average annual available water supplies at different times through planning period.	Water supply and demands are balanced throughout Region over entire planning period.	Compare every five years when Urban Water Management Plan (UWMP) is complete. 2015 is next date for comparison.	Group agreed to target and approach as they are.
2. Continue improving regional water use efficiency by implementing a portfolio of conservation actions that are regionally cost-effective.	<p>a. Continue reducing urban per-capita water use through all available actions that are regionally cost-effective. Measured by time series of annual per-capita water use.</p> <p>b. Increase agricultural water use efficiency by moving towards efficient water management practices for sustainable agriculture. Measured by the number of farms utilizing viable best management practices, including irrigation practices, equipment, and crop types.</p> <p>c. Increase industrial water use efficiency by moving towards applicable best management practices. Measured by the number of industries utilizing viable best water conserving management practices, equipment and technologies.</p>	<p>a. <u>Continue to reduce annual per-capita water use until we reach 100 gallons per capita per day in the region. Reduce per-capita consumption by 2.5% per year.</u></p> <p>b. <u>Continue to reduce agricultural water use as measured by acre feet of per acre of crop. Reduce regional agricultural consumption by 1% per year</u></p> <p>c. <u>Continue to reduce the water used by industrial application. Reduce regional industrial consumption by 1% per year.</u></p>	<p>a. <u>Measure the municipal water use divided by the population.</u></p> <p>b. <u>Measure the amount of water applied in acre feet per acre of agricultural use.</u></p> <p>c. <u>Measure the amount of water pumped by industrial water users.</u></p>	Nick Schneider at MWA (water conservation person) will discuss with AWAC and propose targets and method of tracking for a, b, and c.

Summary of Objective	Quantitative Measurement	Target	Approach	Comments
<p>3. Maintain stability in previously overdrafted groundwater basins and reduce overdraft in groundwater basins experiencing ongoing water table declines.</p>	<p>Measured by long-term stability of groundwater levels in the regional monitoring well network and mass water balance calculations by subarea.</p>	<p><u>For basins not in overdraft: no negative change in groundwater level. For basins currently in overdraft, reduce trend in overdraft by 50% by 2025 and reduce overdraft to 0 by 2035.</u></p>	<p><u>Select key groundwater level indicator wells for each subarea. Establish trend based upon past 5 years. Report progress annually.</u></p>	<p>Project Team will recommend target and tracking method. Kirby suggested the term “reduce overdraft” can serve as the target and can use the Watermaster’s state of the basin for tracking. Questions were raised about how variations in groundwater levels will be considered related to overdraft.</p>
<p>4. Address the State policy goal of reducing reliance on the Delta by meeting water demands with alternative sources of supply during times when State Water Project (SWP) supplies are reduced or unavailable due to droughts, outages, environmental and regulatory restrictions, or other reasons.</p>	<p>Measured by comparing banked or reserve water supplies with water needs to meet a 6-year drought or 3-year outage on the SWP.</p>	<p><u>At least 75,000 acre-feet banked groundwater regionally.</u></p>	<p>Report annual banked and reserve water supplies and compared to targets. <u>Update target every five years based upon the greater of:</u></p> <ul style="list-style-type: none"> • <u>3 years projected SWP demands; or</u> • <u>6 years projected SWP demands less SWP water available during worst 6 dry years per SWP delivery reliability report.</u> 	<p>Lance at MWA will provide proposed target and method of tracking.</p>

Summary of Objective	Quantitative Measurement	Target	Approach	Comments
5. Optimize the use of the Region’s water related assets to maximize available supplies to meet projected demands while mitigating against risks. Water related assets to be optimized include financial resources, groundwater storage programs, available imported water supplies, transfer and exchange opportunities, available physical infrastructure, and management policies.	<ul style="list-style-type: none"> a. Measured by available SWP supplies stored, used locally, transferred or exchanged vs. available SWP supplies unused or lost. b. Measured by financial resources that originate outside of the Region and are made available to improve integrated water management within the Region. c. Measured by long-term cost savings created by improvements in operational efficiency, reduced energy consumption, reduced system failures and repairs, etc. 	<ul style="list-style-type: none"> a. <u>95% of available SWP supplies used, transferred, or exchanged over 5 year period.</u> b. <u>\$20 million every 5 years in revenues or value received through transfers, sales, or exchanges of SWP water.</u> c. Need help with this one. 	<ul style="list-style-type: none"> a. <u>Compare annual SWP supplies available vs amount used, transferred or exchanged using a 5-year running average.</u> b. <u>5-year running total reported annually.</u> c. Need help with this. 	Lance at MWA will provide proposed target and method of tracking for a, b, and c. A suggestion was to create a standard form and ask project proponents to complete and share on a periodic basis for tracking purposes.
6. Prevent land subsidence throughout the Region.	Measured by monitoring land surface changes, every five years, in areas of known historic subsidence.	Target is 0 subsidence.	USGS report is completed every 5 years, which will be used.	Lance, can someone at MWA provide us the name of the USGS report?
7. Provide support and assistance to disadvantaged communities and help facilitate projects and programs that benefit those communities.	Measured by the number of projects and programs implemented and the investments made on an ongoing basis that benefit disadvantaged communities.	Target is ten implemented projects, programs, or investments that help meet Plan objectives for DACs over the next five years.	<u>Annual tracking of projects or programs implemented for DACs.</u>	Recommend forming a subcommittee of the Implementation Support Team to focus on this Objective.

Summary of Objective	Quantitative Measurement	Target	Approach	Comments
8. Improve environmental stewardship related to waterways and water management in the Region.	<ul style="list-style-type: none"> a. Measured by acres of sensitive environmental/habitat areas restored or new sensitive environmental/habitat areas set aside for protection. b. Measured by the number of new recreational or educational projects that are connected to environmental stewardship programs. c. Measured by protection and restoration of riparian habitat areas as identified in Exhibit H of the Mojave Basin Area Judgment. 	<ul style="list-style-type: none"> a. Use 50 wet acres as a starting target for restoring sensitive environmental/ on annual basis?? . b. To complete a minimum of two (2) projects per year. c. Need help setting target on this. 	<ul style="list-style-type: none"> a. MDRCD will provide the information to MWA on an annual basis. b. Establish a data base that includes entities such as cities, water companies, school districts, etc. that are capable of completing recreational or educational projects related to environmental stewardship. Contact these entities semi-annually to determine the status of any projects they may have that fulfill the objective. c. MDRCD will provide the information to MWA on an annual basis?? Chuck do you have this info? 	<ul style="list-style-type: none"> a. Lance and Chuck to provide proposed target and method of tracking. b. Since this objective involves education, we spoke with AWAC. Objective 8b is nearly identical to 12c; information received by Yvonne from the various entities would be used to measure both objectives. c. Lance and Chuck again.

Summary of Objective	Quantitative Measurement	Target	Approach	Comments
9. Improve floodplain management throughout the Plan area.	<p>a. Increase coordination between agencies to establish programs and projects related to floodplain management that have multiple benefits/multiple uses. Measured by the number of new multi-benefit/multi-use floodplain projects or programs established.</p> <p>b. Coordination between multiple agencies to reduce risk of flood damage through proactive operations along the flood prone areas. Measured by reduction in monetary impact of flood damage compared to damage caused by historical floods of similar magnitude.</p>	<p>a. A suggestion was made to use projects in the IRWM Plan for target and tracking. Recommend set target at 5 new multi-benefit/multi-use floodplain projects or programs implemented within next 10 years.</p> <p>b. [Set target(s) for coordination, flood risk reduction, and monetary impacts] [suggested by Tim: 20% reduction in monetary impact of flood damage as compared to last flood of similar magnitude]</p>	<p>a. Track based on annual project status reports and summary of coordination activities related to relevant projects.</p> <p>b. Describe how to measure and report [suggested by Tim: annual review of flood events in region. If a flood event occurred, compare monetary impact to last flood of similar magnitude.]</p>	<p>a. There are 11 flood projects in IRWM Plan (including 1 integrated project that is 6 smaller projects).</p> <p>b. Lance to contact County Flood Control and discuss target and tracking method for Item B.</p>

Summary of Objective	Quantitative Measurement	Target	Approach	Comments
10. Preserve water quality as it relates to local beneficial uses of water supplied by each source, including groundwater, stormwater, surface water, imported water, and recycled water.	a. Measured by policies and programs culminating from regional collaboration of multiple stakeholders resulting in sound public policies that protect water quality. b. Regular summaries of key water quality constituents for various water supplies as they relate to the local beneficial uses.	a. [Set target(s) for collaborative policies and programs] b. [Describe target(s) for key water quality constituents]	a. [Describe how to measure and report] b. [Describe how to measure and report]	a. SNMP is an example of a project that helps meet this objective. Lance to ask RWQCB for ideas on targets and tracking of relevant policies and programs. b. Lance to review what is available in annual summary for water quality in Region and recommend approach. Could use annual drinking water quality. Suggest a target of 0 violations of drinking water standards.

Summary of Objective	Quantitative Measurement	Target	Approach	Comments
11. Obtain financial assistance from outside sources to help implement this Plan across a range of project sizes during the planning horizon.	<p>a. Obtain outside financial assistance for small water systems¹, measured by the number of small systems that acquired outside funding and the amount of funding acquired.</p> <p>b. Obtain outside financial assistance for other projects and programs (not within small water systems), measured by the amount of outside funds acquired.</p>	<p>a. Target is 25% of total investments made for Plan projects over the next five years.</p> <p>b. <u>25% of total investments (not within small systems) in projects and programs over next 5 years.</u></p>	<p>a. Track expenditures and outside financial assistance (including grants and cost savings due to discounted loans) for projects being implemented through annual project summaries.</p> <p>b. <u>Same method as “a” above.</u></p>	<p>Kathy at MWA will propose targets and method of tracking for items #a and #b. May want to set different percentage goals for projects for DACs and other projects.</p>

¹For the purposes of measuring benefit towards this objective, water systems will be considered “small” if they deliver less than 3,000 AF per year or have fewer than 3,000 service connections.

Summary of Objective	Quantitative Measurement	Target	Approach	Comments
12. Improve public awareness of water supply, conservation, water quality, and environmental stewardship challenges and opportunities throughout the planning horizon.	a. Measured by the results of regular surveys that gauge awareness regarding these topics. b. Measured by documented outreach to all stakeholder types as listed in the IRWM guidelines. c. Measured by the number of new recreational or educational projects that are connected with environmental stewardship efforts.	a. Conduct an annual citizen survey gauging public awareness of water supply, conservation and water quality. b. Conduct two outreach programs in each of our subareas per year i.e. Morongo, Alto, Baja, Centro, Este and Oeste. c. Complete a minimum of two projects per year.	a. Maintain a 75% level of concern regarding water supply, conservation and water quality throughout the region (very concerned + somewhat concerned). b. Work collaboratively with various organizations to partner in the development of outreach events. c. Establish a database that includes the entities listed and obtain an email address of the correct contact person. Then, semi-annually, send out an email questionnaire asking about the status of any projects (recreational or educational) that fulfills this objective.	Nick at MWA (water conservation person) will discuss with AWAC and propose targets and method of tracking.

Summary of Objective	Quantitative Measurement	Target	Approach	Comments
13. Identify and establish reliable funding sources to maintain, modernize and improve water infrastructure to ensure a high quality, resilient and reliable water supply.	a. Measured regularly by the estimated cost of deferred maintenance. b. Measured by the number of water systems that improve operations to withstand or reduce the number of system failures and improve system efficiencies.	a. [Set target(s) for reduced deferred maintenance] b. [Set target(s) for operational improvement]	a. [Describe how to measure and report] b. [Describe how to measure and report]	The targets and tracking for this are going to be challenging. Group suggested creating an annual survey or forming a sub-committee to look into this in the future.
14. Increase the use of recycled water in the Region while maintaining compliance with the Mojave Basin Area Judgment as applicable.	Measured by changes in the volume of recycled water being used in the Region.	<u>Double recycled water use (purple pipe; not total discharges from wastewater treatment plants) over next 10 years.</u>	<u>Compare annual recycled water volumes to 2010 volume.</u>	Project Team will provide proposed target and method of tracking.

Draft Climate Change Vulnerability Checklist

Mojave Integrated Regional Water Management Plan

Identification of watershed characteristics that could potentially be vulnerable to future climate change is the first step in assessing the climate change vulnerabilities in the Region. In the context of this analysis, vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with and adapt to, the adverse effects of climate change, consistent with the definition in the recently issued Climate Change Handbook for Regional Water Planning and consistent with climate change requirements in the Proposition 84 IRWM Plan Guidelines (October 2012).

This Climate Change Vulnerability Checklist for the Mojave Region is a required element for an IRWM Plan and was provided by the Department of Water Resources (DWR) in its Climate Change Handbook found at <http://www.water.ca.gov/climatechange/CCHandbook.cfm>.

The questions found in the checklist are identified by number and are **bold** and italicized. This checklist is intended to be an appendix to the IRWM Plan. For the questions with no checks in the boxes, this indicates the answer being “no”. A checked box means “yes”. Therefore, the more boxes checked in a category indicates the more vulnerable the Region is to that category/element of climate change.

I. Water Demand

Are there major industries that require cooling/process water in your planning region?

- As average temperatures increase, cooling water needs may also increase.
- Identify major industrial water users in your region and assess their current and projected needs for cooling and process water.

Does water use vary by more than 50% seasonally in parts of your region?

- Seasonal water use, which is primarily outdoor water use, is expected to increase as average temperatures increase and droughts become more frequent.
- Where water use records are available, look at total monthly water uses averaged over the last five years (if available). If maximum and minimum monthly water uses vary by more than 25%, then the answer to this question is "yes".
- Where no water use records exist, is crop irrigation responsible for a significant (say >50%) percentage of water demand in parts of your region?

Are crops grown in your region climate-sensitive? Would shifts in daily heat patterns, such as how long heat lingers before night-time cooling, be prohibitive for some crops?

- Fruit and nut crops are climate-sensitive and may require additional water as the climate warms.

Do groundwater supplies in your region lack resiliency after drought events?

- Droughts are expected to become more frequent and more severe in the future. Areas with a more hardened demand may be particularly vulnerable to droughts and may become more dependent on groundwater pumping.

Are water use curtailment measures effective in your region?

- Droughts are expected to become more frequent and more severe in the future. Areas with a more hardened demand may be particularly vulnerable to droughts.

 Are some instream flow requirements in your region either currently insufficient to support aquatic life, or occasionally unmet?

- Changes in snowmelt patterns in the future may make it difficult to balance water demands. Vulnerabilities for ecosystems and municipal/agricultural water needs may be exacerbated by instream flow requirements that are:

1. not quantified,
2. not accurate for ecosystem needs under multiple environmental conditions including droughts, and
3. not met by regional water managers.

II. Water Supply

 Does a portion of the water supply in your region come from snowmelt?

- Snowmelt is expected to decrease as the climate warms. Water systems supplied by snowmelt are therefore potentially vulnerable to climate change.

- Where watershed planning documents are available, refer to these in identifying parts of your region that rely on surface water for supplies; if your region contains surface water supplies originating in watersheds where snowpack accumulates, the answer to this question is "Yes."

- Where planning documents are not available, identify major rivers in your region with large users. Identify whether the river's headwaters are fed by snowpack.

 Does part of your region rely on water diverted from the Delta, imported from the Colorado River, or imported from other climate-sensitive systems outside your region?

- Some imported or transferred water supplies are sources from climate-sensitive watersheds, such as water imported from the Delta and the Colorado River.

 Does part of your region rely on coastal aquifers? Has salt intrusion been a problem in the past?

- Coastal aquifers are susceptible to salt intrusion as sea levels rise, and many have already observed salt intrusion due to over-extraction, such as the West Coast Basin in southern California.

 Would your region have difficulty in storing carryover supply surpluses from year to year?

- Droughts are expected to become more severe in the future. Systems that can store more water may be more resilient to droughts.

 Has your region faced a drought in the past during which it failed to meet local water demands?

- Droughts are expected to become more severe in the future. Systems that have already come close to their supply thresholds may be especially vulnerable to droughts in the future.

 Does your region have invasive species management issues at your facilities, along conveyance structures, or in habitat areas?

- As invasive species are expected to become more prevalent with climate change, existing invasive species issues may indicate an ecological vulnerability to climate change.

III. Water Quality

? ***Are increased wildfires a threat in your region? If so, does your region include reservoirs with fire-susceptible vegetation nearby which could pose a water quality concern from increased erosion?***

- Some areas are expected to become more vulnerable to wildfires over time. To identify whether this is the case for parts of your region, the California Public Interest Energy Research (PIER) Program has posted wildfire susceptibility projections as a Google Earth application at: <http://cal-adapt.org/fire/>. These projections are only the results of a single study and are not intended for analysis, but can aid in qualitatively answering this question. Read the application's disclaimers carefully to be aware of its limitations.

Does part of your region rely on surface water bodies with current or recurrent water quality issues related to eutrophication, such as low dissolved oxygen or algal blooms? Are there other water quality constituents potentially exacerbated by climate change?

- Warming temperatures will result in lower dissolved oxygen levels in water bodies, which are exacerbated by algal blooms and in turn enhance eutrophication. Changes in streamflows may alter pollutant concentrations in water bodies.

Are seasonal low flows decreasing for some waterbodies in your region? If so, are the reduced low flows limiting the waterbodies' assimilative capacity?

- In the future, low flow conditions are expected to be more extreme and last longer. This may result in higher pollutant concentrations where loadings increase or remain constant

Are there beneficial uses designated for some water bodies in your region that cannot always be met due to water quality issues?

- In the future, low flows are expected decrease, and to last longer. This may result in higher pollutant concentrations where loadings increase or remain constant.

Does part of your region currently observe water quality shifts during rain events that impact treatment facility operation?

- While it is unclear how average precipitation will change with temperature, it is generally agreed that storm severity will probably increase. More intense, severe storms may lead to increased erosion, which will increase turbidity in surface waters. Areas that already observe water quality responses to rainstorm intensity may be especially vulnerable.

IV. Sea Level Rise

Has coastal erosion already been observed in your region?

- Coastal erosion is expected to occur over the next century as sea levels rise.

Are there coastal structures, such as levees or breakwaters, in your region?

- Coastal structures designed for a specific mean sea level may be impacted by sea level rise.

Is there significant coastal infrastructure, such as residences, recreation, water and wastewater treatment, tourism, and transportation) at less than six feet above mean sea level in your region?

- Coastal flooding will become more common, and will impact a greater extent of property, as sea levels rise. Critical infrastructure in the coastal floodplain may be at risk.

- Digital elevation maps should be compared with locations of coastal infrastructure.

Are there climate-sensitive low-lying coastal habitats in your region?

- Low-lying coastal habitats that are particularly vulnerable to climate change include estuaries and coastal wetlands that rely on a delicate balance of freshwater and salt water.

Are there areas in your region that currently flood during extreme high tides or storm surges?

- Areas that are already experiencing flooding during storm surges and very high tides, are more likely to experience increased flooding as sea levels rise.

Is there land subsidence in the coastal areas of your region?

- Land subsidence may compound the impacts of sea level rise.

Do tidal gauges along the coastal parts of your region show an increase over the past several decades?

- Local sea level rise may be higher or lower than state, national, or continental projections.

- Planners can find information on local tidal gauges at

http://tidesandcurrents.noaa.gov/sltrends/sltrends_states.shtml?region=ca.

V. Flooding

Does critical infrastructure in your region lie within the 200-year floodplain? DWR's best available floodplain maps are available at:

http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fes/best_available_maps/.

- While it is unclear how average precipitation will change with temperature, it is generally agreed that storm severity will probably increase. More intense, severe storms may lead to higher peak flows and more severe floods.

- Refer to FEMA floodplain maps and any recent FEMA, US Army Corps of Engineers, or DWR studies that might help identify specific local vulnerabilities for your region. Other follow-up questions that might help answer this question:

1. What public safety issues could be affected by increased flooding events or intensity? For example, evacuation routes, emergency personnel access, hospitals, water treatment and wastewater treatment plants, power generation plants and fire stations should be considered.
2. Could key regional or economic functions be impacted from more frequent and/or intense flooding?

Does part of your region lie within the Sacramento-San Joaquin Drainage District?

- The SSJDD contains lands that are susceptible to overflows from the Sacramento and San Joaquin Rivers, and are a key focus of the Central Valley Flood Protection Plan. (<http://www.water.ca.gov/cvfmpprogram.cfm>).

Does aging critical flood protection infrastructure exist in your region?

- Levees and other flood protection facilities across the state of California are aging and in need of repair. Due to their overall lowered resiliency, these facilities may be particularly vulnerable to climate change impacts.

- DWR is evaluating more than 300 miles of levees in the San Joaquin and Sacramento Rivers Valleys and the Delta (<http://www.water.ca.gov/levees/>).

Have flood control facilities (such as impoundment structures) been insufficient in the past?

- Reservoirs and other facilities with impoundment capacity may be insufficient for severe storms in the future. Facilities that have been insufficient in the past may be particularly vulnerable.

Are wildfires a concern in parts of your region?

- Wildfires alter the landscape and soil conditions, increasing the risk of flooding within the burn and downstream areas. Some areas are expected to become more vulnerable to wildfires over time. To identify whether this is the case for parts of your region, the California Public Interest Energy Research Program (PIER) has posted wildfire susceptibility projections as a Google Earth application at: <http://cal-adapt.org/fire/>. These projections are the results of only a single study and are not intended for analysis, but can aid in qualitatively answering this question. Read the application's disclaimers carefully to be aware of its limitations.

VI. Ecosystem and Habitat Vulnerability

 Does your region include inland or coastal aquatic habitats vulnerable to erosion and sedimentation issues?

- Erosion is expected to increase with climate change, and sedimentation is expected to shift. Habitats sensitive to these events may be particularly vulnerable to climate change.

 Does your region include estuarine habitats which rely on seasonal freshwater flow patterns?

- Seasonal high and low flows, especially those originating from snowmelt, are already shifting in many locations.

 Do climate-sensitive fauna or flora populations live in your region?

- Some specific species are more sensitive to climate variations than others.

 Do endangered or threatened species exist in your region? Are changes in species distribution already being observed in parts of your region?

- Species that are already threatened or endangered may have a lowered capacity to adapt to climate change.

 Does the region rely on aquatic or water-dependent habitats for recreation or other economic activities?

- Economic values associated with natural habitat can influence prioritization.

 Are there rivers in your region with quantified environmental flow requirements or known water quality/quantity stressors to aquatic life?

- Constrained water quality and quantity requirements may be difficult to meet in the future.

 Do estuaries, coastal dunes, wetlands, marshes, or exposed beaches exist in your region? If so, are coastal storms possible/frequent in your region?

- Storm surges are expected to result in greater damage in the future due to sea level rise. This makes fragile coastal ecosystems vulnerable.

 Does your region include one or more of the habitats described in the Endangered Species Coalition's Top 10 habitats vulnerable to climate change (<http://www.itsgettinghotoutthere.org/>)?

- These ecosystems are particularly vulnerable to climate change.

 Are there areas of fragmented estuarine, aquatic, or wetland wildlife habitat within your region? Are there movement corridors for species to naturally migrate? Are there infrastructure projects planned that might preclude species movement?

- These ecosystems are particularly vulnerable to climate change.

VII. Hydropower

Is hydropower a source of electricity in your region?

- As seasonal river flows shift, hydropower is expected to become less reliable in the future.

Are energy needs in your region expected to increase in the future? If so, are there future plans for hydropower generation facilities or conditions for hydropower generation in your region?

- Energy needs are expected to increase in many locations as the climate warms. This increase in electricity demand may compound decreases in hydropower production, increasing its priority for a region.

Handout 6: Summary of Requested Review, Comments and Input

Mojave Integrated Regional Water Management Plan

Thank you for helping develop the Mojave IRWM Plan. Your input is appreciated and essential to development of a successful and meaningful document. If you would like to provide comments and suggestions to the draft materials presented during Meeting 7, please send your questions, comments, or suggestions to the Plan Development Team by **Friday, February 14, 2014** to comments@mywaterplan.com on the following items (when submitting comments, please submit as a Word document or as email text with the handout # or section #, page #, and paragraph # included for each comment.):

Review Handout 4: Updated Plan Performance Monitoring and Reporting

- Are you clear about what will be tracked to monitor plan performance? If no, what additional information would be helpful to make it clearer?
- Do you have any suggestions to improve the proposed monitoring approach for IRWM Plan implementation?
- Does your organization/agency, or do you know of any organizations/agencies that track data that would be relevant to monitoring how IRWM Plan objectives are being addressed? If so, what is monitored and how are the data stored?

Review Handout 5: Climate Change Vulnerability Assessment

- Do you agree with the recommended responses to the questions in the checklist? If not, what would you modify/add and why? Please be specific.