VOLUME 2: IRWM PLAN APPENDICES

2018 Coachella Valley Integrated Regional Water Management & Stormwater Resource Plan

FINAL
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Plan Prepared by:
Coachella Valley Regional Water Management Group
In Collaboration with the Planning Partners

Appendix VI-A.1: IRWM Plan Standards Review

This appendix includes the Coachella Valley Regional Water Management Group's (CVRWMG's) self-assessment of the IRWM component of the2018 Coachella Valley IRWM/SWR Plan, based on the IRWM Plan Standards Review Form provided by DWR in Volume 2, Section V of the *2016 IRWM Program Guidelines*.

1 IRWM Plan Review Process

The IRWM Plan Review Process detailed in the *2016 IRWM Program Guidelines* Volume 2, Section V provides IRWM regions with guidelines on the IRWM Plan assessment process that will be implemented by DWR prior to the first round of Proposition 1 Implementation Grant funding. This guidance document explains when to submit IRWM Plans, what should be submitted, how regions can submit their IRWM Plans to DWR, and DWR's IRWM Plan review efforts.

1.1 When to Submit

IRWM Plans should be submitted to DWR for review and confirmation that plans are consistent with the standards put forth by DWR in the *2016 IRWM Program Guidelines*. IRWM Plans must be submitted and pass review to establish eligibility for future Proposition 1 Implementation Grant funding, or if a Region has received past Proposition 84 Implementation grant funding that included an IRWM Plan update as a condition of the grant. IRWM Plans may be submitted for other reasons, and other, future opportunities may require confirmation of an IRWM Plan consistent with DWR Guidelines. RWMGs are encouraged to submit plans for review as early as possible, to allow time for review and resolution of any deficiencies in the plan. Plans must be submitted prior to the Proposition 1 Implementation Grant - Round 1. Note that the review process does not extend the deadline for Plan submittal as part of an existing grant agreement.

1.2 What to Submit

IRWM Plans should be submitted in their entirety (including appendices) along with a transmittal letter from the RWMG or Grantee. DWR encourages inclusion of an optional "road map" that provides references to specific pages and plan sections for required plan elements. Details on what must be included in the transmittal letter are provided in Volume 2, Section IV of the *2016 IRWM Program Guidelines*.

1.3 How to Submit

Only electronic copies of the IRWM Plan and transmittal letter will be accepted (CD/DVD preferred, email accepted). Details on how to submit the Plan are provided in Volume 2, Section IV of the *2016 IRWM Program Guidelines*.

1.4 Plan Review

The Plan Review Process will use the Plan Standards Review Form discussed in Volume 2, Section V of the *2016 IRWM Program Guidelines*. Plans will be reviewed on a Pass/Fail basis, and each standard must be passed by meeting 1 (of 1), 2 (of 2 or 3), 3 (of 4 or 5), or 70% (of more than 5) requirements within each standard. Following DWR review of the Plan, a draft review will be provided to the RWMG, who will have an opportunity to comment. Draft Plan Reviews will be open for a 30-day public comment period, and posted on the 1st and 15th of each month. RWMGs will be allowed to follow-up the comment period with revisions if the Final Review finds the IRWM Plan inconsistent with Plan Standards. Adequate revisions will be accepted without immediate re-adoption of the IRWM Plan, if insufficient, further revisions may be made by the RWMG in subsequent follow-ups to DWR.

1.5 Plan Standards Review Tool

The Plan Standards Review Form provided by DWR has been adapted by the CVRWMG for use as Appendix VI-A.1 in the 2018 IRWM/SWR Plan Update. This tool, seen in the table on the following pages, provides the standards included in the 2016 IRWM Program Guidelines, as well as the requirements that make up each standard. The table includes information on requirements (Requirements from *IRWM 2016 Guidelines*), where this requirement is described in the Guidelines (*IRWM 2016 Guidelines* Page Number), where this information is contained in the 2018 IRWM/SWR Plan (Evidence of Sufficiency/Location of Standard in Grantee IRWM Plan), and a description of how this requirement was met (Evidence of Plan Sufficiency/Brief Qualitative Evaluation).

Appendix VI-A.2: SWRP Checklist and Self-Certification

This appendix includes the Coachella Valley Regional Water Management Group's (CVRWMG's) self-assessment of the SWRP component of the 2018 Coachella Valley IRWM/SWR Plan, based on the Checklist and Self-Certification provided by the SWRCB in Appendix A of the *2015 SWRP Guidelines*.

2 SWRP Review Process

In order for a SWRP to be deemed consistent with section 10560 et seq. of the Water Code, SWRPs must address all mandatory elements in the *2015 SWRP Guidelines*, following the guidance provided in Section V through VI of the *2015 SWRP Guidelines*. Appendix A of the Guidelines provides a Checklist and Self-Certification form for agencies to verify that all required elements of the Water Code are being met and that other elements of the SWRCB's SWRP Guidelines are addressed. Entities preparing and submitting a SWRP to the SWRCB must fill out and sign the self-certification checklist. The checklist is used to identify the specific areas of the SWRP or functionally equivalent collection of documents that meet the requirements in the Water Code and SWRCB Guidelines. In cases where multiple documents are being used to create a functional equivalent SWRP, a cover letter explaining how the documents work together to address the SWRP Guidelines is also required. Entities submitting a SWRP will self-certify the SWRP complies with the requirements using the checklist, but the SWRCB must also review the SWRP to confirm the requirements are met.

A SWRP is not a compliance document but is required for any stormwater and dry weather runoff capture projects to receive funding under any bond measure approved by voters after January 2014. The SWRP and signed self-certification checklist must be reviewed by the SWRCB in order to confirm eligibility to receive funding under these grant programs.

2018 Coachella Valley IRWM/SWR Plan
IRWM Plan Standards Review

Requirement		Included		Evidence of Plan Sufficiency		Sufficient
From IRWM 2016 Guidelines	**IRWM 2016 Guidelines Page Number**	**y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.**		**Location of Standard in Grantee IRWM Plan**	**Brief Qualitative Evaluation**	**y/n**
IRWM Plan Standard: Governance					**Overall Standard Sufficient**	**Yes**
The RWMG and individual project proponents who adopted the Plan"	37	**y/n**	y	Section 1.3.1 Region Acceptance Process and Formation of the CVRWMG; Section 7.1 Establishment of the IRWM Program and SWR Planning Process, Section 7.2.1 Group Membership and Participation; Section 7.7 IRWM/SWR Plan Adoption	*Chapter 1, Section 1.3.1 and Chapter 7, Section 7.1* discuss adoption of the IRWM Plan by the CVRWMG members as is required by the MOU that formalizes their partnership. *Chapter 7, Section 7.2.1* states that eligible entities (including tribes) may join the CVRWMG and the required process to do so, and describes the requirement that all project proponents that are selected for IRWM grant funding must adopt the IRWM Plan. *Chapter 7, Section 7.7* describes Plan adoption and lists the dates the CVRWMG members adopted the 2018 IRWM/SWR Plan	y
A description of the IRWM governance structure including a discussion of whether or how Native American tribes will participate in the RWMG.	37	**y/n**	y	Section 7.2 Structure and Organization; Section 7.6 Tribal Outreach and Coordination	*Section 7.2* describes the governance structure of the Region including the CVRWMG, Planning Partners, Issues Groups, and stakeholders. The Native American Tribes Issues Group allows for input from tribal communities and is convened when the tribes deem necessary. The tribal communities are also part of the Planning Partners and are encouraged by the CVRWMG to participate in Planning Partners meetings. *Section 7.6* describes tribal outreach and coordination that occurred for plan development.	y
A description of how the chosen form of governance addresses and insures:						
Public outreach and involvement processes	37	**y/n/q**	y	Section 7.2.1 Group Membership and Participation	As described in *Section 7.2.1*, the CVRWMG has conducted outreach to increase public involvement. All stakeholders are invited to participate in Issues Groups, Planning Partners meeting, and public workshops.	y

Effective decision making	37	**y/n/q**	y	Section 7.2 Structure and Organization; Section 7.3 Effective Decision-Making	*Chapter 7, Stakeholder Involvement, Section 7.2* describes the governance structure and how each group within this structure provides feedback and input to the CVRWMG, who ultimately make all final decisions. The decision making process is further described in *Section 7.3*.	y
Balanced access and opportunity for participation in the IRWM process	37	**y/n/q**	y	Section 7.4 Balanced Access and Opportunity for Participation; Section 7.2.1 Group Membership and Participation; Section 7.5 Disadvantaged Communities Outreach; Section 7.6 Tribal Outreach and Coordination	The governance structure as described in *Chapter 7, Stakeholder Involvement* invites all stakeholders to participate on an equal level to provide input to the CVRWMG. Outreach activities have been undertaken by the CVRWMG to ensure participation of typically underrepresented groups such as DACs and tribes. *Section 7.4* describes how this structure allows for balanced access and opportunities for participation, while *Sections 7.2.1, 7.5, and 7.6* detail how these efforts have been implemented, with an emphasis on traditionally underrepresented groups.	y
Effective communication – both internal and external to the IRWM region	37	**y/n/q**	y	Section 7.4.2 Effective Communication – Both Internal and External to Region	*Chapter 7, Stakeholder Involvement, Section 7.4.2* describes communication efforts within the Region. Such communication occurs through meetings, email, website announcements, and workshops, and notifications of opportunities to communicate with the CVRWMG are provided to all stakeholders, neighboring RWMGs, and relevant government agencies.	y
Long term implementation of the IRWM Plan	37	**y/n/q**	y	Section 7.8 Long-Term Implementation of IRWM Plan	*Chapter 7, Section 7.8 Long-Term Implementation of IRWM/SWR Plan* describes the foundation for long-term implementation of the Plan. The MOU between CVRWMG agencies acknowledges and allows for continued and ongoing coordination efforts (see Appendix VI-C). IRWM Program efforts that contribute to long-term implementation include IRWM grant funding for projects and planning, DAC Outreach Program, and other planning efforts and programs.	y

Coordination with neighboring IRWM efforts and State and federal agencies	37	**y/n/q**	y	Section 7.4.2 Effective Communication – Both Internal and External to Region; Section 10.1.2 Neighboring and/or Overlapping IRWM Efforts; Section 10.1.3 Coordination with Tribal, Federal, State, and Local Agencies	*Chapter 7, Section 7.4.2 Effective Communication – Both Internal and External to Region* describes how communication with neighboring RWMGs and Government Agencies provide opportunities to consider common issues and to coordinate on activities. *Chapter 10, Agency Coordination, Section 10.1.2 and Section 10.1.3* describe coordination efforts with organizations and agencies outside the Region. Neighboring RWMGs are distinct from the CVRWMG and the Region, so communication remains open but there is no active coordination (*Section 7.4.1; 10.1.2*). State, federal, and local agencies are invited to participate in the Region, and outreach has and will be conducted to key agencies (*Section 10.1.3*).	y
The collaborative process(es) used to establish plan objectives	38	**y/n/q**	y	Section 6.1.1 Determining Objectives	The Plan objectives process is described in *Chapter 6, Section 6.1.1. Issues groups* developed the list of issues that led to the identified objectives. Public workshops and meetings were held for broader stakeholder input, and Planning Partners verified the final list of Objectives.	y
How interim changes and formal changes to the IRWM Plan will be performed	38	**y/n/q**	y	Section 7.8.1 Updating or Amending the IRWM Plan	Changes to the plan can be made following the guidance in *Chapter 7, Section 7.8.1 Updating or Amending the IRWM Plan*. Changes may require Planning Partners, Issues Groups, or stakeholder consensus (depending on type of change) and final approval by the CVRWMG.	y
Updating or amending the IRWM Plan	38	**y/n/q**	y	Section 7.8.1 Updating or Amending the IRWM Plan	Changes to the plan can be made following the guidance in *Chapter 7, Stakeholder Involvement, Section 7.8.1*. Changes may require Planning Partners, Issues Groups, or stakeholder consensus (depending on type of change) and final approval by the CVRWMG.	y
IRWM Plan Standard: Region Description					**Overall Standard Sufficient**	**Yes**
If applicable, describe and explain how the plan will help reduce dependence on the Delta supply regionally.	38	**y/n**	y	Section 6.1.1 Determining Objectives: • Objective A • Objective C • Objective D • Objective I	Objectives A, C, D, and I described in *Chapter 6, Objectives, Section 6.1.1* will each contribute to potentially reducing future additional demand for imported water from the SWP through local solutions to increase reliability, securing reliable non-SWP imported supplies or water transfers that potentially reduce future additional dependence on Delta supplies, increasing local supply opportunities, and improving efficiency through conjunctive use.	y

Describe watersheds and water systems	38	**y/n**	y	Section 2.2 Watershed and Water Systems	Watersheds and water systems are described in detail in *Chapter 2, Region Description, Section 2.2*. The Whitewater River Watershed is described in *Section 2.2.1* and water systems are described in *Sections 2.2* through *2.8*.	y
Describe internal boundaries	38	**y/n**	y	Section 2.3 Internal Boundaries	Internal boundaries are described in *Chapter 2, Region Description, Section 2.3*, as well as shown in **Figures 1-2**, **2-3**, **2-5**, **2-6**, **2-8**, and **2-10**.	y
Describe water supplies and demands for minimum 20 year planning horizon	38	**y/n**	y	Section 2.4 Water Supply and Demands	Agency water supplies and demands are based on projections from CVRWMG agencies' 2015 UWMPs and project 20 years from those plans (until 2035). Projected supplies and demands are presented in *Chapter 2, Region Description, Section 2.4* and summarized in **Tables 2-8**, **2-9**, **2-10**, **2-11**, **2-12**, **2-13**, **2-14**, and **2-15**.	y
Describe social and cultural makeup, including specific information on DACs and tribal communities in the region and their water challenges.	38	**y/n/q**	y	Section 2.6 Social and Cultural Make-up; Chapter 4, Disadvantaged Communities; Chapter 5, Tribal Water Resources	*Chapter 2, Region Description, Section 2.6* describes the social and cultural make-up of the Region. Population and demographics data, as well as economic information are provided. Detailed information related to DACs and tribal communities is provided in *Chapters 4* and *5*, respectively. More information on DACs is provided in **Volume II** of the IRWM/SWR Plan.	y
Describe major water related objectives and conflicts **(1)**.	38	**y/n/q**	y	Section 2.7 Major Water-Related Conflicts; Section 6.1.1 Determining Objectives; Section 11.1.3, Benefits and Impacts of Plan Implementation	An overview of major water-related conflicts is presented in *Chapter 2, Region Description, Section 2.7*, while objectives are located in *Chapter 6, Objectives, Section 6.1.1*. Challenges to Plan implementation are described in *Chapter 11, Section 11.1.3.*	y
Explain how IRWM regional boundary was determined and why region is an appropriate area for IRWM planning.	38	**y/n/q**	y	Section 2.1 Selection of Regional Boundary; Section 10.1.2 Neighboring and/or Overlapping IRWM Efforts	The Coachella Valley IRWM Region's boundaries are described in *Chapter 2, Region Description, Section 2.1*. This section also presents an overview of the logic of the selected boundary. *Chapter 10, Agency Coordination, Section 10.1.2* provides more detail on the justification used to set the Region's boundary.	y
Describe neighboring and/or overlapping IRWM efforts	38	**y/n**	y	Section 10.1.2 Neighboring and/or Overlapping IRWM Efforts	*Chapter 10, Agency Coordination, Section 10.1.2* describes neighboring IRWM efforts: Anza-Borrego Desert, Imperial Valley, Mojave, and San Gorgonio IRWM Regions, and the Santa Ana Funding Area IRWM efforts.	y

Explain how opportunities are maximized (e.g. people at the table, natural features, infrastructure)for integration of water management activities	38	**y/n**	y	Section 9.2.2 Project Review and Prioritization Process; Section 8.1 IRWM Integration Approach	*Chapter 9, Project Evaluation and Prioritization, Section 9.2.2* notes that the CVRWMG will assess opportunities for integration during the project review process. *Chapter 8, Resource Management Strategies, Section 8.1* describes integration between stakeholders/institutions, resources, projects, and strategies.	y
Describe water quality conditions. If the IRWM region has areas of nitrate, arsenic, perchlorate, or hexavalent chromium contamination, the Plan must include a description of location, extent, and impacts of the contamination; actions undertaken to address the contamination, and a description of any additional actions needed to address the contamination **(2)**.	38	**y/n**	y	Section 2.5 Water Quality; Section 3.1.5 Water Quality; Section 4.3.5 DAC Water Quality Evaluation; Section 8.4.4 Improve Water Quality; Section 9.1 IRWM Regional Priorities	*Chapter 2, Region Description, Section 2.5* provides a description of water quality for all water resources in the Region, including arsenic and hexavalent chromium contamination. *Chapter 3, Issues and Needs, Section 3.1.5* further discusses the issues caused by water quality contaminants, contaminant concentrations, and location and extent of contamination. *Chapter 4, Disadvantaged Communities, Section 4.3.5* discusses these issues in the context of DACs in the Region. *Section 8.4.4* describes management strategies to address water quality issues in the Region and provides specific examples of efforts in the Region that address water quality issues. *Section 9.1* describes the Region's priorities related to improving water quality	y
Describe likely Climate Change impacts on their region as determined from the vulnerability assessment.	38	**y/n**	y	Section 2.8 Climate Change; Section 3.2 Climate Change Issues and Needs; Section 3.2.3 Vulnerability Analysis; Section 8.4 Overview of Resources Management Strategies; Section 8.5 Adapting Resource Management Strategies to Climate Change	*Chapter 2, Section 2.8 Climate Change* describes climate change impacts on the Region. *Chapter 3, Section 3.2 Climate Change Issues and Needs* and *Section 3.2.3 Vulnerability Analysis* provide discussions of climate change issues and needs, impacts and effects, and the vulnerability assessment. *Chapter 8, Resource Management Strategies, Section 8.4* and *Section 8.5* outline the resource management strategies considered for the Region in the context of climate change.	y
IRWM Plan Standard: Plan Objectives					**Overall Standard Sufficient**	**Yes**
Through the objectives or other areas of the plan, the 7 items on pg 49 of GL are addressed **(1)**.	49	**y/n**	y	Section 6.1.1	Objectives are described in detail in *Chapter 6, Objectives, Section 6.1.1*. The objectives listed here under the “Location of Standard in Grantee IRWMP” column clearly address, either directly or indirectly, the listed requirements.	y

1. Protection and improvement of water supply reliability	49	**y/n**	y	Section 6.1.1 Objective A Objective B Objective C Objective D Objective E Objective I		y
2. Identification and consideration of drinking water quality	49	**y/n**	y	Section 6.1.1 Objective B Objective E Objective K Objective L		y
3. Protection and improvement of water quality consistent with basin plan	49	**y/n**	y	Section 6.1.1 All objectives		y
4. Protection, restoration, improvement of aquatic, riparian, and watershed resources	49	**y/n**	y	Section 6.1.1 Objective E Objective F Objective G		y
5. Identification of threats to groundwater from overdraft	49	**y/n**	y	Section 6.1.1 Objective B		y
6. Protection of groundwater resources from contamination	49	**y/n**	y	Section 6.1.1 Objective B Objective E Objective K Objective L		y
7. Identification and consideration of water-related needs of DACs	49	**y/n**	y	Section 6.1.1 Objective L Objective M		y

Describe the collaborative process and tools used to establish objectives: - How the objectives were developed - What information was considered (i.e., water management or local land use plans, etc.) - What groups were involved in the process - How the final decision was made and accepted by the IRWM effort	48 - 50	**y/n**	y	Section 6.1.2 Describing the Process	*Chapter 6, Objectives, Section 6.1.2* describes how the objectives were identified and developed, what was used in the process, how stakeholders were involved in development of the objective, and how the final list of objectives was chosen consistent with the IRWM Program's governance structure and decision-making process.	y
Identify quantitative or qualitative metrics and measurable objectives: Objectives must be measurable - there must be some metric the IRWM region can use to determine if the objective is being met as the IRWM Plan is implemented. Neither quantitative nor qualitative metrics are considered inherently better **(2)**.	49	**y/n/q**	y	Section 6.1.3 Goals, Objectives, and the Planning Hierarchy	**Table 6-1** in *Chapter 6, Objectives, Section 6.1.3* provides both qualitative and quantitative targets and measurements for each objective and their associated goals. These targets and measurements can be used to assess progress towards achieving the Plan goals and objectives.	y
Explain how objectives are prioritized or reason why the objectives are not prioritized	50	**y/n/q**	y	Section 6.2 Prioritizing Objectives	The Plan objectives have been prioritized by the CVRWMG and stakeholders. *Chapter 6, Objectives, Section 6.2* describes the prioritization of the objectives with stakeholder involvement and through the governance structures described in *Chapter 7, Stakeholder Involvement*.	y

Reference specific overall goals for the region: RWMGs may choose to use goals as an additional layer for organizing and prioritizing objectives, or they may choose to not use the term at all.	50	**y/n**	y	Section 6.1 Goals and Objectives	*Chapter 6, Objectives, Section 6.1* presents the five goals of the IRWM Plan: 1. Optimize water supply reliability 2. Protect or improve water quality 3. Provide stewardship of water-related natural resources 4. Coordinate and integrate water resource management 5. Ensure cultural, social, and economic sustainability of water in the Coachella Valley	y
Address adapting to changes in the amount, intensity, timing, quality and variability of runoff and recharge.	39	**y/n**	y	Section 2.8 Climate Change	*Chapter 2, Section 2.8 Climate Change* discusses the implications of climate change on the Region including changes in precipitation and runoff patterns.	y
Consider the effects of sea level rise (SLR) on water supply conditions and identify suitable adaptation measures.	39	**y/n**	y	Section 3.2.2 Identification of Climate Change Vulnerabilities	As shown in Chapter 3, *Section 3.2.2 Identification of Climate Change Vulnerabilities* **Table 3-4**, sea level rise is not applicable to the Coachella Valley IRWM Region.	y
Reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.	39	**y/n**	y	Section 6.1.1 Goals and Objectives; Section 8.5, Adapting Resource Management Strategies to Climate Change	*Chapter 6, Section 6.1.1 Goals and Objectives describes the Plan objectives, including how achieving the objectives would contribute to reducing energy consumption and GHGs.* *Chapter 8, Section 8.5* and **Table 8-3** distinguish which management strategies help to adapt to climate change and help to mitigate GHG emissions.	y
In evaluating different ways to meet IRWM plan objectives, where practical, consider the strategies adopted by CARB in its AB 32 Scoping Plan1.	39	**y/n**	y	Section 6.1 Goals and Objectives	*Chapter 6, Section 6.1 Goals and Objectives* and **Table 6-1** address climate change requirements and CARB goals.	y
Consider options for carbon sequestration and using renewable energy where such options are integrally tied to supporting IRWM Plan objectives.	39	**y/n**	y	Section 6.1.1 Determining Objectives, Section 8.5, Table 8-3	*Chapter 6, Section 6.1.1, Determining Objectives (Objective D)* states that local supply opportunities that utilize renewable energy will be prioritized. Chapter 8, *Section 8.5 Adapting Resource Management Strategies to Climate Change,* **Table 8-3** lists increase use of renewable energy sources as a climate change management strategy.	y

IRWM Plan Standard: Resource Management Strategies (RMS)					Overall Standard Sufficient	Yes
Address which RMS will be implemented in achieving IRWM Plan Objectives **(1)**.	39	**y/n**	y	Section 8.2.2 Objectives Assessment	*Chapter 8, Resource Management Strategies, Section 8.2.2* describes how each RMS will contribute to each Plan objective (**Table 8-2**: Resource Management Strategies that Achieve IRWM Plan Objectives).	y
Identify RMS incorporated in the IRWM Plan: Consider all California Water Plan (CWP)RMS criteria (29) listed in Table 3 from the CWP Update 2013	39	**y/n**	y	Section 8.2 Resource Management Strategies; Section 8.4 Overview of Resource Management Strategies	*Chapter 8, Resource Management Strategies, Section 8.2* describes the RMS considered when developing the 2018 Plan. **Table 8-1** presents all 29 RMS from the 2013 CWP Update, and indicates which ones were ultimately included and considered relevant. *Section 8.4* describes each RMS in detail.	y
Consideration of climate change effects on the IRWM region must be factored into RMS. Identify and implement, using vulnerability assessments and tools such as those provided in the Climate Change Handbook, RMS and adaptation strategies that address region-specific climate change impacts. -Demonstrate how the effects of climate change on its region are factored into its RMS. -Reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions. -An evaluation of RMS and other adaptation strategies and ability of such strategies to eliminate or	39	**y/n**	y	Section 8.4 Overview of Resource Management Strategies; Section 8.5 Adapting Resource Management Strategies to Climate Change	*Chapter 8, Resource Management Strategies, Section 8.5* details which RMS will contribute to climate change adaptation and how, summarized in **Table 8-3**. Individual RMS descriptions (*Section 8.4 Overview of Resource Management Strategies*) indicate the relationship between the RMS and the potential impacts of climate change in the Region.	y

minimize those vulnerabilities, especially those impacting water infrastructure systems **(2)**.						
IRWM Plan Standard: Integration					**Overall Standard Sufficient**	**Yes**
Contains structure and processes for developing and fostering integration[1]: - Stakeholder/institutional - Resource - Project implementation *1. If not included as an individual section use Governance, Project Review Process, and Data Management Standards per 2016 IRWM Guidelines, p. 52.*	39	**y/n/q**	y	Section 9.2.2 Project Review and Prioritization Process; Section 8.1 IRWM Integration Approach	As described in *Chapter 9, Project Evaluation and Prioritization, Section 9.2.2*, during the project review process, the CVRWMG identifies opportunities for integration and informs project proponents of such opportunities to maximize resources. *Chapter 8, Resource Management Strategies, Section 8.1* describes integration between stakeholders/institutions, resources, projects, and strategies.	y
IRWM Plan Standard: Project Review Process					**Overall Standard Sufficient**	**Yes**
Process for projects included in IRWM plan must address 3 components: - procedures for submitting projects - procedures for reviewing projects - procedures for communicating lists of selected projects	39 - 40	**y/n**	y		See below.	y
procedures for submitting projects	39 - 40		y	Section 9.2.1 Project Submittal Process	*Chapter 9, Project Evaluation and Prioritization, Section 9.2.1* describes how project proponents can submit projects via the online project database to be considered for inclusion in the IRWM Plan and/or IRWM grant opportunities	y

procedures for reviewing projects	39 - 40		y	Section 9.2.2 Project Review and Prioritization Process	*Chapter 9, Project Evaluation and Prioritization, Section 9.2.2* describes how projects that have been submitted to the online project database are evaluated and prioritized for inclusion in the IRWM Plan and/or for funding opportunities. **Table 9-3** is the project scoring guide used when evaluating projects.	y
procedures for communicating lists of selected projects	39 - 40		y	Section 9.3 List of Selected Projects	*Chapter 9, Project Evaluation and Prioritization, Section 9.3* states that the current project list is available through the online project database, and that stakeholders will be notified of projects selected for inclusion in IRWM grant applications via email and at a Planning Partners meeting.	y
Does the project review process in the plan incorporate the following factors:			y	Section 9.2.3 Project Selection Factors	*Chapter 9, Project Evaluation and Prioritization, Section 9.2* describes the Project Selection Process, while *Section 9.2.3* details the Project Selection Factors. Each of these project review standards are included either directly or indirectly in **Table 9-2** (Project Prioritization Criteria and Relationship to IRWM Goals and Objectives) and **Table 9-3** (Project Scoring Guide)	y
How a project contributes to plan objectives	40	**y/n**	y	Section 9.2.3 Project Selection Factors: Contribution to IRWM Plan Objectives		y
How a project is related to Resource Management Strategies identified in the plan.	40	**y/n**	y	Section 9.2.3 Project Selection Factors: Relationship to RMS		y
The technical feasibility of a project.	40	**y/n**	y	Section 9.2.3 Project Selection Factors: Technical Feasibility		y
A projects specific benefits to a DAC water issue.	40	**y/n**	y	Section 9.2.3 Project Selection Factors: Critical Issues in DACs		y
Environmental Justice considerations.	40	**y/n**	y	Section 9.2.3 Project Selection Factors: Environmental Justice Considerations		y
Project costs and financing	40	**y/n**	y	Section 9.2.3 Project Selection Factors: Project Costs and Financing		y

Address economic feasibility	40	**y/n**	y	Section 9.2.3 Project Selection Factors: Economic Feasibility		y
Project status	40	**y/n**	y	Section 9.2.3 Project Selection Factors: Project Status		y
Strategic implementation of plan and project merit	40	**y/n**	y	Section 9.2.3 Project Selection Factors: Strategic Considerations		y
Status of the Project Proponent's IRWM plan adoption	40	**y/n**	y	Section 7.2.1 Group Membership and Participation	Chapter 7, Stakeholder Involvement, Section 7.2.1 details the requirement that organizations whose projects have been included in an IRWM grant application are required to adopt the current IRWM Plan.	y
Project's contribution to reducing dependence on Delta supply (for IRWM regions receiving water from the Delta).	40	**y/n**	y	Section 9.2.3 Project Selection Factors; Section 6.1.1 Determining Objectives	*Chapter 9, Project Evaluation and Prioritization, Section 9.2.3* explains the project selection factors, including contribution to IRWM Plan Objectives. As noted in *Chapter 6, Objectives, Section 6.1.1*, four of the objectives (A, C, D, and I) have the potential to reduce future additional imported water demands, including Delta supplies.	y
Project's contribution to climate change adaptation. -Include potential effects of Climate Change on the region and consider if adaptations to the water management system are necessary **(1)**. -Consider the contribution of the project to adapting to identified system vulnerabilities to climate change effects on the region. -Consider changes in the amount, intensity, timing, quality and variability of runoff and recharge. -Consider the effects of	40	**y/n**	y	Section 3.2.2 Identification of Climate Change Vulnerabilities; Section 8.5 Adapting Resource Management Strategies to Climate Change; Section 9.2.3 Project Selection Factors: Climate Change Adaptation; Section 9.2.3 Project Selection Factors: Climate Change Mitigation	*Chapter 8, Section 8.5 Adapting Resource Management Strategies to Climate Change* describes the potential impacts of climate change and presents how the RMS contribute to climate change mitigation and adaptation strategies. *Chapter 9, Section 9.2.3 IRWM Project Selection Factors* explains the project selection factors, including consideration of the contribution of projects to climate change vulnerabilities adaptation. Also, in *Section 9.2.3*, subsection *Climate Change Adaptation* expands on how climate change concerns are acknowledged and incorporated into long-term planning related to water supply, water quality, and flood management in the Coachella Valley. As shown in *Section 3.2.2 Identification of Climate Change Vulnerabilities* **Table 3-4**, sea level rise is not applicable to the Coachella Valley IRWM Region.	y

SLR on water supply conditions and identify suitable adaptation measures.						
Contribution of project in reducing GHGs compared to project alternatives. -Consider the contribution of the project in reducing GHG emissions as compared to project alternatives -Consider a project's ability to help the IRWM region reduce GHG emissions as new projects are implemented over the 20-year planning horizon. -Reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.	40	**y/n**	y	Section 9.2.3 Project Selection Factors: Climate Change Adaptation; Section 9.2.3 Project Selection Factors: Climate Change Mitigation	*Chapter 9, Project Evaluation and Prioritization, Section 9.2.3* explains the project selection factors, including consideration of the contribution of projects climate change vulnerabilities adaptation and mitigation of GHGs. Specifically, subsection *Climate Change Mitigation* describes how consideration is given to projects in the project selection process that incorporate GHG emissions reductions strategies.	y
Specific benefits to critical water issues for Native American tribal communities.	53	**y/n**	y	Section 9.2.3 Project Selection Factors: Critical Issues on Tribal Lands	*Chapter 9, Project Evaluation and Prioritization, Section 9.2.3* describes the project selection factors, including consideration of critical water issues for Native American tribes in the Region.	y
IRWM Plan Standard: Impact and Benefit					**Overall Standard Sufficient**	**Yes**
Discuss potential impacts and benefits of plan implementation within IRWM region, between regions, with DAC/EJ concerns and Native American Tribal communities	40	**y/n**	y	Section 11.1 Impacts and Benefits	Potential impacts of project implementation are discussed in *Chapter 11, Framework for Implementation, Section 11.1.2* and summarized in **Table 11-2**. Potential benefits of project implementation are described in *Section 11.1.1* and summarized in **Table 11-1**. Impacts and Benefits of Plan implementation are described in *Section 11.1.3*. Potential impacts and benefits affecting DACs/EJs and tribes are described in each section.	y

State when a more detailed project-specific impact and benefit analysis will occur (prior to any implementation activity)	55	**y/n**	y	Section 11.1.1 Overview of Benefits; 11.1.2 Overview of Impacts	Potential benefits may be evaluated in greater detail if required in future IRWM grant applications, as described in *Chapter 11, Framework for Implementation, Section 11.1.1*. Potential impacts will be evaluated in greater detail if CEQA and/or NEPA compliance is required, as described in *Section 11.1.2*.	y
Review and update the impacts and benefits section of the plan as part of the normal plan management activities	55 - 56	**y/n**	y	Section 11.1 Impacts and Benefits	*Chapter 11, Framework for Implementation, Section 11.1* states that impacts and benefits will be reevaluated during Plan updates.	y
IRWM Plan Standard: Plan Performance and Monitoring					**Overall Standard Sufficient**	**Yes**
Contain performance measures and monitoring methods to ensure that IRWM objectives are met **(1)**.	40	**y/n**	y	6.1.3 Goals, Objectives, and the Planning Hierarchy	**Table 6-1** in *Chapter 6, Objectives, Section 6.1.3* presents the targets and measures that will be used to evaluate progress towards achieving Plan objectives.	y
Contain a methodology that the RWMG will use to oversee and evaluate implementation of projects.	40	**y/n**	y	11.4 Plan Performance and Monitoring	As described in *Chapter 11, Framework for Implementation, Section 11.4*, Plan performance will be evaluated by how well its goals and objectives are been addressed (see **Table 6-1**), as well as its progress towards priorities in *Chapter 9, Project Evaluation and Prioritization*. Projects will be evaluated based on project specific monitoring plans.	y
Each project in the IRWM Plan is monitored to comply with all applicable rules, laws, and permit requirements.	58	**y/n**	y	11.4.2 Project-Specific Monitoring Plans	As stated in *Section 11.4.2, Project-Specific Monitoring Plans*, all projects shall be monitored to comply with applicable regulations, laws, and permit requirements such as statutory requirements of the CEQA, which mandates an assessment of project-level impacts.	y
Contain policies and procedures that promote adaptive management and, as more effects of Climate Change manifest, new tools are developed, and new information becomes available, adjust IRWM plans accordingly.	40	**y/n**	y	11.4.1 Plan Performance	*Section 11.4.1, Plan Performance*, describes that the CVRWMG may further develop the thresholds of success for the performance parameters as part of an adaptive management process.	y

IRWM Plan Standard: Data Management					Overall Standard Sufficient	Yes
Describe data needs within the IRWM region	59 - 60	**y/n**	y	11.3.1 Overview of Data Needs	*Chapter 11, Framework for Implementation, Section 11.3.1* describes the types of data that have been used to develop the 2014 IRWM Plan, as well as data gaps.	y
Describe typical data collection techniques	59 - 60	**y/n**	y	11.3.2 Data Collection Techniques	As described in *Chapter 11, Framework for Implementation, Section 11.3.2*, all data collected for use in the plans and studies are presumed to be collected in a defensible manner consistent with typical or standard collection techniques.	y
Describe stakeholder contributions of data to a data management system	59 - 60	**y/n**	y	11.3.3 Stakeholder Contributions	*Chapter 11, Framework for Implementation, Section 11.3.3* describes how stakeholders contributed data to the IRWM Program through outreach efforts, participation in public workshops and Planning Partners meetings, and the DAC Outreach Program's survey.	y
Describe the entity responsible for maintaining data in the data management system	59 - 60	**y/n**	y	11.3.4 Responsible Entity	*Chapter 11, Framework for Implementation, Section 11.3.4* explains that the CVRWMG is responsible for the Region's data management system (DMS) and has a designated person in charge of maintaining the program library, though all agencies are responsible for uploading data to the CVRWMG file sharing site.	y
Describe the QA/QC measures for data	59 - 60	**y/n**	y	11.3.5 Quality Assurance/Quality Control (QA/QC) Measures	*Chapter 11, Framework for Implementation, Section 11.3.5* states that the CVRWMG will vet data collected for regional planning that is unregulated by State or federal agencies but will not conduct additional QA/QC for data required by State or federal agencies.	y
Explain how data collected will be transferred or shared between members of the RWMG and other interested parties throughout the IRWM region, including local, State, and federal agencies **(1)**.	59 - 60	**y/n**	y	11.3.6 Regional Data Sharing; 11.3.7 Statewide Data Sharing	*Chapter 11, Framework for Implementation, Section 11.3.6* and *Section 11.3.7* explain that data is shared regionally through a file sharing website amongst CVRWMG agencies, and with stakeholders through the online Library, available at www.cvrwmg.org. Data submitted to statewide databases are available to the public via those databases.	y
Explain how the Data Management System supports the RWMG's	59 - 60	**y/n**	y	11.3.6 Regional Data Sharing	*Chapter 11, Framework for Implementation, Section 11.3.6* explains that the CVRWMG has used a file sharing site to share data during IRWM planning activities, and that	y

efforts to share collected data					stakeholders may also access data through the online data library available on www.cvrwmg.org.	
Outline how data saved in the data management system will be distributed and remain compatible with State databases including CEDEN, Water Data Library (WDL), CASGEM, California Environmental Information Catalog (CEIC), and the California Environmental Resources Evaluation System (CERES).	59 - 60	**y/n**	y	11.3.7 Statewide Data Sharing	*Chapter 11, Framework for Implementation, Section 11.3.7* describes the statewide databases to which IRWM projects may be required to submit applicable data, and states that it is presumed such data will be compatible with the appropriate state systems, as required.	y
IRWM Plan Standard: Finance					**Overall Standard Sufficient**	**Yes**
Include a programmatic level (i.e. general) plan for implementation and financing of identified projects and programs **(1)** including the following:	41	**y/n**	y	See below.	This requirement is met by meeting the other requirements in this Standard.	y
List known, as well as, possible funding sources, programs, and grant opportunities for the development and ongoing funding of the IRWM Plan.	41	**y/n**	y	11.5.1 Sources and Certainty of Funding	**Table 11-4** in *Chapter 11, Framework for Implementation, Section 11.5.1* summarizes the potential funding sources available for IRWM program activities that are currently known by the CVRWMG. These funding sources are also described in *Section 11.5.1, Sources and Certainty of Funding: Funding Sources*.	y
List the funding mechanisms, including water enterprise funds, rate structures, and private financing options, for projects that implement the IRWM Plan.	41	**y/n**	y	11.5.1 Sources and Certainty of Funding	**Table 11-4** in *Chapter 11, Framework for Implementation, Section 11.5.1* summarizes the potential funding mechanisms available for IRWM projects that are currently known by the CVRWMG. These funding mechanisms are also described in *Section 11.5.1, Sources and Certainty of Funding: Funding Sources*.	y

An explanation of the certainty and longevity of known or potential funding for the IRWM Plan and projects that implement the Plan.	41	**y/n**	y	11.5.1 Sources and Certainty of Funding	**Table 11-4** in *Chapter 11, Framework for Implementation, Section 11.5.1* summarizes the certainty and longevity of potential funding sources available for IRWM projects and program activities that are currently known by the CVRWMG. The certainty and longevity of these funding sources are also described in *Section 11.5.1, Sources and Certainty of Funding: Funding Sources*.	y
An explanation of how operation and maintenance (O&M) costs for projects that implement the IRWM Plan would be covered and the certainty of operation and maintenance funding.	41	**y/n**	y	11.5.1 Sources and Certainty of Funding	**Table 11-4** in *Chapter 11, Framework for Implementation, Section 11.5.1* notes which potential funding sources may allow funding for O&M. This is also noted in the funding source descriptions in *Section 11.5.1, Sources and Certainty of Funding: Funding Sources*. **Appendix VII-C** and **Appendix VII-H** include potential for individual user fees to cover the costs of O&M for on-site water treatment systems and new or retrofitted septic systems, respectively.	y
IRWM Plan Standard: Technical Analysis					**Overall Standard Sufficient**	**Yes**
Document the data and technical analyses that were used in the development of the plan **(1)**.	41	**y/n**	y	Section 3.6 Technical Analysis; Appendix VI-B Data and Technical Sources, Analysis, and Use in 2018 IRWM/SWR Plan; Chapter 12 References	*Chapter 3, Issues and Need, Section 3.6* describes how the technical information was used in the development of the Plan. The technical analyses and data used are listed in *Chapter 12, References*, and throughout the Plan in appropriate chapters where referenced. **Appendix VI-B** contains a detailed description of the data and technical analysis used in the development of the IRWM Plan.	y
IRWM Plan Standard: Relation to Local Water Planning					**Overall Standard Sufficient**	**Yes**
Identify a list of local water plans used in the IRWM plan	41	**y/n**	y	10.2 Relation to Local Water Planning	*Chapter 10, Agency Coordination, Section 10.2* describes the major water plans used to develop the 2018 IRWM/SWR Plan: CVRWMG agency UWMPs, Coachella Valley WMP, Mission Creek – Garnet Hill WMP, IWA's Water Resources Development Plan, the Whitewater River Watershed Municipal Stormwater Program Stormwater Management Plan, and the Coachella Valley Basin GSPs - Alternative GSP Bridge Documents for the Indio and Mission Creek Subbasins.	y

Describe the dynamics between the IRWM plan and other planning documents	41	**y/n**	y	10.2 Relation to Local Water Planning	The description of plans used to develop the IRWM Plan in *Chapter 10, Agency Coordination, Section 10.2* explains the dynamics between the IRWM Plan and these other planning documents	y
Describe how the RWMG will coordinate its water mgmt planning activities	41	**y/n**	y	10.2 Relation to Local Water Planning	*Chapter 10, Agency Coordination, Section 10.2* describes how the CVRWMG agencies coordinate with one another through Joint Board meetings, CVRWMG business meetings, and other specialized efforts.	y
Discuss how the plan relates to these other planning documents and programs. Same as 2012 GL with the following addition: "It should be noted that Water Code § 10562 (b)(7) requires the development of a stormwater resource plan and compliance with these provisions to receive grants for stormwater and dry weather runoff capture projects. Upon development of the stormwater resource plan, the RWMG shall incorporate it into IRWM plan. The IRWM Plan should discuss the processes that it will use to incorporate such plans." Minor wording differences - e.g. Groundwater Sustainability Plan example in the 2016 Guidelines instead of Groundwater Management Plan in the 2012 Guidelines.	63 - 64	**y/n**	y	10.2 Relation to Local Water Planning	The description of plans used to develop the 2018 IRWM/SWR Plan in *Chapter 10, Agency Coordination, Section 10.2* explains the relationship the IRWM Plan has to these other planning documents. As discussed throughout the Plan, this 2018 IRWM/SWR Plan serves as a SWRP functional equivalent, thus the SWRP is fully incorporated into the IRWM Plan.	y

Consider and incorporate water management issues and climate change adaptation and mitigation strategies from local plans into the IRWM Plan.	63 - 64	**y/n**	y	10.2.3 Planning Efforts to Offset Climate Change Impacts to Water Supply; 10.3.1 Linkages between Water Management and Land Use Planning	*Section 10.2.3 Planning Efforts to Offset Climate Change Impacts to Water Supply*, and *Section 10.3.1 Linkages between Water Management and Land Use Planning* includes a discussion of Climate Action Plans and Sustainability Plans	y
IRWM Plan Standard: Relation to Local Land Use Planning					**Overall Standard Sufficient**	**Yes**
Document current relationship between local land use planning, regional water issues, and water management objectives	41	**y/n**	y	10.3.2 Current Relationships between Water Managers and Land Use Planners	*Chapter 10, Agency Coordination, Section 10.3.2* describes the existing relationship between water managers and land use planners. These relationships vary by agency, though Planning Partners meetings provide a forum for land use planners to interact with water managers.	y
Document future plans to further a collaborative, proactive relationship between land use planners and water managers	41	**y/n**	y	10.3.3 Future Efforts to Establish Proactive Relationships	*Chapter 10, Agency Coordination, Section 10.3.3* outlines five ways to address coordination related to land use planning: 1. CVRWMG is committed to coordination with land use planning agencies in Region 2. Important for water planners to be involved in General Plan updates 3. Important for water planners to be involved early in development of Specific Plans 4. Coordination with water planners during development approval to ensure adequate water services 5. Review and approval by local utilities during CEQA	y
Demonstrate information sharing and collaboration with regional land use planning in order to manage multiple water demands throughout the state, adapt water management systems to climate change, and potentially offset climate change impacts to water supply in California.	41	**y/n**	y	10.1.1 Coordination of Activities within IRWM Region; 10.1.3 Coordination with Tribal, Federal, State, and Local Agencies; 10.3 Relation to Local Land Use Planning	*Chapter 10, Section 10.1.1 Coordination of Activities within IRWM Region* describes the coordination efforts for the Coachella Valley IRWM Program including with land use agencies. Three of the CVRWMG agencies are land use agencies (City of Coachella and City of Indio), while others work closely with the land use agencies that have overlapping jurisdictions with their service areas.; *Section 10.1.3 Coordination with Tribal, Federal, State, and Local Agencies* describes the various agencies, including land use entities, that the CVRWMG has coordinated with for IRWM planning efforts. *Section 10.3 Relation to Local Land Use Planning* discusses linkages between water management and land use planning, current relationships between water	y

					managers and land use planners, and future efforts to establish proactive relationships with land use planners.	
IRWM Plan Standard: Stakeholder Involvement					**Overall Standard Sufficient**	**Yes**
Discuss involvement of DACs and tribal communities in the IRWM planning effort	41 - 42	**y/n**	y	7.2.1 Group Membership and Participation; 7.5 Disadvantaged Communities Outreach; 7.6 Tribal Outreach and Coordination; Chapter 4, Disadvantaged Communities; Volume II	The CVRWMG has conducted targeted outreach efforts to DACs and area tribes, as described in *Chapter 7, Stakeholder Involvement, Section 7.5* and *7.6*. DAC outreach is further described in *Chapter 4, Disadvantaged Communities*. As described in *Section 7.2.1 Group Membership and Participation*, future Planning Partners meetings may be held, as needed. **Volume II** of the IRWM/SWR Plan describes the efforts made to involve DACs and the challenges to DAC participation in the IRWM Program.	y
Describe decision-making process and roles that stakeholders can occupy	41 - 42	**y/n**	y	7.3 Effective Decision-Making	*Chapter 7, Stakeholder Involvement, Section 7.3* describes the decision making process for the Region. Planning Partners provide input and help to develop the Plan and implementation, while the CVRWMG makes all final decision and provides the Planning Partners with direction. Any stakeholder may participate as a Planning Partner, Issues Group member, or through public workshops and meetings.	y
Discuss how stakeholders are necessary to address objectives and RMS	41 - 42	**y/n**	y	9.2.3 Project Selection Factors; 8.2.2 Objectives Assessment	*Chapter 9, Project Evaluation and Prioritization, Section 9.2.3* describes how the implementation of projects by stakeholders uses RMS to achieve objectives. **Table 8-2** in *Chapter 8, Resource Management Strategies, Section 8.2.2* shows which RMS will contribute towards achieving IRWM Plan objectives. Further, *Chapter 8* highlights projects and activities implemented by stakeholders that use RMS.	y
Discuss how a collaborative process will engage a balance in interest groups	41 - 42	**y/n**	y	8.1.1 Stakeholder/Institutional Integration	*Chapter 8, Resource Management Strategies, Section 8.1.1* describes the collaborative efforts that involve diverse stakeholders and help to balance interest groups. Such efforts include public workshops, direct outreach with stakeholders, discussion of projects and integration opportunities with stakeholder, and stakeholder approval of key IRWM Program decisions.	y

Contain a public process that provides outreach and opportunity to participate in the IRWM plan **(1)**. Per 2016 GL: "Native American tribes – It should be noted that tribes are sovereign nations, and as such coordination with tribes is on a government-to-government basis."	41 - 42	**y/n**	y	7.2.1 Group Membership and Participation; 7.4 Balanced Access and Opportunity for Participation; 7.5 Disadvantaged Communities Outreach; 7.6 Tribal Outreach and Coordination	*Chapter 7, Stakeholder Involvement* describes how stakeholders participate in the IRWM Program, as well as who may participate. The CVRWMG invites all stakeholders to participate, as described in *Section 7.2.1*, and conducts outreach (general and targeted) during IRWM Program milestone activities (grant opportunities, Plan updates, etc.) as described in *Section 7.4, 7.5*, and *7.6*. *Section 7.6* states that that tribes are sovereign nations, and as such coordination with tribes is on a government-to-government basis.	y
Identify process to involve and facilitate stakeholders during development and implementation of IRWM plan regardless of ability to pay; include description of any barriers to involvement **(2)**. "Stakeholder Involvement" in the 2012 GL is referred to "Native American Tribe and Stakeholder Involvement" in the 2016 GL and Tribes are referred to specifically.	41 - 42	**y/n**	y	7.4 Balanced Access and Opportunity for Participation; 7.6 Tribal Outreach and Coordination; Appendix VII-D	*Chapter 7, Stakeholder Involvement, Section 7.4* and *Section 7.6* describe how the CVRWMG encourages participation of stakeholders in IRWM Plan and Program activities. **Appendix VII-D** documents the challenges to participation by DACs in the IRWM Program, Plan, and grants.	y
IRWM Plan Standard: Coordination					**Overall Standard Sufficient**	**Yes**
Identify the process to coordinate water management projects and activities of participating local agencies and stakeholders to avoid conflicts and take advantage of efficiencies **(1)**.	42	**y/n**	y	10.1.1 Coordination of Activities within IRWM Region; 9.2.2 Project Review and Prioritization Process	The IRWM Program provides a forum for coordination amongst water management projects. *Chapter 10, Agency Coordination, Section 10.1.1* describes the coordination opportunities provided through the IRWM Program. *Chapter 9, Project Evaluation and Prioritization, Section 9.2.2* describes how opportunities for integration are identified during the Project Review Process, and project proponents informed of the potential for improved project efficiencies.	y

Identify neighboring IRWM efforts and ways to cooperate or coordinate, and a discussion of any ongoing water management conflicts with adjacent IRWM efforts	42	**y/n**	y	10.1.2 Neighboring and/or Overlapping IRWM Efforts	*Chapter 10, Agency Coordination, Section 10.1.2* explains that while nearby IRWM Regions did meet to discuss potential collaboration, ultimately it was decided that the regions were too distinct for significant coordination to be efficient or effective.	y
Identify areas where a state agency or other agencies may be able to assist in communication or cooperation, or implementation of IRWM Plan components, processes, and projects, or where State or federal regulatory decisions are required before implementing the projects.	42	**y/n**	y	10.1.3 Coordination with Tribal, Federal, State, and Local Agencies	As described in *Chapter 10, Agency Coordination, Section 10.1.3*, the Plan has identified state agencies that can assist in cooperation and communication related to IRWM Program activities and projects. A meeting was also held with the Regional Board to discuss the 2014 IRWM Plan Update. The agencies listed in *Section 10.1.3* have been invited to participate through inclusion on the stakeholder email list or their participation in IRWM projects.	y
IRWM Plan Standard: Climate Change					**Overall Standard Sufficient**	**Yes**
Contain a plan, program, or methodology for further data gathering and analysis of prioritized vulnerabilities.	42 - 44	**y/n**	y	8.5 Adapting Resource Management Strategies to Climate Change	Through the RMS described in *Section 8.5*, more data collection and analysis of climate change vulnerabilities will occur, especially for projects that implement adaptive management as recommended.	y
Include climate change as part of the project review process.	42 - 44	**y/n**	y	9.2.3 Project Selection Factors; 8.5 Adapting Resource Management Strategies to Climate Change	*Chapter 9, Project Evaluation and Prioritization, Section 9.2.3* describes the relationship of projects to RMS, and how RMS are a project selection factor. **Table 8-3** in *Chapter 8, Resource Management Strategies, Section 8.5* shows which RMS are also climate change management strategies.	y

Evaluate IRWM region's vulnerabilities to climate change and potential adaptation responses based on vulnerabilities assessment in the DWR Climate Change Handbook for Regional Water Planning **(1)**. Addition in 2016 GL - "At a minimum, the vulnerability evaluation must be equivalent to the vulnerability assessment contained in the Climate Change Handbook for Regional Water Planning, Section 4 and Appendix B."	42 - 44	**y/n**	y	3.4 Identification of Climate Change Vulnerabilities; 8.5 Adapting Resource Management Strategies to Climate Change	*Chapter 3, Issues and Needs, Section 3.4* describes and prioritizes the climate change vulnerabilities of the Region. *Chapter 8, Resource Management Strategies, Section 8.5* describes how the RMS will help the Region adapt to or mitigate the effects of climate change.	y
Provide a process that considers GHG emissions when choosing between project alternatives **(1)**. Addition in 2016 GL - "At a minimum, that process must determine a project's ability to help the IRWM region reduce GHG emissions as new projects are implemented over a 20-year planning horizon and consider energy efficiency and reduction of GHG emissions when choosing between project alternatives."	42 - 44	**y/n**	y	9.2.3 Project Selection Factors; 8.5 Adapting Resource Management Strategies to Climate Change	*Chapter 9, Project Evaluation and Prioritization, Section 9.2.3* describes the relationship of projects to RMS, and how RMS are a project selection factor. **Table 8-3** in *Chapter 8, Resource Management Strategies, Section 8.5* shows which RMS will help mitigate GHGs.	y

Include a list of prioritized vulnerabilities based on the vulnerability assessment and the IRWM's decision making process. Addition in 2016 GL - "A list of prioritized vulnerabilities which includes a determination regarding the feasibility for the RWMG to address the priority vulnerabilities."	42 - 44	**y/n**	y	3.4 Identification of Climate Change Vulnerabilities	*Chapter 3, Issues and Needs, Section 3.4* identifies and prioritizes 13 climate change vulnerabilities of the Region and describes how these vulnerabilities were identified and prioritized.	y
Address adapting to changes in the amount, intensity, timing, quality, and variability of runoff and recharge.	42 - 44	**y/n**	y	2.8 Climate Change	*Chapter 2, Section 2.8* discusses the implications of climate change on the Region including changes in precipitation and runoff patterns.	y
Areas of the State that receive water imported from the Sacramento-San Joaquin River Delta, the area within the Delta, and areas served by coastal aquifers must also consider the effects of sea level rise (SLR) on water supply conditions and identify suitable adaptation measures.	42 - 44	**y/n**	y	Section 3.2.2 Identification of Climate Change Vulnerabilities	As shown in *Section 3.2.2 Identification of Climate Change Vulnerabilities* **Table 3-4**, sea level rise is not applicable to the Coachella Valley IRWM Region.	y

IRWM Plan Standard Requirements for 2016 IRWM Guidelines in Addition to Previously Required 2012 IRWM Guideline Requirements. See Appendix H in IRWM 2016 Guidelines.

(1) Requirement must be addressed per CWC §10541 (e)(3).

(2) Requirement must be addressed per CWC §10541 (e)(14).

Storm Water Resource Plan Checklist and Self-Certification

The following should be completed and submitted to the State Water Resources Control Board Division of Financial Assistance in support of a storm water resource plan /functionally equivalent plan. The documents submitted, including this checklist, will be used to determine State Water Board concurrence with the Storm Water Resource Plan Guidelines and statutory water code requirements.

When combining multiple documents to form a functionally equivalent Storm Water Resource Plan, submit a cover letter explaining the approach used to arrive at the functionally equivalent document. The cover letter should explain how the documents work together to address the Storm Water Resource Plan Guidelines.

STORM WATER RESOURCE PLAN GENERAL CONTACT INFORMATION	
Contact Info: **Name** **Phone Number** **Email**	Steve Bigley, Director of Environmental Services Coachella valley Water District 760-398-2661 x2286 sbigley@cvwd.org
Date Submitted to State Water Resource Control Board:	June 8, 2020; Resubmitted December 8, 2020
Regional Water Quality Control Board:	Colorado River Regional Water Quality Control Board
Title of attached documents (expand list as needed):	2018 Coachella Valley Integrated Regional Water Management (IRWM)/Stormwater Resource (SWR) Plan • Date document was prepared: December 2018 • Document can be accessed at: http://www.cvrwmg.org/docs/2019_04_03_CVRWMG-Final2018IRWMSWR-Plan_160437.pdf

STORM WATER RESOURCE PLAN INFORMATION	
Storm Water Resource Plan Title:	2018 Coachella Valley IRWM/SWR Plan
Date Plan Completed/Adopted:	Plan completed December 2018; updated December 2020
Public Agency Preparer:	Coachella Valley Regional Water Management Group (Coachella Valley Water District, Coachella Water Authority, Indio Water Authority, Desert Water Agency, Mission Springs Water District, and Valley Sanitary District)
IRWM Submission:	Submitted to the Coachell Valley Regional Water Management Group upon completion of the 2018 Coachella Valley IRWM/SWR Plan December 2018; resubmitted December 2020

Plan Description:	The Coachella Valley IRWM/SWR Plan serves as a combined plan which addresses the requirements of the *California Department of Water Resources (DWR) Proposition 1 2016 IRWM Grant Program Guidelines* and the *State Water Resources Control Board (SWRCB) 2015 Stormwater Resource Plan (SWRP) Guidelines*. This plan serves as a SWRP functional equivalent for the Coachella Valley.

Checklist Instructions:

For **each element** listed below, review the applicable section in the Storm Water Resource Plan Guidelines and enter ALL of the following information**.** Be sure to provide a clear and thorough justification if a recommended element (non shaded) is not addressed by the Storm Water Resource Plan.

A. Mark the box if the Storm Water Resource Plan meets the provision

B. In the provided space labeled **References**, enter:
   1. Title of document(s) that contain the information (or the number of the document listed in the General Information table above);
   2. The chapter/section, **and page number(s)** where the information is located within the document(s);
   3. The entity(ies) that prepared the document(s) if different from plan preparer;
   4. The date the document(s) was prepared, and subsequent updates; and
   5. Where each document can be accessed[1] (website address or attached).

Y/N	Plan Element	Water Code Section
	STORM WATER RESOURCE PLAN CHECKLIST AND SELF-CERTIFICATION	
	Mandatory Required Elements per California Water Code are Shaded and Text is **Bold**	
	WATERSHED IDENTIFICATION (GUIDELINES SECTION VI.A)	
Y	**1. Plan identifies watershed and subwatershed(s) for storm water resource planning.**	**10565(c) 10562(b)(1) 10565(c)**
	References: • **CV IRWM/SWR Plan, Section 1.1 Background** (pg 1-3) • **CV IRWM/SWR Plan, Section 2.2.1 Watershed** (pg 2-5)	
Y	2. Plan is developed on a watershed basis, using boundaries as delineated by USGS, CalWater, USGS Hydrologic Unit designations, or an applicable integrated regional water management group, and includes a description and boundary map of each watershed and sub-watershed applicable to the Plan.	
	References: • **CV IRWM/SWR Plan, Section 1.1 Background** (pg 1-2, Figure 1-1 on pg 1-6) • **CV IRWM/SWR Plan, Section 2.2.1 Watershed** (pg 2-5 to pg 2-7, Figure 2-2 on pg 2-7)	

[1] All documents referenced must include a website address. If a document is not accessible to the public electronically, the document must be attached in the form of an electronic file (e.g. pdf or Word 2013) on a compact disk or other electronic transmittal tool.

Y	3. Plan includes an explanation of why the watershed(s) and sub-watershed(s) are appropriate for storm water management with a multiple-benefit watershed approach;

References:

- **CV IRWM/SWR Plan, Section 2.2.1 Watershed** (pg 2-5)
- **CV IRWM/SWR Plan, Section 2.2.7 Stormwater and Flood Management** (pg 2-31 to 2-35)

Y	4. Plan describes the internal boundaries within the watershed (boundaries of municipalities; service areas of individual water, wastewater, and land use agencies, including those not involved in the Plan; groundwater basin boundaries, etc.; preferably provided in a geographic information system shape file);

References:

- **CV IRWM/SWR Plan, Section 1.2 Regional Water Management Group** (Figure 1-2 on pg 1-7)
- **CV IRWM/SWR Plan, Section 2.2.2 Water Systems and Distribution** (Figure 2-3 on pg 2-12)
- **CV IRWM/SWR Plan, Section 2.2.3 Wastewater** (Figure 2-5 on pg 2-22)
- **CV IRWM/SWR Plan, Section 2.2.7 Stormwater and Flood Management** (Figure 2-6 on pg 2-33)

Y	5. Plan describes the water quality priorities within the watershed based on, at a minimum, applicable TMDLs and consideration of water body-pollutant combinations listed on the State's Clean Water Act Section 303(d) list of water quality limited segments (a.k.a impaired waters list);

References:

- **CV IRWM/SWR Plan, Section 2.5.3 Surface Water Quality** (pg 2-61 to 2-63)
- **CV IRWM/SWR Plan, Section 2.5.5 Stormwater Quality and Water Quality Compliance** (pg 2-64 to 2-70)
- **CV IRWM/SWR Plan, Section 2.5.6 Stormwater Quality Concerns and Priority Pollutants** (pg 2-70)

Y	6. Plan describes the general quality and identification of surface and ground water resources within the watershed (preferably provided in a geographic information system shape file);

References:

- **CV IRWM/SWR Plan, Section 2.2.1 Watershed** (Identification of surface water resources in Figure 2-2 on pg 2-7)
- **CV IRWM/SWR Plan, Section 2.2.2 Water Systems and Distribution** (Identification of surface/groundwater resources in Figure 2-3 on pg 2-12, Figure 2-4 on pg 2-19)
- **CV IRWM/SWR Plan, Section 2.5.1 Groundwater Quality** (pg 2-57 to pg 2-60)
- **CV IRWM/SWR Plan, Section 2.5.3 Surface Water Quality** (pg 2-61 to pg 2-63)
- **CV IRWM/SWR Plan, Section 2.5.5 Stormwater Quality and Water Quality Compliance** (p 2-64 to 2-70)
- **CV IRWM/SWR Plan, Section 2.5.6 Stormwater Quality Concerns and Priority Pollutants** (pg 2-70)

Y	7. Plan describes the local entity or entities that provide potable water supplies and the estimated volume of potable water provided by the water suppliers;

References:

- **CV IRWM/SWR Plan, Section 1.2 Regional Management Group** (Water supply entities on pg 1-3 to 1-5)
- **CV IRWM/SWR Plan, Section 2.2.2 Water Systems and Distribution** (pg 2-15 to 2-20, Table 2-2)
- **CV IRWM/SWR Plan, Section 2.4.1 Water Supply** (pg 2-44 to 2-46, Table 2-10)

Y	8. Plan includes map(s) showing location of native habitats, creeks, lakes, rivers, parks, and other natural or open space within the sub-watershed boundaries; and

References:

- **CV IRWM/SWR Plan, Section 2.2.1 Watershed** (Figure 2-2 on pg 2-7)
- **CV IRWM/SWR Plan, Section 2.2.8 Natural Communities and Habitats** (Figure 2-8 on pg 2-38, Figure 2-9 on pg 2-39)
- **CV IRWM/SWR Plan, Section 2.3.1 Land Use Agencies** (Figure 2-11 on pg 2-43)

Y	9. Plan identifies (quantitative, if possible) the natural watershed processes that occur within the sub-watershed and a description of how those natural watershed processes have been disrupted within the sub-watershed (e.g., high levels of imperviousness convert the watershed processes of infiltration and interflow to surface runoff increasing runoff volumes; development commonly covers natural surfaces and often introduces non-native vegetation, preventing the natural supply of sediment from reaching receiving waters).

References:

- **CV IRWM/SWR Plan, Section 2.2.1 Watershed** (pg 2-5 to 2-6)
- **CV IRWM/SWR Plan, Section 2.2.7 Stormwater and Flood Management** (pg 2-31 to pg 2-35)

WATER QUALITY COMPLIANCE
(GUIDELINES SECTION V)

Y	**10. Plan identifies activities that generate or contribute to the pollution of storm water or dry weather runoff, or that impair the effective beneficial use of storm water or dry weather runoff.**	**10562(d)(7)**

References:

- **CV IRWM/SWR Plan, Section 2.5.5 Stormwater Quality** (pg 2-64 to pg 2-65)

Y	**11. Plan describes how it is consistent with and assists in, compliance with total maximum daily load implementation plans and applicable national pollutant discharge elimination system permits.**	**10562(b)(5)**

References:

- **CV IRWM/SWR Plan, Section 2.5.5 Stormwater Quality** (pg 2-64 to pg 2-70)

Y	**12. Plan identifies applicable permits and describes how it meets all applicable waste discharge permit requirements.**	**10562(b)(6)**

References:

- **CV IRWM/SWR Plan, Section 2.5.5 Stormwater Quality** (pg 2-65 to pg 2-70)

ORGANIZATION, COORDINATION, COLLABORATION
(GUIDELINES SECTION VI.B)

Y	**13. Local agencies and nongovernmental organizations were consulted in Plan development.**	**10565(a)**

References:

- **CV IRWM/SWR Plan, Section 1.4.1 Stakeholder Coordination and Public Involvement** (pg 1-13)
- **CV IRWM/SWR Plan, Section 1.4.2 Planning Partners** (pg 1-14)
- **CV IRWM/SWR Plan, Section 7.2.1 Group Membership and Participation** (pg 7-5 to pg 7-22, Table 7-1, Table 7-2, and Table 7-3)
- **CV IRWM/SWR Plan, Section 10.1.3 Coordination with Tribal, Federal, and Local Agencies** (pg 10-8 to 10-12)
- **CV IRWM/SWR Plan, Section 10.1.4 Coordination for the Stormwater Resources Plan** (pg 10-12 to 10-14, Table 10-1)

Y	**14. Community participation was provided for in Plan development.** **10562(b)(4)**

References:

- **CV IRWM/SWR Plan, Section 1.4.1 Stakeholder Coordination and Public Involvement** (pg 1-13)
- **CV IRWM/SWR Plan, Section 1.4.2 Planning Partners** (pg 1-14)
- **CV IRWM/SWR Plan, Section 1.4.3 DAC Outreach** (pg 1-14 to 1-15)
- **CV IRWM/SWR Plan, Section 1.4.4 Tribal Outreach** (pg 1-15 to 1-16)
- **CV IRWM/SWR Plan, Section 1.4.5 Public Outreach** (pg 1-16)
- **CV IRWM/SWR Plan, Section 4.2 DAC Outreach Program Activities** (pg 4-6 to 4-17)
- **CV IRWM/SWR Plan, Section 4.4 DAC Projects Developed Through Outreach Efforts** (pg 4-45 to 4-53)
- **CV IRWM/SWR Plan, Section 5.5.2 Coachella Valley IRWM Program** (pg 5-10 to 5-11)
- **CV IRWM/SWR Plan, Section 7.2.1 Group Membership and Participation** (pg 7-5 to 7-22)
- **CV IRWM/SWR Plan, Section 7.4 Balanced Access and Opportunities** (pg 7-23 to 7-27)
- **CV IRWM/SWR Plan, Section 7.5 Disadvantaged Communities Outreach** (pg 7-27 to 7-30)
- **CV IRWM/SWR Plan, Section 7.6 Tribal Outreach and Coordination** (pg 7-30 to 7-32)
- **CV IRWM/SWR Plan, Section 10.1.4 Coordination for the Stormwater Resources Plan** (pg 10-12 to 10-14)
- **CV IRWM/SWR Plan, Additional SWRP Information, Appendix VI-K**

Y	15. Plan includes description of the existing integrated regional water management group(s) implementing an integrated regional water management plan.

References:

- **CV IRWM/SWR Plan, Section 1.2 Regional Water Management Group** (pg 1-3 to 1-5)
- **CV IRWM/SWR Plan, Section 7.2.1 Group Membership and Participation** (CVRWMG sub-section on pg 7-9 to 7-11)

Y	16. Plan includes identification of and coordination with agencies and organizations (including, but not limited to public agencies, nonprofit organizations, and privately owned water utilities) that need to participate and implement their own authorities and mandates in order to address the storm water and dry weather runoff management objectives of the Plan for the targeted watershed.

References:

- **CV IRWM/SWR Plan, Section 1.4.1 Stakeholder Coordination and Public Involvement** (pg 1-13)
- **CV IRWM/SWR Plan, Section 7.2.1 Group Membership and Participation** (pg 7-5 to 7-22)
- **CV IRWM/SWR Plan, Section 10.1.4 Coordination for the Stormwater Resources Plan** (pg 10-12 to 10-14; Table 10-1)

Y	17. Plan includes identification of nonprofit organizations working on storm water and dry weather resource planning or management in the watershed.

References:

- **CV IRWM/SWR Plan, Section 1.4.1 Stakeholder Coordination and Public Involvement** (pg 1-13)
- **CV IRWM/SWR Plan, Section 7.2.1 Group Membership and Participation** (pg 7-5 to 7-22)

Y	18. Plan includes identification and discussion of public engagement efforts and community participation in Plan development.

References:
- **CV IRWM/SWR Plan, Section 1.4.1 Stakeholder Coordination and Public Involvement** (pg 1-13)
- **CV IRWM/SWR Plan, Section 1.4.2 Planning Partners** (pg 1-14)
- **CV IRWM/SWR Plan, Section 1.4.3 DAC Outreach** (pg 1-14 to 1-15)
- **CV IRWM/SWR Plan, Section 1.4.4 Tribal Outreach** (pg 1-15 to 1-16)
- **CV IRWM/SWR Plan, Section 1.4.5 Public Outreach** (pg 1-16)
- **CV IRWM/SWR Plan, Section 7.2.1 Group Membership and Participation** (pg 7-5 to 7-22)
- **CV IRWM/SWR Plan, Section 7.4 Balanced Access and Opportunities** (pg 7-23 to 7-27)
- **CV IRWM/SWR Plan, Section 7.5 Disadvantaged Communities Outreach** (pg 7-27 to 7-30)
- **CV IRWM/SWR Plan, Section 7.6 Tribal Outreach and Coordination** (pg 7-30 to 7-32)
- **CV IRWM/SWR Plan, Section 10.1.4 Coordination for the Stormwater Resources Plan** (pg 10-12 to 10-14)

Y	19. Plan includes identification of required decisions that must be made by local, state or federal regulatory agencies for Plan implementation and coordinated watershed-based or regional monitoring and visualization

References:
- **CV IRWM/SWR Plan, Section 7.8 Long-Term Implementation of IRMW/SWR Plan** (pg 7-35 to 7-36)
- **CV IRWM/SWR Plan, Section 10.1.3 Coordination with Tribal, Federal, State and Local Agencies** (pg 10-8 to 10-12)
- **CV IRWM/SWR Plan, Section 11.6 SWRP Implementation** (pg 11-45 to 11-47)

Y	20. Plan describes planning and coordination of existing local governmental agencies, including where necessary new or altered governance structures to support collaboration among two or more lead local agencies responsible for plan implementation.

References:
- **CV IRWM/SWR Plan, Section 1.2 Regional Water Management Group** (Altered governance structure on pg 1-3 to 1-5)
- **CV IRWM/SWR Plan, Section 1.4.2 Planning Partners** (pg 1-41)
- **CV IRWM/SWR Plan, Section 7.2.1 Group Membership and Participation** (pg 7-5 to 7-22, CVRWMG sub-section on pg 7-9 to 7-11, Desert Task Force sub-section on pg 7-15)
- **CV IRWM/SWR Plan, Section 10.1.4 Coordination for the Stormwater Resources Plan** (pg 10-12 to 10-14)

Y	21. Plan describes the relationship of the Plan to other existing planning documents, ordinances, and programs established by local agencies.

References:
- **CV IRWM/SWR Plan, Section 10.2 Relation to Local Water Planning** (pg 10-15 to 10-41)
- **CV IRWM/SWR Plan, Section 10.3 Relation to Local Land Use Planning** (pg 10-41 to 10-46)
- **CV IRWM/SWR Plan, Section 10.2.5 Technical Evaluations for the 2014 IRWM/SWR Plan** (Integrated Flood Management Plan on pg 10-31 to 10-33)

Y	22. (If applicable) Plan explains why individual agency participation in various isolated efforts is appropriate.

References:
- **CV IRWM/SWR Plan, Section 10.2.6 Individual Planning Efforts by Agency** (pg 10-36 to 10-39)

QUANTITATIVE METHODS
(GUIDELINES SECTION VI.C)

Y	23. **For all analyses:** Plan includes an integrated metrics-based analysis to demonstrate that the Plan's proposed storm water and dry weather capture projects and programs will satisfy the Plan's identified water management objectives and multiple benefits.

References: • **CV IRWM/SWR Plan, Project List Appendix VI-H** • **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-33)	
Y	24. **For water quality project analysis (section VI.C.2.a)** Plan includes an analysis of how each project and program complies with or is consistent with an applicable NPDES permit. The analysis should simulate the proposed watershed-based outcomes using modeling, calculations, pollutant mass balances, water volume balances, and/or other methods of analysis. Describes how each project or program will contribute to the preservation, restoration, or enhancement of watershed processes (as described in Guidelines section VI.C.2.a)
References: • **CV IRWM/SWR Plan, Project List Appendix VI-H** • **CV IRWM/SWR Plan, Section 6.1.3 Goals, Objectives, and the Planning Hierarchy** (Establishing metrics for analysis: Table 6-2, Objectives E and F on pg 6-16 to 18) • **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-35 to pg 9-37)	
Y	25. **For storm water capture and use project analysis (section VI.C.2.b):** Plan includes an analysis of how collectively the projects and programs in the watershed will capture and use the proposed amount of storm water and dry weather runoff.
References: • **CV IRWM/SWR Plan, Project List Appendix VI-H** • **CV IRWM/SWR Plan, Section 6.1.3 Goals, Objectives, and the Planning Hierarchy** (Establishing metrics for analysis: Table 6-2, Objective D, Target 3 on pg 6-15) • **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-38 to pg 40)	
Y	26. **For water supply and flood management project analysis (section VI.C.2.c):** Plan includes an analysis of how each project and program will maximize and/or augment water supply.
References: • **CV IRWM/SWR Plan, Project List Appendix VI-H** • **CV IRWM/SWR Plan, Section 6.1.3 Goals, Objectives, and the Planning Hierarchy** (Establishing metrics for analysis: Table 6-2, Objectives A, C, and D on pg 6-12 to 6-16) • **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-41 to 9-43)	
Y	27. **For environmental and community benefit analysis (section VI.C.2.d):** Plan includes a narrative of how each project and program will benefit the environment and/or community, with some type of quantitative measurement.
References: • **CV IRWM/SWR Plan, Project List Appendix VI-H** • **CV IRWM/SWR Plan, Section 6.1.3 Goals, Objectives, and the Planning Hierarchy** (Establishing metrics for analysis: Table 6-2, Objectives G, J, K, L and M on pg 6-18 to 6-21) • **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-44 to 9-49)	
Y	28. **Data management (section VI.C.3):** Plan describes data collection and management, including: a) mechanisms by which data will be managed and stored; b) how data will be accessed by stakeholders and the public; c) how existing water quality and water quality monitoring will be assessed; d) frequency at which data will be updated; and e) how data gaps will be identified.

References:

- **(a) CV IRWM/SWR Plan, Section 11.3.2 Data Collection Techniques** (pg 11-29 to 11-30)
- **(a) CV IRWM/SWR Plan, Section 11.3.4 Responsible Entity** (pg 11-30)
- **(b) CV IRWM/SWR Plan, Section 11.3.3 Stakeholder Contributions** (pg 11-30)
- **(b) CV IRWM/SWR Plan, Section 11.3.5 Regional Data Sharing** (pg 11-30 to pg 11-31)
- **(b) CV IRWM/SWR Plan, Section 11.3.6 Statewide Data Sharing** (pg 11-31 to pg 11-32)
- **(c,d) CV IRWM/SWR Plan, Section 11.3.1 Overview of Data Needs** (Stormwater Quality Data on pg 11-25 to 11-26)
- **(e) CV IRWM/SWR Plan, Section 11.3.1 Overview of Data Needs** (Data Gaps on pg 11-27 to 11-29)

IDENTIFICATION AND PRIORITIZATION OF PROJECTS
(GUIDELINES SECTION VI.D)

Y	**29. Plan identifies opportunities to augment local water supply through groundwater recharge or storage for beneficial use of storm water and dry weather runoff.**	**10562(d)(1)**

References:

- **CV IRWM/SWR Plan, Section 8.4.3 Increase Water Supply** (Conjunctive Management and Groundwater Storage on pg 8-16 to 8-18)
- **CV IRWM/SWR Plan, Section 9.5.1 Stormwater Priorities** (pg 9-26 to 9-27)
- **CV IRWM/SWR Plan, Section 9.5.2 Stormwater Multiple Benefits and Associated Metrics** (pg 9-27 to 9-28)
- **CV IRWM/SWR Plan, Section 9.5.3 Stormwater Resource Plan Project Prioritization Process** (pg 9-29 to 9-32)
- **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-34; pg. 9-38 to pg 9-40)
- **CV IRWM/SWR Plan, Additional SWRP Information, Appendix VI-K**

Y	**30. Plan identifies opportunities for source control for both pollution and dry weather runoff volume, onsite and local infiltration, and use of storm water and dry weather runoff.**	**10562(d)(2)**

References:

- **CV IRWM/SWR Plan, Section 8.4.4 Improve Water Quality** (Pollution Prevention on pg 8-27 to 8-28, Urban Runoff Management on pg 8-30 to 8-31)
- **CV IRWM/SWR Plan, Section 9.5.1 Stormwater Priorities** (pg 9-26 to 9-27)
- **CV IRWM/SWR Plan, Section 9.5.2 Stormwater Multiple Benefits and Associated Metrics** (pg 9-27 to 9-28)
- **CV IRWM/SWR Plan, Section 9.5.3 Stormwater Resource Plan Project Prioritization Process** (pg 9-29 to 9-32)
- **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-34; pg. 9-41 to pg 9-43)
- **CV IRWM/SWR Plan, Additional SWRP Information, Appendix VI-K**

Y	**31. Plan identifies projects that reestablish natural water drainage treatment and infiltration systems, or mimic natural system functions to the maximum extent feasible.**	**10562(d)(3)**

References:

- **CV IRWM/SWR Plan, Section 8.4.4 Improve Water Quality** (Urban Runoff Management on pg 8-30 to 8-31)
- **CV IRWM/SWR Plan, Section 8.4.5 Improve Flood Management** (pg 8-31 to 8-33)
- **CV IRWM/SWR Plan, Section 9.5.1 Stormwater Priorities** (pg 9-26 to 9-27)
- **CV IRWM/SWR Plan, Section 9.5.2 Stormwater Multiple Benefits and Associated Metrics** (pg 9-27 to 9-28)
- **CV IRWM/SWR Plan, Section 9.5.3 Stormwater Resource Plan Project Prioritization Process** (pg 9-29 to 9-32)
- **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-34; pg. 9-35 to pg 9-37)
- **CV IRWM/SWR Plan, Additional SWRP Information, Appendix VI-K**

Y	**32. Plan identifies opportunities to develop, restore, or enhance habitat and open space through storm water and dry weather runoff management, including wetlands, riverside habitats, parkways, and parks.**	**10562(d)(4)**

References:

- **CV IRWM/SWR Plan, Section 8.4.6 Practice Resource Stewardship** (pg 8-33 to 8-38)
- **CV IRWM/SWR Plan, Section 9.5.1 Stormwater Priorities** (pg 9-26 to 9-27)
- **CV IRWM/SWR Plan, Section 9.5.2 Stormwater Multiple Benefits and Associated Metrics** (pg 9-27 to 9-28)
- **CV IRWM/SWR Plan, Section 9.5.3 Stormwater Resource Plan Project Prioritization Process** (pg 9-29 to 9-32)
- **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-34; pg. 9-44 to pg 9-46)
- **CV IRWM/SWR Plan, Additional SWRP Information, Appendix VI-K**

Y	**33. Plan identifies opportunities to use existing publicly owned lands and gardens, farm and agricultural preserves, school sites, and government office buildings and complexes, to capture, clean, store, and use storm water and dry weather runoff either onsite or easements, including, but not limited to, parks, public open space, community**	**10562(d)(5)** **10562(b)(8)**

References:

- **CV IRWM/SWR Plan, Section 8.4.6 Practice Resource Stewardship** (Land Use Planning & Management on pg 8-35 to 8-36)
- **CV IRWM/SWR Plan, Section 9.5.1 Stormwater Priorities** (pg 9-26 to 9-27)
- **CV IRWM/SWR Plan, Section 9.5.2 Stormwater Multiple Benefits and Associated Metrics** (pg 9-27 to 9-28)
- **CV IRWM/SWR Plan, Section 9.5.3 Stormwater Resource Plan Project Prioritization Process** (pg 9-29 to 9-32)
- **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-34 to pg 9-49)
- **CV IRWM/SWR Plan, Additional SWRP Information, Appendix VI-K**

Y	**34. For new development and redevelopments (if applicable): Plan identifies design criteria and best management practices to prevent storm water and dry weather runoff pollution and increase effective storm water and dry weather runoff management for new and upgraded infrastructure and residential, commercial, industrial, and public development.**	**10562(d)(6)**

References:

- **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (Water Quality Projects Analysis on pg 9-35 to 9-37)

Y	**35. Plan uses appropriate quantitative methods for prioritization of projects. (This should be accomplished by using a metrics-based and integrated evaluation and analysis of multiple benefits to maximize water supply, water quality, flood management, environmental, and other community benefits within the watershed.)**	**10562(b)(2)**

References:	
	• **CV IRWM/SWR Plan, Section 6.3 Stormwater Resource Plan Benefits Prioritization** (Prioritization of benefits that guide project prioritization on pg 6-25 to 6-28) • **CV IRWM/SWR Plan, Section 9.5.2 Stormwater Multiple Benefits and Associated Metrics** (pg 9-27 to 9-28) • **CV IRWM/SWR Plan, Section 9.5.3 Stormwater Resource Plan Project Prioritization Process** (pg 9-29 to 9-32) • **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-33 to 9-50) • **CV IRWM/SWR Plan, Additional SWRP Information, Appendix VI-K**
Y	36. *Overall:* Plan prioritizes projects and programs using a metric-driven approach and a geospatial analysis of multiple benefits to maximize water supply, water quality, flood management, environmental, and community benefits within the watershed.
References:	
	• **CV IRWM/SWR Plan, Section 6.3 Stormwater Resource Plan Benefits Prioritization** (Prioritization of benefits that guide project prioritization on pg 6-25 to 6-28) • **CV IRWM/SWR Plan, Section 9.5.2 Stormwater Multiple Benefits and Associated Metrics** (pg 9-27 to 9-28) • **CV IRWM/SWR Plan, Section 9.5.3 Stormwater Resource Plan Project Prioritization Process** (pg 9-29 to 9-32) • **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-33 to 9-50)
Y	37. *Multiple benefits:* Each project in accordance with the Plan contributes to at least two or more **Main Benefits** and the maximum number of **Additional Benefits** as listed in Table 4 of the Guidelines. (Benefits are not counted twice if they apply to more than one category.)
References:	
	• **CV IRWM/SWR Plan, Section 9.5.3 Stormwater Resource Plan Project Prioritization Process** (Project Screening on pg 9-29 to 9-30, Table 9-7, Table 9-8)

IMPLEMENTATION STRATEGY AND SCHEDULE
(GUIDELINES SECTION VI.E)

Y	38. Plan identifies resources for Plan implementation, including: 1) projection of additional funding needs and sources for administration and implementation needs; and 2) schedule for arranging and securing Plan implementation financing.	
References:		
	• **(1) CV IRWM/SWR Plan, Section 11.5 Finance** (Stormwater Project Funding on pg 11-43, Table 11-5 on pg 11-44) • **(2) CV IRWM/SWR Plan, Section 11.5 Finance** (Stormwater Project Funding, Table 11-6 on pg 11-44)	
Y	**39. Plan projects and programs are identified to ensure the effective implementation of the storm water resource plan pursuant to this part and achieve multiple benefits.**	**10562(d)(8)**
References:		
	• **CV IRWM/SWR Plan, Section 6.3 Stormwater Resource Plan Benefits Prioritization** (Prioritization of benefits that guide project prioritization on pg 6-25 to 6-28) • **CV IRWM/SWR Plan, Section 9.5.2 Stormwater Multiple Benefits and Associated Metrics** (pg 9-27 to 9-28) • **CV IRWM/SWR Plan, Section 9.5.3 Stormwater Resource Plan Project Prioritization Process** (pg 9-29 to 9-32) • **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-33 to 9-50) • **CV IRWM/SWR Plan, Project List Appendix VI-H**	

Y	**40. The Plan identifies the development of appropriate decision support tools and the data necessary to use the decision support tools.** **10562(d)(8)**

References:

- **CV IRWM/SWR Plan, Section 6.3 Stormwater Resource Plan Benefits Prioritization** (Prioritization of benefits that guide project prioritization on pg 6-25 to 6-28)
- **CV IRWM/SWR Plan, Section 9.5.4 Integrated Metrics-Based Analysis of Project Benefits** (pg 9-33 to 9-50)
- **CV IRWM/SWR Plan, Section 11.3 Data Management** (pg 11-23 to 11-24)

Y	41. Plan describes implementation strategy, including: a) Timeline for submitting Plan into existing plans, as applicable; b) Specific actions by which Plan will be implemented; c) All entities responsible for project implementation; d) Description of community participation strategy; e) Procedures to track status of each project; f) Timelines for all active or planned projects; g) Procedures for ongoing review, updates, and adaptive management of the Plan; and h) A strategy and timeline for obtaining necessary federal, state, and local permits.

References:

- **(c, d) CV IRWM/SWR Plan, Section 7.2 Structure and Organization** (pg 7-3 to 7-22)
- **(a) CV IRWM/SWR Plan, Section 7.7 IRWM/SWR Plan Adoption** (pg 7-32 to 7-34, Figure 7-3 on pg 7-34)
- **(b, e, g) CV IRWM/SWR Plan, Section 7.8 Long-Term Implementation of IRMW/SWR Plan** (pg 7-35 to 7-37)
- **(e) CV IRWM/SWR Plan, Section 11.6 SWRP Implementation** (pg 11-45 to 11-46)
- **(e) CV IRWM/SWR Plan, Section 11.4.1 Plan Performance** (pg 11-33 to pg 11-34)
- **(f) CV IRWM/SWR Plan, Section 11.6 SWRP Implementation** (Figure 11-3 on pg 11-46)
- **(g) CV IRWM/SWR Plan, Section 11.6.1 Procedure for Updating the Plan** (pg 11-46 to pg 11-47)
- **(h) CV IRWM/SWR Plan, Section 11.6 SWRP Implementation** (pg 11-45 to pg 11-46)

Y	**42. Applicable IRWM plan:** **10562(b)(7)** **The Plan will be submitted, upon development, to the applicable integrated regional water management (IRWM) group for incorporation into the IRWM plan.**

References:

- **CV IRWM/SWR Plan, Section 1.5 2018 IRWM/SWR Plan Development** (pg 1-17)
- **CV IRWM/SWR Plan, Section 7.7 IRWM/SWR Plan Adoption** (pg 7-32 to 7-34)

Y	43. Plan describes how implementation performance measures will be tracked.

References:

- **CV IRWM/SWR Plan, Section 7.8 Long-Term Implementation of IRMW/SWR Plan** (Online Project Database Sub-section on pg 7-36 to pg 7-37)
- **CV RWM/SWR Plan, Section 11.6 SWRP Implementation** (pg 11-45 to pg 11-46)

EDUCATION, OUTREACH, PUBLIC PARTICIPATION
(GUIDELINES SECTION VI.F)

Y	44. **Outreach and Scoping: Community participation is provided for in Plan implementation.** **10562(b)(4)**

References:

- **CV IRWM/SWR Plan, Section 7.2.1 Group Membership and Participation** (Desert Task Force on pg 7-15)
- **CV IRWM/SWR Plan, Section 7.4 Balanced Access and Opportunities** (pg 7-23 to 7-27)
- **CV IRWM/SWR Plan, Section 7.8 Long-Term Implementation of IRMW/SWR Plan** (pg 7-35 to 7-36)
- **CV IRWM/SWR Plan, Section 11.6 SWRP Implementation** (pg 11-45 to pg 11-46)
- **CV IRWM/SWR Plan, Additional SWRP Information, Appendix VI-K**

Y	45. Plan describes public education and public participation opportunities to engage the public when considering major technical and policy issues related to the development and

References:

- **CV IRWM/SWR Plan, Section 7.2.1 Group Membership and Participation** (Desert Task Force and Issues Groups on pg 7-15 to 7-19, Stakeholder Public Workshops on pg 7-19 to 7-22)

Y	46. Plan describes mechanisms, processes, and milestones that have been or will be used to facilitate public participation and communication during development and implementation of the Plan.

References:

- **CV IRWM/SWR Plan, Section 4.2.4 Outreach Mechanisms** (pg 4-11 to 4-14)
- **CV IRWM/SWR Plan, Section 7.2.1 Group Membership and Participation** (pg 7-5 to 7-22)
- **CV IRWM/SWR Plan, Section 7.4 Balanced Access and Opportunities** (pg 7-23 to 7-27)
- **CV IRWM/SWR Plan, Section 7.5 Disadvantaged Communities Outreach** (pg 7-27 to 7-30)
- **CV IRWM/SWR Plan, Section 7.6 Tribal Outreach and Coordination** (pg 7-30 to 7-32)

Y	47. Plan describes mechanisms to engage communities in project design and implementation.

References:

- **CV IRWM/SWR Plan, Section 7.2.1 Group Membership and Participation** (Desert Task Force on pg 7-15)
- **CV IRWM/SWR Plan, Section 7.8 Long-Term Implementation of IRMW/SWR Plan** (pg 7-35 to 7-37)
- **CV IRWM/SWR Plan, Section 11.6 SWRP Implementation** (pg 11-45 to pg-46)

Y	48. Plan identifies specific audiences including local ratepayers, developers, locally regulated commercial and industrial stakeholders, nonprofit organizations, and the general public.

References:

- **CV IRWM/SWR Plan, Section Table 7-10** (pg 7-37 to 7-40)

Y	49. Plan describes strategies to engage disadvantaged and climate vulnerable communities within the Plan boundaries and ongoing tracking of their involvement in the planning process.

References:

- **CV IRWM/SWR Plan, Section 1.4.3 DAC Outreach** (pg 1-14 to 1-15)
- **CV IRWM/SWR Plan, Section 4.2 DAC Outreach Program Activities** (pg 4-6 to 4-17)
- **CV IRWM/SWR Plan, Section 4.4 DAC Projects Developed Through Outreach Efforts** (pg 4-45 to 4-53)
- **CV IRWM/SWR Plan, Section 7.5 Disadvantaged Communities Outreach** (pg 7-27 to 7-30)

Y	50. Plan describes efforts to identify and address environmental injustice needs and issues within the watershed.

References:

- **CV IRWM/SWR Plan, Section 4.1.2 Previously Characterized Issues and Needs** (pg 4-3)
- **CV IRWM/SWR Plan, Section 4.1.3 Previously Identified Projects** (pg 4-3)
- **CV IRWM/SWR Plan, Section 4.2 DAC Outreach Program Activities** (pg 4-6 to 4-17)
- **CV IRWM/SWR Plan, Section 4.4 DAC Projects Developed Through Outreach Efforts** (pg 4-45 to 4-53)
- **CV IRWM/SWR Plan, Section 7.5 Disadvantaged Communities Outreach** (pg 7-27 to 7-30)

Y	51. Plan includes a schedule for initial public engagement and education.

References:

- **CV IRWM/SWR Plan, Section 7.7 IRWM/SWR Plan Adoption** (pg 7-32 to 7-34)

DECLARATION AND SIGNATURE

I declare under penalty of perjury that all information provided is true and correct to the best of my knowledge and belief.

[illegible]	Director of Environmental Services	[illegible]
Authorized Signature	Title	Date
Authorized Signature	Title	Date

Coachella Valley Water District

Public Agency

Appendix VI-B: Data and Technical Sources, Analysis, and Use in the 2018 Coachella Valley IRWM/SWR Plan Volume I

This appendix contains Table 6 from DWR's *2016 IRWM Program Guidelines*, documenting the technical analysis used in development of the 2018 Coachella Valley IRWM/SWR Plan. Complete source citations are provided following the table, and can also be found in *Chapter 12, References*.

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Data and Technical Sources, Analysis, and Use in 2018 IRWM/SWR Plan

Data or Study (full citation provided following table)	Analysis Method	Results/Derived Information	Use in IRWM Plan	Source Agency
Source: CVRWMG Agency Documents				
Annual Economic Report (2012)	Economic data from cities and agencies in the Region.	Population and demographic data by city. Employment information by city and by industry.	Used to help characterize the Region's social/cultural make-up, economy, and economic drivers and concerns.	Coachella Valley Economic Partnership (CVEP)
Annual Review Water Quality Report (2009)	Reported agency data.	Average gross value per acre of cropland, and total value of crops in 2007.	Used to show the role of agriculture in Region economy.	CVWD
Coachella Valley Health Assessment	Regional health collaborative to address the public health needs of the residents of the Coachella Valley	22 community health needs were identified, additional information included demographic specifics, community health indicators, and stakeholder input.	Used to provide information on the minority population within the Coachella Valley	CVHC
Coachella Valley Integrated Regional Water Management Plan (2014)	Provided basis for 2018 IRWM updated	Comprehensive overview of the Coachella Valley regions water supply, monitoring, quality, recycled and groundwater production and expansion	Used heavily for the 2018 IRWM structure and writing efforts	CVRWMG
Coachella Valley Multiple Species Habitat Conservation Plan (2007)	Scientific Advisory Committee (biologists from federal, State, and local agencies, and private sector groups). Population and land use projections. Scientific Advisory Committee-developed methodology for assessing relative biological value of land using best available science. Review of relevant scientific and planning documents.	Native habitat characterizations and native species of importance to the Region. Threats to native habitats and species.	Used to describe natural communities and habitats and discuss habitat conservation issues and needs.	CVAG

Data or Study (full citation provided following table)	Analysis Method	Results/Derived Information	Use in IRWM Plan	Source Agency
Coachella Valley Multiple Species Habitat Conservation Plan (2016)	Review updated 2007 plan.	Updated native habitat characterizations and native species of importance to the Region. Threats to native habitats and species.	Used to describe updated natural communities and habitats and discuss habitat conservation issues and needs.	CVAG
Coachella Valley Water Management Plan Update (2010)	Review and analysis of existing studies, planning efforts, legal decisions, and contracts/agreements. Evaluation of accomplishments stemming from 2002 WMP. Projections from the Riverside County Center for Demographic Research. Reported water supply, production, and use data. Monitoring data.	Volumes of water delivered, used, supplied. Water quality data. Population, land use, and water supply/demand projections. Groundwater levels and quality data. Characterization of water supply sources and related information.	Used to characterize the Region’s groundwater basins, water supplies, and water demands. Also used to describe recharge volumes, groundwater levels and management efforts, status of groundwater, wastewater and recycled water capacity, potential for use of untreated canal water for irrigation, and the (low) potential for use of desalinated ocean water.	CVWD
Crafting Our Future	Economic analysis of Coachella Valley, potential development and opportunities	Comprehensive overview of the Coachella Valley economy, including population, housing, unemployment, stock market and exchange rates	Used to describe the general economic situation and prediction for future conditions within the Coachella Valley region	Coachella Valley Economic Partnership (CVEP)
DAC Outreach Program Study	Stakeholder input, DAC surveys, review of existing studies, spatial analysis.	Characterization of DACs and their issues/needs.	This program informed the development of Chapter 4, Disadvantaged Communities, as well as other discussions related to DACs.	CVRWMG
Domestic Water Quality Report (2012)	Water samples, federal and state regulations	Levels of constituents that require monitoring by state and federal regulations.	Used to describe constituents monitored in drinking water, and sources of constituents.	CVWD

Data or Study (full citation provided following table)	Analysis Method	Results/Derived Information	Use in IRWM Plan	Source Agency
Engineer's Report on Water Supply and Replenishment Assessment, Lower Whitewater River Subbasin Area of Benefit 2016-2017; Engineer's Report on Water Supply and Replenishment Assessment, Mission Creek Subbasin Area of Benefit 20136-2017; Engineer's Report on Water Supply and Replenishment Assessment, Upper Whitewater River Subbasin Area of Benefit 2016-2017	Groundwater monitoring well data.	Groundwater elevations over time (ranging from 15-90 years of data). Groundwater storage changes.	Provides the baseline for measuring groundwater levels to meet Target under Goal 1, Objective B; Used to describe groundwater overdraft and demonstrate beneficial effects of groundwater overdraft reduction measures (based on increasing groundwater storage capacity).	CVWD
General Plan Environmental Impact Report	Environmental impact analysis of general plan land use and planning, transportation and circulation, air quality, noise, biological resources, cultural resources, public services and utilities, visual resources, hydrology and water quality, geology and soils, agriculture, hazards and hazardous materials, and mineral resources.	Projected population growth and impact of build out	Used to document unincorporated city population and density	City of Coachella
Integrated Flood Management Study	Stakeholder input, mapped flood zones overlaid with geologic, vegetation, soil-type, and land use to determine IFM opportunities.	Flood risks and maps, integrated flood management opportunities and locations.	Informed the discussion of flood issues in the Region, as well as possible opportunities for managing flooding. One of the key technical analyses completed in support of the 2014 IRWM Plan.	CVRWMG
Mission Creek and Garnet Hill Subbasins Water Management Plan	Existing studies and plans. Population, land use and socio-economic trends. Water demand and supply projections. Reported water supply, production, and use data.	Volumes of water delivered, used, supplied. Water quality data. Population, land use, and water supply/demand projections. Groundwater levels and quality data. Characterization of water supply sources and related information.	Used to document demand and projected future demand within the Mission Creek and Garnet Hill Sub-Basins and to describe issues pertaining to the sub-basin such as groundwater overdraft, potential impacts and solutions, and other water sources (recycled water).	CVWD, DWA, MSWD
Non-potable Water Operations Annual Report	Annual overview of groundwater pumping and recharge, residential conservation, recycled water program expansion, and water quality	Summary of water reclamation plant capacity	Used to compare CVWD recycled water production compared to the production from other Coachella Valley region agencies	CVWD

Data or Study (full citation provided following table)	Analysis Method	Results/Derived Information	Use in IRWM Plan	Source Agency
North Cathedral City and Thousand Palms Stormwater Management Plan: Thousand Palms and Morongo Wash Watersheds Alternatives Analysis Report	Review of existing flood hazards within the region and previous hydrologic studies of the watersheds	Flooding vulnerabilities and stormwater planning efforts in the Coachella Valley region	Used to provide detailed analysis for the Stormwater Master Plan	CVWD
Quality of Life and Place	Overview of the Coachella Valley in regard to number and type of jobs available	Coachella Valley region's economy centers around a certain type of jobs, as well as tourism and industry brought from attractions and festivals	Used to cite information on the region's job categories, as well as the region's attractions and festivals that produce jobs and tourism	Coachella Valley Economic Partnership (CVEP)
Region Acceptance Process (2009)	Review of existing planning documents and other technical data.	Hydrologic connectivity (or lack of) in and around the Coachella Valley. Recycled water use over time.	The 2009 RAP was used to describe the Region boundaries and reasons for coordination structure (informal structure) with neighboring IRWM Regions. Also used to describe internal boundaries and discuss recycled water use.	CVRWMG
Urban Water Management Plan (2005)	Agricultural Water Demand	Percent of total demand agricultural water accounted for.	Used to compare historical agricultural demand to current agricultural demand	CVWD
Urban Water Management Plans (2010)	Water meter data, agency financials, monitoring data.	Water supply and demand within service areas, population served, projected water supplies, demands, issues, water quality.	2010 UWMPs were relied on heavily during development of the 2014 IRWM Plan. UWMPs were used to characterize the Region, describe the historical and projected water supplies and demand, document potential issues in the Region, describe water quality, and generally inform the description of the Region as a whole.	CWA, CVWD, DWA, IWA, MSWD

Data or Study (full citation provided following table)	Analysis Method	Results/Derived Information	Use in IRWM Plan	Source Agency
Urban Water Management Plans (2015)	Water meter data, agency financials, monitoring data.	Water supply and demand within service areas, population served, projected water supplies, demands, issues, water quality.	2014 UWMPs were relied on heavily during development of the 2018 IRWM Plan. UWMPs were used to characterize the Region, describe the historical and projected water supplies and demand, document potential issues in the Region, describe water quality, and generally inform the description of the Region as a whole.	CWA, CVWD, DWA, IWA, MSWD
Wastewater Treatment Plant Improvements and Rate Study	City data on treatment plant capacity and state of repair.	Upgrades are necessary to outdated equipment/processes, but sizing is more than adequate. Capacity is 10.9 MGD.	Used to discuss wastewater treatment in the Region and the need to upgrade the City of Palm Springs Wastewater Treatment Plant.	City of Palm Springs
Source: Other Planning and Technical Documents				
Annual Progress Report (2015-2016)	Reported water quality data.	Water quality data and exceedance incidents.	Used to inform the discussion on water quality concerns in the Region and water quality objectives.	Riverside County Flood Control and Water Conservation District (RCFCWCD)
Bulletin 118 –California's Groundwater Updated (2003)	Compilation of existing data from federal, State, and local agencies.	Groundwater basin delineation and characteristics.	Used to help define groundwater basins in the Region, describe characteristics of groundwater basins and their resources, inflow/outflow of basins, and justify Region boundaries.	DWR
California 303(d) Combined List Table (2010)	Water quality monitoring data.	Levels of constituents of concern in impaired waters.	Used to inform the discussion of surface water quality.	State Water Quality Control Board
California Climate Adaptation Strategy (2009)	Summary of best available science on climate change impacts in California.	Effects of climate change in California and identification of vulnerabilities.	Used to describe the potential impacts of Climate Change on the Region.	California Natural Resources Agency
California Climate Science and Data	Overview of climate change's effect on temperature, rain/snow trends, runoff timing, temperature/snowpack/rainfall projections, sea level rise, and predictions	Precipitation trends can vary over regions, potential stress on water systems from water cycle changes, current and future projected conditions	Used to help predict the region's water supply and reliability, how potential impacts can be protected against	DWR
California Water Plan Update (2009)	Review of Resource Management Strategies and water supply and quality data.	Potential climate change impacts on California's water resources, contamination of the Coachella Valley Stormwater Channel, challenges to SWP water supplies.	Used to illuminate the potential impacts of climate change on the Region, provide basis for Objective C (secure reliable imported water supply), characterize water quality issues in the Region, and describe Resource Management Strategies.	DWR

Data or Study (full citation provided following table)	Analysis Method	Results/Derived Information	Use in IRWM Plan	Source Agency
California Water Plan Update (2013)	Review of Resource Management Strategies and water supply and quality data.	Potential climate change impacts on California's water resources, contamination of the Coachella Valley Stormwater Channel, challenges to SWP water supplies.	Used to illuminate the potential impacts of climate change on the Region, provide basis for Objective C (secure reliable imported water supply), characterize water quality issues in the Region, and describe Resource Management Strategies.	DWR
Climate Change Annual Report (2011)	Field studies, planning/modeling/collection agencies, energy & greenhouse gas emissions, and public outreach associated with climate change impacts and projections	Potential impacts and effects climate change is projected to have on the region, including climate sensitivity, internal exposure, and adaptive capacity	Used to document key indicators of the region's potential vulnerability from climate change impacts	DWR
Coachella Valley Area Time Series: Farmland Mapping and Monitoring Program 1984 to 2008	Farmland Mapping and Monitoring Program mapping results – maps use computer mapping system, aerial imagery, public review, and collection of field data.	Land use and conversion from farmland/agriculture to urbanization and other uses over 24 years.	Used to describe extent of agriculture and land use changes in the Region.	California Department of Conservation
Colorado River Basin Water Quality Control Board – Draft Agenda Item w/ Resolution.	Basin Plan amendment to reflect results of an early implementation monitoring program for bacterial indicators	Bacterial indicator TMDL for CVSC	Used to confirm that subsurface drain collectors serving agricultural lands have minimal effect on the bacterial impairment in the CVSC	SWRCB
Detection and Measurement of Land Subsidence Using Global Positioning System Surveying and Interferometric Synthetic Aperture Radar, Coachella Valley, California, 1996-2005.	Subsidence monitoring data collected using GPS surveys and radar.	Location and extent of inferred subsidence in the Region.	Used to describe where land subsidence is inferred and therefore a potential issue for the Region and describe the potential impacts of subsidence on infrastructure.	USGS
Integrated Regional Water Management Grant Program Guidelines (2016)	Review and integration of the 2016 IRWM Guidelines	General process, procedures, and criteria that DWR will use to implement the Proposition 1 IRWM Grant Program, and IRWM Plan Standards and related guidance, and the region acceptance and plan review procedures	Used to structure IRWM outreach, structure, development, and writing efforts	SWRCB

Data or Study (full citation provided following table)	Analysis Method	Results/Derived Information	Use in IRWM Plan	Source Agency
Integrated Regional Water Management Proposition 84 and 1E Guidelines (2012)	Guidelines for IRWM Implementation and Planning grants funded by Proposition 84 (The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coast Protection Bond Act of 2006), and Stormwater Flood Management grants funded by Proposition 1E (The Disaster Preparedness and Flood Prevention Bond Act of 2006)	The Coachella Valley Integrated Regional Water Management/Stormwater Resources Plan serves to address the requirements of these grant programs	Used to show how the IRWM region remains eligible for state grant funding. Development of the IRWM and several projects within the Coachella Valley were funded using Proposition 84 and 1E grants,	DWR
MS4 Permits (2008 and 2013)	Regulatory requirements and water quality testing.	Municipal separate stormwater system requirements for co-permittees.	Used to describe water quality requirements for stormwater and as a driving force behind some regional coordination and planning efforts.	Regional Board
NPDES Permit and Waste Discharge Requirements	Regulatory requirements and water quality testing.	Waste discharge requirements for co-permittees.	Provides foundation for additional water planning activities in Region and agency coordination.	Regional Board
Our Changing Planet (2010)	Review of research and observational elements of agency programs related to climate change.	Effects of increased greenhouse gases (GHGs) and GHG emissions.	Used to describe the potential impacts of Climate Change on the Region.	United States Global Change Research Program
Reconciling Projections of Colorado River Streamflow	High-resolution streamflow loss model for Colorado River.	Up to 20% reduction in Colorado River from Climate Change. Decreased flow in Colorado River Aqueduct.	Used to describe the potential impacts of Climate Change on the Region.	Hoerling, et al.
Report of Waste Discharge	Flood hazard and control characteristics of the Coachella valley and whitewater river and Coachella valley storm channel	Geology and soils of the region, bacterial and chemical impairment, permit regulations	Used to describe the impervious clay layer between the ground surface and main groundwater aquifer	RCFCWCD
Response of Vegetation Distribution, Ecosystem Productivity, and Fire to Climate Change Scenarios for California	MC1 Dynamic General Vegetation Model to determine response of vegetation distribution, carbon, and fire to three scenarios of future climate change.	Increased frequency of wildfires and related increased sedimentation and turbidity of surface water. Increased flash flooding.	Used to describe the potential impacts of Climate Change on the Region.	Lenihan et al.
Sewer System Management Plan (SSMP)	Agency data.	Salton Community Services District wastewater treatment plants and capacity.	Contributed to the discussion of the Region's wastewater treatment, and the potential for recycled water production in the future.	Salton Community Services District
Storm Water Resource Plan Guidelines	Review and integrated of the storm water resource plan guidelines	guidance for public agencies for the development of Storm Water Resource Plans consistent with Water Code sections 10560 et seq,	Used to ensure the Coachella IRWM/SWR Plan was adequately prepared in accordance with State Water Board and other bond-funding agencies	SWRCB

Data or Study (full citation provided following table)	Analysis Method	Results/Derived Information	Use in IRWM Plan	Source Agency
Tapestry Segmentation Database	ESRI Tapestry Segmentation methodology – 65 behavioral market segments for lifestyle demography.	Neighborhood characterizations.	Used to identify areas that likely represent more severe DAC characteristics in the Region. Contributes to the classification and understanding of DACs in the Region.	ESRI
U.S. Census (2016)	Census data collection and analysis.	Spatial demographic information.	Used during identification of DACs in the Region and provide population and demographic information.	U.S. Census Bureau
Use of Municipal Recycled Water	Agricultural water management and proper use to support the viability of agriculture, conserve water, and protect ecological integrity	Water chemical concentration and how application affects crops and seeps into groundwater	Used to detail how proper fertilizer use and irrigation practices can promote groundwater quality	California Agricultural Water Stewardship Initiative (CAWSI)
Watershed Management Initiative	Review and integration of existing federal, State, and local water-related programs, plans, and studies.	Nitrate concentrations in the groundwater basin, sources of nutrients in groundwater, and recommendations on possible strategies to reduce nitrate in drinking water supplies.	Used to discuss the issues and needs related to groundwater quality.	Regional Board
Water Quality Control Plan Colorado River Basin – Region 7 (Basin Plan)	Review of water quality testing data and reports, stakeholder input.	Water quality objectives for the Colorado River Basin.	Used to characterize the Whitewater Hydrologic Unit and describe the water quality and basin plan objectives that are the basis for water quality assessments and issues in the Region.	Regional Board
Whitewater River Region Monitoring Annual Report (2015-2016)	Stormwater long term trends, water quality data to analyze potential impacts	Water quality data and projected trends	Summary of parameters for each sampling site that exceeded Basin Plan WQOs	RCFCWCD

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Appendix VI-C: Memorandum of Understanding

This appendix includes the Memorandum of Understanding (MOU) between the six Coachella Valley Regional Water Management Group (CVRWMG) agencies (Coachella Valley Water District, Coachella Water Authority, Desert Water Agency, Indio Water Authority, Mission Springs Water District, and Valley Sanitary District) that established the CVRWMG and funding mechanisms. This appendix also includes all addendums, supplements, and amendments made to the original MOU.

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MEMORANDUM OF UNDERSTANDING

among

CITY OF COACHELLA/COACHELLA WATER AUTHORITY, COACHELLA VALLEY WATER DISTRICT, DESERT WATER AGENCY, CITY OF INDIO/INDIO WATER AUTHORITY, AND MISSION SPRINGS WATER DISTRICT

for

DEVELOPMENT OF AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN

This Memorandum of Understanding (MOU) dated [illegible] is entered into among the City of Coachella/Coachella Water Authority, Coachella Valley Water District, Desert Water Agency, City of Indio/Indio Water Authority, and Mission Springs Water District (collectively known as Partners) for the purpose of coordinating water resources planning activities undertaken by the water agencies.

WHEREAS, each Partner has adopted a Resolution of commitment pledging to create an Integrated Regional Water Management Plan (IRWMP);

WHEREAS, it is in the interests of the signatory Partners and the region served by the Partners that these water resources are responsibly managed and conserved to the extent feasible; and

WHEREAS, the Partners wish to coordinate their long term water supply planning efforts in accordance with Section 10531 of the *Integrated Regional Water Management Planning Act of 2002* and Division 43 of the *Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006* (Acts); and

WHEREAS, the Partners anticipate the potential need for future agreements on specific projects or programs and with other affected agencies to further coordinate long term water supply planning.

NOW, THEREFORE, it is mutually understood and agreed as follows:

SECTION 1: AUTHORITY OF PARTNERS

1.1 The Coachella Water Authority is a joint powers authority formed as a component of the City of Coachella and Redevelopment Agency of the City of Coachella and has statutory authority over water supply.

1.2 The Coachella Valley Water District is a public agency of the State of California organized and operating under County Water District Law, California Water Code section 30000, et seq., and Coachella District

Merger Law, Water Code section 33100, et seq. Coachella Valley Water District is a State Water Project Contractor and Colorado River Contractor empowered to import water supplies to its service area, and has statutory authority over water supply.

1.3 The Desert Water Agency is an independent special district created by a special act of the state legislature contained in chapter 100 of the appendix of the California Water Code. Desert Water Agency is also a State Water Project Contractor empowered to import water supplies to its service area, replenish local groundwater supplies, and collect assessments necessary to support a groundwater replenishment program as provided for in the Desert Water Agency Law and has statutory authority over water supply.

1.4 The Indio Water Authority is a joint powers authority formed as a component of the City of Indio and Redevelopment Agency of the City of Indio and has statutory authority over water supply.

1.5 Mission Springs Water District is a County Water District formed under Section 30000 et seq. of the California Water Code and has statutory authority over water supply.

SECTION 2: DEFINITIONS

The abbreviations and capitalized words and phrases used in this MOU shall have the following meanings:

2.1 Acts – mean Section 10531 of the Integrated Regional Water Management Planning Act of 2002 and California Water Code Division 43, known as the *Safe Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006*

2.2 Coachella Valley Region – the watershed bounded on the North by the San Bernardino Mountains, Little San Bernardino Mountains and Mecca Hills Area, on the East by Mortmar and Travertine Rock, on the South by the Santa Rosa Mountains and San Jacinto Mountains and on the West by Stubbe Canyon

2.3 CVWD – Coachella Valley Water District

2.4 CVRWMG – Coachella Valley Regional Water Management Group

2.5 CWA – Coachella Water Authority

2.6 DWA – Desert Water Agency

2.7 IRWMP – Integrated Regional Water Management Plan

2.8 IWA – Indio Water Authority

2.9 MSWD – Mission Springs Water District

SECTION 3
PURPOSES AND GOALS OF THIS MOU

3.1 Purpose and Goals:

3.1.1 This MOU is to memorialize the intent of the Partners to coordinate and share information concerning water supply planning programs and projects and other information, and to improve and maintain overall communication among the Partners involved. It is anticipated that coordination and information sharing among the Partners will assist the agencies in achieving their respective missions to the overall well-being of the region. Coordination and information sharing shall focus on issues of common interest in Section 3.2

3.1.2 The execution of this MOU by the Partners shall constitute the formation of a Regional Water Management Group consisting of the Partners, in accordance with the Acts. The Regional Water Management Group shall be named the Coachella Valley Regional Water Management Group(CVRWMG).

3.1.3 It is the goal of the Partners to prepare and adopt an IRWMP for the Coachella Valley Region and to implement projects and programs individually or jointly in groups that address issues of common interest, as the group so identifies.

3.2 Common Issues and Interest:

3.2.1 Water supply programs and projects that may provide mutual benefits in improving water supply reliability and/or water quality

3.2.2 Coordination of near-term and long-term water supply planning activities

3.2.3 Development of regional approaches to problem-solving and issues resolution as well as to further common interest

3.3 Future Agreements By Partners: The Partners acknowledge that by virtue of commitments and intentions stated within this MOU, the need for certain other considerations that will facilitate the preparation of an IRWMP for the Coachella Valley Region will likely emerge. These include and are not limited to

3.3.1 Developing a Scope of Work.

3.3.2 Determining the cost sharing of projects

3.3.3 Establishing methods for project management

3.3.4 Establishing a project timeline

SECTION 4: JOINT PLANNING FOR PROJECTS AND PROGRAMS

4.1 **Projects and Programs Covered by this MOU:** It is the intent of the Partners that they coordinate and collaborate to address the common issues identified. The Partners may develop and implement projects and programs individually or jointly in groupings of two or more or enter into additional agreements in furthering these goals. Applicable projects and programs include, but are not limited to the following.

4.1.1 Water conservation programs and other demand management programs.

4.1.2 Water recycling, desalination, groundwater basin management, and water quality improvement programs and projects

4.1.3 Water banking, conjunctive use and transfer arrangements

4.1.4 Storage development to improve system reliability, efficiencies, and flexibility.

4.1.5 Project and program planning and development to solicit external funding.

4.1.6 Other meritorious projects or programs consistent with the purposes of this MOU

4.2 **Communication and Coordination:** It is the intent of the Partners to meet on a monthly basis in order to carry out the purposes and goals of this MOU. The frequency and location of meetings are subject to the discretion of the Partners and may be changed when appropriate.

SECTION 5:
GENERAL PROVISIONS GOVERNING MOU

5.1 **Term:** The term of the MOU is indefinite. Any Partner may withdraw from the MOU by written notice given at least 45 days prior to the effective date.

5.2 **Construction of Terms:** This MOU is for the sole benefit of the Partners and shall not be construed as granting rights to any person other than the Partners or imposing obligations on a Partner to any person other than another Partner.

5.3 **Good Faith:** Each Partner shall use its best efforts and work wholeheartedly and in good faith for the expeditious completion of the objectives of this MOU and the satisfactory performance of its terms.

5.4 **Rights of the Partners and Constituencies:** This MOU does not contemplate the Partners taking any action that would:

5.4.1 Adversely affect the rights of any of the Partners, or

5.4.2 Adversely affect the customers or constituencies of any of the Partners.

5.5 This document and participation in the IRWMP are nonbinding, and in no way suggest that a Partner may not continue its own planning and undertake efforts to secure project funding from any source.

5.6 It is expected that Partners will contribute the personnel and financial resources necessary to develop the IRWMP.

IN WITNESS WHEREOF, the parties have executed this Memorandum of Understanding as of the day and year indicated on the final page of this MOU.

Tim Brown, City Manager
City of Coachella

Tim Brown, Executive Director
Coachella Water Authority

Steve Robbins, General Manager/Chief Engineer
Coachella Valley Water District

Dave Luker, General Manager
Desert Water Agency

Glenn Southard, City Manager
City of Indio

Glenn Southard, Executive Director
Indio Water Authority

Arden Wallum, General Manager
Mission Springs Water District

MEMORANDUM OF UNDERSTANDING

SUPPLEMENT TO
MEMORANDUM OF UNDERSTANDING
among
CITY OF COACHELLA/COACHELLA WATER AUTHORITY, COACHELLA VALLEY WATER DISTRICT, DESERT WATER AGENCY, CITY OF INDIO/INDIO WATER AUTHORITY, AND MISSION SPRINGS WATER DISTRICT
for
DEVELOPMENT OF AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN

This Supplement dated April 21, 2010 is entered into among the City of Coachella/Coachella Water Authority, Coachella Valley Water District, Desert Water Agency, City of Indio/Indio Water Authority, and Mission Springs Water District (collectively known as Partners) for the purpose of coordinating water resources planning activities undertaken by the water agencies

WHEREAS, each Partner is a party to a Memorandum of Understanding (MOU) for Development of an Integrated Water Management Plan (IRWMP) dated September 9, 2008, and

WHEREAS, the Partners wish to supplement the MOU for the purpose of retaining a consultant to assist in preparing an IRWMP;

NOW, THEREFORE, it is mutually understood and agreed as follows

SECTION 1:
RETENTION OF CONSULTANT

1.1 The consultant's scope of work, fees and contract terms shall be approved by the Partners.

1.2 Mission Springs Water District (MSWD) shall retain a consultant selected by the Partners and administer the consultant agreement as directed by the Partners.

SECTION 2:
PAYMENT

2.1 MSWD shall initially pay the consultant per the terms of the consulting agreement and as approved by the Partners, and then invoice each partner for reimbursement of one-fifth (1/5) of the payment that has been made to the consultant

2.2 Each Partner shall pay the invoice within 14 days of receipt of invoice.

SECTION 3:
PARTICIPATION

3.1 Each Partner retains the right to withdraw its participation in the MOU, as stipulated by the MOU in Section 5.1

3.2 A withdrawing Partner remains obligated for reimbursement of its share of consulting fees to be paid pursuant to agreement with the consultant executed prior to that Partner's withdrawal from participation

SECTION 4:
MISCELLANEOUS

4.1 Abbreviations, capitalized words and phrases used in this supplement shall have the same meaning as in the MOU.

4.2 All terms of the MOU remain unchanged, except as supplemented herein.

4.3 This Supplement may be executed in any number of counterparts, each of which shall be deemed original, but all of which, when taken together, shall constitute one and the same instrument.

IN WITNESS WHEREOF, the Partners have executed this Supplement as of the day and year indicated on the first page of this MOU.

[illegible] Rogers, Interim City Manager
City of Coachella

[illegible] Rogers, Executive Director
Coachella Water Authority

Steve Robbins, General Manager-Chief Engineer
Coachella Valley Water District

Dave Luker, General Manager
Desert Water Agency

[illegible] Adams, City Manager
City of Indio

[illegible] Adams, Executive Director
Indio Water Authority

Arden Wallum, General Manager
Mission Springs Water District

SUPPLEMENT TO MEMORANDUM OF UNDERSTANDING

[illegible], Interim City Manager
City of Coachella

[illegible], Executive Director
Coachella Water Authority

[illegible], General Manager-Chief Engineer
Coachella Valley Water District

[illegible], General Manager
Desert Water Agency

[illegible], Interim City Manager
City of Indio

[illegible], Interim Executive Director
Indio Water Authority

[illegible], General Manager
Mission Springs Water District

SUPPLEMENT TO MEMORANDUM OF UNDERSTANDING

Gene Rogers, Interim City Manager
City of Coachella

Gene Rogers, Executive Director
Coachella Water Authority:

Steve Robbins, General Manager-Chief Engineer
Coachella Valley Water District

Dave Luker, General Manager
Desert Water Agency

Tom Lee Adams, Interim City Manager
City of Indio

Tom Lee Adams, Interim Executive Director
Indio Water Authority

Arden Wallum, General Manager
Mission Springs Water District

SUPPLEMENT TO MEMORANDUM OF UNDERSTANDING

Gene Rogers, Interim City Manager
City of Coachella:

Gene Rogers, Executive Director
Coachella Water Authority:

Steve Robbins, General Manager-Chief Engineer
Coachella Valley Water District:

Dave Luker, General Manager
Desert Water Agency:

Tara Lee Adams, Interim City Manager
City of Indio:

Tara Lee Adams, Interim Executive Director
Indio Water Authority:

Arden Wallum, General Manager
Mission Springs Water District

Gene Rogers, Interim City Manager
City of Coachella

Gene Rogers, Executive Director
Coachella Water Authority

Steve Robbins, General Manager-Chief Engineer
Coachella Valley Water District

Dave Luker, General Manager
Desert Water Agency

Tara Lee Adams, City Manager
City of Indio

Tara Lee Adams, Executive Director
Indio Water Authority

Arden Wallum, General Manager
Mission Springs Water District

SECOND SUPPLEMENT TO
MEMORANDUM OF UNDERSTANDING
among
CITY OF COACHELLA/COACHELLA WATER AUTHORITY, COACHELLA VALLEY WATER DISTRICT, DESERT WATER AGENCY, CITY OF INDIO/INDIO WATER AUTHORITY, and MISSION SPRINGS WATER DISTRICT
for
DEVELOPMENT OF AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN

This SECOND SUPPLEMENT dated March 13, 2012, is entered into among the City Of Coachella/Coachella Water Authority, Coachella Valley Water District, Desert Water Agency, City Of Indio/Indio Water Authority, and Mission Springs Water District (collectively known as Partners) for the purpose of coordinating water resources planning activities undertaken by the water agencies.

WHEREAS, each Partner is a party to a Memorandum of Understanding (MOU) for Development of an Integrated Regional Water Management Plan (IRWMP) dated September 9, 2008; and

WHEREAS, each Partner is a party to a first Supplement to that MOU for the purpose of retaining a consultant to assist in preparing an IRWMP dated April 29, 2010; and

WHEREAS, each Partner wishes to supplement the MOU a second time for the purpose of retaining consultants and entering into grant funding contracts with the Department of Water Resources (State) for *Proposition 84, Chapter 2* as follows:

A. Agreement Number 4600009468, for Disadvantaged Communities Outreach (DAC grant), in the amount of $500,000.
B. Agreement Number 4600009342, for updating the existing IRWMP (Planning grant), in the amount of $1,000,000.

NOW, THEREFORE, [illegible]

[illegible]

[illegible]

[illegible]

1.5 Partners shall share equally with CVWD all necessary costs, risks, and obligations for satisfying the terms of the Proposition 84 grant agreements with the State.

SECTION 2: DAC AND PLANNING GRANT INVOICING AND PAYMENT

2.1 CVWD will establish an escrow account and, upon signing this amendment, each Partner will deposit $50,000 into that account for a total balance of $250,000 to ensure that outstanding invoices can be paid if the State fails to provide reimbursements.

2.2 CVWD will receive invoices from consultants on a monthly basis, and will pay invoices from the escrow account.

2.3 No less than quarterly, CVWD will invoice the State. CVWD will deposit funds received from the State into the escrow account for payment of invoices.

2.4 If outstanding invoices exceed $250,000 more than reimbursement from the State, the escrow account balance will drop to zero and the Partners will postpone grant work until State reimbursements are received.

2.5 CVWD will not be responsible for making payments which are neither backed by reimbursements from the State nor by funds in the escrow account described in Section 2.1.

2.6 Upon completion of the Proposition 84 grant agreements, the funds remaining in the escrow account will be distributed equally to the Partners.

2.7 The sole purpose of escrow account funds is for paying consultant invoices for the DAC and planning grants after the invoices have been reviewed and approved by the Partners. The funds may not be used for any other purpose without the consensus of the Partners.

SECTION 3 [illegible]

3.1 [illegible]

3.2 [illegible]

SECTION 4 [illegible]

4.1 [illegible]

4.2 [illegible]

[illegible]

[illegible]

[illegible]

COACHELLA VALLEY WATER DISTRICT

DESERT WATER AGENCY

CITY OF INDIO/INDIO WATER AUTHORITY

MISSION SPRINGS WATER DISTRICT

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COACHELLA VALLEY WATER DISTRICT

3.13.12

DESERT WATER AGENCY

CITY OF INDIO/INDIO WATER AUTHORITY

MISSION SPRINGS WATER DISTRICT

[illegible]

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COACHELLA VALLEY WATER DISTRICT

DESERT WATER AGENCY

[illegible]

CITY OF INDIO/INDIO WATER AUTHORITY

MISSION SPRINGS WATER DISTRICT

[illegible]

[illegible]

[illegible]

COACHELLA VALLEY WATER DISTRICT

DESERT WATER AGENCY

CITY OF INDIO/INDIO WATER AUTHORITY

MISSION SPRINGS WATER DISTRICT

IN WITNESS WHEREOF, the Partners have executed this Supplement as of the day and year indicated on the first page of this MOU.

CITY OF COACHELLA/ COACHELLA WATER AUTHORITY

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COACHELLA VALLEY WATER DISTRICT

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DESERT WATER AGENCY

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CITY OF INDIO/INDIO WATER AUTHORITY

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MISSION SPRINGS WATER DISTRICT

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THIRD SUPPLEMENT TO
MEMORANDUM OF UNDERSTANDING
among
CITY OF COACHELLA/COACHELLA WATER AUTHORITY, COACHELLA VALLEY WATER DISTRICT, DESERT WATER AGENCY, CITY OF INDIO/INDIO WATER AUTHORITY, and MISSION SPRINGS WATER DISTRICT
for
DEVELOPMENT OF AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN

This THIRD SUPPLEMENT dated August 8, 2012, is entered into among the City Of Coachella/Coachella Water Authority, Coachella Valley Water District, Desert Water Agency, City Of Indio/Indio Water Authority, and Mission Springs Water District (collectively known as Partners) for the purpose of coordinating water resources planning activities undertaken by the water agencies.

WHEREAS, each Partner is a party to a Memorandum of Understanding (MOU) for Development of an Integrated Regional Water Management Plan (IRWMP) dated September 9, 2008; and

WHEREAS, each Partner is a party to a first Supplement to that MOU for the purpose of retaining a consultant to assist in preparing an IRWMP dated April 29, 2010; and

WHEREAS. Each Partner is a party to the second Supplement to that MOU for the purpose of retaining consultants and entering into grant funding contracts with the Department of Water Resources (State) for Proposition 84, Chapter 2 as follows:

A. Agreement Number 4600009468, for Disadvantaged Communities Outreach (DAC Grant), in the amount of $500,000;
B. Agreement Number 4600009462, for updating the existing IRWMP (Planning Grant), in the amount of $1,000,000

WHEREAS. each partner wishes to supplement the MOU a third time for the purpose of entering into grant funding contracts with the Department of Water Resources (State) for Proposition 84, Chapter 2, Agreement Number 4600009460, for an IRWM Implementation Grant (Implementation Grant) in the amount of $4,000,000

NOW, THEREFORE, it is mutually understood and agreed as follows:

SECTION 1
AGREEMENTS

1.1 The Coachella Valley Water District (CVWD), designated by the Partners as lead agency for the Coachella Valley IRWMP, shall have overall responsibility for executing and administering this Implementation Grant as directed by the Partners.

1.2 The Grant administration costs reimbursed to CVWD shall be limited to $100,000 as described in EXHIBIT C, Table 3, Budget Category GA of the Implementation Grant Agreement.

1.3 The purpose of the Implementation Grant is to fund four individual projects, each of which has a Local Project Sponsor responsible for individual project management, oversight, compliance, and operations and maintenance. Local Project Sponsors are expected to act on behalf of CVWD in the fulfillment of Grantee responsibilities where specified in the Implementation Grant Agreement. The four individual projects and their Local Project Sponsors are listed in the Implementation Grant Agreement as follows:

• Regional Water Conservation Program	CVWD
• Short-Term Arsenic Treatment Project	Pueblo Unido Community Development
• Groundwater Quality Protection Program	Mission Springs Water District
• Groundwater Quality Protection Program	City of Cathedral City

1.4 The Regional Water Conservation Program equally benefits each of the five Partners.

[illegible]

2.1 [illegible]

2.2 [illegible]

2.3 [illegible]

2.4 [illegible]

SECTION 3:
PARTICIPATION

3.1 Each Partner retains the right to withdraw its participation in the MOU as stipulated by the MOU in Section 5.1

3.2 A withdrawing Partner remains obligated for reimbursement of its share of costs to be paid pursuant to any agreements executed prior to that Partner's withdrawal from participation.

SECTION 4:
MISCELLANEOUS

4.1 Abbreviations, capitalized words and phrases used in this supplement shall have the same meaning as in the MOU.

4.2 All terms of the MOU remain unchanged, except as supplemented herein.

4.3 This Second Supplement may be executed in any number of counterparts, each of which shall be deemed original, but all of which, when taken together, shall constitute one and the same instrument.

IN WITNESS WHEREOF, the Partners have executed this Supplement as of the day and year indicated on the first page of this MOU.

CITY OF COACHELLA/ COACHELLA WATER AUTHORITY

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COACHELLA VALLEY WATER DISTRICT

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DESERT WATER AGENCY

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SECTION 3.
PARTICIPATION

3.1 Each Partner retains the right to withdraw its participation in the MOU as stipulated by the MOU in Section [illegible].

3.2 A withdrawing Partner remains obligated for reimbursement of its share of costs to be paid pursuant to any agreements executed prior to that Partner's withdrawal from participation.

SECTION 4.
MISCELLANEOUS

4.1 Abbreviations, capitalized words and phrases used in this supplement shall have the same meaning as in the MOU.

4.2 All terms of the MOU remain unchanged, except as supplemented herein.

4.3 This Second Supplement may be executed in any number of counterparts, each of which shall be deemed original, but all of which, when taken together, shall constitute one and the same instrument.

IN WITNESS WHEREOF, the Partners have executed this Supplement as of the day and year indicated on the first page of this MOU.

CITY OF COACHELLA, COACHELLA WATER AUTHORITY

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COACHELLA VALLEY WATER DISTRICT

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DESERT WATER AGENCY

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SECTION 3
PARTICIPATION

3.1 Each Partner retains the right to withdraw its participation in the MOU as stipulated by the MOU in Section 5.1.
3.2 A withdrawing Partner remains obligated for reimbursement of its share of costs to be paid pursuant to any agreements executed prior to that Partner's withdrawal from participation.

SECTION 4
MISCELLANEOUS

4.1 Abbreviations, capitalized words and phrases used in this supplement shall have the same meaning as in the MOU.
4.2 All terms of the MOU remain unchanged except, as supplemented herein.
4.3 This Second Supplement may be executed in any number of counterparts, each of which shall be deemed original, but all of which, when taken together, shall constitute one and the same instrument.

IN WITNESS WHEREOF, the Parties have executed this Supplement as of the day and year indicated on the first page of this MOU.

CITY OF COACHELLA/ COACHELLA WATER AUTHORITY

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COACHELLA VALLEY WATER DISTRICT

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DESERT WATER AGENCY

David K. [illegible]
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CITY OF INDIO/INDIO WATER AUTHORITY

MISSION SPRINGS WATER DISTRICT

CITY OF INDIO/INDIO WATER AUTHORITY

FOURTH SUPPLEMENT TO
MEMORANDUM OF UNDERSTANDING
among
CITY OF COACHELLA/COACHELLA WATER AUTHORITY, COACHELLA VALLEY WATER DISTRICT, DESERT WATER AGENCY, CITY OF INDIO/INDIO WATER AUTHORITY, and MISSION SPRINGS WATER DISTRICT
for
DEVELOPMENT OF AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN

This FOURTH SUPPLEMENT dated February 22, 201[illegible], is entered into among the City Of Coachella/Coachella Water Authority, Coachella Valley Water District, Desert Water Agency, City Of Indio/Indio Water Authority, and Mission Springs Water District (collectively known as Partners) for the purpose of coordinating water resources planning activities undertaken by the water agencies.

WHEREAS, each Partner is a party to a Memorandum of Understanding (MOU) for Development of an Integrated Regional Water Management Plan (IRWMP) dated September 9, 2008, and

WHEREAS, each Partner is a party to a first Supplement to that MOU for the purpose of retaining a consultant to assist in preparing an IRWMP dated April 29, 2010, and

WHEREAS, Each Partner is a party to the second Supplement to that MOU for the purpose of retaining consultants and entering into grant funding contracts with the Department of Water Resources (State) for Proposition 84, Chapter 2 as follows

A. Agreement Number [illegible], for Disadvantaged Communities Outreach (DAC Grant), in the amount of $500,000
B. Agreement Number [illegible], for updating the existing IRWMP (Planning Grant), in the amount of $1,000,000

WHEREAS, each Partner is a party to the third Supplement to the MOU for the purpose of entering into grant funding contracts with the Department of Water Resources (State) for Proposition 84, Chapter 2, Agreement Number [illegible], for an IRWM Implementation Grant (Implementation Grant) in the amount of $4,000,000, and for the purpose of designating the Coachella Valley Water District (CVWD) as administrating agency of the Implementation Grant as directed by the Partners.

WHEREAS, The Partners wish to supplement the MOU for the purpose of retaining a consultant for *Subtask 9.1, Outreach* of the Implementation Grant

NOW, THEREFORE, it is mutually understood and agreed as follows:

SECTION 1:
AGREEMENTS

1.1 The consultant's scope of work, fees and contract terms shall be approved by the Partners.
1.2 CVWD shall retain the consultant selected by the Partners and administer the consultant agreement as directed by the Partners

SECTION 2
REGIONAL WATER CONSERVATION PROGRAM
INVOICING AND PAYMENT

2.1 The Regional Water Conservation Program equally benefits each of the five Partners, and the procedures agreed to for invoicing and payment established in the Third Supplement to the MOU shall be followed.
2.2 CVWD will establish an escrow account, and upon signing this fourth amendment, each Partner will deposit $10,000 into that account for a total balance of $50,000 to ensure that outstanding invoices can be paid if the state fails to provide reimbursements.
2.3 CVWD will receive invoices from the consultant on a monthly basis and will pay invoices from the escrow account.
2.4 No less than quarterly, CVWD will invoice the State. CVWD will deposit funds received from the State into the escrow account for payment of consultant invoices.
2.5 If the escrow account balance drops to zero, the Partners will postpone grant work until state reimbursements are received.
2.6 CVWD will not be responsible for making payments which are neither backed by reimbursements from the State nor by funds in the escrow account.
2.7 Upon completion of <u>Subtask [illegible] Outreach</u>, the funds remaining in the escrow account will be distributed equally to the Partners.
2.8 The sole purpose of this escrow account is for paying consultant invoices for <u>Subtask [illegible] Outreach</u>. The funds may not be used for any other purpose without consensus of the Partners.

3.2 A withdrawing Partner remains obligated for reimbursement of its share of costs to be paid pursuant to any agreements executed prior to that Partner's withdrawal from participation.

SECTION 4
MISCELLANEOUS

4.1 [illegible], capitalized words and phrases used in this Supplement shall have the same meaning as in the MOU.
4.2 All terms of the MOU remain unchanged, except as supplemented herein.
4.3 This Supplement may be executed in any number of counterparts, each of which shall be deemed an original, but all of which when taken together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the Partners have executed this Supplement as of the day and year first stated on the first page of this MOU.

CITY OF COACHELLA, COACHELLA WATER AUTHORITY

COACHELLA VALLEY WATER DISTRICT

DESERT WATER AGENCY

3.2 A Withdrawing Partner remains obligated for reimbursement of its share of costs to be paid pursuant to any agreements executed prior to that Partner's withdrawal from participation.

SECTION 4
MISCELLANEOUS

4.1 Other than as defined, capitalized words and phrases used in this supplement shall have the same meaning as in the MOU.

4.2 All terms of the MOU remain unchanged, except as supplemented herein.

4.3 This Second Supplement may be executed in any number of counterparts, each of which shall be deemed an original, but all of which, when taken together, shall constitute one and the same instrument.

IN WITNESS WHEREOF, the Partners have executed this Supplement as of the day and year indicated on the first page of this MOU.

CITY OF COACHELLA, COACHELLA WATER AUTHORITY

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COACHELLA VALLEY WATER DISTRICT

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DESERT WATER AGENCY

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SECTION 3
PARTICIPATION

3.1 Each Partner retains the right to withdraw its participation in the MOU as stipulated by the MOU in Section 5.1

3.2 A withdrawing Partner remains obligated for reimbursement of its share of costs to be paid pursuant to any agreements executed prior to that Partner's withdrawal from participation.

SECTION 4
MISCELLANEOUS

4.1 Abbreviations, capitalized words and phrases used in this supplement shall have the same meaning as in the MOU.

4.2 All terms of the MOU remain unchanged, except as supplemented herein.

4.3 This Fourth Supplement may be executed in any number of counterparts, each of which shall be deemed original, but all of which, when taken together, shall constitute one and the same instrument.

IN WITNESS WHEREOF, the Partners have executed this Supplement as of the day and year indicated on the first page of this MOU

CITY OF COACHELLA, COACHELLA WATER AUTHORITY

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COACHELLA VALLEY WATER DISTRICT

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DESERT WATER AGENCY

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MISSION SPRINGS WATER DISTRICT

CITY OF INDIO/INDIO WATER AUTHORITY

MEMORANDUM OF UNDERSTANDING
among
CITY OF COACHELLA/COACHELLA WATER AUTHORITY, COACHELLA VALLEY WATER DISTRICT, DESERT WATER AGENCY, CITY OF INDIO/INDIO WATER AUTHORITY, MISSION SPRINGS WATER DISTRICT, AND VALLEY SANITARY DISTRICT
for
DEVELOPMENT AND IMPLEMENTATION OF THE COACHELLA VALLEY INTEGRATED REGIONAL WATER MANAGEMENT PLAN

This Memorandum of Understanding (MOU) dated August 27, 2014 is entered into among the City of Coachella/Coachella Water Authority, Coachella Valley Water District, Desert Water Agency, City of Indio/Indio Water Authority, Mission Springs Water District, and Valley Sanitary District (collectively known as Members) for the purpose of coordinating water resources planning activities undertaken by the water entities. This MOU restates the agreement of the founding Members and incorporates all supplements to the original MOU listed below:

- Supplement 1 – April, 29 2010 – Consultant Retention IRWM Plan
- Supplement 2 – March 13, 2012 – Consultant Retention Plan Update and DAC Outreach
- Supplement 3 – August 8, 2012 – Implementation Grant Round 1
- Supplement 4 – February 22, 2013 – Consultant Retention CV-Strategies Outreach

WHEREAS, each Member has adopted a Resolution of commitment approving this MOU and committing to develop, update, and implement the Coachella Valley Integrated Regional Water Management Plan (CVIRWMP).

WHEREAS, it is in the interests of the Members and the region served by the Members that these water resources are responsibly managed and conserved to the extent feasible; and

WHEREAS, the Members wish to coordinate their long term water supply planning efforts in accordance with Section 10531 of the *Integrated Regional Water Management Planning Act of 2002* and Division 43 of the *Safe Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act* of 2006 (Acts); and

WHEREAS, the Members anticipate the potential need for future agreements on specific activities, projects or programs and with other affected agencies to further coordinate long term water supply planning.

NOW, THEREFORE, it is mutually understood and agreed as follows:

SECTION 1:
AUTHORITY OF MEMBERS

1.1. The Coachella Water Authority is a joint powers authority formed as a component of the City of Coachella and has statutory authority over water supply.

1.2. Coachella Valley Water District is a public agency of the State of California organized and operating under County Water District Law, California Water Code section 30000, et seq, and Coachella District Merger Law, Water Code section 33100, et seq. Coachella Valley Water District is a State Water Project Contractor and Colorado River Contractor empowered to import water supplies to its service area, and has statutory authority over water supply.

1.3. The Desert Water Agency is an independent special district created by a special act of the state legislature contained in chapter 100 of the appendix of the California Water Code. Desert Water Agency is also a State Water Project Contractor empowered to import water supplies to its service area, replenish local groundwater supplies, and collect assessments necessary to support a groundwater replenishment program as provided for in the Desert Water Agency Law and has statutory authority over water supply.

1.4. The Indio Water Authority is a joint powers authority of the City of Indio and the Indio Housing Authority and has statutory authority over water supply.

1.5. Mission Springs Water District is a County Water District formed under Section 30000 et seq of the California Water Code and has statutory authority over water supply.

1.6. The Valley Sanitary District is an independent special district governed under the California Sanitary Act of 1923. The District provides collection, wastewater treatment and water reuse services for customers in the eastern Coachella Valley since 1925.

SECTION 2:
MEMBERSHIP CRITERIA

Membership criteria for participation as a Member includes:

2.1. Possess a water management responsibility in the Coachella Valley. This criterion could apply to but is not limited to the following entities:

a. Wholesale or retail water providers
b. Agricultural, recycled, and raw/surface water providers
c. Wastewater providers
d. Surface water rights holders
e. Regional flood/stormwater managers

2.2. Commit to adopting the 2014 CVIRWM Plan prior to membership and participate in future Plan Updates, as well as commit to good faith effort as a part of the CVRIWMG to approve the future Plan Updates

2.3. Actively participate in management and implementation of Coachella Valley IRWM program. This includes regular attendance at meetings of CVIRWMG, Planning Partners, and other essential meetings, as well as efforts necessary to review and comment on work products

2.4. Participate in funding current and future program costs.

2.5. Commit to transparency and accountability in governing body actions that relate to the Coachella Valley IRWM program.

2.6. Commit to adopt the MOU and abide by the Ground Rules.

2.7. Commit to work toward consensus in supporting the water management needs of the entire Coachella Valley.

SECTION 3:
DEFINITIONS

The abbreviations and capitalized words and phrases used in this MOU shall have the following meanings:

3.1. Acts — mean Section 10531 of the Integrated Regional Water Management Planning Act of 2002 and California Water Code Division 43, known as the Safe Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006

3.2. Coachella Valley Region — the watershed bounded on the North by the San Bernardino Mountains, Little San Bernardino Mountains and Mecca Hills Area, on the East by Mortmar and Travertine Rock, on the South by the Santa Rosa Mountains and San Jacinto Mountains and on the West by Stubbe Canyon.

3.3. CVWD — Coachella Valley Water District

3.4. CVIRWMG — Coachella Valley Integrated Regional Water Management Group

3.5. CWA — Coachella Water Authority

3.6. DWA — Desert Water Agency

3.7. IRWMP — Integrated Regional Water Management Plan

3.8. CVIRWMP — Coachella Valley Integrated Regional Water Management Plan

3.9. IWA — Indio Water Authority

3.10. Planning Partners — primary stakeholder group for the Coachella Valley IRWM Program that provides direct input to the Members

3.11. MSWD — Mission Springs Water District

3.12. VSD — Valley Sanitary District

SECTION 4:
PURPOSES AND GOALS OF THIS MOU

4.1. Purpose and Goals:

4.1.1. The purpose of this MOU is to memorialize the intent of the Members to coordinate and share information concerning water supply planning programs and projects and other information, and to improve and maintain overall communication among the Members involved. It is anticipated that coordination and information sharing among the Members will assist the agencies in achieving their respective missions to the overall well-being of the region. Coordination and information sharing shall focus on issues of common interest in Section 3.2.

4.1.2. The execution of the original MOU by the Members formed the Integrated Regional Water Management Group consisting of the Members, in accordance with the Acts. The Integrated Regional Water Management Group shall be named the Coachella Valley Integrated Regional Water Management Group (CVRIWMG) and shall be comprised of the Members listed in Section 1 and compliant with the membership criteria in Section 2.

4.1.3. The original goal of the Members was to prepare and adopt an IRWMP for the Coachella Valley Region, which was accomplished in 2010 and updated in 2014. Further their future goal is to implement projects, activities and programs individually or jointly in groups that address issues of common interest, as the group so identifies.

4.2. Common Issues and Interest:

4.2.1. Water supply programs and projects that may provide mutual benefits in improving water supply reliability and/or water quality.

4.2.2. Coordination of near-term and long-term water supply planning activities.

4.2.3. Development of regional approaches to problem-solving and issues resolution as well as to further common interest.

4.3. Future Agreements by Members: The Members acknowledge that by virtue of commitments and intentions stated within this MOU, the need for certain other considerations that will facilitate the update and implementation of the CVIRWMP for the Coachella Valley Region will emerge. Those considerations will be subject to the agreement of the parties and documented in subsequent supplements.

SECTION 5:
JOINT PLANNING FOR PROJECTS AND PROGRAMS

5.1. Projects, Programs and Actions which are part of the Coachella Valley Integrated Regional Water Management Plan: it is the intent of the Members that they coordinate and collaborate to address the common issues identified. By consensus, the Members may develop and implement actions, projects and programs individually or jointly in groups of two or more, or enter into additional agreements in furthering those goals. This section shall not be construed as a means of removing general benefit projects from the management oversight of CVRIWMG, nor as a method of circumventing the decision resolution process outlined in the governance documents of the CVRIWMG. Applicable projects and programs include, but are not limited to the following:

5.1.1. Water conservation programs and other demand management programs.

5.1.2. Water recycling, desalination, groundwater basin management, and water quality improvement programs and projects.

5.1.3. Water banking, conjunctive use and transfer arrangements.

5.1.4. Water storage development to improve system reliability, efficiencies, and flexibility.

5.1.5. Project and program planning and development to solicit external funding.

5.1.6. Other meritorious projects or programs consistent with the purposes of this MOU.

5.2. Communication and Coordination: It is the intent of the Members to generally meet on a monthly basis in order to carry out the purposes and goals of this MOU. The frequency and location of meetings are subject to the discretion of the Members and may be changed when appropriate.

The Members will also coordinate with stakeholders in the Coachella Valley through Planning Partners meetings and other correspondence at a frequency determined by the Members. The Planning Partners will provide opportunity for public comment on decisions directly related to the CVIRWMP development and implementation that are made by the governing bodies of the Members.

SECTION 6:
TERMS AND CONDITIONS

6.1. Term: The term of this MOU is indefinite. Any Member may withdraw from the MOU by written notice given at least 45 days prior to the effective date.

6.2. Construction of Terms: This MOU is for the sole benefit of the Members and shall not be construed as granting rights to any person other than the Members or imposing obligations on a Member to any person other than another Member.

6.3. Good Faith: Each Member shall use its best efforts and work wholeheartedly and in good faith for the expeditious completion of the objectives of this MOU and the satisfactory performance of its terms.

6.4. Rights of the Members: This MOU does not contemplate the Members taking any action that would:

6.4.1. Adversely affect the rights of any of the Members; or

6.4.2. Adversely affect the customers or constituencies of any of the Members.

6.5. This document and participation in this CVIRWMP are nonbinding, and in no way suggest that a Member may not continue its own planning and undertake efforts to secure project funding from any source.

6.6. Members shall contribute personnel and financial resources necessary to undertake the CVIRWMP efforts of the CVIRWMG. It is expected that Members will contribute equal shares to the current and future CVIRWM program costs as agreed by the CVIRWMG. These will be documented in subsequent supplements to the MOU.

6.7. From time to time, the CVIRWMG may apply for and receive funding from state or federal agencies, or other entities for projects of mutual benefit within the IRWM Region. The CVIRWMG may appoint a member agency or consultant to administer and coordinate the use of such funding. The administering agency shall not have any additional authority above the CVIRWMG Members regarding project implementation, funding redistribution or any other decisions related to such projects.

IN WITNESS WHEREOF, the parties have executed this Memorandum of Understanding as of the day and year indicated on the first page of this MOU.

Jim Barrett
Coachella Valley Water District

Brian Macy
Indio Water Authority

Arden Wallum
Mission Springs Water District

Dave Luker
Desert Water Agency

Kirk Cloyd Coachella Water Authority

Joseph Glowitz
Valley Sanitary District

Appendix VI-D: Public Meeting Notes

This appendix includes meeting notes from Public Workshops, Disadvantaged Community Outreach meetings, Tribal Outreach meetings, Planning Partners meetings, Targeted Stakeholder Outreach meetings, and other public meetings held between finalization of the 2010 IRWM Plan and the finalization of the 2018 IRWM/SWR Plan.

Meeting	Dates
Planning Partners Meetings	6/20/2012 9/13/2012 12/13/2012 6/13/2013 9/12/2013 3/13/2014 6/12/2014* 12/11/2014 3/12/2015* 6/11/2015* 2/10/2016* 6/14/2016 11/15/2016 5/5/2017* 9/28/2017* 1/17/2018*
Public Workshops – Integrated Flood Management (IFM)	1/15/2013 9/18/2013
Public Workshops – Disadvantaged Communities (DAC)	9/13/2012 12/13/2012 6/18/2013 6/20/2013 11/6/2013
Public Workshops – Draft 2014 IRWM Plan Update	11/6/2013
Public Workshops – Draft 2018 IRWM/SWR Plan Update	
Targeted Outreach – Tribes	8/14/2012 8/22/2012 9/11/2012 9/13/2012 10/22/2013
Targeted Outreach - Stakeholder Groups	Meeting notes not provided; these were separate meetings not hosted by the IRWM Program

*Note: Meeting notes for these meetings are not included.

Coachella Valley Integrated Regional Water Management Program

Planning Partners

Wednesday June 20, 2012
2:00 – 4:00 p.m.

Coachella Valley Water District
Training Facility
75-515 Hovley Lane East
Palm Desert, CA 92260

DRAFT NOTES

Italics denote action items.

Attendees:

Planning Partners	**CVRWMG**
Debi Livesay, Torres Martinez Desert Cahuilla Indians	Berlinda Blackburn, CWA
Theresa Kimsey, Regional Water Quality Control Board	Mitch Nieman, CWA
Jose Cortez, Regional Water Quality Control Board	Brian Macy, IWA
Phoebe Seaton, California Rural Legal Assistance Foundation	Trevor Bisset, IWA
Dan Malcolm, Agua Caliente Band of Cahuilla Indians	John Soulliere, MSWD
Sergio Carranza, Pueblo Unido CDC	Mark Krause, DWA
Brenda Aleman, Council of Mexican Federations in North America	Katie Ruark, DWA
Anna Vargas, Poder Popular	Patti Reyes, CVWD
Mike Gialdini, Supervisor Benoit	Rosalyn Prickett, RMC
Leticia DeLara, Supervisor Benoit	Kathy Caldwell, RMC
	Crystal Mohr, RMC

Meeting Objectives:

A. Kick-off the Coachella Valley IRWM Plan Update

B. Discuss the role of Planning Partners and Workgroups in the IRWM Plan Update

C. Provide an update on salt and nutrient, groundwater, and flood management activities

D. Provide an update on ongoing disadvantaged community (DAC) outreach and assistance efforts

E. Discuss upcoming grant opportunities and updates to the IRWM Project Database

Meeting Notes:

Welcome and Introductions

Patti Reyes, Coachella Valley Water District (CVWD), welcomed the Planning Partners on behalf of the Coachella Valley Regional Water Management Group (CVRWMG), the five regional water suppliers in the Coachella Valley who are responsible for overseeing the Coachella Valley Integrated Regional Water Management (IRWM) Program.

Rosalyn Prickett, RMC Water and Environment (RMC), provided an overview of the agenda and meeting objectives.

Past IRWM Planning in the Coachella Valley Region

Rosalyn updated the group on the State's IRWM grant program. She provided an overview of the history of IRWM planning in the Coachella Valley from the Region Acceptance Process in 2009 to current work underway to update the 2010 IRWM Plan. In total, the Coachella Valley Region has been successful at receiving $5 million in grant money through Prop 84.

Prop 84 Implementation Grants, a component of the IRWM Program, will be available through three separate funding rounds. Round 1 occurred in 2011, through which the Coachella Valley Region was awarded $4 million. This funding will go to four projects: two septic-to sewer conversion projects, one regional conservation project, and one project to provide short-term arsenic treatment to various East Valley communities.

Round 2 is expected to begin in the late summer of 2012, when the California Department of Water Resources (DWR) anticipates releasing the draft grant guidelines (Project Solicitation Package or PSP). DWR has indicated that applications for Round 2 will be due in March 2013.

<u>Questions/Comments</u>

Planning Partner asked about the total amount of funding available for the Coachella Valley Region through Prop 84 Implementation Grants. There is a total of $36 million available for the Colorado River Funding Area, which is competitive between the Coachella Valley, Mojave, Imperial, and Borrego regions. DWR awarded $8 million to Mojave and $4 million to Coachella Valley during Round 1, even though they had previously indicated that only $4 million would be available. That fact, in addition to DWR's 8.5% retention to cover program expenses, has resulted in a lower amount of funding that is available in subsequent rounds of grant funding.

Current Update of Coachella Valley IRWM Plan – 2012-2014

Rosalyn provided an overview on the next steps for the Coachella Valley IRWM Program, which is to update the 2010 IRWM Plan. The original IRWM Plan was completed on a short timeframe in order to allow the region to be eligible for Round 1 funding. As such, there are key issues that need to be addressed within the IRWM Plan Update, including:

- Stakeholder Outreach
- Groundwater Quality Evaluation
- Salt and Nutrient Management
- Integrated Flood Management
- Groundwater Elevation Monitoring
- Comprehensively update the IRWM Plan

Rosalyn explained the timeline for the IRWM Plan Update, which is a 24-month schedule that will occur from now until the summer of 2014. In addition, the CVRWMG is completing work under a separate Disadvantaged Community (DAC) Outreach Program that is also funded by DWR. The DAC Outreach Program is being conducted in parallel to the IRWM Plan Update, and there will be coordination between the two efforts. The DAC Outreach Program has an 18-month timeline, which began in April 2012 and will be complete in October 2013.

Rosalyn then provided an overview of the role of the Planning Partners, who serve as an advisory body to the CVRWMG. She also noted that the CVRWMG is convening three separate workgroups to address technical issues associated with the IRWM Plan Update. Those workgroups will address salt and nutrient management, groundwater quality, and integrated flood management.

Rosalyn provided an overview of each workgroup, noting that each workgroup corresponds to a technical study that is being conducted for the IRWM Plan Update. The workgroups will be a subset of the Planning Partners, and will provide input on the technical analyses prior to incorporation of each technical study into the IRWM Plan Update.

Questions/Comments

Planning Partner noted that there is a need to look into cost-effective and innovative solutions to water issues in the Coachella Valley, especially pertaining to DACs. There are a lot of ongoing infrastructure issues, which cannot be comprehensively addressed with traditional management approaches due to funding constraints.

Planning Partner asked if the DAC Outreach Program will include technical work to assist DACs with developing projects. The answer is yes, the DAC Outreach Program will fund technical assistance (concept planning and design) for a few projects that address critical water supply or water quality issues in DACs.

Salt and Nutrient Management Workgroup

Rosalyn provided an overview of this workgroup, noting that it will specifically address salt and nutrient management associated with recycled water in accordance with the State's Recycled Water Policy. She then asked if the Planning Partners had any initial input for this workgroup or if any Planning Partners were interested in participating on the workgroup, noting that the CVRWMG would like the Regional Water Quality Control Board (RWQCB) to be involved.

Questions/Comments

Planning Partner noted that anybody with a discharge permit and all water agencies should be involved.

CVRWMG clarified that this workgroup is meeting to specifically address salt and nutrient management as it pertains to recycled water and the Recycled Water Policy, and will not necessarily be discussing overall groundwater quality issues. Those issues will be addressed in the Groundwater Quality Workgroup.

Patti Reyes, CVWD, will look into finding a representative from the agriculture sector who may be interested in participating.

Groundwater Quality Workgroup

Rosalyn provided an overview of this workgroup, noting that this planning study will address groundwater quality issues in and around DAC areas throughout the Coachella Valley. This workgroup will include an analysis of groundwater quality issues in the region, and will also address data gaps where further analysis needs to be conducted. The workgroup will concentrate on identifying areas where groundwater quality does not meet maximum contaminant levels (MCLs) defined by the USEPA.

Questions/Comments

Planning Partner noted that there is data available through Pueblo Unido CDC and CVWD efforts to install reverse osmosis systems in the East Valley. Data has been collected through that program regarding where reverse osmosis systems have been installed, and areas where arsenic has been detected in groundwater wells.

Planning Partner noted that there is a need for education in the East Valley regarding groundwater quality issues, and potential solutions such as reverse osmosis systems.

Planning Partner noted that the Torres Martinez tribal group has been conducting quarterly water quality testing on groundwater quality, and has tabular data.

Planning Partner noted that the Agua Caliente and Cabazon tribal groups have also been conducting testing, and that all of the CVRWMG agencies and other agencies such as the Myoma Dunes Mutual Water Company also have water quality data.

Planning Partner asked if there is funding available to define MCLs for things such as Chromium VI. No, there is not budget available for that task.

Planning Partners noted that there are specific issues associated with salts (TDS), nitrates (in conjunction with leaking septic systems), and uranium (which is naturally occurring near fault zones). There are also high fluoride levels at Pierce Street and Avenue 66.

Planning Partner asked if there would be technical staff available to provide Spanish translation for the workgroup meetings, and suggested that meetings be held in the afternoon when more people will be able to attend. It was noted that there are translation tools available through Pueblo Unido.

RMC will send out a poll to find a workgroup meeting time that will work for the maximum number of participants.

Participants identified at the Planning Partners meeting include: Sergio Carranza, Phoebe Seaton, Debi Livesay, CVRWMG agencies

Integrated Flood Management Workgroup

Rosalyn provided an overview of this workgroup, noting that the purpose of this study is to develop multi-benefit flood control projects that also enhance water quality, habitat, and groundwater recharge. She then asked for interested participants and feedback on integrated flood issues in the Coachella Valley.

<u>Questions/Comments</u>

CVRWMG noted that in general, flood issues are from flash flood events. Due to the Region's aquitard and high water table, flood waters tend to pool and generally take time to drain.

Planning Partner noted that there are flood concerns in Oasis, which has forced the Oasis Elementary School to relocate (along with high arsenic in groundwater). This issue has been evaluated, but has not been resolved.

CVRWMG noted that many flood issues are regional in nature, and would therefore require a large, expensive, regional-based solution. There is a need to find cost-effective solutions for many flooding issues in the region.

CVRWMG also noted that Desert Hot Springs has occasional flooding issues, which are flash floods that cause a substantial amount of damage.

Planning Partner noted that CVWD is doing flood-related work in the East Valley, and can share data gathered to date with the workgroup.

Planning Partner stated that the Torres Martinez Tribe has received grants to address flooding issues on the reservation.

Planning Partner noted that municipalities (cities and the County) have data on entitlements, and therefore likely have related flood evaluations.

Planning Partner noted that there was a proposed project in the Travertine area, which has been discontinued due to flooding issues.

Planning Partner inquired if the integrated flood workgroup has any latitude for public policy advocacy. There are currently issues associated with flooding and vector control, which are detrimental to efforts to build affordable housing. There is a need to engage vector control agencies, who may not understand issues in the Coachella Valley. Alternatively, in some places simple retention basins have been built to hold flood flows. While it is not appropriate for the

IRWM Program to advocate for policy changes, the workgroup process can document issues associated with vector control and how regulations can impede affordable housing projects.

Participants identified at the Planning Partners meeting include: Sergio Carranza, Phoebe Seaton, Debi Livesay, CVWD, and Riverside County (including vector control)

DAC Outreach Program

Kathy Caldwell, RMC, provided an overview of the DAC Outreach Program. The purpose of this program is to expand upon previous DAC outreach to target individuals and groups representing DAC issues, and to also engage members of DAC community in order to frame and articulate water management issues facing DACs. She provided an overview of activities that have been completed to date, noting that the next steps are to conduct further outreach and ensure that all DAC-related groups are contacted. A form was handed out to Planning Partners to solicit input on further groups and organizations that should be contacted as part of the effort.

Kathy also provided an overview of the DAC Outreach Program Timeline, noting that this program will be interwoven with the IRWM Plan Update.

<u>Questions/Comments</u>

Planning Partner commented that if possible it would be helpful to conduct outreach efforts on the ground, and hold meetings at such places as the Salton Sea area, Desert Hot Springs, and the East Valley.

CVRWMG suggested that the DAC Outreach team organize a tour of the DAC areas within the Valley to see firsthand and better understand the issues they're facing.

Upcoming DWR Grant Opportunities

Kathy provided an overview of upcoming grant opportunities, including Proposition 1E and Proposition 84 Implementation Grants. She noted the following:

Prop 1E Stormwater Flood Management Grant-Round 2

1. Due to DWR December 2012
2. Last Round of Funding
3. Competitive throughout California (not just funding area)
4. Submitted individually

Prop 84 Implementation Grant-Round 2

1. Due to DWR March 2013
2. 2nd Round of Funding (of 3)
3. Competitive only in Colorado River Funding Area
4. Submitted by Coachella Valley IRWM Region

<u>Questions/Comments</u>

CVRWMG noted that in Prop 84 Implementation Grant-Round 1, the CVRWMG agencies paid for the entire application. There is not currently a strategy for funding future applications.

Planning Partner asked if tribal entities have to complete CEQA documentation if they receive IRWM grant funding. Yes, all projects must adhere to state laws including CEQA, GMA, etc. Tribal entities may choose to partner with other agencies or organizations to resolve potential contracting issues, so that they will not directly sign contracts with CVWD.

Planning Partner asked when the deadline is for submitting projects into the online project database for Prop 1E, and also asked if the CVRWMG has to approve of the projects. The CVRWMG does review projects for consistency with the IRWM Plan, and will generally write a letter that indicates that a project is consistent with the Plan. This generally takes a few weeks. Projects can be submitted into the project database at any time, it does not close for Prop 1E.

Project Database

Rosalyn provided an overview of the IRWM Project database, which is hosted through www.cvrwmg.org. She noted that the database will be updated as part of the IRWM Plan Update. All projects previously submitted are still within the database, and Planning Partners and other local project sponsors are encouraged to update their projects as necessary.

Next Steps

Rosalyn discussed the future meeting dates for IRWM Plan Update work, including:

- Salt and Nutrient Management Workgroup meeting: August 22nd 1-3 p.m.
- Integrated Flood Management Workgroup meeting: August 22nd 3-5 p.m.
- Planning Partners Meeting: TBD, mid-September 2012
- DAC Workshop Meeting: TBD, mid-September 2012 (same day as Planning Partners)

Coachella Valley Integrated Regional Water Management Program
Planning Partners

Thursday September 13, 2012
1:00 – 3:00 p.m.

Coachella Valley Water District
Training Facility
75-515 Hovley Lane East
Palm Desert, CA 92260

DRAFT NOTES
Italics denote action items.

Attendees:

Planning Partners

Debi Livesay, Torres Martinez Desert Cahuilla Indians
Les Ramirez, Augustine Band of Cahuilla Indians
Phoebe Seaton, California Rural Legal Assistance Foundation
Cristina Mendez, California Rural Legal Assistance Foundation
Margaret Park, Agua Caliente Band of Cahuilla Indians
Christina Mokhtarzadeh, BIA SoCal Agency
Elizabeth Versace, City of Desert Hot Springs
Bill Simons, Cathedral City
Rodolfo Pinon, Pueblo Unido
Mike Gialdini, SPVR Benoit
Anna Aljabiry, DWR
Jeremy Wittie, Coachella Valley Mosquito and Vector Control District

CVRWMG

Berlinda Blackburn, CWA
Mitch Nieman, CWA
Brian Macy, IWA
Sara Toyoda, IWA
Michael Thornton, TKE Engineering on behalf of MSWD
Mark Krause, DWA
Katie Ruark, DWA
Patti Reyes, CVWD
Rosalyn Prickett, RMC
Kathy Caldwell, RMC
Crystal Mohr, RMC
Leslie Dumas, RMC
Daniel Cozad, IPM
Diana Cozad, IPM

Meeting Objectives:

A. Discuss Upcoming Grant Opportunities and Submittal Process
B. Status of Coachella Valley IRWM Plan Update, including Salt and Nutrient, Groundwater Quality, and Flood Management Activities
C. Update on Ongoing Disadvantaged Community (DAC) Outreach Efforts

Meeting Notes:

Welcome and Introductions

Patti Reyes, Coachella Valley Water District (CVWD), welcomed the Planning Partners on behalf of the Coachella Valley Regional Water Management Group (CVRWMG), the five regional water suppliers in the Coachella Valley who are responsible for overseeing the Coachella Valley Integrated Regional Water Management (IRWM) Program.

Rosalyn Prickett, RMC Water and Environment (RMC), provided an overview of the agenda and meeting objectives.

Upcoming DWR Grant Opportunities

Rosalyn Prickett noted that there are two upcoming DWR grant opportunities. The first is for Proposition 84 – Round 2 funding, for which the Coachella Valley will be submitting a regional application. In total, there is approximately $36 million in grant funding available to the Colorado River Funding Area, which is a highly competitive funding area consisting of the Mojave, Imperial, Anza Borrego Desert, and Coachella Valley IRWM regions. The Coachella Valley was awarded $4 million in Round 1 of Proposition 84 funding – there will be approximately $5.24 million available in Round 2, although this is competitive among all four IRWM regions.

Proposition 84 funding requires that one complete grant application be submitted per IRWM Region. That means that the Coachella Valley stakeholders will be asked to submit projects into the online project database, and a project selection process will be applied to all projects, which will then be scored and ranked. Some important requirements that potential project applicants should know about include the following:

- Projects must be submitted into the project database by October 19th to be considered for funding. Any projects previously submitted (in 2010 for Round 1 funding) must be updated to be considered.
- DWR has several contracting requirements, including:
    - Grant reimbursement is a lengthy process – it can take months for DWR to reimburse for invoices, and organizations must be prepared for this.
    - All applicants must have a 25% funding match from local or federal sources.
    - DWR holds back (retains) 10% of the grant funding until project completion.
    - CEQA is required for all projects, including those on tribal lands.
    - Labor compliance programs are required for all applicable projects.
    - For projects selected for inclusion in the Coachella Valley regional IRWM application, proponents will be responsible for contributing funds required to produce the grant application.

The project selection process for Round 2 funding is similar to Round 1 funding in that projects will be evaluated with the Project Selection Criteria in the 2010 IRWM Plan. On December 13th the CVRWMG will present the recommended projects and funding amounts to the Planning Partners. The final grant proposal will be submitted to DWR in March 2013, and application development will require input from project proponents.

Proposition 1E funds are also currently available – applications are due in December 2012. These applications, specifically for stormwater flood management, must be completed by individual project sponsors – not by the Coachella Valley Region. These applications are also competitive on a statewide basis rather than within the Colorado River Funding Area. Further, this application requires a 50% funding match, and there is no DAC waiver available. There is $92 million available in this second and last round of Proposition 1E funding.

The group was asked to discuss thoughts and pros/cons regarding how to determine how much of the grant application project proponents should be responsible for. Should proponents all pay a flat fee by equally dividing the total application cost, or should costs be specific to each project?

Below is an overview of the Planning Partners discussion on this topic:

- Are applicants allowed to charge a fee for administration? Could they use this fee to eventually get reimbursed for the application costs?
    - DWR allows a total of 5% of the grant to pay for administration. We generally allocate a portion of this (2-3%) to CVWD for their grant administration costs.
- A proportional fee seems fair; however this is only really fair if some projects require more work than others.
    - Some of the attachments are completed for the whole proposal – others, such as the Work Plan, Budget, Schedule, and Economic Analysis require a certain amount of individual project work and coordination, which may vary project to project.
- Then perhaps the fee should be split evenly for the "global" attachments (those completed equally for all projects), and charged project-by-project for the others.
- A reminder to all applicants: please make sure that you discuss paying for application costs with your organization. Some organizations may need board approval, and will need this approval prior to January 2013 for the application to be produced in time.

<u>Questions/Comments</u>

- How competitive is the other Funding Area within which the Mojave IRWM Region is located?
    - The Mojave IRWM Region is located in our Funding Area (Colorado River) and the Lahontan Funding Area. The Lahontan Funding Area is not very competitive.
- That does not seem very fair – Mojave is double-dipping!
    - The CVRWMG agrees, and has made that comment to DWR several times.
- Do we have the ability to link to a project?
    - Yes – email Crystal Mohr (cmohr@rmcwater.com) to change any information regarding the login and access to an existing project.
- What are the restrictions for eligible applicants?
    - Any subdivision of State – cities, counties, resource conservation districts, associations of governments, etc. In addition, non-profit organizations with an official 501(c)(3) designation and tribes are eligible applicants.
- Can organizations partner such that eligible applicants partner with non-eligible applicants as a pass-through for grant funding?
    - Yes, although we recommend that you have a formal agreement to avoid any contracting issues.
- Is there a waiver for the 25% match?
    - Potentially, this is at DWR's discretion. However, the entire grant application needs a 25% match – if one project has a match that is less than 25% of the total project cost, the other projects in the application will need to provide a larger match to account for the difference.
- When could an organization expect to receive grant funds from DWR?
    - To date, this process has been very lengthy – one year passed between the time that DWR sent the final award letter and the time the grant contract was

executed. DWR says the process could be as short as 60 days, but this assumes that there will be no edits to the work plan, budget, or schedule.

- Other Proposition 84 funds have less strict requirements so that proponents may begin grant reimbursement starting at a set date. Is this possible for IRWM funding?
  - To date DWR has not allowed for any reimbursement to occur until a grant contract is fully executed. Funding match can go back to 2008, but all of those expenditures need to be paid by proponents until a grant contract is executed. The CVRWMG understands the burden this places on proponents, especially non-governmental organizations (NGOs) and disadvantaged community (DAC) organizations.
- Would the CVRWMG agencies, or other agencies, be willing to provide start-up funding to relieve this burden on NGOs and DACs?
  - It is difficult for agencies to provide funding for beneficiaries that are not within their service areas. In addition, agencies are at risk if they pay for activities that may not be reimbursed by DWR.
  - DWR recommends that NGOs and DAC organizations invoice as frequently as possible to speed up the reimbursement process.
- Is it possible for organizations to do a companion application to California Infrastructure Bank to get a loan to help pay for the upfront costs? The terms are very good, 90 day bond rate and no upfront application fees.
  - The CVRWMG will explore this option for NGOs and DACs.
- How do you assess how much of a project benefits DACs?
  - This is something that needs to be quantified in the analysis included in the grant application.
  - The Guidelines are not currently clear on how to assess a project's contribution to a DAC. This comment has been made to DWR.
- Regarding the Proposition 84 funding, is there any way that the Round 2 funding will not be available?
  - No. According to DWR these funds are already secured and ready.

Update on Coachella Valley IRWM Planning Studies

Rosalyn provided an overview on the next steps for the Coachella Valley IRWM Program, which is to update the 2010 IRWM Plan. The IRWM Plan Update will include three planning studies: Salt and Nutrient Management, Groundwater Quality Evaluation, and Integrated Flood Management.

Salt and Nutrient Management

Rosalyn provided an overview of this workgroup, noting that it will specifically address salt and nutrient management associated with recycled water in accordance with the State's Recycled Water Policy. She then noted that the first workgroup meeting was held on August 22nd.

Progress to date for this workgroup includes: developing an approach, continuing to reach out to stakeholders, met with the Regional Board to get their perspective on the proposed approach. Next steps include conducting at least two additional workshops (September 26th and October 24th), and to develop a Work Plan that will provide a scope of work for activities that should be completed to develop a complete Salt and Nutrient Management Plan. The goal is to pull the Work Plan together by 2013.

Groundwater Quality Evaluation

Leslie Dumas, RMC, provided an overview of the groundwater quality evaluation that is being conducted as part of the IRWM Plan Update. She noted that the current step of this evaluation is to identify "areas of concern." Areas of concern include DACs that are not served by municipal water suppliers, and are therefore served by private groundwater wells. After these areas are identified, research will be conducted to try to determine groundwater quality and constituents or contaminants of primary concern within the areas of concern. Similar to the other IRWM planning efforts, this effort focuses on identifying key water quality issues associated with DACs – the identification of these issues will help determine how to allocate resources to critical DAC issues.

Any entity that has groundwater quality and quantity data can really help! If you have data, please send it to Leslie: ldumas@rmcwater.com.

Questions/Comments

- The City of Coachella is not fully served by the municipal water system. As such, the entire boundary for the City of Coachella should not be excluded from the areas of concern.
- Does the list of constituents include Chromium VI?
  - Yes, the list includes Chromium III and Chromium VI.
- Is it true that processes that treat for arsenic also treat for chromium?
  - Yes, they generally also treat for manganese and iron.

Integrated Flood Management

Rosalyn Prickett provided an overview of this workgroup, noting that this study and associated workgroup are currently on hold until the Flood Futures report is available from the State.

Update on DAC Outreach and Assistance

Kathy Caldwell, RMC, provided an overview of the DAC Outreach Program. The purpose of this program is to expand upon previous DAC outreach to target individuals and groups representing DAC issues, and to also engage members of DAC community in order to frame and articulate water management issues facing DACs. She provided an overview of activities that have been completed to date, noting that the fist DAC Workshop was held the morning of September 13th.

Current efforts for the DAC Outreach Program include: completing outreach to stakeholders and interested organizations, conducting DAC-focused mapping, and reaching out to DACs to provide support for Proposition 84-Round 2 Implementation Grant Funding. If any interested non-profit organizations are interested in being involved in the DAC-focused mapping effort, please contact Kathy: kcaldwell@rmcwater.com

Kathy also provided an overview of the DAC Outreach Program Timeline, noting that this program will be interwoven with the IRWM Plan Update.

Next Steps

Please remember to submit your projects into the online database by October 19th!

Please mark your calendars: the next Planning Partners meeting will be on December 13th.

Coachella Valley Integrated Regional Water Management Program
Planning Partners

Thursday December 13, 2012
1:00 – 3:00 p.m.

Coachella Valley Association of Governments
Conference Room #115
73-710 Fred Waring Drive
Palm Desert, CA 92260

DRAFT NOTES

Italics denote action items.

Attendees:

Planning Partners

Anna Aljabiry, DWR
Asaad Akar, Cathedral City
Jeff Benson, City of Rancho Mirage
Bill Engs, City of Rancho Mirage
Mike Gialdini, Supervisor Benoit
Jennifer Henke, Coachella Valley Mosquito and Vector Control District
Jacquelyn Gonzales, Cabazon Band of Mission Indians
Savat Khamphou, City of Palm Springs
Debi Livesay, Torres Martinez Desert Cahuilla Indians
Laura Massie, California Rural Legal Assistance
Alan Pace, Petra Geotechnical
Tim Roberts, Salton Community Services District

CVRWMG

Berlinda Blackburn, CWA
Sara Toyoda, IWA
Mark Krause, DWA
Katie Ruark, DWA
David Tate, DWA
Patti Reyes, CVWD
John Soulliere, MSWD
Rosalyn Prickett, RMC
Randy Raines, RMC
Kathy Caldwell, RMC
Leslie Dumas, RMC
Crystal Mohr, RMC
Daniel Cozad, IPM

Meeting Objectives:

A. Keep Planning Partners Up-to-Date on the Coachella Valley IRWM Program, including Salt and Nutrient, Groundwater Quality, and Flood Management Activities
B. Update on Disadvantaged Community (DAC) Outreach Efforts
C. Review Recommended Project Package for Proposition 84-Round 2 Grant Cycle
D. Review Climate Change Vulnerability Analysis for Coachella Valley

Meeting Notes:

Welcome and Introductions

Rosalyn Prickett, RMC Water and Environment (RMC), welcomed the Planning Partners on behalf of the Coachella Valley Regional Water Management Group (CVRWMG), the five regional water suppliers in the Coachella Valley who are responsible for overseeing the

Coachella Valley Integrated Regional Water Management (IRWM) Program. Ms. Prickett then provided an overview of the agenda and meeting objectives.

Status of IRWM Planning Activities and Schedule

Rosalyn Prickett provided an overview of the Coachella Valley IRWM Plan Update, noting that there are six key pieces of the Plan Update: stakeholder outreach (including outreach with the Planning Partners), a Salt and Nutrient Management Technical Evaluation, a DAC Groundwater Quality Evaluation, an Integrated Flood Management Technical Evaluation, a Groundwater Elevation Monitoring Technical Evaluation, and a comprehensive update to the existing IRWM Plan. Rosalyn Prickett also explained the schedule for the aforementioned pieces of the IRWM Plan Update, noting that stakeholder outreach will occur throughout the two-year process, the DAC Groundwater Quality Evaluation and the Salt and Nutrient Management pieces will be complete by mid-2013, and the Integrated Flood Management and Groundwater Elevation pieces will be complete by the end of 2013. The IRWM Plan Update, which will incorporate information from all of the technical evaluations and stakeholder outreach efforts, will be complete by mid-2014.

Recommended Proposition 84-Round 2 Grant Package

Rosalyn Prickett noted that the Coachella Valley IRWM Region is in the process of developing an application for Round 2 of Proposition 84 Implementation Grant funding, for which the Coachella Valley will be submitting a regional application. In total, there is approximately $36 million in grant funding available to the Colorado River Funding Area, which is a highly competitive funding area consisting of the Mojave, Imperial, Anza Borrego Desert, and Coachella Valley IRWM regions. The Coachella Valley was awarded $4 million in Round 1 of Proposition 84 funding – there will be approximately $5.24 million available in Round 2, although this is competitive among all four IRWM regions.

Rosalyn Prickett provided an overview of the Coachella Valley's Proposition 84-Round 2 Grant application process, noting that the Region recently completed the project selection process. Next steps are for the Planning Partners to review and potentially approve of the recommended project list; once the list of projects is approved, the consultant team will work with the CVRWMG and all local project sponsors (LPS) to complete the grant application.

Rosalyn Prickett then provided an overview of the project selection process that was completed for the Proposition 84-Round 2 Grant application process. After all projects were submitted to the online project database, the CVRWMG reviewed all projects in accordance with the scoring and ranking process outlined within the adopted IRWM Plan. This process involved evaluating each project and assigning a numerical score based upon a set of adopted criteria. Once all projects received a score, the projects were separated into Tier 1 (top 50%) and Tier 2 (bottom 50%) lists. While Tier 1 projects were all considered for further funding, the CVRWMG also evaluated all projects within the Tier 2 list to ensure that any highly eligible projects were not overlooked. Further, the CVRWMG pulled out all projects that involved septic-to-sewer conversion activities and compared and assessed those projects as a group.

Based upon lessons learned from the Proposition 84-Round 1 process, the CVRWMG conducted interviews with the top 9 project applicants to determine further information about project eligibility and competitiveness. Following the project interviews, the CVRWMG formalized a draft recommended project list based on a set of secondary criteria that were applied to each interviewed project. The secondary project selection criteria are as follows:

- Are the proposed scope and budget reasonable? Is the project technically feasible / able to move forward to implementation?
- Is the project cost effective (e.g., grant $$/connection)?

- What value does the project provide to the Coachella Valley? Are those benefits aligned with the California Department of Water Resources' (DWR's) scoring criteria?
- Is the project ready to proceed? Would the project be able to proceed if there were substantial funding delays?
- Are there any potential hurdles to completing the project on-time?
- Is the funding match secure?
- Does the project serve a disadvantaged community (DAC)?
- Has need been documented (e.g., history of septic failures for septic-to-sewer project and associated water quality issues)?

Rosalyn Prickett then noted that based on the secondary criteria, the CVRWMG is currently recommending the following list of projects for Proposition 84 funding:

Project Title	Recommended Funding Award
Coachella Valley Salt and Nutrient Management Plan (SNMP)	$500,000
Groundwater Quality Protection Project – Sub-Area D2	$1,845,000
Non-Potable Water Use Expansion Project	$2,000,000
San Antonio del Desierto – Sewer Sanitary Collection System Extension Project	$740,000
Torres-Martinez Water Line Extension Project Avenue 64	$155,000
TOTAL	**$5,240,000**

Following an explanation of each project, Rosalyn Prickett noted that every project has been recommended for partial funding (below the original grant request). Rosalyn Prickett then inquired if the Planning Partners have any questions or comments about the list of projects or the project selection process.

Questions/Comments

- Can the grant application be partially funded by DWR?
    - Yes. Sometimes DWR will pick projects to fund or not fund, and sometimes they will ask regions to choose projects out of the application to be funded if there is not enough money available in the Funding Area.
- Are the five projects on the recommended list prioritized?
    - No, the projects are not prioritized.
- Why did the Pierce Community Infrastructure – Sewer Sanitary Collection System Project get placed in the list of projects not considered for the Round 2 grant cycle?
    - This project had very high connection costs; the CVRWMG was concerned that this project would not be competitive from a cost-benefit ratio point of view. Given the competitive nature of the Implementation Grant process, the CVRWMG wanted to put forward the most competitive application possible. Please note that all projects within the IRWM database are immediately considered to be within the IRWM Plan; this makes them potentially eligible for other funding sources.
- Given the competitive nature of the process and the fact that DWR could choose to select a subset of projects to fund, wouldn't it be most beneficial to ask for more than the available $5,240,000?
    - Other regions, such as Mojave, have chosen to do this. However, it is risky to ask for more than the available funding amount. Ultimately the CVRWMG decided

that it would be best to go for the full amount available, but not ask for more than that.

- Note that the SNMP Project and the Non-Potable Water Use Expansion Project are connected in that all recycled water discharge permits require a SNMP to be in place.
- Regarding the Torres-Martinez project, you noted that the grant request was originally for full construction, but was reduced drastically to only cover design and engineering costs. Does the CVRWMG see this as a risk regarding the grant application? I had heard previously that design/engineering projects are not very competitive for Proposition 84 funding.
    - There are pros and cons to this decision. Ultimately the tribal and DAC benefits of this project are thought to overcome the fact that the grant request will not be for project implementation. Further, this grant will set the tribe up to receive funding from USDA for construction of the project.
- In the future, will there be an opportunity for other projects to apply for funding to cover engineering and design work, which would also make them eligible for other funding sources?
    - This is something for the CVRWMG and the Planning Partners to consider during future rounds of funding.
- Is there a way that the IRWM Program can be used to increase integration that will help make projects more cost-effective? For example, there are potential septic-to-sewer conversion projects that would be more cost-effective if nearby residents would all hook into the sewer system. Further, this would be more efficient, because it would ensure that an under-sized sewer system is not installed now and replaced in the next few years. It seems like the IRWM Program would be an appropriate venue for this kind of integration.
    - The IRWM Program has not been involved in such activities in the past, but could consider further integration activities that increase efficiencies within the Region.
- How much consideration was given to the need for the project? How was this evaluated?
    - The CVRWMG considered the actual need for the project from an environmental and technical standpoint, such as if septic systems were failing and causing public health and environmental issues. The CVRWMG also evaluated if project-related issues were impacting DACs, and then evaluated the security of the funding match. The security of the funding match helps to determine how likely the project is to actually move forward if provided grant funding. It is a priority to the CVRWMG to ensure that grant funding brought into the Region is put to use in an effective manner.

Following the discussion regarding the recommended Proposition 84-Round 2 Project List, the Planning Partners approved the project list.

Climate Change Vulnerability Analysis

Crystal Mohr, RMC, provided an overview of the climate change vulnerability analysis that is being conducted as part of the IRWM Plan Update. This analysis is being conducted in accordance with DWR standards for climate change planning per the IRWM Guidelines. DWR requires the climate change analysis to include two types of analysis: adaptation analysis and mitigation analysis. The first step of both analyses is to conduct a literature review; the consultant team did this by using widely cited statewide climate change resources as well as all relevant local climate change sources such as Climate Action Plans for various cities within the

Coachella Valley. Cumulatively, these sources demonstrate that the Coachella Valley could experience the following effects as a result of climate change:

- Temperature Change: Increase between 5-10 degrees (Fahrenheit)
- Precipitation: Little to no change in annual average rainfall
- Wildfire Risk: Same or slightly increased likelihood of wildfire
- Water Demand: Increases expected but not quantified
- Water Supply: Expect decreases to imported water (Colorado River) delivery and non-quantified changes to local groundwater supply

Ms. Mohr then provided an overview of the potential climate change vulnerabilities that the Region could face. These vulnerabilities are categorized into 7 categories, including: water demand, water supply, water quality, sea level rise, flooding, ecosystem and habitat, and hydropower. Ms. Mohr provided a brief overview of the analysis, inquiring if the Planning Partners had any comments. Following the meeting, the consultant team will distribute the climate change vulnerability matrix to stakeholders for further comments.

Questions/Comments

- Did the literature take into account population change associated with temperature increases? It seems like if the temperature in the Coachella Valley actually increased by 10 degrees, there would be much less people, and therefore water demand would not increase as currently projected.
  - RMC will check with the technical team on this question, however, in general the analysis only took into consideration very specific water-related climate change issues and did not analyze things such as population change.
- The matrix needs to be edited under water quality – it currently says that the Coachella Valley does not use any surface water sources, which is not accurate.

Update on DAC Outreach and Assistance

Kathy Caldwell, RMC, provided an overview of the DAC Outreach Program. The purpose of this program is to expand upon previous DAC outreach to target individuals and groups representing DAC issues, and to also engage members of DAC community in order to frame and articulate water management issues facing DACs. She provided an overview of activities that have been completed to date, noting that the second DAC Workshop was held the morning of December 13th.

Current efforts for the DAC Outreach Program include: continuing outreach to stakeholders and interested organizations, continuing work on DAC-focused mapping and characterization, contracting with non-profit organizations to assist in the process, holding stakeholder outreach meetings (DAC Workshops), beginning the flood mapping process, and continuing to coordinate with the IRWM Plan Update efforts.

Kathy also provided an overview of the DAC Outreach Program Timeline, noting that this program will be interwoven with the IRWM Plan Update.

Questions/Comments

- Does the flood mapping process include updating FEMA maps?
  - Yes and no. The process will start with available data such as FEMA data, and use locally-collected data to update those maps. The focus, however, will be on mapping disadvantaged communities that face flood-related issues.
- Does the flood analysis include Salton City? Flooding is a huge problem there.

- Yes. The flood analysis will cover the entire IRWM Region, which includes Salton City.

Update on Coachella Valley IRWM Technical Evaluations

Rosalyn Prickett provided an overview on the three planning studies that will be incorporated into the IRWM Plan Update: Salt and Nutrient Management, Groundwater Quality Evaluation, and Integrated Flood Management.

Salt and Nutrient Management

Rosalyn provided an overview of this workgroup, noting that it will specifically address salt and nutrient management associated with recycled water in accordance with the State's Recycled Water Policy. She then noted that three stakeholder workshops were conducted for this planning study.

The current status of the planning study is that the technical team has compiled a draft work plan, which outlines the salt and nutrient management planning process that would be recommended for the Coachella Valley. The next step with this planning study is to compile and respond to all comments – if you have not submitted comments, please do so ASAP! Modifications will be made to the work plan based upon relevant comments, and then the revised work plan will be reviewed by the CVRWMG. After the CVRWMG has approved of the work plan, they will meet with the Regional Water Quality Control Board staff for feedback, and potentially revise the work plan again based upon the Regional Board's comments. Following these steps, the CVRWMG will give a presentation to the Regional Board on January 17th to discuss the process and receive input from the board before moving on to the next phase, which would involve developing a salt and nutrient management plan.

Groundwater Quality Evaluation

Leslie Dumas, RMC, provided an overview of the groundwater quality evaluation that is being conducted as part of the IRWM Plan Update. She noted that the current step of this evaluation is to identify "areas of concern." Areas of concern include DACs that are not served by municipal water suppliers, and are therefore served by private groundwater wells. Information available from the Coachella Valley water purveyors as well as publically available state and federal data has allowed the technical team to identify areas of concern as well as constituents of concern in those areas. The data that was analyzed shows that there are four primary constituents of concern: arsenic, fluoride, nitrate, and uranium. The next step in the analysis is to determine potential solutions for addressing the various constituents. According to information from the EPA, membrane separation (which includes reverse osmosis), is the best available technology for addressing each constituent potentially present in local groundwater basins. Future steps in this process will involve a data gap analysis to determine more information that may be useful such as the exact location of wells, the volume of water being pumped and used, and a confirmation of water quality at each well. Following the data gap analysis, the technical team will develop an outline for a monitoring program that can potentially be implemented to address identified data gaps and other outcomes from the planning study.

<u>Questions/Comments</u>

- The number of sampling points reported for constituents of concern – do those represent the number of samples throughout the County or within the Coachella Valley Groundwater Basin?
    - The number of sampling points represents the number of samples that exceeded the MCL value – these sampling points are only for the local groundwater basins and are not County-wide.

Integrated Flood Management

Rosalyn Prickett provided an overview of this workgroup, noting that this study and associated workgroup will kick off during the new year. The first integrated flood management workgroup will be held on January 15th, 2013. The technical team will send an announcement to stakeholders for this meeting.

Next Steps

The technical team, CVRWMG, and LPS will begin preparing the Round 2-Proposition 84 Implementation Grant application, and will continue to conduct work on the various planning studies that will be incorporated into the IRWM Plan Udpate.

Please mark your calendars: the next Planning Partners meeting will be held on March 14, 2013!

Coachella Valley Integrated Regional Water Management Program
Planning Partners

Thursday June 13, 2013
2:30 – 4:30 p.m.

Coachella Valley Association of Governments
Conference Room #115
73-710 Fred Waring Drive
Palm Desert, CA 92260

DRAFT NOTES
Italics denote action items.

Attendees:

Planning Partners

Mike Gialdini, Supervisor Benoit
Phoebe Seaton, California Rural Legal Assistance
Maria Elena Kennedy, DAC Representative
Margaret Park, Agua-Caliente Band of Cahuilla Indians
Jim Sullivan, Coachella Valley Association of Governments
Abdi Haile, Colorado River Regional Board
Susie del Toro, El Sol Neighborhood Educational Center
Rodolfo Piñon, Pueblo Unido CDC
Ryan Sinclair, Loma Linda University
Jaime Lopez, Loma Linda University
Tom West, Carollo Engineers
Dave Rydman, Carollo Engineers

CVRWMG

Berlinda Blackburn, CWA
Sara Toyoda, IWA
Katie Ruark, DWA
David Tate, DWA
Patti Reyes, CVWD
John Soulliere, MSWD
Rosalyn Prickett, RMC
Kathy Caldwell, RMC
Leslie Dumas, RMC
Crystal Mohr, RMC
Daniel Cozad, IPM

Meeting Objectives:

A. Keep Planning Partners Up-to-Date on the Coachella Valley IRWM Program, including Salt and Nutrient, Groundwater Quality, and Flood Management Activities
B. Update on Disadvantaged Community (DAC) Outreach Efforts
C. Discuss IRWM Goals, Objectives, and Targets for the IRWM Plan Update

Meeting Notes:

Welcome and Introductions

Rosalyn Prickett, RMC Water and Environment (RMC), welcomed the Planning Partners on behalf of the Coachella Valley Regional Water Management Group (CVRWMG), the five regional water suppliers in the Coachella Valley who are responsible for overseeing the

Coachella Valley Integrated Regional Water Management (IRWM) Program. Ms. Prickett then provided an overview of the agenda and meeting objectives. The group did self-introductions.

Status of IRWM Planning Activities and Schedule

Rosalyn Prickett provided an overview of the Coachella Valley IRWM Plan Update, noting that there are five key pieces of the Plan Update: stakeholder outreach (including outreach with the Planning Partners), a Salt and Nutrient Management Technical Evaluation, a DAC Groundwater Quality Evaluation, an Integrated Flood Management Technical Evaluation, and a comprehensive update to the existing IRWM Plan.

Rosalyn Prickett also explained the schedule for the aforementioned pieces of the IRWM Plan Update, noting that stakeholder outreach will occur throughout the two-year process, the Salt and Nutrient Management piece is complete, and the DAC Groundwater Quality Evaluation and the Integrated Flood Management pieces will be complete by the end of 2013. The IRWM Plan Update, which will incorporate information from all of the technical evaluations and stakeholder outreach efforts, will be complete by mid-2014.

Patti Reyes, Coachella Valley Water District (CVWD), added that the Salt and Nutrient Management piece of the IRWM Plan Update (Workplan) has been completed, and the CVRWMG is currently soliciting proposals to develop the Salt and Nutrient Management Plan (SNMP). The loose schedule for this process is:

- Proposals due in July
- July-August: select consultant team
- September: finalize contracting
- October: begin work to prepare the SNMP

Overview of IRWM Grant Program and Other Grant Opportunities

Rosalyn Prickett noted that the Coachella Valley IRWM Region submitted an application for Round 2 of Proposition 84 Implementation Grant funding for five high-priority projects. In total, there is approximately $36 million in grant funding available to the Colorado River Funding Area, which is a highly competitive funding area consisting of the Mojave, Imperial, Anza Borrego Desert, and Coachella Valley IRWM regions. The Coachella Valley was awarded $4 million in Round 1 of Proposition 84 funding – there will be approximately $5.24 million available in Round 2, although this is competitive among all four IRWM regions.

Rosalyn Prickett provided an overview of the Coachella Valley's project evaluation and selection process, noting that the Region followed the process outlined in the 2010 IRWM Plan, which included vetting the recommended projects through the Planning Partners in December of 2012.

Rosalyn Prickett then provided an overview of other funding opportunities that are is available to the Region. The California Department of Public Health (CDPH) is currently soliciting proposals across the state. Pre-applications are due on July 8, 2013. CVWD and the other CVRWMG agencies are interested in working with interested parties to submit pre-applications. Rosalyn Prickett also noted that there is a flyer for the California Financing Coordinating Committee (CFCC) in the Planning Partners handout packet – there will be a local funding fair held in Cathedral City on September 26, 2013.

Update on Coachella Valley IRWM Technical Evaluations

Integrated Flood Management

Rosalyn Prickett provided an overview of this workgroup, noting that the first integrated flood management workgroup was held on January 15th, 2013. The technical team will be coordinating a second workgroup meeting, and all stakeholders will receive an invitation to attend.

DAC Groundwater Quality Evaluation

Leslie Dumas, RMC, provided an overview of the groundwater quality evaluation that is being conducted as part of the IRWM Plan Update.

Ms. Dumas explained the process that was taken for this evaluation, involving seven primary steps. At this point, data indicates that there are existing water quality concerns pertaining to arsenic, fluoride, nitrate, and uranium. Although there is not a current maximum contaminant level (MCL) or CDPH standard for hexavalent chromium, this constituent is being considered due to pending regulations. Information gathered to date demonstrates that membrane separation (reverse osmosis) and ion exchange systems will both be adequate in treating the aforementioned constituents to levels established by the MCLs. Information gathered to date also suggests that point-of-use (POU), point-of-entry (POE), and wellhead treatment systems are likely realistic to address water quality concerns given the location of many of the areas of concern (very far from municipal water service areas). Ms. Dumas explained that these systems are already being installed in the East Valley by Pueblo Unido CDC and other organizations. These systems are both technologically and economically effective in addressing DAC water quality concerns.

Given the technological and economical effectiveness of these systems, one of the recommendations of this study (Technical Evaluation) is that a program for installation of POU/POE/wellhead treatment systems be developed for the entire Coachella Valley.

<u>Questions/Comments</u>

- How does the public health goal recommended for hexavalent chromium relate to the future potential MCL?
    - The two are not necessarily related – it is just a goal and needs substantial input before it becomes a MCL. We are using the public health goal, because it is the only health-related water quality standard we have for hexavalent chromium at this time.
- Where has the Short Term Arsenic Treatment Program (by Pueblo Unido CDC) been implemented?
    - Five mobile home parks (MHPs) have been retrofitted with reverse osmosis systems to treat water to-date. These have all been installed in the eastern Coachella Valley.
- The onsite reverse osmosis systems are fine, but have you considered consolidation with the municipalities? Seems like a better long-term solution.
    - The study analyzed distance to municipal water systems – part of the issue is the remoteness of some of the MHPs is so extreme, that the systems are simply not cost effective (i.e. several millions of dollars for a single pipeline extension).
- One of the major issues that needs to be discussed is, once funding is received from the state (specifically from DWR Proposition 84 funds) – reimbursement makes installation challenging. Pueblo Unido CDC would have installed more systems already if the reimbursement process did not take so long.
    - The DAC Outreach Program will cumulatively address funding issues such as these.

Update on DAC Outreach and Assistance

Kathy Caldwell, RMC, provided an overview of the DAC Outreach Program. The purpose of this program is to expand upon previous DAC outreach to target individuals and groups representing DAC issues, and to also engage members of DAC community in order to frame and articulate water management issues facing DACs. She provided an overview of activities that have been completed to date.

Dr. Ryan Sinclair from Loma Linda University (LLU) provided an overview of the process that has been taken to-date, which involved pairing trained promoters (promotoras) from El Sol and Pueblo Unido CDC with students from LLU. All students and promotoras were trained, and the team developed a survey that would be taken out into the field in both the east and west valley. To-date, 214 surveys have been completed.

Kathy Caldwell noted that the next step is to hold workshops: one in the East Valley and one in the West Valley. She welcomed all Planning Partners to attend, and to get the word out! Attendance is welcome at both meetings by all interested parties.

- East Valley Workshop: June 18th, 5-7 p.m. San Jose Community and Learning Center, 69455 Pierce Street, Thermal, CA
- West Valley Workshop: June 20th, 5-7 p.m. DHS Family Resource Center, 14201 Palm Drive, Suite 108, Desert Hot Springs, CA

Daniel Cozad, IPM then explained noted that part of the DAC Outreach Program includes funding for preliminary planning and design/engineering. The idea being that these funds can be used to develop and grow projects into formal projects that can be competitive for other forms of grant funding. Mr. Cozad explained that this process is looking at projects or project concepts that will meet pressing needs on a near-term basis. To-date, the team has found that there is a need for projects that fall in three general categories: water quality (drinking water), wastewater (addressing septic systems), and flooding. Ms. Caldwell explained that part of the handouts include forms for the Planning Partners to fill-out, which will provide additional input to the team as they choose project concepts to move forward for preliminary design and engineering.

Dr. Sinclair then asked the partners (Susie del Toro from El Sol and Rodolfo Piñon from Pueblo Unido CDC) to provide information about their survey experiences with the group. Below is an overview of this discussion, which took place with input from the Planning Partners.

- The survey teams in the West Valley were surprised to hear of some of the issues, particularly involving concerns with drinking water. This was a surprise, because the West Valley water is generally considered very high in quality and surveyors did not expect to hear that people did not trust the water quality in that area.
- The survey teams were highly successful – in part due to their intergenerational nature with surveyors and students of all ages. The diversity of the team really helped with outreach to individuals across the valley.
- In general the survey teams in the East Valley were not surprised to hear the issues: wastewater disposal and treatment, potable (drinkable) water supplies, and flooding issues. In addition, many residents are concerned with unpaved streets.
    - Yes and no. The process will start with available data such as FEMA data, and use locally-collected data to update those maps. The focus, however, will be on mapping disadvantaged communities that face flood-related issues.
- Does the flood analysis include Salton City? Flooding is a huge problem there.
    - Yes. The flood analysis will cover the entire IRWM Region, which includes Salton City.

- Will the workshops be conducted in English and in Spanish? How will this be handled?
    - The team is planning on getting headsets from the Healthy Communities organization. There will be a translator at each meeting to do in-person translation.
- There are concerns with using the headset translation services. There are communities that do not like these and find them isolating.
    - The team spoke with the non-profit partners, who stated that the residents in Coachella Valley are ok with this type of communication.
- What is being done to address big picture issues? Surveys will reveal site-based issues, but I would like to see some holistic planning – for example, holistically addressing flooding in the East Valley.
    - The IRWM Program in conjunction with the DAC Outreach Program is attempting to do this, especially through the integrated flood management study.
- Although the on-site treatment systems are technologically effective, they are still near-term in nature. In general my input is that consolidation (connection to the municipal system) is the most effective long-term solution.
    - The program is considering this – the issue is that especially with grant funding, those projects are simply not cost-effective enough to be competitive in our highly competitive funding area. As development increases in the East Valley, the cost-benefit ratios may change.

Overview of IRWM Grant Program and Other Grant Opportunities

Rosalyn Prickett then provided an overview of the IRWM Objectives, included in the 2010 IRWM Plan. Those objectives are the backbone of the IRWM Plan in that they define regional priorities and provide a mechanism for measuring implementation success.

The next step of the IRWM Plan Update will be to go over the existing objectives, which were developed with the Planning Partners, and discuss the following:

- Which objectives are the most important?
- What issues are addressed by the objectives?
- What do we want to accomplish through implementation of the IRWM Plan?

The CVRWMG members then went through and explained each of the 13 objectives included in the 2010 IRWM Plan, which are:

A. Provide reliable water supply for residential and commercial, agricultural community, and tourism needs.

B. Manage groundwater levels to reduce overdraft, manage perched water, and minimize subsidence.

C. Secure reliable imported water supply, including restoring/improving reliability of State Water Project supply and securing other imported water supplies.

D. Maximize local supply opportunities, including water conservation, water recycling and source substitution, and capture and infiltration of runoff.

E. Protect groundwater quality and improve, where feasible.

F. Preserve and improve surface water quality by maintaining integrity of agricultural drainage systems, protecting the quality of natural runoff used for potable supply, and reducing pollution in stormwater runoff.
G. Preserve local environment and restore, where feasible.
H. Manage flood risks, including current acute needs and needs for future development.
I. Optimize conjunctive use of available water resources.
J. Maximize stakeholder involvement and stewardship in water resource management.
K. Address water-related needs of local Native American culture.
L. Address water and sanitation needs of disadvantaged communities, including those in remote areas.
M. Maintain affordability of water.

Planning Partners were each given seven stickers and asked to place their stickers on the objectives to indicate which are most important to them. The result of the exercise is as follows:

A. 8 stickers
B. 8 stickers
C. 9 stickers
D. 9 stickers
E. 13 stickers
F. 1 stickers
G. 5 stickers
H. 6 stickers
I. 3 stickers
J. 11 stickers
K. 5 stickers
L. 13 stickers
M. 10 stickers

<u>Questions/Comments</u>

- Objective E could be modified to address relevant permit requirements for agricultural drains.
- Targets for Objective L need to be modified to address distance form municipal services.
- Objective L could also be modified to reflect that wastewater is not just a local, but a global issue. The Gates Foundation is actively seeking out alternatives to wastewater treatment and disposal.
- Would it be possible to develop some sort of master plan for sewer systems? It would be good to see holistically – if sewers were to be installed across the Valley – where would this occur, and how much would it cost?
- For flooding – more consideration needs to be taken for existing ponds and lagoons. Also, regrading sites can really help move water away from homes.

- Objective J does not include outreach or education. Perhaps this could be included as a target? A lot of the issues, particularly with septic systems involve education on proper use and maintenance.
- What about addressing ownership issues? Many of the East Valley residents are renters – even if you do outreach to these folks, it will not change mobile home park practices. The education needs to be with the owners and the residents.
- It is also important to conduct outreach and education on the regulatory level – so that regulators are aware of the issues.

Next Steps

Please mark your calendars: the next Planning Partners meeting will be held on September 12, 2013!

Coachella Valley Integrated Regional Water Management Program

Planning Partners

Thursday September 12, 2013
1:00-3:00 p.m.

Coachella Valley Association of Governments
Conference Room #119
73-710 Fred Waring Drive
Palm Desert, CA 92260

DRAFT NOTES
Italics denote action items.

Attendees:

Planning Partners

Margaret Park, Agua-Caliente Band of Cahuilla Indians
Tim Roberts, Salton Community Services District
Jon Rokke, Colorado River Regional Board
Jennifer Henke, Coachella Valley Mosquito and Vector Control District
Anna Aljabiry, DWR
Melissa Sparks, DWR
Evon Willhoff, DWR
Laura Massie, California Rural Legal Assistance
Frank Kopcinski, California Rural Legal Assistance

CVRWMG

Sara Toyoda, IWA
Katie Ruark, DWA
David Tate, DWA
Patti Reyes, CVWD
John Soulliere, MSWD
Rosalyn Prickett, RMC
Sally Johnson, RMC
Daniel Cozad, IPM

Meeting Objectives:

A. Keep Planning Partners Up-to-Date on the Technical Evaluations
B. Update on Disadvantaged Community (DAC) Outreach Program
C. Discuss Revisions to Existing IRWM Plan Chapters: Region Description, Issues & Needs, and Project Selection
D. Discuss New IRWM Plan Chapters: Tribal Water Resources and Disadvantaged Communities

Meeting Notes:

Welcome and Introductions

Rosalyn Prickett, RMC Water and Environment (RMC), welcomed the Planning Partners on behalf of the Coachella Valley Regional Water Management Group (CVRWMG), the five regional water suppliers in the Coachella Valley who are responsible for overseeing the Coachella Valley Integrated Regional Water Management (IRWM) Program. Ms. Prickett then provided an overview of the agenda and meeting objectives. The group did self-introductions.

Status of IRWM Planning Activities and Schedule

Update from DWR Representatives

Anna Aljabiry, DWR, announced she was stepping down from her position at DWR and this would be her last Planning Partners meeting. She introduced Melissa Sparks and Evon Willhoff as the CVIRWM Region's new DWR representatives for grant administration. Ms. Sparks will be responsible for the Disadvantaged Communities (DAC) program, while Ms. Willhoff will be responsible for Implementation grants. Melissa Sparks provided a handout with the IRWM grant solicitation timelines, a summary of the proposed water bonds (Senate Bill 42 and Assembly Bill 1331), an overview of the draft Appendix H, Plan Review Process for the 2012 IRWM Grant Program Guidelines, and dates for the Round 2 Strategic Plan Workshops. She noted that the draft Appendix H was open for public comment until October 18, 2013, with public workshops being held in Sacramento on October 7, 2013, and Ventura on October 9, 2013. Appendix H is expected to be adopted by the end of 2013, with Plan review beginning in January 2014.

Rosalyn Prickett asked if DWR could provide an update on the IRWM grant schedule. Evon Willhoff informed the group that senior supervisor review of the Proposition 84 Round 2 Implementation Grants was wrapping up, and public review of grant awards would be available by the end of the month.

The Planning Partners and CVRWMG informed DWR that there were problems with the format of the previous Strategic Plan Workshop, and asked if the format would be different for the Round 2 workshops. Ms. Sparks informed the group that there would likely be changes to the format of the workshop for this round. Patti Reyes, Coachella Valley Water District (CVWD) and Laura Massie, California Rural Legal Assistance (CRLA) both expressed that the table-wide statements used in the previous format did not capture all of the issues, and that the resulting conversation tended to lose unique views and issues that were not obvious.

Ms. Aljabiry provided a handout on new environmental education materials that had become available. These materials are designed for classrooms with material geared towards students from kindergarten through twelfth grade (K-12), with a water focus. Materials can be ordered in "classroom sets" which contain 30 student copies and 1 teacher copy. Anyone can order these free materials by visiting http://www.water.ca.gove/education/wffcatalog.cfm. Questions regarding the education program should be directed to:

> Michelle Robinson
> Water Education Specialist
> Public Affairs Office
> Department of Water Resources
> Office 916-653-9892
> Fax: 916-653-3310
> Michelle.Robinson@water.ca.gov

Ms. Prickett provided an overview of the key activities for the Coachella Valley IRWM Plan Update, and the timeline for completion, noting that the DAC Water Quality Evaluation, and Salt and Nutrient Planning were almost finished, while the Integrated Flood Management and DAC Outreach Program were in the final stages. The Groundwater Monitoring is underway.

<u>Questions/Comments</u>

- Is the groundwater monitoring program only looking at groundwater elevations?
  - No, it is also looking at water quality and other water management parameters.

Update on Coachella Valley IRWM Technical Evaluations

Integrated Flood Management

Rosalyn Prickett provided an overview of the Integrated Flood Management Workgroup, noting that an integrated flood management workshop will be held on Wednesday, September 18th, 2013. She explained the purpose of Integrated Flood Management is to assess the opportunities for utilizing flood water a resource. One of the ways the study is doing this to map flood areas and overlay this on maps of soil permeability to see if there are naturally occurring flood areas that could be suitable for groundwater recharge basins. The results of these efforts will be presented at the September 18th workshop. Ms. Prickett encouraged the Planning Partners and DAC representatives to attend. The workshop will be held at the Coachella Valley Water District (75-515 Hovley Lane East, Palm Desert, CA 92211) from 10:00 am until noon.

DAC Groundwater Quality Evaluation

Rosalyn Prickett provided an overview of the Coachella Valley-wide Groundwater Monitoring Plan, which builds on the DAC Water Quality Evaluation. The DAC Water Quality Evaluation identified maximum contaminant level (MCL or drinking water standards) exceedances and mapped the location of DACs as they pertain to exceedances, but the overall Groundwater Monitoring Plan will extend this mapping effort across the entire Coachella Valley. This effort will also incorporate recommendations from the Coachella Valley Water Management Management Plan and the Mission Creek-Garnet Hills Sub-Basin Water Management Plan.

Patti Reyes added that this effort will establish the information gaps and issues for future IRWM projects to address, and set up projects that monitor groundwater. Ms. Prickett stated that more recommendations would be presented at the November Public Workshop (scheduled for November 6th, 2013).

<u>Questions/Comments</u>

- There should be an extended conversation on where additional wells are needed.
- Does the Groundwater Monitoring Program include the Salton Community Services District (SCSD)?
    - No, SCSD does not use groundwater, so this does not apply.
- Groundwater monitoring program will consolidate information so the Region will be able to determine what information already exists, what information is missing, and will help identify the roadblocks to achieving what the Region wants.
- The Groundwater Monitoring Program should include salts when considering constituents of concern.
- Does the Program look at funding for groundwater data or for groundwater treatment?
    - Only groundwater data.
- Don’t see any biological indicators in the monitoring criteria/constituents. Is this because the groundwater is too deep for septic system contamination?
    - Yes. The only biological constituent that might be present is nitrate.

Update on DAC Outreach and Assistance

Rosalyn Prickett provided an overview of the DAC Outreach Program. The purpose of this program is to expand upon previous DAC outreach to target individuals and groups representing DAC issues, and to also engage members of DAC community in order to frame and articulate water management issues facing DACs. She provided a timeline for the DAC Outreach Program components, and noted that the Program will be complete by the end of 2013.

Daniel Cozad, IPM presented the DAC Outreach Program components.

Presentation of Surveying Effort Results

Mr. Cozad explained the DAC surveys conducted by Loma Linda University. This effort will result in refined maps of DAC locations and issues, and a formal report on the perceived water resources issues and needs.

Questions/Comments

- Will the report be circulated?
    - We are still working on the final report, but will give a presentation during November 6th.

Mr. Cozad then explained the DAC projects. The goal of this process was to develop projects based on issues and needs defined by Planning Partners and DAC stakeholders. He explained the process used to identify issues, and the four projects that were selected. The Outreach Program met with DACs who were aware of their water issues, and DACs that were not aware of water issues they may have. For the most part, this outreach reaffirmed the issues previously identified by the Region. The four DAC projects that were selected are:

- Design and engineering for faulty or under-sized septic systems
- Mapping of problematic DAC systems within proximity to existing infrastructure
- Bilingual outreach and educational materials for residents
- Reverse osmosis systems to treat water from onsite groundwater wells

Patti Reyes asked Mr. Cozad to please explain why there is a focus on septic issues. Mr. Cozad explained that septic was considered one of the most important issues (self-reported by stakeholders) and is also the most complex issue to fix. Ms. Reyes added further clarification that the East Valley has very limited wastewater infrastructure, and such infrastructure is too expensive to fund. Sewer needs in the East Valley are as important as water needs, and many stakeholders ranked wastewater needs as their most important issue.

There will be a final DAC Workshop on November 6th, from 10:00 am – noon, at the Coachella Valley Water District (75-515 Hovley Lane East, Palm Desert, CA 92211), immediately prior to the Public Workshop on the Coachella Valley IRWM Plan Update Meeting (1:00-3:00 pm). The DAC Workshop will present all final findings of the DAC Outreach Program, and the draft DAC Outreach Report.

Questions/Comments:

- Which 4 mobile home parks were selected for the Septic project?
    - Pueblo Unido was used to select the mobile home parks, they are all located in Thermal and include: Don Jose, Cisneros, Valenzuela, and Gutierrez Mobile Home Parks.
- The bilingual outreach and education materials are designed to close information gaps determined during the outreach process. If residents have a problem, the program can tell residents how to solve the problem. These materials, therefore work to empower people to solve their own problems. The program will not solve the problems themselves. In part this is to respect other agencies that might be responsible for managing the potential problem.
- Is IVAN included? IVAN is a central database of East Valley residents to report issues. Issues get reported to IVAN, and then IVAN filters these reports and informs the appropriate agency. Information about IVAN is included in the outreach and education materials.
    - Jon Rokke, Colorado River Regional Board is the individual who receives the IVAN reports and sends them to the appropriate agency. He also follows up

on the reports he sends out to make sure they are getting addressed. He does not have any objections to expanding this resource to the entire Coachella Valley.

  - IVAN allows people to report via phone, text message, or website. Many different types of reports are submitted. Mr. Rokke said some reports are not appropriate for any agency, but are often left on the site, which acts as a community board.
  - *Ms. Reyes said IVAN will be addressed in the report, but will delegate to El Sol to work with Mr. Rokke to expand IVAN*
  - See-Click-Fix is a mobile app that allows people who see a problem to take a picture and add a short description of the problem. The photo, message, and location is automatically sent to a responsible party (based on location) and has gotten quick responses. Mobile devices are the future for easily reporting issues.

IRWM Plan Update Components

Rosalyn Prickett then provided an overview of the IRWM Plan Update. She presented the proposed changes to three chapters: Region Description, Issues and Needs, and Project Evaluation and Prioritization. She presented two proposed new chapters: Tribal Water Resources and Disadvantaged Communities.

Questions/Comments

- What is the timeline for the draft IRWM Plan?
  - Feedback solicited from Planning Partners and RWMG at meetings will be used to write the chapters. The draft Plan is scheduled to be available for public review starting on November 4, 2013. There will be a 2 month public comment period to accommodate schedules during the holidays. The comment period will close at the end of December. Comments will be incorporated in early 2014, with the final plan likely to be released in mid-February, and adopted by the RWMG agencies' governing boards by the end of March. While the final release schedule has not been finalized; the CVRWMG's grant agreements require that the Plan be finalized and adopted by the end of March, 2014.
- Will discussion of the proposed Chrome-6 MCL be part of the Plan Update?
  - Yes.

Region Description

Rosalyn Prickett reviewed the updated Region Description chapter. She noted that the chapter was updated for consistency with current planning documents, including those released after the 2010 IRWM Plan was adopted. Key changes include improving discussion of the differences between the East Valley and West Valley, expanding discussion of groundwater basins, non-potable water, and natural communities, and updating with new stormwater permit information.

Questions/Comments

- Will the differences between the East Valley and the West Valley include demographics, water quality, and other factors?
  - The East and West Valley differences were explored in the outreach survey – the Plan will include information gathered from the survey.
- The Regional Board's Onsite Wastewater Treatment Policy will be updated next week (Thursday, September 19). This will change the way septic systems in the Valley are permitted.

Issues and Needs

Rosalyn Prickett presented the updated Issues and Needs chapter. The chapter was updated to be consistent with current plans and issues identified by stakeholders. Key changes in the chapter include a lower project water demand for 2030, expanded discussion of water supplies, stormwater capture, water quality, and flooding. There were no changes to Table 3-1 in the Plan, Summary of Significant Water Management Issues in Coachella Valley. Planning Partners were asked to confirm that this table should remain the same.

<u>Questions/Comments</u>

- For Issue #5, Groundwater Quality – Change "Several small private water systems in mobile home parks…" to "Many small private water systems in mobile home parks…" The use of the word "several" diminishes the problem and doesn't reflect the severity of the issue.
    - *May cross-reference the actual number of systems exceeding arsenic MCL*
- For Issue #12, Affordability of Water – if the Chrome 6 MCL is adopted, costs will go up because of the added costs of treatment options to address the MCL
    - *May add statement at end of first paragraph to acknowledge regulatory changes as a cost related toe continued overdraft*
- Were the population projections based on RHNA (Regional Housing Needs Assessment)?
    - Population projections were based on the projections from the Urban Water Management Plans, which are based on the Riverside County population projections.
- RHNA projects how much housing will be needed to accommodate the projected population, should link the water needs planning and the housing needs planning.
    - The population projections used in the UWMPs and in the Plan are more conservative than the RHNA projections because they are not the revised down version of the projections. Therefore, we are planning for the "worst-case" population projections, which is more conservative.
- The SCAG Region RHNA is due in October.
    - *We will ask CVAG about the RHNA numbers in October.*
    - The planning horizon is different for the different plans. Even with a dip in projected populations on a shorter timescale, it is expected that in the long-term, population projections will go back up.
- We don't want to have too much housing and not enough water to serve residents.
    - With the projections currently being used for the UWMPs and the IRWM Plan, we are planning for more water than the planned housing. It takes a long time to plan, fund, and build water infrastructure, as well as to receive the actual water. It is better to over-plan for water.
- There are mechanisms already in place that force communication between water and housing/land use planners.
- Water use has dropped through conservation efforts and other factors, and water demand projections have been adjusted down accordingly.
- Reminder that everything in the Plan must be publicly adopted.

Project Evaluation and Prioritization

Rosalyn Prickett presented the updated Project Evaluation and Prioritization chapter. Changes to this chapter include highlighting how IRWM efforts address priorities, describing how the project evaluation process was used during recent grant application cycle, the addition of a new criterion to the project scoring process: “Maximizes stakeholder involvement and stewardship in water resources management”, addition of a interview for project selection for grant applications, and the removal of Appendix B (Project List).

Questions/Comments

- To clarify, there are State Requirements and there are Plan Requirements. Plan requirements incorporate state requirements, but also have other requirements. Projects are scored based on the Plan requirements.
- Regarding Appendix B (Project List), people won’t go to the website to look at the project list, so a project list should be included in the Plan. However, not all projects are valuable, so we should consider only including high-scoring projects as an example.
- DWR reaffirmed that a printed list of projects is required for grant applications. They cannot accept a link because that is external data. Additionally, most reviewers look at the hard copy of the application. It would be acceptable to include a link in the Plan, but not in grant applications. Applications are competitive, but the Plan Review Process is not, so if the Plan reviewer thinks it is necessary, they will probably ask for a hardcopy of the project list.
- In what format is the Plan distributed?
    - Electronic (pdf).
- Suggest writing into the Plan that the official Project List is on the database, and then date Appendix B as “Project List as of DATE”.
- Is there a button that can be added to the Project Database that would allow a visitor to easily export the list of projects?
    - No, it would require users to log in to the database.

The Planning Partners decided that Appendix B should remain in the Plan.

Tribal Water Resources

Rosalyn Prickett presented a new chapter in the Plan, Tribal Water Resources. This chapter was developed in response to stakeholder feedback and with significant input from the Tribes. Key content includes description of the Tribes, their water resource concerns, their water quality monitoring efforts, and tribal participation in water resources planning.

Questions/Comments

- Does the chapter contain geographic information about the Tribal lands?
    - Yes, there is also a map of the Region showing the location of tribal lands.
- What research, other than meeting with Tribes and receiving their feedback, was or will be conducted for developing this chapter? The U.S. EPA? The Days Desert Sun article on the arsenic problem at a mobile home park on Torres-Martinez land?
    - RMC consulted Bureau of Indian Affairs, and any electronic sources they could find. Patti Reyes sent the Days Desert Sun article to Ms. Prickett.

Disadvantaged Communities

Rosalyn Prickett presented a new chapter in the Plan, Disadvantaged Communities. This chapter was developed in response to stakeholder feedback. It presents the results of the DAC Outreach Program, and key content includes the history of DAC participation in the IRWM Program, the DAC Outreach Program, DAC characterization and mapping, DAC project Development, and process recommendations for DAC participation in the IRWM program.

Questions/Comments

All questions and comments were related to the Process Recommendations portion of the chapter.

- DWR stated that Process Recommendations should include recommendations for future funding for DACs
- Would the funding be for information gathering or project development?
    - Should create a guideline for other regions in the state for improving DAC involvement. Can go a step further to work on the projects that were identified during the process.
    - Must meet DWR recommendations and regional recommendations to move forward on a project
        - Project development for the DAC Outreach Program is meant to provide a tool to DWR to show how to move forward on a DAC project.
    - There is no agreement between DWR and Grantees to fund projects identified during the process. They will still need to go through the project selection process and grant application process that any other IRWM project is subject to.
- In the previous IRWM grant cycle, the CVIRWM Program held a project database workshop with DACs to explain how to submit projects successfully. The CVRWMG also entered DAC projects into the database for those DAC project proponents who needed help.

Next Steps

The CVRWMG is conducting direct outreach to stakeholder groups (e.g., golf course superintendent association, builders associations, etc.). If anyone knows of a group that would be appropriate for direct outreach, please email Rosalyn Prickett (rprickett@rmcwater.com).

Please mark your calendars for upcoming workshops and meetings:

- Integrated Flood Management Workshop: September 18, 10:00 am – noon (at CVWD)
- Public Review for 2014 IRWM Plan: November 4 – December 31, 2013
- DAC Workshop: November 6, 10:00 am – noon (at CVWD)*
- Public Workshop on IRWM Plan Update: November 6, 1:00 – 3:00 pm (at CVWD)*

*Lunch will be provided for those attending the DAC workshop and staying for the Public Workshop on the IRWM Plan Update. Please RSVP to Crystal Mohr: cmohr@rmcwater.com, 858-875-7421.

Coachella Valley Integrated Regional Water Management Program

Planning Partners

Thursday March 13, 2014
1:00-3:00 p.m.

Coachella Valley Association of Governments
Conference Room #115
73-710 Fred Waring Drive
Palm Desert, CA 92260

DRAFT NOTES

Italics denote action items.

Attendees:

Planning Partners

Margaret Park, Agua-Caliente Band of Cahuilla Indians
Sergio Carranza, Pueblo Unido CDC
Susie del Toro, El Sol Neighborhood Educational Center
Jon Rokke, Colorado River Regional Water Quality Control Board
Jennifer Henke, Coachella Valley Mosquito and Vector Control District
Evon Willhoff, DWR
Laura Massie, California Rural Legal Assistance
Michele Hasson, Leadership Counsel
Joe Glowitz, Valley Sanitary District
Monica Telles, Economic Development Agency
Bobby Melkesian, Desert Empire Builders
Mike Gialdini, Supervisor Benoit
Roland Ferrero, Torres-Martinez Desert Cahuilla Indians
Darcy Kuenzi, Riverside County Flood Control and Water Control District

CVRWMG

Sara Toyoda, IWA
Katie Ruark, DWA
Mark Krause, DWA
Berlinda Blackburn, CWA
Mitch Nieman, City of Coachella
Patti Reyes, CVWD
John Soulliere, MSWD
Rosalyn Prickett, RMC
Crystal Mohr, RMC
Sally Johnson, RMC

Meeting Objectives:

A. Discuss Proposition 84 Grant Awards
B. Overview of Disadvantaged Community (DAC) Outreach Program
C. Discuss IRWM Plan Comments and Revisions
D. Provide Update of Current IRWM Projects

Meeting Notes:

Welcome and Introductions

Rosalyn Prickett, RMC Water and Environment (RMC), welcomed the Planning Partners on behalf of the Coachella Valley Regional Water Management Group (CVRWMG), the five regional water suppliers in the Coachella Valley who are responsible for overseeing the Coachella Valley Integrated Regional Water Management (IRWM) Program. Ms. Prickett then provided an overview of the agenda and meeting objectives. The group did self-introductions.

Status of IRWM Planning Activities and Schedule

Ms. Prickett reviewed the schedule for the 2014 IRWM Plan, and noted that the IRWM Plan Update was recently completed and has been adopted by Coachella Valley Water District (CVWD) and Coachella Water Authority (CWA).

Round 1 Grant Projects – Award Redistribution

Ms. Prickett reminded the Planning Partners of the Region's success under the Proposition 84 Round 1 Implementation Grant (Round 1), which awarded $4 million to four projects in the Region. Two of those projects were septic-to-sewer conversion projects in disadvantaged communities (DACs) that were sponsored by Mission Springs Water District (MSWD) and Cathedral City. Due to unanticipated costs, the Cathedral City project is no longer able to move forward and the Coachella Valley IRWM Region needs to decide how to redistribute the funding originally awarded to the Cathedral City project. The California Department of Water Resources (DWR), who administers the statewide Proposition 84 IRWM Program and its associated grants, has told the CVRWMG that replacement projects must provide similar benefits as the Cathedral City project and meet basic IRWM requirements. The Cathedral City project would have offset 132 Equivalent Dwelling Units (EDUs) in a DAC with septic conversion in the Perez Road area, which was recommended for septic conversion by the Regional Water Quality Control Board (Regional Board). Benefits include groundwater quality protection and improvement, addressing water and wastewater needs of a DAC, improving system reliability, and increasing quantity of reclaimed water. Patti Reyes, Coachella Valley Water District (CVWD), explained that had the CVRWMG better-understood potential costs of the Cathedral City project when developing the Round 1 grant application, the excess costs that would have been incurred during project implementation could have been built into the grant request. Ms. Reyes emphasized the CVRWMG's disappointment that the project did not move forward as scheduled, but said that they hoped to improve project scoping in the future and reapply for future grant funding.

There is $1.3 million available for redistribution from the Cathedral City project. The CVRWMG has two projects that are potential candidates to receive this funding, but would like the Planning Partners to provide input on the two projects and on how they would like to see the money redistributed. Below is an overview of the two potential projects:

> *Project 1: MSWD Area J-1 Groundwater Quality Protection Project*
>
> MSWD is the project sponsor for the Area J-1 Groundwater Quality Protection Project, located approximately between Hacienda Dr, Mountain View Road, Via Domingo, and Calle Amapola in Desert Hot Springs. Area J-1 is defined as part of an Assessment District within the MSWD service area; this area currently has failing septic systems. The project would offset up to 306 EDUs in a DAC reliant on the local groundwater basin for its economy (Desert Hot Springs), and protects drinking water supplies. Benefits from the Area J-1 Groundwater Quality Protection Project include protection and improvement of groundwater quality, addressing water and sanitation needs of a DAC, increasing quantity of reclaimed water, and compliance with California State Law.
>
> John Soulliere, MSWD, described the project to the Planning Partners. Mr. Soulliere emphasized that there is an urgency to commit funds to the project, because the funding

match is being met through an Assessment District. Any funds not committed to the project by July 2014 will no longer be available, meaning that MSWD would lose the opportunity to use that money for a funding match, and would be required to pass a new Assessment District, which is time-consuming, expensive, and uncertain. The project would require between $4,513 and $5,285 grant funding per EDU to implement.

Project 2: Oasis Gardens Groundwater Quality Protection Project

The Oasis Gardens project would offset up to 157 EDUs in a severely DAC mobile home park in the Eastern Coachella Valley (Oasis) located over the perched aquifer through conversion from septic to sewer. Diversion of flows from this DAC would protect surface water quality by reducing the chance for flows from septic systems to enter agricultural storm drains and the Salton Sea. Benefits from this project include protection and improvement of groundwater quality, addressing water and sanitation needs of a DAC, increasing quantity of reclaimed water, and providing onsite wastewater services to a severely DAC. The project would require $4,800 grant funding per EDU to implement.

Ms. Reyes explained to the group that that Bobby Melkesian, Desert Empire Builders, would cover all private costs, including all onsite improvements. Mr. Melkesian built a second phase of the project to provide housing for Duroville residents, and CVWD was a project sponsor for a USDA grant to extend sewer to the area. During this sewer extension, CVWD paid to upsize the pipe to accommodate future connection capacity. Within the CVWD service area, connection fees in these types of areas are used to reimburse CVWD for upsizing the pipe. Therefore, the grant money being requested would cover the money required to upsize the CVWD sewer pipelines, and thereby fund public infrastructure. Ms. Reyes also noted that onside costs have been a barrier to implementation of DAC projects in the past, and that it is highly notable that Mr. Melkesian is agreeing to pay all of the onsite costs.

Mr. Melkesian presented his project to the group. He explained that the Oasis Gardens Mobile Home Park is currently on septic systems, but that due to percolation issues, the leach pits are beginning to fail. Oasis Gardens was built 11 years ago, and is at 100% capacity, primarily providing housing to low income farmworkers. When the nearby Mountain View Estates Park (Phase 2 project mentioned by Ms. Reyes) was built, the County of Riverside teamed with the USDA and CVWD to construct a sewer line adjacent to the Oasis Gardens Mobile Home Park, with the intent to eventually connect Oasis Gardens to the sewer system. There are 17 systems and the mains and tees are in place already, costing $350,000. To demolish the existing tanks, it is estimated to cost $170,000. Mr. Melkesian told the group that the permits are in place, there is an immediate need, he is the owner, developer, and contractor so there would be no issues with implementing the project, and the connection fees are half the cost of the project. The grant would cover the cost of the connection fees, which would otherwise potentially be borne by the onsite residents.

<u>Questions/Comments</u>

- For the MSWD project, how many areas of the Assessment District have already been constructed?
    - Approximately $40 million of the $69 million from the Assessment District has been committed to projects that have been completed or are underway
    - The areas in question are mostly low-income housing
    - In 2007-2008, MSWD had been very successful getting federal funding through earmarks, but those opportunities are mostly gone. Future money would have to come from a future Assessment District.

- Will the Round 2 project (D-2 Conversion Project) be completed in time to meet the Assessment District deadline?
    - Yes.
- How much IRWM grant funding did the Round 2 project (Sub-area D-2) receive?
    - $1.85 million
- Is MSWD's board moving forward on leveraging another Assessment District?
    - MSWD is currently planning a survey to determine community interest in a future Assessment District. Public opinion on the subject generally depends heavily on the economy.
- Construction bids came in lower than anticipated for the Round 1 MSWD project, does that mean that more EDUs will be able to be connected in Round 2?
    - The Round 2 budget used updated funds from the Round 1 experience; however, if construction costs are lower than anticipated, more EDUs could potentially be connected.
- Can the project make use of a partial grant? Or is it not feasible if MSWD receives less than the full $1.3 million?
    - There is a threshold where it doesn't make sense to move forward with the project. MSWD doesn't consider the project worthwhile with less than $1 million in grant funding.
- Can the Assessment District make up any overages if the project turns out to be more expensive than anticipated?
    - MSWD would absorb any costs above what is budgeted, but due to recent bid estimates, MSWD believes that the project budget as presented to the group is accurate.
- Has the Regional Board been involved with potential failures at the Oasis Gardens Mobile Home Park?
    - DACs are often unable to afford all of the repairs necessary, and the Regional Board is concerned that issuing citations in such communities would result in homelessness. The Regional Board generally only steps in when violations occur, not when they are about to occur – that is why they have not yet been involved.
- The Region's DAC Outreach Project, a sister program to the Coachella Valley IRWM Program, did an analysis of connection opportunities for DACs, and Oasis Gardens is included in that report.
- When Supervisor Williams asked local developers to step up and help out DACs in the region, Mr. Melkesian was the only local developer that stepped forward to provide housing support for farmworkers. Supervisor Benoit's office supports the Oasis Gardens project.
- Will all of MSWD's sites be able to afford the connection fees for the project?
    - Yes, there is both an ordinance in place and a loan program available.
    - It is a condition of the grant that to count as a benefit, an EDU must be connected to the system.
- What is the issue with splitting the money, from the state's perspective?
    - The Cathedral City project is already in the signed grant contract. The state can adjust the contract to do what the Region wants to do. In other words, the Region could choose to fund as many or as few projects as it would like, provided that those projects provide the same benefits as the Cathedral City project.

- The merits of the two projects seem equitable.
- The costs presented in the table don't seem to add up for MSWD. The total cost should be the sum of the grant funding and funding match, but they are not.
    - The extra costs will be absorbed by MSWD.
- There was an indication that the J-1 area septic tanks are failing. How many are failing?
    - Approximately 10% of the septic systems in Area J-1 are failing.
- How many of the leach pits in the Oasis Gardens project are functioning properly, and how many of them are on the verge of failing?
    - Approximately half are on the verge of failing
- Will abating some (say, 6) of the leach pits help the problem at Oasis Gardens?
    - This could help the issue, but the preference would be to connect the entire system at one time.
- Can MSWD help the group understand their $1 million threshold?
    - The way that the J-1 system was established was due to elevations and other engineering considerations; MSWD will need to confer with engineering staff to determine if it would be possible to reduce the size (and EDUs) of the J-1 system.
- Is it possible to reduce the size of the MSWD Area J-1 project, and give more money to Oasis Gardens?
    - Could scale the project some, but it is already scaled down substantially. Would need to consult MSWD engineers for an answer on how much scaling is possible and feasible.
- The East Valley perceives MSWD as getting a lot of money from the IRWM grants. The Oasis Gardens project represents a developer trying to do the right thing in the East Valley to address serious issues.
- Is the situation time-sensitive for the Oasis Gardens project?
    - If we wait to do the project, the situation will get worse. If the systems start failing there is a concern that regulators will start to get involved.
- Will the state be able to reimburse for the Oasis Gardens project?
    - Under the Round 1 grant opportunity, yes. The funding match funds (upsizing the sewer infrastructure) were spent in 2013, which coincides with the Round 1 grant contract.
- There are a lot of projects in the IRWM database; due to the serious regional need for projects, especially in the East Valley, it makes sense to try and spread the grant funding around the Coachella Valley as much as possible.
- Can we do a site visit to Oasis Gardens to verify how many and which leach fields represent an immediate need?
    - If we do that, we would need to do the same for Area J-1 to be fair and consistent.
- If the MSWD project is not selected, the Assessment District funds will expire and MSWD will have to acquire more matching funds. If the Oasis Gardens project is not selected, it is a lost opportunity.
- We want to be able to leverage the investments that have already been made.
- Aside from the expiration of assessment district funds, are there any other impediments to the MSWD project?
    - No, the project is ready to go

- What are the long-term benefits for the region and its program? What sets us up well in DWR's mind?
    - The State is unable to weigh in on this. Direction from DWR is that the region must decide what to do. There is money still left in the Funding Area for future rounds of funding, and there is a possible future water bond that may be on the November ballot that would have similar funding opportunities.
- There are other sources of funding that could be leveraged to achieve the goals of the Oasis Gardens project. For example, even though St. Anthony's Mobile Home Park has the lowest rents in the region, it is still able to pay off loans it received to fund important infrastructure improvements. The Oasis Gardens project should consider loan funding.
    - Loan terms are more favorable for non-profits than for private entities, so a loan for the Oasis Gardens project would likely be more expensive than for the St. Anthony's Mobile Home Park, which is owned by a non-profit organization.

The CVRWMG asked the Planning Partners to provide input on how to distribute the funding between the two projects. The group indicated a preference to split the money in some fashion between the Area J-1 project and the Oasis Gardens project. The CVRWMG will meet to make a decision.

Round 2 Grant Funding Success!

Ms. Prickett informed the group that the Proposition 84 Round 2 Implementation grant awards had been finalized in February, and the Region had been awarded the full $5.24 million it requested to fund five projects. Project Sponsors must provide the requested materials for the grant contract to CVWD by March 21, 2014. Evon Willhoff, DWR, informed the group that the Round 2 contract will likely be signed and executed by the end of June.

Round 3 Schedule and Next Steps

Ms. Prickett reviewed the remaining Proposition 84 Implementation Grant funding available to the Colorado River Funding Area. There is $16.7 million remaining. The recently passed Senate Bill 104 (SB104) directed DWR to release all remaining Proposition 84 funding ($472.5 million). Ms. Prickett explained that of that $472.5 million, $21.8 million will fund regions whose Round 2 funding award increased between the draft and final awards. $200 million is for "expedited" drought relief, and $250.7 million will be allocated to non-expedited IRWM funding. There is a possible expedited funding cycle due this summer for drought relief, and a possible consolidated Round 3 or Round 4 cycle in 2015/2016. Ms. Prickett told the group that nothing had been finalized by DWR at this point – the expedited drought relief funding is speculative at this point.

Ms. Willhoff provided an update on what DWR has been doing in response to SB104. DWR is still trying to figure out the best approach to meet the requirements of SB104, the IRWM program, and meet the governor's directive. DWR has been developing different scenarios on how to appropriate the funding opportunities, and these scenarios are on the desk of the director of DWR. DWR is also trying to incorporate the comments from the recent Process Improvement Workshops into the IRWM guidelines as quickly and effectively as possible. DWR is trying to remain fair regarding how the funding will be distributed or potentially allocated. It is likely that projects that receive expedited funding will be those that are ready to start. SB104 limits the types of projects that can receive the expedited funding. In the best case, Regions will receive guidance next week, and two weeks in the worst case.

SB104 drought relief projects are those that "provide immediate regional drought preparedness, increase local water supply reliability and the delivery of safe drinking water, assist water suppliers and regions to implement conservation programs and measures that are not locally cost-effective, or reduce water quality conflicts or ecosystem conflicts created by the drought."

The project selection process will begin as soon as DWR has provided guidance to the region. As soon as anything is known, the Planning Partners will be notified via email. In the meantime, the group is strongly encouraged to enter projects that they believe qualify as drought relief projects into the project database now. The project database is always open, and has been updated to include SB104 language and links to the legislation. If stakeholders have questions, please contact Crystal Mohr (cmohr@rmcwater.com).

Questions/Comments

- Will the expedited funding be regionally allocated?
    - DWR is still trying to determine the best way to allocate the funding, or if it will be allocated by funding area or region at all.
- The Region may want to shift their focus from groundwater quality projects (such as those funded in previous rounds) to water supply projects.
- SB103 (passed alongside SB104) allocates an additional $19 million for projects that reduce greenhouse gases and water and energy use. This program is supposed to begin on July 1, 2014. It is a separate program from IRWM but may be administered through the IRWM branch of DWR.
- Does DWR have any guidance on what is "locally cost-effective"?
    - Not yet.
    - An example provided by DWR has been leak detection systems for purposes of water conservation.
- SB104 expedited projects must still be IRWM projects (multi-benefit projects).

Overview of DAC Outreach and Assistance

The CVRWMG conducted a DAC Outreach Program as a sister program to the IRWM Program. That program has been completed, and a final report submitted to DWR.

DAC Outreach Demonstration Program Report

Ms. Willhoff informed the group that Melissa Sparks, DWR representative for the Coachella Valley DAC Outreach Demonstration Program, presented on the report to DWR, and it was very well received. Crystal Mohr, RMC, presented the final DAC Outreach Demonstration Program Report. The Report was included as Volume II to the 2014 Coachella Valley IRWM Program, and includes all the DAC efforts conducted during the Outreach Program and the update of the IRWM Plan.

Next Steps

Ms. Mohr explained that the Region is not done with its DAC efforts, and will continue to advocate for improvements to the grant process for DACs, provide technical support to DACs for IRWM projects and processes, and focus on project types identified by DACs as being most important (septic-to-sewer conversion, onsite water and wastewater treatment, and connection to municipal water system)

IRWM Plan Update

Ms. Mohr presented the final IRWM Plan, and discussed what comments were received during the Public Comment Period and how those comments were addressed. The 2014 Coachella Valley IRWM Plan was broken into two volumes, the first being the Plan chapters and their appendices, the second being the DAC Outreach Program and DAC-related appendices. The Plan has been adopted by two CVRWMG agencies at the time of the meeting, and is scheduled to be adopted by the end of March. The group was reminded that the Plan was finalized and undergoing adoption because of the March 31st deadline from the Planning Grant that funded the Plan Update.

Major comments included clarifying and articulating DAC issues and needs, improve explanation of water quality issues, acknowledge conflicts between residents and landowners, improve measurements of Plan and Program performance, incorporate technical study and DAC recommendations, improve discussion of water supply and demand, and be more consistent with terminology within the industry.

Ms. Mohr reviewed the general and major changes made to the Plan in response to these comments. Changes included cross-referencing throughout the Plan to carry information throughout the Plan where relevant, clarification over points of confusion as indicated by comments received, expanded discussion and clarification of water supplies and demand, increased discussion of data and additional targets, improved discussion of the project selection and scoring process and its purpose, more comprehensive incorporation of DAC information from the items in Volume II, updated information from studies and data that were obtained or finalized after the Public Draft had been released, and an expansion of the discussion of issues and needs. The Region has also committed to continuing to hold Planning Partner meetings, and incorporated more details on and commitments to coordination and communication efforts.

Next Steps

Planning Partners are encouraged to adopt the IRWM Plan. There are a few final deliverables outstanding. These include a Public Outreach document, Progress Report on the IRWM Program, development of DAC projects, and development of groundwater projects.

Questions/Comments

- Planning Partners are encouraged to adopt the Plan
- Is a redline copy of the Plan available?
    - Because there were multiple rounds of revisions after the public comment period closed, there is not a red line version of the Plan that shows all the changes made between the Public Draft and the Final version. All comments and how they were addressed are included as Appendix VI-F in the Public Comment Matrix. Stakeholders are encouraged to contact the CVRWMG if they would like to go over the changes together, the CVRWMG is happy to accommodate such requests.
- Water supplies in the Region are complex. We went through many iterations of the explanation included in the final version of the Plan, and tried to explain in detail what everything meant, the source of the information, and explain potentially confusing aspects of the water supplies. If anyone has questions about it, please contact the CVRWMG, they will be happy to answer any questions you may have.

Final Announcements

The next Planning Partners meeting is anticipated to be held in June. Depending on DWR's decision on how to move forward with the expedited funding round, there may be a Planning Partners meeting in May. Please pay attention to emails from the CVRWMG and RMC regarding this meeting and grant information.

Questions/Comments

- Darcy Kuenzi was introduced as the new government affairs officer for the Riverside County Flood Control and Water Conservation District. Ms. Kuenzi will be attending Planning Partners meetings in the future.

Coachella Valley Integrated Regional Water Management Program

Planning Partners

Thursday December 11, 2014
1:00-3:00 p.m.

Coachella Valley Water District
75-515 Hovley Lane East
Palm Desert, CA 92211

DRAFT NOTES
Italics denote action items.

Attendees:

Planning Partners

Dan Malcolm, Agua Caliente Band of Cahuilla Indians
Debbi Livesay, Livesay Solutions
Jennifer Henke, Coachella Valley Mosquito and Vector Control District
Evon Willhoff, DWR
Mitch Mansfield, Salton Community Services District
Phoebe Seaton, Leadership Counsel for Justice & Accountability
Sergio Carranza, Pueblo Unido CDC
Tim Roberts, Salton Community Services District

CVRWMG

Brian Macy, IWA
Sara Toyoda, IWA
Katie Ruark, DWA
Mark Krause, DWA
Castulo Estrada, City of Coachella
Patti Reyes, CVWD
John Soulliere, MSWD
Ron Buchwald, VSD
Crystal Benham, RMC
Sally Johnson, RMC

Meeting Objectives:

A. Discuss Updates to the Statewide IRWM Grant Program
B. Discuss Round 3 Drought Solicitation
C. Discuss Round 2 Redistribution Funding
D. Discuss IRWM Program Next Steps

Meeting Notes:

Welcome and Introductions

Patti Reyes, Coachella Valley Water District, welcomed the Planning Partners on behalf of the Coachella Valley Regional Water Management Group (CVRWMG), the five regional water suppliers in the Coachella Valley who are responsible for overseeing the Coachella Valley Integrated Regional Water Management (IRWM) Program. Ms. Reyes then provided an overview of the agenda and meeting objectives. The group did self-introductions.

Coachella Valley IRWM Program Update

Ms. Reyes informed the Planning Partners that Valley Sanitary District (VSD) was added to the CVRWMG, and as a result of this addition the CVRWMG Memorandum of Understanding

(MOU), Ground Rules, and 2014 IRWM Plan were adopted by VSD. The CVRWMG is a formal group required by California Department of Water Resources (DWR) to be formally recognized as an IRWM region by DWR.

DWR Capacity Building Workshop

DWR recently hosted a Capacity Building Workshop focused on disadvantaged community (DAC) outreach and involvement. This workshop was attended by Ms. Reyes and Mr. Derek Nguyen, Indio Water Authority (IWA). Ms. Reyes stated that a number of DAC representatives attended the workshop from the CVIRWM Region, and that others attended via webcast. There was a video from the Inyo-Mono IRWM Region about how they were able to use grant funds to build a water station for their rural communities. DAC involvement is a priority for DWR and the IRWM Program, and Coachella Valley has a significant amount of DAC involvement.

Status of IRWM Grant Program

Crystal Benham, RMC Water and Environment (RMC), reminded the Planning Partners that Proposition 84 Round 1 and Round 2 Implementation Grant programs followed a classic IRWM grant process. The Coachella Valley IRWM Region signed its grant agreement with DWR for Round 1 in 2012. This grant funded four projects with $4 million grant dollars. All of these projects are underway. The Round 2 grant agreement has been signed, and the Region has received $5.24 million to fund four projects. Invoicing for the Round 2 projects will begin in January.

Questions/Comments

- Did the grant funds for the East Valley Oasis Gardens project cover the costs for the plumbing or the connection fees?
    - Oasis Gardens was developed by the County and the property owner to meet the housing needs of East Valley farm workers. At the time, there sewer services did not extend that far out. Later, a high school and Coal Ranch was built nearby, so the sewer main was extended to the area, with help from a U.S. Department of Agriculture grant. Connections to Oasis Gardens was not constructed at that time. Developments are responsible for the cost of system expansion required for connections (cost is pro-rated), so the grant covered the cost of the public system extension required for the connection, and the park owner is paying for the on-site plumbing and connections.

Project Highlight: Regional Conservation Program

The Regional Conservation Program is a joint effort between all five CVRWMG members (prior to the addition of VSD), and led to the creation of the CV Water Counts program (www.cvwatercounts.com) which focuses on public outreach, and connecting users to their local water agency and each individual agency's conservation programs and rebate opportunities. Recently, the Program participated with United Way in Make a Difference Day. The Program encourages involvement with CV Water Counts through its website, social media, and contests.

Questions/Comments

- Is participation in Make a Difference Day and annual thing?
    - Participation in events like Make a Difference Day is an ongoing process. We are trying to get involved with a number of different events, such as the golf cart parade, and events at the Living Desert.
    - The website started because surveys showed that residents in the Coachella Valley did not know who their water district was.

- o The website is more of a webtool – it directs users to programs that are applicable to them based on where they live.

Drought Solicitation

Ms. Benham reminded the Planning Partners that the recent Drought Grant Solicitation was different from previous IRWM Implementation Grant solicitations. The focus of the Drought Grant was on water production and projects that would address drought. $221 million was made available, up from the originally allocated $200 million. $12.25 million was given to the Colorado River Funding Area, with $5.3 million of this awarded to the Coachella Valley IRWM Region. The remaining Colorado River Funding Area funds were awarded to the Mojave IRWM Region. The Coachella Valley Region had applied for $9 million, and the CVRWMG is currently modifying the projects included in the application to accommodate the reduced funding.

There is anticipated to be a fourth and final round of Prop. 84 IRWM Implementation Grants. There is $4.175 million available to the Colorado River Funding Area, and Coachella Valley IRWM Region competes with other IRWM Regions for these funds. It is anticipated that the Round 4 grant solicitation will begin in late 2015, with applications due in Fall 2016. There is a possibility that this final round would also have a drought-focus, but this is still unknown.

Proposition 1

Proposition 1 passed! Of the $7.545 billion included in the proposition, $510 million has been allocated to IRWM. The Colorado Funding Area would receive up to $22.5 million. There are some differences between Prop. 84 and Prop. 1. There will be a 50% funding match requirement, instead of the 25% match required under Prop. 84. Funding match waivers would still be available for DACs, and 10% of the funds statewide must go to DACs. There is also a stipulation that 10% of the funds go to economically distressed communities, but there remains uncertainty regarding the definition and intent of this stipulation.

<u>Questions/Comments</u>

- Lahontan Funding Area's allocation was reduced by only $2.5 million versus the Colorado Funding Area, whose allocation was reduced by $14 million between Prop. 84 and Prop. 1 What was the logic behind the funding area allocation values in Prop. 1?
  - o Prop. 1's allocations were set in the legislation itself. The exact metric used is unknown, but may have reverted back to an older metric, and could be related to legislative pressures.
- Does Prop. 1 include funding for planning grants?
  - o There is uncertainty over how much would be available for planning grants.
  - o Still determining which state agency will be responsible for which funds. DWR is still finalizing grant agreements for the Prop. 84 Drought Solicitation, so they will not focus on Prop. 1 until January 2015. They may start with planning funds to help Regions lay the groundwork for future implementation projects.
  - o July 2015 is the earliest any of the Prop. 1 funds would be available, because they would need to be allocated by the legislature in the budget.
  - o DWR's first steps would be conduct public meetings to get feedback on the Prop. 84 grant processes, and try to incorporate what has been learned through Prop. 84 into what would be done for Prop. 1.
- The CVRWMG would like comments from the Planning Partners when DWR opens a public comment period on the IRWM grant process and Prop. 1.
- Is the 10% for DACs per Funding Area or is it for the state as a whole?

- o It is statewide, not by Funding Area. It is unclear if the 10% for the economically distressed area is the same 10% as the DAC or if it is an additional 10%.

Proposition 84 Round 2 Redistribution

As the Planning Partners might remember, the Region was awarded $5.24 million under Prop. 84 Round 2 Implementation Grant. $500,000 was for the Coachella Valley Salt and Nutrient Management Program (SNMP). The SNMP project would develop a regional SNMP and implement outreach. The original project is still moving forward, but not under the CVIRWM Program. This means that the funds awarded to the SNMP need to be redistributed. The project(s) that receive these funds must have similar benefits and be regional in nature. The CVRWMG received eight projects for consideration, which are currently being reviewed for eligibility. In addition to being a regional project, eligible projects need to provide groundwater and water supply benefits, and meet DWR requirements to move forward under the Round 2 grant. Once the CVRWMG has selected the potential replacement project(s), it will be presented to the Planning Partners at the March 2015 meeting.

Other Funding Opportunities

The CVRWMG wanted to highlight opportunities to leverage IRWM funding to secure other sources of funding. One funding program that has been successful for some projects in the Region is the USDA Rural Development Grants and Loans. It requires complete environmental documents and preliminary engineering reports, which can be costly to complete, especially for DACs. DACs may use IRWM funds to complete these document, and can then apply for USDA funding for construction and implementation of the projects. This can be an effective way to complete rural projects, because they are often not ideal IRWM projects due to the high cost per capita benefitting from the project. The USDA funds, however, are specifically earmarked for rural communities, and this cost per capita is not a concern.

Questions/Comments

- The CVIRWM Region's DAC Outreach Program mapped DACs and mobile home parks in the CVIRWM Region. These maps can be used to help identify opportunities for creating additional benefits (e.g., mobile home parks near one another could implement a joint project).
- It would be good to coordinate with the CVIRWM Program to provide more information and timing of other funding opportunities.

Ms. Reyes noted that no DAC project was submitted to the database for consideration for the Drought Grant opportunities. However, DACs are a priority for the Region, and the CVRWMG reached out to nonprofits that serve DACs to solicit projects. The DAC project that was included in the Drought Grant application will provide rebates for sources of water waste (e.g., rebates to fix leaks, replace bad meters, etc.). Because this project is a rebate project, it can fund improvements on private properties. The rebates are not available yet, but an email will be distributed to DAC contacts and the CVIRWM Program email list once the final grant agreement is signed and the rebate processes have been established.

Coachella Valley Regional Example of Leveraging Other Funds for DAC Projects

Sergio Carranza, Pueblo Unido Community Development Corporation, presented on the success that his organization has had in leveraging IRWM funding to obtain USDA funding for the San Antonio del Desierto DAC Sewer Extension Project, which will extend the sewer system to serve an East Valley DAC. $740,000 in IRWM funds were used to develop a Preliminary Engineering Report for the project, and this report was used to apply for USDA funding to implement the project.

Mr. Carranza also spoke about the DAC Retreat hosted by DWR. It was a three day retreat attended by NGOs and government agencies. The goal was to combine expertise across the board to develop recommendations to improve the IRWM program to be more inclusive for DACs. DWR provided good feedback and perspective on successful DAC integration in regions. The draft recommendations that came out of the retreat were:

1. Build Capacity

NGOs try to address issues related to lack of infrastructure, but NGOs are fragile organizations because they have limited budget and staff. Despite this fragility, NGOs are critical for providing appropriate education and training to DACs. There needs to be a focus on building capacity both within NGOs and within communities. This is most effective when building capacity for NGOs within the target communities.

2. Education

DWR produces a number of bilingual educational materials and information that they can provide to DACs and NGOs for distribution in communities. There are two sides to the education piece of involving DACs. The first is to education children, and requires working with local schools. The second piece is to provide educational access for parents and adults.

3. Governance and Transparency

There are challenges related to funding requirements that hinder DAC participation in the IRWM program. DWR needs to improve and streamline funding mechanisms. Although the reimbursement system used for the grant awards is challenging for NGOs and DACs, DWR has been getting better at processing reimbursement requests. One of the other challenges for DACs is being able to deliver projects in a timely manner within the requirements of the grant agreements. This challenge is often related to capacity limitations.

Questions/Comments

- The CV Water Counts website has been translated into Spanish, and is available on mobile devices in both English and Spanish.

Next Steps

The next Planning Partners meeting will be in March, 2015. The CVRWMG will continue to track Prop. 84 Round 4 Implementation Grant and Prop. 1 funding opportunities. Planning Partners are encouraged to provide input on topics they would like to see on the next Planning Partners meeting agenda.

Coachella Valley Integrated Regional Water Management Program

Planning Partners

Tuesday June 14, 2016
1:00-3:00 p.m.

Coachella Valley Water District
75-515 Hovley Lane East
Palm Desert, CA 92211

DRAFT NOTES
Italics denote action items.

Attendees:

Planning Partners	CVRWMG
Sergio Carranza, Pueblo Unido CDC	Eric Del Bosque, IWA
Margaret Park, Agua Caliente Band of Cahuilla Indians	David Tate, DWA
Mariela Magana, Leadership Counsel	Ashley Metzger, DWA
Maria Davydova, RWQCB-Colorado River Basin	Scott Rogers, Coachella Water Authority
Michelle Gonzales Bleza, Torres-Martinez Desert Cahuilla Indians	Patti Reyes, CVWD
Alberto Ramirez, Torres-Martinez Desert Cahuilla Indians	Mike Thornton, MSWD
Ed Muzik, HDWD	Crystal Benham, RMC
Joaquin Tijerina, Riverside County EDA	Alexis Cahalin, RMC
Matthew Howard, Mojave Water Agency	

Meeting Objectives:

A. Updates on Coachella Valley IRWM Program
B. Updates on Proposition 1 IRWM Program
C. Overview of DAC Solicitation Opportunity and Coachella Valley Priorities
D. Grant Workshop for DAC Solicitation

Meeting Notes:

Welcome and Introductions

Patti Reyes, Coachella Valley Water District, welcomed the Planning Partners on behalf of the Coachella Valley Regional Water Management Group (CVRWMG), the five regional water suppliers in the Coachella Valley who are responsible for overseeing the Coachella Valley Integrated Regional Water Management (IRWM) Program. Ms. Reyes then provided an overview of the agenda and meeting objectives. The group did self-introductions.

Coachella Valley IRWM Program Update

Crystal Benham, RMC Water and Environment (RMC), provided an overview of grants received by the CVIRWM Region through Proposition 84. The CVIRWM Region received six grants for a total of over $18 million, with over $8 million going toward DACs.

Proposition 1 IRWM Program Update

Ms. Benham discussed the Proposition 1 DAC Involvement Solicitation. The focus for the DAC Solicitation in the Coachella Valley is to fund project development activities that will lead to projects that will leverage implementation funding (i.e. planning, engineering, environmental, permitting, or design). Projects submitted for funding under the Proposition 1 DAC Solicitation will need to be completed within 2 years of grant contracting.

Ms. Benham reminded the Planning Partners that the DAC Solicitation will be submitted as one joint proposal from the Colorado River Funding Area, including the Coachella, Imperial, and Mojave Funding Regions. The total funding available for this solicitation is $2.25 million, and the three regions met and agreed upon a funding split for the DAC Solicitation. The Coachella Valley Region will receive $1,118,030, the Imperial Region will receive $724,870, and the Mojave Region will receive $407,100 per the agreed upon funding split.

Ms. Benham presented the eligibility requirements for the DAC Solicitation and provided the definitions of DAC, EDA, and Underrepresented Communities. The overall anticipated schedule for the DAC Solicitation was presented as follows:

- Coachella Valley Call for Projects: June 1 – July 1, 2016
- Project Interviews: July 13th
- Colorado River Funding Area Meeting: July 20th
- DWR Funding Area Meeting: July or August
- Submit Application to DWR: September
- Awards Completed by DWR: October

<u>Questions/Comments</u>

- Can small community water systems be a project sponsor?
- Is the State willing to pay connections fees? Connection fees are a significant barrier – need clarification on whether connection fees are eligible.
- Are tribal land wells eligible?
- Is there a minimum required life span for the projects?
- Will the State provide advanced payment?

DAC Grant Workshop

The purpose of the DAC Grant Workshop is to discuss the CVIRWM Programs DAC needs, to discuss types of projects that can be funded, to identify key funding and contracting expectations, and to answer questions about funding and next steps.

DAC Issues and Needs in the Coachella Valley

Projects submitted for funding under the Proposition 1 DAC Solicitation must address a water resources-related need of a DAC, EDA, or underrepresented community. The five major issues identifies in the Coachella Valley IRWM Plan include drinking water quality, adequate wastewater treatment and disposal, access to municipal services, onsite flooding, and cost of water and sewer services.

Eligible Project and Project Competitiveness

The project scoring process is outlined in the Coachella Valley IRWM Plan. The two steps of the scoring process are intended to ensure projects meet DWR requirements and the needs of the Coachella Valley and include numeric (quantitative) scoring followed by project vetting (qualitative).

The DAC Solicitation is intended solely for planning activities. The priority in the Coachella Valley is to fund project development activities that will lead to implementation projects.

Ms. Benham discussed how to increase competitiveness of project applications by focusing on multiple project benefits, maximizing benefits, quantifying benefits, and ensuring the application addresses each eligibility item clearly. Providing supporting documentation can also help to provide clarity.

Contracting Requirements

Ms. Benham presented the contracting requirements for projects awarded funding under the Proposition 1 DAC Solicitation. Project sponsors must be willing to work with DWR and the IRWM Program in a timely manner, must adopt the 2014 Coachella Valley IRWM Plan, and if the project sponsor is a public agency, must be in compliance with water-related regulations. Ms. Benham reminded the group of the funding restrictions associated with the DAC Solicitation. Grant funds will not cover costs that are incurred prior to contract execution, projects must be complete within two years, and all spending must be in line with provisions of the contract. Ineligible activities include application preparation costs for funding not consistent with Proposition 1 IRWM funding, meals not directly related to travel, or payment of stipends.

Next Steps

The next Planning Partners meeting will be in November, 2016. The CVRWMG will continue to track and Prop. 1 funding opportunities. Planning Partners are encouraged to provide input on topics they would like to see on the next Planning Partners meeting agenda.

Coachella Valley Integrated Regional Water Management Program

Planning Partners

Tuesday November 9, 2016
10:00-12:00 p.m.

Coachella Valley Water District
75-515 Hovley Lane East
Palm Desert, CA 92211

DRAFT NOTES
Italics denote action items.

Attendees:

Planning Partners	**CVRWMG**
Sergio Carranza, Pueblo Unido CDC	Adekunle Ojo, IWA
Mariela Magana, Leadership Counsel	David Tate, DWA
Ed Muzik, High Desert Water District	Ashley Metzger, DWA
Matthew Howard, Mojave Water Agency	Steve Johnson, DWA
David Bradshaw, Imperial Irrigation District	Scott Rogers, CWA
Joe Glowitz, Valley Sanitary District	Berlinda Blackburn, CWA
Shawn Muir, Twenty-Nine Palms Band of Mission Indians	Patti Reyes, CVWD
Sylvester Beltran	Steve Ledbetter, MSWD
Joe Pradetto, Riverside County Board of Supervisors	John Soulliere, MSWD
Roger Shintaku, CSU PACC	Crystal Benham, RMC
Justin Conley, Agua Caliente Band of Cahuilla Indians	Alexis Cahalin, RMC

Meeting Objectives:

A. Updates on Coachella Valley IRWM Program
B. Overview of DAC Solicitation
C. Overview of Planning Grant
D. Updates on Proposition 1 IRWM Program

Meeting Notes:

Welcome and Introductions

Patti Reyes, Coachella Valley Water District, welcomed the Planning Partners on behalf of the Coachella Valley Regional Water Management Group (CVRWMG), the six regional water suppliers in the Coachella Valley who are responsible for overseeing the Coachella Valley Integrated Regional Water Management (IRWM) Program. Ms. Reyes then introduced Crystal Benham, RMC Water and Environment (RMC). Ms. Benham provided an overview of the agenda and meeting objectives. The group did self-introductions.

Coachella Valley IRWM Program Update

MS. Benham, provided an overview of grants received by the CVIRWM Region through Proposition 84. The CVIRWM Region received six grants for a total of over $18 million, with over $8 million going toward DACs. Ms. Benham introduced John Soulliere, Mission Springs Water District (MSWD) to present on MSWD's Groundwater Protection Program. Portions of the Program received funding under Proposition 84.

Mr. Soulliere provided an overview of water issues in MSWD's service area. MSWD struggled with gaining voter support on water projects. Through the turmoil, MSWD determined that if they decreased project costs by leveraging outside funding and increasing value perception, voter support for projects would increase. The Groundwater Protection Program officially began in 1995 and intended to remove septic systems and connect the majority of the service area to the municipal sewer system. The Program was a huge undertaking, particularly for a DAC, with a price tag of $70,000,000. MSWD received approximately $3.8 million for the Program through IRWM Proposition 84 funding.

2016 DAC Solicitation

Ms. Benham provided an overview of the DAC Involvement Solicitation to the group. This grant solicitation is for activities that involve DACs, EDAs, or URCs. The focus in the Coachella Valley is to fund project development activities including planning, engineering, environmental, permitting, or design, which will lead to projects that will leverage funding.

There will be one joint proposal submitted for the entire Colorado River Funding Area. The regions have been coordinating and agreed to a funding split. Of the $2.25 million available to the Funding Area, Coachella Valley will receive $1,118,030, Mojave will receive $407,100, and Imperial will receive $724,870.

In June 2016, the CVRWMG opened the call for projects for the DAC solicitation. During the previous Planning Partners meeting in June, the public and interested parties were provided an opportunity to comment on the scoring criteria developed by the CVRWMG. Subsequently, three high priority projects were selected for funding. Ms. Benham invited Scott Rogers, CWA, to present the Chromium-6 Treatment Facilities Design and Permitting Project that will be included in the application.

Mr. Rogers discussed the need for the project, as many of CWA's wells produce water with Chrom-6 levels that are higher than the State's maximum contaminant level (MCL). The DAC Involvement funding would allow CWA to complete design and permitting for the project.

Ms. Reyes presented CVWD's DAC Design and Environmental Permitting project to the group. The funding will be used to complete design and environmental planning for a pipeline extension to a DAC that is currently not connected to municipal water and wastewater systems.

Mr. Soulliere presented MSWD's project that will be included in the DAC Involvement Grant. The project is a component of MSWD's previously discussed Groundwater Management Program. The funding will provide planning and engineering to connect Areas H and I to MSWD's wastewater system.

2016 Planning Grant Submittal

The planning grant application was submitted in September, requesting $211, 982 to complete a comprehensive update to the 2014 Coachella Valley IRWM Plan. Updates will include requirements per the 2016 IRWM Guidelines, a functionally equivalent Stormwater Resources

Plan, and governance updates. These updates are needed to maintain eligibility for projects to receive grant funding.

Proposition 1 IRWM Program Update

Ms. Benham provided the anticipated timeline for Proposition 1 grant funding:

- Planning Grant: December 2016 – December 2018
- Implementation – Round 1: December 2018
- DAC Solicitation: January 2017 – January 2020
- Implementation – Round 2: January 2020

Ms. Benham provided an overview of the types of projects that will be eligible for implementation funding, the focus of IRWM (multiple benefits, maximizing benefits, and quantifying benefits), and Coachella Valley IRWM Plan objectives.

Ms. Benham reminded the group that the Coachella Valley Project Database is always open and the CVRWMG is available for project discussions. Projects are submitted through the Coachella Valley IRWM Project Database which can be accessed on the CVRWMG website under the "Projects" tab.

Other Proposition 1 grant programs include the DWR Sustainable Groundwater Planning Grant and the DWR Water Desalination Grant. There is $90 million available under the Sustainable Groundwater Planning Grant which will fund projects that develop and implement sustainable groundwater planning projects. There is $49 million available under the Water Desalination Grant which will fund planning, design, and construction of water desalination facilities for brackish and ocean water. Both are anticipated to be released in December 2016/January 2017.

Next Steps

The next Planning Partners meeting will be in February, 2017. The CVRWMG will continue to track Prop. 1 funding opportunities. Planning Partners are encouraged to provide input on topics they would like to see on the next Planning Partners meeting agenda.

Coachella Valley Integrated Regional Water Management Plan

Integrated Flood Management Workshop #1

Tuesday January 15, 2013
1:00 – 3:00 pm

Coachella Valley Water District
CVWD Training Room
75-515 Hovley Lane East
Palm Desert, CA 92260

DRAFT NOTES
Italics denote action items.

Attendance

Berlinda Blackburn, CWA
David Tate, DWA
Mark Krause, DWA
Sara Toyoda, IWA
Tim Roberts, Salton Community Services District
Jennifer Henke, Coachella Valley Mosquito and Vector Control
Jeremy Wittie, Coachella Valley Mosquito and Vector Control
Janis Smith, Dudek
Chuck Greely, Dudek
Patti Reyes, CVWD
Matthew Palavido, CVWD
Tesfaye Demissie, CVWD
Margaret Park, Agua Caliente Tribe
Elizabeth Versace, City of Desert Hot Springs
Paul Russell, Riverside County Transportation Department
Bill Simons, Cathedral City
Rodolfo Piñon, Pueblo Unido
Scott Lynch, RMC
Bruce Phillips, PACE

Meeting Objectives

- Introduction to Integrated Flood Management
- Understanding of Flood Risks, Issues, and Sources in Region
- Implementation of Flood Hazard Mitigation

Agenda

1. **Integrated Flood Management (IFM) Background**

   Bruce Phillips welcomed the group, who did self-introductions. Mr. Phillips then provided an overview of the meeting objectives and an overview of IFM.

2. **Why IFM?**

   Bruce Phillips identified the benefits offered by IFM planning and common IFM strategies at different scales.

3. **Progress to Date**

   Bruce Phillips explained the IFM planning process that would be undertaken for the Coachella Valley IRWM Plan and across the Coachella Valley IRWM Region, and informed the group of all progress to date on information gathered and findings, including the Region's flood hazards, sources, and maps of flood hazard zones. He also identified IFM opportunities through analysis of GIS data related to the physical and biological characteristics of the Region.

4. **Stakeholder Input Requested**

   Bruce Phillips led a discussion and presentation on the input that is being requested from stakeholders to complete the IFM Study:

   a) Input needed includes:
      - Additional documents not already received
      - Additional data
      - Existing localized flooding locations (key hot spots)
      - Chronic flood damage loss areas
      - Critical facilities/locations
      - Participation
      - Review of draft vision

   b) Vision document will be a regional vision for multi-purpose IFM opportunities to develop projects

   c) Overlaying of data can help to identify multi-objective project opportunities

   d) GIS Layers needed to develop opportunities include:
      - Pollutant sources
      - Flood hazards
      - Groundwater basins
      - Habitat/wetlands
      - Sensitive species
      - Permeable soils
      - Erosion hazards
      - Debris/sediment potential
      - Impaired water bodies

   e) Stakeholder Workshop Input – *will send survey requesting data/information on*:
      - Common flooding problem/sources (local)
      - Common watershed flood problems/sources
      - Chronic/key flood locations/damages/issues
      - Deficiency locations of existing stormwater/drainage facilities

Discussion followed the presentation, and included:

a) Are we using the DWR flood information? Yes, we are using DWR database in our data. DWR used the FEMA database, but not the State's own data. FEMA is missing a lot of areas. *We will look into using the additional state database.*

b) Are we identifying alluvial fans via aerial photos? We have limited budget to be able to do that, but we are using the FEMA database, which shows the alluvial fans.

c) There are a lot of agricultural facilities, but they may not be providing any flood protection.

d) CVAG is working on a new aerial photography/mapping of the area in 2013. They are looking for more agencies to provide funding for this valley-wide effort. Plan is to have 6" resolution. They can get elevation data with another contractor.

e) Patti Reyes: As part of the IRWM process, we are encouraging Disadvantaged Community (DAC) involvement. Are there opportunities within the IRWM area to assist in identifying local flood areas in DAC areas? Note, as part of the IFM process, we do want to encourage multi-benefits with major factors being recharge/capturing of water and not just standard flood protection projects.

f) There is not a weighting system on the benefits to the opportunities being identified. The benefits/scoring is just based on the number of multi-objective opportunities being identified.

g) Some strategies (i.e. project benefits) may be in conflict with each other. One example is mosquito control vs. groundwater recharge (esp. underground). How is this addressed? We want to get this input so that we can identify potential concerns and adjust the strategies as appropriate.

5. Next Steps

a) Make today's presentation available online

b) Identify next workshop date

c) Send information request to stakeholders.

Coachella Valley Integrated Regional Water Management Plan Update
IFM Workshop # 2

Wednesday September 18, 2013
10:00am – 12:00 pm

Coachella Valley Water District
Training Room
75-515 Hovley Lane East
Palm Desert CA

DRAFT NOTES
Action items in italics

Attendance

Mike Gialdini, County of Riverside
Donald Raymond, County of Riverside – Transportation Dept.
Berlinda Blackburn, City of Coachella
Jim Sullivan, CVAG
Jennifer Henke, Coachella Valley Mosquito and Vector Control District
Bill Enos, City of Rancho Mirage
Phenvana Panpradith, Cathedral City
Jerry Santillan, SCSD
Sarah Jimenez, Agua Caliente Band of Cahuilla Indians
David Tate, DWA
William Meraz, GODWIN
Patti Reyes, CVWD
Tesfaye Demissie, CVWD
Rosalyn Prickett, RMC
Bruce Phillips, PACE

Agenda

1. **Introductions**

   Patti Reyes gave introductions for the five Coachella Valley Regional Water Management Group (CVRWMG) agencies. Introductions were made around the room.

2. **IFM Study Objectives and Benefits**

   Bruce Phillips presented an overview of the Coachella Valley's Integrated Regional Water Management (IRWM) efforts, noting that the original IRWM Plan was developed in 2010 and is currently being updated. As part of the Plan Update effort, the Integrated Flood Management (IFM) study is being developed to improve the understanding of IFM and increase competitiveness of flood projects. Mr. Phillips noted that the study is also being developed to meet the requirements in the 2012 IRWM Program Guidelines. He also stated that IFM would provide opportunity for flood and stormwater projects to participate in State grant funding, would engage watershed stakeholders, provide coordination between flood and water agencies, and promote watershed and land use planning.

3. **Review of IFM Principles and Background**

   Bruce Phillips provided a brief background on IFM.

4. **Characterize Flood Problems/Flood Risk and Exposures**

   Bruce Phillips presented the characterization of Coachella Valley flood hazards and exposure that was developed in the IFM study. These characterizations included existing and future flood risk, level of risks, sources of flooding, and priorities. This analysis was developed through spatial analysis using GIS overlays of data related to flood causes and predictors, the extent of flooding and damage, and potential flood management strategies.

5. **Guidance for Planning IFM in the Coachella Valley**

   The mapping analysis, which included pollutant sources, flood hazards, groundwater basins, habitat/wetlands, sensitive species, permeable soils, erosion hazards, debris/sediment production, and impaired water bodies, was used to characterize the Coachella Valley IRWM Region as it relates to flooding.

6. **Applicable IFM Techniques to the Desert**

   Bruce Phillips explained that the study considered which IFM techniques are applicable or feasible for a desert area such as the Coachella Valley IRWM Region.

7. **Correlate Watershed Characteristics to IFM Measures**

   Bruce Phillips explained how the IFM study correlated watershed characteristics to IFM measures. Using the East Valley's portion of the stormwater channel as an example, he presented how IFM could work.

   The East Valley Storm Water Channel is narrow and roughness is high because of large trees. IFM would involve working with the Coachella Valley Association of Governments (CVAG) to expand channel width while retaining habitat benefits.

   - For IFM Approach A (Increased floodplain infiltration) – Managers could increase the base width of the stormwater channel
   - For IFM Approach F (Application of Low Impact Development (LID) techniques, Parks with flood storage areas) – Managers could develop Freedom Park with ground water recharge and LID
   - For IFM Approach M (Retention/Detention Storage) – Managers could construct the Big Horn Detention Basin with a hidden outflow device to disguise it and help it blend into the surrounding environment

8. **Mapping IFM Opportunities**

   Combining the results of the mapping analysis with the correlated watershed characteristics and IFM measures allowed the IFM technical team to map IFM opportunities in the Region.

9. **GIS Guidance Tool Planning IFM Measures Locations for the Coachella Valley Area**

   IFM strategies were then considered in relation to these maps to provide guidance on IFM Planning for the Region. Areas of different IFM opportunities are geocoded, allowing planners to select project locations on the map, and see which IFM Opportunities may be feasible for that particular project area.

10. Stakeholder Funding Opportunities

A brief overview of potential IRWM funding opportunities was presented. Included was Proposition 84 Implementation grant funding, the success the Region has had in Rounds 1 and 2 of Proposition 84 grants, and the anticipated Round 3 application period in Fiscal Year 2014/2015. Stakeholders were encouraged to submit projects to the online Project database, available on the IRWM Program website (www.cvrwmg.org).

11. Stakeholder Input

The workshop was opened to discussion to solicit stakeholder input. The discussion included:

a) Stakeholders noted that Coachella Valley Mosquito and Vector Control (CVMVCD) should be included in the flood section.
   - Jennifer Henke, CVMVCD said that her group may have GIS maps of flood areas. CVMVCD focuses on standing water.

b) It was noted that IRWM is working to reach out to land use planners to teach them about IFM and multiple benefits from coordinating water and land use planning.

c) It was noted that IFM has been happening in the Region.
   - The CVAG Thousand Palms Project is coordinating with the Multiple Species Habitat Conservation Plan. There should be acknowledgement of these efforts and agencies in the IFM Study.

d) The County has Emergency Management Zones in Sky Valley. New FEMA maps were produced 6 years ago.
   - Can we ask Riverside County Flood Control and Water Conservation District for update on layers?
   - Will follow-up with CVWD flood engineer

e) Need to acknowledge that CVAG vegetation map is old and from the 1990's

f) For the IFM examples that were presented for the East Valley's stormwater channel:
   - IFM Approach A:
     - Purchase land with floodplain
     - Morongo, CVMSHCP, Thousand Palms flood control project
     - USACE/CVWD has design plans (*Create a call-out box*)
     - Drainage of Torres-Martinez (Torres Canyon)
   - IFM Approach F:
     - Recreation opportunities in Salton City?
     - Natural washes (unimproved) breech with summer storms.
     - Interim IFM for DAC areas?
     - Levees and washes?
     - Erosion/slope stabilization.
     - Repeated spot flooding in Vandevere, North Shore, reported in disadvantaged communities mapping, Salton City.
     - Agricultural drains – as East Valley urbanizes, is drainage system maintained for reuse, or will it continue to the Salton Sea to support habitat?

- IFM Approach M:
  - Thousand Palms has a sand deposition area for fringe toed lizard. This slows water down, and leads to recharge

12. Next Steps

- Bruce Phillips will provide the presentation to the CVRWMG, who will post it on the IRWM website (www.cvrwmg.org).
- A new data page will be added to the IRWM Program website for IFM data
- The CVRWMG will review the IFM analysis prior to distribution of the final IFM report.
- There will be a closed CVRWMG meeting in October to discuss needs and projects with Salton City.

Coachella Valley Integrated Regional Water Management Program

Disadvantaged Communities Outreach Program
Disadvantaged Communities Workshop #1

Thursday September 13, 2012
10:00 a.m. – 12:00 p.m.

Coachella Valley Water District
Training Facility
75-515 Hovley Lane East
Palm Desert, CA 92260

DRAFT NOTES

Italics denote action items.

Attendees:

Planning Partners

Anna Aljabiry, DWR
Phoebe Seaton, California Rural Legal Assistance Foundation
Cristina Mendez, California Rural Legal Assistance Foundation
Christina Mokhtarzadeh, Bureau of Indian Affairs Southern California Agency
Elizabeth Versace, City of Desert Hot Springs
Mike Gialdini, Supervisor Benoit
Jennifer Henke, Coachella Valley Mosquito and Vector Control
Anna Vargas, Poder Popular.
Ellen Shimakawa, Cal State University, San Bernardino
Robert Phalen, Cal State University, San Bernardino
Phenvana Panpradith, City of Cathedral City
Carrie McLeod, USDA
Brian Sinclair, Loma Linda University

CVRWMG

Berlinda Blackburn, CWA
Brian Macy, IWA
Mark Krause, DWA
Katie Ruark, DWA
Patti Reyes, CVWD
Michael Thornton, TKE Engineering on behalf of MSWD
Rosalyn Prickett, RMC
Kathy Caldwell, RMC
Crystal Mohr, RMC
Leslie Dumas, RMC
Daniel Cozad, IPM
Diana Cozad, IPM

Meeting Objectives:

A. Provide an overview of IRWM Planning and Coachella Valley specific IRWM Planning efforts
B. Provide an overview of efforts completed to date and next steps
C. Share/capture other relevant thoughts and ideas for future discussion

Meeting Notes:

Welcome and Introductions

Patti Reyes, Coachella Valley Water District (CVWD), welcomed the meeting attendees on behalf of the Coachella Valley Regional Water Management Group (CVRWMG), the five regional water suppliers in the Coachella Valley who are responsible for overseeing the Coachella Valley Integrated Regional Water Management (IRWM) Program.

Kathy Caldwell, RMC Water and Environment (RMC), provided an overview of the agenda and meeting objectives.

Overview of CV IRWM DAC Program

Kathy Caldwell, RMC, provided an overview of the Disadvantaged Community (DAC) Outreach Program. The purpose of this program is to expand upon previous DAC outreach to target individuals and groups representing DAC issues, and to also engage members of DAC community in order to frame and articulate water management issues facing DACs. One of the forms within the agenda packet is a letter and corresponding stakeholder form – Kathy encouraged all attendees to fill out the stakeholder form to assist in identifying issues and helping the team contact all relevant stakeholders.

Introduction to CV IRWM Planning

Kathy Caldwell provided an overview of IRWM planning and DAC outreach efforts, noting that there are two distinct yet interwoven planning efforts being conducted. She explained that the first effort, the DAC Outreach Program has five main components:

- Completing directed outreach to DACs to create a database of stakeholders that are interested or involved in DAC-related issues.
- Identify where DAC populations are located within the Coachella Valley.
- Work with identified stakeholders and DAC populations to characterize issues faced by DACs.
- Work to identify DAC issues through the creation of projects that could potentially be funded with Proposition 84 (IRWM) funding.
- Coordinate DAC Outreach efforts with the larger IRWM planning effort.

Rosalyn Prickett, RMC, briefed the group on the State's IRWM program. She provided an overview of the history of IRWM planning in the State of California and in Coachella Valley, noting that the three goals of the State's IRWM Program are: develop long-term water supply reliability, improve water quality, and protect natural resources. The first Coachella Valley IRWM Plan was adopted in 2010 (available on www.cvrwmg.org), which made the region eligible for Proposition 84 funding. In Round 1 of Proposition 84 funding, in 2011, the Coachella Valley was awarded $4 million in grants.

The Coachella Valley IRWM Region generally follows the Whitewater River watershed, but also extends to encompass Salton City. The Coachella Valley IRWM planning efforts are led by the CVRWMG, which includes the Coachella Water Authority, Coachella Valley Water District, Desert Water Agency, Indio Water Authority, and Mission Springs Water District.

Rosalyn provided an overview on the Coachella Valley IRWM Plan Update, which is a "sister effort" to the DAC Outreach Program. The Coachella Valley IRWM Plan Update will include six major efforts, including:

- Stakeholder Outreach
- Groundwater Quality Evaluation
- Salt and Nutrient Management
- Integrated Flood Management
- Groundwater Elevation Monitoring
- Comprehensively update the IRWM Plan

Rosalyn then explained that the Coachella Valley IRWM planning effort has always included outreach efforts and planning associated with DACs. Such efforts include the formation of a DAC Issues Group, identifying DAC-specific issues in the IRWM Plan, and awarding funds to two projects that provide benefits to DACs.

<u>Questions/Comments</u>

- Does the information provided regarding the amount of funding available to the Region include funds for Proposition 84 and Proposition 1E, or just Proposition 84?
    - There will be more information at the Planning Partners meeting. However, the amount of funding available to the Colorado River Funding Area in Round 2 of Proposition 84 (approximately $5 million) only pertains to Proposition 84. Please remember that while there is more money available through Proposition 1E, those funds are competitive on a state-wide basis rather than competitive within the Colorado River Funding Area.
- With regards to the mapping, I have some questions about the scale and how this was completed.
    - There will be a detailed discussion of the DAC mapping later in the meeting.
- What is the range of the Salton Sea CSD? This jurisdiction is not delineated on the map provided of the Region.
    - We will update the figure to include the boundaries of the Salton Sea CSD.

DAC Outreach Efforts and Planning

Kathy Caldwell provided an overview of the DAC Outreach Program, which is a companion project to the IRWM Plan Update effort described previously by Rosalyn. Kathy noted that these efforts are closely coordinated with similar tasks. The primary difference is that the DAC Outreach Program focuses exclusively on DACs, while the IRWM Plan Update focuses on the entire IRWM Region. Kathy noted that there is a DAC Outreach Project tab on the CVRWMG website, please check the website for pertinent information.

Kathy explained that upcoming activities include use of mapping with GIS to identify and characterize smaller DAC areas and flood control needs. This work will be completed, in part, by non-profit organization(s) within Coachella Valley. One of the forms within the agenda packet is a form for non-profit organizations to fill out to express their interest in working on this task. Organizations must be registered as a 501(c)(3) organization to be eligible to participate in this task.

Kathy explained that, as will be discussed later in the meeting, the IRWM Program is currently soliciting projects for Round 2 of Proposition 84 funding. The DAC Outreach Program will assist this effort by helping to identify DAC issues and projects, as well as provide some engineering and planning support to help NGOs and organizations involving DACs develop projects that can be eligible and competitive for Proposition 84 funding.

Daniel Cozad, IPM, asked that any stakeholders who did not directly receive an invitation to the meeting please contact Diana Cozad to be added to the DAC Outreach Program stakeholder list.

Initial DAC Characterization Maps/ Characterization mapping, 501C3 Participation Overview

Daniel Cozad provided an overview on the initial DAC characterization maps, noting that the primary purpose of this exercise is to use Census and demographic data to try to better understand key issues in the Coachella Valley. This process of identifying key issues will help the Region determine where it allocates resources (IRWM funding, etc.) For example, the focus for this effort is to locate DACs that are primarily not served by municipal water services – these are the areas that are more likely to experience critical water quality issues due to the use of untreated groundwater. The maps were produced with information from the U.S. Census, Tapestry Community Data (from ESRI), and the American Communities Survey.

Daniel noted that the purpose of the overview today is to discuss the maps that have been produced, and provide any feedback. Please feel free to be critical – we want to know if there are any errors in the information being presented or misperceptions about the way it is shown.

Daniel then walked the group through each map, describing what each map represents. He noted that the team started by analyzing information from DWR regarding the location of DACs in the Coachella Valley. It is notable that the DWR data is very different from the US Census and other data, indicating that the DWR data may not be accurate. Daniel also explained the tapestry profile maps, which are a tool to understand demographics within an area, and in particular to understand the economic purchasing power of various communities.

As indicated previously by Kathy, the next step in the mapping process is to take a closer look at the maps with support from local non-profit organizations. This work will begin very soon, as it needs to be completed in early 2013. If your organization is interested in participating in this process, please fill out a form and return it to Kathy Caldwell.

Questions/Comments

- Do the maps take into consideration metropolitan statistic overlays?
  - Yes, to a certain extent. We can consider this data source as we refine the maps.
- What do you mean by “closer look” when referring to the mapping exercise?
  - We mean refining the scale of the maps, and incorporating actual on-the-ground data collected by local entities.
- To clarify – does DWR consider Palm Springs to be a DAC?
  - Palm Springs does appear as a DAC in DWR’s data set. You will see that this area is largely not considered a DAC within the refined mapping using U.S. Census and other data.
- Can you please clarify the data source on each of the maps?
  - Yes.
- Suggest that you use US Department of Commerce data and the American Community Survey. Specifically, it would be helpful to look at USDA food stamp allocations, foreclosure rates, and unemployment. These factors help to characterize the Region’s economic status.
- It would also be good to look at areas with high rates of renters.
- Does DWR have a population minimum with regards to providing financial support to DACs? In other words, are there DAC projects that are too small to fund through the IRWM Program?
  - DWR does not have a set minimum value; however, each project included within the grant application needs to have a benefit: cost ratio that is greater than 1. In past evaluations we have found that very small communities that require very expensive infrastructure improvements cannot meet this benefit/cost ratio.

Groundwater Quality and Flood Risk Studies

Leslie Dumas, RMC, provided an overview of the groundwater quality evaluation that is being conducted as part of the IRWM Plan Update. She noted that the current step of this evaluation is to identify "areas of concern." Areas of concern include DACs that are not served by municipal water suppliers, and are therefore served by private groundwater wells. After these areas are identified, research will be conducted to try to determine groundwater quality and constituents or contaminants of primary concern within the areas of concern. Similar to the other IRWM planning efforts, this effort focuses on identifying key water quality issues associated with DACs – the identification of these issues will help determine how to allocate resources to critical DAC issues.

Any entity that has groundwater quality and quantity data can really help! If you have data, please send it to Leslie: ldumas@rmcwater.com.

Questions/Comments

- Do you have the AB2020 Report?
  - Yes.
- Do you need surface hydrology studies?
  - Not necessarily, this study is focusing on groundwater. However, those would be useful for the IRWM Plan Update.
- It would be easier to provide data if you can first narrow down the areas where you need data. If you identify the areas of concern, CVWD can potentially provide groundwater quality data for those areas.

Kathy Caldwell provided an overview of the flood management study that is going to be conducted as part of the IRWM Plan Update and the DAC Outreach Program. She noted that this process is going to dovetail with the State's Flood Futures report, which has not yet been released by DWR.

Although the Coachella Valley effort will dovetail with the state effort, through the Outreach Program the team is working to collect additional data from stakeholders regarding flooding and flood risks. If you have any data or information regarding flooding, please submit it to the team through the stakeholder form that is within the agenda packet.

Issue Identification and Project Development

Kathy Caldwell explained that previous outreach efforts and current DAC-specific outreach efforts have led to the development of a preliminary list of DAC issues, including:

1. Cost of conversion to combined/advanced treatment or connection to sewer
2. Provision of quality water supply and wastewater services
3. Accurate DAC stakeholder data
4. Coordination between cities, tribes, county, and water agencies

The next steps are to expand upon the preliminary list of DAC issues, and create a robust list of DAC issues within the Coachella Valley. Those issues will lay the foundation for characterizing DAC issues, and will also guide development of potential projects that can be developed or implemented to address the issues.

Other next steps are associated with Round 2 of Proposition 84, for which the Region is currently accepting projects. If there are ready-to-go DAC projects, the Program will channel those projects to the IRWM Plan for consideration.

For future grant funding, the DAC Outreach Program is able to provide technical support to help develop project ideas into projects, or to provide some preliminary engineering or planning work that will assist organizations in developing projects that are competitive for IRWM grant funding.

Questions/Comments

- Do you know the status of the DAC project (the Short-Term Arsenic Treatment Project)?
    - Our understanding is that the project did face start-up funding issues, but that those issues have been resolved. CVWD is working to schedule a kick-off meeting with all project proponents.
- Can you please email out the project database information? Who do I contact if I need to change an existing project?
    - Contact Crystal Mohr: cmohr@rmcwater.com or (858) 875-7421

Next Steps

Kathy Caldwell closed the meeting by thanking attendees, and informing them how to be involved in the DAC Outreach Program. She asked attendees to please contact an IPM or RMC team member with any additional questions. Kathy also encouraged attendees to stay for the Planning Partners meeting, which will begin at 1 p.m.

Coachella Valley Integrated Regional Water Management Program

Disadvantaged Communities Outreach Program
Disadvantaged Communities Workshop #2

Thursday December 13, 2012
10:00 a.m. – 12:00 p.m.

Coachella Valley Association of Governments
Conference Room #115
73-710 Fred Waring Drive
Palm Desert, CA 92260

DRAFT NOTES
Italics denote action items.

Attendees:

Planning Partners

Anna Aljabiry, DWR
Sergio Carranza, Pueblo Unido Community Development Corporation
Mike Gialdini, Supervisor Benoit
Jennifer Henke, Coachella Valley Mosquito and Vector Control District
Jacquelyn Gonzales, Cabazon Band of Mission Indians
Debi Livesay, Torres Martinez Desert Cahuilla Indians
Laura Massie, California Rural Legal Assistance
Tim Roberts, Salton Community Services District
Jon Rokke, Colorado River Basin Regional Water Quality Control Board
Ryan Sinclair, Loma Linda University
Thomas Weiler, Inland Congregations United for Change

CVRWMG

Berlinda Blackburn, CWA
Sara Toyoda, IWA
Mark Krause, DWA
Katie Ruark, DWA
David Tate, DWA
Patti Reyes, CVWD
Rosalyn Prickett, RMC
Randy Raines, RMC
Kathy Caldwell, RMC
Leslie Dumas, RMC
Crystal Mohr, RMC
Daniel Cozad, IPM

Meeting Objectives:

A. Keep Participants Up-to-Date on the Coachella Valley DAC Outreach Program, including Updated Characterization Maps
B. Provide an Overview of Non-Profit Contracting for the DAC Outreach Program
C. Provide an Update on Groundwater Quality and Flood Risk Studies

Meeting Notes:

Welcome and Introductions

Patti Reyes, Coachella Valley Water District (CVWD), welcomed the meeting attendees on behalf of the Coachella Valley Regional Water Management Group (CVRWMG), the five regional water suppliers in the Coachella Valley who are responsible for overseeing the

Coachella Valley Integrated Regional Water Management (IRWM) Program and the DAC Outreach Program, which is a companion program to the IRWM Program.

Kathy Caldwell, RMC Water and Environment (RMC), provided an overview of the agenda and meeting objectives.

Overview and Status of Coachella Valley IRWM DAC Outreach

Kathy Caldwell, RMC, provided an overview of the Disadvantaged Community (DAC) Outreach Program. The purpose of this program is to expand upon previous DAC outreach to target individuals and groups representing DAC issues, and to also engage members of DAC community in order to frame and articulate water management issues facing DACs. The program is a pilot program that was designed to improve outreach to DACs with respect to the IRWM Program; as such, the DAC Outreach Program is considered a companion program to the IRWM Program.

Discuss Non-Profit Assistance for the DAC Outreach Program

One component of the DAC Outreach Program will include hiring local non-profit organizations to provide on-the-ground support to the DAC Outreach Program. Local organizations will be hired to provide local expertise and knowledge on DAC issues. The non-profit organizations will provide support through three primary tasks: outreach, mapping, and a final report.

In September the DAC Outreach team distributed a form (which was also distributed online) to all stakeholders, which was intended to capture all potential non-profit partners interested in participating. Since that time, interviews were conducted and a preliminary selection has been made. The next step in this process will be to finalize contracts, and begin work in January of 2013.

The non-profit organizations will play a large role in refining DAC maps and helping to characterize the locations of DACs and their specific water-related issues. This will be done through ground-validating existing data through field work, and talking with members of the community.

Update on DAC Groundwater Quality Evaluation

Leslie Dumas, RMC, provided an overview of the groundwater quality evaluation that is being conducted as part of the IRWM Plan Update. She noted that the current step of this evaluation is to identify “areas of concern” (AOC). Areas of concern include DACs that are not served by municipal water suppliers, and are located in areas where the groundwater quality is known to exceed maximum contaminant levels (MCLs). Information available from the Coachella Valley water purveyors as well as publically available state and federal data has allowed the technical team to identify areas of concern as well as constituents of concern in those areas. The data that was analyzed shows that there are four primary constituents of concern: arsenic, fluoride, nitrate, and uranium. The next step in the analysis is to determine potential solutions for addressing the various constituents. According to information from the EPA, membrane separation (which includes reverse osmosis), is the best available technology for addressing each constituent potentially present in local groundwater basins. Future steps in this process will involve a data gap analysis to determine more information that may be useful such as the exact location of wells, the volume of water being pumped and used, and a confirmation of water quality at each well. Following the data gap analysis, the technical team will develop an outline for a monitoring program that can potentially be implemented to address identified data gaps and other outcomes from the planning study.

Questions/Comments

- A lot of DACs use drinking water that is not reported at all, because it is not regulated. Is there any attempt to describe groundwater quality in those areas?
  - Yes, we have put out requests for additional data, especially at the Federal-level. We do have some data for those areas, because the government has some monitoring wells within proximity to private groundwater wells.
- Does this assessment take into consideration new or anticipated MCLs?
  - No, this assessment only considered existing MCLs.
- How is “community” defined? Is there a threshold for how many people are needed to define a community?
  - This is a good question – we will look into the SWRCB document titled, “Communities that Rely on Contaminated Groundwater” to see if they specify a population threshold.
- There is a gap between AOC 2 and AOC 4 – is this because of a lack of data? There are arsenic-related groundwater quality issues there.
  - Yes, this is due to a lack of groundwater quality data for that area. We will expand the area to ensure that this entire area is covered, and also do additional research to see if we can find data for that area.
- Mike Gialdini from Supervisor Benoit’s office can potentially get data from the Bureau of Indian Affairs (BIA) for the area that is missing between AOC 2 and AOC 4. Supervisor Benoit’s office has been working with BIA and other federal agencies to obtain such data.
- The Regional Board also has a Study Group that is looking into gathering data throughout the Coachella Valley, and potentially has groundwater quality data for the Region.
- There are serious groundwater quality issues in the East Valley due to previous activities that involved dumping of sludge from the San Diego Bay. The Department of Toxic Substances Control (DTSC) used to monitor this area, but they no longer monitor it because the site no longer accepts hazardous waste.
- Please note that in areas where there is an aquitard, monitoring wells generally only measure above the aquitard and do not monitor low-level groundwater. It is important to note the quality associated with the depth of groundwater, because, in this same area (East Valley), the Coachella Valley Water District has deep groundwater wells, and the groundwater system in this area is healthy. Also, CVWD offers groundwater quality testing, and can be of assistance in this regard.
- Sergio Carranza from PUCDC can provide water quality data from mobile home park sampling, which has been conducted with CVWD.
  - *Patti Reyes will look into whether or not CVWD maintains a database of their groundwater quality data.*
- Work conducted by PUCDC demonstrates that reverse osmosis systems are able to remove approximately 90% of arsenic from the groundwater, indicating that these systems are very effective.
- As a potential treatment alternative, please consider suggesting drilling deeper wells rather than only installing on-site treatment systems.

- Please add “reverse osmosis” into the “Membrane Separation” column in the assessment – this will make it clear to folks what is meant as reverse osmosis is much more familiar than membrane separation.
- We know that mobile home parks and other communities in the East Valley tend to be under-counted in the US Census data – have you considered using other data sources?
    - This is the primary purpose of the non-profit contracting: to ground-truth existing data (such as Census data) with real on-the-ground data.
- The County of Riverside has a database of all permitted mobile home parks, and also has information about those on the way to become permitted. Contact Mike Gialdini for this information, which is available through the County’s Code Enforcement department.

Kathy Caldwell then provided an overview of a draft survey, which would be conducted by the non-profit partners as part of the DAC Groundwater Quality Evaluation. Ms. Caldwell provided an overview of the survey questions, then asked if there were any comments or suggestions.

Questions/Comments

- You need to make sure to talk with Tribal Council before conducting these surveys on tribal lands. Also, you should make sure that you are conducting the survey with someone who would be trusted by tribal members, or you will not likely have people respond.
- The same is true across the East Valley mobile home parks. You need to be very careful about how you approach people, or they will not be likely to respond. Make sure that you know somebody such as the mobile home park owner or a resident – this will help establish trust and increase the likeliness that people will talk to you. Also, be aware that residents have a history of not reporting issues because they are afraid of retaliation – this may deter people from providing honest answers to the survey questions.
- In general, the promotores must have trust and established relationships in the community in order to be effective.
- Consider explaining to tenants and community members that in order to develop long-term solutions, we must first fully understand the problem.
- Are there any plans to have the survey reviewed by the Humans Ethics Commission or other party that would evaluate the survey? If being conducted through Loma Linda University, the survey would likely need to be funneled through the Institutional Review Board.
- Residents may not have information about contamination, but they will know about things onsite such as flooding or if the septic tanks fail or overflow. Consider asking these more simple questions to infer information about contamination, etc.

Presentation of Updated DAC Characterization Maps

Daniel Cozad provided an overview on the initial DAC characterization maps, noting that the primary purpose of this exercise is to use Census and demographic data to try to better understand key issues in the Coachella Valley. The maps have been updated since the previous DAC Workshop in order to take into consideration comments that were received, and provide additional detailed maps about specific DAC areas.

Daniel then walked the group through each map, describing what each map represents. He noted that there are 14 discrete DAC areas in the Coachella Valley, which have been mapped at a more refined level. He asked the group if there is any information or feedback, noting that everything, including what the communities are called, needs to be vetted through stakeholders to ensure that the maps are accurate and cognizant of local issues, etc.

<u>Questions/Comments</u>

- While the MHI is a good indicator, it would likely be more useful to look at the poverty level. Poverty level, which takes into consideration household size, is a better indicator. For example, in the Coachella Valley population and household size tend to increase towards the south and east – this means that the poverty level is generally higher in those areas, where a similar income is used to provide for a larger family. For example, a retired couple who earns $40,000 per year is at a much higher poverty level than a family of six who lives off the same income.
- It is possible that polanco parks exist in the tapestry areas classified as “Top Rung”, which in many cases are agricultural lands.
- Agricultural wells, which were not intended for drinking water purposes may be used by polanco parks. These wells are often shallow and have groundwater quality issues.

Next Steps

Kathy Caldwell closed the meeting by thanking attendees, and informing them how to be involved in the DAC Outreach Program. She asked attendees to please contact an IPM or RMC team member with any additional questions. Kathy also encouraged attendees to stay for the Planning Partners meeting, which will begin at 1 p.m.

Coachella Valley Disadvantaged Community (DAC) Outreach Program
Community Water Workshop – Eastern Coachella Valley

Tuesday June 18th, 2013
5:00 p.m. – 7:00 p.m.

San Jose Community and Learning Center
69455 Pierce Street
Thermal, CA 92274

Notes

Italics denote action items

Meeting Notes:

Welcome and Introductions

Matthew Doyle, President of the San Jose Community and Learning Center (Center), welcomed the meeting attendees to the Center. He stated that this workshop was the first to be held in the Center, a new facility for the eastern Coachella Valley, which will provide important resources to the community. Sister Gabriella Williams, Director of Programs for the Center, also welcomed the group and thanked Sergio Carranza, Executive Director of Pueblo Unido Community Development Corporation (PUCDC) for organizing the meeting.

Kathy Caldwell, RMC Water and Environment (RMC), provided an overview of the agenda and meeting objectives.

Background and Purpose of DAC Outreach Project

Kathy Caldwell, RMC, provided an overview of the Disadvantaged Community (DAC) Outreach Program. The purpose of this program is to expand upon previous DAC outreach to target individuals and groups representing DAC issues, and to also engage members of DAC community in order to frame and articulate water management issues facing DACs. Ms. Caldwell explained that the DAC Outreach Program is a companion program to the Integrated Regional Water Management (IRWM) Program that has been active in the Coachella Valley since 209.

Kathy Caldwell provided an overview of IRWM planning and DAC outreach efforts, noting that there are two distinct yet interwoven planning efforts being conducted. She explained that the first effort, the DAC Outreach Program has five main components:

- Completing directed outreach to DACs to create a database of stakeholders that are interested or involved in DAC-related issues.
- Identify where DAC populations are located within the Coachella Valley.
- Work with identified stakeholders and DAC populations to characterize issues faced by DACs.
- Work to identify DAC issues through the creation of projects that could potentially be funded with Proposition 84 (IRWM) funding.

- Coordinate DAC Outreach efforts with the larger IRWM planning effort.

Kathy Caldwell then briefed the group on the overall IRWM program. She provided an overview of the history of IRWM planning in the State of California and in Coachella Valley, noting that the three goals of the State's IRWM Program are: develop long-term water supply reliability, improve water quality, and protect natural resources. The first Coachella Valley IRWM Plan was adopted in 2010 (available on www.cvrwmg.org), which made the region eligible for Proposition 84 funding. In Round 1 of Proposition 84 funding, in 2011, the Coachella Valley was awarded $4 million in grants. The Coachella Valley IRWM Region generally follows the Whitewater River watershed, but also extends to encompass Salton City. The Coachella Valley IRWM planning efforts are led by the Coachella Valley Regional Water Management Group (CVRWMG), which includes the Coachella Water Authority, Coachella Valley Water District, Desert Water Agency, Indio Water Authority, and Mission Springs Water District.

DAC Mapping and Surveying Approach

Dr. Ryan Sinclair, Loma Linda University (LLU) provided an overview on the DAC mapping and surveying, which was conducted as part of the DAC Outreach Program. Dr. Sinclair explained that the purpose of this exercise was to more clearly define where the DACs are located throughout the Coachella Valley, and to conduct a survey of residents to understand their issues pertaining to water management. This portion of the program was conducted by LLU and two local non-profit organizations: El Sol Neighborhood Educational Center (El Sol) and PUCDC.

As of the East Valley Workshop, the survey team had completed 196 surveys in the West Valley and over 150 surveys in the East Valley. Dr. Sinclair explained that surveys were conducted by groups containing LLU students and promotores from El Sol and PUCDC. To-date, the group has gathered a lot of very useful information pertaining to the location of DACs and to water-related issues that are faced by DACs. The team will continue to finish surveys in the East Valley, and will have the data ready to present to stakeholders in September of 2013.

Community Mapping Exercise

Dr. Ryan Sinclair then asked meeting attendees to participate in a brief mapping exercise. Meeting attendees had already been grouped into tables according to where they live, and would be completing the exercise with their designated group. During this exercise, attendees would be given a large piece of paper and asked to draw a localized community (apartment or mobile home park) where they live. In the drawing, they were asked to color-code information as follows:

- Black Ink would indicate functioning infrastructure such as roads and buildings.
- Blue ink would indicate resources such as groundwater wells and lagoons.
- Red ink would indicate challenges and issues.

The groups were given the appropriate materials and asked to draw their communities. Once drawings were completed, a representative from each group gave a presentation of their drawing. Below is a summary of each drawing as presented by meeting attendees:

1. Oasis: Oasis Mobile Home Park
    - Map shows the Oasis Mobile Home Park (infrastructure) and septic systems (black).
    - Map shows a wastewater lagoon that was shut down by the government (red).
    - Red ink in the street shows where wastewater (black water) from the septic systems leaks into the streets.

- The map also shows that the red area (leaking wastewater) is in very close proximity to the mobile home parks and to the groundwater well. There is concern that the black water contaminates the park's drinking water well.
- Red ink in the corner of the mobile home park shows an area where trash is illegally dumped. There is concern about the proximity of the trash pile to the groundwater well, and potential contamination.
- Red ink in the streets also indicates flooding, which happens when it rains. Flooding also causes issues with access – when it rains the ground erodes (the roads and ground are not paved), and cars cannot access the park.
- The group indicated that the conditions described for this park also apply to two other neighboring mobile home parks: La Cienega and Rancho los Ferros

2. Mecca: Lake St. Anthony Mobile Home Park
   - Map shows the Lake St. Anthony Mobile Home Park (black ink), which has about 92 units.
   - Map shows wastewater lagoons, which are very close to the mobile home park units.
   - Map shows (red ink) flooding that covers almost the entire park. The flooding also causes access issues as the entire park is un-paved. Access issues here are severe as the school bus has access issues when picking up children for school. This forces children to wait for the bus along Highway 111, which is very dangerous.
   - Map shows red ink throughout the park as an indicator of electricity issues.
   - The mobile home park has blue ink (resources) associated with a water well that is being connected by PUCDC.
3. Pierce: Avenue 69 Mobile Home Park
   - Map shows the Avenue 69 Mobile Home Park (black ink).
   - Map shows septic system issues, as black water comes up from the systems.
   - Map shows severe flooding issues, which cause access issues. When there is a severe rain and flooding, no cars (even emergency vehicles) can access the park.
   - Map shows a pile of rocks that spontaneously ignites – some residents believe due to satanic activity. Others believe that this is a dump site that has burning trash beneath the rocks.
4. Indio: Sunbird Mobile Home Park
   - Map shows the Sunbird Mobile Home Park (black ink) along Highway 86.
   - Map shows (red ink) overflowing septic tanks in the area.
   - Map shows (red ink) wastewater lagoons from Valley Sanitary District, which present odor issues to residents.
   - Map also shows that residents in the area, especially children, suffer from asthma and other health issues.
5. West Thermal: Harrison/Avenue 66 Mobile Home Park
   - Map shows that there is a need for drinking water and sewer infrastructure.

- Map shows that there are no recreational facilities (playground, etc.) for the children.
- Map shows that there is no paving or electricity. Both of these things cause safety issues as children play outside in the dark at night and may be hit by cars. Additionally, the paving issue presents access issues as others have mentioned.

Kathy Caldwell thanked each group for their input, and explained that the next step of the exercise would be to discuss potential solutions to each of the issues that were raised by the groups. Ms. Caldwell explained that part of the DAC Outreach Program includes limited funding to complete design and engineering for a few projects. The design and engineering work will develop projects to the necessary level to be competitive for IRWM funding or other funding sources. On this topic, Ms. Caldwell noted that the meeting packet included a form for stakeholders to fill out to further articulate potential projects to be considered for funding.

Below is a summary of the potential solutions that were discussed for each of the five mobile home parks described above:

1. Oasis: Oasis Mobile Home Park
    - Residents believe that there is an organizational issue – help is needed to organize the community. The current issues are extreme, and need a lot of help.
    - Another issue is that this park is on tribal land – residents are concerned that this will impact what can be done.
    - Residents think that the government should come fix conditions in the community. There is not enough money for basic infrastructure in this community, although it seems like the government has money available for other things.
    - A mobile home park owner in the area was present at the meeting, and stated that they would be open to making infrastructure improvements.
2. Mecca: Lake St. Anthony Mobile Home Park
    - Residents believe that full-scale infrastructure: connection to the water and sewer system, electrical upgrades, and pavement are necessary.
    - In the short-term, the park has point-of-use reverse osmosis systems installed by PUCDC to resolve drinking water issues.
3. Pierce: Avenue 69 Mobile Home Park
    - Residents see paving as the primary issue and the most pressing issue. Flooding and erosion are the biggest issues.
    - Residents see the overflowing septic systems as the second-largest issue, but do not know how to resolve this issue.
4. Indio: Sunbird Mobile Home Park
    - Residents believe that the best solution would be to connect to the local sewer system, and to put in internal piping systems in place of the wastewater lagoons.
    - Residents see the need to purchase bottled water as the biggest issue: the water is not safe to drink.
    - Residents believe that detention basins on the property could be used to hold flood flows.

- Issues are considered severe, and believe that relocation (such as what happened with the Duroville residents) would be a last resort, but is an option.

5. West Thermal: Harrison/Avenue 66 Mobile Home Park
    - Potable water is seen as the largest issue in this mobile home park. Overflowing septic systems is the second issue.
    - Residents are unaware of potential solutions, but believe that governmental intervention is required.

Questions and Comments

Kathy Caldwell thanked each group for their input, and invited all meeting attendees to ask any questions or make any comments. Below is an overview of the questions and comments received and answers (*in italics*).

- If we were interested in getting money for preliminary design and engineering, who would we meet with.
    - *The first step will be to synthesize the information received at the meeting. Please fill out a project concept form for consideration, and contact Kathy Caldwell with any additional questions.*
- What system will be used to determine who is helped (what projects are selected)?
    - *The project team will develop a set of criteria, which will be applied to all projects equally.*
- What will happen with mobile home parks on tribal lands? Can they get help too?
    - *Tribal lands to present unique jurisdictional challenges, but this does not mean that no help is available. Federal funding may be the most appropriate for projects on tribal lands. The biggest issue would be to find a sponsor, and make sure that tribal land owners will agree to the project on their land.*
- Can we have our water tested to make sure it is safe?
    - *If you are located within the Coachella Valley Water District, you can call and have your water tested. There are pamphlets (in English and Spanish) on the back table with the necessary information.*

Next Steps

Kathy Caldwell thanked everyone for attending the meeting. She noted that there will be another workshop in the West Valley on June 20th. Information for that meeting is:

- **DATE:** June 20th, 2013
- **TIME:** 5 p.m. - 7 p.m.
- **LOCATION:**
  DHS Family Resource Center (in the Kmart shopping center)
  14201 Palm Drive Suite 108
  Desert Hot Springs, CA

There will be another meeting on September 12th (location TBD) – please give us your contact information, and we will send you the details. Any questions, please contact Kathy Caldwell: kcaldwell@rmcwater.com or (310) 566-6460.

Coachella Valley Disadvantaged Community (DAC) Outreach Program
Community Water Workshop – Western Coachella Valley

Thursday June 20th, 2013
5:00 p.m. – 7:00 p.m.

DHS Family Resource Center
14201 Palm Drive, Suite 108
Desert Hot Springs, CA

Notes

Italics denote action items

Meeting Notes:

Welcome and Introductions

Larry Singh, Director of the DHS Family Resource Center, welcomed the meeting attendees to the Center. He thanked Susie del Toro of El Sol Neighborhood Educational Center (El Sol) for putting the meeting together. John Soulliere of Mission Springs Water District (MSWD) also thanked meeting attendees and organizers for coming and for dedicating their evening to discuss important water-related issues in the West Valley.

Kathy Caldwell, RMC Water and Environment (RMC), provided an overview of the agenda and meeting objectives.

Background and Purpose of DAC Outreach Project

Kathy Caldwell, RMC, provided an overview of the Disadvantaged Community (DAC) Outreach Program. The purpose of this program is to expand upon previous DAC outreach to target individuals and groups representing DAC issues, and to also engage members of DAC community in order to frame and articulate water management issues facing DACs. Ms. Caldwell explained that the DAC Outreach Program is a companion program to the Integrated Regional Water Management (IRWM) Program that has been active in the Coachella Valley since 209.

Kathy Caldwell provided an overview of IRWM planning and DAC outreach efforts, noting that there are two distinct yet interwoven planning efforts being conducted. She explained that the first effort, the DAC Outreach Program has five main components:

- Completing directed outreach to DACs to create a database of stakeholders that are interested or involved in DAC-related issues.
- Identify where DAC populations are located within the Coachella Valley.
- Work with identified stakeholders and DAC populations to characterize issues faced by DACs.
- Work to identify DAC issues through the creation of projects that could potentially be funded with Proposition 84 (IRWM) funding.
- Coordinate DAC Outreach efforts with the larger IRWM planning effort.

Kathy Caldwell then briefed the group on the overall IRWM program. She provided an overview of the history of IRWM planning in the State of California and in Coachella Valley, noting that the three goals of the State's IRWM Program are: develop long-term water supply reliability, improve water quality, and protect natural resources. The first Coachella Valley IRWM Plan was adopted in 2010 (available on www.cvrwmg.org), which made the region eligible for Proposition 84 funding. In Round 1 of Proposition 84 funding, in 2011, the Coachella Valley was awarded $4 million in grants. The Coachella Valley IRWM Region generally follows the Whitewater River watershed, but also extends to encompass Salton City. The Coachella Valley IRWM planning efforts are led by the Coachella Valley Regional Water Management Group (CVRWMG), which includes the Coachella Water Authority, Coachella Valley Water District, Desert Water Agency, Indio Water Authority, and Mission Springs Water District.

DAC Mapping and Surveying Approach

Dr. Ryan Sinclair, Loma Linda University (LLU) provided an overview on the DAC mapping and surveying, which was conducted as part of the DAC Outreach Program. Dr. Sinclair explained that the purpose of this exercise was to more clearly define where the DACs are located throughout the Coachella Valley, and to conduct a survey of residents to understand their issues pertaining to water management. This portion of the program was conducted by LLU and two local non-profit organizations: El Sol Neighborhood Educational Center (El Sol) and PUCDC.

As of the East Valley Workshop, the survey team had completed 196 surveys in the West Valley and over 150 surveys in the East Valley. Dr. Sinclair explained that surveys were conducted by groups containing LLU students and promotores from El Sol and PUCDC. To-date, the group has gathered a lot of very useful information pertaining to the location of DACs and to water-related issues that are faced by DACs. The team will continue to finish surveys in the East Valley, and will have the data ready to present to stakeholders in September of 2013.

Community Mapping Exercise

Dr. Ryan Sinclair then asked meeting attendees to participate in a brief mapping exercise. Meeting attendees had already been grouped into tables according to where they live, and would be completing the exercise with their designated group. During this exercise, attendees would be given a large piece of paper and asked to draw a localized community (apartment or mobile home park) where they live. In the drawing, they were asked to color-code information as follows:

- Black Ink would indicate functioning infrastructure such as roads and buildings.
- Blue ink would indicate resources such as groundwater wells and lagoons.
- Red ink would indicate challenges and issues.

The groups were given the appropriate materials and asked to draw their communities. Once drawings were completed, a representative from each group gave a presentation of their drawing. Below is a summary of each drawing as presented by meeting attendees:

1. Corkill Park, Mobile Home Park
    - Map shows that septic tanks (overflowing) are the biggest issue in this community.
    - This is a large park, with approximately 150 units
    - Septic tanks in the middle of the park overflow into the streets and into houses.
    - There are basic issues associated with water and electricity: at times water pressure is very low, and there is no electricity.

- The entire park has issues with pine trees – the roots push into the pipes and break them. The pine needles get caught in ditches and cause flood problems.
- This mobile home park has lack of basic infrastructure, and residents do not feel that it is safe. There are particular safety issues associated with the lack of electricity – it is not safe for children to play at night.

2. Palm Drive Mobile Estates, Mobile Home Park

   - This is a large park, with approximately 100 units
   - The park has many infrastructure issues, and is not well-kept.
   - There are issues with trees that push up the concrete and break pipes. Residents were told (by mobile home park owner) that they would need to pay to remove them.
   - The power lines in the park are loose, and can break. It is also not safe for children to play here at night.
   - There are other issues associated with animals – dogs and cats. There are cats everywhere, and they are dirty. There are dogs that people do not pick up after, and it is not pleasant to residents.
   - Many people have issues associated with septic system overflows into the yards, or backing up into the homes.
   - When it rains, water gathers and pools on the property and there are mosquitoes.
   - The residents have expensive water bills, and wonder if the water is safe to drink. The community experienced un-notified water shut-offs, sometimes for days.
   - Residents believe that this park is located within the City of Desert Hot Springs.

3. El Sol

   - The El Sol organization provided a presentation on West Valley issues and potential solutions.
   - They noted that one major concern is education regarding what can go down the drain – especially cooking oil. Many residents are not aware that this will destroy their septic systems.
   - They also noted that there are many resources available, and El Sol is here to work with residents to resolve issues!

Kathy Caldwell thanked each group for their input, and explained that the next step of the exercise would be to discuss potential solutions to each of the issues that were raised by the groups. Ms. Caldwell explained that part of the DAC Outreach Program includes limited funding to complete design and engineering for a few projects. The design and engineering work will develop projects to the necessary level to be competitive for IRWM funding or other funding sources. On this topic, Ms. Caldwell noted that the meeting packet included a form for stakeholders to fill out to further articulate potential projects to be considered for funding.

Below is a summary of the potential solutions that were discussed for issues brought up during the meeting.

- For the issue of septic systems:
  - Residents would like regular maintenance and inspections to determine the issues. They do not know why there are regular overflows. Is it roots? Behavior? Unmaintained systems? Under capacity?

- For the issue of flooding:
  - Residents note that detention infrastructure is necessary. Some noted that there are detention basins on-site, but in bad locations (such as at the park entrance).
  - There is an issue with mosquitoes in the detention basins, so residents do not always like this option.
- For the issue of drinking water:
  - Residents do not believe that their water is safe to drink, and do not know if they are served water from a municipal provider. Residents want their water tested by the government.
  - MSWD noted that there are some concerns with testing. MSWD assures that water going into the park (at the master meter) is clean. The mobile home parks have internal infrastructure (piping) that may be compromised and could be contaminated.
  - It was also noted that mobile home park owners must agree to the testing before the agencies can do this work.

Questions and Comments

Kathy Caldwell thanked each group for their input, and invited all meeting attendees to ask any questions or make any comments. Below is an overview of the questions and comments received and answers (*in italics*).

- In general it seems like government agencies should be able to help. These are permitted mobile home parks – if there is wastewater leaking in the streets and the water is not clean, then there are code violations that should be addressed.
  - *The projects could include educational materials about who to contact and how to contact the proper government officials.*
- Who can residents go to? Who would be enforcing these codes?
  - *Likely the City of Desert Hot Springs and the County of Riverside, depending upon where you live.*
- There is some concern about this code violation reporting. Must recognize that some of the municipalities simply come in and shut down parks once violations are reported – then residents lose their homes! Also, there is concern that the mobile home park owners will illegally try to push off costs for operations and maintenance to the residents.
  - *We can include all of this in the educational materials – thank you.*
- Why doesn't someone check up on this? Why do we have to go to them to report?
  - *We cannot answer the specifics of code enforcement for the municipalities, but in general they are experiencing staffing issues.*

Next Steps

Kathy Caldwell thanked everyone for attending the meeting. She noted that there will be another meeting on September 12th (location TBD) – please give us your contact information, and we will send you the details. Any questions, please contact Kathy Caldwell: kcaldwell@rmcwater.com or (310) 566-6460.

Coachella Valley Integrated Regional Water Management Program
Disadvantaged Communities Workshop #5

Wednesday, November 6, 2013
10:00 AM – 12:00 PM

Coachella Valley Water District
Training Room
75-515 Hovley Lane East
Palm Desert, CA 92211

DRAFT NOTES
Italics denote action items.

Attendees:

Stakeholders

Melissa Sparks, DWR
Evon Willhoff, DWR
Jim Schmitt, Coachella Valley Engineers
Jacky Gonzales, Cabazon Band of Mission Indians
Margaret Park, Agua-Caliente Band of Cahuilla Indians
Mike Gialdini, Supervisor Benoit
Leticia DeLara, Supervisor Benoit
Dale Schafer, Imperial DAC CCOP
Sergio Carranza, Pueblo Unido CDC
Rodolfo Piñon, Pueblo Unido CDC
Carrie McLeod, USDA Rural Development
Michele Hassen, Leadership Counsel
Phoebe Seaton, Leadership Counsel
Laura Massie, California Rural Legal Assistance
Frank Kopcinski, California Rural Legal Assistance
Tim Roberts, SCSD
Jerry Rowling, Borrego Water District
Cynthia Manna, Imperial Valley Economic Development Corporation (IVEDC)
Robert Wilkinson, La Quinta Rotary
Jennifer Henke, Coachella Valley Mosquito and Vector Control District (CVMVCD)
Ryan Sinclair, Loma Linda University
Jaime Lopez, Loma Linda University
Susie del Toro, El Sol Neighborhood Educational Center
Maria Elena Kennedy, DAC Representative
Jim Sullivan, Coachella Valley Association of Governments

CVRWMG

Berlinda Blackburn, CWA
Castulo R. Estrada, CWA
Sara Toyoda, IWA
Mark Johnson, CVWD
Patti Reyes, CVWD
Mark Krause, DWA
David Tate, DWA
John Soulliere, MSWD
Rosalyn Prickett, RMC
Kathy Caldwell, RMC
Leslie Dumas, RMC
Crystal Mohr, RMC
Sally Johnson, RMC
Daniel Cozad, IPM
Diana Cozad, IPM

Meeting Objectives:

A. Provide an overview of the DAC Outreach Program and IRWM Program

B. Describe DAC outreach, surveying, and issue identification

C. Review four projects developed through program

D. Review accomplishments

Meeting Notes:

Welcome and Introductions

Patti Reyes, Coachella Valley Water District (CVWD), welcomed workshop attendees on behalf of the Coachella Valley Regional Water Management Group (CVRWMG), the five regional water suppliers in the Coachella Valley who are responsible for overseeing the Coachella Valley Integrated Regional Water Management (IRWM) Program. The group did self-introductions.

General Background on IRWM Planning

Kathy Caldwell, RMC, provided an overview of Integrated Regional Water Management (IRWM) Planning and the Coachella Valley IRWM Program. Ms. Caldwell also provided a brief overview of the workshop agenda and objectives, noting that the focus of this workshop was the Disadvantaged Communities (DAC) Outreach Program.

Coachella Valley DAC Outreach Program Efforts

Kathy Caldwell provided a brief overview of the Coachella Valley DAC Outreach Program. Ms. Caldwell explained that this was a sister program to the Coachella Valley IRWM Program, and funded through a separate grant from the California Department of Water Resources (DWR). The goals of the program were to expand upon previous DAC outreach conducted by the region, identify DACs that were overlooked by previous methods (such as small pockets of areas that are DAC) and to engage DACs to help identify priority water management issues and develop projects to address critical needs. She noted that two workshops were held in June 2013, with the support of local non-profits with existing relationships with area DACs, proved to be very successful.

Daniel Cozad, IPM, presented the DAC Outreach Program by reviewing past DAC outreach in the Coachella Valley IRWM region, noting that DAC outreach has been occurring in the region since before the formal foundation of the Coachella Valley IRWM program. He explained that the DAC Outreach Program sought to expand on these efforts, and used new techniques such as a “marketing style” database, bilingual outreach materials and door hangers distributed directly to residences to reach a greater number of stakeholders. Ms. Caldwell highlighted the important role of the CVRWMG’s partnership with local non-profits in successfully reaching DACs in the region.

Ryan Sinclair, Loma Linda University, presented the DAC Survey and Mapping project. He explained that the surveying process used trained students and “promotores” to conduct surveys in areas that were identified as DACs, as well as areas selected by El Sol Neighborhood Educational Center (El Sol) and Pueblo Unido Community Development Corporation (PUCDC), two local non-profits that work regularly with DACs in the region. Mr. Sinclair introduced Susie del Toro, from El Sol, and Sergio Carranza, from PUCDC.

Ms. Del Toro explained that the survey efforts were successful because the promotores were trusted by the community because of past work of the promotores. She stated that they received a lot of feedback and were happy and surprised to find that people wanted to help find solutions for their water issues. Ms. del Toro also expressed surprise over the findings of which people do not drink their tap water, even if it was safe to drink. She noted that some communities are far from cities and services, making it difficult to provide services to them, and to be aware of their existence and needs. She noted that the communities really opened up to the surveyors, and that a number of people contacted El Sol for assistance following the survey efforts.

Questions/Comments

- What are promotores?
  - Promotores are community health workers who are recruited from the communities in which they work. Promotoroes are trained for specific programs and education efforts. El Sol recruits and trains these promotores, and provides services in homes, schools, and churches, among other community areas, but primarily provides services to people where they are, rather than having people come to them for El Sol's services.
  - Ms. Reyes added that the promotores model is used by many non-profits (especially Latino non-profits) and that the Coachella Valley IRWM program benefitted from using the existing system and promotores program.
  - Ms. del Toro noted that the promotores program is expanding.
  - Mr. Sinclair added that Loma Linda University has a training program with El Sol.

Mr. Carranza explained that PUCDC works primarily in the East Valley. He said that the DAC Outreach Program was the first opportunity to expose the reality of the needs of the East Valley. Mr. Carranza stressed that this was only possible because of the non-profits' existing relationships with communities. PUCDC's community base is Polanco parks, approximately 30 parks with a total of 3,000 to 5,000 residents. Mr. Carranza said that the residents of these communities have a good understanding of their critical issues, and stated that the Short-Term Arsenic Treatment Program (funded under a Proposition 84 Round 1 Implementation grant) has been successful because the residents PUCDC serves identified arsenic as an issue. Mr. Carranza continued by explaining that efforts to find solutions began with feedback from the community, followed by interactive exchanges of ideas and information, which leads to the formulation of potential and viable solutions. Information was documented by the survey, and accessible. The workshops held in June were successful and allowed communities to identify their top issues and priorities. Overall, Mr. Carranza noted that communities were optimistic. He said that this was the largest outreach program and that the survey was very comprehensive. Some of the challenges to past outreach are that Polanco parks are dispersed and not well documented, and residents may perceive surveys as a threat to their community due to history of problems associated with having identified park issues. Agencies need to use the networks and relationships that local non-profits have with these parks just to find them and to let them know that surveyors will be visiting and do not pose a threat to their continued residence in the parks or a threat to the park's existence. Mr. Carranza explained that the combination of promotores with Polanco park leadership led to the success of the survey process and explaining the purpose of the survey to residents. Promotores and Polanco park leaders were able to utilize the strong community networks to let people know about the survey quickly and effectively. The combined efforts of these two groups also promoted cultural fluency for surveyors, which is important for effective outreach and awareness. Mr. Carranza finished by announcing that the first Institute of Community Training will be launched in the spring, and will include training on how to sustain mobile home park infrastructure. He emphasized that Polanco park communities love to learn and desire to have their communities be in compliance with regulations.

Questions/Comments

- John Soulliere, Mission Springs Water District (MSWD) said that there is a difference between data for the sake of data and using the survey process as an introduction to communities, and then leveraging it to build relationships. Mr. Soulliere congratulated the DAC Outreach Program team for going beyond the State's requirements and building these relationships.
    - Mr. Sinclair emphasized that the surveys were a true collaboration with the partner non-profits
- How long was the outreach/survey conducted?
    - Three months
- Was every household surveyed?
    - Households to be surveyed were selected based on appropriate statistical methods. Households represented 20-30 parks, with a random selection of addresses based on existing DAC maps, and an extra 100 households (50 from the East Valley and 50 from the West Valley) surveyed based on the non-profits' networks and knowledge of DACs.
- Many DAC communities are not on any maps. Identifying these communities is a huge asset for the region.
- What was the consideration for defining DACs? What is DWR's definition?
    - DACs are defined as communities with 80% or less of the Statewide MHI. Communities with 60% or less of Statewide MHI are considered severely disadvantaged.
- Did you only survey severely disadvantaged communities?
    - No, the randomly selected ones were chosen from severely DAC areas, but the additional 100 households selected by El Sol and PUCDC were not necessarily in severely DAC areas on the map.
- The next state water bond is concerned about leaving out DACs. However, there is concern over gaps from the census data.
    - This study first looked at data from the census block level, then tried assessing for severely DAC areas using affordability index. However, income is really the only metric that we currently have or are able to use unless there are people in the region who can help identify where DACs exist (such as NGOs like El Sol and PUCDC). Poverty areas can be helpful in identifying DACs, but it all depends on scale. Some DACs are located immediately adjacent to wealthy areas, and this detail can get lost.
- What kind of language should be considered for the bond in order not to lose DACs? What income level?
    - DWR guidelines say 80% of MHI qualifies as a DAC or a more detailed study can be used to identify DACs.
    - There is no uniformity across state agencies on how to identify DACs or what qualifies as a DAC.
    - Clear legislative intent would be helpful.
- The problem with identifying DACs is that communities don't even show up in surveys or the census. There needs to be a way to document them.

- Census does not visit everywhere
- This challenge will be discussed in the final survey report
- Polanco parks have fewer than 13 homes, and permitting is faster for them. They are only in the East Valley. The West Valley doesn't have Polanco parks.

Following this discussion, Mr. Sinclair presented the findings of the survey results. He presented maps of the results and discussed some of the major findings. He noted that because the data came from surveys and was not independently confirmed, it represents only the perceived situation by residents, and cannot be assumed to be the actual situation. Mr. Sinclair explained that residents in the East Valley were more aware of their water sources than residents of the West Valley, and that the East Valley had a poorer perception of the quality of their tap water. Though the East Valley seemed have more on-site wastewater treatment systems (such as septic systems), people were often unaware of what type of wastewater systems they used. West Valley residents were frequently unaware of what wastewater system they had. Generally, residents were aware of flood problems, and reported flood issues in areas within mapped flood zones or near the Whitewater River Stormwater Channel.

Questions/Comments

- Did the team survey only the park owners or did it survey residents?
  - Surveys were conducted with residents – not all park owners were notified in advance of the survey.
  - Park owners were used as a link to the communities, but the survey focus was on the residents.
  - *This will be clarified in the DAC chapter of the 2014 Coachella Valley IRWM Plan and other areas of the 2014 Plan that discuss the survey results.*

DAC Project Overview

Kathy Caldwell introduced the DAC Project by explaining that the DAC workshops validated the results of the survey when workshop participants identified key issues and where these were located. Ms. Caldwell explained that DAC Workshops were another way to get information about issues and locations. She stated that the workshops generally reinforced the known issues, and that the issues were (1) wastewater, (2) drinking water, and (3) flood.

DAC projects had to meet the following criteria to be considered by the DAC Outreach Program:

- Does the project address an identified issue?
- Does the project have an implementing agency?
- Is the project consistent with the 2009 IRWM Plan objectives?
- Will the project either leverage other funding or be able to leverage other funding in the future?
- Is the project cost effective?

Questions/Comments

- Future meetings should consider including non-water/sewer parties because attendees at the DAC Workshops brought up a wide variety of issues. Other agencies could have leveraged those meetings.
  - Many of the issues brought up during the workshop are problems communities could solve themselves but did not know that they could or how to do so.

DAC Project 1: Educational Materials

Mr. Daniel Cozad presented the first DAC Project, Educational Materials. He noted that El Sol is currently translated the materials from English to Spanish, and that the Spanish version would be available for public review by December 1, 2013. The educational materials contain basic information regarding sewer and septic systems, system maintenance, which agencies are in charge of which systems or issues, and contact information by type of issue that will enable communities to get the help they need for their issues.

<u>Questions/Comments</u>

- Comments are still being accepted on the handouts, the English versions are available as Appendix G in the Public Draft 2014 Coachella Valley IRWM Plan, and some copies are available as workshop handouts.
    - Many of the contact numbers are not local. Can local numbers be provided?
    - *The County will provide local numbers for as many of the listed agencies as possible*.
- This handout was designed as a resource for the Coachella Valley, but also as a template for other areas, which could replace all the contact information with the appropriate information for their regions.

DAC Project 2: Connection Opportunities

Leslie Dumas, RMC, presented the second DAC Project, Connection Opportunities. This project was designed to help identify water and wastewater connection opportunities for DACs in the region. Through the use of multiple mapped data, DACs that appeared to be near service areas were sorted into connection feasibility classes based on distance to existing water and wastewater mains. Next steps are to clarify the data, starting with high feasibility sites. We will also need to learn more about the feasibility are each sites. Periodically the sites will need to be reprioritized and continued outreach should be conducted.

<u>Questions/Comments</u>

- How was the “Multiple sites to one pipeline” classification scored for feasibility? Some sites may be in a different distance classification than other sites within a single “multiple sites to one pipeline” site.
    - This was mainly a judgment call. For any of these sites, a further investigation of feasibility must be conducted.
- Can we use a cost per dwelling unit when assessing projects?
    - Part of the recommended next steps for assessing feasibility includes costs and willingness, etc.
- Did the analysis consider pressure zone, pump stations, or lifting?
    - No, that was beyond the scope of the project
    - The East Valley is flat, so any projects in that area would need pump stations and lifts.
- Was the analysis done Valley-wide or only in the survey areas?
    - Valley-wide.
- Do we need to look at the permanence of the communities? Don’t some of these parks move or only have seasonal residents?

    - Not all parks move.
    - Need to determine the feasibility criteria
- Some communities may have other, non-physical, circumstances that would exclude or affect their feasibility (example: are they up to code?)
    - Despite the feasibility analysis, there is a chance that we may encounter other issues when implementing connections.
    - Parks are working to be in compliance, and trying to address all code violations or issues as a package. For example, projects to bring parks into fire code compliance could provide an opportunity to add a municipal connection.

DAC Project 3: Polanco Park Septic Upgrades

Rich Bichette, RMC, presented the third DAC Project, Polanco Park Septic Upgrades. This project was designed to help assist local DACs in addressing public health issues and potential groundwater contamination, as well as provide guidance for implementing such a project. It will also serve to prepare these communities for future funding opportunities. Mr. Bichette gave an overview of the project and the process for designing septic upgrades for Polanco Park. Using four demonstration sites, the project has developed a roadmap for similar projects. Steps include soils testing, assessing wastewater treatment alternatives - conventional septic systems, nitrogen removal (for areas with high nitrogen or nutrient issues, not applicable to the Coachella Valley), emerging technology, and centralized and decentralized options. Mr. Bichette explained that for the region's Polanco Parks used in this project, a decentralized conventional system was best, with one system serving 2-3 homes. Mr. Bichette explained that the framework created by this project outlines the steps required to determine the type of system as well as potential permits that may be required. The project also prepared design plans, which have positioned the sites for future permitting.

<u>Questions/Comments</u>

- Did this project consider the steps and costs required to clean up the results of failed systems?
    - No. Typically cleaning would be done when installing the new system, but Mr. Bichette was not certain of the regulations or potential regulatory penalties.
- Motivation for this project is the fund regional projects in the future. The framework will allow regional projects to be developed for Proposition 84 Round 3 Implementation grants. This will allow the Region to get money that can be used to solve wastewater and septic problems and implement the framework. This project does not implement the framework or design.
- Funding was for design only?
    - There was no funding for implementation. It is difficult to get large amounts of money for sewer project serving small populations. Septic provides a near-term, cheaper, solution until funding and opportunity are available for conversion to sewer.
    - Grants are small but will still be able to implement these designs.
- What are the average construction budgets for these designs?
    - It costs $10,000 - $15,000 per system. Each system serves 2-3 homes. Approximately 6 systems per park. Construction costs would be between $60,000 and $90,000 per park. Engineering only costs about $5,000 per park.

DAC Project 4: DAC Groundwater Quality Treatment

Leslie Dumas, presented the fourth DAC Project, DAC Groundwater Quality Treatment. Ms. Dumas explained that this project was designed to be used as a template for bringing safe drinking water to communities. It is a model project that can easily be implemented by local DAC organizations. In the region, five constituents of concern may be present in groundwater, of which the greatest concern is arsenic. Of the different treatment systems considered by the project, only reverse osmosis was effective as treating all five constituents, including arsenic. The project identified key challenges to providing clean drinking water to DACs. These challenges included regulatory requirements, the ability of point-of-use (POU) systems address multiple contaminants, the cost of units and unit maintenance, sustainability of treatment system programs, obstacles to installation, and brine disposal (for point-of-entry systems). Ms. Dumas explained that the project team coordinated with local non-profits and other organizations working with DACs and working on drinking water concerns. The project developed a guide for buying, installing, and testing under the counter reverse osmosis systems. It also developed an operations and maintenance (O&M) manual for monitoring and maintain systems. For smaller system (those with fewer than 15 connections), the Rotary Club's POU treatment system program is a good model. The project also recommended that for larger systems (those with over 15 connections), the Short-Term Arsenic Treatment Program be used as a guide for an effective DAC drinking water treatment program.

Questions/Comments

- Does the county regulate communities with 25 units?
  - The county regulates all permitted mobile home parks, no matter their size.
- Are the data used for this project going to be shared?
  - Yes, and the draft report for this project will be available for public review and comment by December 1, 2013.

Program Deliverables

Kathy Caldwell presented the outcomes of the DAC Outreach Program and the deliverables that will be completed as part of the DAC Outreach Program. Ms. Caldwell described how the DAC Outreach Program led to the development of a new chapter in the 2014 Coachella Valley IRWM Plan on DACs that was mad available for review with the Public Draft of the 2014 Plan on November 4, 2013 (available on the CVRWMG website, www.cvrwmg.org). She noted that the appendices for the DAC chapter will be available (online and sent out via email) for review and comment by December 1, 2013. These appendices will contain the deliverables from each of the four DAC projects. Ms. Caldwell also explained that local organizations also wrote a memorandum on DAC participation in the IRWM Program, with a focus on challenges to DAC participation. The primary deliverable for the DAC Outreach Program, in addition to the individual DAC project deliverables, is a DAC Outreach Program Model that can be used in other areas of the State that face similar DAC issues.

Review of Accomplishments

Kathy Caldwell reviewed the accomplishments of the Coachella Valley DAC Outreach Program, including the outreach meetings and workshops, Promotores and student training, survey results, DAC proejcts, the region's contribution to Statewide DAC efforts, and an increased DWR commitment to the region.

Next Steps

Kathy Caldwell presented the next steps for the DAC Outreach Program. These steps include the timeline for deliverables presented below, as well as identification of opportunities to continue DAC engagement and coordination, addressing challenges to outreach, applying for Proposition 84 Round 3 Implementation Grant funding, and completion and implementation of the 2014 Coachella Valley IRWM Plan.

- Program deliverables available for public comments and review – December 1, 2013
- Program deliverables submitted to DWR – December 2013
- Completion of the 4 DAC projects – December 2013

Question and Answer Session

Workshop attendees were encouraged to stay for the 2014 Coachella Valley IRWM Plan Public Workshop to be held that afternoon (1:00 – 3:00 pm) in the same room.

Coachella Valley Regional Water Management Group
Public Workshop
Draft 2014 IRWM Plan Update

Wednesday November 6, 2013
1:00 – 3:00 pm

Coachella Valley Water District
Training Room
75-515 Hovley Lane East
Palm Desert, CA 92211

DRAFT NOTES

Action items in italics

Attendees:

Planning Partners

Dale Schafer, Imperial IRWM
Evon Willhoff, DWR
Frank Kopcinski, CRLA
Jennifer Henke, Coachella Valley Mosquito & Vector Control District
Jim Schmitt, Coachella Valley Engineering
Jim Sullivan, CVAG
Jon Rokke, RWQCB
Laura Massie, CRLA
Margaret Park, Agua Caliente Band of Cahuilla Indians
Melissa Sparks, DWR
Michele Hasson, Leadership Counsel
Mike Gialdini, Supervisor Benoit
Octavio Gonzalez, Rep for Raul Ruiz MD
Phoebe Seaton, Leadership Counsel
Ron Buchwald, Valley Sanitary District
Tim Roberts, SCSD

CVRWMG

Berlinda Blackburn, CWA
Castulo R. Estrada, CWA
Sara Toyoda, IWA
Mark Krause, DWA
Katie Ruark, DWA
David Tate, DWA
Patti Reyes, CVWD
Ivory Reyburn, CVWD
John Soulliere, MSWD
Rosalyn Prickett, RMC
Crystal Mohr, RMC
Sally Johnson, RMC
Daniel Cozad, IPM
Diana Cozad, IPM

Meeting Objectives:

A. Keep participants up-to-date on the Coachella Valley IRWM Program, including schedule and key milestones
B. Present Draft IRWM Plan and solicit feedback
C. Share/capture other relevant thoughts and ideas for future discussion

Meeting Notes:

Welcome and Introductions

Ms. Patti Reyes, Coachella Valley Water District (CVWD), welcomed everyone to the meeting. Introductions were made around the room.

IRWM Program Overview and Planning Activities

Ms. Rosalyn Prickett, RMC Water and Environment, provided an overview of the IRWM Program. Ms. Prickett explained that IRWM planning is a regional planning strategy that involves stakeholder input and coordination between local agencies. In the Coachella Valley IRWM region, the program is headed by the Coachella Valley Regional Water Management Group (CVRWMG) consisting of five local water supply agencies (Coachella Water Authority, CVWD, Desert Water Agency, Indio Water Authority, and Mission Springs Water District). Ms. Prickett presented the IRWM grant funding the Region has been awarded, including a $4 million Proposition 84 Round 1 Implementation Grant, and the preliminarily awarded $5.24 million Proposition 84 Round 2 Implementation Grant. Ms. Reyes added that the region has been successful when asking for smaller amounts of money. For DAC projects, this means funding short-term solutions that keep project moving. Ms. Reyes noted that projects with lower costs and high number of beneficiaries are more successful in funding applications. Ms. Reyes told attendees that projects are selected for inclusion in funding applications because they met the needs and objectives of the 2010 IRWM Plan. She asked attendees to consider if the 2014 Draft IRWM Plan addressed their agency's goals when reviewing the draft plan. Ms. Reyes added that compared to the 2010 IRWM Plan, the 2014 Plan has had more time to gather detailed information for the Region, and therefore is more comprehensive than the 2010 Plan.

Ms. Pricket presented the role of the IRWM Plan in making the region eligible for Proposition 84 grant funds, and then presented the key components of the 2014 IRWM Plan Update process:

- Stakeholder Outreach
- Disadvantaged Community (DAC) Groundwater Quality Evaluation
- Salt and Nutrient Management
- Integrated Flood Management
- Groundwater Monitoring Assessment, and
- IRWM Plan Update

Salt and Nutrient Management Program (SNMP) Strategy

Ms. Prickett presented the Salt and Nutrient Management Strategy developed as part of the 2014 IRWM planning process. She explained that it was developed with the CVRWMG and included three stakeholder workshops do discuss local groundwater and key concerns and receive feedback on the draft SNMP workplan, which was presented to the Regional Water Quality Control Board. Ms. Prickett added that this was just one phase of a multiphase process, and presented the steps that had already been undertaken as well as where the SNMP was expected to go from here.

Disadvantaged Community (DAC) Groundwater Quality Study

The DAC Groundwater Quality Study sought to determine where poor groundwater quality was reported within DACs. Ms. Prickett explained that the study used local, State, and federal data, along with constituents of concern (arsenic, fluoride, nitrate, uranium, and hexavalent chromium), areas of concern, and existing groundwater plans to analyze groundwater quality issues and potential solutions in DACs. The study found that many DACs are in rural or outlying areas, though some are within or adjacent to water agency services areas. Reverse osmosis systems were determined to be the best treatment option for DACs not on municipal supply. The study recommended expanding the existing Short-Term Arsenic Treatment program.

<u>Questions/Comments</u>

- How is adjacent to service area defined?
  - Adjacent to service area were areas near portions of an agency service area with pipelines (not all of a service area necessarily has pipelines). The focus was on outlying areas, and there is not a specific distance that led to an area being considered "adjacent". Did look at the other groundwater study completed as part of the DAC Outreach Program (and presented at the Nov. 6, 2013 morning workshop) to help determine this.
- Hexavalent chromium does not have an MCL yet, so how was it evaluated?
  - Originally hexavalent chromium was not included, but after the draft MCL was released it was added because it was a good opportunity to reassess our data so we did so in anticipation of future regulation using the draft MCL as our standard.

Integrated Flood Management Study

Ms. Prickett reviewed the Integrated Flood Management (IFM) study that was conducted for the 2014 IRWM Plan. She explained that the study created a mapping tool that incorporates IFM opportunity mapping (based on various features of an area) to identify which IFM approaches are applicable for a given area in the region. She also explained that IFM strategies were screened for use in the desert, that the study created a detailed fact sheet for IFM techniques, and that it defined priorities for implementation of IFM based on flood exposure.

<u>Questions/Comments</u>

- Where are the IFM fact sheets?
  - The fact sheet can be found in the IFM appendix to the 2014 IRWM Plan, but most of the information from the study and fact sheets has been synthesized and incorporated into the plan itself.
- What data sources were used?
  - This will also be in the IFM appendix to the Plan (appendix to be released by December 1, 2013).

Groundwater Monitoring Assessment

The Groundwater Monitoring Assessment compiled existing programs and program evaluations, and evaluated monitoring programs and the existing recommendations in the context of new work. It identified additional improvements and recommendations for basin-wide groundwater evaluation and quality monitoring.

<u>Questions/Comments</u>

- Using this process can we pinpoint what needs funding, and how to make them an IRWM project?
  - The draft 2014 IRWM Plan is available for review and can be downloaded from the CVRWMG website. *See the flyer for directions on how to access the plan.*

Stakeholder Outreach

Ms. Pricket presented a brief overview of the region's stakeholder outreach, including Planning Partners meetings and Issues Groups for DACs, Tribal Nations, SNMP, and IFM.

Draft IRWM Plan Update

Ms. Crystal Mohr, RMC, presented the 2014 Draft Coachella Valley IRWM Plan. Ms. Mohr presented the purpose and general and key changes for each chapter of the Plan to inform attendees of potential items they may want to focus on during their review of the draft 2014 Plan. The ten Plan chapters Ms. Mohr presented were Region Description, Issues and Needs, Disadvantaged Communities, Tribal Water Resources, Objectives, Stakeholder Involvement, Resource Management Strategies, Project Evaluation and Prioritization, Agency Coordination, and Framework for Implementation. The two chapters that were not presented were Introduction and References.

Mr. Daniel Cozad, IPM, presented the Disadvantaged Communities chapter. He explained that this chapter was developed as a result of the DAC Outreach Program and to highlight the importance of DAC participation in the Coachella Valley IRWM Program.

Ms. Mohr presented the Tribal Water Resources chapter as a new chapter for the 2014 IRWM Plan, and how this chapter was developed with input from five of the area tribes that chose to participate in the IRWM Program.

Other key changes that were presented included that the Water Supply section in the Region Description was fleshed out, and included discussion of DACs, people not on municipal supplies, and non-potable supplies. These changes were included because the Water Supply section from the 2010 Plan did not contain enough detail to fully describe the region's water supplies and water supply issues and needs. The Issues Group discussion included the four Issues Groups used during development of the 2014 IRWM Plan, but also a fifth "Ad-Hoc" Issues Group which provides the region flexibility to add Issues Groups as needed without amending the Plan. The Project Selection process description was updated to reflect the process used for the Proposition 84 Round 2 Implementation Grant (e.g., added interview step). It was noted that project scoring is tied to the project database, so project sponsors should enter information into each field in the database to maximize the points they receive.

<u>Questions and Comments</u>

- The plan is a valuable resource even for non-water organizations. It can answer a number of types of questions about water management in the Coachella Valley. Stakeholders are encouraged to comment on anything in the plan; comments are welcome through December 31, 2013.
- Can we get an update on next funding cycle?
    - The tentative schedule from DWR is a draft solicitation will be released in Summer 2014, so it likely a Final solicitation will be released in Fall 2014. This means applications will be due in early 2015.
    - When the draft solicitation is released, the Region will begin preparing for project selection by reassessing the project database and preparing for the project selection process.
    - Project selection is expected in late 2014.
- What if funding runs out?
    - DWR is trying to figure this out with IRWM strategic planning and the Water Board.
- How do you continue programs from the planning process if funds run out?
    - See Plan implementation section of the 2014 IRWM Plan. The CVRWMG has not made a commitment to fund the program if IRWM funding runs out, but it is committed to look for other sources of funding.

- Other funding sources may be contingent on IRWM Plans. The State has the ability to keep the region involved in IRWM planning through regulations or limiting funding opportunities to regions with IRWM Plans.
- Agencies had been skeptical about the amount of funding spent on outreach and communication but have found it to be invaluable; the agencies want to maintain these communications and relationships.

Next Steps

- Public review period of the 2014 Draft IRWM Plan is November 4th through December 31, 2013.
- Final appendices for the 2014 Draft IRWM Plan will be available: December 1st, 2013
- Submit comments:
  - Electronically: cvirwm@rmcwater.com
  - Hard Copy: Rosalyn Prickett, 10509 Vista Sorrento Parkway, Ste 205, San Diego, CA 92121

Flyers distributed at the meeting provide direction on how to download the 2014 Draft Coachella Valley IRWM Plan. It can be found on Library page of the CVRWMG website (www.cvrwmg.org), if visitors scroll down to the IRWM Plan. Let Ms. Prickett, know if you would like a copy of the Plan on a CD.

Coachella Valley Integrated Regional Water Management Tribal Outreach Meeting

August 14, 2012
11:00 am – 12:00 pm

Agua Caliente
5401 Dinah Shore Drive
Palm Springs 92264

DRAFT NOTES
Action items in italics

Attendance

Margaret Park, Agua Caliente Band of Cahuilla Indians

Daniel Cozad, IPM
Rosalyn Prickett, RMC
Crystal Mohr, RMC

Meeting Objectives

- Provide Updates on the IRWM Program
- Discuss Upcoming Grant Opportunity
- Define Characterization to be Included in Plan Update

Agenda

Updates on Coachella Valley IRWM Program

- Rosalyn Prickett provided an overview of the IRWM Program, noting that the Coachella Valley IRWM Region is currently updating the existing IRWM Plan. Updates will include a series of technical evaluations and workgroups to receive input from stakeholders throughout the Plan Update process.
- Daniel Cozad provided an overview of the DAC Outreach Program that is being conducted in parallel with the IRWM Plan Update through a separate grant from DWR.

Proposition 84-Round 2 Grant Opportunity

- Rosalyn Prickett provided an overview of the Proposition 84 Round 2 Implementation Grant opportunity, including an estimate timeline based on the approximate due date for grant applications provided by DWR (March 2013).
- Margaret Park indicated that the Agua Caliente tribal group may be interested in submitting a project for Round 2 funding, and indicated that DWR requirements associated with CEQA, permitting, grant administration, and other items would not be a deterrent to the tribe.

Tribal Characterization in IRWM Plan Update

- Rosalyn Prickett provided an overview of the tribal characterization included in the existing IRWM Plan, noting that the RWMG received feedback that tribes would like to be characterized separately and not lumped together as one “tribal” group.
- Margaret Park indicated that in general, the tribes are not a unified group, and do not like to be referenced as such. It would be helpful in the IRWM Plan Update to include specific descriptions of each tribal group and their issues. This is especially important because the tribes vary geographically and socio-economically, and therefore have different issues.
- Margaret Park suggested that if the IRWM Plan needs to contain information that generalizes tribal issues, the CVRWMG should contact the state-level BIA representative (Doug Garcia) located in Sacramento, who has general knowledge of tribal issues in Coachella Valley. She noted that the Palm Desert BIA office only handles issues associated with the Agua Caliente tribal group, and that the Riverside BIA office manages tribal groups throughout Southern California.
- Margaret Park noted that most tribes have environmental staff that conduct groundwater quality and groundwater level monitoring. Much of this data is submitted to the United States Environmental Protection Agency (USEPA), and could possibly be collected through the USEPA.
- Margaret Park noted that most of the Agua Caliente tribal area is served by either DWA or CVWD for water and wastewater services. Further, she noted that information regarding the Agua Caliente’s development plans is easily accessible. Agua Caliente has agreements with the cities of Rancho Mirage, Cathedral City, and Palm Springs, such that the general planning documents for these cities include land use and zoning projections for the Agua Caliente tribal areas. Because this information about the tribe is made publically available, Urban Water Management Plans, planning documents, and CEQA documents contain population and land use projections that are accurate, and provided directly to municipalities from the tribe.
    - Margaret Park noted that she believes the Torres-Martinez tribal group is working on a similar agreement with the County of Riverside.
- Margaret Park indicated that it would help to have a template that provides an overview of the type of information the CVRWMG is looking to include in the IRWM Plan Update pertaining to the Agua Caliente tribe.
    - *RMC to create and send a template that outlines information that would be helpful to include in the IRWM Plan Update.*
- Major issues for the Agua Caliente tribal group have remained relatively constant, and include three primary points:
    - Agencies need to recognize the tribe’s water rights.
    - Concerns about TDS levels in Colorado River water, which is being pumped into ‘pristine’ water in the Coachella Valley Groundwater Basin.

- Concerns about a lack of transparency on behalf of local water agencies. It has been the tribe's experience that agencies request substantial tribal data, but will not provide their own data or information about modeling and model projections.

- Rosalyn Prickett noted that issues pertaining to the tribe's water rights – or any water rights –are not appropriate for the IRWM Plan Update, and will not be included in the IRWM Plan Update.
- Daniel Cozad noted that concerns pertaining to TDS in imported water supplies will be discussed in the Salt and Nutrient Management Planning (SNMP) Technical Evaluation for the IRWM Plan Update. Mr. Cozad encouraged Ms. Park to come to the SNMP workgroup meeting prepared to discuss potential policy drivers that would allow the tribe to request that TDS restrictions in the Coachella Valley Groundwater Basin are less than those required by the Basin Plan (set by the MCL for TDS). Further, he requested that Ms. Park consider what impacts are felt by the tribe pertaining to increased salt loading into the Coachella Valley Groundwater Basin. These topics will be of importance to discuss at the workgroup meeting.
- Rosalyn Prickett asked if there are any specific water supply or water quality concerns pertaining to disadvantaged communities within the Agua Caliente tribal area. Ms. Park noted that much of the Agua Caliente area is not considered economically disadvantaged, and because most of the area is served by CVWD and DWA, the issues are not necessarily critical. Ms. Park noted that she has heard of issues associated with economic hardship in connecting to the sewer system within the Cathedral Cove area of Cathedral City.

Next Steps

- The Salt and Nutrient Management Plan Workgroup will meet on August 22nd, and Margaret Park plans to attend.
- The next Planning Partners meeting will be held on September 13th, and Rosalyn encouraged Margaret Park to attend.

Coachella Valley Integrated Regional Water Management
Tribal Outreach Meeting

August 22, 2012
10:00 – 11:00 am

29 Palms Tribal EPA
47-250 Dillon Road
Coachella, CA 92236

DRAFT NOTES
Action items in italics

Attendance

Marshall Cheung, PhD, Tribal EPA	Daniel Cozad, IPM
Alison Millar, Environmental Scientist	Rosalyn Prickett, RMC

Meeting Objectives

- Provide Updates on the IRWM Program
- Discuss Upcoming Grant Opportunity
- Define Characterization to be Included in Plan Update

Agenda

Updates on Coachella Valley IRWM Program

- Rosalyn Prickett provided an overview of the IRWM Program, noting that the Coachella Valley IRWM Region is currently updating the existing IRWM Plan. Updates will include a series of technical evaluations and workgroups to receive input from stakeholders throughout the Plan Update process.
- Daniel Cozad provided an overview of the DAC Outreach Program that is being conducted in parallel with the IRWM Plan Update through a separate grant from DWR.

Proposition 84-Round 2 Grant Opportunity

- Rosalyn Prickett provided an overview of the Proposition 84 Round 2 Implementation Grant opportunity, including an estimate timeline based on the approximate due date for grant applications provided by DWR (March 2013).
- Why are no tribes on the CVRWMG?
    - Tribes are invited to participate on the Planning Partners, but the CVRWMG is currently comprised of water managers in accordance with DWR standards.

- Attendance at Planning Partners meetings does not mean that tribes necessarily agree with the outcomes of the IRWM Program. Suggest meeting with the 29 Palms tribal council.
    - *Marshall to coordinate meeting with tribal council to gauge their interest.*
- Can you add tribal participation in the Planning Partners in the grant application? Tribes need funding/stipend for tribal participation.
    - Any funding for tribal participation would be project specific.

Tribal Characterization in IRWM Plan Update

- Rosalyn Prickett provided an overview of the tribal characterization included in the existing IRWM Plan, noting that the RWMG received feedback that tribes would like to be characterized separately and not lumped together as one “tribal” group.
- Marshall Cheung indicated that a major issue is groundwater quality – the tribes want CVWD to treat Colorado River water before it is used to recharge the groundwater basin. The other major issue is groundwater quantity.
- 29 Palms tribe uses City of Coachella water and sewer services, but also monitors local groundwater wells. Willing to share groundwater data if CVWD does first.
- Tribal EPA has full surface water quality regulatory authority.
- Should the Salt and Nutrient Management Plan be incorporated into tribal documents as Tribal EPA authority?
    - No, Tribal EPA only has jurisdiction over surface water, not groundwater.
- Stakeholder is a bad word to the tribes due to past experience. The tribes tried to exert pressure during the Coachella Valley Water Management Plan, but were “just stakeholders.” They sent comment letters, which were not considered. The 2002 Plan was not fully implemented.
- Water quality is a right to the tribes – water needs to be good quality to be drinkable. Marshall Cheung is interested in the Salt and Nutrient Management Planning process.
    - *RMC to add Marshall Cheung to Salt and Nutrient Management Planning Workgroup list.*
- May need to go through formal government-to-government consultation process to engage the tribal council, possible through CVWD.
- *RMC to send template for tribal characterization to Marshall Cheung.*

Next Steps

- The Salt and Nutrient Management Plan Workgroup will meet on August 22nd, notes will be sent to Marshall, who will try to attend future meetings.
- The next Planning Partners meeting will be held on September 13th, and Rosalyn encouraged Marshall to attend.

Coachella Valley Integrated Regional Water Management
Tribal Outreach Meeting

September 11, 2012
10:00 – 11:00 am

Cabazon Band of Mission Indians
84-245 Indio Springs Drive
Indio, CA 92203

DRAFT NOTES
Action items in italics

Attendance

Becky Ross, Cabazon Band of Mission Indians

Jacquelyn Gonzales, Cabazon Band of Mission Indians

Daniel Cozad, IPM

Rosalyn Prickett, RMC

Crystal Mohr, RMC

Meeting Objectives

- Provide Updates on the IRWM Program
- Discuss Upcoming Grant Opportunity
- Define Characterization to be Included in Plan Update

Agenda

Updates on Coachella Valley IRWM Program

- Rosalyn Prickett provided an overview of the IRWM Program, noting that the Coachella Valley IRWM Region is currently updating the existing IRWM Plan. Updates will include a series of technical evaluations and workgroups to receive input from stakeholders throughout the Plan Update process.
- Daniel Cozad provided an overview of the DAC Outreach Program that is being conducted in parallel with the IRWM Plan Update through a separate grant from DWR.
- Becky Ross indicated that it would be beneficial to have a meeting with all of the tribes together. Also, she noted that there is a coalition of tribal interests – the Four Winds Coalition –that may be helpful to meet with.
    - *RMC to follow-up with Becky Ross on the Four Winds Coalition*
- Jacquelyn Gonzales indicated that she is going to the California Water Plan (CWP) Tribal Meeting.
    - *RMC to follow-up with Jacquelyn Gonzales regarding the CWP meeting.*

Proposition 84-Round 2 Grant Opportunity

- Rosalyn Prickett provided an overview of the Proposition 84 Round 2 Implementation Grant opportunity, including an estimate timeline based on the approximate due date for grant applications provided by DWR (March 2013).

Tribal Characterization in IRWM Plan Update

- Rosalyn Prickett provided an overview of the tribal characterization included in the existing IRWM Plan, noting that the RWMG received feedback that tribes would like to be characterized separately and not lumped together as one "tribal" group.
- Becky Ross indicated that the tribes see water as a resource, not as something that is somebody's property. This makes water-related issues difficult to address.
- Becky Ross indicated that groundwater quality is the key issue of concern throughout the Coachella Valley, and in particular recharge with Colorado River water and subsequent ammonium perchlorate issues. In addition, arsenic is of particular concern in the East Valley.
- Flooding is also a major issue for the tribe, particularly within the East Valley.
- The Cabazon resort has the ability to connect to Indio Water Authority or the Coachella Valley Water District for water services. Tribes are not subject to wastewater and water treatment standards applicable to California, which makes permitting for water and wastewater activities difficult for the tribes.
- A major current concern of the tribe is the issue in Mecca regarding the Cabazon Resource Recovery Park. Air Quality Control Board reports have shown no impact from tribal facilities, yet the tribes are still under fire by the media and the public. Are IRWM funds able to pay for public outreach efforts?
    - *Yes, IRWM funding can be used for public outreach efforts <u>associated with water management</u>. We would recommend that public outreach be completed as part of a larger project – public outreach alone is likely not substantial enough to be competitive for Proposition 84 funding.*
    - The East Valley population needs education regarding groundwater quality issues – many people are not aware that the groundwater is not safe to drink.
- Agriculture uses are a concern due to the agricultural community's use of Coachella Canal water (ammonium perchlorate) and the addition of other pollutants to the soil and therefore the groundwater. This is of particular concern in the East Valley where many groundwater wells are less than 800 feet deep, and therefore pump contaminated water. Finally, arsenic is of a concern due to potential anthropogenic causes – grapes grown in the Coachella Valley historically used arsenic for pest control.
- Jacquelyn Gonzales noted that the IRWM Plan should acknowledge the tribe's traditional ecological knowledge (TEK) and the value this provides to the Region. TEK can dictate tribes' interest and investment in certain issues. For example, protection of native plant populations.

- Other groups that were suggested to contact (particularly for DAC Outreach) include: Mecca (ICUC) and East Coachella Valley Coalition (EVC-IVAN).
- *Jacquelyn Gonzales to provide a write-up of TEK to include within the IRWM Plan Update.*
- *Becky Ross to ask Business Committee for groundwater data for IRWM Program.*
- *RMC to send tribal template for tribal excerpts to Becky Ross and Jacqueline Gonzales.*
- *RMC to send a "mission statement" and summary of the salt and nutrient management planning effort and its nexus with the IRWM Program to Becky Ross and Jacqueline Gonzales, for distribution to tribal council.*
- *RMC to send the Call-for-Projects email and website link to Becky Ross and Jacqueline Gonzales.*

Next Steps

- The Salt and Nutrient Management Plan Workgroup will meet on August 22nd; Rosalyn encouraged the Cabazon tribal group to send a representative.
- The next Planning Partners meeting will be held on September 13th; Rosalyn encouraged the Cabazon tribal group to send a representative.

Coachella Valley Integrated Regional Water Management Tribal Outreach Meeting

September 13, 2012
9:00-10:00 am

Torres-Martinez
Coachella Valley Water District
Training Facility
75-515 Hovley Lane East
Palm Desert, CA 92260

DRAFT NOTES
Action items in italics

Attendance

Debi Livesay, Torres-Martinez
Roland Ferrer, Torres-Martinez
Daniel Cozad, IPM
Diana Cozad, IPM
Rosalyn Prickett, RMC
Crystal Mohr, RMC

Meeting Objectives

- Provide Updates on the IRWM Program
- Discuss Upcoming Grant Opportunity
- Define Characterization to be Included in Plan Update

Agenda

Updates on Coachella Valley IRWM Program

- Daniel Cozad provided an overview of the IRWM Program, noting that the Coachella Valley IRWM Region is currently updating the existing IRWM Plan. Updates will include a series of technical evaluations and workgroups to receive input from stakeholders throughout the Plan Update process.
- Daniel Cozad provided an overview of the DAC Outreach Program that is being conducted in parallel with the IRWM Plan Update through a separate grant from DWR.

Proposition 84-Round 2 Grant Opportunity

- Daniel Cozad provided an overview of the Proposition 84-Round 2 Implementation Grant opportunity, including an estimate timeline based on the approximate due date for grant applications provided by DWR (March 2013).
- Debi Livesay indicated that the Torres-Martinez tribal group plans to submit a project for grant funding. The project would include water and sewer connections to the CVWD system from Avenue 62 to Avenue 64. This project would provide

services to the main community within the Torres-Martinez tribal lands, which is also a mapped disadvantaged community.

  - Torres-Martinez reports that there are water quality issues associated with ammonium perchlorate from Colorado River water. According to the tribe, the groundwater wells that are being used on the tribal lands are very close to recharge points, and are therefore highly impacted by ammonium perchlorate. This issue is a priority for the Regional Water Quality Control Board.
    - This project would shift tribal members to municipal supplies from groundwater wells.
    - *Debi Livesay will send sampling reports indicating levels of ammonium perchlorate to RMC.*
  - Torres-Martinez has a will-serve letter from CVWD to connect to the sewer system. Need to clarify how tribal members will pay for connection fees – potentially set up a payment plan with CVWD.
  - The timing of the projects needs to be worked out to ensure that it aligns with the Round 2 grant cycle. For timing purposes it may be appropriate to pursue the sewer project during Round 2, and the water supply project during Round 3.
  - *Debi Livesay will follow-up with Jonathan Rash of Indian Health Services next week regarding additional engineering information for the water supply component, and will follow-up with RMC to determine if additional support is needed.*
  - *Debi Livesay will determine if appropriate matching funds are available for the proposed Torres-Martinez projects.*
  - *RMC will have internal discussions to determine the appropriate engineer that could provide DAC technical support to the Torres-Martinez group for their proposed projects.*
- Debi Livesay also expressed concern for stormwater and sewer capacity issues within Salton City, which could potentially be addressed with the assistance of Proposition 84 grant funding. She indicated that any project in this area would need engineering support.

Tribal Characterization in IRWM Plan Update

- Rosalyn Prickett provided an overview of the tribal characterization included in the existing IRWM Plan, noting that it is important to characterize the issues faced by the Region because that helps to lay the groundwork for the Region's needs – this process helps to determine which projects within the IRWM Plan can fulfill the Region's most pressing needs.
- Debi Livesay noted that flooding and stormwater are key issues, and the Torres-Martinez tribe has no money to address these issues. CVWD intends to review issues associated with flooding from what is referred to as the "Oasis Slope," in

order to better understand this flooding issue. The tribe is working with the Army Corps of Engineers, who is able to provide modeling support, but still needs additional funding to address flooding.

    - Rosalyn Prickett suggested that the Torres-Martinez consider Proposition 1E funding, which provides grant funding for stormwater and flood projects.
    - *Debi Livesay to provide an overview of flooding locations and issues within the Torres-Martinez tribal lands; this information will be provided after it is reviewed by the tribal council.*

- Water quality data compiled by Tribal EPA is collected on the national EPA website. The contact person for this information is Helen McKinley.
- *RMC to create a template that outlines information that would be helpful to include in the IRWM Plan Update. RMC will send the template to Debi Livesay.*

Next Steps

- The next Salt and Nutrient Management Plan Workgroup will meet on September 26th, and Torres-Martinez representatives are encouraged to attend.

Coachella Valley Integrated Regional Water Management Tribal Outreach Meeting

September 13, 2012
3:00-4:00 pm

Augustine
Coachella Valley Water District
Training Facility
75-515 Hovley Lane East
Palm Desert, CA 92260

AGENDA

Attendance

Les Ramirez, Augustine Band of Cahuilla Indians

Daniel Cozad, IPM
Diana Cozad, IPM
Rosalyn Prickett, RMC
Crystal Mohr, RMC

Meeting Objectives

- Provide Updates on the IRWM Program
- Discuss Upcoming Grant Opportunity
- Define Characterization to be Included in Plan Update

Agenda

Updates on Coachella Valley IRWM Program

- Rosalyn Prickett provided an overview of the IRWM Program, noting that the Coachella Valley IRWM Region is currently updating the existing IRWM Plan. Updates will include a series of technical evaluations and workgroups to receive input from stakeholders throughout the Plan Update process.
- Daniel Cozad provided an overview of the DAC Outreach Program that is being conducted in parallel with the IRWM Plan Update through a separate grant from DWR.
- Les Ramirez noted that from the Augustine tribe's point of view, the value of IRWM is participating in a larger discussion of water issues in the Coachella Valley.
- Les Ramirez indicated interest in the salt and nutrient management planning effort, and would be particularly interested if meetings were available via webcast/ teleconference. The tribe is concerned with 3 key issues related to water quality:
    - the salts in agricultural tail water,
    - the water quality of Colorado River water being used for recharge, and

- the fact that the Region's high-quality aquifer is being degraded by TDS.

- *RMC to add Les Ramirez to the Salt and Nutrient Management Workgroup meeting invitation.*

Proposition 84-Round 2 Grant Opportunity

- Rosalyn Prickett provided an overview of the Proposition 84 Round 2 Implementation Grant opportunity, including an estimate timeline based on the approximate due date for grant applications provided by DWR (March 2013).
- Les Ramirez indicated that the Augustine tribe is not interested in applying for Proposition 84 funding – tribal issues can be addressed with the tribe's own resources. He also indicated that the tribe could potentially be interested in providing support to DACs – in general, the tribe sees the importance and value of being a good neighbor to those in Coachella Valley.

Tribal Characterization in IRWM Plan Update

- Rosalyn Prickett provided an overview of the tribal characterization included in the existing IRWM Plan, noting that the RWMG received feedback that tribes would like to be characterized separately and not lumped together as one "tribal" group.
- Les Ramirez provided his thanks for the separate tribal meetings, indicating that it is important for the tribes to individually provide their own information.
- Les Ramirez explained the tribe's perspective on the salt and nutrient issue, noting that any litigation would not be fruitful because it would focus on groundwater quantity not quality. There needs to be an operational solution to the issue, which needs to be established with the CVRWMG agencies to better manage the basin and preserve water quality.
    - Why should the region pay to address the issue (treating TDS and ammonium perchlorate from Colorado River water) when it is only a few agencies that are causing the issue?
    - In addition, it seems more logical to treat water before it is pumped into the groundwater, rather than requiring all individual users to treat the water before it is used.
- As far as the tribe's water supply, the tribe has its own water supply through groundwater wells. Wastewater is sent to CVWD's system.
- The Whitewater River is adjudicated – Augustine has rights that are not quantified. However, groundwater is not adjudicated, so there is a need to find ways to address mutual issues together, for all users. From the tribe's perspective, they want to find a way to maintain the reservation as a homeland for their people in perpetuity – this requires usable groundwater (quality and quantity).
- The tribe is concerned with how salts that accumulate in soils are flushed for agricultural purposes. Flushing is necessary to maintain some crops, but may exacerbate issues in the Salton Sea. The tribe's focus is being fair with respect to these issues, and understanding how they may contribute to any resolution.

- The tribe is also concerned with discharges to the Salton Sea. Discharges are required to maintain levels in the Salton Sea, however agricultural water discharges continue to impact the sea's water quality. With regards to the Salton Sea, the main issue is how to permit discharges of salts to the Salton Sea.
- There is an inherent conflict between the Winter's Doctrine and California water law. The Winter's Doctrine states that tribes do not have to use their water rights, these rights are in reserve. However, California has a "use it or lose it" water law system.
- The tribe is not able to share data – this information is held in the tribal trust.
- In general, Augustine is interested in seeking a rational approach to Coachella Valley water management, and would like to be proactive instead of reactive.
- The tribe is concerned with flooding issues along Avenue 54 and Harrison Avenue. Need to identify appropriate structural improvements.
- The tribe is also concerned with the quality of stormwater runoff; will work with the City of Coachella to address safety, roadway improvements, and the intersection of roadway/runoff stormwater collection and CVWD's regional stormwater system.

Next Steps

- The Salt and Nutrient Management Plan Workgroup will meet on September 26th, and Les Ramirez is interested in attending if available via webinar.

Coachella Valley Integrated Regional Water Management Tribal Outreach Meeting

October 22, 2013
9:00 – 11:00 am

Coachella Valley Water District
75-515 Hovley Lane East
Palm Desert, CA

DRAFT NOTES
Action items in italics

Attendance

Margaret Park, Agua Caliente Band of Cahuilla Indians
John Soulliere, MSWD
Katie Ruark, DWA
David Tate, DWA
Mark Krause, DWA
Sara Toyoda, IWA
Castulo Estrada, CWA
Daniel Cozad, IPM
Crystal Mohr, RMC

Meeting Objectives

- Provide Updates on the IRWM Program
- Discuss Draft Tribal Water Resources Chapter
- Announce Upcoming Meetings and Opportunities to Comment on the IRWM Plan

Agenda

Updates on Coachella Valley IRWM Program

- Daniel Cozad provided an overview of the IRWM Program, noting that the Coachella Valley IRWM Region is currently wrapping up the update to the existing IRWM Plan.
- Mr. Cozad provided a brief overview of the series of technical evaluations and workgroups that were conducted to receive input from stakeholders throughout the Plan Update process. Mr. Cozad also provided an overview of the DAC Outreach Program that is being conducted in parallel with the IRWM Plan Update through a separate grant from DWR. The DAC Outreach Program will be complete by the end of 2013, and the final 2014 IRWM Plan Update will be finalized in early 2014.
- Mr. Cozad also noted that in their draft Proposition 84-Round 2 Implementation Grant awards, DWR recommended that the Coachella Valley IRWM Region receive 100% of their funding request. If the Region is awarded this full grant amount, a portion of the grant will go to the Torres-Martinez Tribe to extend a water pipeline to a housing subdivision within their Reservation.

Discuss Draft Tribal Water Resources Chapter

- Crystal Mohr provided an overview of the draft Tribal Water Resources Chapter that was sent out to the Region's Tribal Nations for pre-review. The purpose of the chapter is to include a synthesis of information pertaining to Tribal Water Resources. This chapter, in essence, includes a synthesis of the Tribal-related information in the Region Description and Issues and Needs Chapters, but at a greater level of detail than in the 2010 IRWM Plan. This approach was also taken for the Disadvantaged Communities, and there will also be a stand-alone chapter in the 2014 IRWM Plan Update to discuss disadvantaged communities and their issues and needs.
- Ms. Mohr then went through the chapter, explaining the various sections and their purpose as well as how they correspond to other chapters of the IRWM Plan.
- Katie Ruark noted that she thinks the Tribal Water Resources Chapter needs to explain the nexus that Tribes have to land use planning. If this information is not in the Tribal Water Resources Chapter, it should be in the Agency Coordination Chapter.
- Margaret Park asked why Table 5-1 specifically calls out ethnology and language.
    - The Twenty-Nine Palms Band of Indians had specifically noted that they are often mistaken as being ethnically Cahuilla, when in fact they are Chemehuevi. We called this information out in the table to highlight the different Tribes' ethnicities.
- Katie Ruark asked if Section 5.3.5 regarding the Torres-Martinez Tribe could include more information about the Tribe's wetlands along the Salton Sea. It is unclear who is responsible for the wetlands, what other agencies are involved, and what the water rights are associated with the wetlands.
    - *RMC will contact Debi Livesay of the Torres-Martinez Tribe for input on this question.*
- Margaret Park asked if the Tribal Water Resources Chapter could clarify that the one-on-one meetings held in 2012 with the Tribal Nations were with tribal staff and not with Tribal Council.
- Margaret Park asked why the Tribal Water Resources Chapter had a specific call-out for the California Water Plan Update.
    - This information was included, because it is an adopted water-related planning document that has information about tribal water resources, and therefore was used as a reference document. In addition, because the IRWM Plan will be ultimately sent to DWR (and is funded through a DWR grant), it seemed appropriate to acknowledge DWR's planning efforts related to tribal water resources.
- Margaret Park noted that she will be sending new information for Section 5.3.1 regarding the Agua Caliente Tribe.
- Mark Krause asked Ms. Park if she will send information about the Tribe's management or plans to manage surface water resources.
    - Ms. Park stated that the content for Section 5.3.1 is still in development, and she did could not speak to the precise content.
- David Tate asked if the asterisks on Page 5-1 of the chapter could be reversed to only highlight the Tribe who is not involved in the IRWM planning process.

Next Steps

- Mr. Cozad thanked Ms. Park and the rest of the meeting attendees for participating, and noted that there are several upcoming items to be aware of:
  a. Public Comment Period for 2014 IRWM Plan Update: Nov. 4th – Dec. 31st
  b. Final Disadvantaged Communities Workshop:
     i. November 6th 10:00 am – 12:00 pm
     ii. Please RSVP to cmohr@rmcwater.com or (858) 875-7421
  c. Public Workshop on the IRWM Plan: November 6th (1-3 pm)

Coachella Valley IRWM Outreach – Fall 2013/Winter 2014

During Fall 2013 and early Winter 2014, CVRWMG representatives made presentations on the IRWM Program to a number of stakeholder groups in the Coachella Valley and surrounding region. To improve attendance and reduce meeting fatigue, these presentations were included as an agenda item at regular meetings held by the stakeholder groups, and were not separate meetings hosted by the CVRWMG.

	Date	Meeting Title	Time	Location	Presenter
2013	November 5	Coachella Valley Irrigated Lands Coalition	1:30pm – 2:30pm	Peter Rabbit Farms 85810 Peter Rabbit Lane, Coachella, CA 92236	Patti Reyes, CVWD
	November 7	Desert Valley Builders Association – Legislative Affairs Forum	7:30 a.m.	City of Rancho Mirage 69-825 Highway 111, Rancho Mirage, CA	John Soulliere, MSWD
	November 13	MS4 Desert Task Force	9:00 a.m.	Palm Desert Administrative Conference Room 73-510 Fred Waring Drive, Palm Desert, CA	Berlinda Blackburn, CWA; Sara Toyoda, IWA
	November 14	Regional Water Quality Control Board	9:00a.m., after hearing items	RWQCB Offices 73-720 Fred Waring Drive, Suite 100, Palm Desert, CA 92260	Katie Ruark, DWA
	November 14	CVAG Energy/Environmental Resources Workgroup	12 p.m.	CVAG Offices 73-710 Fred Waring Drive, Suite 119, Palm Desert, CA 92260	Katie Ruark, DWA
	November 19	CVAG Technical Advisory Committee	11:30 a.m.	CVAG Offices 73-710 Fred Waring Drive, Suite 119, Palm Desert, CA 92260	Sara Toyoda, IWA
	December 4	County Planning Commission	9 a.m. – 1 p.m.	County Administration Center 4080 Lemon Street, 1st Floor Board Chambers Riverside, CA 92501	Patti Reyes, CVWD
2014	January 13	Coachella Valley Housing Review Committee	3 p.m. – 5 p.m.	45-701 Monroe Street, Suite G Indio, CA 92201	Patti Reyes, CVWD

Appendix VI-E: Public Outreach and Involvement Plan and Disadvantaged Communities Outreach Plan

This appendix contains the Public Outreach and Involvement Plan that was created for the 2018 Coachella Valley Integrated Regional Water Management (IRWM)/Stormwater Resource (SWR)Plan. It also includes the DAC Outreach Plan as a subsection of the Public Outreach and Communications Plan.

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Public Outreach and Involvement Plan

Coachella Valley Integrated Regional Water Management (IRWM) & Stormwater Resources (SWR) Plan Update

Prepared for:	Coachella Valley Regional Water Management Group Coachella Valley Planning Partners
Prepared by:	Rosalyn Prickett, Becky McDonnell
Reviewed by:	Alexis Cahalin, Enrique Lopezcalva
Date:	September 26, 2017
Reference:	0574-002.00

1 Introduction

The Coachella Water Authority (CWA), Coachella Valley Water District (CVWD), Desert Water Agency (DWA), Indio Water Authority (IWA), Mission Springs Water District (MSWD), and Valley Sanitary District (VSD) – collectively referred to as the Coachella Valley Regional Water Management Group (CVRWMG) – have established an Integrated Regional Water Management (IRWM) Program consistent with guidelines established by the California Department of Water Resources (DWR). The IRWM planning process is intended "to coordinate and share information concerning water supply planning programs and projects and other information, and to improve and maintain overall communication among the Members involved" (from Section 4.1.1 of the August 2014 MOU). This effort addresses the Coachella Valley IRWM Region boundaries initially identified through DWR's Region Acceptance Process and updated through the *2018 IRWM/SWR Plan Update*. DWR recently released *2016 IRWM Program Guidelines*, which prompted the current *IRWM/SWR Plan Update*.

The State Water Resources Control Board (SWRCB) recently established the Storm Water Grant Program (SWGP), which requires agencies to develop Storm Water Resource Plans (SWRPs) to be eligible for grants for stormwater and dry weather runoff capture projects. As part of the program, the SWRCB adopted guidelines to assist agencies in developing adequate SWRPs. The SWRP must address the requirements listed in the California Water Code (CWC) and be developed in accordance with the SWRCB's *2015 SWRP Guidelines*. The Guidelines encourage collaborative partnerships among water supply and stormwater agencies, non-governmental organizations, and other water utilities in managing stormwater as a resource. Per the Guidelines, certain existing planning documents and ordinances may be used as a "functionally equivalent Plan" in lieu of a separate SWRP. Thus, the CVRWMG has decided to prepare a functionally-equivalent SWRP in combination with the IRWM Plan Update.

The CVRWMG is continuing its established stakeholder outreach process to achieve the following goals:

- Support development and adoption of the *IRWM/SWR Plan Update*, which will meet the *2016 IRWM Program Guidelines* established by DWR and the *2015 SWRP Guidelines* established by SWRCB,
- Build awareness that storm water and dry weather runoff projects may be underutilized water sources and identify potential projects, and
- Maintain support among key stakeholders and public for the IRWM Program, grant processes, and plan implementation.

In addition to supporting the integrated management of water resources in the region, the *IRWM /SWR Plan Update* will maintain the Coachella Valley IRWM Region's ability to receive grant funding through

Proposition 1 and other sources. A proactive approach to implementing public outreach and information dissemination will assist the CVRWMG in generating broad-based support for the effort. This Public Outreach and Involvement Plan identifies a variety of outreach mechanisms to improve general awareness of the Coachella Valley IRWM program and provide means for all interested parties to stay engaged during the planning process and plan implementation.

Table 1 contains a summary of the near-term outreach activities planned for the *IRWM/SWR Plan Update.* Update to eight (8) Planning Partners meeting may be conducted during the planning process; note that only five (5) Planning Partners meetings are shown in the preliminary list below.

Table 1: Summary of Outreach Activities for *2018 IRWM Plan/SWRP Update*

Activity	Anticipated Date	Discussion / Topic
Website	Ongoing	Monthly updates
Stakeholder email list, including DACs/EDAs	Ongoing	Regular updates/announcements, as needed
Online Project Database (OPTI)	Ongoing	Always open for project proponents to add/edit projects and review other projects in region Online access to User guide
Outreach Flyers	As Needed	To advertise meetings/workshops, Call for Projects, and release of *IRWM/SWR Plan Update*
Planning Partners Meeting	Sept 28, 2017	Kick-off *IRWM/SWR Plan Update* Gather info on potential projects that will be submitted
Planning Partners Meeting	January 2018	Discuss watershed characterization, Plan objectives, and scoring criteria Provide OPTI tutorial for next round of funding
Call for Projects	February 2018	Open Call for Projects for inclusion in *IRWM/SWR Plan Update*
Planning Partners Meeting	March/April 2018	Export project list and scoring from OPTI Discuss benefits analysis/calculator
Public Workshop/ Planning Partners Meeting	May 2018	*IRWM/SWR Plan Update* – Public Review Draft
Public Comment Period	May – June 2018	Accept comments on Public Review Draft
Planning Partners Meeting	September 2018	Present *IRWM/SWR Plan Update* - Final

This Public Outreach and Involvement Plan is organized into the following components:

- Stakeholder Coordination and Public Involvement
- Disadvantaged Communities (DAC) Outreach
- Tribal Outreach and Coordination

This Plan may be updated as needed throughout the IRWM planning process as stakeholder outreach and communication methods are refined.

2 Stakeholder Coordination and Public Involvement

2.1 Purpose

The goal of stakeholder coordination is to provide a means for the Region's various entities with interests and/or authority over water management to maintain an active level of involvement in the IRWM program and plan implementation. These entities have a vested interest in local water resources and can assist in articulating the needs of the Region and their membership during the planning phase, as well as implementing water management projects in the future. Opposition to the *IRWM/SWR Plan Update* by entities with water management authority could present a significant obstacle to plan implementation if these groups are not given ample opportunity to contribute to the definition of and approach to addressing regional priorities.

The goal of public involvement is to increase awareness, understanding, and support for the Coachella Valley IRWM Plan and associated SWRP among the general public. The benefits of keeping the general public informed of the IRWM Program and *IRWM/SWR Plan Update* include educating constituents and politicians about the importance and interrelation of water management strategies, increasing regional as well as local support for projects, and generating broad-based support for continued regional coordination. Stakeholders from throughout Coachella Valley can provide leadership, innovation, and expertise in planning and conducting water management (including stormwater) projects that benefit local communities.

2.2 Participants

All interested stakeholders and members of the general public are invited to maintain coordination with the CVRWMG and Coachella Valley IRWM Program.

Individuals representing the following groups have been identified as potential stakeholders:

- State, county and municipal governments
- MS4 Copermittees
- Community councils
- Environmental conservation and natural resources organizations
- Resource agencies and special interest groups
- Flood control districts
- Farm Bureau and agricultural interests
- Academic institutions
- Regional planning organization
- Stormwater management agencies
- Desert Task Force
- Wastewater and water agencies
- School districts
- Private pumpers and large landscape irrigators
- Disadvantaged and environmental justice communities
- Elected officials
- Native American Tribes
- Recreational interests
- Regulatory agencies
- Development community

Interested members of the general public may include:

- Private homeowners or landowners
- Landscape architects and contractors
- Chambers of Commerce
- Commercial, industrial, and residential developers
- Home owners associations
- Garden clubs and organizations
- Rotary clubs and other service clubs

Outreach to the general public, plus the above groups, will be conducted to solicit multi-benefit stormwater projects and to provide guidance to develop/prioritize projects that offer greatest benefits targeting regional and watershed priorities. **Table 7** (at the end of this Plan) lists of all Coachella Valley IRWM Region stakeholders. All stakeholders identified by the CVRWMG and Planning Partners (discussed below) have been contacted and invited to participate in the program.

2.2.1 Planning Partners

One of the first steps in soliciting public involvement was to establish a list of key stakeholders that can serve in an advisory capacity. This advisory group, otherwise known as the Planning Partners, were established early in the IRWM planning process to help the CVRWMG identify the preliminary list of critical water resources issues that should be the focus of early stakeholder meetings. The Planning Partners consist of CVRWMG partners and other stakeholders in the region, including the County of Riverside, Coachella Valley cities, special districts, public agencies, non-governmental organizations, and Tribal Nations.

The Planning Partners played a valuable role in shaping key elements of the *2010* and *2014 IRWM Plans*, such as helping to establish goals and objectives, developing prioritization criteria for projects, reviewing and weighing in on draft Plan chapters, and implementing Plan activities. The Planning Partners will continue to play an important role in the development of the *IRWM/SWR Plan Update.* The *2015 SWRP Guidelines* requires plans to provide for and document community participation in the plan development and implementation. The *IRWM/SWR Plan Update* will achieve this by involving the Planning Partners in the watershed characterization, benefits quantification, and new prioritization criteria for storm water projects. The goal of the Planning Partners is balanced membership and participation from representatives of all significant water resource issue areas in the Valley. **Table 2** below provides a current list of the Planning Partners; however, additional Planning Partners may be added as the IRWM Program evolves.

Planning Partners meetings will take place on a quarterly basis, as needed. The agenda for these meetings will be set by the content for the development of the relevant stage of the IRWM Program and the needed materials, information, feedback, and recommendations from the Planning Partners. Meetings will be held regularly, and will be focused on discussing key program milestones, including project solicitation and prioritization and development of the *IRWM/SWR Plan Update*. Meetings are generally held during business hours in a central location to allow for participation by stakeholders throughout the Coachella Valley. As appropriate, meetings may be located in disadvantaged areas to facilitate attendance by members of the general public.

The Planning Partners are the primary advisory group for development of the *IRWM/SWR Plan Update* and other phases of the IRWM Program. They are involved with all facets of Plan development and implementation. They comprise many of the project submissions and are therefore essential to plan implementation. Planning Partners also provide support for public outreach efforts. The general public who may wish to participate in the IRWM planning process may contact their city and district representatives of the Planning Partners, and may interact with any member of the Planning Partners that they wish.

Table 2. Coachella Valley Planning Partners

No.	Agency / Organization
CVRWMG	
1	City of Coachella/Coachella Water Authority
2	City of Indio/Indio Water Authority
3	Coachella Valley Water District
4	Desert Water Agency
5	Mission Springs Water District
6	Valley Sanitary District
Planning Partners	
1	Agua Caliente Band of Cahuilla Indians
2	Augustine Band of Cahuilla Indians
3	Annenberg Trust at Sunnylands
4	Borrego Water District
5	Building Healthy Communities
6	Cabazon Band of Mission Indians
7	California Department of Water Resources
8	California Department of Housing and Community Development
9	California Rural Legal Assistance, Inc.
10	California State University - San Bernardino
11	Center for Collaborative Policy
12	City of Cathedral City
13	City of Desert Hot Springs
14	City of Palm Desert
15	City of Palm Springs
16	City of Rancho Mirage
17	Clean Water Action
18	Clinicas de Salud
19	Coachella Valley Association of Governments
20	Coachella Valley Economic Partnership
21	Coachella Valley Housing Coalition
22	Coachella Valley Mosquito and Vector Control District
23	Colorado River Regional Water Quality Control Board
24	County of Riverside
25	Desert Alliance for Community Empowerment
26	Desert Edge Community Council
27	Desert Empire Homes
28	Desert Healthcare District
29	Desert Highland Gateway Health & Wellness
30	East Valley Housing Review Committee
31	El Sol Neighborhood Educational Center
32	Environmental Justice Coalition for Water
33	Friends of the Desert Mountains

No.	Agency / Organization
34	Hi-Lo Desert Golf Association
35	Imperial Irrigation District
36	Leadership Counsel for Justice and Accountability
37	Lideres Campesinas
38	Mojave Water Agency
39	Morongo Band of Mission Indians
40	Natural Science Collaborative of the Desert Region
41	Pueblo Unido Community Development Corporation
42	Representative from Assemblymember Garcia
43	Representative from Senator Jeff Stone
44	Representative from Assemblymember Chad Mayes
45	Representative from Supervisor V. Manuel Perez
46	Riverside County Flood Control and Water Conservation District
47	Riverside County Economic Development Agency
48	Rural Community Assistance Corporation
49	Salton Community Services District
50	San Gorgonio Pass Water Agency
51	Torres-Martinez Desert Cahuilla Indians
52	Twenty-Nine Palms Band of Mission Indians
53	University of California – Irvine
54	University of California - Riverside
55	U.S. Bureau of Indian Affairs
56	U.S. Department of Agriculture

2.2.2 Issues Groups

The Coachella Valley IRWM RAP presented many issue areas that were important to the stakeholders in the Coachella Valley and established separate, formal Issues Groups to address them. The format of these Issues Groups was originally envisioned as formal workgroups with specific leadership, terms, meeting, and other governance requirements. Instead, key planning issues have been addressed in an informal manner through ad-hoc Issues Groups – where a specific planning topic was addressed through 2-3 meetings and then the group was disbanded. This revised format was implemented due to low stakeholder turnout at Issues Groups meetings and was revised to increase participation in critical decisions.

In total, four Issues Groups have been formed: Disadvantaged Communities (DAC), Native American Tribes, Salt and Nutrient Management Planning (SNMP), and Integrated Flood Management (IFM). No additional Issues Groups are anticipated at this time; however, they may be implemented ad-hoc if the need arises during the *IRWM/SWR Plan Update*.

DAC Issues Group

DAC needs and issues were identified as special and different than other groups at the initiation of planning efforts. The DAC Issues Group meetings began in May 2010 and concluded in January 2014. **Table 3** indicates the principal organizations that were represented the meetings.

Table 3: DAC Issues Group Participants

Organization
California Rural Legal Assistance, Inc.
Clean Water Action
Community Water Center
Desert Alliance for Community Empowerment
Desert Edge Community Council
El Sol Neighborhood Educational Center
Environmental Justice Coalition for Water
Loma Linda University
Pueblo Unido Community Development Corporation
Poder Popular
Representative from Assemblymember Perez

Native American Tribes Issues Group

The Native American Tribes Issues Group that was active during development of the *2010 IRWM Plan* brought specific issues of cultural water use and special needs related to sovereign tribes in the Region. Like other Valley users, the tribes are concerned about regional water issues such as groundwater supply and quality. Tribal principals, as well as representatives the U.S. Bureau of Indian Affairs, were included in this Issues Group. **Table 4** indicates the organizations that participated in the Native American Tribes Issues Group.

The Native American Tribes Issues Group met several times in 2010, and was re-contacted in 2012 as part of the *2014 IRWM Plan Update* process. While tribal members met together as an Issues Group during development of the *2010 IRWM Plan*, tribal members requested that the CVRWMG hold separate meetings with each tribe to discuss the *2014 IRWM Plan Update*. One meeting was held with each tribe during development of the *2014 IRWM Plan Update* to gain feedback and information for the Plan. In the future, the Native American Tribes Issues Group may meet to discuss tribal-related water resources issues or as future items arise such as future rounds of grant funding.

Table 4: Native American Tribes Issues Group Participants

Organization
Agua Caliente Band of Cahuilla Indians
Augustine Band of Mission Indians
Cabazon Band of Mission Indians
Morongo Band of Mission Indians
Torres-Martinez Desert Cahuilla Indians
Twenty-Nine Palms Band of Mission Indians
Bureau of Indian Affairs
Indian Health Services
Tribal Environmental Protection Agency

SNMP Issues Group

The SNMP Issues Group met from August to November 2012, during development of the *2014 IRWM Plan Update*, to develop the work plan for the Region's Salt and Nutrient Management Plan. The group discussed salinity management strategies, direction received from the Regional Water Quality Control Board, and work plan elements. **Table 5** lists the organizations that participated in the SNMP Issues Group, in addition to the CVRWMG members.

Table 5: SNMP Issues Group Participants

Organization
Regional Water Quality Control Board
Agua Caliente Band of Cahuilla Indians
Augustine Band of Mission Indians
Hi-Lo Desert Golf Course Superintendent's Association
Myoma Dunes Water Company
Salton Community Services District
General Public (Farmer)

IFM Issues Group

The IFM Issues Group met from January to September 2013, during development of the *2014 IRWM Plan Update*, to identify common flooding problems/sources, deficiencies in existing storm water/drainage facilities, and multi-benefit project opportunities. **Table 6** lists the organizations that participated in the IFM Issues Group, in addition to the CVRWMG members.

Table 6: IFM Issues Group Participants

Organization
Coachella Valley Mosquito and Vector Control District
Agua Caliente Band of Cahuilla Indians
Coachella Valley Association of Governments
City of Cathedral City
City of Desert Hot Springs
City of Rancho Mirage
County of Riverside, Supervisor Benoit
County of Riverside, Transportation Department
Salton Community Services District
Pueblo Unido Community Development Corporation

2.3 Outreach Activities

CVRWMG believes that public access is critical to the success of the IRWM Program. The CVRWMG has taken a strategic approach to public outreach using the following tactics:

A. Develop an initial public outreach plan that can be executed by any combination of agency staff or consultants.

B. Determine best management practices for the dissemination of information for public review and input (e.g. print media, agency public information personnel, email and website).

C. Make suggestions for establishing public meetings or reformatting of current meeting schedules to enhance public participation.

D. Refine the timeline for the IRWM process in such a way that appropriate dates for notification of public meetings, workshops, sub-committee meeting, etc. can be documented and addressed in a logical and orderly manner.

E. Apprise the members at each meeting, and sooner if necessary, as to the issues and needs for supporting public outreach.

The public is notified of meetings and given specific contact information, and participants are given sufficient time to prepare. The first opportunity for the public to attend IRWM program meetings was concurrent with the RAP application in October 2009. Since 2009, Planning Partners, Issues Groups, and public meetings have been held at various times and in conjunction with various milestones and phases of the IRWM Program.

Workshops are the core of stakeholder and public participation. Initial stakeholder workshops were aimed at formulation of interest groups for more specific development of concepts and funding proposals. The public workshops and Issues Groups are organized to help guide the actions and policies of the CVRWMG and support plan development and implementation. The CVRWMG recognizes the need and importance of public participation and will work diligently to make sure that not only the public is listened to, but that its valuable advice helps create the best IRWM Program possible for the region.

Public Workshops

Public workshops have, and will continue to be, conducted to enable stakeholders and the general public to help guide the actions and policies of the CVRWMG, as well as support the development of future phases of the IRWM Program. Public workshops may be held at variable times of day as needed and in different geographic locations within the Region. As appropriate, meetings will be located in disadvantaged areas to facilitate attendance by members of the local public. Email notifications and telephone calls targeting DACs and EDAs will encourage participation in public workshops.

A public workshop is planned during the *IRWM/SWR Plan Update* to present the draft plan and solicit stakeholder and public feedback on its contents. Workshop preparation will include advertising on the website and through the existing stakeholder communication list, as well as other media to encourage public participation. Additional preparation will also include public meeting notices and invitations, development and distribution public workshop presentations, meeting handouts and notes, distribution of comment/feedback questionnaires, and compilation and summarization of public responses obtained during the workshops.

Website

A Coachella Valley IRWM website (http://www.cvrwmg.org/) was developed as a key component of the regional outreach program. The website contains a wealth of information about the IRWM Program, including: explanation of the IRWM Program and funding opportunities; issues identification, goals and objectives, and other planning materials; the adopted *2010 IRWM Plan*; the adopted *2014 IRWM Plan Update*; information about potential IRWM projects to be included in grant applications; information about the CVRWMG; Planning Partners and Issues Group meeting agendas, summaries, and presentations; and other helpful links. Materials related to the planning process the complete *IRWM/SWR Plan Update* will be uploaded to the website once final. The website continues to be updated and amended on a monthly basis as the IRWM Program continues.

Newsletters

Information regarding upcoming meetings may be relayed to the general public via fliers posted at community facilities, city and county office buildings, and announcements published in local media and organizational newsletters. An electronic newsletter may be produced at major milestones of the IRWM program, as needed to ensure stakeholders are being engaged.

Press Releases

The CVRWMG will encourage local newspapers to provide coverage of meetings or to provide updates on the progress of IRWM planning efforts. Media relations provide a credible and economic approach to achieving widespread dissemination of key project information. Studies show that information presented to the public through a third party, such as the media, is more readily believed by the public, as opposed to advertising or other methods of information coming directly from the source. Press releases may be distributed quarterly or in conjunction with major milestones of the IRWM Program, including an open call for projects and *IRWM/SWR Plan Update* approval, as well as other important junctures.

Online Project Database

To facilitate communications among planners and project proponents, the CVRWMG has developed an online project database that provides universal access to information about IRWM projects in the Coachella Valley region. The project database allows project proponents and other interested parties to add, edit, and review project proposals throughout the region. This tool will be updated to accommodate projects for the SWRP, as well to provide a single clearinghouse for both sets of projects. The enhancements will include updating project input forms for the additional SWRP information needs, map-based visualizations of projects, project search and reporting tools, and other advanced queries. Trainings for users will be available, as well as an updated user guide.

This enhanced tool, coupled with the public workshop, is intended to connect stakeholders with one another to identify and enhance synergies among projects, hopefully leading to better integration and stronger partnerships. Having a "living" project list online also allows project sponsors to edit and refine their projects to maximize multi-benefit outcomes. Finally, the online project database will enhance CVRWMG efforts to inform the general public about collaborative IRWM and SWRP approaches through concrete project examples.

Correspondence

An electronic email list of stakeholders and interested parties, and any special subgroups, will be maintained and updated throughout the *IRWM/SWR Plan Update* process. Email notices, the primary method of communication, will be sent to announce the availability of new materials on the website, meeting notes, and upcoming meetings.

3 Disadvantaged Communities Outreach

There are several terms that are used in referencing disadvantaged communities throughout this Outreach Plan. A Disadvantaged Community (DAC) is defined as a community with an annual median household income of that is less than 80% of the statewide annual median household income. Environmental Justice (EJ) is defined as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." An Economically Distressed Area (EDA) is a community with a population of 20,000 persons or less, a rural county, or a reasonably isolated and divisible segment of a larger community where the segment of the population is 20,000 persons or less, with a median household income of less than 85% of the statewide median household income, and with one or more of the following conditions: (1) financial hardship, (2) unemployment rate at least 2% higher than the statewide average, and/or (3) low population density. [1]

3.1 Purpose

The goal of DAC outreach is to identify and obtain input from groups that may be otherwise restricted from participating in the IRWM planning and implementation efforts due to financial constraints. Through targeted outreach, the CVRWMG has sought to learn more about the major water-related concerns facing these groups such that long-term implementation of the IRWM Program is responsive to those needs. Outreach to organizations also involved with EJ issues ensures that water management activities implemented under the Coachella Valley IRWM Program do not unduly burden DACs (e.g., through plant siting decisions). Involvement by DAC and EDA stakeholders in the SWRP development process is also essential to ensure that environmental injustice within local watersheds is addressed.

Regional DAC outreach effort was coordinated with the DAC Outreach Demonstration Program that was conducted in the Coachella Valley through a separately-funded grant from DWR in 2013/2014 (described in detail below). The DAC Outreach Demonstration Program for the CVIRWM was developed concurrently with the *2014 IRWM Plan Update* and was incorporated as Volume II of the Plan. The Program can be found here: http://www.cvrwmg.org/dac.php.

3.2 Participants

Numerous local and statewide DAC and EJ organizations were targeted during outreach for the Coachella Valley IRWM Program:

- Building Healthy Communities
- California Rural Legal Assistance Inc (CRLA)
- Clean Water Action
- Coachella Valley Economic Partnership
- Coachella Valley Housing Coalition
- Community Water Center
- Desert Alliance for Community Empowerment
- Desert Edge Community Council
- El Sol Neighborhood Educational Center
- Environmental Justice Coalition for Water (EJCW)
- Leadership Counsel for Justice and Accountability
- Building Healthy Communities
- California Rural Legal Assistance Inc (CRLA)
- Coachella Valley Economic Partnership
- Coachella Valley Housing Coalition
- Clean Water Action
- Community Water Center
- Desert Alliance for Community Empowerment
- Desert Edge Community Council
- El Sol Neighborhood Educational Center
- Environmental Justice Coalition for Water (EJCW)
- Leadership Counsel for Justice and Accountability
- Poder Popular
- Pueblo Unido Community Development Corporation
- Inland Congregation United for Change (ICUC)
- Representative from Assemblymember Garcia
- Representative from Senator Jeff Stone
- Representative from Assemblymember Chad Mayes
- Rural Community Assistance Corporation

Communities targeted as part of the DAC and EJ outreach are groups that have historically been disproportionately impacted with respect to the development, implementation, or enforcement of environmental laws, regulations, and policies due to race, culture, or income. The CVRWMG has conducted work through the DAC Outreach Demonstration Program to tailor a more regionally-specific definition of DACs and identify representatives of those communities.

3.3 Outreach Activities

DAC/EJ Outreach Meetings

After completion of the DAC Outreach Contract, the CVRWMG has continued to facilitate meetings with DAC members to better understand their critical water supply and water quality needs and to identify potential solutions. Initial meetings, conducted under the DAC Outreach Contract, focused on bringing any groups that were not involved in the earlier efforts up to speed and informing all groups about recent activities and opportunities. Subsequent meetings expanded the methods of outreach in DAC/EJ communities, updated those groups which may not be able to attend or participate in broader Planning Partner meetings, and developed IRWM planning efforts to meet the needs of each community. The DAC outreach meetings aimed to facilitate the integration of disparate project needs into meaningful programs to better manage water supply and water quality in underserved areas. The CVRWMG will continue to reach out to DACs throughout the development of the *IRWM/SWR Plan Update*. Additional DAC/EJ outreach meetings may be held, as needed, to ensure DAC needs are considered in the SWRP additions to the plan.

Some of the outreach meetings may be held at times convenient for DAC representatives (in the evening) and in different geographic locations within the Region. Meeting preparation includes public meeting notices and invitations; development and distribution of presentations, meeting handouts and notes; and coordination of speakers/presenters.

Notices and Newsletters

Upon completion of the DAC Outreach Contract, the CVRWMG has continued to notify members of DACs of the current state of the Coachella Valley's water-related resources, the IRWM program, and solutions being generated to address their needs. The focus of these efforts is to continue to identify the critical needs of the targeted communities.

Technical Support for DACs

Through the work completed for the *2014 IRWM Plan Update* and the DAC Outreach Program, critical DAC issues and conflicts have been relatively well defined. However, DAC representatives often do lack the resources or technical capacity to develop project submittals that address those critical needs. The CVRWMG has continued to work with those project sponsors during the grant solicitations to develop project scopes, budgets, and cost estimates to help ensure that DAC projects are developed in sufficient detail to be included in the IRWM Plan Update and future funding applications. Multiple DAC projects were funded through the Proposition 84 IRWM funding rounds as a result of this ongoing support.

4 Tribal Outreach and Coordination

4.1 Purpose

The goal of engaging the Valley's tribal governments is to better understand their critical water resources issues and needs. Through targeted outreach, the CVRWMG seeks to learn more about the major water-related concerns facing the tribes such that long-term implementation of the IRWM Plan is responsive to those needs.

4.2 Participants

Tribal participants were contacted based on input from currently identified tribal representatives and the Planning Partners. The following six Native American tribes in the region were targeted during outreach for the IRWM program:

- Agua Caliente Band of Cahuilla Indians
- Augustine Band of Mission Indians
- Cabazon Band of Mission Indians
- Morongo Band of Mission Indians
- Torres-Martinez Desert Cahuilla Indians
- Twenty-Nine Palms Band of Mission Indians

Additionally, meetings may include the Bureau of Indian Affairs or other tribal coordinating agencies or groups as appropriate.

4.3 Outreach Activities

Tribal Outreach Meetings

The CVRWMG hosted one-on-one meetings with five of the aforementioned tribal representatives and one Issues Group meeting open to all tribal representatives to better understand their critical water supply and water quality needs and to identify potential solutions as part of the *2014 IRWM Plan Update*. Tribal outreach meetings aimed to inform the tribes about the IRWM program and its purpose, the local IRWM planning process, and upcoming funding opportunities. These meetings also focused on clarifying the tribe's water resources issues and needs, and identifying integrated project concepts that address those needs. The CVRWMG will continue to reach out to these tribes throughout the development of the *IRWM/SWR Plan Update*.

Notices and Newsletters

CVRWMG staff have worked with community leaders to identify appropriate methods for notifying members of the tribes of the current state of the IRWM program and timing of project submittals. These methods may include techniques such as notices at community gathering sites, newsletters, or mailings. The focus of these efforts is to identify the tribes' critical water resources needs and how those are represented in the IRWM Plan. In addition, one-on-one communication between tribal representatives and the CVRWMG will continue to be used to encourage participation in IRWM public meetings.

Table 7: Coachella Valley IRWM Region Stakeholders

Agency	Contacted	Stakeholder List	Planning Partners
CVRWMG			
Coachella Valley Water District		✓	✓
Coachella Water Authority		✓	✓
Desert Water Agency		✓	✓
Indio Water Authority		✓	✓
Mission Springs Water District		✓	✓
Valley Sanitary District		✓	✓
Cities			
City of Cathedral City	✓	✓	✓
City of Coachella	✓	✓	✓
City of Desert Hot Springs	✓	✓	
City of Indian Wells	✓		
City of Indio	✓	✓	✓
City of La Quinta	✓		
City of Rancho Mirage	✓		
City of Palm Desert	✓	✓	✓

Agency	Contacted	Stakeholder List	Planning Partners
City of Palm Springs	✓	✓	
County of Riverside			
Coachella Valley Economic Partnership	✓	✓	✓
Riverside County Transportation and Land Management Agency	✓	✓	
Riverside County Department of Health	✓	✓	
Riverside County Regional Park District	✓		
Riverside County Economic Development Agency	✓	✓	
Riverside County Flood Control and Water Conservation District	✓	✓	✓
Community Councils			
Bermuda Dunes Community Council	✓		
Desert Edge Community Council	✓	✓	
Desert Palms Community Council	✓		
Indio Hills Community Council	✓		
Mecca Community Council	✓		
North Shore Community Council	✓		
Oasis Community Council	✓		
Sky Valley Community Council	✓		
Thermal Community Council	✓		
Thousand Palms Community Council	✓		
Vista Santa Rosa Community Council	✓		
Elected Officials			
Senator Jeff Stone	✓	✓	✓
Assemblymember Eduardo Garcia (56th Dist.)	✓		
Assemblymember Chad Mayes (42th Dist.)	✓	✓	
Supervisor Manuel Perez (4th Dist.)			
Resource Agencies			
California Department of Fish and Wildlife	✓		
California Department of Water Resources	✓	✓	✓
Colorado River Regional Water Quality Control Board	✓	✓	✓
Indian Health Services	✓		
U.S. Bureau of Indian Affairs	✓	✓	
U.S. Bureau of Land Management	✓		
U.S. Department of Agriculture	✓	✓	
Special Interests			
Big Morongo Preserve	✓		
Bighorn Research Institute	✓		
Building Healthy Communities		✓	
Building Industry Association	✓		
Center for Collaborative Policy		✓	
Center for Natural Land Management (fringed toed lizard preserve)	✓		
Clean Water Action	✓	✓	
Coachella Valley Archaeological Society	✓		
Coachella Valley Association of Governments	✓	✓	
Coachella Valley Conservation Commission	✓		
Coachella Valley Economic Partnership		✓	✓
Coachella Valley Housing Coalition		✓	

Agency	Contacted	Stakeholder List	Planning Partners
Coachella Valley Mosquito and Vector Control	✓	✓	
Coachella Valley Mountains Conservancy	✓		
Coachella Valley Parks and Recreation District	✓		
Coachella Valley Resource Conservation District	✓		
Council of Mexican Federations in North America	✓		
Deep Canyon Desert Research	✓		
Desert Alliance for Community Empowerment	✓	✓	
Desert Empire Homes		✓	✓
Desert Recreation District	✓		
East Valley Housing Review Committee		✓	
Friends of the Desert Mountains	✓	✓	
Groundwater Guardians	✓		
Hi-Lo Golf Course Superintendents Association	✓	✓	
Inland Congregations United for Change	✓		
League of Women Voters	✓		
Natural Science Collaborative of the Desert Region		✓	
Sierra Club	✓		
Wildlands Conservancy	✓		
Tribes			
Agua Caliente Band of Cahuilla Indians	✓	✓	✓
Augustine Band of Mission Indians	✓	✓	✓
Cabazon Band of Mission Indians	✓	✓	✓
Morongo Band of Mission Indians	✓	✓	
Torres-Martinez Desert Cahuilla Indians	✓	✓	✓
Twenty-Nine Palms Band of Mission Indians	✓	✓	✓
Inter-tribal Council	✓		
School Districts			
Coachella Valley Unified School District	✓		
Desert Sands Unified School District	✓		
Palm Springs Unified School District	✓		
Academia			
California State University San Bernardino	✓	✓	
Loma Linda University	✓	✓	
University of California Irvine	✓	✓	
University of California Riverside	✓		
Other Water/Wastewater Companies			
Borrego Water District	✓	✓	
Imperial Irrigation District	✓	✓	✓
Hi-Desert Water District		✓	✓
Mojave Water Agency	✓	✓	✓
Myoma Dunes Mutual Water Company	✓		
Salton Community Services District	✓	✓	
San Gorgonio Pass Water Agency	✓	✓	
Private Pumpers and Large Irrigators			
Agricultural pumpers	✓		
Home Owners' Associations	✓		
Golf courses	✓		
Nurseries	✓		

Agency	Contacted	Stakeholder List	Planning Partners
Disadvantaged Community Organizations			
California Rural Legal Assistance, Inc.	✓	✓	
Clean Water Action	✓	✓	
Community Water Center	✓	✓	
Desert Alliance for Community Empowerment	✓	✓	
El Sol Neighborhood Educational Center		✓	
Environmental Justice Coalition for Water	✓	✓	
Leadership Counsel for Justice and Accountability	✓	✓	✓
Poder Popular	✓		
Pueblo Unido CDC	✓	✓	✓
Rural Community Assistance Corporation	✓	✓	✓

Appendix VI-F: Public Comments

This appendix includes all of the comments received during the public comment period for the draft 2018 Coachella Valley IRWM/SWR Plan (August 20, 2018 through September 21, 2018).

In addition to the comment letters, this appendix includes a comment matrix that includes notes regarding if, how, and/or why comments received during the public comment period were incorporated into the final 2018 IRWM/SWR Plan.

Comment letters were received from the Agua Caliente Band of Cahuilla Indians, the City of Indio, and the Colorado River Basin Regional Board.

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Comments Received on the Draft 2018 Coachella Valley Integrated Regional Water Management & Stormwater Resource Plan

#	Date Received	Commenter	Plan Section	Page Number	Comment	Response
1	9/20/2018	Agua Caliente Band of Cahuilla Indians	General	N/A	("Groundwater is currently the largest source of water supply for the Region." "Collecting groundwater data is vitally important in the Region to ensure adequate water quality and supply.") The tribe appreciates the efforts made by the CVRWMG to include all referenced materials in the appendix package; however, the 510 pages of appendices accompanied by a 510 page Plan document is difficult to navigate in a 30-day comment period. To help stakeholders and other readers, the Tribe suggests that an effort be made to streamline this process by providing links in the Plan to the locations of the citations within the appendices so that readers can more readily find this information.	We appreciate the comment and the driver behind it. Given the size of the document, unfortunately, due to the level of effort and the structure of the document, we cannot update the report with hyperlinks at this time.
2	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.2.1 Watershed	2-6	The plan states "The Whitewater River Watershed consists of sparsely populated mountains, desert, and agricultural lands with few impervious urban areas." Later in the same paragraph on P 2-6, the Plan states "...with increased development in the Region, natural recharge areas have been disrupted. Large urban areas have led to impervious surface that generate greater runoff flows and decrease groundwater recharge." The Tribe recommends re-wording this paragraph for consistency, removing the contradiction.	Comment incorporated and reflected in the report.
3	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.2.2 Water Systems and Distribution	2-8 to 2-10	This section provides information about quantities of water extracted from the groundwater basin as well as recharge areas and quantities. The first reference to groundwater quantity is on Page 2-8 where it notes "(t)he Coachella Valley Groundwater Basin has an estimated storage capacity of approximately 40 million acre-feet of water." Page 2-10 lists "recent annual pumping volumes" by each water purveyor in total, then in a separate paragraph it notes the sub-basin each water purveyor pumps from. To help stakeholders and other readers, the Tribe would like to see a new table with the groundwater information broken down by sub-basin (using a common set of sub-basins, as suggested in the preceding paragraph) to allow for comparison. The table would need to include: 1. Sub-basin name 2. Sub-basin storage capacity (AF) 3. Annual pumping volume from each sub-basin 4. Annual recharge to each sub-basin 5. Annual overdraft in each sub-basin 6. Cumulative overdraft in each sub-basin	The CVRWMG endeavors to base management actions on the most relevant and accurate information available. Given the complex interactions between and among subbasins and differing importance for regional water management, including significant variation in storage capacity, recharge, and pumping volumes, a subbasin-to-subbasin comparison is not always possible or useful as a planning mechanism. The requested information is available for the Indio and Mission Creek Subbasins in the SGMA Annual Reports, which can be accessed here: http://www.cvwd.org/357/Sustainable-Groundwater-Management-Act The SGMA Annual Reports are prepared annually as a requirement of SGMA.
4	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.2.2 Water Systems and Distribution	2-12	The Plan states "Recent years have experienced a less than average rate of natural recharge, approximately 40,000 AFY on average from 2000-2009." The Tribe believes the information cited on the average rate of natural recharge is dated and questions why the CVRWMG is not utilizing more current data. For this reason, the Tribe recommends that this paragraph is updated with the most recent data or discuss why the data is not available.	The report will be updated to include more recent values.
5	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.2.2 Water Systems and Distribution	2-12	The Plan states that the facility has an average annual recharge goal of 100,000 AFY. It is unclear whether the facility has achieved this goal in recent years. (i.e. 2010 to present) since the Plan only includes information regarding 2017 performance. The Tribe recommends that the Plan include a table that compares the actual yearly rate of recharge for years 2010 to present to the annual recharge goal of 100,000 AFY, or discussion that contains this information.	The following sentence will be added to the report: "From 2010 to 2017, the average amount of water delivered to the Whitewater River Groundwater Replenishment Facility was 146,315 AF with a maximum of 385,994 AF in 2017, and a minimum of 865 AF in 2015."
6	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.2.2 Water Systems and Distribution	2-13	The Plan states "...from 2000 to 2009 there was an average annual groundwater storage loss of 110,000 AFY in the Whitewater River Subbasin." The Tribe recommends that this statement be updated to also include current information (i.e., 2010 to present) so this stakeholders and other readers can see what progress, if any, has been achieved towards eliminating overdraft conditions.	The following sentence will be added to the report: "Since 2009, the 10-year average change in storage has been positive, with an upward trend from 2009-2017 (CVWD 2017).
7	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.2.2 Water Systems and Distribution	2-17	Phasing of the sentence "Surface water that is not diverted by the Tribe is put to beneficial use, such as groundwater recharge" suggests that water diversions by the Tribe are not being put to beneficial use.	The sentence will be changed to "Surface water that is not diverted for beneficial use by the Tribe is put to other beneficial uses such as groundwater storage for municipal and agricultural uses."

Comments Received on the Draft 2018 Coachella Valley Integrated Regional Water Management & Stormwater Resource Plan						
#	Date Received	Commenter	Plan Section	Page Number	Comment	Response
8	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.3.1 Land Use Agencies	2-40 (Table 2-7)	The Plan explains that the population figures in Table 2-7 are based on the 2015 American Communities Survey (ACS) 2011-2015 Population Estimates data and notes that the population estimates "do not take into consideration seasonal population which increases significantly between October and May..." A similar statement was made in the 2014 IRWM Plan. It is unclear whether the members of the CVRWMG are tracking water usage associated with the Valley's seasonal population. For this reason, the Tribe requests that the Plan more clearly and adequately address the seasonality of the Valley's population and how this affects water usage. It would be helpful to also include the most recent data, which as of writing is 2017. Here is the information from the US Census for select cities int he west Whitewater River:....	Water supply agencies that are members of the CVRWMG keep track of water use on a monthly basis based on billing records. The effect of the seasonal population is clearly identifiable in the water consumption data available from the Region's water utilities. The footnote will be modified to say " These population figures are based on 2015 American Communities Survey (ACS) 2011-2015 Population Estimates data. As such, they do not take into consideration seasonal population, which increases significantly between October and May due to the Region's mild winter climate. The water use and wastewater generation by the seasonal population is considered in the Region's water and wastewater agencies forecasts and plans, such as the UWMPs"
9	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.5.1 Groundwater Quality	2-55	The Plan states "Basin-wide groundwater quality is difficult to characterize as groundwater quality varies throughout the Valley. The water quality in a given well depends upon well depth (or the screened interval of the water supply well), proximity to faults, presend of surface contaminants, proximity to recharge basins, and other hydrogeologic features." If true, this statement is somewhat troubling because it implies a lack of coordination between members of the CVRWMG and a lack of comprehensive information on the subject. If there is any validity to this statement, the Tribe recommends that CVRWMG members develop a state-of-the-art groundwater quality database for the Valley that incorporates all data into a format useable for each member and the various stakeholders. Further, does the Region 7 Water Quality Review Board agree with this statement?	The report will be changed to read: "Basin-wide groundwater quality varies naturally throughout the Coachella Valley depending on proximity to faults and other hydrogeological features. Groundwater quality can also vary depending on proximity to recharge basins or to the presence of surface contaminants. At individual wells, water quality depends on the depth of the well and screened intervals. Public water systems in the Region consistently monitor groundwater production wells to ensure compliance with drinking water quality standards. Water supply agencies in the Region also monitor the groundwater to comply with permit requirements and as part of other required and voluntary groundwater monitoring programs.
10	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.4.1 Water Supply	2-43 (Table 2-8)	The title of Table 2-8 is misleading. Groundwater is the primary source of water supply to the Valley. However, due to almost total depletion of the Valley's groundwater basins over the years, external sources have been used as the primary supply for these basins. So, it is misleading to suggest that the external supply sources noted in Table 2-8 are in addition to groundwater - they are the groundwater once recharge. Furthermore, Table 2-8 identifies SWP Exchange water as a different supply source than from the Colorado River. This is also misleading since the Valley does not currently receive SWP Exchange water. The Tribe requests that the Plan more clearly identify whether a portion of the SWP Exchange water noted in the Table is actually Colorado River water or whether the SWP Exchange water noted in the Table is water that a CVRWMG member may be legally entitled to but has not received.	The title of the table will be changed to "Summary of Coachella Valley Non-Groundwater Supply Sources" Also, "Natural Inflow" in the table will be changed to "Natural Surface Inflow". The SWP item will include an additional footnote reading "3: Actual SWP water is not received in the region due to limitations in the infrastructure to deliver it. The SWP water into the region is exchanged for Colorado River water as part of an agreement with Metropolitan Water District of Southern California.
11	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.4.1 Water Supply	2-43 (Table 2-8)	The SWP Exchange uses the historical water deliveries prediction of 43%, rather than DWR's numbers which average 62% of the total Table A deliveries. It is unclear why this table does not also include variation and uncertainty for the non-SWP water sources. For example, the Colorado River is projected to be near a "shortage" declaration on January 1, 2019, and currently projected to be found in "shortage" on January 1, 2020.	Table 2-8 will be edited to include SWP reliability of 50% and 65% representing the low end and high end of expected long-term average reliability. To date, CVWD has had 100% reliabiity for its imported Colorado River water source and there is currently no basis for forecasting reliability under potential uncertain future conditions.
12	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.4.2 Water Demand	2-48	"The total potable water (water that meets drinking water standards) demand for the CVRWMG agencies is projected to increase by approximately 32% from 197,911 AFY in 2020 to 289,980 AFY in 2035." Note, this is inconsistent with a similar statement on page 3-1 stating "by approximately 50%." Moreover, (289,980/197,911)*100%=146.5%, which is a 46.5% increase.	The sentence will be changed to "The total potable water (water that meets drinking water standards) demand for the CVRWMG agencies is projected to increase approximately 47% from 197,911 AFY in 2020 to 289,980 AFY in 2035."

Comments Received on the Draft 2018 Coachella Valley Integrated Regional Water Management & Stormwater Resource Plan

#	Date Received	Commenter	Plan Section	Page Number	Comment	Response
13	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.4.2 Water Demand	2-47 (Table 2-12 & Table 2-13)	Table 2-12 shows 2017 DWA Potable Demand is 27,648 AFY. In Table 2-13, the 2020 DWA Projected Demand is 42,670 AFY (36,570 AFY potable municipal + 6,100 AFY non-potable recycled) demand. This shows between 2017 and 2020, DWA Potable Demand will increase significantly by 32%. Further on Page 2-48, the Plan notes that "DWA has a diverse source of water supply, including groundwater, surface water, imported water, and recycled water." This description of water use is misleading; 5% of potable water supply is surface water, and 95% of the water supply is groundwater. In short, the basin is pumped for water, and then replenished with imported Colorado River water - imported water is not in addition to groundwater, it replaces groundwater previously pumped from the basin.	1) Comment on demand: A footnote will be added to Table 2-12 to indicate that demands in 2017 are effected by multiple demand management and water use efficiency measures applied during the recent/current drought, as wells as lower than expected population growth due the 2008 economic downturn. Additionally, a footnote will be added to Table 2-13 to indicate that, due to recent water use efficiency measures and the lower demands currently being observed, the forecasted demands for 2020 may not be realized in that year. We will also indicate that the forecasts in the table correspond to the most recent demand forecasts available at the time of production of this plan and are well documented in the agencies' Urban Water Management Plans. 2) Comment on Supply: the sentence will be modified to read: "DWA's supply portfolio includes groundwater, surface water, imported water and recycled water". With respect to the groundwater use, imported water used for groundwater replenishment constitutes a distinct source of water with respect to native groundwater and it is common practice by agencies, and appropriate from a technical stand point, to refer to imported replenishment water as a separate source. The surface water for replenishment is subject to different drivers of surplus and shortage than local groundwater, and it is managed and administered separately from native groundwater, up to the point where it is extracted for use.
14	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.4.2 Water Demand	2-52	Here, the Plan shows the monthly service and meter charges of each CVWMG agency. DWA is the only agency that does not use a tiered system. "DWA does not use a tiered rate system but does not impose an increased rate for customers at higher elevation, based on DWA Zone Areas (locations) and has a drought surcharge that can be imposed when necessary." The Tribe requests further clarification in the Plan for why DWA does not use a tiered system especially when tiered rate systems have been shown to reduce water usage.	The purpose of this section is to accurately show the rate structure for each agency. The plan does not advocate any one particular rate structure. Without tiered rates, Desert Water Agency has been able to achieve water use reduction figures similar to those achieved by neighboring agencies in both short and long-term.
15	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.5.1 Groundwater Quality	2-55	The Plan states "Naturally occurring substances as uranium, arsenic, chromium, and fluoride have been detected, and are likely due to natural geological conditions." The Tribe suggests adding a few sentences to help clarify to the reader what the member agencies have done to investigate the sources of these substances, some of which are cancer-causing, and how the member agencies arrived to the claim that they are "likely due to natural geologic conditions."	The report will be updated to include additional language supporting that statement.
16	9/20/2018	Agua Caliente Band of Cahuilla Indians	2.6 Social and Cultural Make-up	2-70	"Population growth in Coachella Valley increased by 49.5% from 2000-2015, which is faster than the US (14%), and California (15%) rates." Sentence is unclear. This is presumably the increase in population of the valley as a whole was 49.5% over this time period, not the increase in the growth rate of the population, or annual compounding growth rates. Population growth was not evenly distributed. Using numbers from the US Census for the years 2000-2015, cities in the West Whitewater River area had large population growth, but less than 49.5% growth:...	The word rate will be deleted from the sentence.
17	9/20/2018	Agua Caliente Band of Cahuilla Indians	3.1.5 Water Quality	3-16	The Plan states "Although groundwater quality is generally considered high in the Region, groundwater quality is a concern in isolated areas of the Region." The Tribe requests that the Plan more clearly depict these isolated areas of concern. The Plan also states that there are wells that have detected high salinity, arsenic, nitrate, fluoride, ammonium perchlorate, chromium-6, uranium, several organic compounds, PCE, and others. Again, the Tribe recommends that the Plan include a depiction that shows the location of current and emerging water quality issues.	The plan is an overall narrative of water quality within the Coachella Valley. The individual agency or district that serves water to a particular area would be best suited to provide more information regarding isolated areas.
18	9/20/2018	Agua Caliente Band of Cahuilla Indians	3.1.9 Tribal Nations	3-30	Section starts by a comparison to DAC issues, rather than starting with the specific issues identified by tribal governments and tribal water management. While several Tribes do include DAC areas and similar problems, tribal land is located throughout the Coachella Valley, and so the section should start on shared tribal issues.	The report has been modified to include this distinction.
19	9/20/2018	Agua Caliente Band of Cahuilla Indians	3.1.10 Summary of Water Management Issues	3-32 (Table 3-2)	Groundwater quality section should include perchlorate and uranium as issues of concern. Perchlorate is an issue identified in a project in Appendix VI-H, and has been detected in tribal wells. Uranium is actively managed by the Mission Springs Water District through wellhead treatment "at a significant cost" (Appendix VI-H).	Perchlorate and uranium are listed in Section 3.1.5 as issues of general concern. Section 2.5.1 also listed uranium as a contaminant of concern and the report will add a discussion of perchlorate to that section as well.

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20	9/20/2018	Agua Caliente Band of Cahuilla Indians	3.2.1 Project Impacts and Effects of Climate Change	3-36	An additional flood risk that can be exacerbated by wildfires is non-native invasive vegetation species. Land that has been cleared by wildlife is more susceptible to regrowth of non-native species such as fountain grass and tamarisk. The species can out-compete native species and dominate riparian areas. Once established, tamarisk in particular can cause a decrease in water filtration and increase water degradation. The Tribe recommends incorporating a discussion of this type of potential risk as it relates to climate charge.	The report will be modified to include: "Although lands that have been subject to stochastic events such as wildfire can potentially be susceptible to invasion by non-native vegetation, such as non-native grass and/or tamarisk, native species often re-sprout vigorously following fire. If lands were previously dominated by native vegetation, these native species typically re-establish first and can outcompete non-native species that may be introduced afterwards. Where non-native species establish, there can be changes to the soil hydrology and chemistry."
21	9/20/2018	Agua Caliente Band of Cahuilla Indians	5.1 Coachella Valley Tribes	5-2 (Table 5-1)	Table 5-1 identifies Agua Caliente Ethnology/Language as "Pass Cahuilla" and correct Tribal Member Population to 504.	Corrected Tribal Member Population to 504.
22	9/20/2018	Agua Caliente Band of Cahuilla Indians	5.4.1 Tribal Water Resources Concerns	5-9	"However, arsenic and hexavalent chromium are not found in Colorado River water but are believed to be naturally-occurring in the geologic formations of the Coachella Valley, and perchlorate in Colorado River water has been remediated at the source (CVWD 2012)." [emphasis added] A categorical statement such as the bolded text is generally false for all natural waters, this includes the Colorado River where both hexavalent chromium and arsenic have been measured. The general statement here is similar to the other descriptions of tribal lands which are somewhat unclear that tribal lands are found throughout the Coachella Valley. In terms of arsenic this is additionally misleading. As shown in Figure 1 of Appendix VI-J, groundwater arsenic concentrations under tribal lands in the East Whitewater River Valley are generally significantly higher than Colorado River water. However, as also shown in the same figure, natural groundwater under tribal lands in the West Valley generally have concentrations of arsenic less than the detection limit.	The identified sentence will be modified to read:"Arsenic and hexavalent chromium are naturally occurring in the geologic formations of some areas of the Coachella Valley, and no evidence suggests that Colorado River water is the source of existing detections. Moreover, perchlorate in Colorado River water has been remediated at the source (CVWD 2012)."
23	9/20/2018	Agua Caliente Band of Cahuilla Indians	9.1 IRWM Regional Priorities	9-4	As was noted in the 2014 Plan, Priority 7 is to create a data management system. The Tribe has made this comment repeatedly throughout the years, when given an opportunity to comment on various agency water management plans, and continues to strongly support the development of an online database. There is no mention of a comprehensive database of all water information to improve transparency and management of the regional water resources and enable greater public participation. CVRWMG could best serve federally recognized tribes, its stakeholder, and the public at large by organizing information about the region from these websites into a coherent and usable source of water information.	A regional data management system continues to be of interest in the Region. Financial resources for the development of such system have not been identified. Resources to keep such system relevant by adding more data and maintaining its functionality and value are significant. That continues to be the main hurdle in implementation of such as system. As of the production of this document, no specific funding sources or plans exist for its implementation. The State of California maintains a publicly available water quality database, known as Groundwater Ambient Monitoring and Assessment Program, that contains information regarding water quality in the Coachella Valley.
24	9/20/2018	Agua Caliente Band of Cahuilla Indians	9.5.3 Stormwater Resource Plan Project Prioritization Process	9-29	As projects move forward from conceptual to the implementation stages, the Tribe recommends that the CVRWMG or project sponsors provide adequate notice to appropriate tribes, stakeholders, and other readers about the comment periods for projects that have been included in the project database.	The IRWM process includes regular meetings with planning partners where we keep them up to date on the evolution of the program. This includes communication when projects in the database are moving from the conceptual phase in the database to being included in a grant application. If and when projects in the grant application are funded, the CVRWMG provides information on the grant award and continues communication on the overall program through emails and Planning Partners meetings. The CVRWMG is committed to continuing communication by email, website and Planning Partners meetings.
25	9/20/2018	Agua Caliente Band of Cahuilla Indians	9.5.4 Integrated Metrics-Based Analysis of Project Benefits	9-44	It is unclear how "increased urban green space" is considered an environmental benefit and how increased urban green space achieves the objectives of the Plan since, arguably, the increase of urban green space in a desert environment such as the Valley increases water demand. For this reason, the Tribe recommends rewording this sentence as to promote increased pervious surfaces and not green space.	The sentence will be changed to "increase in urban natural landscape and pervious surface"

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26	9/20/2018	Agua Caliente Band of Cahuilla Indians	5.5 Tribal Participation in Water Resources Planning	5-10 to 5-11	Tribal participation in development of the 2018 plan is not described. Out reach and discussions describe earlier 2010 and 2014 meetings and outreach.	The document will be changed as follows: Second paragraph on page 5-11 first sentence will be changed from to "The CVRWMG has sought to implement this statewide priority at the local level by conscientiously engaging the Tribes in the 2014 IRWM Plan Update with continued input through Planning Partners meeting in the 2018 Update." Also, the last sentence in the same paragraph will be changed to: "Tribes, as members of the Planning Partners, have continued to attend Planning Partners meetings and have provided feedback in the process of developing this IRWM/SWR Plan, including the prioritization of benefits for stormwater projects as part of a workshop exercise. This chapter is based on those communications.
27	9/20/2018	Agua Caliente Band of Cahuilla Indians	11.5 Finance	11-35	All project proponents that receive IRWM grant funding will generate project progress reports to be submitted to CVWD with quarterly invoices." [emphasis added] The previous paragraphs indicated that "CVRWMG is the Responsible Agency in charge of evaluating" so it is unclear if this it should be CVRWMG or CVWD in the above.	Sentence revised to "All project proponents that receive IRWM grant funding will generate project progress reports to be submitted to the Lead Agency with quarterly invoices."
28	9/20/2018	Agua Caliente Band of Cahuilla Indians	Appendix VI-H		Of the 53 pages of listed projects included as of February 23, 2018, only two projects "Desert Cahuilla Wetlands Expansion" and the "Whitewater Channel Extension to Connect with Current Salton Sea Water Level" are indicated as being organized under the auspices of a tribal government. The first being "Tribal Government" (not indicating which tribe), and the second being "Torres Martinez Desert Cahuilla." This number seems very low considering the identified tribal needs and concerns in the document.	The database historically follows some trends where projects are added or updated as grant opportunities become available. At the time of the public draft, it is the case that there are only two projects from tribal governments. Given that Round 1 of the Implementation grants is launching now (with DWR releasing the guidelines for the grants) there will be a new call for projects issued in November 2018. There will also be a Planning Partners meeting on November 8, 2018 to solicit projects and encourage tribes to submit.
29	9/20/2018	Agua Caliente Band of Cahuilla Indians	Appendix VI-H		The proposed "Perris Dam Remediation Program" is outside of the IRWM planning region. The listed need statement does not explain the relevance of the project to the IRWM region.	The database will be corrected as necessary
30	9/20/2018	Agua Caliente Band of Cahuilla Indians	Appendix VI-H		"Torres Martinez Septic to Sewer Conversion Project" states 'This project will eliminate virtually raw Colorado River water into the homes. Because it is sitting on a recharge site, there is no way to eliminate the contaminates. The ammonium perchlorate was recently tested, and the results were at 6.9 ppb exceeding California State Standards.' More details regarding this measurement such as where and when would be useful to understand this project.	The program will follow up with project sponsors to vet this project description The project description was provided by the project proponent and we will forward the comment for them to update the database.
31	9/21/2018	Sara Toyoda - City of Indio	3.1.4	3-16	Stormwater Capture: You may want to acknowledge that many cities have been requiring this since long before the Board required it.	The text has been modified to read: "Stormwater capture has been identified as a potential method to augment local water supplies in the Coachella Valley. Stormwater retention systems located in strategic areas of suitable geology could capture runoff from surrounding mountains within the Whitewater River and Mission Creek Subbasins (CVWD 2012; CVWD et al. 2013; CVWD 2016a). The 2013 MS4 permit requires builders of new developments to include stormwater capture and recharge infrastructure (Regional Board 2013). Water agencies will need to coordinate with the local cities and the County of Riverside to maximize use of stormwater capture and recharge infrastructure related to development, because management of development requirements is not under the purview of the water agencies (CVWD et al. 2013). While the 2013 MS4 permit requirement solidifies this strategy for runoff management, stormwater capture and beneficial use is a long-standing strategy in the Coachella Valley, where MS4 permittees have required stormwater onsite retention (detention and infiltration) through municipal ordinances years before the 2013 MS4 permit."
32	9/21/2018	Sara Toyoda - City of Indio	2.8.1 Legislative and Policy Context	2-80	In the current MS4 permit negotiations climate change is addressed through stormwater retention in order to reduce flooding associated with sudden intense storms and to increase groundwater supply to mitigate against longer more frequent droughts.	The report will be modified to reflect this with the last sentence on the page changed to: "Central to these adaptation efforts will be the full implementation of IRWM/SWR Plans, MS4 permits, and municipal ordinances, which address regionally-appropriate management practices that incorporate climate change adaptation. The plans will evaluate and provide a comprehensive, economical, and sustainable water use strategy at the watershed level for California.
33	9/21/2018	Sara Toyoda - City of Indio	3.1.5 Water Quality	3-23	I don't think stormwater is a concern for wells they are improperly constructed. I see that the statement in the current text is referenced but I don't think properly built wells would be contaminated from stormwater.	Report has been modified to read: "Contamination of drinking water wells from agricultural and urban stormwater runoff is a concern for improperly constructed or sealed wells in the Coachella Valley IRWM Region (CVWD 2012)."

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34	9/21/2018	Sara Toyoda - City of Indio	3.1.4 Stormwater		First paragraph references consistent flow in the CVSC east of Washington Street. I don't think this is correct. I think the only consistent flow is after Valley Sanitary District near Dillon Road.	The backbone of this system is the Region's 49-mile Whitewater River Stormwater Channel/Coachella Valley Stormwater Channel (WRSC/CVSC). West of Washington Street, the channel is referred to as the WRSC; east of Washington Street, the channel is referred to as the CVSC. The WRSC follows the natural Whitewater River, and flows in the WRSC are ephemeral, while the CVSC is the channelized portion of the Whitewater River, and generally contains flow year-round east of Dillon Road from agricultural drains, permitted discharges, and stormwater runoff from occasional storm flows.
35	9/21/2018	Sara Toyoda - City of Indio	8.4.3 Increase Water Supply	8-17	Include information about the NPDES efforts for stormwater retention and infiltration	As part of the Whitewater Watershed Protection Program, many efforts to capture and infiltrate stormwater are being implemented including the water quality management plan which includes infiltration as one of its BMP's. The Whitewater BMP Design Handbook for Low Impact Development includes infiltration basins and trenches which can be used as a tool for stormwater quality management.
36	9/21/2018	Sara Toyoda - City of Indio	8.4.4 Improve Water Quality	8-28	Under the picture please remove "City of Indio Pollution Prevention materials identify over-irrigation as a violation of the NPDES permit" Not sure what the materials say but irrigation run-off is not a violation of the permit.	The caption will be changed to read "over-irrigating landscape can result in dry-weather urban runoff that may result in pollutant transport"
37	9/21/2018	Sara Toyoda - City of Indio	8.4.4 Improve Water Quality	8-31	This should include the inspections done by the MS4 Permitees. The SWMP includes provisions to inspect certain commercial/industrial facilities for outreach and to reduce the possibility of any illegal discharges. The detection and elimination of illicit discharges also requires field screening during maintenance and upkeep of the MS4 systems.	The report will include an additional bullet category for "Inspections by MS4 permitees: The Storm Water Management Plan includes provisions to inspect some commercial and industrial facilities. Inspection includes outreach and verifications to prevent and reduce the possibility of illegal discharges. Field screening during maintenance and upkeep of the MS4 systems for the detection and elimination of illicit discharges is also required."
38	9/21/2018	Sara Toyoda - City of Indio	8.4.5 Improve Flood Management	8-33	Should include the retention and infiltration efforts required by ordinances for stormwater.	Under the title "Coachella Valley Efforts" and before the specific bullets, the document will add "Listed below are specific programs, projects, and facilities with flood risk management primary components. In addition to these elements below, stormwater retention and infiltration efforts are present in the Region in stormwater ordinances and as part of the NPDES".
39	9/21/2018	Sara Toyoda - City of Indio	8.4.6 Practice Resources Stewardship	8-39	The Construction General Permit that covers most construction sites in the Valley does not allow pollution including sediment to leave the site and certainly not into receiving waters.	Under the title "Coachella Valley Efforts" on page 8-39 we will include a bullet: Sediment Management at Site Level: Construction Permits in the Region include specific sediment management requirements to avoid sediment from construction activities from reaching receiving waters"
40	9/21/2018	Sara Toyoda - City of Indio	8.4.7 People & Water	8-41	The NPDES public outreach program should be included https://www.rcwatershed.org. Also the individual permitees also support the RC watershed outreach and supplement with their own outreach.	We will include an additional bullet with under Outreach and Engagement: "NPDES Public Outreach Program and Website": the Riverside County Watershed Protection website includes outreach and practical content educating residents, businesses, schools and everyone in the watershed. The site includes news, resources, and clear and specific actions residents, businesses and schools can take to actively contribute to watershed protection."
41	9/21/2018	Sara Toyoda - City of Indio	8.5 Adapting Resource Management Strategies to Climate Change	8-49	Does Conjunctive Management and Groundwater Storage include recharge from retention basins. If not, please add Retention Basin Recharge separately.	Yes, it does. We will make it explicit adding "Including Stormwater Retention Basins" in parenthesis
42	9/21/2018	Sara Toyoda - City of Indio	8.5 Adapting Resource Management Strategies to Climate Change	8-50	Add Stormwater Retention	We will add a footnote to the table to indicate that "stormwater retention is included in Urban Runoff Management, Flood Management, and Integrated Flood Management"
43	9/21/2018	Sara Toyoda - City of Indio	11.1.1 Overview of Benefits	11-6	I think an addition to the bulleted included projects should be -New or upgraded MS4 systems that include retention and infiltration	We will include that as an additional bullet

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44	9/21/2018	Sara Toyoda - City of Indio	11.3.1 Overview of Data Needs	11-29	Due to the arid nature of the Valley, many would be MS4 sampling sites are often dry and cannot be consistently sampled.	We will add a final sentence stating: an important consideration in data collection is the hydrology and precipitation patterns and seasonality in the Region, where many sampling sites cannot generate year-round data as they are often dry. "
45	9/28/2018	Cathy Sanford - Colorado River Basin Regional Board	2.5.1 Groundwater Quality	2-58 (Table 2-19)	Table 2-19 lists the quality of water sources and states the secondary maximum contaminant levels (S-MCLs) for total dissolved solids (TDS) as 1,000 and 1,500 milligrams per liter (mg/L). Table 2-19 is incomplete and misleading because it does not include the 'recommended' consumer acceptance level of 500 mg/L TDS cited in CCR, Title 22, Table 64449-B (Consumer Acceptance Contaminant Level Ranges). Table 64449-B cites three ranges of consumer acceptability for TDS contaminant levels; a recommended limit of 500 mg/L; an upper limit of 1,000 mg/L; and a short-term limit of 1,500 mg/L. Providing water for municipal use with a recommended TDS of 500 mg/L or less is desirable for a higher degree of consumer acceptance. Water with 1,000 mg/L TDS is acceptable only if it is neither reasonable nor feasible to provide more suitable waters, and a level of 1,500 mg/L TDS is acceptable only for existing community water systems on a temporary basis.	Table 2-19 will be modified to indicate that the "Consumer Acceptance Contaminant Level Ranges" are 500-1,500 mg/L for TDS. The footnote will be modified to indicate that the Consumer Acceptance Contaminant Level of 500 mg/L is the recommended value desirable for the highest consumer acceptance; 1,000 mg/L is the upper limit of the consumer acceptance level; and 1,500 mg/L is the short-term consumer acceptance level.
46	9/28/2018	Cathy Sanford - Colorado River Basin Regional Board	3.1.5 Water Quality	3-18	[TDS concentrations in the groundwater basin need to be managed properly to prevent long-term degradation of groundwater quality in the basin. Potential options to manage TDS concentrations may have high costs; however, in accordance with the Recycled Water Policy, the agencies are currently developing a Salt and Nutrient Management Plan to address this constituent throughout the Region (CVWD 2012; CVWD et al. 2013).] Staff concur that TDS levels in groundwater need to be managed properly, and an adequate SNMP will facilitate this. During generation of the Coachella Valley SNMP, Regional Water Board staff communicated several technical concerns, in particular: a. determination of ambient groundwater quality, b. assigning a water quality objective for TDS that was not protective of existing water quality, and c. lack of adequate monitoring or implementation measures to manage all salt loading in the basin on a sustainable basis. The June 2015 SNMP does not adequately address these concerns, and we advised the Regional Water Board not to approve or accept the SNMP until staff's technical concerns were satisfactorily addressed. The Coachella Valley SNMP is incomplete and does not fully comply with the Recycled Water Policy (Resolution 2013-0003). Regional Water Board staff encourages recovering the SNMP Issues Group to address the inadequacies of the SNMP as development of an adequate SNMP for the Coachella Valley will supplement the IRWM/SWR Plan as stated, and will address many of staff's concerns regarding protection of water quality in the Coachella Valley Groundwater Basin.	The Coachella Valley Salt and Nutrient Management Plan (CVSNMP) was completed in exact accordance with the State's Recycled Water Policy via a comprehensive stakeholder process that included six stakeholder meetings and three comment periods. Many positive changes to the plan were made as a direct result of stakeholder input including RWQCB staff input. Fourteen meetings were held with RWQCB staff to encourage input and address concerns. We presented the final CVSNMP to the Boards of the Coachella Valley Water District (CVWD), Desert Water Agency (DWA) and Indio Water Authority (IWA) and each board adopted the final plan. The CVSNMP accurately characterizes the water quality of the Coachella Valley Groundwater Basin, includes all the required elements applicable to local existing and planned recycled water use projects, and identifies Management Strategies and recommends a Monitoring Plan that protects groundwater beneficial uses and supports future recycled water use needed to provide a sustainable groundwater supply for the Coachella Valley. The text will be modified to read: "TDS concentrations in the groundwater basin need to be managed properly to prevent long-term degradation of groundwater quality in the basin. Potential options to manage TDS concentrations may have high costs; however, in accordance with the Recycled Water Policy, the agencies submitted a Salt and Nutrient Management Plan to the RWQCB to address this constituent throughout the Coachella Valley (MWH 2015).
47	9/28/2018	Cathy Sanford - Colorado River Basin Regional Board	8.4.4 Improve Water Quality	8-30	[The SNMP was completed in June 2015, provides guidance for basin-wide management of salts and nutrients, and ...] The Coachella Valley SNMP cannot provide guidance for basin-wide management of salts and nutrients as it does not propose sufficient verification monitoring or implementation measures to adequately quantify or manage salt and nutrient loading in the Coachella Valley Groundwater Basin from all identified sources, on a long-term, sustainable basis. Imported water from the Colorado River has introduced nearly a ton of salts (TDS) per acre foot of recharge volume into the groundwater basin, however omitted from the SNMP and from this IRWM/SWR Plan are measures to manage long-term salt loading from this significant sources of salt to the Coachella Valley.	The Coachella Valley Salt and Nutrient Management Plan (CVSNMP), completed in exact accordance with the State's Recycled Water Policy, identifies Management Strategies and recommends a Monitoring Plan that protects groundwater beneficial uses and supports future recycled water use needed to provide a sustainable groundwater supply for the Coachella Valley. The agencies are implementing this monitoring plan. The document will be updated to read: "The SNMP was completed in June 2015, and the implementing agencies are currently in the process of addressing comments from the Regional Water Quality Control Board for a plan that will provide guidance for basin-wide management of salts and nutrients."

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48	9/28/2018	Cathy Sanford - Colorado River Basin Regional Board	10.2.5 Technical Evaluations for the IRWM/SWR Plan	10-30	[SNMP actions and efforts are included in the Alternative Groundwater Sustainability Plans (GSPs) as part of the Sustainable Groundwater Management Act (SGMA) context and compliance.] As the Coachella Valley SNMP is neither approved nor complete, it does not qualify as a supplemental document and may not be considered as context for or in compliance with SGMA, as stated in the IRWM/SWR Plan.	The Coachella Valley Salt and Nutrient Management Plan (CVSNMP), completed in exact accordance with the State's Recycled Water Policy, identifies Management Strategies and recommends a Monitoring Plan that protects groundwater beneficial uses and supports future recycled water use needed to provide a sustainable groundwater supply for the Coachella Valley. The agencies are implementing this monitoring plan. As such, it is critically important that it be included and considered in any basin planning, such as the SGMA Alternative GSPs. The report will be modified as follows: "When completed and approved, the SNMP actions and efforts will supplement the Alternative GSPs as part of the SGMA context and compliance.
49		CVWD	2.2.6 Agricultural Water	2-29	In Desalinated Water section, second paragraph, first sentece, please remove "by 2025". Please change the fourth sentence to "In addition, it was determined that semi-perched brackish groundwater will be utilized instead of agricultural drain water for desalination. The 2010 Coachella Valley WMP Update indicates that the amount of water recovered through water desalination will range from 55,000 to 85,000 AFY."	In Desalinated Water section, second paragraph, first sentece, "by 2025" was removed. The fourth sentence was changed to "In addition, it was determined that semi-perched brackish groundwater will be utilized instead of agricultural drain water for desalination. The 2010 Coachella Valley WMP Update indicates that the amount of water recovered through water desalination will range from 55,000 to 85,000 AFY."
50		CVWD	2.4.2 Water Demand	2-51	In the first paragraph, fifth sentence change "desalination of local agricultural drain water" to "desalination of local semi-perched brackish groundwater".	In the first paragraph, fifth sentence has been changed from "desalination of local agricultural drain water" to "desalination of local semi-perched brackish groundwater".
51		CVWD	6.1.1 Determining Objectives	6-6	In Objective D, change "desalination of agricultural drain water" to "desalination of semi-perched brackish groundwater".	In Objective D, change "desalination of agricultural drain water" to "desalination of semi-perched brackish groundwater".
52		CVWD	Table 6-2	6-16	Remove "drain water" and "agricultural drain water" from the table. Just talk about Water Desalination capacity.	Comment incorporated and reflected in the report.
53		CVWD	8.4.3 Increase Water Supply (Desalination)	8-19	For the section CVWD Agricultural Drain Water Desalination Project, please change to "CVWD Desalination Project. The Coachella Valley is evaluating the development of up to 85,000 AFY of semi-perched brackish groundwater".	For the section CVWD Agricultural Drain Water Desalination Project, please change to "CVWD Desalination Project. The Coachella Valley is evaluating the development of up to 85,000 AFY of semi-perched brackish groundwater".
54		CVWD	8.4.4 Improve Water Quality	8-28	For the section CVWD Agricultural Drain Water Desalination Project, please change to "CVWD Desalination Project. As summarized in the Desalination section above, this project is currently being evaluated by the CVWD, and one of its main purposes is to treat and reuse semi-perched brackish groundwater at a quality appropriate for agricultural irrigation".	For the section CVWD Agricultural Drain Water Desalination Project, please change to "CVWD Desalination Project. As summarized in the Desalination section above, this project is currently being evaluated by the CVWD, and one of its main purposes is to treat and reuse semi-perched brackish groundwater at a quality appropriate for agricultural irrigation".
55		CVWD	10.2.2 Non-Potable Water Supplies	10-24	In the first paragaph, first sentence, change to "The 2010 Coachella Valley WMP recommends that a water desalination program be developed, and states that the amount of water recovered through water desalination will potentially range from 55,000 to 85,000 AFY. Water would be taken for desalination from the semi-perched brackish groundwater and would be delivered to the Coachella Canal distribution system for non-potable use. Please delete the sentence "Based on non-potable demand projections as preseneted in CVWD's 2015 UWMP, the initial phase of the this program will need to be implemented by 2025 to supplement Canal water supply."	In the first paragaph, first sentence, change to "The 2010 Coachella Valley WMP recommends that a water desalination program be developed, and states that the amount of water recovered through water desalination will potentially range from 55,000 to 85,000 AFY. Water would be taken for desalination from the semi-perched brackish groundwater and would be delivered to the Coachella Canal distribution system for non-potable use. Please delete the sentence "Based on non-potable demand projections as preseneted in CVWD's 2015 UWMP, the initial phase of the this program will need to be implemented by 2025 to supplement Canal water supply."

Appendix VI-G: Work Plan for the Coachella Valley Groundwater Basin's Salt and Nutrient Management Planning Strategy

This appendix includes the final Work Plan developed for the Salt and Nutrient Management Planning Strategy technical study conducted as part of the 2014 Coachella Valley IRWM Plan update process.

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Work Plan for the Coachella Valley Groundwater Basin's Salt & Nutrient Management Plan

BACKGROUND

The State of California adopted the Recycled Water Policy (Policy) that requires Salt and Nutrient Management Plans (SNMPs) be developed to manage salts, nutrients, and other significant chemical compounds on a watershed- or basin-wide basis. The Policy specifies that SNMPs be developed in a cooperative and collaborative manner among water and wastewater agencies and other salt/nutrient stakeholders. The SNMPs are intended to help streamline permitting of new recycled water projects while ensuring compliance with water quality objectives and protection of beneficial uses. For each groundwater basin, a SNMP is to be provided to the Regional Water Quality Control Board (RWQCB) no later than May 2014. An extension of up to 2 years may be granted by the RWQCB if the region demonstrates substantial progress by the May 2014 deadline.

In 2011, the Coachella Valley Regional Water Management Group (CVRWMG) began preliminary discussions about preparing a SNMP for the Coachella Valley. In order to either meet the May 2014 deadline or show substantial progress in developing its SNMP, the CVRWMG is working toward consensus on a SNMP strategy and scope of work by early 2013.

The CVRWMG application for Planning Grant Funding included budget for initial scoping of the salt and nutrient planning to augment the Integrated Regional Watershed Management (IRWM) plan for the Coachella Valley. The grant was awarded, and the consulting team of RMC Water and Environment and Integrated Planning and Management, Inc. were contracted to initiate the scoping.

To date, three public workshops have been held on August 22, 2012, September 26, 2012, and November 28, 2012 with good interaction between stakeholders interested in the SNMP. Based on the direction from the CVRWMG, interests, comments and concerns of the stakeholders, and input from the Colorado River Regional Water Quality Control Board (RWQCB), the consulting team has prepared this Work Plan for preparation of the Coachella Valley Groundwater Basin Salt and Nutrient Management Plan. Included in this Work Plan is the list of roles and responsibilities for the entities that will be involved in the development of the SNMP, the scope of work, and a schedule for work plan implementation.

ROLES AND RESPONSIBILITIES

The following defines the team structure and roles and responsibilities for completing the SNMP.

Acronyms, Groups, and Roles

CVRWMG (Coachella Valley Regional Water Management Group)

Members: Coachella Valley Water District, Coachella Water Authority, Desert Water Agency, Indio Water Authority, and Mission Springs Water District

Roles: Responsible for maintaining the Stakeholder List and identifying members that need to be included. Responsible for establishing and overseeing the Technical Working Group. Will review work product, provide data, manage the Technical Working Group, manage Stakeholders, make or seek agreement on policy decisions and direction and ensure integration of the SNMP into the Coachella Valley Integrated Regional Water Management Plan (IRWMP).

Technical Team

Members: Technical experts to be determined for each task including, but not limited to, agencies, their consultants, RWQCB and other key regulatory personnel, and other organizations as deemed appropriate by the CVRWMG.

Roles: Perform technical work related to SNMP development, from collecting data to final analysis and documentation of the SNMP. This technical work may be conducted by CVRWMG agency staff, a consultant or other combination that is acceptable to the stakeholders and approved by the CVRWMG. When decided, the final roles of the Technical Team members will require further clarification as to who is performing the work and who will be reviewing and approving the work products.

Stakeholders

Members: Open to all public agencies, including the RWQCB, other regulators, Tribes, environmental organizations, and other interested members of the community. Note: The current stakeholder list is shown in work plan section.

Roles: Provide public input and review major milestone tasks.

DRAFT WORK PLAN

As part of the development of the Coachella Valley Basin SNMP Work Plan, the current CVRWMG and Stakeholders explored several of the issues that are likely to be addressed as part of the SNMP process. One of the challenges identified for this SNMP was the number of issues and size/scale of the SNMP, especially given the current Basin Plan's lack of sub-basin distinction. Therefore, the SNMP process is being developed using a phased approach that it will allow it to be completed over time in an incremental manner. The following defines the three plan development phases:

- **Phase 1: Initial SNMP Scoping and SNMP Work Plan Development**
  - Invite Stakeholders group for scoping early in the process
  - Develop the process, scope, and schedule for SNMP development (i.e. this Work Plan)
- **Phase 2: Initial SNMP development**
  - Characterize the groundwater basin(s), including estimating the assimilative capacity of the basin(s)
  - Identify salt / nutrient loadings and trends
  - Identify any supplemental monitoring needs
  - Identify water management goals and potential strategies, including any potential basin plan amendments recommendations
  - Conduct anti-degradation process
  - Finalize Phase 2 SNMP, including:
    - Develop initial implementation and monitoring plans
    - Develop initial SNMP data management, reporting, and audit processes
    - Determine CEQA/NEPA compliance needs
    - Documentation of SNMP
- **Phase 3: Finalize SNMP**
  - Conduct any necessary supplemental monitoring
  - Update salt / nutrient loading and trends (as necessary)
  - Update water management goals and strategies (as necessary)
  - Support processing of any recommended Basin Plan Amendments with the RWQCB
  - Update anti-degradation process (as necessary)
  - Finalize Phase 3 SNMP, including:
    - Update the implementation and monitoring plans
    - Update the SNMP data management, reporting, and audit process
    - Develop environmental documentation for any proposed Basin Plan Amendments
    - Documentation of SNMP

The following Work Plan describes the tasks necessary to prepare a Salt/Nutrient Management Plan (SNMP) for the Coachella Valley Groundwater Basin. Detailed tasks are shown for Phase 2, and an outline of some possible tasks necessary for Phase 3 are included.

Phase 2 Work Plan

Task 1. Establish Collaborative Process

The primary purpose of this task is to assist the CVRWMG in refining the stakeholder process established during the Scoping and Work Plan Development (Phase 1) to ensure that the process meets State Policy requirements and represents the community. This will occur by continuing to engage stakeholders in the SNMP development process, establishing plan goals and objectives, gathering input on technical analysis tasks, and collaboratively developing implementation and basin management measures. The CVRWMG will direct or lead the collaborative process.

Subtask 1.1 Develop Working Groups

Active participants in the SNMP process are assumed to fall into one of two groups intended to help guide and gain input for the SNMP.

1) **Stakeholders.** This group will consist of those whose activities and operations may impact salt and nutrient management in the Basin, including agricultural interests, private well owners, environmental groups, regulatory staff, and the general public. The current stakeholder list developed by the CVRWMG as part of the IRWMP and SNMP Work Plan development process will be used as the initial list of stakeholders (see current list of Stakeholder in table below). Additional stakeholders will be solicited by the CVRWMG prior to initiation of the SNMP and throughout the SNMP development process. This can be done as part of the IRWMP public workshops or separately. The CVRWMG shall maintain the stakeholder list and coordinate all workshop notifications and deliverable distributions with stakeholders.
2) **Technical Team.** This group consists of those who contribute technical information, conduct the technical analyses, develop the SNMP, and provide initial technical reviews prior to the CVRWMG reviews and Stakeholder meetings. The CVRWMG shall establish the Technical Team members, oversee their work, and coordinate their activities. This group is proposed to consist of the staff and designated technical consultants from local water and wastewater agencies and municipalities and staff from the Colorado River Basin (Region 7) Regional Water Quality Control Board. The CVRWMG will identify any other key members that should be included in the Technical Team. This technical work may be conducted by CVRWMG agency staff, a consultant(s), or other combination that is acceptable to the stakeholders and approved by the CVRWMG. When decided, the final roles of the Technical Team members will require further clarification as to who is performing the work and who is reviewing and approving the work products.

Current Salt/Nutrient Management Planning Workgroup	
Affiliation	**Contact**
CVRWMG - Coachella Valley Water District	Patti Reyes
CVRWMG - Coachella Water Authority/Sanitation District	Berlinda Blackburn
CVRWMG - Desert Water Agency	Mark Krause
CVRWMG - Indio Water Authority	Brian Macy
CVRWMG - Mission Springs Water District	John Soulliere
29 Palms Tribe	Marshall Cheung
Agricultural Sector	Peter Nelson
Agua Caliente Tribe	Margaret Park
Augustine Tribe	Les Ramirez
Cabazon Tribe	Becky Ross
Cabazon Tribe	Jacquelyn Gonzales
Cabazon Tribe	Paul Slama
City of Palm Springs	David Barakian
Coachella Valley Water District	Olivia Bennet
Coachella Valley Water District	Steve Bigley
Coachella Water Authority / Sanitation District	Jerry Jimenez
Coachella Water Authority / Sanitation District	Kirk Cloyd
Desert Water Agency	Mark Krause
Friends of the Desert Mountains	Buford Crites
Hi-Lo Desert Golf Course Superintendent's Association	Stu Rowland
Indio Water Authority	Sara Toyoda
Mission Springs Water District	Brent Gray
Mission Springs Water District	Mike Thornton
Myoma Dunes Mutual Water Company	Mark Meeler
Regional Water Quality Control Board	Abdi Haile
Regional Water Quality Control Board	Jon Rokke
Riverside County Executive Office	Mike Shetler
Riverside County Flood Control and Water Conservation District	Jason Uhley
Riverside County Flood Control and Water Conservation District	Scott Bruckner
Salton Community Services District	Jerry Santillan
San Gorgonio Pass Water Agency	Jeff Davis
Torres-Martinez Tribe	Debi Livesay
Valley Sanitary District	Joe Glowitz

Subtask 1.2 Conduct Technical Review Meetings

In addition to conducting the technical work, the Technical Team shall conduct six (6) Technical Review Meetings. Members of the CVRWMG shall also attend these Technical Review Meetings. The purpose of the meetings will be to discuss data collection efforts, review work in progress, review/discuss comments on work products, coordinate, prepare and follow-up from Stakeholder meetings, and to solicit input/direction from the CVRWMG. The Technical Team shall prepare all meeting notices, agendas, and meeting summaries. Technical Review Meetings are planned at the following project milestones:

- Project kick-off and data collection
- Groundwater characterization review
- Salt/Nutrient loading assessment review
- Establish goals and identify management strategies for the SNMP
- Review anti-degradation process and assess management strategies
- Develop implementation and monitoring plans

Subtask 1.3 Conduct Technical Review Conference Calls

The Technical Team shall conduct additional conference calls with all or sub-members of the Technical Team, as necessary, to discuss technical issues, preliminary analyses, etc. Any key decisions or major question should be brought up to the entire Technical Team or the CVRWMG as necessary.

Subtask 1.4 Conduct SNMP Stakeholder Workshops

The Technical Team shall conduct five (5) stakeholder workshops for the purpose of presenting information, gathering input from stakeholders, and providing a forum for discussion of salt/nutrient issues. The Technical Team will prepare agendas, workshop notifications, sign-in lists, presentations, and summaries, and guide stakeholder discussion and technical presentations. The CVRWMG will review presentations prior to the workshops and provide comments to the Technical Team no later than three days prior to a workshop date. CVRWMG shall also assist with workshop location coordination. The Technical Team will distribute workshop notifications and materials prior to each workshop, and shall provide the following in support during each workshop:

Workshop 1 – Review Basin Characterization. At end of **Task 2**, the Technical Team will prepare for and present an overview of the State Policy on SNMPs and key elements in developing the SNMP, the SNMP development process, elements/sections of the SNMP, salt/nutrient constituents that will be assessed, and an overview of current understanding of the groundwater basin and potential salt/nutrient sources in the Basin.

Workshop 2 – Review Salt / Nutrient Loading and Trends. Following **Task 3,** the results of salt/nutrient loading analysis and assimilative capacity analysis will be presented by the Technical Team.

Workshop 3 – Input on SNMP Goals and Management Strategies. During **Task 4**, the Technical Team will present a summary of the goals established for the SNMP and the potential salinity/nutrient management strategies to be analyzed, along with the process for analyzing these strategies. Stakeholder input shall be considered by the Technical Team and CVRWMG.

Workshop 4 – Review Anti-Degradation Process and Management Strategies, Following **Task 5**, the Technical Team will present a summary of the evaluation of preferred management strategies and the results of the anti-degradation process.

Workshop 5 – Review Draft SNMP, During **Task 6,** the Technical Team will present the Draft SNMP to the stakeholders after the CVRWMG has reviewed and commented on the Draft Plan. This workshop will be a forum to discuss and respond to stakeholder comments on the Draft Plan. The Technical Team shall present the collaborative process used in development of the Draft Plan and the SNMP's key components.

Task 1 Deliverables:

- Technical Team and Stakeholder Working Group Lists
- Six (6) Technical Review Meetings
- Technical Team Conference calls, as necessary
- Five (5) SNMP Stakeholder Workshops
- For each Technical Team Review Meeting, Technical Team conference call, and Stakeholder workshop: announcements, agendas, meeting/conference call materials, including presentations and handouts, and summary notes

Task 2. Conduct Basin Characterization

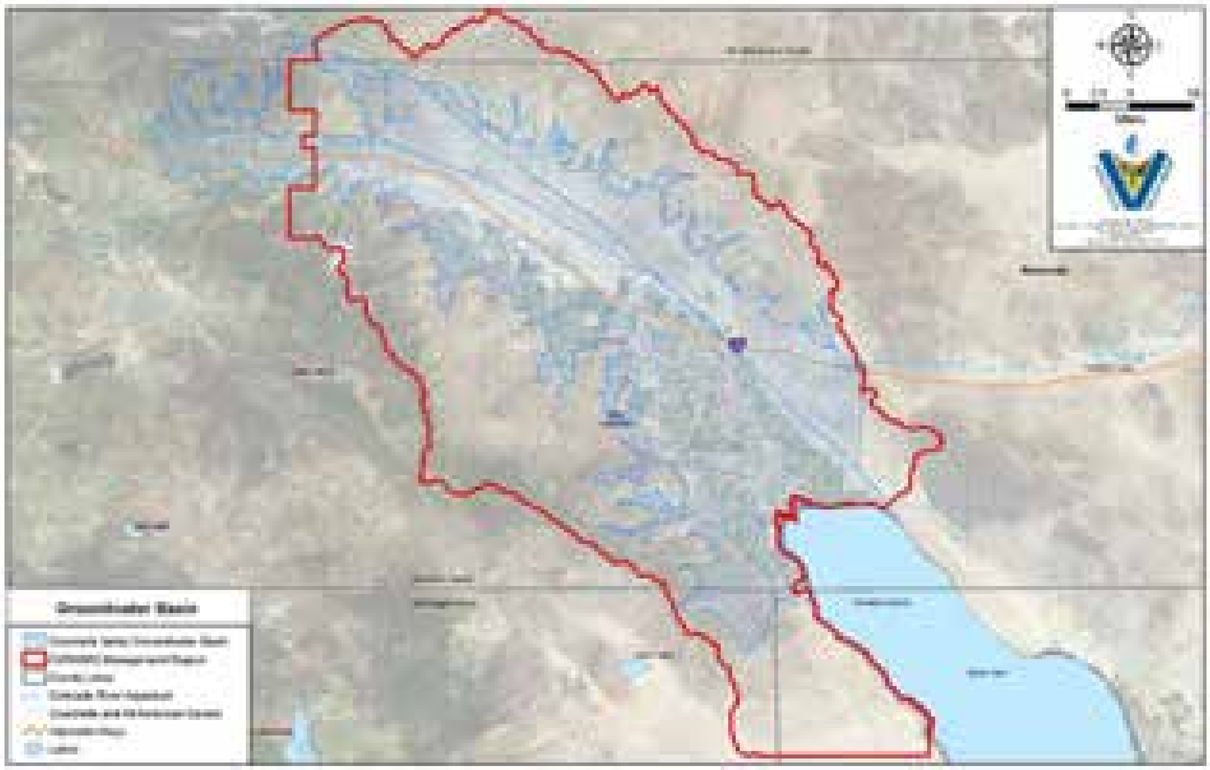
This task will involve identifying and characterizing the groundwater basin being assessed and delineating the study area.

Subtask 2.1 Identify the Groundwater Basins Being Evaluated

The Technical Team will conduct work to define the groundwater basin and potential sub-basins or management areas, and identify the upstream tributary area that may contribute source loads to the basin. The study area will include all or portions of the San Gorgonio Pass, Whitewater (Indio), Garnet Hill, Murrieta, Mission Creek, and Desert Hot Springs groundwater sub-basins. Figure 1 shows the current project study area.

Any tributary lands that are suspected or known to influence groundwater flow or quality in the groundwater basin will be included. A determination of basis for the selected study area will be documented, and a Geographic Information Systems (GIS)-based map depicting the areal extent of the groundwater basin and proposed management areas, the proposed study area, and the tributary watershed will be prepared. This map will be posted on the CVRWMG website for public viewing.

Figure 1: Coachella Valley Salt and Nutrient Management Plan Study Area



Subtask 2.2 Identify, Collect, and Review Existing Groundwater Studies and Data

The Technical Team shall identify and review prior groundwater management studies, hydrogeologic assessments, or evaluations that have assessed issues relevant to salinity and nutrient planning and/or groundwater basin management within the study area. This work will include region-wide, local and basin-specific studies, as applicable and available. Information to be collected will include, but is not limited to:

- Areas of groundwater recharge (including direct and/or indirect groundwater discharges into the Salton Sea)
- Estimation of groundwater storage capacity (and other studies related to a basin-wide water balance)
- Public, private, and agricultural supplies, usage, and water quality information
- Location of recycled water irrigation/application
- Recycled water quality
- Storm water runoff quality and permitted outfalls
- Projected future water demands (including recycled water)
- Projected future wastewater and recycled water production

- Location and quantity/quality of brined disposal
- Land use plans from CVAG

Technical data or assessments on which groundwater management studies were based will also be used. Appropriate agencies, groups, and co-permittees will be contacted to assist with identifying and obtaining these studies.

Subtask 2.3 Document Beneficial Uses

The Technical Team shall perform a preliminary analysis to identify and quantify existing and likely potential future uses of groundwater in the basin. This work will include identifying and characterizing existing and planned municipal supply wells or projects and quantified pumping in the Basin, identifying and characterizing private groundwater wells and users in the Basin, quantifying or estimating the irrigation pumping from private wells, identifying areas where groundwater-dependent habitat is known to exist, quantifying the amount of groundwater uptake required by the habitat, and identifying the actual listed Beneficial Use(s) within the basin and sub-basin areas from the Basin Plan. Existing documentation, where available, will be used, including water agency records, well surveys and well records, County of Riverside permit records, and other relevant data. GIS-based mapping will be used to identify the locations of municipal and private wells.

Work conducted under this task would provide preliminary indication of uses that may need to be protected. Should differences between current existing or potential future use and Basin Plan Beneficial Uses be identified, significant additional work and study, potentially up to a Use Attainability Analysis, would be required to modify the beneficial uses. Such a change requires an amendment to the current Basin Plan and is not included in this scope of work.

Subtask 2.4 Characterize Groundwater Quality and Occurrences

The Technical Team shall characterize existing and historic groundwater quantities and qualities within the Basin through review of existing studies and contact with agencies or groups engaged in ongoing data collection. The Technical Team will also identify and obtain additional data, as available, to fill identified data gaps. Work may include collecting, aggregating, and analyzing historic and current water quality data for the beneficial uses and objectives review, and for purposes of completing the salt/nutrient loading analysis and anti-degradation process. Geographic and depth-dependent distribution of concentrations will be assessed for the salinity and nutrient parameters of interest (determined in **Subtask 2.5**, below). GIS-based maps will be developed depicting groundwater quality, concentration contours, depth-to-water, groundwater flow directions, and key hydrogeologic features that may affect constituent transport. All data will be accumulated into GIS- and/or Excel-based database for subsequent analyses. GIS-based mapping will be posted on the CVRWMG website for public viewing.

Subtask 2.5 Identify Salinity, Nutrient, and Constituents of Concern

The Technical Team shall identify recommended salinity and nutrient parameters to be addressed within the SNMP. The focus of this subtask shall be to identify constituents of concern relative to attainment of groundwater basin objectives and water quality standards as related to beneficial use for the groundwater basin. The recommended list of constituents of concern will be developed on the basis of prior groundwater studies, collected groundwater quality information, consultation with Regional Board staff, and discussions with study partners and stakeholders.

Anticipated constituents to be considered include total dissolved solids (TDS) and/or Specific Electrical Conductance or Electrical Conductivity (EC), and may include one or more individual ions such as chlorine, sulfates, or sodium if such constituents are determined to be of concern; nitrate-nitrogen; and potentially iron and/or manganese. During Stakeholder Workshop 1, the relevance of the aforementioned constituents and other potential constituents shall be discussed, and input regarding other potential constituents will be received.

As noted, the CVRWMG is encouraged to coordinate with its technical team to maximize use of prior studies that have assessed groundwater hydrogeology, groundwater quality, and beneficial uses within the Coachella Valley groundwater basin.

Subtask 2.6 Establish Baseline Conditions

Using the data collected and evaluated in the prior subtasks, a baseline period will be selected and baseline groundwater conditions identified using available data for that period. This baseline period will be utilized in subsequent tasks to establish basin assimilative capacity.

Task 2 Deliverables:

- Basin Study Area Map
- List of existing groundwater studies and hydrogeologic assessments in the Basin
- Well Listings in the Basin
- Well Location Map in the Basin
- Quantification of historical pumping (public and private wells), groundwater recharge, septic systems, recycled water usage, discharges, and runoff in the Basin
- Estimation of groundwater storage capacity (based on available data)
- An identification (list) of any groundwater-dependent habitat
- Groundwater Quality and Basin Characteristics GIS layers and Map
- Summary of preliminary existing and potential future Beneficial Uses within the Basins
- Baseline groundwater conditions
- List of Salinity and Nutrient Parameters and other Constituents of Concern to the SNMP
- Technical Memorandum (TM) summarizing the above
- Stakeholder Workshop 1 - Basin Characterization

Task 3. Identify Salt / Nutrient Loading and Trends

This task will involve identifying, and the preliminary quantification of, salt and nutrient sources to the groundwater basin for the identified constituents of concern.

Subtask 3.1 Identify Salinity and Nutrient Sources

The Technical Team shall identify land use characteristics, known point sources and non-point sources of salts and nutrients, and their locations. Water sources and their places of use shall be identified based on information gathered with input from appropriate water suppliers, irrigators, and stakeholders. The type or source of water used for outdoor irrigation for each parcel shall be defined using available information. Data collected under this task will be accumulated into GIS and/or Excel databases for subsequent analyses. During the first Technical Team Review Meeting, and subsequently in Stakeholder Workshop 1, the Technical Team shall seek input regarding significant land cover changes that might have taken place since the date of available data to more accurately reflect current land cover data.

Subtask 3.2 Quantify Salinity and Nutrient Source Loads

The Technical Team shall use existing available data to quantify salinity and nutrient sources in terms of volume, concentration, and/or mass loads using data and information collected in previous tasks, along with other salinity and nutrient source loading information, to conduct a loading analysis. The Technical Team shall prepare a preliminary water budget and mass load estimate for the study area, as well as for individual groundwater sub-basins or management areas.

The Technical Team shall conduct the initial source loading analysis using a GIS-based tool to input all data into a GIS format and to perform initial water budget and mass loading analyses. The GIS-based tool shall be used to conduct analyses of historical, existing, and projected future basin conditions and to identify any water quality trends. Salt and nutrient loads to each sub-basin or management area will be identified, as will the salinity and nutrient load sources that appear to be most important in influencing historical and projected groundwater quality trends.

The mass balance model will assume instantaneous mixing of waters within the groundwater basin and will be developed to analyze sub-basins or management areas that may have specific water quality or salt/nutrient source loadings that differ significantly from the rest of the basin.

Where data history on sources, water balance, and conditions is adequate for use in projecting future conditions, the Technical Team will perform an assessment of historic and projected future trends of salinity and nutrient concentrations in groundwater basins. This preliminary work could indicate an increase, decrease, or no expected changes in the future. More detailed study (Phase 3) would provide quantified future contaminant concentrations for the 20-year planning horizon.

Subtask 3.3 Develop a Plan for Data Gaps

The Technical Team shall identify potential data gaps or needs based on the work completed in **Tasks 2 and 3**. Data gaps could include groundwater quality data, groundwater monitoring data, salinity and nutrient source data, and data for hydrogeologic and other groundwater modeling parameters. The Technical Team shall determine what additional data may be required to support future analysis or modeling efforts to be completed in Phase 3. If necessary, the Technical Team will develop a plan for obtaining the data, including the identification of responsible parties for collecting the data as part of the monitoring plan to be developed under **Task 6**.

Task 3 Deliverables:

- Salt and nutrient source location and loads maps
- Preliminary water budget and mass load estimates
- Preliminary salinity and nutrient source load assessment and evaluation of model results of existing and projected basin conditions
- Stakeholder Workshop 2: Salt/Nutrient Loading and Trends

Task 3 Assumptions:

- Loading assessments will include an initial analyses, a review by the Technical Team, and then a final analyses for presentation to the Stakeholders

- A Technical Memorandum or other written summary in digital format will be developed that can be used in subsequent workshop presentations and handouts and for use in the Draft and Final Salt/Nutrient Management Plan. This summary will include appropriate figures and maps based on the analyses conducted.

Task 4. Identify Water Management Goals and Potential Strategies

The purpose of this task is to identify the principal goals to be achieved by the SNMP and to develop an initial list of management strategies that may be appropriate for achieving the established goals.

Subtask 4.1 Identify Water Supply and Water Quality Management Goals

The Technical Team shall identify the preferred goals of the key agencies that will implement the SNMP and other stakeholders, including processes for obtaining stakeholder input and resolving potential conflicts.

Working with the CVRWMG, the Technical Team shall develop an approach to solicit input from Stakeholders that will be used to identify and rank overall management goals to be achieved within the groundwater basin or sub-basin/management area. Desired goals may focus on source load reduction, treatment, providing other forms of water quality protection, or increased recycled water use. The selected goals should be specific to the needs and conditions of the basin, and will, in part, depend on:

- Existing groundwater quality and occurrence
- Existing salinity/nutrient source loads and locations
- Water agency needs and proposed supply projects
- Recycled water agency needs and proposed projects
- Existing Basin Plan objectives and compliance issues
- Water conservation considerations
- Potential within the basin to implement specific groundwater management strategies
- Basin assimilative capacity
- Funding/implementation considerations
- Future growth (development depends on water supply assessments)

The CVRWMG shall be responsible for managing and addressing potential stakeholder conflicts and refinement of the SNMP goals as may be necessary. The Technical Team will provide a Technical Memorandum or other written summary that can be used in subsequent workshop presentations and handouts and for use in the Draft and Final Salt/Nutrient Management Plan. This updated summary will include appropriate figures and maps based on the analyses conducted previously and the salt/nutrient management plan goals developed under this task.

Subtask 4.2 Develop List of Potential Management Strategies

The Technical Team shall review possible salinity and nutrient management strategies, including those being implemented or under consideration by agencies, those identified in previous studies, and based on input from the CVRWMB and stakeholders. The Technical Team will develop a preliminary list of alternative management strategies that are feasible for implementation in the groundwater basin, and obtain stakeholder input on the preliminary list. The following are potential strategies that may be considered:

Summary of Potential Salinity/Nutrient Management Strategies	
Category	**Potential Salinity/Nutrient Management Strategy**
Wastewater salinity/nutrient source control	• Water softener control (ordinance and/or rebates) • Local pretreatment limits (industrial discharge controls) • Recycled water nutrient treatment • Recycled water demineralization treatment
Public education	• Salinity source reduction best management practices • Water softener use • Irrigation best management practices • Fertilizer use best management practices
Source load reduction	• Agency lease-holder requirements • Fertilizer reduction requirements for recycled water users • Source load diversion
Source water salinity control	• Brackish source water demineralization • Modify ratios of local or imported water sources
Salt export	• Brine line • Salt flushing to the Salton Sea or other location • Concentrate management including disposal • Zero liquid discharge involving salt sequestration
Groundwater recharge	• Imported water recharge • Recycled water recharge • Stormwater recharge • Percolation basins • Injection wells • Aquifer Storage Recovery (ASR) wells
Groundwater management	• Conjunctive use • Demineralization treatment • In lieu (exchange use of untreated groundwater for recycled water) • Decrease detention time • Seasonal storage • Carryover storage • Emergency storage
Land use regulation	• Modify land use policy • Require sewer connections
Water use efficiency (20 x 2020 goals)	• Landscape ordinance • Water use restrictions • Water conservation rate structures

Summary of Potential Salinity/Nutrient Management Strategies	
Category	**Potential Salinity/Nutrient Management Strategy**
	• Public education/behavior change
Stormwater/runoff management	• Stormwater BMPs to reduce salinity/nutrient loading • Stormwater diversion to beneficial use • Low flow runoff diversion

Regulatory	• Changes to current basin plan (work in conjunction with RWQCB in Phase 3):
	  • Designated Beneficial Uses (See Task 2)
	  • Numerical groundwater concentration objectives or narrative translation procedures
	  • Implementation policies and projects

Subtask 4.3 Evaluate Feasibility of Potential Management Strategies

Following completion of **Subtask 4.2**, the Technical Team will evaluate the list of potential management strategies to identify and compare the most feasible strategies (including existing and proposed strategies) on the basis of factors such as:

- Costs (capital and O&M, including monitoring costs)
- Anticipated water quality improvements
- Local water supply development potential, including increasing the use of recycled waters or enhanced development of groundwater supplies
- Regulatory compliance
- Sustainability and funding considerations
- Ability to implement
- Environmental impacts

After this evaluation is complete, preferred management strategies will be recommended for implementation by the Technical Team using stakeholder feedback and a pre-defined decision process and will be carried forwarded into the anti-degradation process for further review and consideration (**Task 5**). The CVRWMG will oversee the evaluation process and make final decisions regarding the recommended strategies.

The methodology for evaluating and ranking the list of potential management strategies will be developed by the Technical Team to help determine which management strategies should be implemented to help address the various SNMP goals (preferred management strategies). If necessary, a decision methodology will be developed with input from the Stakeholders to help define and document the decision-making process. The potential costs for implementation, including monitoring needs, of the strategies should also be considered in the prioritization process.

Subtask 4.4 Assimilative Capacity Analysis

Assimilative capacity represents a comparison of existing water quality concentrations to the limits set in the Colorado River RWQCB’s Water Quality Control Plan (Basin Plan). In general, water quality better than the Basin Plan limits is an indicator of available assimilative capacity, while water quality constituent levels above the Basin Plan limits indicate that load reduction measures may be necessary (or that Basin Plan objectives may need to be changed). In this subtask, the Technical Team will conduct several activities that will allow comparison of groundwater quality at representative locations within the basin to identified limits set in the Basin Plan to estimate the assimilative capacity of the groundwater basin, either in whole or by management area.

Step 1: Identify Basin Management Levels

The Technical Team will work with Colorado River RWQCB staff to identify a method for translating the existing narrative water quality objectives for Municipal Supply (MUN), Agricultural Supply (AGR) and Industrial Supply (IND), as documented in the Basin Plan, into basin management targets for the recommended list of constituents of concern developed in **Subtask 2.5**. These levels will be used in the subsequent steps to estimate the basin assimilative capacity.

Step 2: Compare Baseline Groundwater Quality Conditions with Basin Management Targets

After identifying the Basin Management Targets, baseline groundwater quality will be compared to the targets to determine if the current status of the basin with respect to the Basin Plan's management goals.

Step 3: Evaluate Fate and Transport of Salts and Nutrients in Groundwater Basin

The Technical Team will also perform a qualitative analysis of the fate and transport of the identified constituents of concern using the GIS-based mass balance model.

Step 4: Estimate Basin Assimilative Capacity

The results of the previous steps will then be brought together to estimate the groundwater basin's assimilative capacity.

This approach will facilitate future updates to the analysis as well as allow reviewers to monitor specific areas of concern within the basin.

Task 4 Deliverables:

- SNMP goals
- Summary of identified and ranked alternative management strategies
- Decision methodology for selecting the preferred strategy(ies)
- Stakeholder Workshop 3: SNMP Goals and Management Strategies
- Mass balance model and results
- Assimilative capacity analysis

Task 4 Assumptions:

- The CVRWMG shall be responsible for managing and addressing potential stakeholder conflicts and refinement of the SNMP goals and preferred management strategies.

Task 5. Conduct Anti-Degradation Process

The anti-degradation process incorporates and builds, as well as informs, efforts performed in previous tasks to evaluate the preferred management strategies. Strategies developed under **Task 4** should be reconsidered as a result of the initial analyses. In addition, assumptions and/or data collection needs resulting from the Salt/Nutrient Loading and Trends Analysis may also have to be revised or updated as a result of this analysis.

Subtask 5.1 Assess Load Reductions and Water Quality Improvements

The purpose of this task is to assess the existing and preferred water management strategies and their ability to meet the goals of the SNMP, including any salt/nutrient load reduction, other water quality goal, and water supply/beneficial use goals. The Technical Team will identify the necessary mass loading modeling scenarios to be analyzed on a projected basis to assess the effectiveness of each management strategy in meeting the SNMP goals. It is assumed that the mass balance tool developed under **Task 3** will be utilized to perform this analysis. Initial strategies that should be assessed will be those strategies currently employed by agencies. If additional strategies are needed to meet SNMP goals, then the additional analyses will consider new/additional strategies based on the preferences identified under **Task 4**.

Subtask 5.2 Identify Preferred Management Strategies

The Technical Team shall evaluate the preferred management strategies identified in **Subtask 4.3**, along with any additional management strategies determined potentially feasible, to determine their compliance with the State's Anti-Degradation Policy (Resolution Number 68-16). Specifically, the assessment will:

- Determine if their implementation will degrade groundwater;
- Verify that they meet best practicable treatment or control (BPTC) requirements; or
- If the strategy is consistent with the maximum benefit to the people of the State.

After this evaluation is complete, the revised list of preferred management strategies will be recommended for implementation by the Technical Team using stakeholder feedback and a pre-defined decision process. The CVRWMG will oversee the evaluation process and make final decisions regarding the recommended strategies.

If any Basin Plan Amendments are recommended (including those identified in **Task 4**) after conducting the anti-degradation process and evaluation of management strategies, then the following steps should be undertaken as part of the Phase 2 effort:

- Identify required Basin Plan Amendments (e.g. changes to numerical objectives, implementation policies, or beneficial uses) associated with the preferred salinity/nutrient management strategies. This effort will most likely occur during Phase 2 activities, but additional amendments may be developed as part of the initial Phase 3 efforts as well.
- Coordinate with Regional Board staff to (1) reach agreement on the approach for Basin Plan amendment; (2) identify information needs necessary for the proposed Basin Plan Amendment; and (3) identify if data are available for proposed amendment.
- Under **Task 6**, develop a data collection or monitoring plan necessary to collect any necessary data as part of the Phase 3 process.

Actual Basin Plan Amendments would be prepared under Phase 3.

Task 5 Deliverables:

- Assessment of load reduction and/or water quality improvements (anti-degradation process) - Technical Memorandum
- Evaluation and selection of SNMP Management Strategies - Technical Memorandum, including any recommended Basin Plan Amendments for Phase 3
- Recommendations for any additional Basin Plan Amendments - Technical Memorandum
- Stakeholder Workshop 4: Anti-Degradation Process and Management Strategies

Task 6. Finalize Phase 2 SNMP

This task will involve developing an implementation plan, identifying the metrics to evaluate effectiveness of selected salinity and nutrient management strategies, developing monitoring and audit plans, finalizing the SNMP, and working with the Colorado River Basin RWQCB (Region 7) to obtain approval of the Phase 2 SNMP and scope for the Phase 3 SNMP.

Subtask 6.1 Develop Implementation Plan

The Technical Team will develop an Implementation Plan that will include the following components:

- Identification of the selected management strategies
- Activities to be implemented
- Phases of implementation
- Estimated costs
- Implementation timeframes

Subtask 6.2 Identify Metrics and Develop Monitoring Program

The Technical Team shall identify metrics (measureable parameters) that can be used to evaluate the effectiveness of the selected salinity and nutrient management strategies following implementation. The Technical Team shall develop a monitoring program, including identification of the responsible agency, the schedule for implementation, and monitoring required to measure the effectiveness of any implemented groundwater management strategy. Existing monitoring efforts will be incorporated into the SNMP monitoring plan. Where possible, existing monitoring efforts will be adjusted to include any necessary SNMP monitoring needs. The costs for additional monitoring needs shall be considered when assessing the feasibility of the implementation strategies under **Task 5.2.** The monitoring program shall comply with the State Water Resources Control Board's (SWRCB's) policy on monitoring of contaminants of emerging concern (CECs) that is currently in draft form and expected to be approved in late 2012 or 2013. In addition, data collection/monitoring needs identified under **Tasks 3** will also be included in this monitoring plan. The metrics and monitoring plan shall be reviewed by the CVRWMG prior to input from the Stakeholder Workshop.

Subtask 6.3 Develop SNMP Data Management, Reporting, and Audit Processes

The Technical Team shall establish the framework and schedule for how data will be managed, including ongoing monitoring efforts, in addition to reporting and auditing processes. Auditing of the SNMP and its implementation will likely be conducted on a periodic basis and should include updating of the SNMP (based on adaptive management principles) and identifying the responsible agency or agencies for implementing the effectiveness assessment.

Subtask 6.4 Determine CEQA/NEPA Compliance Needs

In conjunction with the RWQCB, the Technical Team shall determine how the recommended SNMP will need to conform to California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) requirements. In accordance with the SWRCB's Recycled Water Policy, the SNMP is required to be in compliance with CEQA to determine potential significant environmental impacts and identify measures to avoid or mitigate impacts where feasible.

However, under the California Secretary for Natural Resources, the SWRCB's basin planning process is exempt from certain requirements of CEQA, including the preparation of an Initial Study, Negative Declaration, and Environmental Impact Report [CCR, Title 14, §15251(g)].The SNMP may still be subject to other CEQA provisions, including the avoidance of significant adverse effects to the environment where feasible. Completion of an environmental checklist and a written report consisting of a description of the proposed activities, analysis of reasonable alternatives, and identification of mitigation measures to minimize potential significant adverse environmental impacts may still be required (CCR, Title 23, §3777(a)). In lieu of an Initial Study, Negative Declaration, and Environmental Impact Report, a Substitute Environmental Documentation (SED) may be required for any water quality control plan, state policy for water quality control, and other components of California's water quality management plan, prior to RWQCB approval or adoption. This assessment will identify if implementation of the recommended strategies or any identified Basin Plan Amendments (to be developed under Phase 3 of this work plan) will be subject to review under CEQA or NEPA and if an SED or other documentation will be necessary.

The Technical Team will support the RWQCB in preparing the necessary CEQA documentation for implementation of the SNMP. For the purposes of this work plan, it is assumed that all management strategies identified in previous tasks for implementation under the SNMP will be non-structural in nature (e.g. policies, monitoring). Therefore, the scope of work under this subtask is limited to:

- One scoping meeting to seek input on environmental information that should be considered;
- Completion of an environmental checklist evaluating environmental factors that may be potentially affected by the SNMP implementation;
- Preparation of a response to any comments received on the environmental checklist and during the scoping meeting; and
- A cover memorandum identifying the preferred management strategies and summarizing the results of the checklist and scoping meeting (including identification of any recommended mitigation measures).

If the recommended strategies or identified Basin Plan Amendments would be subject to review, then in conjunction with the RWQCB and as part of the Phase 2 work, the CVRWMG and the

Technical Team will:

- Identify the appropriate governing body (lead agency)
- Identify the required documentation and responsible parties

Since preparation of the Basin Plan Amendments are proposed under Phase 3, the Environmental Documentation process will occur in Phase 3 as well.

Subtask 6.5 Finalization of the SNMP

The Technical Team shall prepare a Draft and Final Salt/Nutrient Management Plan that summarize the results of all deliverables described within **Tasks 1 through 6** into a comprehensive planning document that is stand-alone or that can be incorporated into the IRWM Plan Update.

Task 6 Deliverables:

- Summaries or Technical Memorandums from **Tasks 2 through 5**,
- SNMP Implementation Plan
- Performance metrics and monitoring plan
- SNMP Audit Plan
- Scope and Schedule for Phase 3 efforts, including any proposed Basin Plan modifications for Phase 3
- Assessment of any required CEQA/NEPA documentation
- Draft and Final Salt/Nutrient Management Plan
- Stakeholder Workshop 5: Draft SNMP

Task 6 Assumptions:

- One Draft Plan will be developed and after review by the CVRWMG, will be reviewed by the public stakeholders as part of Stakeholder Workshop 5. Comments from this review will then be incorporated into a Final Plan for approval by the CVRWMG.

Phase 3 Tasks

The purpose of Phase 3 is to update the SNMP based on additional data and/or recommendations resulting from the Phase 2 tasks. Possible tasks for inclusion in Phase 3 may include the following. Please note, however, that this list does not constitute a complete Work Plan for Phase 3.

Supplemental Monitoring

This task includes collecting of supplemental monitoring needs identified under Phase 2. Such data could be a limited, one-time collection effort or could become an ongoing monitoring/effort that is required to evaluate the SNMP performance measures.

Update Salt/Nutrient Loading and Trends (if necessary)

This would be an update to the analysis conducted under Task 3 in Phase 2, and would only be necessary if new or updated data were collected.

Update Water Management Goals and Strategies (if necessary)

This would be an update to the analysis conducted under Tasks 4 and 5 in Phase 2 and would only be necessary if there were significant changes due to new data and/or the salt/nutrient loading and trends analysis. In addition, new goals or strategies may be developed and initial performance feedback on the existing or early implementation strategies under Phase 2 may warrant a change in the preferred strategies. If any Basin Plan Amendments are proposed as part of the implementation strategies (from Phase 2 or 3), then potential steps for this process include:

- Identifying required Basin Plan Amendments
- Coordinate with RWQCB staff on approach/process amending the Basin Plan
- Develop necessary documentation in coordination with the finalization of the SNMP
- Submitting the documentation to the RWQCB for review
- Coordinating with the RWQCB and establishing a plan for developing and submitting the environmental documentation to the RWQCB, as required

Update Anti-Degradation Process (if necessary)

This would be an update to the analysis conducted under Tasks 5 and 6 in Phase 2 and would only be necessary if new data were collected or updates were necessary as a result of changes in the salt/nutrient loading and trends analysis or changes made in the proposed water management goals or strategies.

Update SNMP (if necessary)

The SNMP may be updated, if necessary, based on the result of afore-mentioned Phase 3 tasks.

EXISTING DATA / REPORT BIBLIOGRAPHY

The following table lists a sample of currently known data/information that is being requested from agencies involved with the SNMP.

Agency	Data/ Report	Date	Filename
Coachella Valley Water District (CVWD)	WQ Data / Coachella Canal at Avenue 52 East Annual Data 2007-2012	Oct. 2, 2012	Canal WQ Data 2007 to 2012.pdf
CVWD	WQ Table / TDS for Colorado River Aqueduct at San Jacinto Tunnel and Coachella Canal at Avenue 52 East Annual Data 2007-2012		Table 1_TDS for Colorado River Aqueduct and Coachella Canal Jan_2007 to Aug_2012.prf
CVWD	WQ Chart / TDS for Colorado River Aqueduct at San Jacinto Tunnel and Coachella Canal at Avenue 52 East Annual Data 2007-2012		Chart 1_TDS for Colorado River Aqueduct and Coachella Canal Jan_2007 to Aug_2012.prf
Coachella Water Authority (CWA)			
Desert Water Agency (DWA)			
Indio Water Authority (IWA)			
Mission Springs Water District (MSWD)			

Appendix VI-H: Coachella Valley IRWM Program Project List (as of December 14, 2018)

This appendix includes a list of all projects submitted for inclusion in the 2018 Coachella Valley IRWM/SWR Plan. The list is divided into an IRWM project list and a SWRP project list. Per requirements of the 2015 SWRP Guidelines, the SWRP projects are scored and ranked in three tiers.

The lists as printed are current as of December 14, 2018 but may be updated at any time. Please refer to the online project database for a current list of all projects included in the Plan. The project database can be accessed here: http://irwm.rmcwater.com/cv/login.php. Please be aware that users must register and login prior to viewing the database. Registration is free.

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Coachella Valley IRWM Project List (as of December 14, 2018)

Project Title	Organization	Project Type	Project Description
Water Recycling Efficiency and Capacity Improvement Project	Desert Water Agency	Construction Project	From #19: To meet the proposed recycled water demands, capacity and production will be increased at the Agency owned water reclamation plant. #20 The Agency proposes to install two wells to pump non-potable groundwater. This groundwater will be fed into the recycled water plant to supplement the water currently being treated during high demand water periods. A new 500,000-gallon water reservoir is being added, along with a new hydro pneumatic tank, increasing the water storage capacity at the plant. The project will also increase energy efficiency, through the installation of solar power generating modules. The solar power created will be used to offset power costs, reduce the electrical grid demand and carbon footprint of the recycled water plant.
Mid Valley Pipeline - Phase II	Coachella Valley Water District	Construction Project	The Mid-Valley Pipeline is a non-potable water distribution system to convey recycled water and Colorado River water to golf courses for irrigaion in lieu of groundwater. The project consists of two phases estimated at a total cost of approximately $75 million. Phase 1 is complete and consists of a booster station at the Coachella Canal in the City of Indio, approximately 7 miles of 54-inch pipeline along the Whitewater River Stormwater Channel, and 90 acre-feet of storage reservoirs at CVWD's WRP 10. Phase 1 pumps Colorado River water from the canal to the existing WRP 10 recycled water distribution system which serves 8 golf courses. Colorado River water augments the recycled water supply in summer months when golf course irrigation demand exceeds recycled water supply. Phase II is estimated to cost $35 million and consists of expansion of the WRP 10 distribution system to serve 50 golf courses with an average demand of 1,000 acre-feet per year each.
Posse Park Surface Water Treatment Plant	Indio Water Authority	Construction Project	IWA has signed a letter of intent to purchase 20,000 AFY of Delta water to be exchanged with Colorado River water to be delivered to the new SWTP via the Coachella Canal. A SWTP would increase IWA?s flexibility in serving its customers and would help reduce the groundwater overdraft in the area. The intention is that treated water from the SWTP would be primarily for potable use, but it may also be used as a blending source for future groundwater recharge. The IWA Conceptual Design report evaluated six alternatives and identified full conventional pretreatment, low pressure membrane filtration, blending of filtered surface water with existing groundwater supplies and free chlorine for primary and residual disinfection as the prefered alternative. The project will be designed and constructed in two phases with an initial capacity of 10 MGD and expanded once for an additional 4 MGD by 2025.
Fargo Canyon Spreading Facility	Indio Water Authority	Construction Project	Through the construction of a new diversion from the CRA, the project will provide for the storing of water within the Fargo Canyon aquifer through spreading. During a ?put? year, surplus Colorado River water or other surface water entitlements may be taken directly from the CRA and spread directly into the Fargo Canyon Spreading Basins. During a ?take? year, annual replenishment deliveries would be reduced by an equivalent amount of ?take? from the new storage account. Water normally delivered to the Valley via Metropolitan?s CRA would now be available for delivery to other water purveyors via exchange within Metropolitan?s water system. Valley-wide agencies would pump groundwater from the storage account, and thus would not require replenishment. This project presents a proactive approach to meeting future needs as well as providing a storage opportunity for agencies currently lacking adequate storage.
Belardo Road Pipeline Replacement	Desert Water Agency	Construction Project	The Desert Water Agency General Plan suggested that this pipeline be installed in 2009. Due to budget restraints, the project was postponed. There is a need to install the infastructure to increase the efficiency of the distribution system as well as minimize other water supply or quality problems relating to deterioration of other pipelines over time. This project is several years old and was stopped due to archeological reasons. This section of pipe will connect two sections of 24" pipeline allowing us to move water from north to south as intended in the general plan. Currently, the water must flow through smaller pipes, increasing head loss and reducing flow capacity.
Well Pumping Plants 44 and 45 of the Palm Springs Main Well Field	Desert Water Agency	Construction Project	The project consists of construction of two wells, followed by the construction and operation of associated pumping plants. Each well will be drilled to a depth of approximately 1,000 feet, and will have a 20 inch diameter casing fitted with about 400 feet of perforations. Each pumping plant will be designed to produce approximately 2,000 to 2,500 gallons per minute (gpm), and will be driven by a 400? horsepower electric motor.

Project Title	Organization	Project Type	Project Description
Groundwater Quality Protection Project	Mission Springs Water District	Construction Project	Areas M. F, D1 are part of a larger assessment district, which voters passed in 2004. In creating the Assessment District, voters provided $28 million of match funding which expires in 2014. Engineering design of the 10 sub areas that make up the assessment district is almost complete and funds are needed for construction. The project will abate septic systems and protect both the drinking water supply and the hot water that is the basis of the spa economy for the city of DHS and the Coachella Valley. In some parts of the city the septic tank density is 2.3 to 2.8 times the density recommended by the Regional Water Quality Control Board.
Smart Water Conservation Programs	Indio Water Authority	Conservation	The Smart Water Conservation Programs will be used to help residence and stakeholders make smart water conservation decisions and also make conservation equipment more available. Home water audits are an excellent educational tool, and the IWA would like to provide indoor and outdoor audits. Turf conversion to drought tolerant plants is one of the most effective water conservation practices but the costs are prohibitive to many people. This project could make this option possible to many more people. Irrigation systems in the region are poorly designed, aged, and outdated. New irrigation products such as spray heads and smart controllers are available but more education is needed. Smart controllers are costly so different rebate options should be available.Additional programs include supplying consumers with plumbing retrofitting, water efficient shower heads and low flow toilets. Program monitoring will be used evaluate cost effectiveness and to enhance outreach and education.
Groundwater Elevation Monitoring--Regional project of CVRWMG	CVRWMG	Planning	Develop the groundwater elevation monitoring for the groundwater basins/subbasins in the Coachella Valley Water Management Region, so as to better manage the resource during normal, wet and dry water years. An entity must volunteer to be the monitoring agent by January 1, 2011, with reporting to begin by January 1, 2012.
Information Systems--a Regional Project of CVRWMG	CVRWMG	Planning	Conceptual design needed--information systems that will report on those metrics that relate to attainment of Plan objectives
Resource Action Programs	Mission Springs Water District	Conservation	MSWD will sponsor a RAP program which provides conservation kits containing water efficient fixtures such as a low flow showerhead and faucet aerators. Program is administered in part through partner agencies that provide free financial counseling to families in economically disadvantaged communities. Customers learn about the water saving fixtures they are being supplied with and how, along with good conservation habits, installing the efficient fixtures will reduce their monthly utility bills while conserving water. In the 2008-2009 school year, the RAP "Living Wise" program administered thru 6th grade classrooms resulted in over 13,000 gallons saved annually per household - an annual community savings of over 5 million gallons of water. Bringing a similar program to adults in the community will result in additional significant savings.
Agricultural Conservation Program	Coachella Valley Water District	Conservation	CVWD has demonstrated through past Bureau of Reclamation sponsored programs that CVWD sponsored agricultural conservation programs with grower participation are effective. This Agricultural Conservation Program will provide a tiered approach to conservation, graduating to more stringent steps as necessary to achieve a goal of 14 percent conservation in agricultural irrigation. The steps are 1) grower education and training, 2) CVWD provided services such as scientific irrigation scheduling, scientific salinity management, moisture monitoring, and irrigation distribution uniformity evaluations, 3) irrigation system upgrades/retrofits which includes full or partial funding to convert from flood and sprinkler to micro-sprinkler and drip, 5) economic incentives to those who maintain a water use budget.
Semi-Perched Brackish Groundwater Treatment Facility for Agricultural Irrigation	Coachella Valley Water District	Conceptual Design	A brackish groundwater treatment pilot/feasibility study was completed in 2008 (Malcolm-Pirnei) testing treatment alternatives, brine management approaches, and source water supply capture. The study recommended capturing semi-perched brackish groundwater return flows (via bank filtration/pumping) for desalination using either reverse osmosis or nano filtration. It is proposed that the desalinated water would be used for agricultural irrigation in lieu of Colorado River Water. This would create new water for agricultural irrigation, making more Colorado River water and groundwater available for municipal use or recharge. Brine could also be reused for saline wetlands habitat.
Colorado River Water Treatment Facility for Municipal Use	Coachella Valley Water District	Conceptual Design	As growth occurs in the eastern Coachella Valley and farms convert to urban uses, agricultural demand for Colorado River Water water decreases. To avoid increased urban groundwater pumping, Colorado River water water will need to be treated for municipal use. A surface water treatment feasibility study was successfully completed by Malcolm-Pirnie in 2008 testing alternative treatment methods and system compatibility. It is proposed that facilities could be designed to treat up to 90,000 acre-feet per year of Colorado River water by 2045.

Project Title	Organization	Project Type	Project Description
Groundwater Quality Protection Perez Road Sewers	City of Cathedral City	Construction Project	Replace existing septic tanks with sanitary sewers in the vicinity of Perez Road from Date Palm Drive to Campbell Street and from Kieley Road to Cathedral Canyon Channel. The project includes 6,820 feet of 8" diameter sewer and 4,324 feet of 15" sewer. The project will eliminate over 80 existing septic tanks and provide sanitary sewer service to 98 individual parcels.
Verbena Channel	Riverside County Flood Control and Water Conservation District	Construction Project	Verbena Channel is south of Dillon Road and north of Two Bunch Palms Trail, and will replace a storm drain and detention basin system from Camino Idilio approximately one mile north Verbena Drive at Park Lane.
Palm Springs MDP line 41	Riverside County Flood Control and Water Conservation District	Construction Project	Project would construction flood control facilities benefitting the communities of Palm Springs and Cathedral City. Line 41 from Golf Center Drive westerly in East Palm Canyon Drive to Cherokee Way.
Groundwater Quality Protection South City Improvement District (SCID)	City of Cathedral City	Construction Project	The South City Improvement District involves constructing municipal wastewater collection systems and eliminating septic tanks that overlie regional aquifers. The project will build over five miles of wastewater pipelines and eliminate approximately 500 septic tanks?extending the municipal wastewater collection system to over 700 properties. Septic tanks have infiltrated the region at a fast pace due to rapid growth in the area. The rapid spread of septic tanks has lead to increased levels of total dissolved solids and nitrate salts in regional groundwater.
Groundwater Quality Protection and Floodplain Management - Eagle Canyon Dam and Lines 43 and 41	City of Cathedral City	Construction Project	The proposed project would include the construction, operation, and maintenance of an earthen dam, debris catchment and underground storm drain. The project will provide flood detention and flood hazard mitigation for the developed portion of Cathedral City located downstream of the canyon. The outlet works would be ungated and the dam would therefore only hold water for brief periods of time following significant flood events. The debris basin would keep sediment and debris from flowing downstream, and would be cleaned out on a periodic basis to prevent buildup of materials and storm water. Storm water flows from the wash would be conveyed in 3300 linear feet of 42? drainage pipeline (Line 43), which extends to East Palm Canyon Drive (Highway 111) for approximately 1,000 LF, terminating at the West Cathedral Channel. Prior to construction of the project, the Project Proponent anticipates remediation of potentially hazardous materials resulting from illegal dumping.
Water, Sewer and Drainage - North City Specific Plan	City of Cathedral City	Conceptual Design	A primary goal of the North City Specific Plan is to provide for sustainably-designed infrastructure in new development. Ensure that an adequate infrastructure system is in place for future development in North City. To conserve precious water resources, an area-wide reclaimed water system would be desirable. Per the CVWD Master Plan, a new sewer system will be installed to the southeast of the Specific Plan area that will direct the flow on the north side of the I-10 freeway to the Thousand Palms area. There is currently no storm drain infrastructure within the Specific Plan area. CVWD will own and maintain future storm drain systems. Two major storm drain system backbone lines are recommended: (1) To serve the Edom Hill-Light Industrial District (2) To serve all new development along I-10. Two major channels are recommended to carry the runoff to a detention system or to the Whitewater Wash: (1) Morongo Wash and (2) Long Canyon/Willow Hole.

Project Title	Organization	Project Type	Project Description
Eastern Coachella Valley Water Supply Project -- Small Water Systems	Coachella Valley Water District	Conceptual Design	In the eastern Coachella Valley, there are a number of rural communities that are not connected to Coachella Valley Water District's (CVWD's) potable water system. These communities are classified as disadvantaged communities (DACs) and depend on local private wells connected to independent small water systems (SWSs) to supply their drinking water. The local groundwater supplies of several of the SWSs have shown elevated concentrations of arsenic and other constituents that are currently regulated by the State or may be in the near future (e.g., hexavalent chromium). To improve the reliability and potential safety of water supply to the SWSs, CVWD evaluated consolidation of the SWSs into CVWD's potable water system. CVWD evaluated and prioritized 42 SWSs for consolidation. This project will develop preliminary engineering and environmental compliance documents for the highest priority SWSs. CVWD is partnering with its DAC Infrastructure Task Force to implement the project in coordination with other water and wastewater infrastructure projects in the eastern Coachella Valley. The 12 highest priority SWSs have been put into 2 groups. The first group (Valley View Mobile Home Park) will consolidate 9 SWSs with 135 service connections representing approximately 118 acre-feet per year. The second group (Saint Anthony Mobile Home Park) will consolidate 3 SWSs with 112 service connections representing approximately 106 acre-feet per year. Two preliminary engineering reports (PERs) and environmental compliance documents will be prepared. The PERs will include, but are not limited to, data collection, hydraulic modeling, water system and distribution system improvements, identification of property easements necessary, estimated capital construction costs and O&M costs, refined funding needs, and project schedule.
Pierce Community Infrastructure - Regional Water Treatment Facility (North)	Pueblo Unido CDC	Construction Project	Agricultural Worker families represent the local labor force that contributes approximately 500 million dollars a year in agriculture to the region. Farm workers constitute the back bone of our national food system sustainability. But despite their remarkable contribution, these hard working families is the largest disadvantaged community in the region plagued with extreme rates of poverty, unemployment, virtually non-existent access to critical social and economic development services, and lack of affordable and safe housing. The major barrier is the lack of basic infrastructure that has been detrimental in bringing new resources and opportunities to improve the quality of life. The proposed Pierce Community Infrastructure ? Regional Water Treatment Facility consist of extending approximately 20,000 linear feet of pipeline from the nearest connection point located at Avenue 74 and Harrison Rd. The pipeline will be extended east along Av. 74, and north along Pierce St
Bridge Drainage System Design for 3 Whitewater River Bridges	City of Cathedral City	Conceptual Design	Bridge deck drainage is accomplished in the same manner as drainage of other curbed roadway sections, bridge decks are often less effectively drained because of lower cross slopes, uniform cross slopes for traffic lanes and shoulders, parapets that collect relatively large amounts of debris, drainage inlets and piping that are relatively small, and clogging of inlets and drainage systems. Bridge inlets collect flow into relatively small ductile cast-iron or welded-steel chambers. By contrast, pavement systems have features that are much larger pre-cast, cast-in-place, or masonry structures. Such weight and size is incompatible with bridge structures. Bridge drains are typically steel tubes that must withstand vibrations and deflections better than the storm drains associated with pavement drainage. Requirements in the design of deck drainage systems differ in the following respects from roadway drainage systems: Near total interception may be a desirable upgrade of expansion joints
Wetland, Riparian, and Pupfish Habitat for CVMSHCP and Natural Community Conservation Plan	Coachella Valley Water District	Protection/Restoration	This project consists of constructing 3 permanent habitats including 66 acres of wetland for California Black Rail and Yuma Clapper Rail, 44 acres of Sonoran Cottonwood-Willow riparian forest, 25 acres of managed replacement habitat for desert pupfish, and 5 acres of emergent wetland and riparian habitat in the Coachella Valley Storm Water Channel and Delta Conservation area.
Master Drainage Plan Implementation - Ramon Road Corridor	City of Cathedral City	Conceptual Design	Address intercepting runoff flows along Ramon Road between the White Water River and Date Palm Drive by utilizing the combination of storm drain pipe, and detention basin systems. However, due to the significant size of drainage facilities required to intercept all the flows reaching Ramon Road further studies of viable alternatives to intercept runoff flows along Ramon Road between the White Water River and Canyon Vista Road, east of existing high point along Ramon Road should be accomplished. The logic in looking at the set of alternatives is based on considering the high point east of Avenida Valdez as the terminus point for the Ramon Road system connecting at the Whitewater River. These additional alternatives also provide the City the opportunity to develop a phased implementation plan to intercept runoff flow tributary to Ramon Road at Date Palm Drive via a future system along Date Palm Drive.

Project Title	Organization	Project Type	Project Description
IWA Recycled Water Program	Indio Water Authority	Construction Project	The proposed Indio Water Authority (IWA) Recycled Water project would include: (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand. Several treatment options would comply with Title 22 Standards for irrigation waterincluding tertiary filtration, tertiary microfiltration and membrane bioreactors. Title 22 effluent requirements for each treatment option are tailored to ensure the reliability of the specific treatment option.
Implement projects in the Desert Hot Springs Area Master Drainage Plan	Mission Springs Water District	Protection/Restoration	See Flood Control entry for full description. Additionally, project should investigate recharge of flood waters into Mission Creek Subbasin, as a source of "new water" for the basin and to offset high TDS of Colorado River Aqueduct water that is currently being percolated.
Whitewater River Region and Coachella Valley Stormwater Channel Site Specific Objective Evaluation	Riverside County Flood Control and Water Conservation District	Protection/Restoration	The proposed project will build upon existing data collected to evaluate bacterial indicator contributions from existing dischargers, natural sources and uncontrollable sources. The objective will be to determine if existing natural background and uncontrollable sources of bacterial indicators are causing exceedances of the default water quality objectives for recreational uses that are currently defined in the Colorado River RWQCB Water Quality Control Plan. IF such sources are found to be causing the exceedances, the project will develop the necessary reports, ceqa documents and revised basin plan language necessary to support the incorporation of a Site Specific Objective for the CVSC into the RWQCB Water Quality Control Plan.
Cathedral City North City Specifc Plan - East Sub-Region	City of Cathedral City	Conceptual Design	A primary goal of the North City Specific Plan East - Subregion is to provide for sustainably-designed infrastructure in new development. Ensure that an adequate infrastructure system is in place for future development in the East-Subregion. To conserve precious water resources, an area-wide reclaimed water system would be desirable. Per the CVWD Master Plan, a new sewer system will be installed to the east of the Specific Plan area that will direct the flow on the north side of the I-10 freeway to the Thousand Palms area. There is currently no storm drain infrastructure within the planning area. CVWD will own and maintain future storm drain systems. Two major storm drain system backbone lines that are recommended in the North City Specific Plan would be continued eastward to the Thousand Palms area and sized for the future planned area.
Tahquitz Creek Levee Reconstruction	City of Palm Springs	Construction Project	The Tahquitz Creek levee, a concrete lined levee, was constructed in 1984 to provide flood control protection of the City's Demuth Park and its Wastewater Treatment Plant. In 1994, the City constructed the Tahquitz Creek Golf Course which raised the elevation of the channel within the golf course and covered the concrete lined levee. The top of the levee is a concrete golf cart path and the channel side slopes are part of the golf course. The City has determined that the levee is not compliant with 44 CFR 65.10, as it does not meet freeboard requirements, long-term static stability with seepage, and rapid drawdown condition. A geotechnical analysis of the levee was performed, and it was determined that: 1) the existing concrete liner does not provide adequate revetment protection and must be replaced; 2) the landside slope of the levee must be stabilized with flattening the slopes to meet minimum requirements; and 3) the height must be increased to meet freeboard requirements.
BDCP and DHCCP	Desert Water Agency	Conservation	The project will convey water around the delta increasing supply for SWP contractors and residents of California. The plan includes tunnels, intakes, fish screens, pump stations, levee retrofits and other upgrades to the delta system.

Coachella Valley IRWM Project List (as of December 14, 2018)

Project Title	Organization	Project Type	Project Description
Little Tuscany Sewer Improvements	City of Palm Springs	Construction Project	Construction of 8" V.C.P. sewers to connect to the City of Palm Springs public sewer system within the 70+ enclave of homes commonly referred to as "Little Tuscany", located on Milo Drive, Janis Drive, Vista Drive, Palermo Drive and Leonard Road. The residential subdivision of approximately 70 homes, located south of Racquet Club Road and west of N. Palm Canyon Dr. on the lower portion of the Chino Cone is without a public sewer system. These 70 homes continue to operate on privately owned septic systems. With many homes constructed 30 or 40 years ago, some septic tanks have failed, and given the rocky terrain, finding suitable replacement leach fields for septic systems can be difficult. Over the long term, impairment of groundwater quality exists due to the potential for septic systems to fail and wastewater to percolate into the water table. Extending public sewers to these homes will allow the properties to connect directly to a publicly maintained sewer system.
1400 Zone Facilities	Mission Springs Water District	Construction Project	MSWD's 1400 Zone has experienced significant growth due to residential infill in the 2004-2007 period, reducing redundancy in this zone to minimal levels. Additionally, the primary wells serving this zone have developed elevated levels of uranium, with one well having been removed from the system and the other fitted for wellhead treatment of uranium at a significant cost. A new Well 42 has been designed and with it is needed a 4 million gallon reservoir and associated transmission lines.
Implementation of Total Maximum Daily Load Best Management Practices	Riverside County Flood Control and Water Conservation District	Construction Project	The proposed project would assist the City of Coachella with the implementation of Best Management Practices (BMPs) to reduce and/or eliminate discharges of bacterial indicators from within the city to the CVSC, which has been identified as impaired due to bacterial indicators. The City has identified specific projects that can be implemented to achieve these goals. The projects include low impact development approaches to retrofitting urban areas, such as dry wells, infiltration swales and similar.
Groundwater Quality Protection - West Cathedral City Septic Tank Replacement	City of Cathedral City	Construction Project	These projects are located in the western part of Cathedral City north and south of East Palm Canyon Drive. The four un-sewered areas include a 24 acre, 200 unit, mobile home park, 25 acres of commercial property, and 48 acres of residential property. The project areas are a listed priority for the Regional Water Quality Control Board Colorado River Basin Region 7. The projects provide a permanent solution to reducing the amount of nitrates, bacteria, viruses and Total Dissolved Solids (TDS) migrating towards the Coachella Valley's underground aquifer, which provides the drinking water supply in the region. This is a groundwater non-point source pollution reduction project providing sewer improvements in Cathedral City to protect drinking water in the Coachella Valley.
Pierce Community Infrastructure ? Water Extension Supply (South Section)	Pueblo Unido CDC	Construction Project	Agricultural Worker families represent the local labor force that contributes approximately 500 million dollars a year in agriculture to the region. Farm workers constitute the back bone of our national food system sustainability. But despite their remarkable contribution, these hard working families is the largest disadvantaged community in the region plagued with extreme rates of poverty, unemployment, virtually non-existent access to critical social and economic development services, and lack of affordable and safe housing. The major barrier is the lack of basic infrastructure that has been detrimental in bringing new resources and opportunities to their desire to improve the quality of life. Funding for the proposed project will cover engineering, environmental reports and construction costs to provide safe and reliable drinking water to existing mobile home parks in the vicinity and address the high levels of arsenic and fluoride at onsite wells.
Master Drainage Plan Implementation - Cathedral City South	City of Cathedral City	Planning	The project will prepare a master drainage plan for the southern portion of Cathedral City. The area currently does not have any drainage infrastructure. The planned improvements will include detention and retention basins, pipelines, and BMPs for treatment. The improvements will provide a permanent solution to reducing the amount of nitrates, bacteria, viruses and Total Dissolved Solids (TDS) migrating towards the Coachella Valley's underground aquifer, which provides the drinking water supply in the region. This is a groundwater non-point source pollution reduction project providing drainage improvements in Cathedral City to protect drinking water in the Coachella Valley.

Project Title	Organization	Project Type	Project Description
Flood Control and Recycling of Storm, Non Storm Run Off Water - Desert Cove Golf Course	City of Cathedral City	Conceptual Design	The Desert Cove flood control plan has 7 distinct elements of flood control improvement types. The plan was designed to resolve existing flood control deficiencies and mitigate increases in flow depth and/or velocity. (1) Hybrid Bermuda Turf grass channel lining/armoring - resisting flow velocity induced erosion, (2) Soil cement lined ponds - stabilize 14 acres of the river channel and serve as water reservoirs for the capture and recycling of water, (3) Turf Reinforcement mats - to stabilize 1.5 acres, (4) Buried soil cement grade control structures - prevent under mining of slope lining in the event of 100 flood, (5) Soil cement fill on top of the southerly bank - mitigate overtop in the 100 year flood, (6) Construct a floodwall atop the northerly bank - mitigate overtop in the 100 year flood , and (7) Reinforced concrete slope protection toe-extension - resolve and existing condition of the East Cathedral Channel and mitigate proposed conditions North Cathedral channel.
Ramon Road Corridor - Improve Flood Protection	City of Cathedral City	Conceptual Design	Implement improved flood protection along Ramon Road from Date Palm Drive to the Whitewater River. The project drainage area extends from the Union Pacific Railroad right of way to the north, Ramon Road to the South, the Whitewater River Levee to the west and Date Palm Drive to the east. The Whitewater River serves as the backbone drainage infrastructure facility providng flood protection in the Coachella Valley. Due to the significant size of drainage facilities required to intercept all flows reaching Ramon Road, additional alternatives provide the City the opportunity to develop a phased implementation plan to intercept runoff flow tributary to Ramon Road at Date Plam Drive via a future system along Date Palm Drive.
Evaluate Stormwater Recharge Opportunities within the Desert Hot Springs MDP	Riverside County Flood Control and Water Conservation District	Protection/Restoratio n	The proposed project would conduct a planning level study to evaluate, with the cooperation and partnership of Mission Springs Water District, opportunities to use existing and proposed flood control infrastructure to additionally facilitate stormwater capture and recharge and surface water quality improvements. The project would also investigate the viability of recharging stormwater into the Mission Creek Subbasin as a source of new water and to offset high TDS Colorado River Water that is currently being percolated. The evaluation will include consideration of retrofit of existing flood control infrastructure, modification of proposed flood control infrastructure plans, and consideration of new and/or supplemental projects. Projects that are determined to be viable will be incorporated into the Desert Hot Springs MDP.
Palm Springs Unified School District - Storm Drain Outflow Transport Contamination	City of Cathedral City	Planning	The source of the contamination is not known. The first phase of this project will conduct field research to establish the source or sources and develop corrective actions to eliminate the problem. Because the upstream residential and commercial areas are in the process of connecting to a new sanitary sewer system, some septic tank systems are still in use. If the contamination is coming from failures of the existing septic tank systems and leach fields, then subsidizing the cost to connect those properties to the sewer system could solve the problem. Once the source of the contaminatio has been determined and the contamination stopped, the existing catch basins, storm drain piping, distribution boxes, and drywells would have to be cleaned and disinfected. If surface contamination flowing down the curb and gutter is the cause, then a group of filtration systems could be designed and constructed to accept nuisance and storm water.
Groundwater Protection- Cathedral City Cove Drainage System 4	City of Cathedral City	Construction Project	The project will construct 18", 24" and 36" diameter storm drain pipe and appurtenances. The constructed system will convey stormwater to the east Cathedral Canyon Channel which, in turn, discharges to the Whitewater River. BMPs will be implemented to remove gross pollutants.
St. Anthony of the Desert - Water Treatment Facility	Pueblo Unido CDC	Construction Project	Agricultural Worker families represent the local labor force that contributes approximately 500 million dollars a year in agriculture to the region. Farm workers constitute the back bone of our national food system sustainability. But despite their remarkable contribution, these hard working families is the largest disadvantaged community in the region plagued with extreme rates of poverty, unemployment, virtually non-existent access to critical social and economic development services, and lack of affordable and safe housing. The major barrier is the lack of basic infrastructure that has been detrimental in bringing new resources and opportunities to improve the quality of life. Funding for the proposed project will cover engineering, environmental reports, local permit fees and construction costs to provide safe and reliable drinking water to resident at St. Anthony of the Desert and effectively address high levels of arsenic and fluoride at the onsite well.
Harrison Street (Sunbird and surrounding cluster)	Pueblo Unido CDC	Construction Project	A connection to the CVWD main line needs to be constructed to connect these mobile home parks to CVWDs water. There are 158 mobile home units, that are home to 1,100 residents. There needs to be a planning, Engineering and Construction phase to this project. Aside from the drinking water infrastructure, there is also a need to convert the current septic systems into sewer. Currently places like sunbird mobile home park suffer from serious septic system leaks which could also contribute to the groundwater contamination. Both the water quality and wastewater issues are a public health issue for the residents.

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Perris Dam Remediation Program	Desert Water Agency	Construction Project	DWR has identified potential seismic safety risks in a section of the foundation of Perris Dam. There is no imminent threat to life or property. But, in the interest of ensuring the maximum public safety for those downstream of the lake, DWR has lowered the lake's water level. DWR is moving ahead with its plans to repair Perris Dam. The consulting board released its findings to DWR, the Division of Safety and Dams and the Metropolitan Water District. DWR has thoroughly evaluated the best and most feasible repair options to address the seismic concerns at Perris Dam. The proposed repair plan includes upgrading the dam by replacing the foundation material and reinforcing it with a stability berm placed on top of the improved foundation. This will allow the lake to return to its previous maximum operating pool elevation after construction. Other aspects of the proposed plan include a new outlet tower and emergency outlet release facilities.
Desert Edge Geothermal Water Conservation and Preservation	Riverside County, Supervisor Benoit	Construction Project	A sewer system extension from a planned wastewater facility near Mountain View Avenue/Varner Road to Desert Edge east along 18th Avenue would meet the immediate needs for wastewater removal. A sewer system will prevent groundwater contamination from septic systems, leach lines and commercial/industrial runoff into the ground. Groundwater contamination poses a significant health threat to the community of Desert Edge, and seasonal/recreational visitors. Lack of sewer system prevents improvements to existing mobile home and recreational vehicle parks and proposed developments, and thus, has hindered the economy. The community is disadvantaged by age, health and income and lack of economic viability as a result of limitations placed on proposed development and existing facilities that are inadequate. Many facilities are in dire need of improvements to meet a basic standard for quality of life of disenfranchised and retired persons.
College Of the Desert MTC Infrastructure	College of the Desert	Construction Project	Temporary utilities are available and close by. However, this is an issue, according to CVWD. CVWD has a policy that requires any temporary utilities to be installed for only 1 year. If at the expiration of one year, permanent utilities are not installed, CVWD will step in and install the permanent utilities. I asked if we could negotiate the 1 year time line and was told no ? this is policy. We will connect to water in a 18? line down the middle of Buchanan. However, if there is possibility that Panorama will start the road and street infrastructure before we have our first permanent building ready, and permanent utilities will not be in until at least 2009. We have much to do just for the logistics of timing and interaction among all the developers putting in their developments and infrastructure while we?re between interim and permanent facilities.
Desert Hot Springs Community Gardens	Mission Springs Water District	Conservation	Build raised beds for one community garden location and install irrigation equipment needed for each plot in the garden; construct demonstration area in which to teach about soils, irrigation techniques, mulch, plant selection. The City will provide the location and the Toro Company has interest in providing and installing the irrigation equipment. MSWD will provide education programs and oversee construction of the raised beds. The emphasis is on organic gardening and sustainable techniques and water use.
Identification of Septic Wastewater Plumes in the MSWD Service Area	Mission Springs Water District	Planning	Investigate the transport of septic wastewater at key sites. Study rate of wastewater movement and changes in concentration of selected contaminants with depth in the unsaturated zone and the saturated zone to be monitored at each site.
Mission Creek/ Garnet Hill Subbasins Monitoring Program	Mission Springs Water District	Planning	Improve the understanding of local hydrologic and geologic conditions, especially with respect to overdraft conditions in the Mission Creek and Garnet Hill Subbasins and artificial recharge of the subbasins.
DMMs for CVRWMG Partners	CVRWMG		Seeking funding to support a range of programs supporting the DMMs in the various partner agencies' Urban Water Management Plans. May include such programs as plumbing retrofits, smart controller rebates, water efficient fixture rebates, ULFT rebates, education programs and more.
Coachella Valley Groundwater Model	Indio Water Authority	Planning	The proposed project would build upon the existing groundwater model developed by CVWD. The work would: 1) Enhance the current knowledge of hydrogeology, 2) Compile reliable data describing hydrogeologic properties, groundwater recharge, groundwater pumpage, and groundwater discharge to evapotranspiration, 3) Improve model calibration methods, and 4) Improve model verification methods.

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South Mecca Plan	South Mecca Group	Conceptual Design	The Project will accommodate future logical development activity in the Mecca area. Several years ago the County of Riverside was engaged in a process to update its general plan to reflect future development needs. That effort was stalled due to the County's lack of funding. Notwithstanding, the land owners in the immediate vicinity of Mecca have participated in all community planning activities and expect that any future expansions of the Mecca community would include those adjacent parcels. This objective is further supported by the recent and future capital investments made by the County, including the new library, fire station, commercial center, the soon to be constructed boys and girls club and the future grade separation at 66th street, allowing residents of Mecca to travel safely over the railroad tracks on their way to the new K-12 school at 66th and Tyler.
Desert Cahuilla Wetlands Expansion	Tribal Government	Conservation	We will increase the size of the wetlands by building 100 acre cells. These cells will be shallow (no more than 3 feet deep. Fresh (White Water Storm Channel) and Salt Water (from the Salton Sea) will be used to maintain this project. We will build the project using the natural materials and not importing new materials. We will build on land that the sea has already receeded from. This project is consistant with the States plan for shallow habitat complexes as described in the planning documents of Salton Sea Restoration.
Update of the Coachella Valley Salt and Nutrient Management Plan -- Regional Project of CVRWMG	CVRWMG	Planning	The project will include the development of updates to the Coachella Valley Salt and Nutrient Management Plan (SNMP) in response to the Recycled Water Policy amendments, including: 1. Update the constituents of concern and management zones to be addressed with stakeholders. 2. Coordinate with the Colorado River Basin Regional Water Quality Control Board (RWQCB) to address specific findings and recommendations for what may need to be included or modified for the Coachella Valley SNMP to be accepted. 3. Update the regulatory framework to reflect relevant changes, including the amendments to the Recycled Water Policy. 4. Update the evaluation of existing beneficial uses of water quality criteria and objective to protect these beneficial uses. 5. Collect, aggregate, and analyze water quality data collected since the submittal of the Coachella Valley SNMP to update the ambient water quality analysis and beneficial uses of groundwater. 6. Update calculations of assimilative capacity, future water quality projections, and anti-degradation analysis. 7. Update the management strategies, monitoring plan, and remaining data gaps. 8. Coordinate stakeholder meetings at various key stages of the Coachella Valley SNMP development. 9. Develop the updated Coachella Valley SNMP for submission to the Colorado River Basin RWQCB.
Palm Springs Line 43 and 43a	RCFC&WCD	Construction Project	This underground stormdrain will extend from the existing West Cathedral Canyon Channel west to East Palm Canyon Boulevard (HWY 111) then northwest in East Palm Canyon Boulevard to Via Capri Street then southwest approximately 600 feet to the outlet of the future Eagle Canyon Dam.
Pierce Community Infrastructure - Sewer Sanitary Collection System (North)	Pueblo Unido CDC	Construction Project	Funding for the proposed project will cover construction costs to provide sewer sanitary collection system to existing mobile home parks in the vicinity and address the substandard septic systems, and sewage lagoons. Construcion: 1. 2,640 feet of 8-inch gravity sewer line from Oasis Park easterly along Avenue 70 to Pierce Street 2. 5,270 feet of 12-inch gravity sewer from the intersection at Avenue 70 and Pierce Street northerly along Pierce Street to Avenue 68, connect to Polancos and Duro mobile home parks at Avenue 68 3. Sewage lift station at the northeast corner of Avenue 68 and Pierce Street 4. 5,200 feet of 6-inch sewer force main from the lift station northerly along Pierce Street to Avenue 66 5. 1,000 feet of sewage force main from Pierce Street and Avenue 66 to CVWD?s 10-inch force main at the Coachella Valley Stormwater Channel. The existing force main will transfer the sewage to WRP-4
Torres Martinez Septic to Sewer Conversion Project	Torres Martinez DCI	Construction Project	The homes will be hooked up to an existing water line provided by Coachella Valley Water District at the Avenue 62 water trunk. This water is filtered and blended. This project will eliminate virtually raw Colorado River water into the homes. Because it is sitting on a recharge site, there is no way to eliminate the contaminates. The ammonium perchlorate was recently tested and the results were at 6.9 ppb exceeding California State Standards.
Torres Martinez Sewer Extension Project Avenue 64	Torres Martinez DCI	Construction Project	This project will take 30 homes off of septic tanks that have regular failures and hook them up to a reliable sewage line operated by the Coachella Valley Water District. This is crucial because these homes are located at the head of the watershed to the valley where CVWD has a recharge project that supplies the lower valley drinking water, agricultural water and commercial usage. This project would be located entirely on Torres-Martinez tribal lands, and would serve tribal members.

Project Title	Organization	Project Type	Project Description
Recycled Water Feasibility Study	City of Coachella Water Authority	Feasibility Study	Project Description: The project will include development of a recycled water feasibility study, including: 1. Define the existing and projected quantities of secondary effluent available for tertiary treatment and recycling over a 25 year time horizon. 2. Define the study area and conduct a recycled water market assessment which defines potential recycled water users, quantifies estimated demand for those users, summarizes water quality needs, and accounts for on-site retrofits. 3. Describe the latest regulatory framework governed by State mandates and laws concerning recycled water. 4. Develop a plan for low-demand, wet season discharge planning which provides for storage and/or reliable year-round disposal of tertiary effluent. 5. Develop and compare alternatives for tertiary treatment technologies to implement at the existing Avenue 54 Wastewater Treatment Plant. 6. Short-list viable alternatives which represent various combinations of treatment and recycled water distribution for use within CWA?s service area and outside CWA?s service area. 7. Document an alternatives selection process in which a preferred alternative is identified. 8. Describe the facilities required for the preferred alternative and develop a timeline for installation of the new facilities. 9. Prepare a capital and life-cycle cost estimate for the preferred alternative. 10. Delineate necessary environmental documentation, interagency agreements, operating permits, market assurances, and financing requirements.
City of Coachella Stormwater Master Plan	City of Coachella Water Authority	Planning	The project will include development of a stormwater master plan, including: 1. Summary of existing storm water management system, storm drain gravity and pumping network, and synopsis of existing problems with flooding. 2. Stormwater runoff and flood routing hydraulic analysis to identify existing system deficiencies. 3. Development of storwater conveyance, pumping, and detention alternatives to correct system deficiencies; development of a stormwater BMP (including stormwater quality) program to complement permanent facilities 4. Identification of preferred alternative based on cost and non-economic factors. 5. Prepare capital and life cycle cost estimates for the preferred alternative. 6. Prepare a schedule for the various implementation phases of the preferred alternative. 7. Summarize potentially available funding sources.
Surface Water Treatment Study	City of Coachella Water Authority	Feasibility Study	This project will include development of a Surface Water Treatment Study, including: 1. Tabulate the current and projected City-wide potable water demands and supplies over a 30-40 year time horizon. 2. Perform a source water characterization of Canal water delineating water quality and treatability characteristics. 3. Develop siting and process alternatives for a water treatment plant. 4. Evaluate alternatives based on economic and non-economic factors and select preferred alternative. 5. Develop projected capital and life-cycle costs for the preferred alternative. 6. Prepare capital improvements and phasing plan for water treatment plant and future expansion of City water distribution system.
Short Term Arsenic Treatment Program	Pueblo Unido	Construction Project	The CVATP envisions short term projects and long term connection projects. The long term connection projects are presented in other projects entered into the database. This project description focuses on short term projects primarily point of entry and point of use treatment for arsenic. These systems also reduce hardness, nitrates and other contaminants, if present. These systems have been implemented in the Coachella Valley; they are effective and have low operating costs. These systems are most appropriate for areas that will not be connected to municipal supply in the next 5 years. Further evaluation in the work plan will evaluate the locations, timing and type of system. Pueblo Unido CDC will be coordinating the development and implementation of this program under its existing Agricultural Worker Housing Rehabilitation Program (AWHRP). AWHRP provides technical assistance and training to farmworker and low-income families to improve the existing infrastructure and bring the Polanco parks up to Riverside Code compliance. The scope of the work includes engineering redesign, redevelopment of domestic water distribution, fire suppression, waste water and electrical system, and road improvements. Additionally, the program has training and education component that consists of helping farmworker families understand the proper monitoring of the quality of the water and functioning of decentralized wastewater systems. The proposed CVATP will be an outstanding resource and it will effectively fit -as a critical component- of the AWHRP. AWHRP examples of currently redevelopment projects include St. Anthony of the Desert that is effectively operating 1500 gallons per day point-of-entry, and three Polanco parks that will require point-of-use systems.

Project Title	Organization	Project Type	Project Description
Drinking Water Hexavalent Chromium Removal Demonstration Facilities	Coachella Valley Water District	Construction Project	This project would use the results of ongoing bench and pilot Cr6 removal tests to identify the best available technology for meeting the Cr6 drinking water MCL for variable water quality conditions found in Coachella Valley groundwater sources. Five representative sources would be identified based on regional water quality differences. Environmental assessments and design work would be completed for each site. Cr6 removal facilities would be constructed at each site to demonstrate effective Cr6 removal and supply potable drinking water to local communities. Technologies currently under assessment as part of Water Research Foundation Project #4445 include reduction coagulation filtration (RCF), weak-base anion exchange (WBA), absorption, and strong-base anion exchange (SBA). Different technologies may be needed at representative community water system sources in the Coachella Valley due to the impact of variable water quality characteristics on technology effectiveness. Waste management considerations at each representative site are an important driver in technology selection and developing an effective Cr6 compliance plan. CVWD has constructed three full-scale facilities to remove naturally occurring arsenic from groundwater in the eastern Thermal subarea within the Coachella Valley. These facilities are also effective at removing Cr6 from the unique water quality conditions occurring in this area. Experience gained implementing this arsenic compliance strategy will benefit the project.
Sunbird Mobile Home Park Septic to Sewer Conversion	Coachella Valley Water District	Construction Project	The proposed project involves installing approximately 13,000 linear feet of 8-inch and 10-inch diamter gravity sewer pipeline and installing capacity upgrades to CVWD's existing Lift Station 55-21 to serve approximately 86 units and one community center. The proposed gravity sewer pipeline would extend from Sunbird Mobile Home Park, east along Echols Road, to Harrison Street. It would then continue south along Harrison Street to Avenue 66, continue east on Avenue 66 and connect to an existing sewer in Polk Street. The Polk Street sewer pipeline conveys flows to CVWD's lift station 55-21 then eventually to CVWD's Water Reclamation Plant 4 on Fillmore Street via an 18-inch diameter force main. The project will provide a permanent solution to reducing the amount of nitrates, bacteria, viruses and Total Dissolved Solids (TDS) migrating towards the aquifer, which is the source of the drinking water supply for the Coachella Valley region. This is a groundwater non-point source pollution reduction project providing sewer improvements in Thermal to protect drinking water in the Coachella Valley.
Irrigation Pipeline Replacements	Coachella Valley Water District	Conservation	The project involves replacing the following four irrigation pipeline sections to reduce leaks and wasteful irrigation practices: 1. Lateral No. 123.45-6.0, phase 2. Replace 1,320 feet of an existing 12-inch diameter concrete pipeline with a new 12-inch diameter polyvinyl chloride (PVC) pipeline. The irrigation pipeline begins 1,320 feet west of Harrison Street and extends north 1,320 feet. 2. Lateral No. 123.45-6.0, phase 3. Replace 1,350 feet of an existing 12-inch diameter concrete pipeline with a new 12-inch diameter polyvinyl chloride (PVC) pipeline. The irrigation pipeline connects to Lateral No. 123.45-6.0, phase 2 and extends east 1,350 feet to Harrison Street. 3. Lateral No. 102.3, phase 1. Replace 1,500 feet of an existing 20-inch diameter concrete pipeline with a new 24-inch diameter polyvinyl chloride (PVC) pipeline. The irrigation pipeline begins approximately 2,600 feet west of Fillmore Street and extends another 1,500 feet to the west along Avenue 52. 4. Lateral 102.3, phase 2. Replace 2,640 feet of an existing 16-inch diameter concrete pipeline with a new 12-inch diameter polyvinyl chloride (PVC) pipeline. The irrigation pipeline connects to Lateral 102.3-6.0, phase 1 and extends south another 2,640 feet.
Mid-Valley Pipeline, Phase 2	Coachella Valley Water District	Construction Project	The Mid Valley Pipeline is a non-potable water distribution system designed to convey recycled water and Colorado River water to Golf Courses for irrigaion in lieu of groundwater. This is a multi-phase project estimated at a total cost of approximately $75 million. Phase 1 is complete and consists of a booster station at the Coachella Canal in Indio, approximately 7 miles of 54-inch pipeline along the Whitewater River Stormwater Channel, and 90 acre-feet of storage reservoirs at CVWD's Water Reclamation Plant No. 10 (WRP 10). Phase 1 pumps Colorado River water from the canal to the existing WRP 10 recycled water distribution system which serves 8 golf courses. Colorado River water augments the recycled water supply in summer months when golf course irrigation demand exceeds recycled water supply. Phase II is estimated to cost $2 million and consists of expanding CVWD's WRP 10 distribution system to serve 4 golf courses with an average demand of 1000 AFY each. Additional phases are proposed to be developed to ultimately connect up to 50 golf courses to the Mid-Valley Pipeline.

Project Title	Organization	Project Type	Project Description
Little Tuscany Sewer Improvements	Palm Springs	Construction Project	Construction of 8" V.C.P. with 4" laterals up to property lines connecting to the City of Palm Springs public sewer system within the 70+ enclave of homes commonly referred to as "Little Tuscany", located on Milo Drive, Janis Drive, Vista Drive, Palermo Drive and Leonard Road. This residential subdivision of approximately 70 homes, located South of Racquet Club Road and West of N. Palm Canyon Drive on the lower portion of the Chino Cone is without a public sewer system. With many homes constructed 30 to 40 years ago, some septic tanks have failed, and given the rocky terrain, finding suitable replacement leach fields for septic systems can be difficult. Over the long term, impairment of groundwater quality exists due to the potential for septic systems to fail and wastewater to percolate into the water table. Installation of public sewers to these homes will allow the properties to connect directly to a publicly maintained sewer system.
Groundwater Quality Protection Project - Sub-Area D2	Mission Springs Water District	Construction Project	Area D2 is part of a larger assessment district, which voters passed in 2004. In creating the Assessment District, voters provided $28 million of match funding which expires in 2014. Engineering design of the 10 sub areas that make up the assessment district is complete and funds are needed for construction. The project will abate septic systems and protect both the drinking water supplies and the hot water that is the basis of the spa economy for the city of DHS and the Coachella Valley. In some parts of the city, the septic tank density is 2.3 to 2.8 times the density recommended by the Regional Water Quality Control Board.
Shady Lane Sewer Improvement Project	City of Coachella Water Authority	Construction Project	Proposed sewer improvements include installation of approximately 3,300 linear feet of 8-inch diameter gravity sewer main, approximately 500 linear feet of 4-inch diameter force main, approximately 14 manholes, and 86 lateral service connections with a diameter of 4 inches. Wastewater will flow by gravity westerly in the community towards Shady Lane, and then northerly to south of 54th Avenue. A new manhole in Shady Lane immediately south of 54th Avenue will serve as a wet well for sewer pumps to lift the flow through a short force main to a new manhole installed in the existing sewer main in 54th Avenue. Proposed water improvements include installation of approximately 1,650 linear feet of 8-inch CML&C Pipeline and Fittings(Chaparral Extension) water distribution line. Approximately two 8" gate valves, one Air Valves, Blowoffs, Fire Hydrant and Water Service Meter with Double Detector Check.
Non-Potable Water Use Expansion	Coachella Valley Water District	Construction Project	CVWD recently connected two farming groups to canal water for a total savings of almost 10,000 acre-feet per year. A third location of expansion of canal water delivery is the Oasis area which did not receive canal water when the original irrigation system was constructed by the Bureau of Reclamation. In addition, agriculture exists within the Cities of Coachella and Indio that could be converted from groundwater to canal water.
Groundwater Quality Protection Project	Mission Springs Water District	Construction Project	Areas A, G, H, I, J, and K are part of a larger assessment district, which voters passed in 2004. In creating the Assessment District, voters provided $28 million of match funding which expires in 2014. Engineering design of the 10 sub areas that make up the assessment district is complete and funds are needed for construction. The project will abate septic systems and protect both the drinking water supplies and the hot water that is the basis of the spa economy for the city of DHS and the Coachella Valley. In some parts of the city the septic tank density is 2.3 to 2.8 times the density recommended by the Regional Water Quality Control Board.
Coachella Water Authority Conservation Program	City of Coachella Water Authority	Conservation	The Coachella Water Conservation Program is designed to bring water conservation activities to an accessible level to a wide range of constituents throughout the region, through outreach, water audits, and various mechanisms to assist in implementation of water conservation methods.
Arsenic and Fluoride Wellhead Treatment/Removal Feasibility Study	City of Coachella Water Authority	Construction Project	Project involves development of a study as a byproduct of a regional wellhead treatment pilot program.
Replacement Well 42	Mission Springs Water District	Construction Project	MSWD is experiencing uranium contamination in concentrations greater than 20 pCi/L in the northerly portions of its service area. As a result, Well 28, one of two wells servicing the 1400 Zone, was placed on standby due to elevated uranium concentration. Thus, the 1400 Zone currently does not have enough water supply to meet demand and no redundancies are in place. Therefore, MSWD proposes to construct a replacement well, Well 42, to provide water supply reliability and to replace lost capacity in the 1400 Zone. The proposed project includes drilling and equipping (i.e. pumps, motors, piping, electrical, etc.) a new well, startup, and testing. MSWD owns the proposed Well 42 site and has already completed design; as such, the project is shovel ready.
Environmental Justice and Equity Through Water Pollution Prevention in Eastern Coachella Valley	The Esperanza Youth and Family Center	Planning	FALSE

Project Title	Organization	Project Type	Project Description
Little Morongo Regional Wastewater Treatment Plant	Mission Springs Water District	Conceptual Design	MSWD has identified a 2.3 square mile area, located off I-10 Freeway and Indian Canyon Drive, to be part of a new sewer assessment district in order to eliminate on-site sewer disposal systems and construction of a Regional Wastewater Treatment Plant. The creation of the Assessment District will provided future match funding to complete the proposed project and wastewater collection system. Feasibility studies has been completed for the RWWTP and the District is moving forward withj plant design. The project will abate septic systems and protect both the drinking water supplies and the hot water that is the basis of the spa economy for the city of DHS and the Coachella Valley. In some parts of the city, the septic tank density is 2.3 to 2.8 times the density recommended by the Regional Water Quality Control Board.
1. Project Title: Pierce Community Infrastructure - Sewer Sanitary Collection System (North)	Pueblo Unido CDC	Construction Project	Funding for the proposed project will cover construction costs to provide sewer sanitary collection system to existing mobile home parks in the vicinity and address the substandard septic systems, and sewage lagoons. Construcion: 1. 2,640 feet of 8-inch gravity sewer line from Oasis Park easterly along Avenue 70 to Pierce Street 2. 5,270 feet of 12-inch gravity sewer from the intersection at Avenue 70 and Pierce Street northerly along Pierce Street to Avenue 68, connect to Polancos and Duro mobile home parks at Avenue 68 3. Sewage lift station at the northeast corner of Avenue 68 and Pierce Street 4. 5,200 feet of 6-inch sewer force main from the lift station northerly along Pierce Street to Avenue 66 5. 1,000 feet of sewage force main from Pierce Street and Avenue 66 to CVWD?s 10-inch force main at the Coachella Valley Stormwater Channel. The existing force main will transfer the sewage to WRP-4
San Antonio del Desierto - Sewer Sanitary Collection System Extension	Pueblo Unido CDC	Construction Project	The project proposes the installation of a gravity sewer pipeline, lift station and a sewer force main pipeline that will collect wastewater from the San Antonio del Desierto which population is about 700 people. The proposed project will provide sewer service to the residents and transfer the wastewater to the Coachella Valley Water District (CVWD) Water Reclamation Plant No. 4 (WRP-4). The proposed pipelines will be installed within the road rights-of-way along Lincoln Street. The gravity sewer pipeline begins at the San Antonio del Desierto & Lincoln Street and extends southerly to the intersection of Avenue 68 connecting to the proposed lift station on a half-acre site within the intersection of Lincoln Street and Avenue 68. A sewer force main pipeline will extend from the lift station northerly along Lincoln Street to Avenue 66 and connect to an existing 18-inch sewer force main pipeline, located at the intersection of Avenue 66 and Lincoln Street Pierce Street (east of the Coachella Valley Storm Water Channel) which ultimately connects to WRP-4.
Cathedral City South City Improvement District (SCID) Groundwater Protection Project	City of Cathedral City	Protection/Restoration	FALSE
Eastern Coachella Valley Septic to Sewer Conversions	Coachella Valley Water District	Construction Project	This project focuses on connecting mobile home parks to CVWD's sewer system in instances where it is determined that connections are technically and economically feasible. Conditions that lend to feasibility include, close proximity to existing infrastructure and the ability of mobile home park owners to fund private on-site costs of connection.
DWA Turf Buy Back	Desert Water Agency	Conservation	DWA will administer a program where we pay some of the cost of turf removal for customers who change to drought tolerant landscaping to help relieve the impacts of the drought.
Palm Springs Airport Turf Removal	Desert Water Agency	Conservation	This project would remove the turf around the airport and replace it with drought tolerant landscaping.
Coachella Water Authority Demonstration Garden	Coachella Water Authority	Conservation	The demonstration garden is designed to be an educational tool and role model for the community. The garden will showcase water-efficient landscaping and irrigation, and supports CWA's ongoing water conservation efforts and initiatives. The garden will feature different grades of synthetic turf, desert-friendly plants, and water-efficient irrigation systems such as drip lines and smart controllers. All trees, plants, and other materials will be selected to provide year-round color and be compatible with the existing soil type. The garden will be open to the public during normal working hours with self-guided tour materials available. In addition, guided tours may be scheduled.
Coachella Valley Golf Course Turf Reduction Program	Coachella Valley Water District	Conservation	It is estimated that removal of one acre of golf course turf saves 5 acre-feet of water annually (5 AFY). This project proposes to use $1.5 million in grant funding and 1.5 million in local funding to remove at least 100 acres of golf course turf. Thus, overdraft of the groundwater basin is reduced by 500 AFY and future reliance on the Delta is also reduced by 500 AFY. 500 AFY of water allotments at about $5,000 per acre-foot is a savings of $2.5 million so the benefit/cost ratio for this project is 2.5/1.5=1.7/1.

Coachella Valley IRWM Project List (as of December 14, 2018)

Project Title	Organization	Project Type	Project Description
Regional Wastewater Treatment Plant Tertiary Upgrade	Coachella Water Authority		After tertiary treatment, effluent from the WWTP will meet California Code of Regulations, Title 22 requirements for unrestricted recycled water, and will be available for use as a new, lower cost irrigation supply for up to 600 acres of nearby agricultural property, or for other nonpotable uses like groundwater basin recharge. The recycled water supply will offset a portion of the existing agricultural irrigation water demand and/or imported water used for groundwater recharge that is currently met with imported water delivered by CVWD via MWD exchange agreement, and local surface water diverted by CWA, and local irrigation wells. Project generates over 3,100 acre feet of local water annually.
Avenue 54 Water Main Loop Between Harrison & Frederick	Coachella Water Authority		FALSE
Indio Water Authority (IWA) Recycled Water Project Phase 1A	Indio Water Authority	Construction Project	Phase 1A of the IWA Recycled Water Project includes construction of 1) tertiary treatment facilities with a capacity of 4 mgd complying with Title 22 Standards for recycled irrigation water and 2) 14,900 ft of recycled water conveyance ranging in size from 18-inch to 30-inch. The Phase 1A project will serve the Terra Lago Golf Club and Rancho Casa Blanco Country Club and HOA, delivering approximately 1,850 AFY in the near term. The project will also set the stage for future recycled water system expansion addressing both non-potable and potable water service in the long-term.
DAC Onsite Plumbing Retrofit Project	CVWD	Construction Project	This project is a regional residential rebate program that will provide rebates to DACs that have faulty or leaking onsite plumbing systems. The program would provide rebates to DACs to implement indoor plumbing retrofits to reduce water waste or to repair onsite plumbing systems that are leaking or damaged and therefore causing water quality issues. The need for this project was identified by DAC stakeholders during the DAC Outreach Program, and was also explained and identified in the 2014 Coachella Valley IRWM Plan.
Shady Lane Mobilehome Park Water & Wastewater Systems Project	Shady Lane Mobilehome Park, Inc.	Construction Project	FALSE
Coachella Water Authority Turf Buy Back	Coachella Water Authority	Conservation	Data shows that residential customer spends about 60% of their water on outdoor irrigation. By changing turf to a yard of drought tolerant plants you can save water and money. Coachella Water Authority will administer the turf buy back program that will increase turf removal response to Governor Edmund G Brown Jr.s emergency drought declaration.
Desert Willows Waterline Replacement	Mission Springs Water District	Conservation	FALSE
Chromium 6 Wellhead Treatment	Mission Springs Water District	Construction Project	FALSE
Automated Meter Reading Pilot Program	Mission Springs Water District	Conservation	MSWD will install 100 automated water meters with data collection systems. Each automated water meters combines the functions of a water meter, a valve controller, and a water delivery scheduler into one unit. These features give MSWD and the property owner the ability to track and monitor usage based on flow-time, flow-rate, and flow-volume, and detect leaks down to 1 gallon per hour.
DAC Septic Rehabilitation and Demand Reduction Program	Coachella Valley Water District	Construction Project	This project is regional, and would provide rebates to DACs located in mobile home park communities in the East Valley. The program would provide rebates to install greywater systems that would divert flows from washing machines to onsite irrigation systems. The greywater would be targeted to irrigate non-ornamental plants such as grass used for recreation and trees that can provide a source of food for the community, such as citrus trees. This type of greywater system has already been implemented in the East Valley, and can be permitted per information from the County of Riverside Department of Environmental Health. The ultimate purpose of this project is to offload a major source of wastewater to onsite septic systems, which will help to ensure the systems do not fail and present public health issues associated with surfacing wastewater. Furthermore, the project would encourage beneficial reuse of water that would otherwise flow to septic systems. Given the aquitard present within the East Valley, this water is not currently beneficially reused, because it would be retained within the shallow portion of the aquifer, which is not suitable for drinking. As groundwater overdraft subsides in the East Valley, positive pressure has led to artesian conditions. Groundwater flows from artesian wells are generally not beneficially reused, but rather flow into the Coachella Valley Stormwater Channel and ultimately the Salton Sea. Artesian conditions and increasing levels of groundwater have the potential

Project Title	Organization	Project Type	Project Description
Regional Well Retrofit and Abandonment Program	Coachella Valley Water District		FALSE
Oasis Gardens Mobile Home Park: Connection Fee for Chromium 6 Contamination	Desert Empire Homes	Construction Project	The Oasis Gardens Mobile Home park was built by developer Bobby Melkesian where he utilized state funding to pay for affordable housing. The mobile home park met all county requirements and was built in what was previously an agricultural area. The land was used for dates for the previous ten years. When building the site, Bobby opted to drill a well to provide water to the residents. This route was utilized due to a lack of water infrastructure in the area. The well for the Oasis Gardens Mobile Home Park serves 157 low income families. Since this project, Bobby has built a neighboring park to provide housing to the relocated residence of Duroville. This new project is called the Mountain View Estates. The Mountain View Estates is an important element to this project. The Mountain View Estates brought new water connections to the previously built park. Thus, the new option of connecting the homes to the CVWD line exists. However, the fees of $4,000.00 per home are too high for Bobby to afford. We are requesting $800,000.00 to pay for the connection fees and additional labor required (157x4,000=628,000 connection fee total)(800,000-628,000=172,000 additional labor). The other option would be to put a filter on the existing
Oasis Gardens Mobile Home Park Septic To Sewer Conversion	Desert Empire Homes	Construction Project	The Oasis Gardens Mobile Home Park sits on 20 acres in the city of Thermal. The park was built in the early 2000's, and was originally built with large septic tanks. The septic tanks originally served all 157 families living in the park. However, 71 of the units have been converted to sewer through a CVWD grant program. These units are no longer a problem for the community, but the 86 unconverted tanks are. There are periodic malfunctions with the tanks that leave hazardous wastewater in the streets of the disadvantaged community. The malfunctions are primarily caused by excessive dumbing of lard and bacon grease down the garbage disposal. Additionally, there is heavy use of chemicals that kill the bacteria in the tanks. The Oasis Gardens Mobile Home Park Septic Conversion Project will aim to convert the remaining 86 units in the park to sewer. There is already an existing sewer line that is running through the middle of the streets in Oasis Gardens. The scope of work for the project will simply be tying into the existing line. The farthest connection should be approximately 20' (feet). Upon completion of the project, the 157 families of the disadvantaged community will be served.
Thousand Palms Flood Control Project	Coachella Valley Water District	Construction Project	Design and construct a series of levees and channels to protect a portion of the Thousand Palms and North Cathedral City from flooding. The project will collect flows from the alluvial fans to the north and convey them to existing Sun City Palm Desert flood control system. The project will help to provide flood protection and maintain a sand transport system for the Coachella Valley Fringe-Toed Lizard Preserve.
North Cathedral City Storm Water Master Plan	Coachella Valley Water District	Construction Project	Prepare design plans, specifications, and environmental documentation to construct Phase I of the North Cathedral City Storm Water Master Plan (SMP). The scope includes the design and construction of improvements to convey a portion of the 100-Year Flood from the Morongo Wash south of Interstate 10 to the Whitewater River Storm Water Channel. The design and construction of the Phase I of the SMP plan will provide protection to existing development in Northern Cathedral City from the 100-Year Flood, including a portion of riverine flows currently conveyed to Thousand Palms. The construction of the project will also provide biological benefits through improved wildlife connectivity and sand transport between the Willow Hole and Whitewater Floodplain Conservation Areas.
East Side Dike Improvement Project - Phase I	Coachella Valley Water District	Conceptual Design	Engage a consultant to prepare levee mitigation plans, and a contractor to construct the identified improvements, to certify the East Side Dike (Dike) from Dune Palms Road to Interstate 10 to the standards of the Federal Emergency Management Agency (FEMA) as a regional stormwater facility. Certifying the Dike will help ensure compliance with FEMA's 100-Year Flood design standard by providing flood protection to adjacent developments. It also helps to remove existing developments or land areas from special flood hazard areas.

Project Title	Organization	Project Type	Project Description
CVWD Palm Desert Demonstration Garden	Coachella Valley Water District	Conservation	The design of the Palm Desert Operations demonstration garden will display the most water efficient irrigation systems, various ground covers, provide examples of maintaining challenging slopes and microclimates as well as encourage the selection of current desert friendly varieties of plant material reflecting the most recent edition of our Lush and Efficient book. The design proposal includes redesigned parking for our disabled customers as well as ADA compliant ramps for inclusion of all visitors. The centrally located garden will provide an excellent educational space for self-guided and group tours. The potential design will provide an area so that CVWD sponsored presentations, such as our educational workshops would have the ability to provide real time demonstrations of topics such as pruning, vegetable gardening, selecting desert plants and irrigation zones. The incorporation of technology is proposed into the garden via a web/phone app. interface that will allow visitors to be able to look up in real time plant species, rock types and irrigation elements by simply downloading our app and scanning an identification marker.
Trash Capture Systems	City of Indio		This project would install full capture trash devices in the MS4 system. These devices are designed to work in the storm drain inlets to capture trash before it enters the MS4 system. The devices capture trash particles down to 5mm. Funding would be used for purchase and installation of devices. The State Water Board identified trash as a significant pollutant in California Waterways because trash harms aquatic life, wildlife and public health. Trash often enters the environment through the MS4 systems when it is washed into storm drain inlets during rain events. The State Water Board adopted the Trash Amendments on April 7, 2015 and funding would accelerate installation of the devices and more efficiently support the goals.
Maxwell Installation	City of Indio	Construction Project	This project is designed to address urban run off and flooding. The project involves the construction of maxwell systems on the north side of Avenue 48 between Monroe Street and Arabia Street. The maxwells will capture storm water run off and direct it into the ground which supports using storm water as a resource. This will reduce flooding while retaining the flood water within the watershed. This project supports low impact development and groundwater recharge. The City of Indio requires stormwater infiltration through an ordinance and maintains current engineering plans for maxwells, dry wells and other low impact development structures.

Project Title	Organization	Project Type	Project Description
White Water Channel Extension to Connect with Current Salton Sea Water Level	Torres Martinez Desert Cahuilla	Construction Project	The Torres Martinez Desert Cahuilla Indians will build a connection between the White Water Channel and the current Salton Sea water level. The Tribe will begin project by procuring an Archeologist Consultant to complete required Environmental Studies. Afterward, the Tribe will procure an Engineer Consultant to finalize Engineering Design. Once the Environmental Report and Engineering Design are complete, the Tribe will construct the proposed Channel modification connection. The Tribe will secure a general contractor through its procurement process and will lease necessary heavy equipment to facilitate excavation and construction. The Tribe anticipates completing construction by Month 12 of the project period. This project will be under the supervision of the Natural Resources Manager (NRM). 1. TASK 1 - Complete Environmental Report and Engineering Design by Month 6 1.1 NRM will prepare Scope of Work to initiate RFP 1.2 Contract Coordinator will issue RFP 1.3 Procurement will facilitate Vendor selection 1.4 Approved Contract (Deliverable) 1.5 Consultant begins Environmental Study/Report 1.6 Consult with Tribal MLD 1.7 On-Call Cultural Monitors will be brought in as necessary 1.8 Consultant will complete Environmental Report (Deliverable) 1.9 Consultant will begin Engineering Design 1.10 Consultant will complete Engineering Design (Deliverable) 2. TASK 2 - Complete construction of proposed Channel Modification by Month 12 2.1 NRM will submit Scope of Work to Procurement to procure general contractor for construction of Channel Modification 2.2 Contract Coordinator will issue RFP 2.3 Procurement will facilitate selection of vendor 2.4 Approved contract (Deliverable) 2.5 Blessing by Tribal Elder to begin construction 2.6 NRM will oversee beginning of construction 2.7 Completion of construction 2.8 Blessing of Completion - Gathering and Refreshments The Tribe will coordinate invoicing with IRWMP. It will also submit quarterly reports to the Tribe as per Tribal po
St. Anthony Storm Water Capture Project	Pueblo Unido CDC	Construction Project	St. Anthony is a mobile home park community that provides affordable housing to farmworkers and low-income families. The project is a 32-acre parcel located south west of Highway 111, east of Lincoln Street and north of Avenue 68 in the unincorporated community of Mecca, Riverside County. In 2010, Pueblo Unido CDC (PUCDC) started a comprehensive rehabilitation program to address substandard conditions, and code violations at the park. To date, major infrastructure improvements have been achieved in this community including, electrical stabilization, access to drinking water, off-site access roads; and the construction of the off-site sewer sanitation collection system to the site is scheduled to start in April 2018. A key element of this success is PUCDC's outreach and organizing experience that has enable community members to be involved in the planning and supporting of this community development endeavor. Furthermore, the support and partnership with other local, state and federal agencies, as well with private foundations have made these improvements a reality.
Coachella Monitoring Well Application and Project Study	Coachella Water Authority	Construction Project	By implementing this Project, the Authority intends to move depth to groundwater measurements from a monitoring system reliant upon dedicated monitoring wells. This effort will drastically improve the reliability and constancy of depth to groundwater readings. Per the Authority WMP this effort will increase the ability to have reliable data to make water management decisions including groundwater recharge efforts and surface water deliveries. All of these efforts are to decrease the depletion of groundwater overdraft within the Authority.
Improvements for Existing Dry Well Located South of 52 Ave.	City of Coachella	Protection/Restoration	The drywell will intercept and pretreat contaminants like suspended solids and improve surface water quality of the CVSC. California is in a severe drought Legislation is calling for: –Water reuse – Treating stormwater as a resource Improving the infiltration field of the Avenue 52 drywell will assist with reducing localized flooding and convey Stormwater away from property to the Coachella Valley Storm Channel

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Project Title	Organization	Project Type	Project Description
Storm Water Conveyance System 1	City fo Indio		The area at 48th Avenue and Hjorth street experiences flooding problems during rain events. A storm water conveyance system is needed to alleviate the flood problems. This project would address the problems through the installation of a storm water conveyance system to move the water from the area before it floods. The project consists of storm drain inlets and associated piping.
Revitalize 20 existing dry wells	City of Indio		The City of Indio has worked to infiltrate storm water for many years. There are at least 20 dry wells used for infiltration that are 30 years old. Over time, these devices become inefficient and ineffective so they must be revitalized. This project would revitalize 20 existing dry wells that are at least 30 years old with new maxwells. These would allow the devices to effectively address urban run off and flooding.
Storm Water Conveyance System 2	City of Indio		A large portion of south east Indio drains to the area where Van Buren and Cabazon are in close proximity. Storm water floods these areas and has threatened property. This project would direct the stormwater from Van Buren Street to Cabazon to the intersection of Cabazon and Dillon Road. This would reduce flooding, manage urban run off and protect property. The project includes construction of storm drain inlets and associated piping.
Jackson and Avenue 50 Retention Pond with Maxwells	City of Indio		This is a low impact development project that consists of construction of a storm water retention pond and includes maxwells for efficient infiltration. The project will manage storm water as a resource and keep the water within the watershed. The project manages urban run off, reduces flooding and directs the storm water into the groundwater basin.
Storm Water Conveyance System 3	City of Indio		This is a significant storm water conveyance project that would manage urban run off and reduce flooding. In addition, this project is a "backbone" for several smaller storm water conveyance projects would eventually be connected to this in order to manage urban run off in smaller more specific areas. This project would begin at Dr. Carreon and Arabia Street east to Dr. Carreon and Van Buren Street north following Van Buren connecting to Indio Boulevard and outlet to the storm channel. This project consists of inlets and associated piping.
Pierce Community Storm Water Project	Pueblo Unido CDC	Planning	Pierce Street Community is a DAC project geared towards the implementation of Storm Water Control in the vicinity. Residents have experience major flood events along Pierce Street where adequate flood control and storm water capture system is lacking. Flood control has been identified as one of the top priorities by the community.
Avenue 76 Community Storm Water Control Project	Pueblo Unido CDC	Planning	The proposed project is to provide storm water control service to an existing large rural cluster that consist of single dwelling units, Polanco parks and Oasis mobile home park located in the Torres Martinez Desert Cahuilla Indians Reservation. Additionally, this area is served by Centro Medico Oasis, Community Park, and a small grocery store. The target community consists of agricultural workers and low-income families. It is estimated that the storm water control project will provide service to an approximate 194 units with a population of 1,300 residents. The average combined population per mobile home is 6.76. This population data was provided by the United States Environmental Protection Agency (USEPA).
Avenue 48 Storm Drain	City of Indio		This is a construction project to manage urban run off and flooding. The project consists of installing inlets and piping to convey storm water from an area that floods during rain events to the Coachella Valley Storm Channel. The projects starts at Avenue 48 at Las Brisas Way and extends west to Avenue 48 and Jefferson then north to the Coachella Valley Storm Channel.
Desert Hot Springs MDP Line E-5 Stg 1	Riverside County Flood Control and Water Conservation District	Construction Project	This project will reduce flooding along 8th Street between Mesquite Avenue and West Drive. Approximately 3,700 lineal feet of underground storm drain will be constructed along 8th Street beginning at District's existing Line E channel near West Drive with upstream end near Mesquite Avenue.
Implementation of the Palm Springs MDP	Riverside County Flood Control and Water Conservation District	Planning	The plan consists primarily of a network of underground storm drains and several open channels. Also included in the plan are 4 retention basins and a combination debris-detention dam. The proposed system will carry storm runoff through the community to outlet into either the Whitewater River, Chino Canyon Channel, Tahquitz Creek, Palm Canyon Wash or Cathedral Canyon Channel.

Project Title	Organization	Project Type	Project Description
Hexavalent Chromium Compliance Program	Mission Springs Water District	Construction Project	MSWD investigated several available compliance methods and well head treatment proved to be the best option for their operations. Further, based on a demonstration project conducted by CVWD at wells within the Mission Creek subbasin, with similar constituents of concern as MSWD's wells, along with MSWD's own investigation, it was determined that stannous chloride ($SnCl_2$) wellhead treatment would be optimal. CVWD's demonstration project used low impact wellhead treatment that proved to be easily adaptable to existing well systems and at a low capital cost. Therefore, MSWD will install hexavalent chromium wellhead treatment with stannous chloride ($SnCl_2$) at potentially seven (7) existing production wells, depending on the new MCL adopted by the State Water Board. The project will include construction of wellhead treatment within existing well sites. The treatment systems will generally consist of chemical feed pumps, injection equipment, chemical housing/storage, chemicals (i.e. stannous chloride ($SnCl_2$)), piping, sampling station, and data acquisition and monitoring devices. No additional well upgrades are anticipates since the proposed wellhead treatment does not place additional hydraulic head on existing systems.
Groundwater Quality Protection Project - Sub Areas H & I	Mission Springs Water District	Construction Project	Areas A, G, H, I, and K are part of a large Assessment District 18 currently in progress to begin the process of converting areas from a septic system to a sewer system. If Assessment District 18 is approved, voters will provide $12 million of match funding to complete these improvements. This application focuses on Sub Areas H and I and its construction to connect 676 parcels to the MSWD sewer system and abate over 458 on-site septic systems. Engineering design and CEQA for Sub Areas H and I are underway and are expected to be completed April 2019. This project will protect both the drinking water supplies and the hot water that is the basis of the spa economy for the City of Desert Hot Springs and the Coachella Valley.
Recycled Water and Groundwater Recharge Project - Phase I	Mission Springs Water District	Construction Project	This project consists of adding tertiary treatment facilities at the WVWRF with off-site groundwater recharge facilities approximately 2.5 miles north at a MSWD owned 80 acre parcel. This parcel is located on 14th Avenue between North Indian Canyon Drive and Little Morongo Road and adjacent to Mission Creek. Tertiary treatment will include either sand or cloth filters and a secondary effluent pump station to pump effluent to the new tertiary filters and disinfection system. In addition, an effluent pump station and recycled water storage tank will also be needed to provide recycled water transmission. The transmission pipeline and pump station will be constructed to convey the flows from the WVWRF to the groundwater recharge site. The proposed recharge basin is adjacent to Mission Creek and can be used to divert and recharge stormwater runoff, reducing peak storm flows to downstream areas.
Denitrification Upgrade at Horton Wastewater Treatment Plant	Mission Springs Water District	Construction Project	In 2015, MSWD completed a technical memorandum for the HWWTP Expansion No. 5. The objective was to provide MSWD with a summary of the requirements to update and redesign the 2008 Expansion No.5 project based on the current conditions that exist at the HWWTP. As part of that process, MSWD held discussions with the RWQCB about the possible upgrade and expansion; in which, the RWQCB expressed concerns about possible negative impacts of nitrogen on the local groundwater quality. Further, they made it clear that in the absence of a study, any expansion to the HWWTP would trigger a new requirement to remove Nitrates and Total Nitrogen to effluent levels below 10 mg/L. While the HWWTP Expansion No. 5 is still planned for the future, MSWD desires to add the necessary treatment processes to reduce Nitrates and Total Nitrogen in the effluent waters now to address the concerns of the RWQCB and to ensure any potential long-term impacts to the groundwater aquifer are eliminated.
Groundwater Quality Protection Project - Sub Area M2	Mission Springs Water District	Construction Project	Area M2 is part of Assessment District 15, approved by voters in 2017, system to a sewer system. Assessment District 15 will provide $5.2 million of match funding to complete these improvements. This application focuses on Sub Area M2 and its construction to connect 695 parcels to the MSWD sewer system and abate over 405 on-site septic systems. Engineering design and CEQA for Sub Area M2 is complete. This project will protect both the drinking water supplies and the hot water hat is the basis of the spa economy frot he City of desert Hot Springs and the Coachella Valley.
Coachella Valley Golf Course Lake Lining Rebate Program	Coachella Valley Water District	Conservation	Golf courses irrigate their areas with the use of lakes. The lakes serve as reservoirs for the irrigation systems. Many courses have lakes that were built decades ago and as such now leak and/or seep water. Many representatives in the Golf and Water Task Force have indicated that they have an interest in lining their lakes, however doing so is cost prohibitive. The Coachella Valley Golf Course Lake Lining Rebate Program will operate along the same parameters of CVWD's existing Golf Course Turf Rebate program. Through the use of grant funding, CVWD would offer a rebate of up to 50% of the cost to reline a lake.

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Project Title	Organization	Project Type	Project Description
Groundwater Quality Protection Project - Sub Area M2-1	Mission Springs Water District	Construction Project	Area M2-1 is part of Assessment District 15, approved by voters in 2017, system to a sewer system. Assessment District 15 will provide $1.95 million of match funding to complete these improvements. This application focuses on Sub Area M2-1 and its construction to connect 318 parcels to the MSWD sewer system and abate 182 on-site septic systems. Engineering design and CEQA for Sub Area M2-1 is complete, and the project is shovel ready. This project will protect both the drinking water supplies and the hot water that is the basis of the spa economy for the City of Desert Hot Springs and the Coachella Valley.
Enhancement of Coachella Valley Groundwater Monitoring	CVRWMG	Construction Project	This project would identify and prioritize areas in the Coachella Valley Groundwater Basin that are in need of dedicated monitoring wells. Three multi-cased monitoring wells will be installed to enhance groundwater monitoring. Each well will contain 3 wells casings installed to different depths to monitor depth specific layers of the groundwater basin.

Project Title	Organization	Describe Project Location	Describe Need for Project	Project Summary	Project Description	Tier Ranking
Thousand Palms Flood Control Project	Coachella Valley Water District	The project is located north of the I-10 freeway from Rio del Sol Road in North Cathedral City to Washington Street in Thousand Palms.	The project will help to provide flood protection and maintain a sand transport system for the Coachella Valley Fringe-Toed Lizard Preserve.	Design and construct a series of levees and channels to protect a portion of the Thousand Palms and North Cathedral City from flooding.	Design and construct a series of levees and channels to protect a portion of the Thousand Palms and North Cathedral City from flooding. The project will collect flows from the alluvial fans to the north and convey them to existing Sun City Palm Desert flood control system.	Tier 2
North Cathedral City Stormwater Master Plan	Coachella Valley Water District	Southeast of the intersection of I-10 and Gene Autry Trail, along the south side of I-10 in northern Cathedral City.	Design and construction of improvements to convey a portion of the 100-Year Flood from the Morongo Wash south of Interstate 10 to the Whitewater River Storm Water Channel. The design and construction of the Phase I of the SMP plan will provide protection to existing development in Northern Cathedral City from the 100-Year Flood, including a portion of riverine flows currently conveyed to Thousand Palms. The construction of the project will also provide biological benefits through improved wildlife connectivity and sand transport between the Willow Hole and Whitewater Floodplain Conservation Areas.	Prepare design plans, specifications, and environmental documentation to construct Phase I of the North Cathedral City Storm Water Master Plan (SMP).	The scope of the project includes the design and construction of improvements to convey a portion of the 100-Year Flood from the Morongo Wash south of Interstate 10 to the Whitewater River Storm Water Channel. The design and construction of the Phase I of the SMP plan will provide protection to existing development in Northern Cathedral City from the 100-Year Flood, including a portion of riverine flows currently conveyed to Thousand Palms. The construction of the project will also provide biological benefits through improved wildlife connectivity and sand transport between the Willow Hole and Whitewater Floodplain Conservation Areas.	Tier 2
East Side Dike Improvement Project - Phase I	Coachella Valley Water District	North of I-10 at Dune Palms Road to the intersection with I-10 near Dillon Road.	Certifying the East Side Dike will help to ensure compliance with FEMA's 100-Year Flood Design Standard by providing flood protection to adjacent developments. It also helps to remove existing developments or land areas from special flood hazard areas. The East Side Dike traverses through the East Indio Hills Conservation Area. Certifying the East Side Dike will help to ensure compliance with FEMA's 100-Year Flood Design Standard by providing flood protection to the Conservation Area. The flood waters that originate in the tributary watershed impounds behind the East Side Dike, thereby giving the water time to infiltrate into the groundwater system. When flood levels reach a certain elevation, the water leaves through the outlet system known as Wasteway Channels.	Engage a consultant to prepare levee mitigation plans to certify the East Side Dike (Dike) from Dune Palms Road to Interstate 10 to the Federal Emergency Management Agency (FEMA) as a regional stormwater facility.	Engage a consultant to prepare levee mitigation plans to certify the East Side Dike (Dike) from Dune Palms Road to Interstate 10 to the Federal Emergency Management Agency (FEMA) as a regional stormwater facility.	Tier 2
Trash Capture Systems	City of Indio	MS4 System within the City of Indio	The State Water Board identified trash as a significant pollutant in California Waterways because trash harms aquatic life, wildlife and public health. Trash often enters the environment through the MS4 systems when it is washed into storm drain inlets during rain events. The State Water Board adopted the Trash Amendments on April 7, 2015 and funding would accelerate installation of the devices and more efficiently support the goals.	Installation of full capture trash systems in the MS4. The systems prevent trash from polluting waterways preserving water quality and beneficial uses.	This project would install full capture trash devices in the MS4 system. These devices are designed to work in the storm drain inlets to capture trash before it enters the MS4 system. The devices capture trash particles down to 5mm. Funding would be used for purchase and installation of devices.	Tier 3
Maxwell Installation	City of Indio	North side of Avenue 48 between Monroe and Arabia	Runoff in the area on the north side of Avenue 48 between Monroe street and Arabia Street creates flooding problems. This project supports low impact development and groundwater recharge. The City of Indio requires stormwater infiltration through an ordinance and maintains current engineering plans for maxwells, dry wells and other low impact development structures.	Installation of maxwells on the north side of Avenue 48 between Monroe street and Arabia Street.	This project is designed to address urban runoff and flooding. The project involves the construction of maxwell systems on the north side of Avenue 48 between Monroe Street and Arabia Street. The maxwells will capture storm water runoff and direct it into the ground which supports using storm water as a resource. This will reduce flooding while retaining the flood water within the watershed.	Tier 3
Whitewater Channel Extension to Connect with Current Salton Sea Water Level	Torres Martinez Desert Cahuilla	The extension between the Whitewater Channel and the current Salton Sea water level will be located at the Salton Sea Delta.	The current excavated Whitewater Channel is not connecting with the present level of water at the Salton Sea due to the reduction of water inflow in the Salton Sea. The Whitewater Channel discharges all storm water as well as waters from the water treatment plant, and agricultural drainage waters from the entire Coachella Valley. In the past, agricultural drainage channels have been insufficient to move water to the Salton Sea. Connecting the Whitewater Channel with the current	The project consists of constructing a connection between the Whitewater Channel and the current Salton Sea water level.	The Torres Martinez Desert Cahuilla Indians will build a connection between the Whitewater Channel and the current Salton Sea water level. The Tribe will begin project by procuring an Archeologist Consultant to complete required Environmental Studies. Afterward, the Tribe will procure an Engineer Consultant to finalize Engineering Design. Once the Environmental Report and Engineering Design are complete, the Tribe will construct the proposed Channel modification connection. The Tribe will secure a general contractor through its procurement process and will lease necessary heavy equipment to facilitate excavation and construction. The Tribe	Tier 3

[1] The CVRWMG requested additional projects from the RCFCWCD following the call for projects deadline, so these project submissions have been included.

Project Title	Organization	Describe Project Location	Describe Need for Project	Project Summary	Project Description	Tier Ranking
			water level at the Salton Sea will benefit all communities in the Coachella Valley by increasing water volume in the Salton Sea and thus minimizing playa exposure. The project will benefit the water supply for the entire north end of the Salton Sea as well as water quality for recreational activities in the north end of the Salton Sea. It will also have environmental benefits by contributing to the reduction of exposed playa and supporting habitat conservation for fish populations by reducing salt concentration. The project will also benefit community and flood management by increasing capacity to move water in the Whitewater Channel to prevent overflows in the Coachella Valley.		anticipates completing construction by Month 12 of the project period. This project will be under the supervision of the Natural Resources Manager (NRM).	
St. Anthony Storm Water Capture Project	Pueblo Unido CDC	The existing San Antonio del Desierto (St. Anthony Trailer Park) consists of a 95 unit mobile home park serving farm worker and low-income families. It is located on a 32-acre site at 67-075 Highway 111 just south of the unincorporated community of Mecca, east of Lincoln Street, and North of Avenue 68th.	The project was developed without adequate grading design and benefit of a permit. The topography of the site is prone to flooding at different areas including mobile home spaces, community park, streets and other common areas. Additionally, the site lacks adequate retention basin to contain and manage storm water. During winter season, flooding has created a burden for farmworker families while driving to work, and a challenge for students accessing school transportation. There is a pressing need for precise grading design, street improvements including curb and gutters, pavement with minimum slopes, and a retention basin area to capture storm water; and to prevent future flooding at the site.	St. Anthony MHP is an affordable housing project that houses farmworkers and low-income families with an estimated population of 500 people; located within a Disadvantaged Community area designation.	St. Anthony is a mobile home park community that provides affordable housing to farmworkers and low-income families. The project is a 32-acre parcel located south west of Highway 111, east of Lincoln Street and north of Avenue 68 in the unincorporated community of Mecca, Riverside County. In 2010, Pueblo Unido CDC (PUCDC) started a comprehensive rehabilitation program to address substandard conditions, and code violations at the park. To date, major infrastructure improvements have been achieved in this community including, electrical stabilization, access to drinking water, off-site access roads; and the construction of the off-site sewer sanitation collection system to the site is scheduled to start in April 2018. A key element of this success is PUCDC's outreach and organizing experience that has enable community members to be involved in the planning and supporting of this community development endeavor. Furthermore, the support and partnership with other local, state and federal agencies, as well with private foundations have made these improvements a reality.	Tier 1
Coachella Monitoring Well Application and Project Study	Coachella Water Authority	Project will be located within the service boundary of the Coachella Water Authority	The Authority currently gathers groundwater data for the area from existing groundwater wells that are read at various times of the year. By establishing additional wells for the dedicated groundwater well monitoring system the Authority hopes to gain a better and more accurate understanding of the groundwater system in the area. This monitoring system will include details regarding the sampling, location and usage of data that is collected from each monitoring well. The information that is gathered will help assess the groundwater situation in the Authority and provide guidance as to future practices. It is also intended that this information will be utilized in future groundwater modeling efforts given the availability of funding. This model will be a powerful tool in understanding the movement and capacity of groundwater in the Authority's service area.	This Project will allow for the long-term monitoring of the depth to groundwater conditions within the Authority and the ability to report this information to DWR through the CASGEM online reporting system.	By implementing this Project, the Authority intends to move depth to groundwater measurements from a monitoring system reliant upon dedicated monitoring wells. This effort will drastically improve the reliability and constancy of depth to groundwater readings. Per the Authority WMP this effort will increase the ability to have reliable data to make water management decisions including groundwater recharge efforts and surface water deliveries. All of these efforts are to decrease the depletion of groundwater overdraft within the Authority. The Authority typically takes depth to groundwater readings twice a year, once in the fall and once in the spring. This Project will create a long-term plan to implementing future dedicated monitoring wells via the Dedicated Monitoring Well Location Report when funding is made available. The Authority will maintain the monitoring wells included in this Project to ensure the longevity of the facilities.	Tier 2
Improvements for Existing Dry Well Located South of 52 Ave.	City of Coachella	Project is located in the City of Coachella west of the Coachella Valley Storm Channel at Avenue 52	California is in a severe drought Legislation is calling for: –Water reuse – Treating stormwater as a resource Improving the infiltration field of the Avenue 52 drywell will assist with reducing localized flooding and convey stormwater away from property to the Coachella Valley Storm Channel.	The drywell will intercept and pretreatment contaminants like suspended solids and improve surface water quality of the CVSC.	The current drywell captures and stores urban storm water runoff and is infiltrated to reduce discharge to the Coachella Valley Storm Channel (CVSC). The drywell will intercept and pretreatment contaminants like suspended solids and improve surface water quality of the CVSC.	Tier 1
Stormwater Conveyance System 1	City of Indio	Avenue 48 and Hjorth east to Whitewater	The area at 48th Avenue and Hjorth street experiences flooding problems during rain events. A storm water conveyance system is needed to alleviate the flood problems.	Install storm water conveyance system from Avenue 48 and Hjorth Street east to Whitewater.	This project would address the problems through the installation of a storm water conveyance system to move the water from the area before it floods. The project consists of storm drain inlets and associated piping.	Tier 2
Revitalize 20 Existing Dry Wells	City of Indio	There are twenty existing dry wells within the City of Indio boundaries	The City of Indio has worked to infiltrate storm water for many years. There are at least 20 dry wells used for infiltration that are 30 years old. Over time, these devices become inefficient and ineffective, so they must be revitalized.	Revitalize 20 existing dry wells with new maxwells to allow the devices to function as needed to address urban runoff and flooding.	This project would revitalize 20 existing dry wells that are at least 30 years old with new maxwells. These would allow the devices to effectively address urban runoff and flooding.	Tier 2
Stormwater Conveyance System 2	City of Indio	Cabazon and Van Buren Street south to Cabazon and Dillon	A large portion of south east Indio drains to the area where Van Buren and Cabazon are in close proximity. Storm water floods these areas and has threatened property.	Install a storm water conveyance system from Van Buren Road to Cabazon Road to Cabazon and Dillon Road.	This project would direct the stormwater from Van Buren Street to Cabazon to the intersection of Cabazon and Dillon Road. This would reduce flooding, manage urban runoff and protect property. The project includes construction of storm drain inlets and associated piping.	Tier 2

[1] The CVRWMG requested additional projects from the RCFCWCD following the call for projects deadline, so these project submissions have been included.

Project Title	Organization	Describe Project Location	Describe Need for Project	Project Summary	Project Description	Tier Ranking
Jackson and Avenue 50 Retention Pond with Maxwells	City of Indio	Jackson Street and Avenue 50	The project manages urban runoff, reduces flooding and directs the stormwater into the groundwater basin.	This project involves construction of a retention pond with maxwells in order to address urban runoff and flooding.	This is a low impact development project that consists of construction of a storm water retention pond and includes maxwells for efficient infiltration. The project will manage storm water as a resource and keep the water within the watershed.	Tier 2
Stormwater Conveyance System 3	City of Indio	Dr. Carreon and Arabia	This is a significant storm water conveyance project that would manage urban runoff and reduce flooding. In addition, this project is a "backbone" for several smaller storm water conveyance projects would eventually be connected to this in order to manage urban runoff in smaller more specific areas.	This is an extensive project that consists of constructing storm water conveyance systems.	This project would begin at Dr. Carreon and Arabia Street east to Dr. Carreon and Van Buren Street north following Van Buren connecting to Indio Boulevard and outlet to the storm channel. This project consists of inlets and associated piping.	Tier 2
Pierce Community Stormwater Project	Pueblo Unido CDC	The proposed project is located south of Avenue 66 and north of Avenue 70 in the unincorporated community of Oasis, in a portion of Section 21, Township 7 South, Range 8 East, San Bernardino Base and Meridian	The neighborhood lacks adequate flood control, street improvement including curb and gutters. The topography of the site is prone to flooding at different areas including mobile home spaces, community center, streets and other common areas. Additionally, the site lacks adequate retention basin areas to capture and manage storm water. During winter season, flooding creates storm water swamps along Pierce Street that remain for months due to poor soil percolation. This become a real burden for farmworker families while driving to work, and a challenge for students accessing school transportation. There is a pressing need for precise grading design, street improvements including curb and gutters, pavement with minimum slopes, and a retention basin area along Pierce Street to capture storm water; and to prevent future flooding in the vicinity.	Pierce Street Community is a DAC project geared towards the implementation of Storm Water Control in the vicinity.	Pierce Street Community is a DAC project geared towards the implementation of Storm Water Control in the vicinity. Residents have experience major flood events along Pierce Street where adequate flood control and storm water capture system is lacking. Flood control has been identified as one of the top priorities by the community. Pierce Street Community is a farmworker and low-income vicinity with an estimated population of 1,800 people, located within a Disadvantaged Communities designated area. Community residents have been engaged in planning meetings to address different infrastructure related issues including lack of drinking water, sanitation collection system, and storm water control. The majority of the residents live in small mobile home parks known as "Polanco" parks, and have created two community committees: Union de Polancos, and Pierce Community Infrastructure. Community outreach and planning activities are held at the San Jose Community Learning Center which provide a critical space for neighborhood revitalization in the vicinity. The center held the DAC Outreach Workshop providing an opportunity for community leaders to memorialize their infrastructure priorities, resulting in the DACs Outreach Report.	Tier 2
Avenue 76 Community Stormwater Control Project	Pueblo Unido CDC	The proposed project is located east of Harrison Rd, and west of Pierce Street along Avenue 76 in the unincorporated community of Oasis, in a portion of Section 21, Township 7 South, Range 8 East, San Bernardino Base and Meridian.	The project is a community driven initiative which is addressing the lack of storm water control. The neighborhood has a history of severe flooding that has impacted the residents for many years. There is a pressing need for flood control including adequate grading, curb and gutters and paving. The residents have participated in community outreach activities including the DACs Outreach Program which the project was identified.	The proposed Avenue 76 Community Storm Water Control Project consist of designing an effective storm water control along Avenue 76 to manage flood risk in the vicinity. including grading and construction of curb and gutters in both sides, and inverted street section.	The proposed project is to provide storm water control service to an existing large rural cluster that consist of single dwelling units, Polanco parks and Oasis mobile home park located in the Torres Martinez Desert Cahuilla Indians Reservation. Additionally, this area is served by Centro Medico Oasis, Community Park, and a small grocery store. The target community consists of agricultural workers and low-income families. It is estimated that the storm water control project will provide service to an approximate 194 units with a population of 1,300 residents. The average combined population per mobile home is 6.76. This population data was provided by the United States Environmental Protection Agency (USEPA).	Tier 2
Avenue 48 Storm Drain	City of Indio	Avenue 48 at Las Brisas Way west to Avenue 48 and Jefferson then north to the Coachella Valley Storm Channel	This is a construction project to manage urban runoff and flooding.	This project consists of installing inlets and associated pipes to convey storm water to the Coachella Valley Storm Channel from Avenue 48 at Las Brisas Way to the Coachella Valley Storm Channel.	The project consists of installing inlets and piping to convey stormwater from an area that floods during rain events to the Coachella Valley Storm Channel. The projects start at Avenue 48 at Las Brisas Way and extends west to Avenue 48 and Jefferson then north to the Coachella Valley Storm Channel.	Tier 2
Implementation of Total Maximum Daily Load Best Management Practices	River County Flood Control and Water Conservation District	City of Coachella, adjacent to the Coachella Valley Stormwater Channel, in the County of Riverside, California.	A Total Maximum Daily Load (TMDL) for bacterial indicators was recently adopted by the Regional Water Quality Control Board- Colorado River Region. It calls for the City of Coachella to ensure that discharges into the Coachella Valley Stormwater Channel (CVSC) do not contribute to load of the bacterial indicators in the channel. Therefore, the City of Coachella needs to implement Best Management Practices (BMPs) and solutions to prevent non-storm urban runoff flows from entering the CVSC. The City is in a disadvantaged area that has been disproportionately affected by the economic downturn. The city therefore needs assistance to implement the necessary programs and measures to address bacterial indicator discharges.	Implementation of structural and/or treatment BMPs to help reduce pollutant loading to the CVSC.	The proposed project would assist the City of Coachella with the implementation of Best Management Practices (BMPs) to reduce and/or eliminate discharges of bacterial indicators from within the city to the CVSC, which has been identified as impaired due to bacterial indicators. The City has identified specific projects that can be implemented to achieve these goals. The projects include low impact development approaches to retrofitting urban areas, such as dry wells, infiltration swales and similar.	Tier 3
Desert Hot Springs Master Drainage Plan, Line E-5 Stg 1	River County Flood Control and Water Conservation District	8th Street beginning at District's existing Line E channel near West Drive with upstream end near Mesquite Avenue.	A storm drain system is needed to help prevent flooding problems in the area. This project will reduce flooding along 8th Street between Mesquite Avenue and West Drive. Approximately 3,700 lineal feet of underground storm drain will be constructed along 8th Street beginning at District's existing Line E channel near West Drive with upstream end near Mesquite Avenue.	This project will reduce flooding along 8th Street between Mesquite Avenue and West Drive.	This project will reduce flooding along 8th Street between Mesquite Avenue and West Drive. Approximately 3,700 lineal feet of underground storm drain will be constructed along 8th Street beginning at District's existing Line E channel near West Drive with upstream end near Mesquite Avenue.	Tier 2
Implementation of the Palm Springs Master Drainage Plan	River County Flood Control and Water Conservation District	Primarily in the City of Palm Springs, the westerly portion of City of Cathedral City,		The plan consists primarily of a network of underground storm drains and several open channels.	The plan consists primarily of a network of underground storm drains and several open channels. Also included in the plan are 4 retention basins and a combination debris-detention dam. The proposed system will carry storm runoff through the	Tier 3

[1] The CVRWMG requested additional projects from the RCFCWCD following the call for projects deadline, so these project submissions have been included.

Project Title	Organization	Describe Project Location	Describe Need for Project	Project Summary	Project Description	Tier Ranking
		and portions of the County of Riverside			community to outlet into either the Whitewater River, Chino Canyon Channel, Tahquitz Creek, Palm Canyon Wash or Cathedral Canyon Channel.	
Verbena Channel	River County Flood Control and Water Conservation District	Verbena Channel is south of Dillon Road and north of Two Bunch Palms Trail, near Desert Hot Springs, in the County of Riverside, California	Verbena Channel was a natural channel. During major storm events flows from this channel need to be controlled to prevent loss of property downstream and to assist with continued development of the area.	Replace a channel with a storm drain and a detention basin.	Verbena Channel is south of Dillon Road and north of Two Bunch Palms Trail and will replace a storm drain and detention basin system from Camino Idilio approximately one-mile north Verbena Drive at Park Lane.	Tier 3
Palm Springs Master Drainage Plan, Line 41	River County Flood Control and Water Conservation District	Palm Springs, Riverside County, California. Line 41 from Golf Center Drive westerly in East Palm Canyon Drive to Cherokee Way.	A storm drain system is needed to help prevent flooding problems in the area. The storm drain system would also convey urban runoff. The project works in concern with Eagle Canyon Dam and Palm Springs Line 43 to provide flood protection to property along Highway 111 from Golf Club Drive to Auto Park Road. Project is ready to go, but currently has a $5,000,000 budget shortfall.	Construct flood control facilities from Golf Center Drive westerly in East Palm Canyon Drive to Cherokee Way.	Project would construction flood control facilities benefitting the communities of Palm Springs and Cathedral City. Line 41 from Golf Center Drive westerly in East Palm Canyon Drive to Cherokee Way.	Tier 3
Stormwater Master Plan	City of Coachella Water Authority	The area contained within the City limits of Coachella	The City of Coachella is a low-lying area situated below sea level and is subject to flooding on a regular basis. The project will develop a stormwater improvement master plan that will establish a program of capital improvement projects to reduce flooding, provide stormwater detention, and route stormwater to the Whitewater Channel, which is the regional conduit that drains stormwater runoff from the Coachella Valley into the Salton Sea.	This project will include development of a stormwater master plan to establish a capital improvements program for stormwater projects that will mitigate flooding issues.	The project will include development of a stormwater master plan, including: 1) Summary of existing storm water management system, storm drain gravity and pumping network, and synopsis of existing problems with flooding, 2) Stormwater runoff and flood routing hydraulic analysis to identify existing system deficiencies, 3) Development of stormwater conveyance, pumping, and detention alternatives to correct system deficiencies; development of a stormwater BMP (including stormwater quality) program to complement permanent facilities, 4) Identification of preferred alternative based on cost and non-economic factors, 5) Prepare capital and life cycle cost estimates for the preferred alternative, 6) Prepare a schedule for the various implementation phases of the preferred alternative, 7) Summarize potentially available funding sources.	Tier 2

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Appendix VI-I: Integrated Flood Management Planning Study

This appendix includes the draft report from the Integrated Flood Management Planning Study conducted as part of the 2014 Coachella Valley IRWM Plan update process.

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COALACHELLA VALLEY

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1 Introduction

1.1 Background

The Coachella Valley Integrated Regional Water Management (IRWM) region has the potential to experience flooding problems because of the physical features of the area and metrological conditions, which can result in significant losses and economic damages. The desert is conducive to flooding due to unique soil and topography characteristics, winter and summer rainy seasons, and numerous natural washes and channels. During a rainstorm, the normally dry waterways can quickly become raging rivers causing widespread overland flooding when unchecked. The topographic characteristics, as well as the extreme rainfall events for the Coachella Valley, can result in generating floodplain conditions which dominate the existing flood hazards. Figure 1-1 shows the topography of the region.

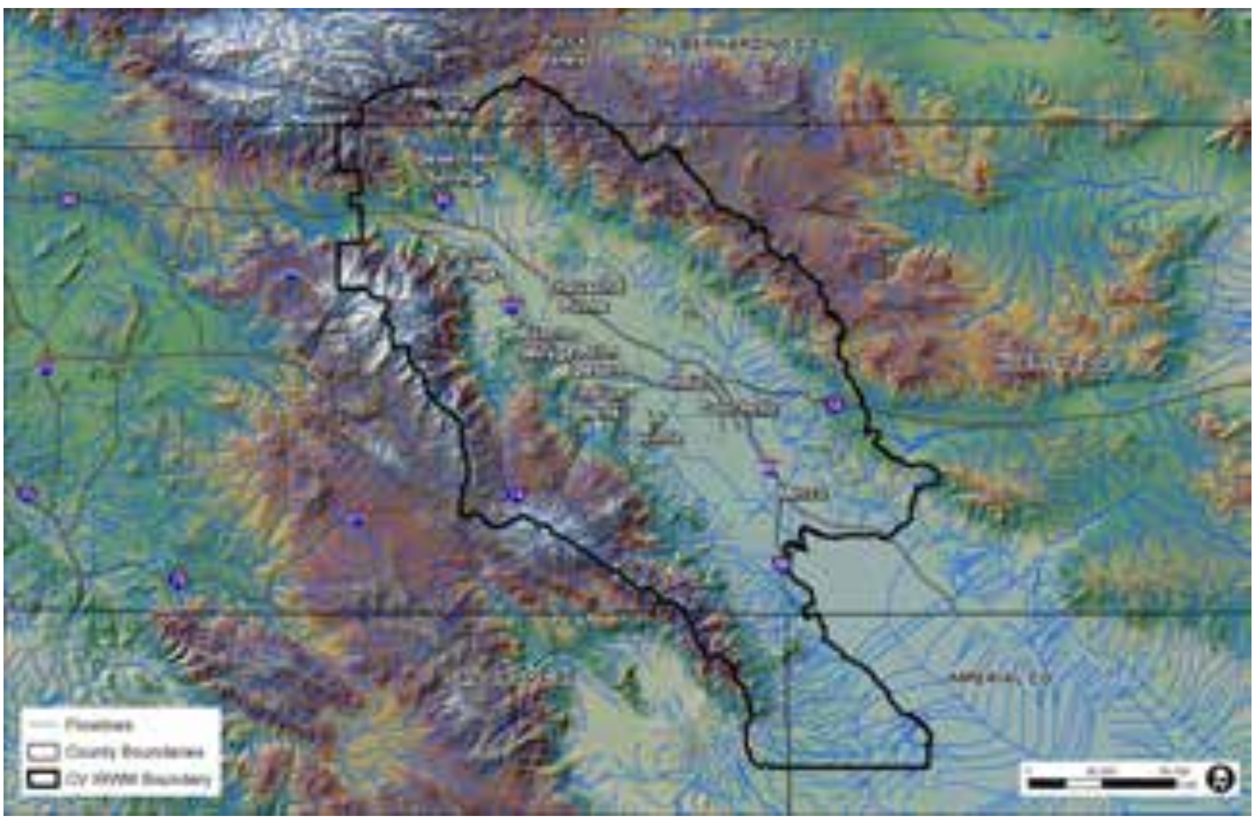

Figure 1-1: Coachella Valley IRWM regional drainage patterns and hydrography

From a meteorological perspective, the occasional high intensity thunderstorms and tropical rainfall events can develop a flashy response from the tributary mountainous watersheds resulting in flash flooding. In addition, the Coachella Valley is surrounded by rugged mountainous watersheds and mouths of steep canyons that have resulted in the formation of numerous alluvial fans. The alluvial fan is one of the primary physiographic features which dominates the flooding conditions. Regional flood hazards can generally be divided between the (1) alluvial fan and (2) valley floor area, which carries large amounts of debris and sediment as well as unconfined flood flows which undergo unpredictable changes in direction. These physical characteristics, combined with the intense rainfall events, generate flood hazards that are different from conventional riverine floodplains.

Effective floodplain management planning and mitigation of flood hazards is extremely complex with multiple issues and different watershed responses. The Coachella Valley region is comprised of multiple regional watershed units which are unique in their hydrologic responses, as well as their floodplain functions, which lend the flood management planning assessments to a watershed approach. However, flood and stormwater runoff generated from watersheds can also represent a valuable water resource that can be managed successfully, rather than just being typically viewed as a hazard. This *Integrated Flood Management Planning Study* (IFM Study) has been prepared as a companion document to support the addition of multi-benefit floodplain management into the *Coachella Valley Integrated Regional Water Management (IRWM) Plan Update* as a key water resource element in regional water planning. There is not a one size fits all solution, but comprehensive planning is required on a watershed basis to develop an implementable system-wide answer. Integrated Flood Management (IFM) combines land and water resources development in a floodplain, with a view to maximize the efficient use of the floodplains and minimize loss of property and life.

This IFM Study is not a traditional watershed/flood management planning document since it does not provide specific regional flood mitigation projects as a conventional master plan would provide. However, this IFM Study is intended as a “guidance document” to facilitate an integrated water resources approach to flood management and promote this planning technique. This assessment is based on readily available information to perform planning level risk assessment in order to provide high level recommendations. In addition, it defines general applicable strategies, as well as provides planning level tools, to guide flood management decision making. This approach embraces protection of the natural integrity of the floodplain and ensuring that maximum value will be realized from effort to protect life and property. The focus of integrated planning is on balancing the community flood management needs with the environmental constraints and watershed resources. A sustainable flood and water management approach would recognize the:

- Interconnection of flood risk management actions within broader water resources management, ecosystems, and land use planning
- Value of coordinating across geographic and agency boundaries
- Need to evaluate opportunities and potential impacts from a system perspective
- Importance of environmental stewardship and sustainability
- Need for system flexibility and resiliency in response to changing conditions, such as climate change and population growth

1.2 Integrated Flood Management Approach

IFM is an approach that varies from traditional flood protection with a focus on maximizing the efficient use and net benefit of a floodplain while promoting public safety. IFM is a process that promotes an integrated, rather than fragmented, approach to flood management, and that recognizes the connection of flood management actions to water resources management. IFM requires the holistic development of a long-term strategy, balancing current needs with future sustainability. Incorporating sustainability means looking to identify opportunities to enhance the performance of a watershed system as a whole.

An integrated strategy usually requires the use of both structural and non-structural solutions. Depending on the characteristic of an individual watershed, various resource management strategies may be used such as: land stewardship, conjunctive water management, conveyance, ecosystem restoration, forest management, land use planning and management, surface storage, urban runoff management, and watershed management. It is important to recognize the level and characteristics of existing risk and likely future changes in risk. Integrated flood management also includes the recognition that flood risk can never be entirely eliminated and that resilience to flood risk can include enhancing the capacity of people and communities to adapt to and cope with flooding.

Figure 1-2: IFM combines three major areas of watershed planning

The benefit of using a regional and system-wide approach is that it takes into account a wide range of causes and effects, reducing potential negative unintended consequences in nearby regions. Regional approaches allow for the best use of public resources by increasing the number of issues considered. This also promotes system flexibility and resiliency by developing solutions that provide the best benefit to the overall system or region. In contrast, localized and narrowly focused projects may solve an issue or problem while transferring the problem up or downstream. One of the benefits of using an IFM approach is the potential to access funding sources that might not have been available to single-benefit projects. This can lead to achieving sufficient and stable funding for long-term flood management.

1.3 California Statewide Flood Management Program Study

California Department of Water Resources (DWR) has recently completed the initial phase of a Statewide flood management planning study which is similar in many respects to this flood management planning study for the Coachella Valley IRWM Plan. The database development for this study mirrored the Statewide information process and resulted in the similar database, as well as inventory of issues. The results of the initial Statewide study are available to the public. This report, *California's Flood Future: Recommendations for Managing the State's Flood Risk* (Flood Future Report) presents an overview of the flood threats facing the state, approaches for reducing flood risk, and recommendations for managing California's flood risk. The Flood Future Report is the first statewide report to be developed through collaboration between DWR and the United States Army Corps of Engineers (USACE). This report is the first product of DWR's State Flood Management Planning (SFMP) Program. The SFMP Program was developed under the FloodSAFE Initiative to expand the focus of California's flood management planning statewide in compliance with Public Resources Code (PRC) Section 75032. The SFMP Program was funded under Proposition 84 as part of the DWR FloodSAFE Initiative and IRWM Program.

Both the SFMP and this IFM Study reviewed flood management projects and how these faced increased stakeholder involvement, land use constraints, changing regulatory requirements, and new environmental considerations. These issues have led to an increase in the cost of flood management. Addressing these issues will require a move away from the traditional approach to developing flood management projects. Specific issues impacting flood management projects which were identified and provide a useful background in developing IFM guidance planning include the following:

- **Projects require extensive stakeholder involvement, which increases project planning costs.** Stakeholders have become more educated about project development and environmental requirements. Successful projects require proper engagement of a diverse set of stakeholders. The cost associated with stakeholder engagement activities must be included in planning and implementation costs.
- **Different methodologies and inadequate data make risk assessment complex and costly to complete.** Insufficient data on the specifics of flood hazards in many areas makes it difficult to assess the level of problems. Much of the available data is based on FEMA flood hazard mapping, but this does not identify the chronic flood problems which current on a frequent basis and on smaller storm events other than a 100-year event. In addition, the data related to existing drainage facilities and the original design capacities is not readily available in digital format which makes it difficult to perform rapid assessments at a regional scale.
- **Land use decisions may not adequately prioritize public safety.** Uninformed residents and policymakers can make decisions that inadvertently put people and property at increased risk. In some cases, providing adequate space for flood management facilities to

meet existing and future needs during the development approval process would reduce flooding impacts. Internal and intra-agency coordination is important when local agencies make development decisions. Improving coordination within and between agencies could inform the potential land use decisions to considerations in General Plans, flood managers are not always included in land use discussions.

- **Delayed permit approvals and complex permit requirements are obstacles to flood risk reduction.** Many agencies wait years for permits, resulting in poorly maintained projects and missed funding opportunities for new projects. Often, agencies face conflicting or confusing requirements regarding project permits. Also, regulatory requirements to renew existing permits or obtain new permits frequently require extensive mitigation. This mitigation can greatly increase project costs and cause project delays.
- **Flood management projects are not prioritized from a "watershed" system-wide or multi-benefit perspective.** State and Federal flood management funding has traditionally been provided to local projects by analyzing a narrowly focused and localized set of benefits. In addition, funding levels for flood management are often set without regard to a system-wide prioritization of needs.
- **Flood risk funding as well as long term funding for operations and maintenance.** Funding for flood projects is based upon the potential that a significant flood will occur, rather than providing for day-to-day flood management needs. Inadequate funding for flood management maintenance, operations, and improvements makes flood risk reduction difficult or impossible for many local agencies. Agencies at all levels are facing funding constraints. Local agency funding is often based on available funds, which have been impacted by the economic downturn. Reductions in Federal funding have occurred, resulting in potential reductions in funding levels for flood risk studies and projects

1.4 Work Program and Objectives

The objectives of this IFM Study are to (1) develop planning level tools, (2) plan formulation processes, and (3) guidance documentation for regional collaborative planning of watershed and flood risk management using IFM techniques. Developing solutions for effectively managing flood risks requires a "watershed approach" which allows holistic strategies that can also address "beneficial uses" as well as watershed functions. The goal is to provide the forum and guidelines to allow for improved regional flood management planning on a watershed basis, as well as defining the global strategies that can be used by all the watershed stakeholders to form the foundation in developing prospective projects for funding.

This IFM Study is organized as follows:

(1) Chapter 1 provides an overall introduction to the IFM Study and concepts.
(2) Chapter 2 explains the flood management database developed for this study.
(3) Chapter 3 includes a regional assessment of flood hazards.
(4) Chapter 4 presents information on the watersheds within the IRWM region.
(5) Chapter 5 provides an overview of IFM guiding principles.
(6) Chapter 6 provides a general overview of IFM strategies.

(7) Chapter 7 specifies which IFM strategies are appropriate to Coachella Valley.

1.5 Watershed Stakeholder Involvement

Stakeholder outreach was performed as part of the study process in order to involve different agencies, community groups, and other watershed stakeholders in the development of the IFM Study. This included the development of the initial feedback on the information database and providing an opportunity to discuss current issues with existing flood hazards, as well as implementation of floodplain management projects. Several workshops were held with interested stakeholders that provided local input, project background, guidance, and specialized technical information. The effort was aimed at developing a strategic plan that will result in understanding watershed guidance needs and flood protection strategy that are compatible with both the physical, political, environmental, and regulatory constraints. The stakeholder workshops were divided into two different periods during the overall study process and included different objectives to solicit input from the stakeholders as well as provide information on the progress of the study:

Workshop No.1 – Background /Inventory of Watersheds / Mapping Assessments

- Logistics – Held on January 15, 2013 at CVWD with 20 stakeholders, including CVWD, Riverside County Flood Control and Water Conservation District (RCFCWCD), Coachella Valley Mosquito and Vector Control District (CVMVCD), Salton Community Services District, Coachella Valley Association of Governments (CVAG), Agua Caliente Band of Cahuilla Indians, and local city representatives
- Topics – Discuss the overall objective of the program and how integrated flood management can be develop and work effectively for the stakeholders. Define the meaning of integrated flood management. Focus discussion will include developing an understanding of the existing flood programs, common issues in each of the different watersheds, obstacles and constraints encountered with flood management, priority flood hazards in the different watersheds, understanding how flood risks are evaluated.
- Feedback – Additional data sources and inventory from the stakeholders, defining lines of communication, understanding the needs within the different watershed for flood management, existing and future planned project for flood management, current flood management planning process.
- Deliverable – Watershed mapping worksheet with mapped flood hazards

Workshop No.2 – Review DRAFT IFM Planning Tools / Guidance Document

- Logistics – Held on September 18, 2013 at CVWD with 15 stakeholders, including CVWD, RCFCWCD, CVMVCD, Salton Community Services District, CVAG, and local city representatives
- Topics – Present the DRAFT Guidance Document which will focus on the planning and the underlying principles and alternative strategies, planning tools, and processed GIS mapping database information.
- Feedback – Input and comments on the DRAFT document

2 Flood Management Database

2.1 Data Needs

A wide range of data was required to develop a minimum "baseline" database that would assist in developing background and understanding in order to characterize the existing watershed and flooding conditions. The general categories and types of data that were researched as part of the initial baseline included the following:

- **Watershed** – Data related to characterizing the watershed conditions, including hydrologic parameters
- **Hydrology** – Studies and information related to estimates of the surface hydrology quantities and watershed response for different storm events
- **Meteorological** – Information related to the types of rainfall events characteristic of the region and the historical rainfall magnitudes including frequency as well as aerial distribution
- **Flood Control Facilities** – Existing regional flood control facilities within the watershed that have been constructed
- **Urban Drainage Facilities** – Existing local drainage facilities that have been installed
- **Drainage Facility Master Plans** – Watershed plans for proposed drainage facilities
- **Floodplain Mapping** – Studies delineating the existing floodplain boundaries, which define the limits of flood hazards
- **Historical Flooding** – Locations where existing flooding has historically occurred from storm events and locations chronic flood locations
- **Flood Damage Estimates** – Monetary estimates of the amount of flood damage associated with different storm events
- **Geomorphology** – Historical information on landform changes within the watershed and particularly trends for changes within the alluvial creeks of the floodplains
- **Erosion/Sedimentation** – Different erosion/sedimentation processes occurring within the watershed including historical trends related to locations of sedimentation and erosion hazards
- **Biological** – Existing biologic resources and habitat within the floodplain
- **Environmental / Regulatory** – Existing environmental permitting requirements related to restrictions for modifications within the active floodplains

Table 2-1 provides a detailed listing of the data and information collected as part of this planning study.

Table 2-1: Data and Information Collected

Flood Hazards / Floodplain Analysis
Historical Flooding Locations / Issues
FEMA Floodplain Mapping / DFIRM
FEMA Technical Backup / Floodplain Models
FEMA FIS (Riverside County)
Floodplain Hydraulic Models (other than FEMA)
Environmental Documentation
Coachella Valley MSHCP documentation
Biology / Wildlife
Plant Community Maps
Critical Habitat Maps
Animal Communities Maps
Riparian Habitat Maps
Prior Reports, Studies, or Data on Biological Resources, Species Occupation & Wildlife Movement
Water Quality
Point Sources
Non-Point Sources
Municipal NPDES Permit
Previous Watershed Hydrology / Hydraulic Studies
Municipal Drainage Master Plans
Development Drainage Master Plans / Hydrology Studies
Flood Control Deficiency Studies
Hydrology Studies – Proposed Developments
Development Drainage Master Plans / Hydrology Studies
Hydraulic Studies – Roadway Bridges / Culvert Crossings
USACE Regional Watershed Studies or Flood Control Planning Studies
Land use
General Plan - land use
Future Land use Plans
Census Population Demographic data
Available GIS Mapping Data Layers
Soils
Geologic Features
Property Ownership / Property Boundaries / APN
Existing Land use
Planned Development
Utilities
Roadways
Vegetation
Jurisdictional Boundaries (ACOE, CDFG, etc.)
Habitat / Wildlife / Endangered Species / Conservation Areas
FEMA Flood Hazard Zones
Existing Condition Floodplain Boundaries
Government / Civic Boundaries

Table 2-1: Data and Information Collected

	Right of Way Data
	Traffic Circulation Elements
	County / City Maintained Flood Control / Stormwater Facilities
	Alquist - Priolo
Mapping / Right-of-Way	
	Topographic Mapping - Digital DTM
	Aerial Photography – Rectified Digital Color
	Property Ownership / Property Boundaries / APN

The specific studies that were reviewed and used as part of this IFM study are referenced throughout this report and indicated with parenthetical citations. The data sources that were used for select GIS mapping as part of the IFM study are listed below in Table 2-2.

Table 2-2: GIS Mapping Data and Detailed Source Information

Dataset	Source	Scale
Soils	Natural Resource Conservation Service, USDA	County
Geologic Features	U.S. Geological Survey, California Geological Survey	State
Property Ownership / Property Boundaries / APN	County of Riverside Parcel Assessment Areas	County
Existing Land Use	Southern California Council of Governments, Combined 2008 Counties Riverside, San Bernardino, and San Diego	County
Planned Development	County of Riverside Active GIS Files	County
Utilities		
Roadways	County of Riverside Active GIS Files	County
Vegetation	Coachella Valley Multi Species Habitat Conservation Plan (CVMSHCP)	County
Jurisdictional Boundaries (ACOE, CDFG, etc.)	National Hydrography Dataset	State
Habitat / Wildlife / Endangered Species / Conservation Areas	Coachella Valley Multi Species Habitat Conservation Plan (CVMSHCP)	County
FEMA Flood Hazard Zones	FEMA Digital Flood Insurance Rate Maps, 06065C	County
Flood Awareness Areas	Department of Water Resources	County
Existing Condition Floodplain Boundaries		County
Government / Civic Boundaries	County of Riverside Active GIS Files	County
Right of Way Data	County of Riverside Parcel Assessment Areas\City of Desert Hot Springs	County
Traffic Circulation Elements	City of Desert Hot Springs	City
County / City Maintained Flood Control / Stormwater Facilities	Riverside County Flood Control District Flood Facilities	County
Irrigation Facilities / Drain line	Coachella Valley Water District	County
Alquist - Priolo	U.S. Geological Survey, California Geological Survey	State
Topographic Mapping - Digital DTM	U.S. Geological Survey, Digital Elevation Model, 1 arc second	State
Aerial Photography – Rectified Digital Color	ESRI, World Imagery Service	County

2.2 Data Sources

The information about watershed characteristics and existing flooding was gathered in order to establish a database of the baseline flood problem conditions in the region and was obtained in the following ways:

- **Existing flood documents -** A search was conducted for existing flood-related documents. This included flood control plans, stormwater/flood evaluation studies, surface flow studies, Federal Emergency Management Agency (FEMA) maps, drainage plans, master plans, general plans, flood assessments, and other documents related to climate change and wetlands.
- **Historical Flooding –** Locations of historical flooding, flood damage, and chronic flooding areas based on eye witness accounts, maintenance efforts, and newspaper articles. This information was obtained through phone calls, emails, outreach efforts, and periodical searches.
- **Data requests -** Specific data requests were made to participating municipalities and floodplain management agencies for records of current, ongoing flood problems in their respective municipal and unincorporated areas. A similar request for available data was also solicited to the watershed stakeholders related to existing reference documentation, studies, and data related to watershed flood information. An attempt to maximize the initial information gathering effort by contacting multi-agency and/or multi-regional entities with known flood management responsibilities in the Coachella Valley. In addition, stakeholder outreach provided an opportunity to initiate relationship building between watershed stakeholders utilizing the floodplain managers' forum. Once provided, this information was used to develop maps of flood hazards and watershed information
- **Existing GIS databases** – Available digital geographic information databases were consulted through a variety of agencies. In particular, the local database generated through the Coachella Valley Association of Governments was utilized as the initial data source, as well as CVWD and RCFCWCD.

2.3 Data Gaps

Available information was limited to fulfill the data needs, particularly in a geographic information format to facilitate regional planning. Flood infrastructure information is very limited and it is difficult to obtain digital mapping to inventory existing facilities on a regional basis or within local municipalities. There was not a GIS or CAD database of all the drainage and flood control facilities within the Coachella Valley, although this is an item which is being developed. In many cases, agencies did not have a complete inventory of infrastructure that they owned and/or maintained. In addition, it was difficult to find information related to locations of flood deficiencies, problem "hot spots," and recurring problem areas. Some of the issues in the development of a comprehensive database sufficient for watershed planning on a system wide basis include:

- Database utilized for the current study is limited to primarily to the available GIS data

- Data inventory conducted at a regional scale
- Existing flood hazards data limited to FEMA and DWR database
- Not sufficient information to identify locations of flood problem sources and deficiencies
- Insufficient information to generate a comprehensive inventory of existing flood protection infrastructure

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3 Existing Flood Hazards

3.1 Coachella Valley Flooding Characteristics and Issues

The Coachella Valley's desert environment, along with watershed/basin characteristics, result in unique flooding conditions and issues which are much different from more common riverine floodplains. The hydrologic response of the watershed units associated with high intensity type rainfall events as well as the channel processes/geomorphology trends influence the flooding characteristics. These different characteristics of the watersheds and floodplains are important to understand since these define and limit potential flood management solutions.

<u>Watershed</u>

The Coachella Valley IRWM Region is essentially comprised of the **Whitewater River watershed** with all of the tributaries on the west and east side of the Coachella Valley draining to the Whitewater River Stormwater Channel, which traverses the Coachella Valley floor. The watershed has a drainage area at its outlet into the Salton Sea of approximately 1,500 square miles. It is bounded on the west by the San Jacinto Mountains and the Santa Rosa Mountains and on the north and east by the Little San Bernardino Mountains; by the peninsular Tehachapi Mountains on the Northwest; together with the San Gabriel and the San Bernardino Mountains on the Southwest. The valley is approximately 15 miles wide along most of its length.

The adjacent mountains which ring the valley can reach up to 10,830 feet in elevation (San Jacinto Peak) and discharge to the valley floor which provides a dramatic change in elevation. The valley floor elevation at Palm Springs is approximately 470 feet and in Mecca it is 250 feet below sea level. The valley floor is extremely flat compared to the mountain watershed and alluvial fan/foothill areas. Approximately 28% of the area within the IRWM boundary has slopes ranging from 0-3% which is the generally valley floor. Approximately 54% of the Coachella Valley IRWM area has slopes which are greater than 10% which reflects the amount of mountainous/foothill area.

Watershed boundaries and surface drainage patterns are difficult to define within the flatter down-valley portions of the watershed and on the alluvial fans. The majority of the urbanization has occurred within the valley floor or on the lower portions of some of the different alluvial fans. The majority of the agricultural uses are in the southern portion of the valley while the urbanization has occurred north of the agricultural uses.

<u>Floodplain / Geomorphology</u>

Much of the valley floor is subject to inundation and shallow flooding with unpredictable flow paths. The sides of the Coachella Valley have been formed by coalescing alluvial fans below the foothills which generally lack defined natural channels and are subsequently subject to unpredictable sheet flow patterns on the fans. However, many of the fans have regional flood control systems which include engineered dikes and channels to provide flood protection (Digital Desert, 2012).

Alluvial fans are an erosional feature - unpredictable flow paths/braided channel patterns; not channelized, difficult to provide control structures, sheet flows are common, development exists on the alluvial fans themselves. Flood dynamics of an idealized alluvial fan can be characterized by several zones which are defined beginning from the apex as: (1) channelized zone, (2) braided zone, and (3) sheet flow zone (see Figure 3-1) (French, 1996).

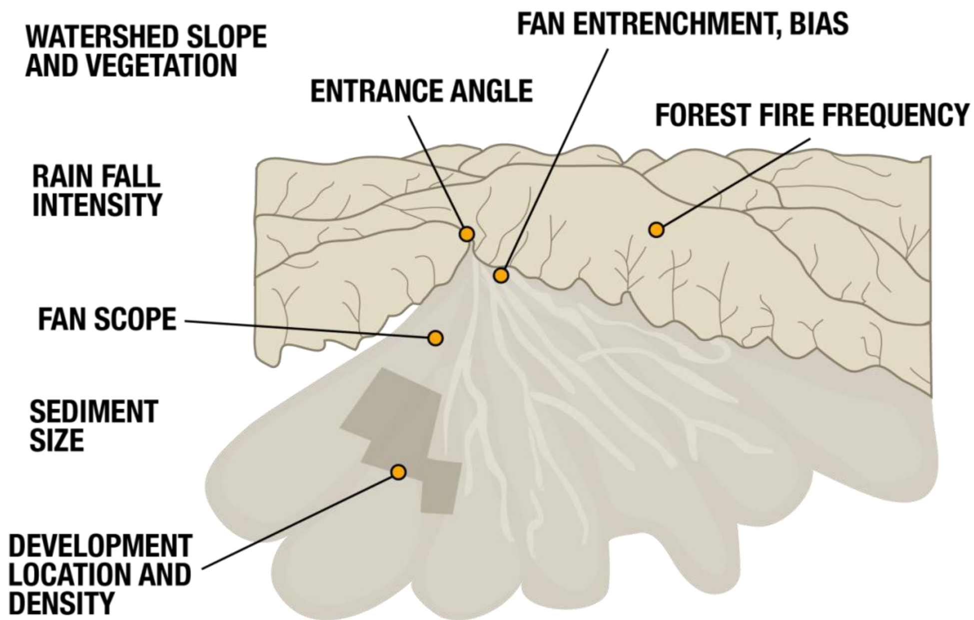

Figure 3-1: Definition of Alluvial Fan Characteristics

Published FEMA mapping of regional flood hazards may not accurately define the limits and floodplains and magnitudes of the flood hazards. Multiple alluvial fans coalesce or overlap which is common below the foothill canyons which are known as bajadas and create complex flooding patterns. Most of the surface waters, because of the arid conditions, are ephemeral streams which only flow in direct response to precipitation (French, 1996)..

Existing roadways may modify and concentrate flows in the shallow floodplain areas, particularly in the valley floor. Channel migration/erosion/sediment deposition is common. Location of the stream channel on a fan is often erratic due to the rapid expansion of the width and highly variable sediment load. Shallow flooding often occurs along highly unpredictable flow paths because the source of the flow may be variable, topographic relief may be low, channels may shift or may be nonexistent, or sediment and debris may be deposited or removed during or after a flood altering the flow path. Sheet flooding occurs on the lower valley floor, which are the lower fringes of the alluvial fans that have limited topographic relief and difficult to define the level of flood hazards (Anderson-Nichols & Company, 1981).

Drainage Infrastructure

There is significant regional flood infrastructure in different areas of the valley; however, there are also many areas which are lacking any regional flood control facilities. The primary regional facilities include (1) dikes constructed on some locations of both the east and west side of the valley along alluvial to intercept flows, (2) Whitewater River channel which includes engineered earthen channel with concrete slope lining in many areas as well as leveed sections and grade control structure, (3) debris basins on some of the alluvial fans and corresponding channels (Bechtel, 1990 1991, 1997, 2003; FEMA, 2008).

Urban drainage facilities located within the urbanized portions have limited hydraulic capacity and are not designed to accommodate regional overland flooding that exceeds the smaller urban watershed. Urban drainage facilities generally consist of local retention/detention basins, street drainage inlets, underground storm drain pipes, and culverts. Detention and retention is utilized significantly for the smaller urban drainage watersheds.

Metrologic / Hydrologic Response

Precipitation can vary considerably within the watershed and location, based on elevation. Average annual precipitation in the Coachella Valley ranges from about 20 inches in the mountains to less than 4 inches on the valley floor. Rainfall-runoff watershed response varies based on elevation within the watershed and corresponding soil types. Typically frequent wildfires in Southern California can result in burn conditions that can result in changes to the surface soil layer that can dramatically reduce infiltration and increase runoff. Larger storm events may result in higher flooding from "cascading" watersheds where watershed boundaries may coalesce and combine because of limited hydraulic capacity or undefined floodplains. This affect is particularly evident in flooding with the valley floor watershed areas because of the limited topographic relief. Flashy storms include high flow volumes, low frequency, and high volumes of sediment transfer. Steep and short watersheds, combined with brief intense storms, results in flashy systems where discharge can vary by several orders magnitude over short time period (French, 2012).

Rainfall is caused by three types of storms in the Valley which include (1) low-pressure systems originating in the Gulf of Alaska or near the Hawaiian Islands, (2) low pressure system originating from the tropics during the late summer and early fall, and (3) cloudbursts or thunderstorm covering small areas and originating from convective uplifting occurring during the summer and early fall. Most storms greater than 1-inch of precipitation in one day are from frontal or low-pressure systems that are most prevalent during December through March. The largest historical rainfall event recorded was in Indio from a thunderstorm preceding the occurrence of a tropical storm from off the west coast of Mexico from which 6.45 inches of rain feel in a period of 6-hours (ACOE, 1980, 1983, 1997).

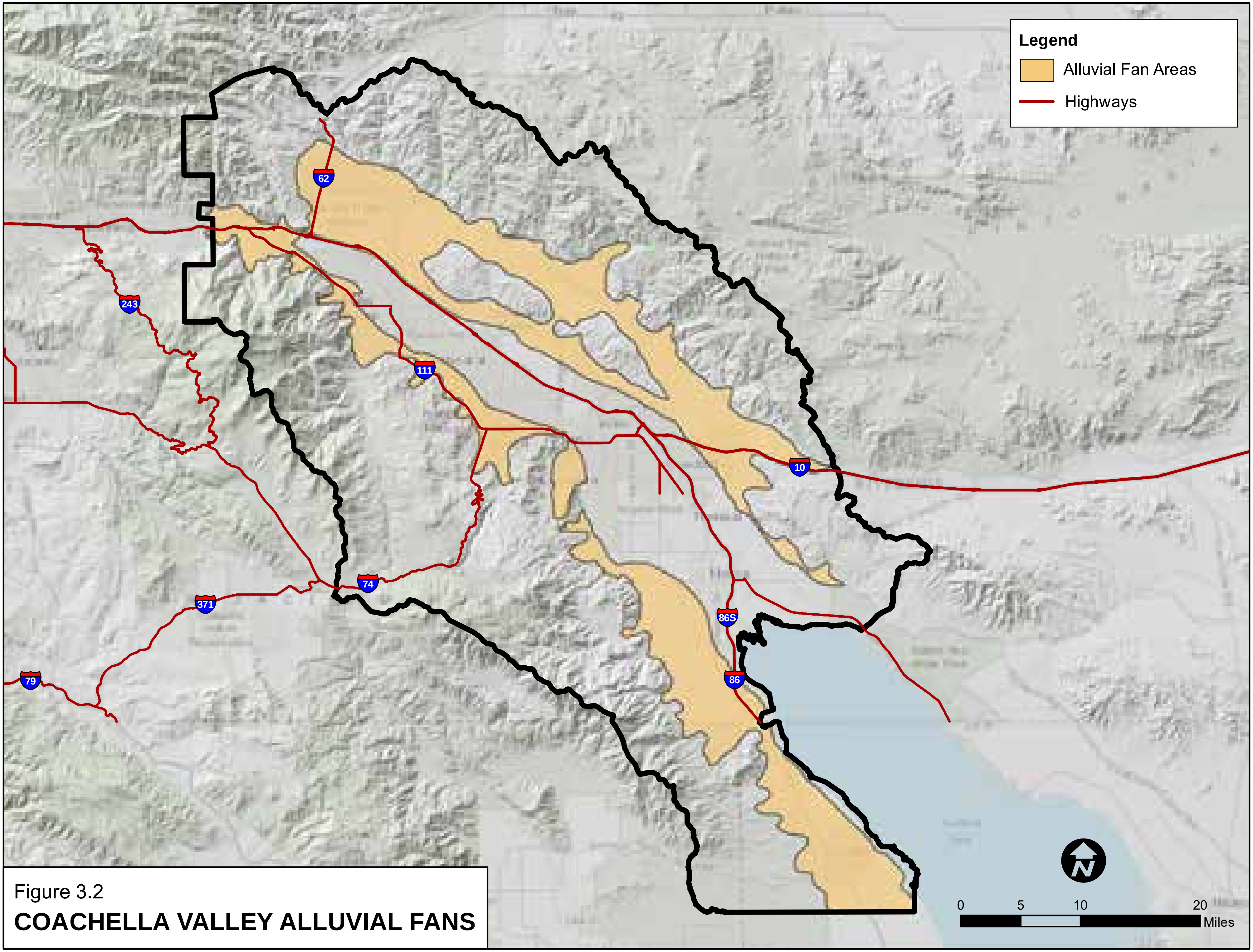

Figure 3.2
COACHELLA VALLEY ALLUVIAL FANS

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3.2 Existing Floodplain Management Programs and Agencies

Regional flood protection within the Coachella Valley is divided between CVWD and RCFCWCD, with the majority of the valley within the CVWD service area. The different cities within the valley are responsible for the local urban drainage facilities as well as the administrators of floodplain management activities. The responsibility for drainage in the eastern part of Riverside County is borne by a combination of the County Transportation Department, CVWD, the various cities and a variety of local entities. There are some regional facilities where both CVWD and RCFCWCD share jurisdiction, such as the Whitewater River channel system in the Palm Springs and Cathedral City area.

The Coachella Valley Stormwater District (part of CVWD) was formed in 1915 to control regional flooding. CVWD protects 590 square miles from flooding and within CVWD's boundaries there are 16 stormwater protection channels. The entire system includes approximately 135 miles of channels built along the natural alignment of dry creeks that naturally flow from the surrounding mountains into the Whitewater River. The backbone of the stormwater protection system is a 50-mile storm channel that runs from the Whitewater area north of Palm Springs to the Salton Sea. The western half of the channel runs along the natural alignment of the Whitewater River that cuts diagonally across the valley to Point Happy in La Quinta (near Highway 111 and Washington Street). Because the riverbed flattens out naturally in the eastern valley, downstream from Point Happy a man-made storm channel funnels flood waters to the Salton Sea.

The RCFCWCD was created in July 1945 by an Act of the California State Legislature. Following the devastating floods of 1938, the Riverside County Board of Supervisors saw the need for a regional drainage authority and petitioned the California State Legislature to create such a body. On July 7, 1945, the Legislature took the appropriate action and the RCFCWCD was born. In establishing the District, the Legislature not only formed an entity charged with keeping county residents safe from flood hazard but also established an independent tax revenue stream for funding. The District (2700 sq. mi.) is located in the western portion of Riverside County (7200 sq. mi.). It extends easterly far enough to include the cities of Palm Springs, Cathedral City and Desert Hot Springs. The mission of the District is to "protect people, property and watershed from damage or destruction from flood and storm waters and to conserve, reclaim and save such waters for beneficial use."

3.3 History of Flooding

Historical references indicate that relatively large winter floods occurred in or near the Whitewater River Basin in 1825, 1833, 1840, 1850, 1859, 1876, 1884, 1889 and 1891. More authoritative records since 1891, including newspaper and eyewitness accounts, show that moderate to large winter floods occurred in January 1909, February 1927, March 1938, December 1940, January 1943, November 1965, January and February 1969, January, February, and Marc 1978, January and February 1980, March 1983, and January 1993. From the little information available, the floods of 1927 and 1938 appear to have been the largest general floods since 1891 in this region. Several general summer storms have also produced significant flows in the region. The most notable of these storms are the tropical storms of September 1939 and September 1976. In addition, numerous local summer storms have occurred; however, because of the relatively small areal extent of these storms and the large percentage of undeveloped area within the region, little attention has been given to any, except for a few unusually intense thunderstorms which have occurred in the more populated areas (ACOE, 1980, 1983, 1997; FEMA, 2008).

The September 1939 storm, one of the largest observed thunderstorms in the region, occurred in the vicinity of Indio and has been defined as the local "Standard Project Storm" (SPS) for the Coachella Valley area.

(a) **Storm and Flood of September 24 – 26, 1939**. The September 1939 storm originated off the west coast of Mexico as a tropical hurricane. The hurricane intensity was gradually lost as the storm approached southern California from the south. As the storm reached southern California and crossed the greater Los Angeles area, it veered towards the northeast. According to the National Weather Service records, this is one of only two known tropical storms that have passed over the region with such intensity. Most eastern Pacific tropical cyclones die out before they reach the latitude of southern California. The total storm precipitation in the Whitewater River basin varied from 9.65 inches at Raywood Flat to 1.51 inches at Palm Springs. At Indio, in a thunderstorm preceding the occurrence of the main storm, 6.45 inches fell in a period of 6 hours. No estimates of runoff during the thunderstorm storm at Indio are available. Runoff during the main storm was generally light over the Whitewater River basin (ACOE, 1980, 1983, 1997).

Figure 3-3: Damage after the 1936 Flood in the Coachella Valley

(b) **Storm and Flood of January 18-29, 1969**. Between January 18 and 25, 1969, a series of very heavy storm hit southern California as a strong flow of warm and very moist tropical air moved into the area from out of the southwest. This was followed by a period of cooler and less intense storminess on January 27 to 29. Except for a brief lull on January 22 and 23, almost continuous, heavy rains, with high snow levels, soaked the coastal and mountain portions of southern California from January 27 to 29. Except for a brief lull on January 22 and 23, almost continuous, heavy rains, with high snow levels, soaked the coastal and mountain portions of southern California form January 18 through 26, climaxed by an extraordinary downpour on January 25. Total precipitation for January 18 to 29 in the Whitewater River basin ranged from less than one inch on the desert floor from Indio to the Salton Sea to more than 31 inches in the south slopes of Mt. San Gorgonio. About 5.7 inches fell in 40 hours at the Mission Creek rain gage maintained by RCFCWCD. At the U.S. Geological Survey (USGS) gaging station at Mission Creek near Hot Desert Springs (DA=35.6 mi2) a peak discharge of 1660 cfs was recorded on January 25 (ACOE, 1980, 1983, 1997).

Figure 3-4: Whitewater River at Indian Avenue as it appeared on March 23, 1965. Indian Avenue was destroyed by flood waters cutting back from a sand and gravel pit on the downstream side.

(c) **Storm and Flood of October 22, 1974**. An extremely high intensity thunderstorm occurred in the area easterly of Desert Hot Springs on October 22, 1974 as the result of an influx to the Coachella Valley of moist, unstable tropical air from Mexico. Precipitation occurred over most of the Coachella Valley, but the most intense rainfall apparently occurred in the uninhabited lower reaches of Wide Canyon east of Desert Hot Springs. Based on field interviews and RCFCWCD's recording rain gage at Desert Hot Springs, the duration of the storm was determined to be approximately 1.5 hours in the Wide Canyon area. Precipitation at Desert Hot Springs, west of Wide Canyon Dam, began about 4:45 PM Pacific Daylight Time (PDT). Flooding and resultant property damage was widespread in the area between Long and Wide Canyons, and Willow Hole (ACOE, 1980, 1983, 1997).

The most severe flooding and property damage resulted from flows generated in the Little San Bernardino Mountains, specifically Long and Wide Canyons. Aerial photographs taken at the time show the wide extent of the flooding, from the canyons to Willow Hole and the unpredictable fanning and braiding of flood flows on alluvial cones and flood plains. The discharge from Long Canyon at the USGS gage was 790 cfs. Slope-area computations by RCFCWCD indicate the discharge was probably much higher further downstream just below the mouth of the canyon; however, due to the unstable nature of the alluvial streambed, a precise determination of the flow rate could not be made.

(d) **Storm and Flood of September 9 to 11, 1976**. This unusually widespread and heavy summer storm occurred when Tropical Storm Kathleen, from off the west coast of Mexico, traveled northward through the western Imperial Valley and dumped very intense rain along the eastern slopes of the San Jacinto Mountains and the southern and eastern slopes of Mt. San Gorgonio. Total precipitation for the storm - most of it falling within 12 to 18 hours - ranged from 1.8 inches to 2.8 inches in the center of the Coachella Valley to 14.4 inches just south of San Gorgonio Peak (ACOE, 1980, 1983, 1997).

(e) **Storm and Flood of August 15 to 17, 1977**. Tropical storm Doreen moved northerly up the Sea of Cortez, across Baja California, and passed about 60 miles west of San Diego on a north-northwest course during the period of August 15 to 17, 1977. Thunderstorms triggered by Tropical Storm Doreen caused flash floods, high winds and power outages to Riverside County. Preceding this storm, moist air was forced into California desert regions, producing intense local rainfall on Monday afternoon, August 15 (ACOE, 1980, 1983, 1997).

The heaviest rainfall fell at the top of the Palm Springs mountain tramway and foothill areas. The gage at Desert Hot Springs recorded 4.49 inches of rain in 1 day. Desert Hot Springs maximum short duration values were broken, with 1.18 inches recorded in 1 hour and 3.85 inches in 12 hours. Business and residential flooding were most prevalent in the communities of Indio, Palm Desert, Thousand Palms and Desert Hot Springs. The peak discharges recorded at the Mission Creek, Long Canyon, and Deep Canyon gages are 463, 350, and 410 cfs, respectively.

(f) **Storm and Flood of September 10, 1977**. A late summer storm, characterized by short periods of locally intense rain, lightning, hail, and strong winds, hit the desert areas on September 10, and caused mud slides, a broken dike, washed-out roads, and flooded homes. The scattered nature of the heavy rain was demonstrated by the fact that only (ACOE, 1980, 1983, 1997).

3.4 Flood Hazard Identification

Regional mapping of the existing flood hazards for the Coachella Valley region has been prepared by FEMA as part for the National Flood Insurance Program (NFIP), which requires each community to identify 100-year recurrence interval flood prone areas as part of adopting floodplain management regulations. In addition, additional mapping for some of the areas not covered by the published FEMA flood hazard mapping has been prepared by DWR through their “Flood Awareness Mapping” which provides identification of floodplain limits through approximate methods (see Figure 3-5). The intent of the Awareness Floodplain Mapping project by DWR is to identify all pertinent flood hazard areas by 2015 for areas that are not mapped under FEMA NFIP and to provide the community and residents an additional tool in understanding potential flood hazards currently not mapped as a regulated floodplain. The flood hazard areas generally align with the Region’s identified floodplains, which are shown in Figure 3-6.

The minimum federal flood protection goals and requirements are administered by FEMA NFIP. The NFIP, originally established in 1968, provides low-cost federally subsidized flood insurance to those communities that participate in this program. Participation in the program requires that the community adopt floodplain regulations which meet the requirements of the NFIP defined in *44CFR Chapter 1 Part 59* which include mapping of existing flood hazards. Hydrologic-hydraulic studies are required to analyze the delineation of the 100-year recurrence interval floodplain limits. The published FEMA flood hazard maps provide an approximation of the regional floodplain limits based on the standards for FEMA alluvial fan hazards. The mapped flood hazards focus on regional flood hazards and do not evaluate localized flooding, particularly in urbanized areas, so there can be areas which may flood in even small storm events but may not be within a mapped flood hazard zone.

FEMA is the federal entity responsible for producing Flood Insurance Rate Maps (FIRMs). The flood risk information presented on the FIRM is based on historic, meteorological, hydrologic, and hydraulic data, as well as open-space conditions, flood-control works, and development within the study area. The FEMA flood hazard zones represents the areas susceptible to the 1% annual chance flood (commonly referred to as the "100-year flood), and the 0.2% annual chance flood ("500-year flood"). The 1% annual chance flood has at least a 1% chance of occurring in any given year. FEMA designates this area as a Special Flood Hazard Area (SFHA) and requires flood insurance for properties in this area as a condition of a mortgage backed by federal funds.

FIRMs are the mapped product of engineering studies, called Flood Insurance Studies (FISs). The effective date of the first FIS for the Unincorporated Areas of Riverside County was April 15, 1980, with the initial coordination meetings with FEMA in December 1974. Since that time, the FIS for the County has been updated multiple times. The most recent revision being August 28, 2008 is a "countywide" study update which includes various communities within the Coachella Valley including Desert Hot Springs, Coachella, Cathedral City, Indian Wells, Indio, La Quinta, Palm Desert, Rancho Mirage, as well as the unincorporated areas of the County (FEMA, 2008). The existing published FEMA flood hazard mapping illustrates general characteristics of the floodplain and provides an understanding of the extent of the existing flood potential. It is apparent that there are uncertainties and discrepancies in the flood hazard mapping, particularly where there are dramatic changes in the mapping at local government boundaries where there are not any hydraulic influences. The mapping should be used cautiously because of its approximate nature and it does not necessarily define the magnitude of flooding, but just the approximate extent of the floodplain.

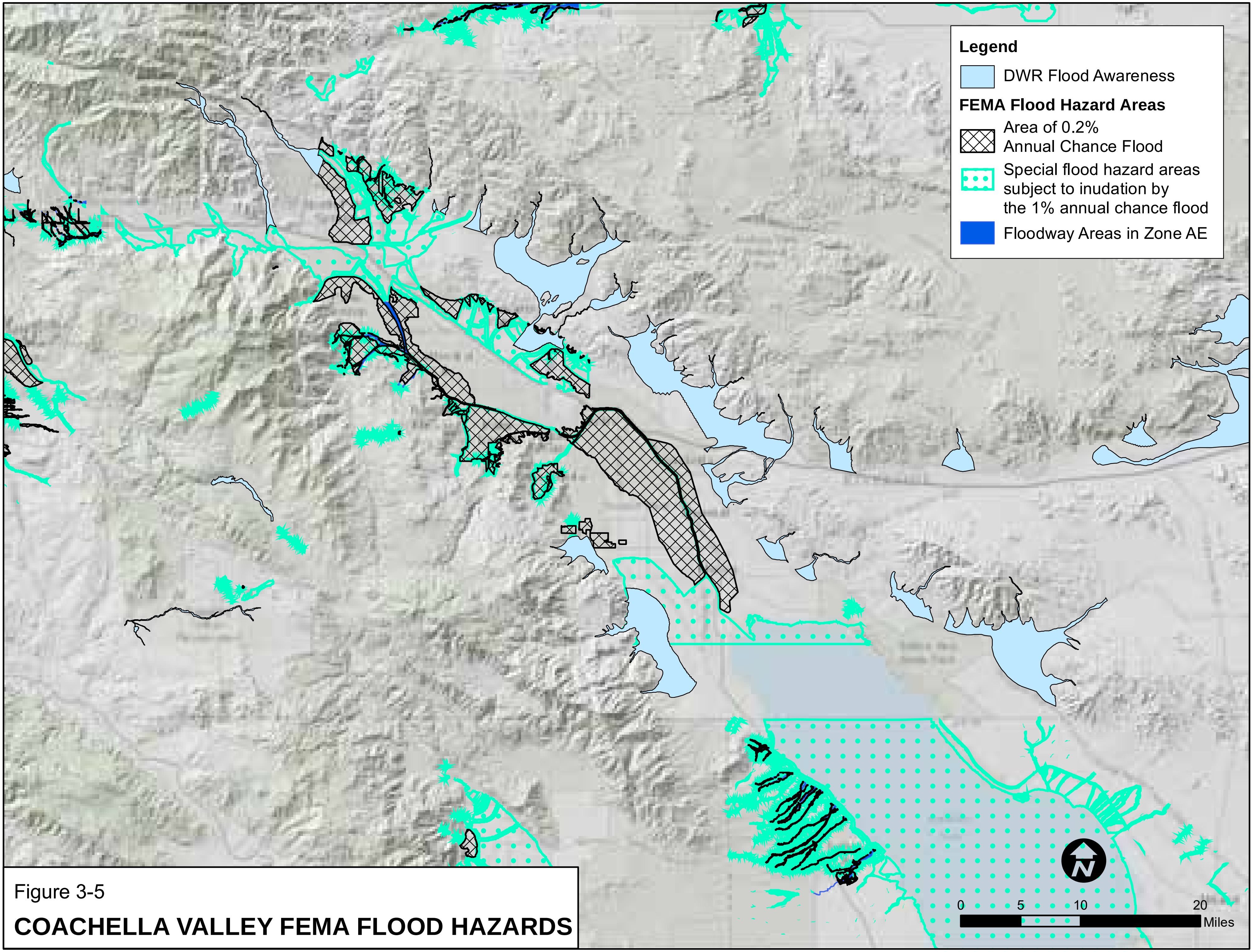

Figure 3-5

COACHELLA VALLEY FEMA FLOOD HAZARDS

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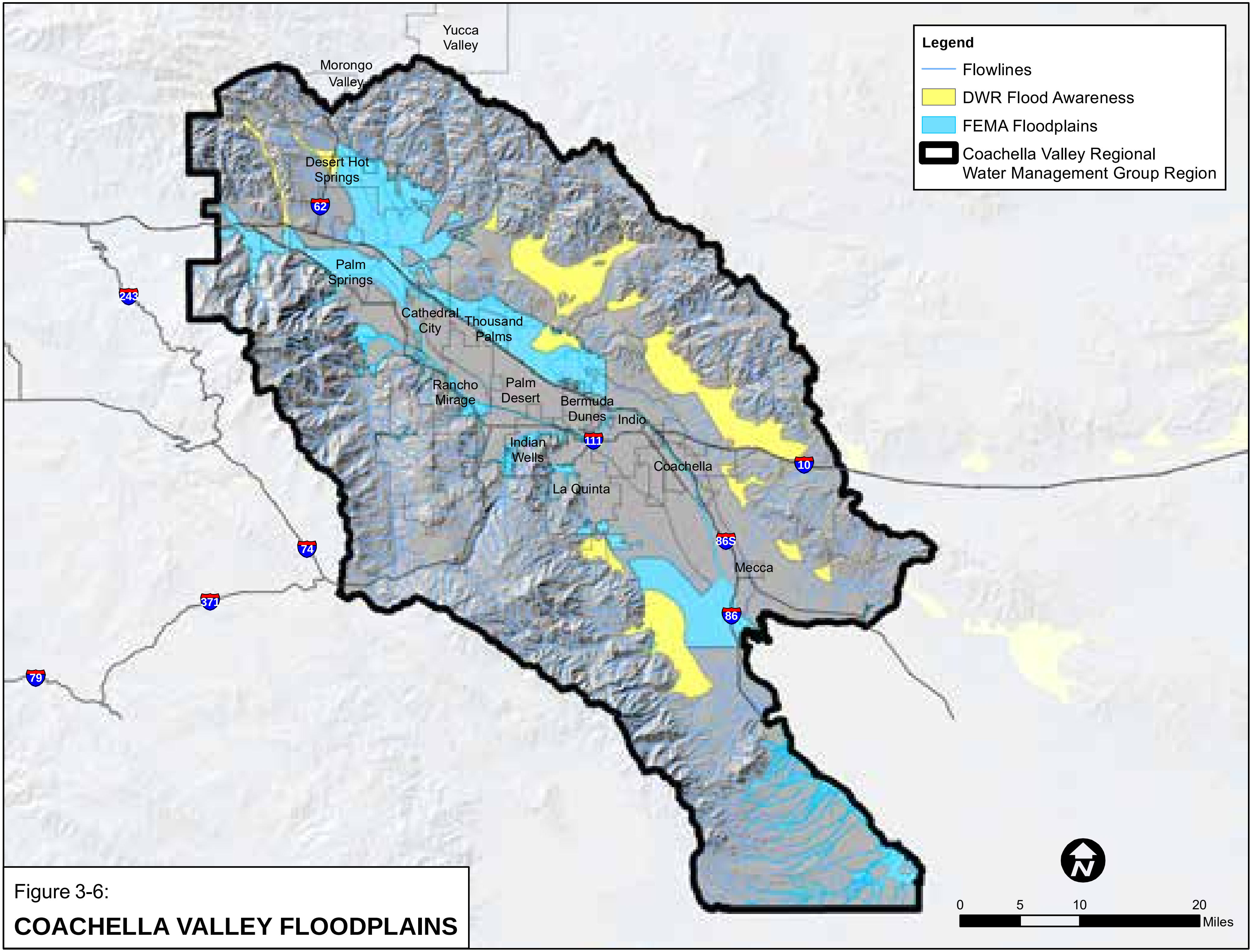

Figure 3-6:

COACHELLA VALLEY FLOODPLAINS

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3.4.1 General Trends from Flood Hazards Mapping

General trends regarding the floodplain that can be developed from the mapping which include:

(1) floodplains are very well defined in the lower mountains/foothill canyon areas where there are incised streams within the canyons,
(2) valley floor and alluvial fans result in wide floodplains with locations of flow redistributing and splitting to other channels downstream,
(3) linear floodplain boundaries for locations of shallow flooding in several locations is associated with freeway and railroad embankments in some area; however in some areas appears it is not necessarily associated with a physical boundary, but actual political boundaries for local government jurisdictions reflecting different time periods when the mapping was performed or methodology used in alluvial fan analyses,
(4) shallow flooding floodplains encompass many portions of valley floor areas,
(5) all the floodplains illustrate that the general surface drainage patterns are directed to the center and down valley,
(6) the larger unconfined floodplains are within the Desert Hot Springs area, north Palm Springs, Thousand Palms / north Indio area, and the Thermal area,
(7) all the alluvial fans also reflect unconfined shallow floodplain areas,
(8) the uncertainty associated with the unconfined flooding patterns on the alluvial fans and also in the down valley floor would suggest utilizing the 500-year floodplain to evaluate potential overflow areas in the 100-year flood,
(9) the I-10 freeway/railroad appears to block the flows from the eastern valley watershed and direct them down-valley until Indio,
(10) below Indio the central portion of the valley could have significant amount of down valley flooding from channel overflows, and
(11) the central portion of the valley between Indio and Cathedral City (bounded to the east by the railroad and Whitewater River to the west) does not have regional flood hazards.

3.5 Defining Flood Risk

Flood risk can be defined by three different components which include (1) “flood hazard” which is generally the probability of occurrence of a particular flood event, (2) the” exposure” of human activity to the flood which is equated to the flood damage potential, and (3) the specific “vulnerability” or the lack of resistance to damaging/destructive forces. Flood risk can be mathematically calculated as the product of hazard, exposure, and vulnerability. Understanding these definitions is an important foundation in flood management planning. A smaller flood that causes less damage occurs more frequently than a very severe flood that can cause much great damage. However, from a loss prevention standpoint, it may be more beneficial to protect for the more frequent events. The assessment of community vulnerabilities can be evaluated through review of existing codes, plans, policies, programs, and regulations used by local jurisdictions to determine whether existing provisions and requirements adequately address the flood hazards that pose the greatest risk to the community.

Flood Risk – likelihood of consequence from inundation. Identifies the cause and the frequency of the problem (how often)

Flood Exposure – relationship between the flood hazard on the effect on loss of property, life, and environmental resources.

Vulnerability – identifies level of exposure expected (how flooding adversely affects people and property)

3.5.1 Flood Event-Specific Factors Influencing Flood Damage

Although there are many issue that effect flood damage, there are several key factors associated with the flood characteristics which influence the amount and severity of the flood damage. In addition, Figure 3-8 provides a general outline of the types of flood losses and the assessment of the type of damage. A description of the primary factors that influence on the severity of flood damage includes the following:

Flood depth: The height flood waters reach is an important consideration affecting flood losses. Structures are more susceptible to damage as flood depths increase. Generally, the valley floor areas and the alluvial fans in the Coachella Valley are subject to lower flood depths and more mountainous regions where narrow floodplains and step terrain along the stream corridor prevails are subject to greater flood depths during flood events.

Flood duration: The longer flood waters are in contact with building components (such as structural members, interior finishes, and mechanical equipment), the greater the potential for damage. The duration of flooding is very specific to the nature of an event. However, the structures closest to a flooding source (such as a river, bay, or canal) are more likely to sustain longer durations of flooding and be more vulnerable to flood damage. As flood waters recede, these structures will remain flooded for longer durations than structures located along the edge of the floodplain, increasing the potential for damage.

Velocity: The velocity of flood waters is an important factor impacting potential flooding damage. Flowing water exerts forces on the structural members of a building, increasing the likelihood of significant damage. In addition, flowing waters can increase erosion and scour around the foundation of a structure, which can further increase the vulnerability of a building to flood damage.

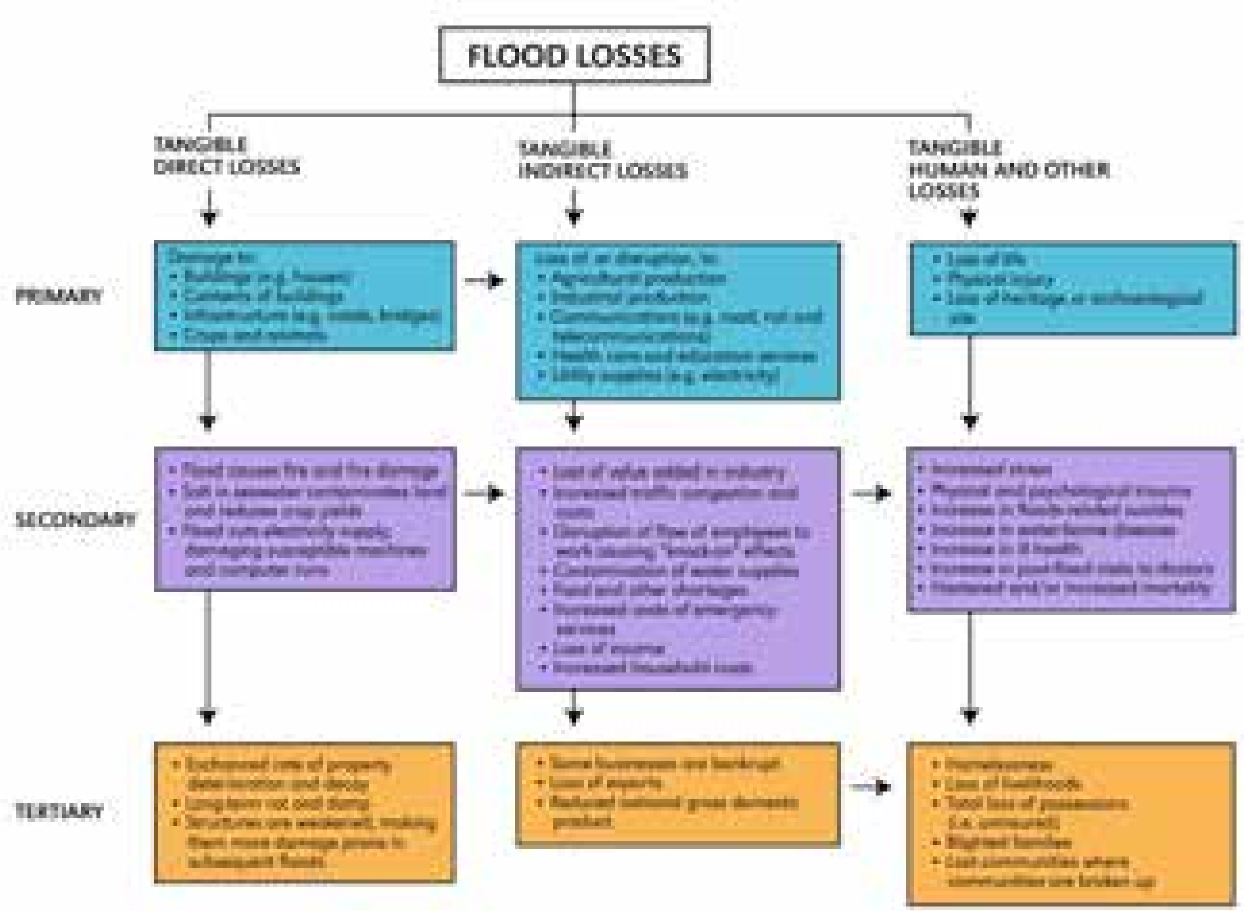

Figure 3-7: Illustration of different types of flood losses and the associated impacts

3.5.2 Repetitive Flood Damage Losses

A “repetitive loss property” is one for which two flood insurance claim payments of at least $1,000 have been paid by the NFIP within any 10-year period since 1978 (e.g., two claims during the periods 1978-1987, 1979-1988, etc.). These properties are important to the NFIP because they cost $200 million per year in flood insurance claim payments throughout the country. Repetitive loss properties represent only one percent of all flood insurance policies in the country, yet historically they account for nearly one-third of the claim payments (over $4.5 billion to date). Mitigation of the flood risk to these repetitive loss properties will reduce the overall costs to the NFIP as well as to individual homeowners. FEMA programs encourage communities to identify the causes of their repetitive losses and develop a plan to mitigate the losses. Repetitive flood damage loss illustrates areas of an existing recurring chronic flood hazard which should be targeted as a priority to be addressed. The Coachella Valley is vulnerable to specific “hot spot” areas that have experienced repeated flooding since there generally occur based on natural water flow patterns.

3.6 Assessment of Flood Risks

Assessment of the flood risk is a complex problem that can only be solved through interdisciplinary research. In general, a two-step approach is utilized. First, we must characterize the flood hazard using a selected set of indicator maps, like the spatial distribution of flow velocity, water height, speed of propagation, duration, etc. Second, we estimate how the flood hazard indicators interfere with human activities in the flooded area. Agricultural activities will suffer damage in different ways than for instance an industrial zone or an urban area.

An initial assessment of the magnitude of the existing "flood risk" which correlates directly to the potential amount of flood damage can be developed through quantifying encroachment of different land uses within the floodplain. Any area located within 100-year floodplain flood hazard area is considered to be at high risk of flooding. An overlay the land use plan with the mapped flood hazard zones can be generated. The FEMA flood hazard zone "A" is the 100-year floodplain designation, although there are different types of this flood hazard for insurance purposes. The mapping indicates that the majority of the areas have land use zoning which is compatible with the floodplain being zoned primarily "open space." However, it is important to note the amounts of other general land uses within the floodplain, particularly the more urban type of uses which would result in more extensive flood damage. The magnitudes of the general land use designations within the flood hazard zones have been developed utilizing the existing database available. This generalized mapping overlay can be utilized as an effective planning tool as part of the initial plan formulation. The land use areas which have a high dollar value within flood hazard zones would indicate locations to target and prioritize projects. Other benefits of this mapping assessment include:

- Identification of flooding vulnerable structures based on flood inundation hazards
- Approximate magnitudes of potential flood losses
- Potential critical public lifeline facilities and infrastructure that could be impaired by flooding
- Identification of key transportation facilities, including roadways that could reduce public access and emergency response
- Identification of the different land uses encroaching within the 100-year flood hazard zones as well as quantifying the amount of these areas for different land use

Figures 3-8, 3-9, 3-10, and 3-11 of this IFM Study illustrate the mapped floodplain risk and exposure assessment based on the amount of land use within the published mapped flood hazard zones. The precise risks to the different land uses would require detailed analyses of different flooding depths for different flood frequencies to determine how risk varies within the floodplain, but this data was not available for this study.

3.6.1 Land Use Located within Flood Hazards – Total Distribution

The land use mapping database of the different land use within the Coachella Valley were overlaid with the existing flood hazard mapping to determine the amount of land uses within the floodplain. The land use reflects both the existing and proposed land uses for the valley based on the different "general plan" data from the Cities and County. The total amounts within the valley were accounted for within the four different mapping quadrants, as well as the grand total for the valley. The results of this assessment are shown in the tables and charts on the following pages.

The comparison of the different information presented in both the tabular and graphical summary of the data indicates the following general trends:

- Southwestern portion of the valley has the largest amount of residential area within the mapped floodplain areas
- The northeast quadrant has the largest amount of mapped floodplain acreage which is because of the Morongo/Mission alluvial fan and the Mid-Valley floodplain on the eastern side of the valley.
- The largest land use within the floodplain for all the quadrants is open space and this is desired outcome or trend from a floodplain management perspective.

Table 3-1: Total of Land Use types located within mapped flood hazard zones for entire Coachella Valley

Grand Total – Entire Valley Area	
Land Use	**Acres**
Agriculture	16,076
Commercial and Services	2,178
Industrial	1,120
Open Space and Recreation	110,901
Residential	12,875
Transportation, Communications, and Utilities	13,332
Water	183
Total	**156,664**

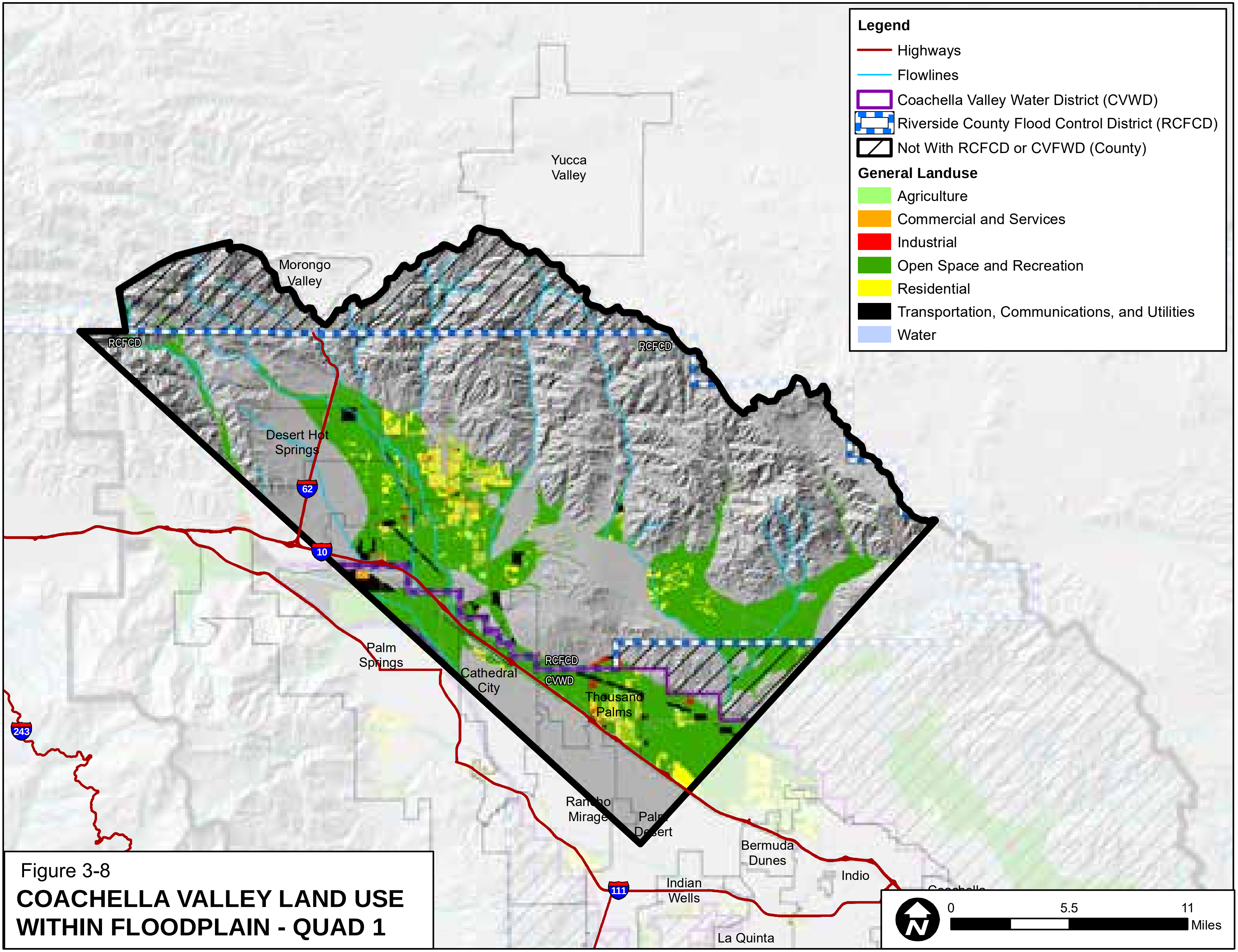

Figure 3-8

COACHELLA VALLEY LAND USE WITHIN FLOODPLAIN - QUAD 1

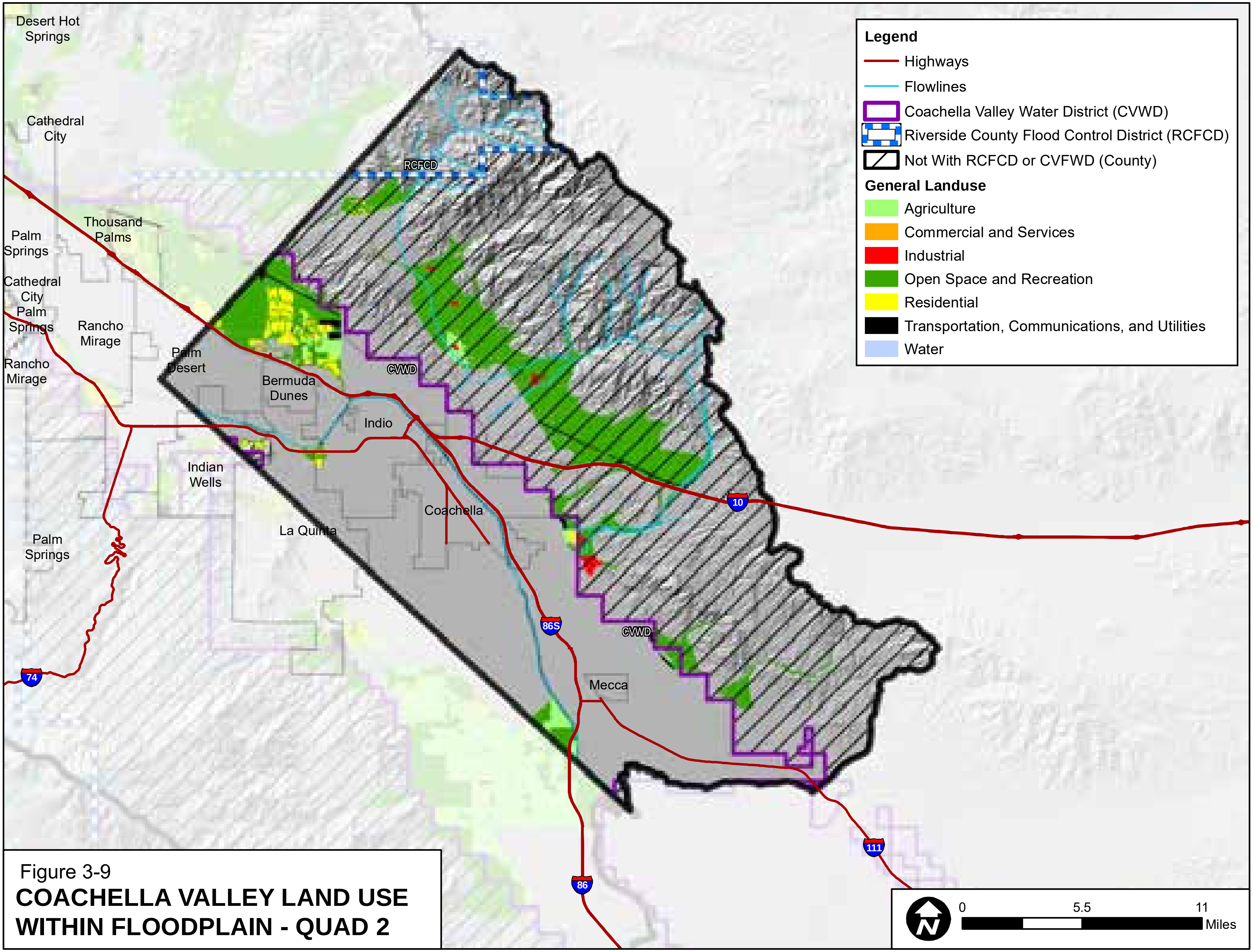

Figure 3-9
COACHELLA VALLEY LAND USE WITHIN FLOODPLAIN - QUAD 2

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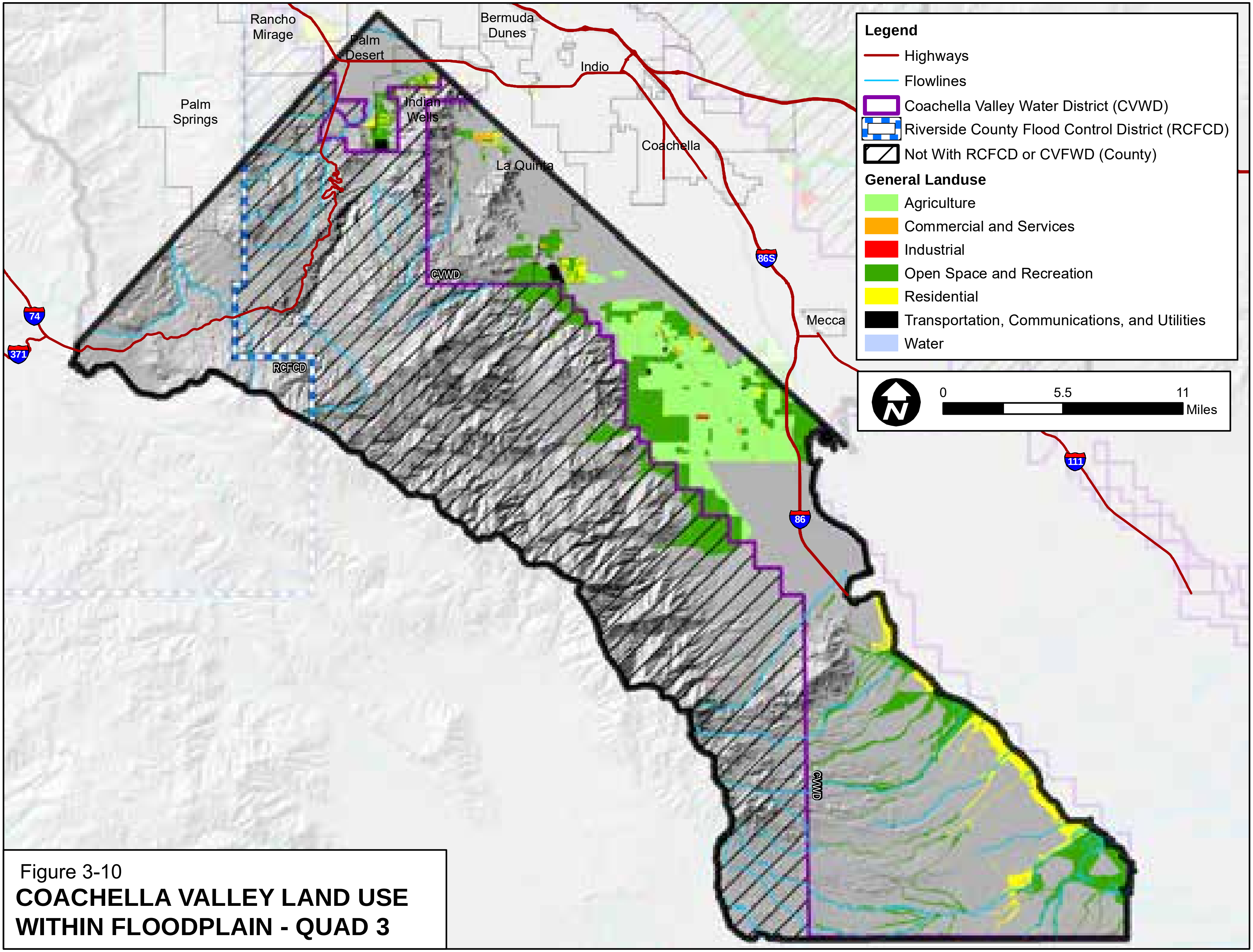

Figure 3-10

COACHELLA VALLEY LAND USE WITHIN FLOODPLAIN - QUAD 3

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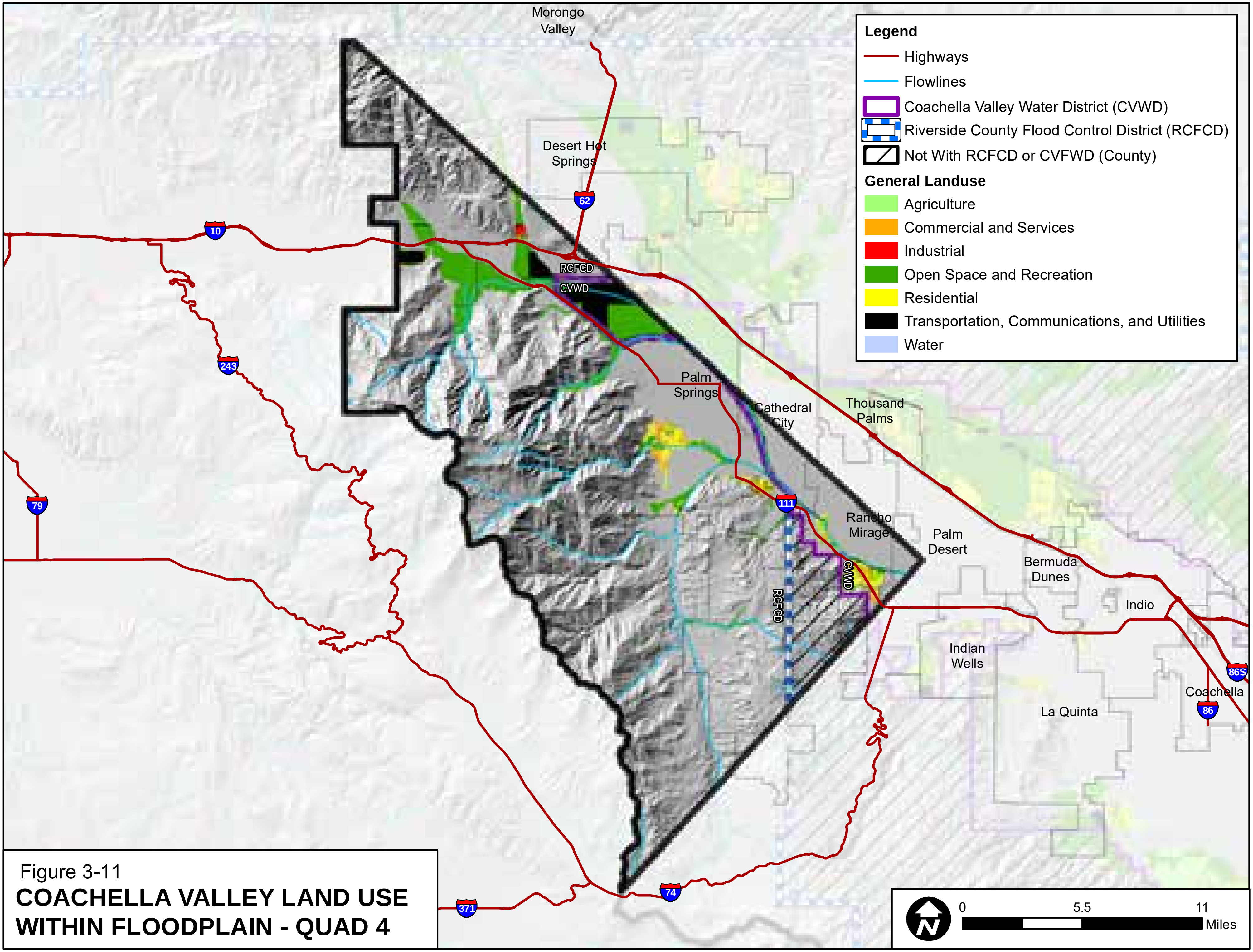

Figure 3-11
COACHELLA VALLEY LAND USE WITHIN FLOODPLAIN - QUAD 4

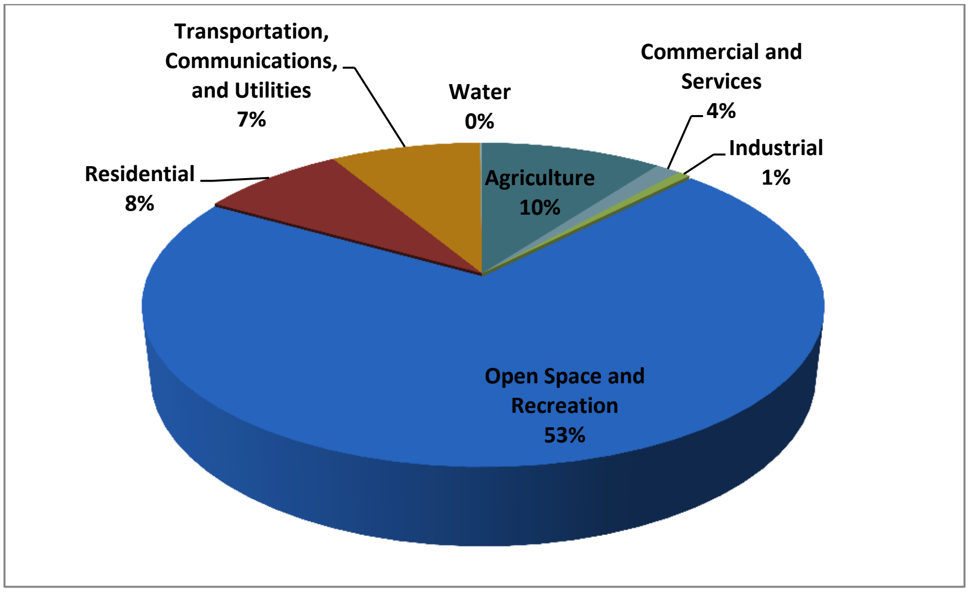

Figure 3-12: Total distribution of different land uses within mapped floodplain areas for entire Coachella Valley

Table 3-2: Land use types located within mapped flood hazard zones based on Four Mapping Quadrants

CV Quadrant No.1 - Northeast	
Land use	**Acres**
Agriculture	262
Commercial and Services	889
Industrial	503
Open Space and Recreation	49105
Residential	4571
Transportation, Communications, and Utilities	5135
Water	0
TOTAL	**60,464**

CV Quadrant No. 2 - Southeast	
Land use	**Acres**
Agriculture	1,610
Commercial and Services	152
Industrial	462
Open Space and Recreation	27,564
Residential	1,956
Transportation, Communications, and Utilities	3,097
Water	138
TOTAL	**34,979**

CV Quadrant No.3 – Southwest	
Land use	**Acres**
Agriculture	14,188
Commercial and Services	308
Industrial	45
Open Space and Recreation	24,627
Residential	5,229
Transportation, Communications, and Utilities	1,590
Water	45
Total	**46,032**

CV Quadrant No. 4 – Northwest	
Land use	**Acres**
Agriculture	16
Commercial and Services	829
Industrial	110
Open Space and Recreation	9,605
Residential	1,119
Transportation, Communications, and Utilities	3,510
Water	0
Total	**15,189**

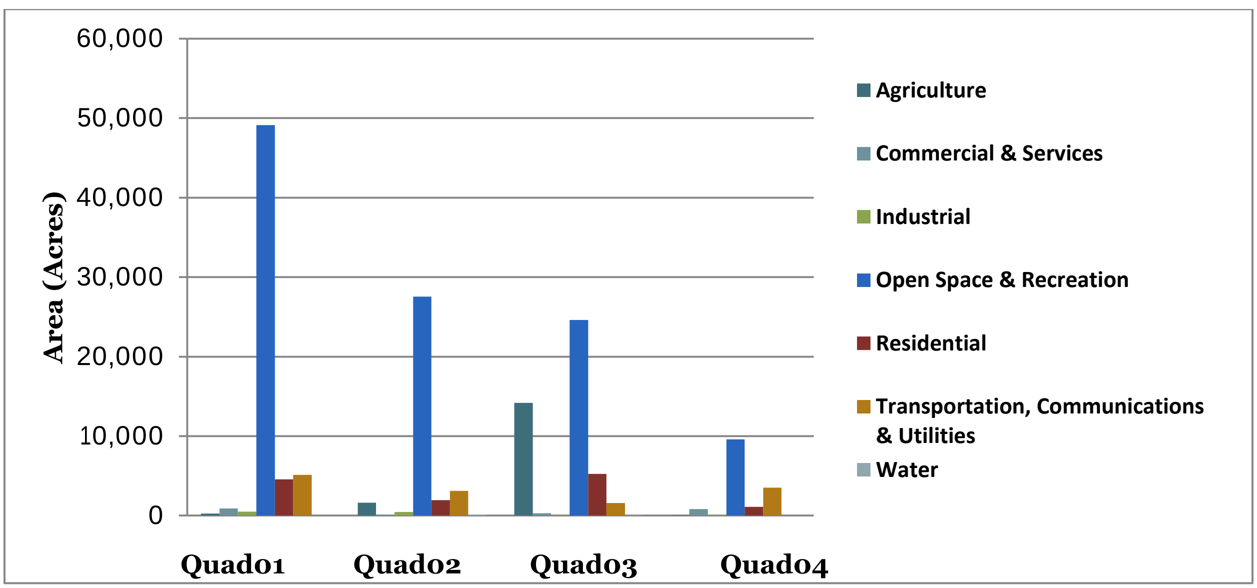

Figure 3-13: Comparison of the different land uses within the mapped flood hazards within the four different quadrants used in mapping the Coachella Valley

3.6.2 Land Use Located within Flood Hazards – City Boundaries

The amount of the different land uses that are within the mapped flood hazard zones for the different major cities within the Coachella Valley were quantified and are presented in following table. This is a planning level assessment in order to provide an indication of the flood hazard risk based on the existing data for land use within the mapped floodplain. The land use mapping data is from the FEMA DFIRM and the DWR Flood Awareness Mapping.

Table 3-3: Land use types located within mapped flood hazard zones for Coachella Valley based on different City boundaries

Cathedral City	Area (acres)
Agriculture	0
Commercial and Services	147
Industrial	18
Open Space and Recreation	3,003
Residential	105
Transportation, Communications, and Utilities	676
Water	0
Grand Total	**3,948**

Coachella	Area (acres)
Agriculture	0
Commercial and Services	0
Industrial	0
Open Space and Recreation	2,706
Residential	0
Transportation, Communications, and Utilities	493
Water	0
Grand Total	**3,199**

Desert Hot Springs	Area (acres)
Agriculture	0
Commercial and Services	380
Industrial	25
Open Space and Recreation	5,579
Residential	1,578
Transportation, Communications, and Utilities	1,294
Water	0
Grand Total	**8,856**

Indian Wells	Area (acres)
Agriculture	0
Commercial and Services	26
Industrial	0
Open Space and Recreation	1,160
Residential	347
Transportation, Communications, and Utilities	279
Water	6
Grand Total	**1,818**

Indio	Area (acres)
Agriculture	576
Commercial and Services	44
Industrial	9
Open Space and Recreation	1,580
Residential	700
Transportation, Communications, and Utilities	585
Water	0
Grand Total	**3,494**

La Quinta	Area (acres)
Agriculture	0
Commercial and Services	177
Industrial	0
Open Space and Recreation	2,472
Residential	451
Transportation, Communications, and Utilities	369
Water	157
Grand Total	**3,626**

Palm Desert	Area (acres)
Agriculture	0
Commercial and Services	91
Industrial	0
Open Space and Recreation	127
Residential	102
Transportation, Communications, and Utilities	172
Water	1
Grand Total	**493**

Palm Springs	**Area (acres)**
Agriculture	0
Commercial and Services	506
Industrial	28
Open Space and Recreation	9,537
Residential	622
Transportation, Communications, and Utilities	2,970
Water	0
Grand Total	**13,662**

Rancho Mirage	**Area (acres)**
Agriculture	13
Commercial and Services	210
Industrial	4
Open Space and Recreation	433
Residential	437
Transportation, Communications, and Utilities	333
Water	0
Grand Total	**1,430**

Unincorporated Imperial County	**Area (acres)**
Agriculture	0
Commercial and Services	0
Industrial	0
Open Space and Recreation	1,064
Residential	4,215
Transportation, Communications, and Utilities	0
Water	0
Grand Total	**5,279**

Unincorporated Riverside County	**Area (acres)**
Agriculture	15,487
Commercial and Services	597
Industrial	1,036
Open Space and Recreation	74,762
Residential	4,407
Transportation, Communications, and Utilities	5,160
Water	33
Grand Total	**101,481**

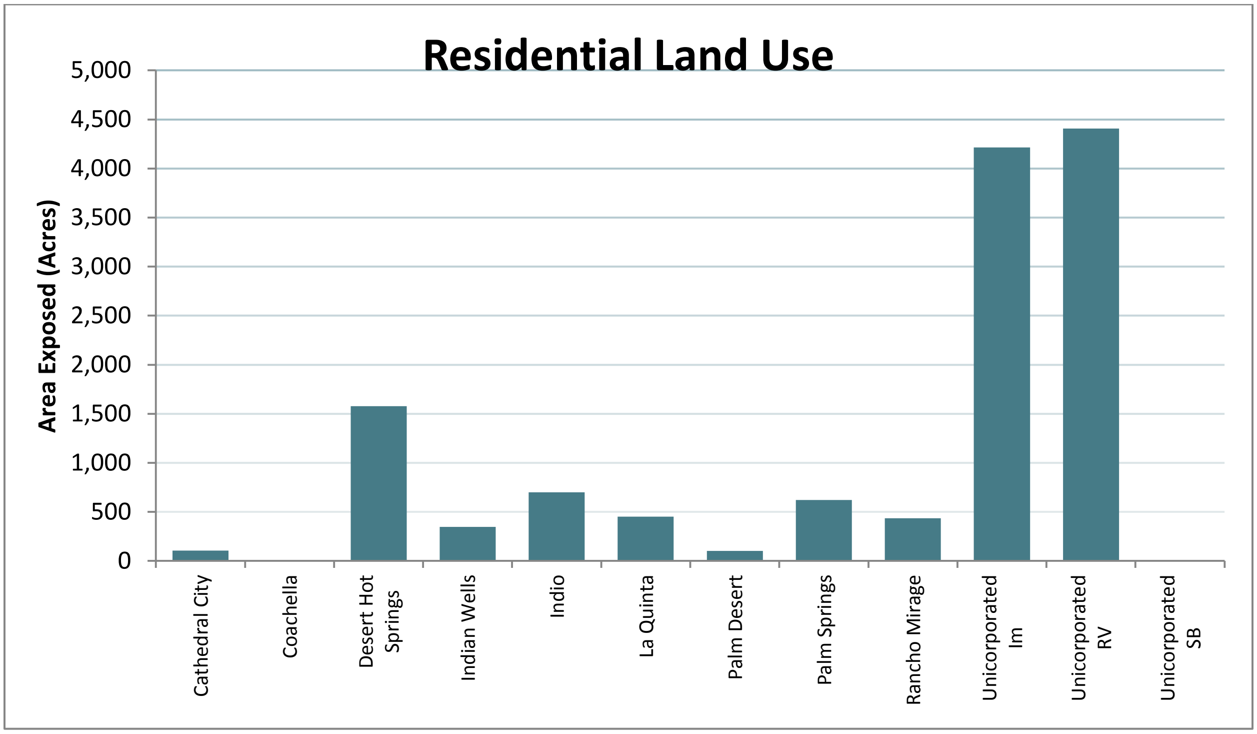

Figure 3-14: Residential land use within mapped floodplain comparison between the different Cities and County areas within the Coachella Valley

3.6.3 Planning Estimates of Flood Damage Loss Areas

The estimated loss for flood hazards, in addition to exposure, throughout the Coachella Valley IRWM boundary was prepared at a planning level to provide guidance with the watershed planning. "Loss" is that portion of the exposure that is expected to be lost to a hazard. Loss is estimated by referencing frequency and severity of previous hazards. Hazard risk assessment methodologies were applied to flood hazards within the Coachella Valley which were considered to be any land use other than open space within the mapped floodplain. The procedure adopted integrates GIS mapping data to provide dollar damage estimates for the potential impact of flood hazards as a common, systematic framework for evaluation of flood exposure. "Average" flood damage costs for different land uses based on FEMA guidelines and similar values embedded in to the HAZ-US (FEMA national hazard model) were applied to the amount of the different land uses areas within the floodplain. This data included economic and structural data on infrastructure and critical facilities, including replacement value to use in loss estimation assumptions. This approach provides estimates for the potential impact by using a common methodology and database. Uncertainties result from approximations and simplifications that are necessary for a comprehensive analysis (such as incomplete inventories, demographics, or economic parameters). However, the results provide a useful planning level tool to identify locations of high value assets within the watershed and prioritizing flood management projects around these locations in order to reduce the potential dollar damage losses.

The data developed for the different levels of flood exposures/risk based on land uses within the mapped flood hazard zones for each of the regional watersheds was used to develop planning level assessment of the potential economic losses or dollar damage. Studies on flood damage estimates illustrate that the dollar damage for residential and commercial structure increases with flood depth. However, this planning level assessment did not differentiate the variation of flood depths within the floodplain. A generalized dollar damage cost was applied to the different land use categories based upon national information for flood damage. A variety of assumptions were made in averaging these damage costs for a variety of land uses and differing conditions. The results of this assessment are illustrated in Figure 3-15 and Figure 3-16. This illustrates some useful trends related to the locations and most susceptible types of flood damage when planning management activities.

The planning level estimate for flood damages was conducted applying generalized flood damages costs for different land uses or structures associated with those land uses. The methodology that is applied in HAZUS-MH was adopted for this generalized study. Application of the HAZUS-MH for this project would greatly exceed the available study budget and insufficient GIS mapping data as well as detailed flood depth inundation mapping was not available. Flood damage costs are generally associated with the types of structures damage and the depths of flooding, or in agriculture losses the types of crops which would include the value of that crop. The HAZUS-MH model has an extensive library dataset as part of the program for different types of damages around the country. (FEMA, 2012) The data set was utilized to develop average damage costs based on different flood damage assumptions including the depth of flooding since the actual depths are not part of the flood hazard mapping in all areas. Very broad assumptions were necessary in developing the damages estimates given the limited data on the (1) depth of flooding, (2) number and type of structures within the floodplain, and (3) precise value of the different uses including the different types of agriculture crops. The flood damages cost for lumped land use types were generated based on the following information and assumptions from HAZUS-MH dataset:

1. Agricultural flood damage losses were based on the crop loss which includes revenue and reduction for harvest costs for an average value of $35,000 per acre.
2. Residential flood damage losses were based on the structural damage based on 1,800 square feet of main living area per residential unit, 1 story unit, 4 units per acre, 30% flood damage at depth of one-foot for an average value of $250,000 per acre.
3. Commercial land use flood damage was based on a standard 30,000 square foot unit with one unit per acre with an average damage cost of $76 per square foot structure and 30% flood damage for an average value of $684,000 per acre.
4. Industrial land use flood damage was based on a standard 30,000 square foot unit with one unit per acre with average damage costs of $88 per square foot structure and 30% flood damage for an average value of $794,000 per acre.

Transportation land use assumed roadway flood damage and replacement for 200 feet of urban road per square mile valued at $5,000,000 per 3,200 feet and 2 lanes with 30% flood damage for an average value of $91,000 per acre.

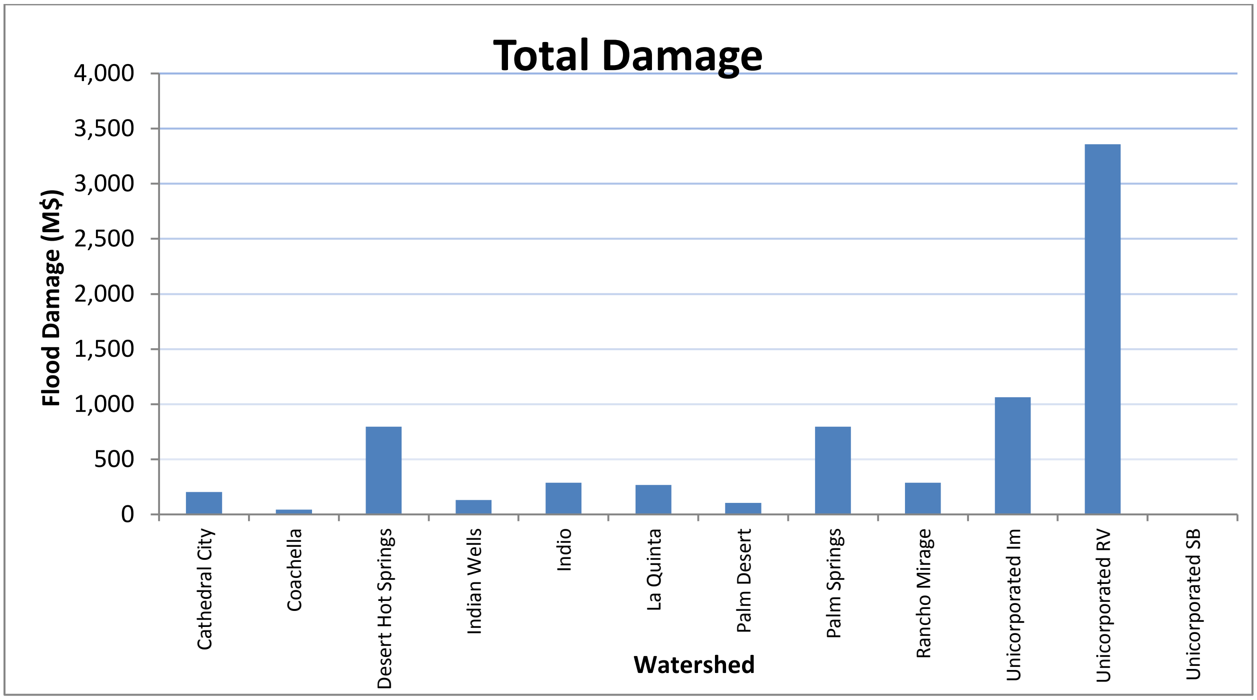

Figure 3-15: Total estimated 100-year approximate dollar flood damage for all land use within the floodplain comparing different Cities and County areas in the Coachella Valley

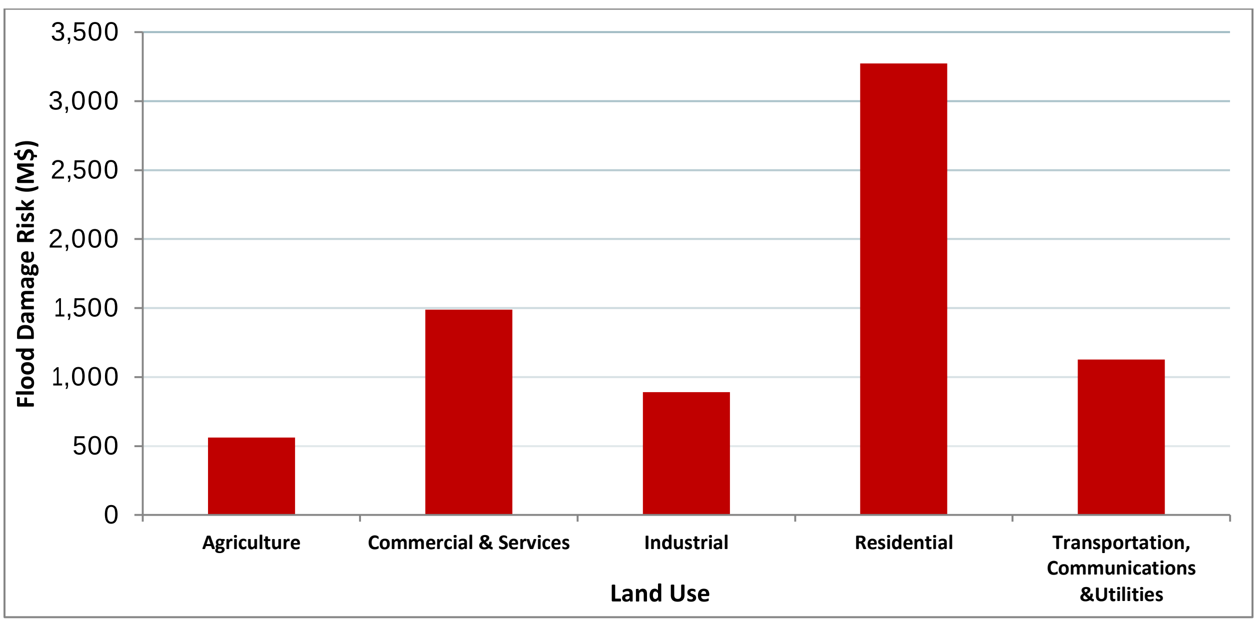

Figure 3-16: Total estimated 100-year flood damage to the different land use types over all mapped floodplain area within the Coachella Valley

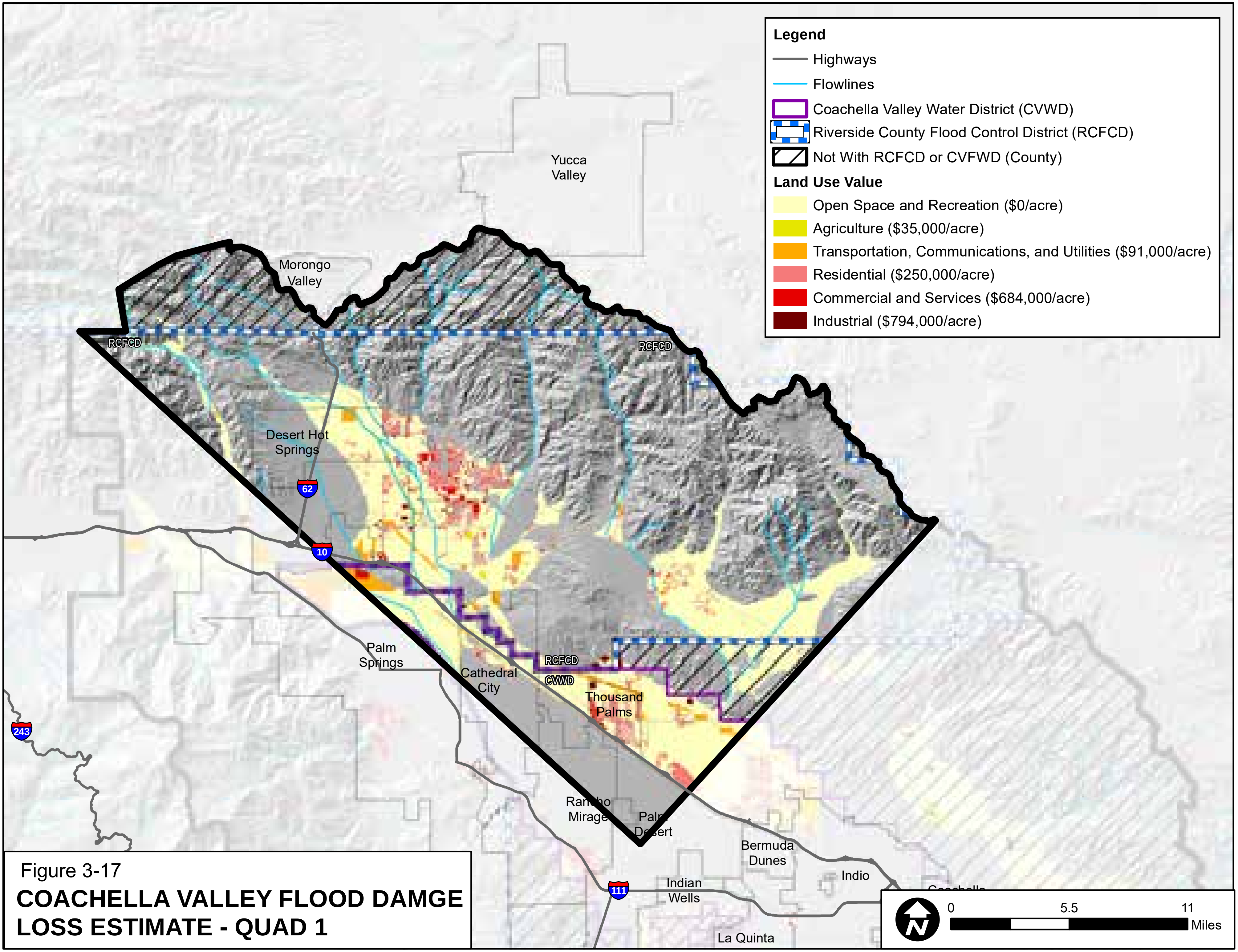

Figure 3-17

COACHELLA VALLEY FLOOD DAMGE LOSS ESTIMATE - QUAD 1

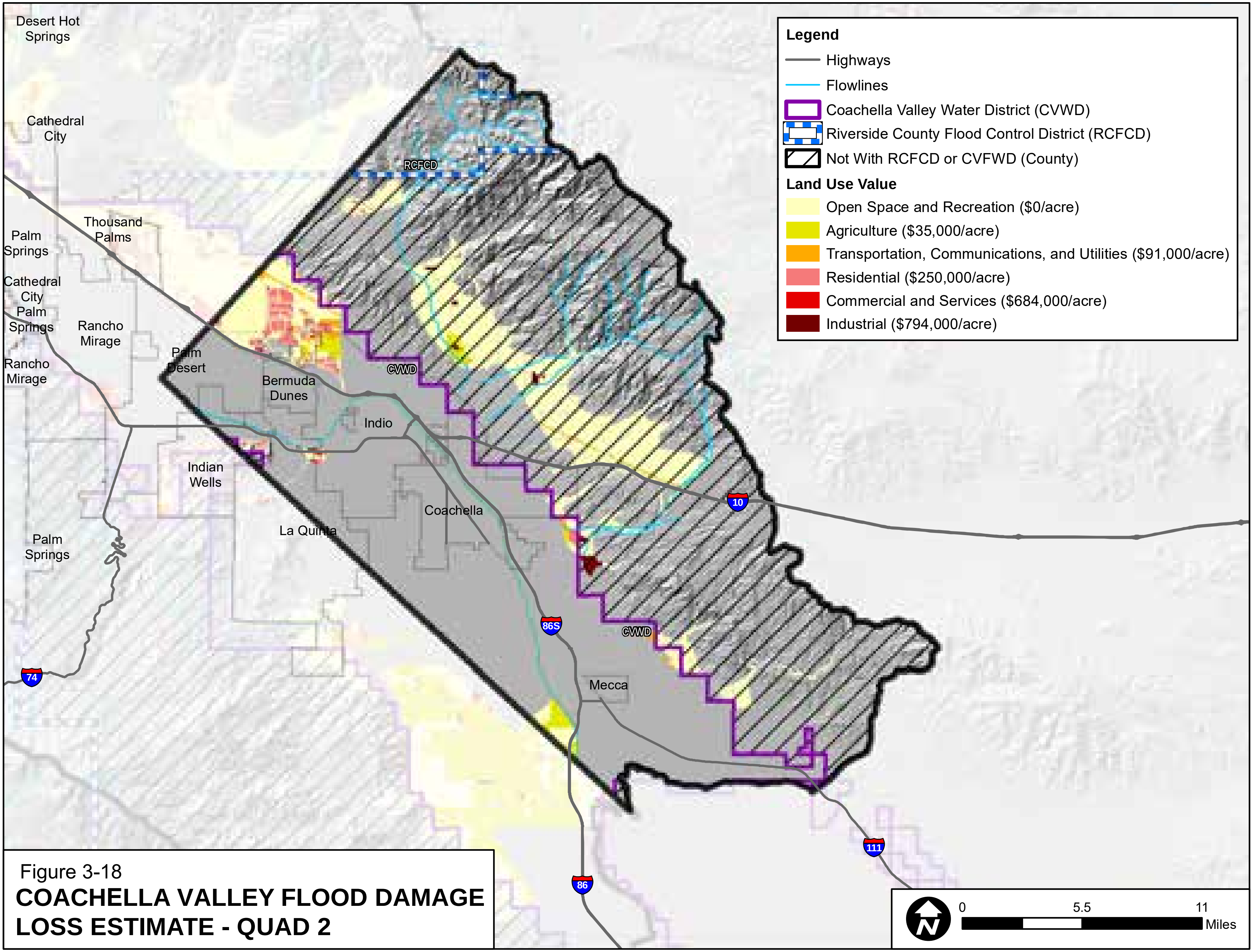

Figure 3-18
COACHELLA VALLEY FLOOD DAMAGE LOSS ESTIMATE - QUAD 2

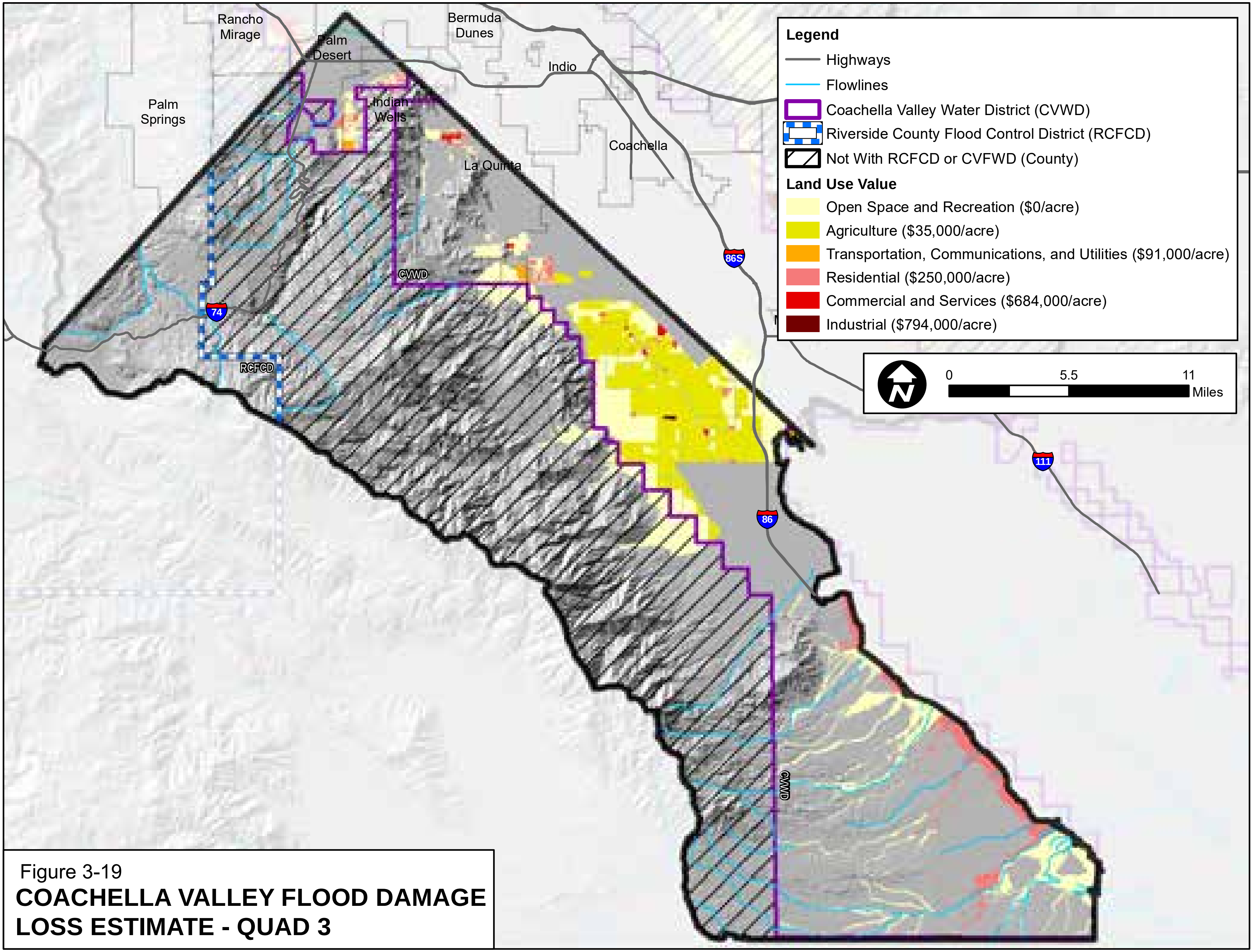

Figure 3-19
COACHELLA VALLEY FLOOD DAMAGE LOSS ESTIMATE - QUAD 3

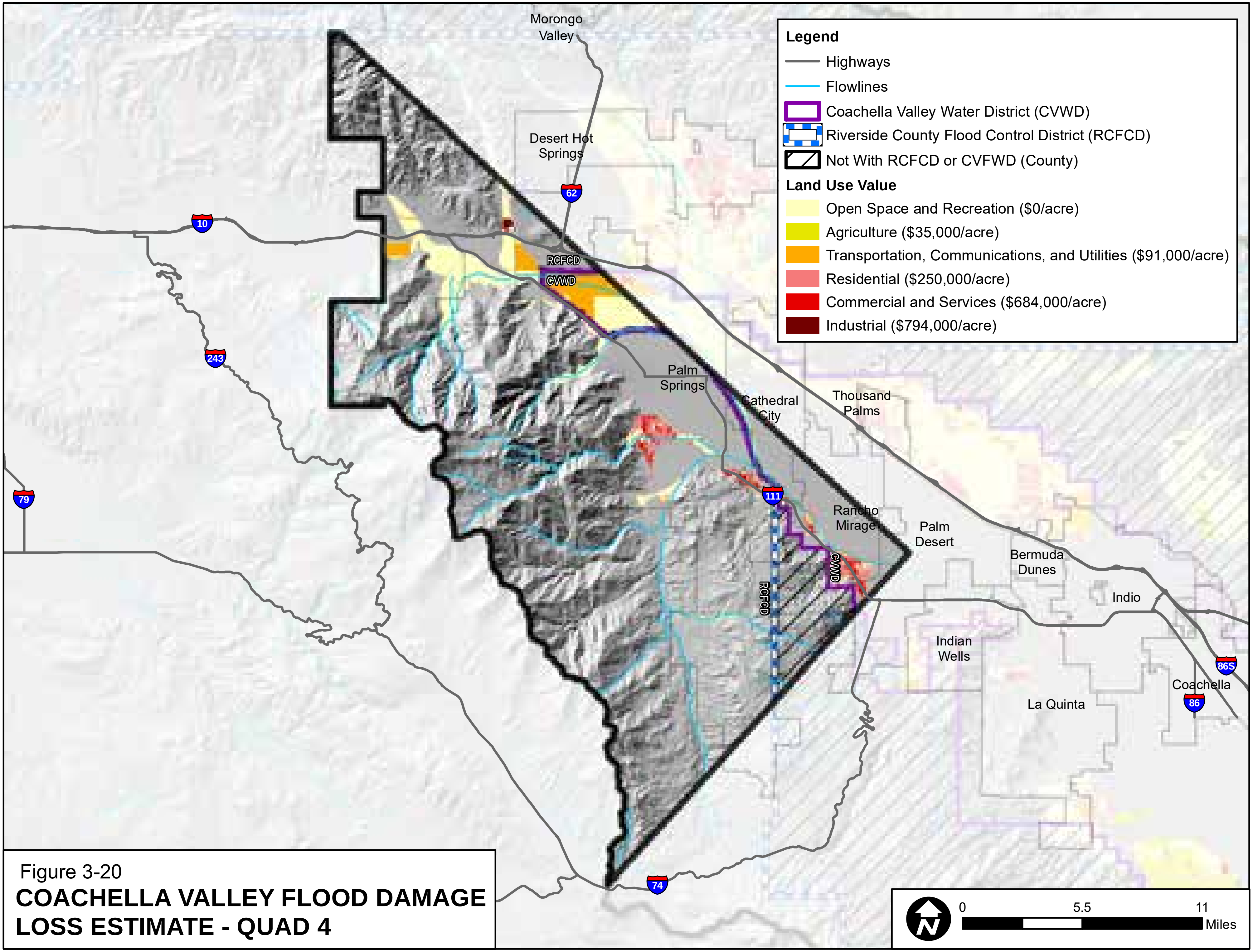

Figure 3-20

COACHELLA VALLEY FLOOD DAMAGE LOSS ESTIMATE - QUAD 4

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4 Regional Watersheds Description

4.1 Regional Watersheds Hydrologic Characteristics

The Coachella IRWM region is comprised of numerous tributary watersheds which originate on the eastern and western side of the valley, or offsite beyond the limits of the IRWM boundary, but are all ultimately to the Salton Sea. These watersheds are either within the CVWD or RCFCWCD jurisdictional boundary and can generally be divided into 12 larger watershed units which are illustrated on Figure 4-1. The designations of these watershed units utilize, for a portion of the study area, the classifications adopted by CVWD for their jurisdictional watersheds within the Coachella Valley.

Figure 4-1: Regional delineation of major watershed units utilized for watershed planning within the Coachella Valley

The watersheds are the surface hydrology features or the tributary basin areas corresponding to the regional drainage systems and floodplains. The hydrologic response of these <u>watershed units</u> for rainfall events as well as the channel processes/geomorphology trends, which influence the flooding characteristics which are examined at a regional scale. In addition, different characteristics of the watersheds and floodplains that may limit potential flood management solutions are also explored. The "watershed units" provide a useful method to divide the region and basis for focusing on flood management planning utilizing a regional watershed basis.

Characteristic information and watershed parameters were developed for each of the different watershed units to assist in characterizing the different watershed and facilitate understanding the potential response. The watershed characteristics were manually generated utilizing GIS mapping measurements from the topographic and hydrographic datasets.

4.1.1 Whitewater Canyon

Figure 4-2: Whitewater Canyon watershed unit with major population centers

Table 4-1: Whitewater Canyon watershed unit characteristics

Watershed Area (sq. Miles)	82.8 mi^2
Length Naturally Occurring Waterways	519,851.8 ft
Percentage of Free Flowing River	92%
Percentage of River Miles in Protected Lands	50%
Number of Stream Crossings	13
Average Precipitation per Year	23.6 in
Percentage Area above 15% Slope:	83%
Longest Watershed Flow Path Length	124,178.6 ft
Maximum Elevation	10,392.4 ft
Minimum Elevation	1,065.3 ft
Watershed Elevation Difference	9,327.1 ft
Average Map Slope	0.075

4.1.2 Morongo Wash/Mission Creek

Figure 4-3: Morongo Wash / Mission Creek watershed unit with major population centers

Table 4-2: Morongo Wash / Mission Creek watershed unit characteristics

Watershed Area (sq. Miles)	265.6 mi^2
Length Naturally Occurring Waterways	2,053,933.9 ft
Percentage of Free Flowing River	95%
Percentage of River Miles in Protected Lands	40%
Number of Stream Crossings	146
Average Precipitation per Year	12.4 in
Percentage Area above 15% Slope:	71%
Longest Watershed Flow Path Length	138,940.6 ft
Maximum Elevation	4,022.32 ft
Minimum Elevation	248.8 ft
Watershed Elevation Difference	7,779.1 ft
Average Map Slope	0.056

4.1.3 Garnet Wash

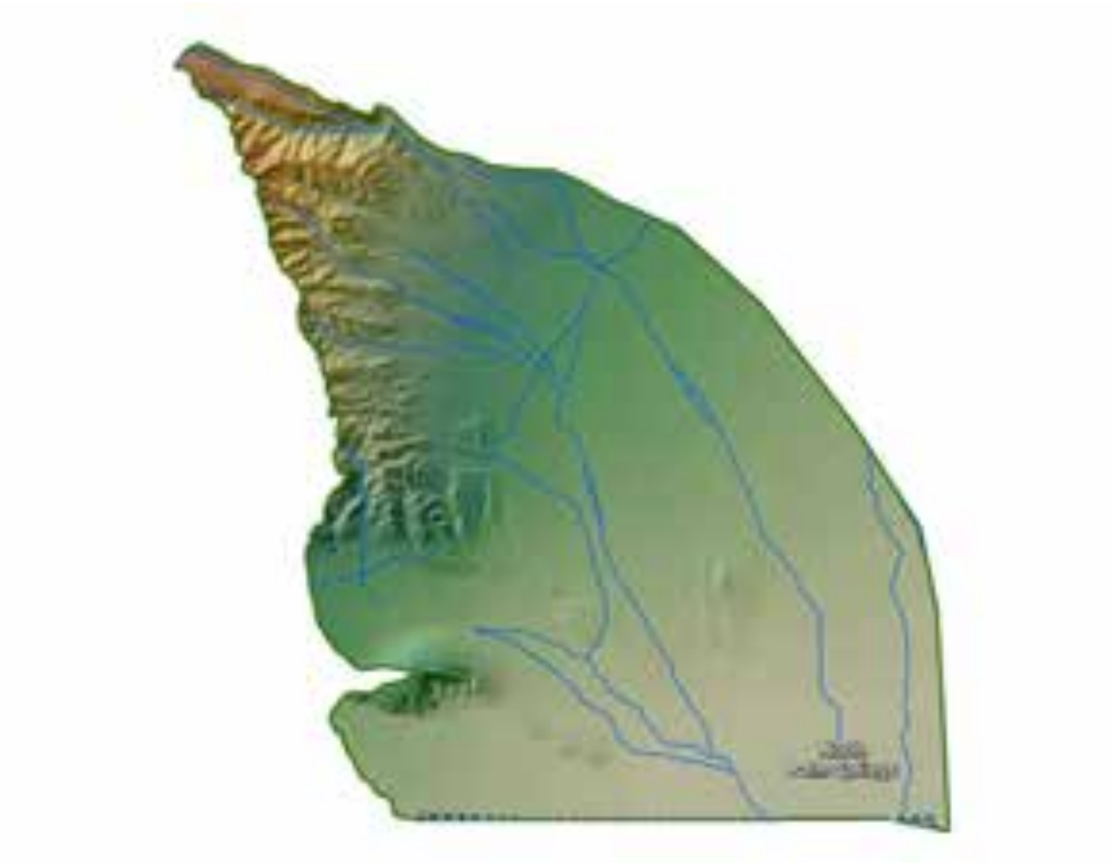

Figure 4-4: Garnet Wash watershed unit with major population centers

Table 4-3: Garnet Wash watershed unit characteristics

Watershed Area (sq. Miles)	34.4 mi^2
Length Naturally Occurring Waterways	240,123.4 ft
Percentage of Free Flowing River	90%
Percentage of River Miles in Protected Lands	30%
Number of Stream Crossings	80
Average Precipitation per Year	9.8 in
Percentage Area above 15% Slope:	17%
Longest Watershed Flow Path Length	57,679.7 ft
Maximum Elevation	3,287.7 ft
Minimum Elevation	718.3 ft
Watershed Elevation Difference	2,569.4 ft
Average Map Slope	0.045

4.1.4 Eastern San Jacinto Mountains

Figure 4-5: Eastern San Jacinto Mountains watershed unit with major population centers

Table 4-4: Eastern San Jacinto Mountains watershed unit characteristics

Watershed Area (sq. Miles)	205.0 mi^2
Length Naturally Occurring Waterways	1,500,641.6 ft
Percentage of Free Flowing River	98%
Percentage of River Miles in Protected Lands	61%
Number of Stream Crossings	44
Average Precipitation per Year	16.7 in
Percentage Area above 15% Slope:	79%
Longest Watershed Flow Path Length	114,355.2 ft
Maximum Elevation	6,014.0 ft
Minimum Elevation	564.8 ft
Watershed Elevation Difference	1,640.5 ft
Average Map Slope	0.014

4.1.5 Thousand Palms

Figure 4-6: Thousand Palms watershed unit with major population centers

Table 4-5: Thousand Palms watershed unit characteristics

Watershed Area (sq. Miles)	134.5 mi^2
Length Naturally Occurring Waterways	651,001.5 ft
Percentage of Free Flowing River	93%
Percentage of River Miles in Protected Lands	89%
Number of Stream Crossings	57
Average Precipitation per Year	7.6 in
Percentage Area above 15% Slope:	45%
Longest Watershed Flow Path Length	125,572.0 ft
Maximum Elevation	4,762.0 ft
Minimum Elevation	38.4 ft
Watershed Elevation Difference	4,723.6 ft
Average Map Slope	0.038

4.1.6 Valley Floor

Figure 4-7: Valley Floor watershed unit with major population centers

Table 4-6: Valley Floor watershed unit characteristics

Watershed Area (sq. Miles)	140.3 mi^2
Length Naturally Occurring Waterways	205,965.9 ft
Percentage of Free Flowing River	41%
Percentage of River Miles in Protected Lands	25%
Number of Stream Crossings	110
Average Precipitation per Year	5.2 in
Percentage Area above 15% Slope:	0.9%
Longest Watershed Flow Path Length	187,708.7 ft
Maximum Elevation	1014.1 ft
Minimum Elevation	-95.1 ft
Watershed Elevation Difference	1,109.2 ft
Average Map Slope	0.006

4.1.7 North Indio

Figure 4-8: North Indio watershed unit with major population centers

Table 4-7: North Indio watershed unit characteristics

Watershed Area (sq. Miles)	109.4 mi^2
Length Naturally Occurring Waterways	585,792.4 ft
Percentage of Free Flowing River	88%
Percentage of River Miles in Protected Lands	78%
Number of Stream Crossings	67
Average Precipitation per Year	7.0 in
Percentage Area above 15% Slope:	63%
Longest Watershed Flow Path Length	91,055.8 ft
Maximum Elevation	4,388.9 ft
Minimum Elevation	15.4 ft
Watershed Elevation Difference	4,373.5 ft
Average Map Slope	0.048

4.1.8 Eastern Santa Rosa Mountains

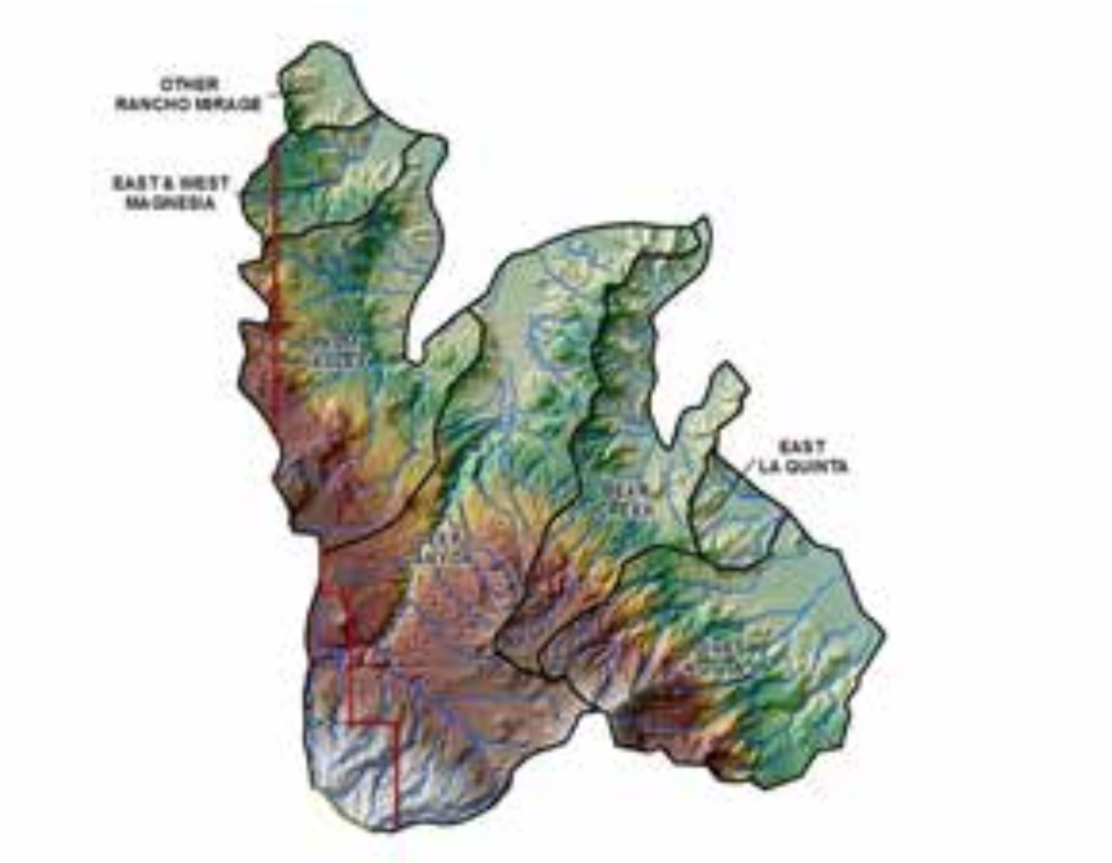

Figure 4-9: Eastern Santa Rosa Mountains watershed unit with major population centers

Table 4-8: Eastern Santa Rosa Mountains watershed unit characteristics

Watershed Area (sq. Miles)	129.7 mi^2
Length Naturally Occurring Waterways	1,072,336.2 ft
Percentage of Free Flowing River	99.8%
Percentage of River Miles in Protected Lands	85%
Number of Stream Crossings	82
Average Precipitation per Year	9.9 in
Percentage Area above 15% Slope:	76%
Longest Watershed Flow Path Length	100,754.2 ft
Maximum Elevation	7,999.8 ft
Minimum Elevation	293.6 ft
Watershed Elevation Difference	7706.2 ft
Average Map Slope	0.076

4.1.9 Oasis Area

Figure 4-10: Oasis Area watershed unit with major population centers

Table 4-9: Oasis Area watershed unit characteristics

Watershed Area (sq. Miles)	231.6 mi^2
Length Naturally Occurring Waterways	1,438,057.2 ft
Percentage of Free Flowing River	57%
Percentage of River Miles in Protected Lands	59%
Number of Stream Crossings	262
Average Precipitation per Year	7.2 in
Percentage Area above 15% Slope:	43%
Longest Watershed Flow Path Length	122,315.1 ft
Maximum Elevation	7,896.1 ft
Minimum Elevation	-194.9 ft
Watershed Elevation Difference	8,091.0 ft
Average Map Slope	0.066

4.1.10 Mecca / North Shore SMP

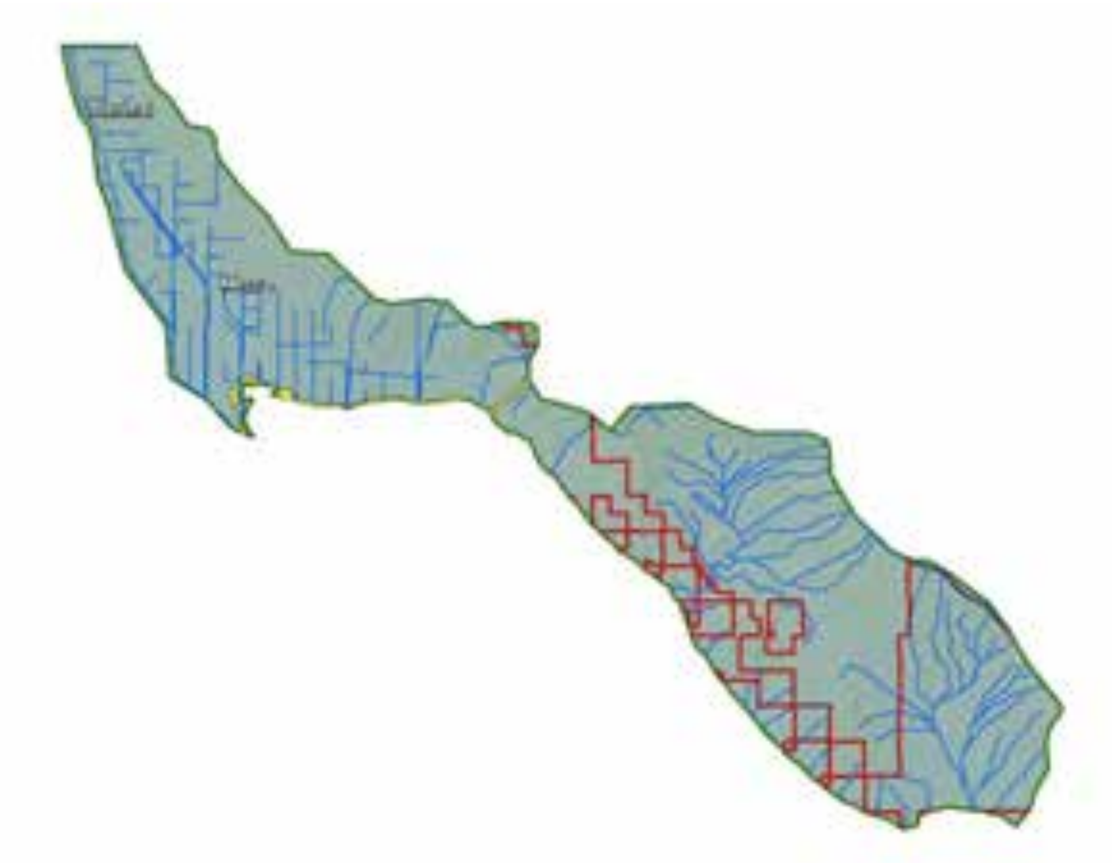

Figure 4-11: Mecca / North Shore SMP watershed unit with major population centers

Table 4-10: Mecca / North Shore SMP watershed unit characteristics

Watershed Area (sq. Miles)	151.1 mi^2
Length Naturally Occurring Waterways	740,633 ft
Percentage of Free Flowing River	53%
Percentage of River Miles in Protected Lands	43%
Number of Stream Crossings	60
Average Precipitation per Year	3.3 in
Percentage Area above 15% Slope:	0.5%
Longest Watershed Flow Path Length	69,024.9 ft
Maximum Elevation	-97.9 ft
Minimum Elevation	-224.7 ft
Watershed Elevation Difference	322.6 ft
Average Map Slope	0.005

4.1.11 Mecca / North Shore Area

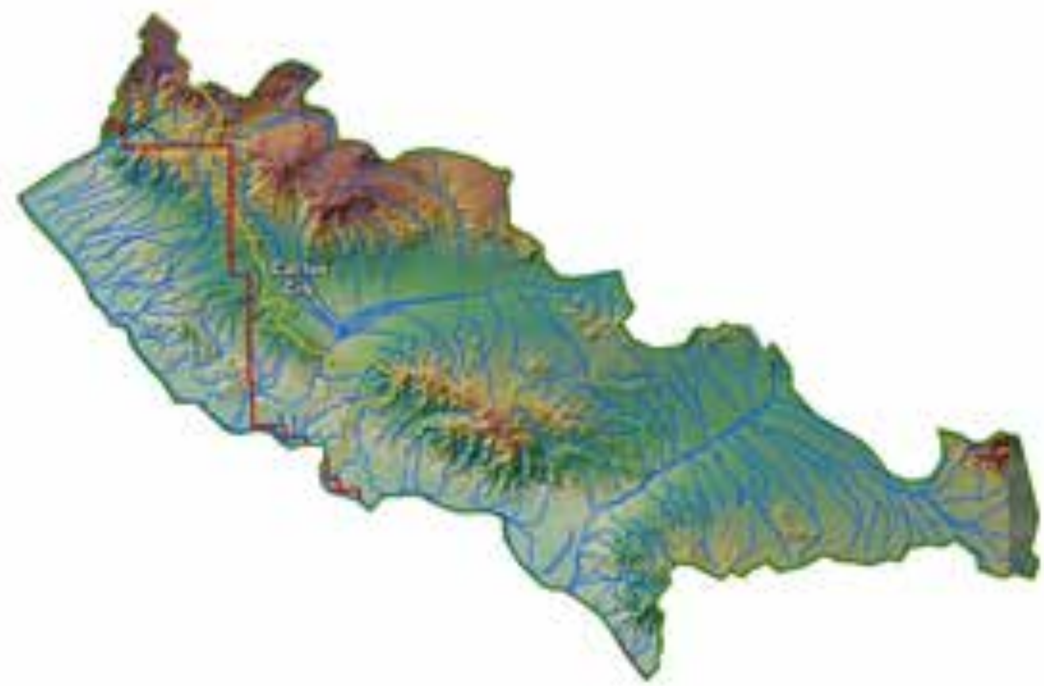

Figure 4-12: Mecca / North Shore Area watershed unit with major population centers

Table 4-11: Mecca / North Shore Area watershed unit characteristics

Watershed Area (sq. Miles)	554.9 mi^2
Length Naturally Occurring Waterways	3,651,875 ft
Percentage of Free Flowing River	88%
Percentage of River in Protected Lands	64%
Number of Stream Crossings	148
Average Precipitation per Year	5.0 in
Percentage Area above 15% Slope	42%
Longest Watershed Flow Path Length	156,923.7 ft
Maximum Elevation	3,953.3 ft
Minimum Elevation	39.9 ft
Watershed Elevation Difference	3,913.0 ft
Average Map Slope	0.025

4.1.12 West Shore of Salton Sea

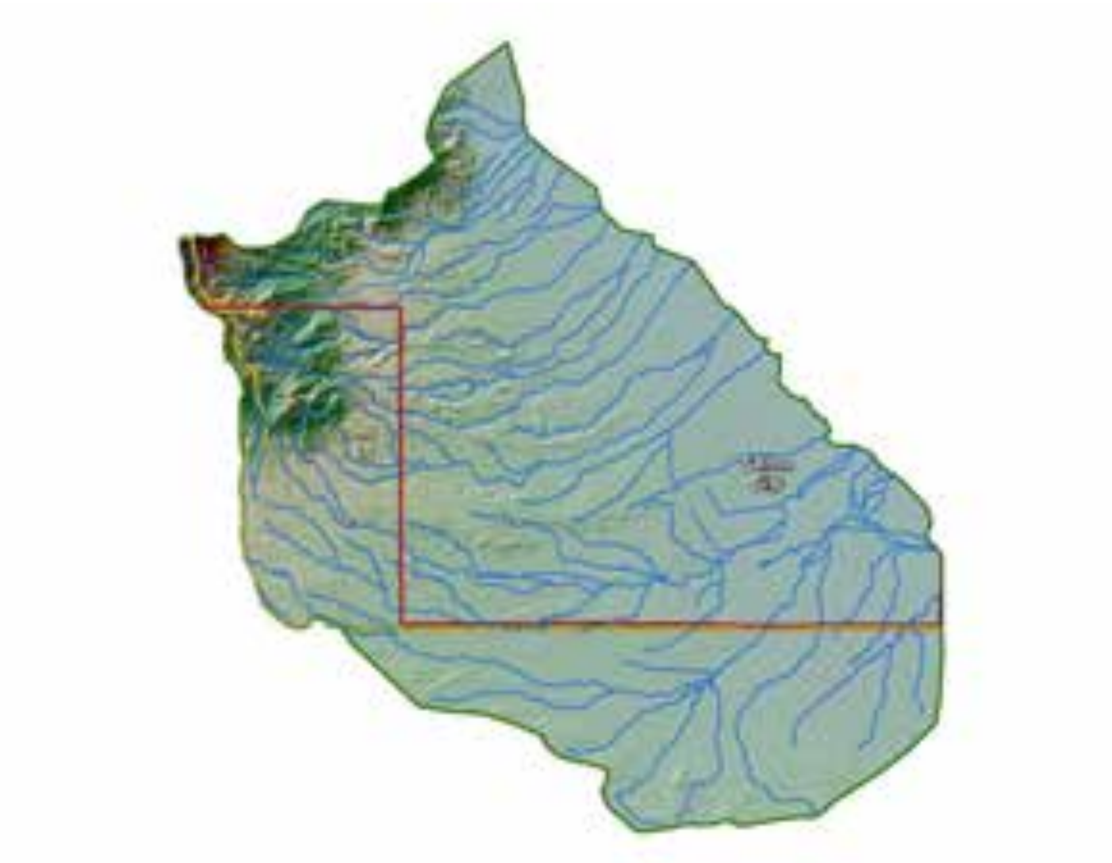

Figure 4-13: West Shore of Salton Sea watershed unit with major population centers

Table 4-12: West Shore of Salton Sea watershed unit characteristics

Watershed Area (sq. Miles)	172.3 mi^2
Length Naturally Occurring Waterways	1,539,088.6 ft
Percentage of Free Flowing River	95%
Percentage of River Miles in Protected Lands	0%
Number of Stream Crossings	27
Average Precipitation per Year	4.4 in
Percentage Area above 15% Slope:	19%
Longest Watershed Flow Path Length	101,071.9 ft
Maximum Elevation	595.1 ft
Minimum Elevation	-224.9 ft
Watershed Elevation Difference	820.0 ft
Average Map Slope	0.008

4.2 Metrologic Conditions / Historic Precipitation

The Coachella Valley IRWM Region climate is an extension of the Sonoran Desert and is classified as an extremely arid environment based on the amount of precipitation. Most precipitation falls during the winter months from passing mid-latitude frontal systems from the north and west, nearly all of it as rain, but with snow atop the surrounding mountains. Rain also falls during the summer months as surges of moisture from both the Gulf of Mexico and the Gulf of California are drawn into the area by the desert monsoon. Occasionally, the remnants of a Pacific tropical cyclone can also affect the valley. In 1976, Tropical Storm Kathleen brought torrential rain and catastrophic flooding to the Coachella Valley as it swept in from the Pacific, traversing the region from south to north. The historical variation of the total annual rainfall is illustrated on Figure 4-14 which identifies the wet-years, but this does not necessarily correlate directly to flood events since flooding is general associated with large amount of rainfall in a short period of time.

Figure 4-14: Coachella Valley 100-year 24-hour precipitation in inches variation illustrating lines of constant rainfall (isopluvials)

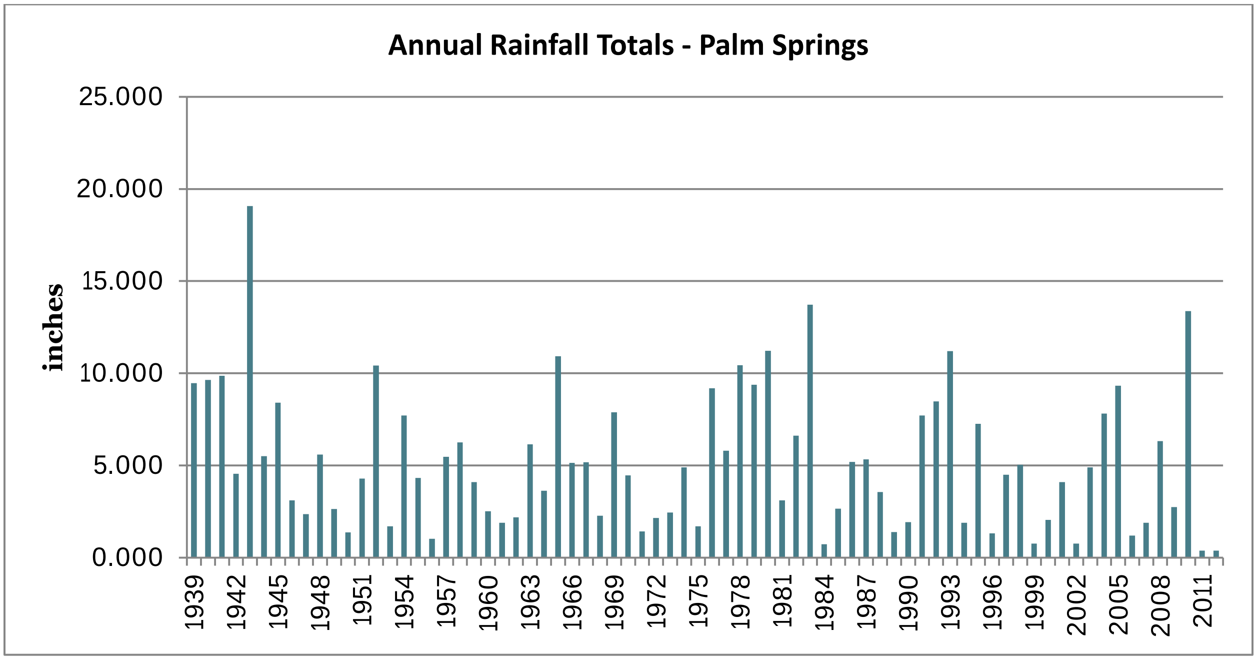

Figure 4-15: Variation of annual rainfall totals in Coachella Valley (Palm Springs Airport) from the later 1930s

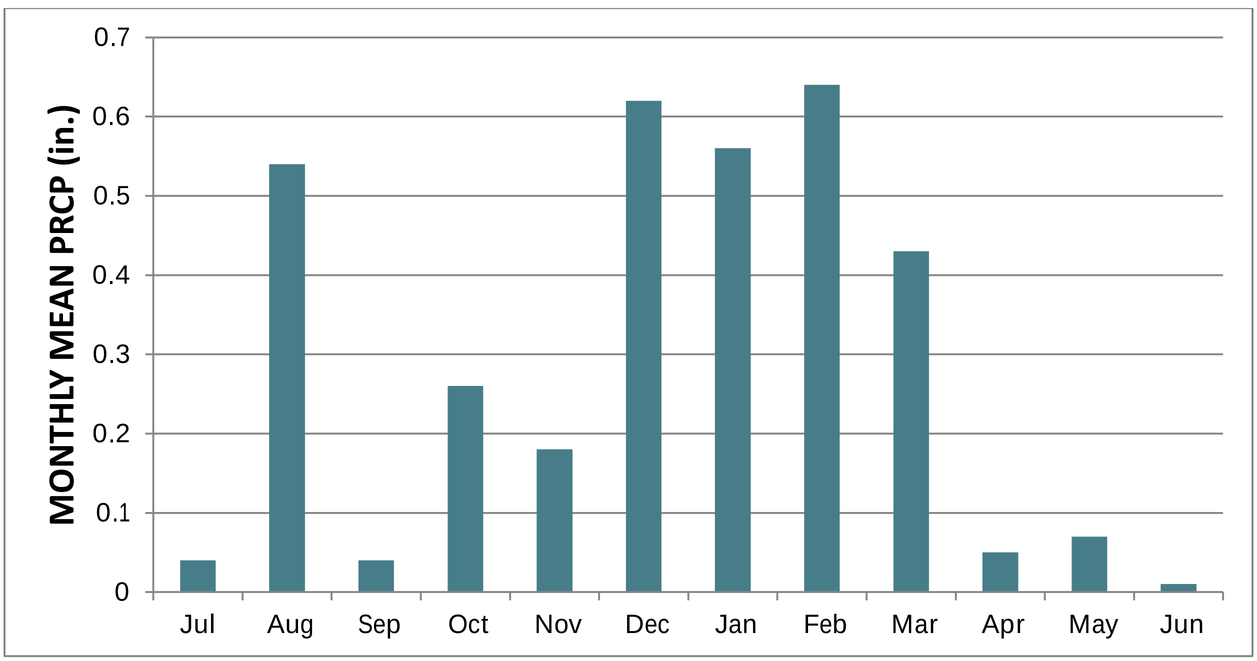

Figure 4-16: Typical "lower valley" (Indio) average monthly variation of rainfall over the year, noting the months of highest rainfall ()

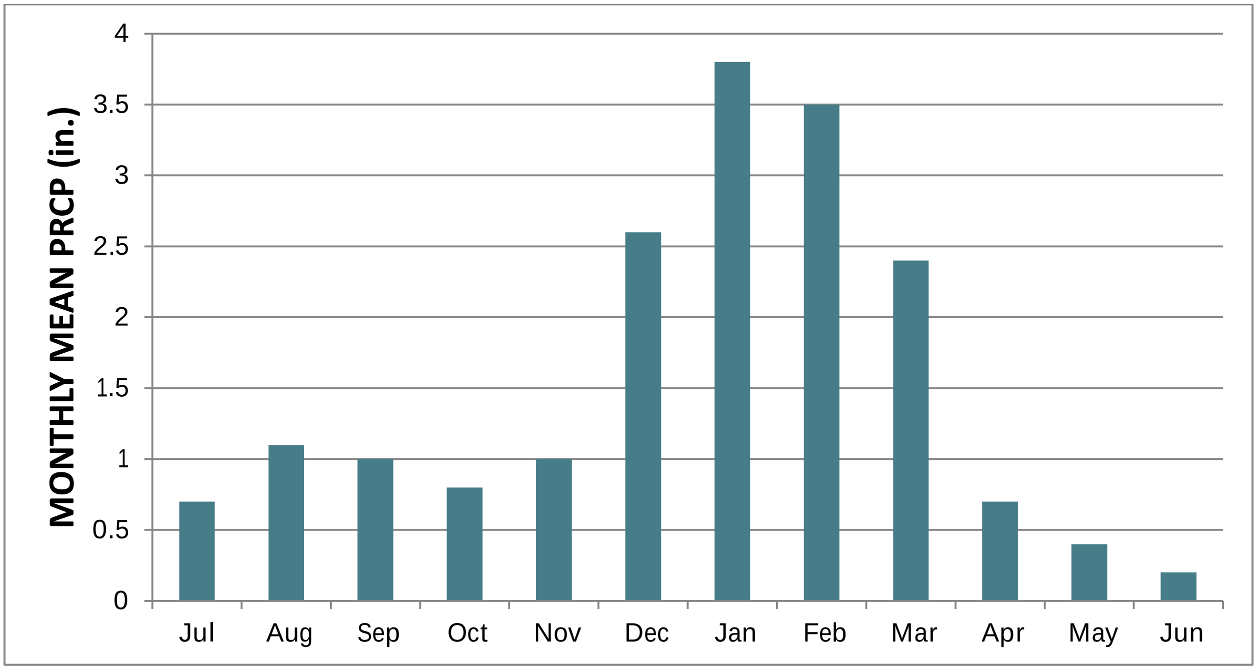

Figure 4-17: Typical "upper valley" (Palm Springs) average monthly variation of rainfall over the year

4.3 Floodplain Hydrology – Major Regional Flood Sources

The flood hazard mapping generated by FEMA and utilized for the risk/exposure assessment in this study were prepared as part of the original FEMA FIS and this included the engineering hydrologic analyses. The hydrology utilized as 100-year floodplain delineation from the FIS provides a general indication of the magnitude of the flow rate from the different watersheds. A summary of the select larger watersheds hydrology values from the FIS are provided in Table 4-13 below in order to get an understanding of the watershed characteristics and the magnitude of the hydrologic response as part of the watershed planning effort. There may be other watershed studies that have performed more refined hydrology analyses, but the intent is to provide a general understanding of the flow rates generated from the major watersheds for planning purposes. The specific concentration points or location within the watershed is based on the information provided from the FIS (FEMA, 2008).

Table 4-13: Major Regional Flood Sources

Flooding Source / Location	Drainage Area (square miles)	Peak Discharge (cfs)		
		10-year (10% chance)	50-year (2% chance)	100-year (1% chance)
Big Morongo Wash				
At Pierson Blvd.	41.98	1,000	6,590	11,560
Blind Canyon Channel				
At Confluence w/ Desert Hot Springs Channel	4.6	560	1,900	2,800
Approx. 2,500 feet upstream of West 16th St.	4.6	560	1,900	2,800
At Confluence w/ Colorado River Aqueduct	3.2	440	1,500	2,200
Dead Indian Canyon				
At Della Robia Ln.	16.5	1,000	4,200	6,700
Approx. 200 feet South of Della Robia Ln.	16.2	1,000	4,200	6,700
Deep Canyon Channel				
Approx. 1,000 feet East of Haystack Channel Junction	63.8	2,000	8,200	13,000
At Buckboard Trail	63.1	2,000	8,200	13,000
Deep Canyon Storm Water Channel				
At Whitewater River	68.7	2,000	8,600	14,000
At Camino Del Ray	67.4	2,000	8,600	14,000
Approx. 700 feet South of El Dorado Dr.	66.2	2,000	8,200	13,000
Approx. 1,000 feet east of Haystack Channel Junction	63.8	2,000	8,200	13,000
At Buckboard Trail	63.1	2,000	8,200	13,000
Desert Hot Springs Channel				
At Confluence w/ Big Morongo Wash	8.2	600	2,000	3,000
Approx. 500 feet South of West 8th St.	7.9	600	2,000	3,000
Below Confluence w/ Blind Canyon Channel	5.8	600	2,000	3,000
At Palm Dr.	1.0	200	660	1,000
At Verbena Dr.	0.5	160	330	500
Dry Morongo Wash				
At Apex	8.91	500	3,060	5,170
East Rancho Mirage Storm Channel				
At Confluence w/ Palm Valley Drain	0.9	120	510	860
Approx. 4,000 feet Southwest of Indian Trail Rd.	0.4	70	300	500

Flooding Source / Location	Drainage Area (square miles)	Peak Discharge (cfs)		
		10-year (10% chance)	50-year (2% chance)	100-year (1% chance)
Haystack Channel				
At Confluence w/ Deep Canyon Channel	0.70	100	440	730
At Medina Dr.	0.10	30	120	200
Approx. 1,500 feet Upstream of Medina Dr.	0.05	20	80	131
Little Morongo Wash				
At Pierson Blvd.	63.71	1,250	9,090	16,420
Long Canyon				
At 2S./5E.-34 SW Corner	26.01	6,570	11,300	13,350
Magnesia Springs Channel				
At Confluence w/ Whitewater River	5.2	480	2,100	3,400
Approx. 4,000 feet Southwest of Indian Trail Rd.	4.7	460	2,000	3,200
Martinez Canyon				
Martinez Canyon	48.5	2,219	7,948	12,376
Mission Creek				
At Highway 62	41.09	1,930	8,480	13,170
North Cathedral Channel				
Downstream of Confluence w/ Tramview Wash	3.9	400	1,550	2,600
Palm Canyon Wash				
Downstream of Confluence w/ Tahquitz Creek	138.8	4,600	17,000	25,000
Palm Desert Channel				
Downstream of Confluence with Palm Desert Channel Tributary	18.0	1,000	4,400	7,000
At State Highway 74	1.40	160	800	1,250
Palm Valley Stormwater Channel				
At Confluence w/ Whitewater River	9.70	700	3,000	5,000
At Park View Dr. Upstream of Confluence w/ Diversion Channel	8.40	640	2,700	4,600
At Pitahaya St.	7.90	620	2,700	4,500
At Willow St.	7.00	560	2,500	4,200
Approx. 1,500 feet Southwest of State Highway 74 and Bel Air Rd.	6.20	520	2,400	3,800
At Starburst Dr.	4.60	450	2,000	3,200

Flooding Source / Location	Drainage Area (square miles)	Peak Discharge (cfs)		
		10-year (10% chance)	50-year (2% chance)	100-year (1% chance)
Pushawalla Canyon				
At Apex	33.7	3,460	6,680	8,050
Thousand Palms Canyon				
At Apex	84.1	5,330	11,170	14,510
Thousand Palms Tributary A				
At Apex	1.4	640	980	1,160
Thousand Palms Tributary B				
At Apex	0.9	560	850	1,000
Thousand Palms Tributary C				
At Apex	1.1	680	1,030	1,220
Thousand Palms Main Channel				
At Apex	7.5	1,240	2,350	2,820
Thunderbird Wash				
At Confluence w/ Whitewater River	1.0	120	550	920
At Pecos Rd.	0.6	90	400	660
At Thunderbird Rd.	0.4	70	300	500
Tramview Tributary				
At State Highway 111	1.1	180	700	1,160
Tramview Wash				
Approx. 230 feet Upstream of Upstream Corporate Limits	1.7	240	920	1,530
Whitewater River				
At Salton Sea	1,600	8,500	27,000	43,000
At Point Happy	843	8,500	27,000	43,000
Downstream of Confluence with Palm Canyon Wash	743	9,000	30,000	47,000
Below Palm Valley Drain	*	8,800	28,000	46,000

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5 Integrated Flood Management (IFM) Planning Guiding Principles

5.1 Overview of IFM and Basic Planning Principles

IFM deviates from traditional flood protection approaches since IFM combines land and water resources development within a watershed, within the context of IRWM, and with a focus on maximizing the efficient use/net benefit of floodplain while promoting public safety. IFM is a process that promotes an integrated, rather than fragmented, approach to flood management and recognizes the connection of flood management actions to water resources management, land use planning, environmental stewardship, and sustainability. Traditional flood management practices focus on reducing the chance of flooding and flood damages through physical measures intended to store and convey floodwaters away from areas to be protected. Although this approach can reduce the intensity and frequency of flooding, it can also limit the floodplain's natural function and have other unintended consequences. In addition, the traditional approach has typically been reactive or piecemeal in addressing the negative aspects of flooding without looking at the larger watershed processes and riverine ecosystem.

IFM uses various techniques to manage flooding, including structural projects (such as levees), nonstructural measures (such as land use practices), and natural watershed functions. Depending on the characteristics of individual watersheds, various resource management strategies may be used, such as: agricultural land stewardship, conjunctive water management, conveyance, ecosystem restoration, forest management, land use planning and management, surface storage, system reoperations, urban runoff management and watershed management. In recent years, flood managers have recognized the potential for natural watershed features to reduce the intensity or duration of flooding. Natural watershed features include: undeveloped floodplains that can store and slowly release floodwaters and wetlands acting as sponges, soaking up floodwaters, filtering runoff, and providing opportunities for infiltration to groundwater. Natural watershed features also include healthy forests, meadows, and other open spaces that can slow runoff during smaller flood events, reducing peak lows, mudslides, and sediment loads in streams.

5.1.1 Basic Planning Principles of IFM

Table 5-1 provides basic guiding principles that provide the foundation in planning integrated flood management.

Table 5-1: Basic guiding principles of integrated flood management planning

1. Every flood risk scenario is different: there is no flood management blueprint.
Understanding the type, source and probability of flooding, the exposed assets and their vulnerability are all essential if the appropriate urban flood risk management measures are to be identified. The suitability of measures to context and conditions is crucial: a flood barrier in the wrong place can make flooding worse by stopping rainfall from draining into the river or by pushing water to more vulnerable areas downstream, and early warning systems can have limited impact on reducing the risk from flash flooding.

2. Designs for flood management must be able to cope with a changing and uncertain future.
The impact of urbanization on flood management is currently and will continue to be significant. But it will not be wholly predictable into the future. In addition, in the present day and into the longer term, even the best flood models and climate predictions result in a large measure of uncertainty. This is because the future climate is dependent on the actions of unpredictable humans on the climate – and because the climate is approaching scenarios never before seen. Flood risk managers need therefore to consider measures that are robust to uncertainty and to different flooding scenarios under conditions of climate change.

3. Rapid urbanization requires the integration of flood risk management into regular urban planning and governance.
Urban planning and management which integrates flood risk management is a key requirement, incorporating land use, shelter, infrastructure and services. The rapid expansion of urban built up areas also provides an opportunity to develop new settlements that incorporate integrated flood management at the outset. Adequate operation and maintenance of flood management assets is also an urban management issue.

4. An integrated strategy requires the use of both structural and non-structural measures and good metrics for "getting the balance right".
The two types of measure should not be thought of as distinct from each other. Rather, they are complementary. Each measure makes a contribution to flood risk reduction but the most effective strategies will usually combine several measures – which may be of both types. It is important to identify different ways to reduce risk in order to select those that best meet the desired objectives now – and in the future.

5. Heavily engineered structural measures can transfer risk upstream and downstream.
Well-designed structural measures can be highly effective when used appropriately. However, they characteristically reduce flood risk in one location while increasing it in another. Urban flood managers have to consider whether or not such measures are in the interests of the wider catchment area.

6. It is impossible to entirely eliminate the risk from flooding. Hard-engineered measures are designed to defend to a pre-determined level.
They may fail. Other non-structural measures are usually designed to minimize rather than prevent risk. There will always remain a residual risk which should be planned for. Measures should also be designed to fail gracefully rather than, if they do fail, causing more damage than would have occurred without the measure.

7. Many flood management measures have multiple co-benefits over and above their flood management role.
The linkages between flood management, urban design, planning and management, and climate change initiatives are beneficial. For example, the greening of urban spaces has amenity value, enhances biodiversity, protects against urban heat island and can provide fire breaks, urban food production and evacuation space. Improved waste management has health benefits as well as maintaining drainage system capacity and reducing flood risk.

8. It is important to consider the wider social and ecological consequences of flood management spending.
While costs and benefits can be defined in purely economic terms, decisions are rarely based on economics alone. Some social and ecological consequences such as loss of community cohesion and biodiversity are not readily measureable in economic terms. Qualitative judgments must therefore be made by city managers, communities at risk, urban planners and flood risk professionals on these broader issues.

9. Clarity of responsibility for constructing and running flood risk programs is critical.
Integrated urban flood risk management is often set within and can fall between the dynamics and differing incentives of decision-making at national, regional, municipal and community levels. Empowerment and mutual ownership of the flood problem by relevant bodies and individuals will lead to positive actions to reduce risk.

Table 5-1: Basic guiding principles of integrated flood management planning

10. Implementing flood risk management measures requires multi-stakeholder cooperation. Effective engagement with the people at risk at all stages is a key success factor. Engagement increases compliance, generates increased capacity and reduces conflict. This needs to be combined with strong, decisive leadership and commitment from national and local governments.
11. Continuous communication to raise awareness and reinforce preparedness is necessary. Ongoing communication counters the tendency of people to forget about flood risk. Even a major disaster has a half-life of memory of less than two generations and other more immediate threats often seem more urgent. Less severe events can be forgotten in less than three years.
12. Plan to recover quickly after flooding and use the recovery to build capacity. As flood events will continue to devastate communities despite the best flood risk management practices, it is important to plan for a speedy recovery. This includes planning for the right human and financial resources to be available. The best recovery plans use the opportunity of reconstruction to build safer and stronger communities which have the capacity to withstand flooding better in the future.

5.1.2 General Elements of IFM

An integrated strategy usually requires the use of both structural and non-structural solutions. It is important to recognize the level and characteristics of existing risk and likely future changes in risk. Integrated flood management also includes the recognition that flood risk can never be entirely eliminated and that resilience to flood risk can include enhancing the capacity of people and communities to adapt to and cope with flooding.

The defining characteristic of IFM is integration simultaneously occurring in different forms such as: mix of different strategies, types of mitigation (structural and non-structural), short-term or long-term, and a participatory approach by multiple agency stakeholders within the watershed to decision making. Key elements of IFM would include:

Enhanced Level of Watershed Stakeholder Communication

- Open communication and participation by stakeholders, planners, and decision makes at all levels.
- Public consultation and involvement of watershed stakeholders for decision-making
- Promote coordination/communication across jurisdiction boundaries within the watershed including information management and exchange

Integrate Land and Water Management

- Land use planning and water management combined through coordination authorities to obtain consistency in planning
- Main elements of watershed management (water quantity, water quality, and processes of erosion/sedimentation) should be linked in planning
- Effect of land use changes on the hydrologic cycles should be evaluated and considered

Manage the Water Cycle as a Whole

- Resource management using an ecosystem approach

- Flood management linked with drought management in the effective use of flood water
- Promote multi-benefit solutions that achieve multiple water resource benefits simultaneously

Adopt a Best-Mix of Strategies

- Flood management strategies should involve a combination of complementary strategies
- Formulate a layered strategy based on economic and watershed characteristics that is adaptable to changing conditions
- Appropriate combination of structural and non-structural measures should be evaluated recognizing the different advantage and disadvantages for the most effective plan

Adopt Integrated Hazard Management Approaches

- Flood management should be integrated into the risk management process

5.2 General Flood Management Opportunities / Constraints

The characteristics of the region provide background into understanding the both potential opportunities as well as constraints for developing potential IFM solutions for the existing flood hazards. Flood management projects are planned and implemented to solve problems reducing risk to public safety and property, meet challenges, and seize opportunities. A "problem" can be thought of as an undesirable condition, while an "opportunity" offers a chance for improvement, and "constraints" limit the ability for implementation. The Coachella Valley IRWM Region includes a specialized terrain conditions, as well as geographic features, which can generate a range of different types of watershed response. These features include urban development surrounded by rainfall-collecting steep terrain that discharges onto the flat valley floor. The geography as well meteorological conditions are conducive to sudden flooding. The desert environment has unique geomorphic features that have been formed from historical flooding and the responses of the watersheds. The arid climate, where the total rainfall is typically concentrated in a few short months, adds to the uncertainty of flood prediction. In addition, the unique issues associated with the watershed conditions also limit the application of even conventional flood management solutions. It is important to identify and recognize the areas within the watershed which have specific unique properties as part of the planning process to assist in the formulation of alternative solutions. This study is utilizing a watershed scale assessment as part of an IFM approach that allows examination of flood hazards and their management in combination with other water resources and environmental restoration on a broad scale.

Based on the characteristics discussed above, the Region's flood management opportunity/constraints may be divided into four major categories which include: (1) physical conditions, (2) regulatory, (3) land use, and (4) environmental/biological.

Physical

Different physical features define the types of flooding issues since the topographic features greatly influence the response of the watershed. The nature of the flooding created by the topography also results in different constraints and limits the ability to apply different conventional solutions for the flood hazard mitigation. Table 5-2 illustrates the opportunity and constraints with floodplain management that are associated with "physical features" within the watershed.

Table 5-2: Opportunity / Constraints for regional floodplain management – Physical

Physical	
Opportunity / Constraint	**Reference**
Hydraulic conveyance limitations of existing roadway and utility crossings	• Identification of hydraulic limitations as potential target areas for fixes that may reduce areas of flooding and sedimentation
Existing manmade facilities and structures located with the floodplain	• Define existing flood risk from existing facilities/uses within the floodplain
Sediment delivery with flood flows from canyons / mountainous areas	• Excessive sediment delivery causes deposition and will ultimately be deposited at a downstream location with flatter slope • High sediment yields bulk the flood waters and increase depth of flooding
Limited topographic relief/slope that limits hydraulic conveyance in valley areas compared to the canyon and alluvial fans	• Facility sizes will increase further downstream within the watershed because of the reduced slope
Soils/geology primarily alluvial deposits that are highly erodible	• Channel migration routinely occurs • Erosion hazards for development adjacent to channels
Specialized geographic/geomorphic features which include alluvial fans and coastal plains	• Hydraulic conditions are unique and conventional flood management solutions are not applicable
Topographic features result in steep slopes in the mountains/foothills and extremely flat slopes on the valley floors	• Changes in hydraulic conveyance and sediment delivery because of the change in slopes

Regulatory

The existing regulations related to floodplain management/flood control influence the existing level of flood protection provided to the community. Table 5-3 illustrates the opportunity and constraints with floodplain management that are associated with "regulatory" items within the watershed.

Table 5-3: Opportunity / Constraints for regional floodplain management – Regulatory

Regulatory	
Opportunity / Constraint	**Reference**
Two different regional flood control agencies have jurisdiction for different portions of the Coachella Valley (CVWD and RCFCWCD), while there are some areas which are in neither jurisdiction that come under the County	• Comprehensive planning required that reflects the current though process for flood management and the environmental considerations for each of the regional watersheds that will cross over political boundaries
FEMA/NFIP requirements for community floodplain regulations	• NFIP requirements have the most influence on floodplain restrictions
Water quality limitations and restrictions based on the Basin Plan and identified TMDLs	• Water quality restrictions should be implemented as part of the regional planning solution

Land Use

Existing land use and future proposed development should be closely coordinated with the existing mapped flood hazards. Land use restrictions are one of the primary tools for floodplain management in order to reduce flood risks. Table 5-4 illustrates the opportunity and constraints with floodplain management that are associated with "land use features" within the watershed.

Table 5-4: Opportunity / Constraints for regional floodplain management – Land Use

Land Use	
Opportunity/Constraints	**Reference**
Various urban/commercial land use and additional manmade encroachments within the floodplain	• Cost/benefit assessments should be performed to evaluate cost effectiveness of flood control facilities or removing these uses from the floodplain
Limitations of development and land use restrictions within active flood hazard zones	• Modifications to current General Plan modifying land uses so that they are compatible with the floodplain overlay since many locations have development zoned for floodplain areas

Environmental/Biological

Existing biological resources within the floodplain corridor are an important opportunity to integrate into the regional planning as part of the preservation of these resources. However, in addition to an opportunity these resources can represent constraints in the different types of solutions that can be applied for flood mitigation and may result in additional costs. Table 5-5 illustrates the opportunity and constraints with floodplain management that are associated with "environmental/biological" elements within the watershed.

Table 5-5: Opportunity / Constraints for regional floodplain management – Environmental / Biological

Environmental / Biological	
Opportunity/Constraints	**Reference**
Environmental permitting limitations for activities/structures within the floodplain (i.e. endangered species, etc.)	• Additional costs or limitations on the potential solutions available because of environmental regulatory restrictions
Many existing floodplain corridors have special defined ecological preserve or similar designations because of habitat for sensitive species (i.e. CV MSHCP)	• Existing floodplains and streams are valuable biological resources for preservation

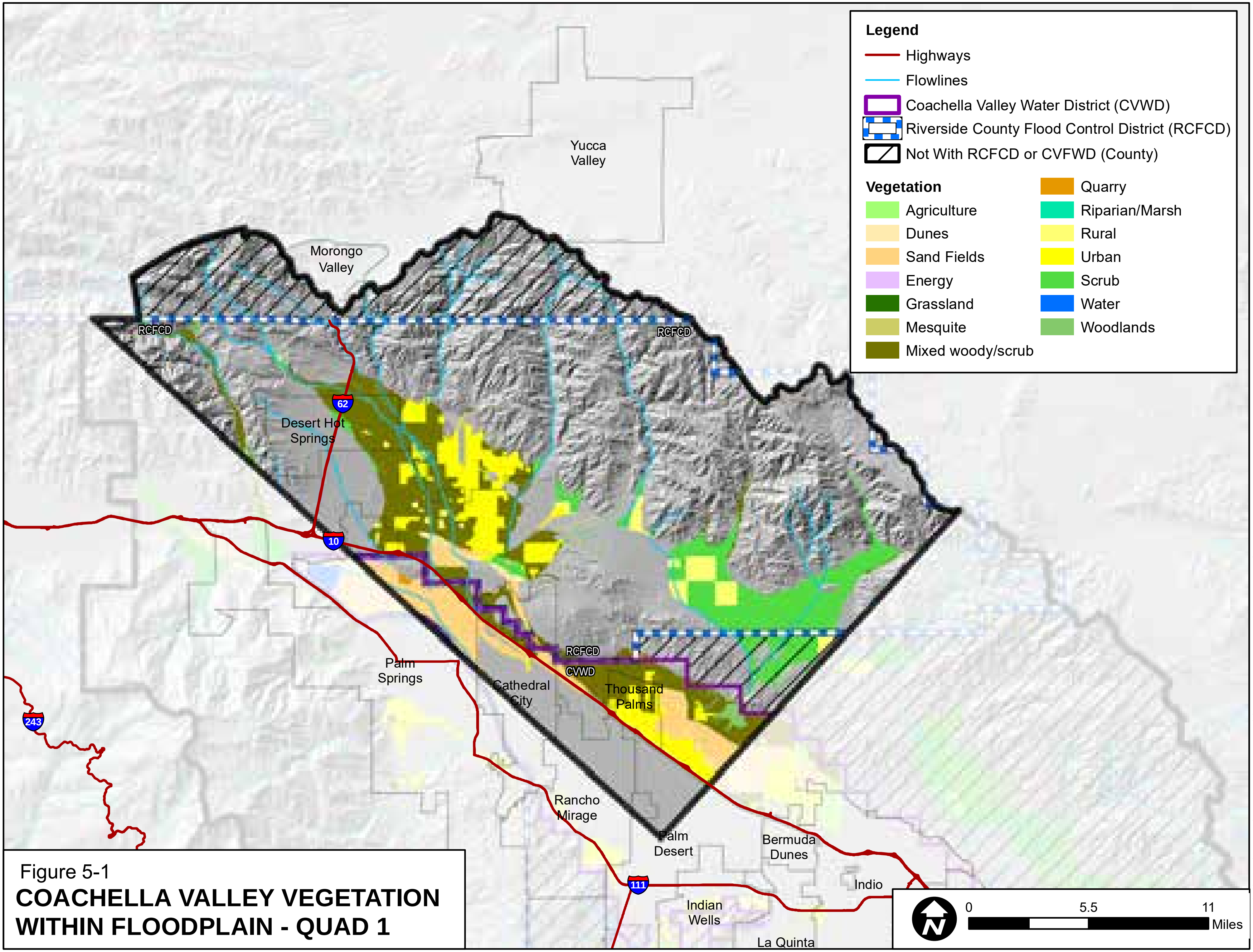

Figure 5-1
COACHELLA VALLEY VEGETATION WITHIN FLOODPLAIN - QUAD 1

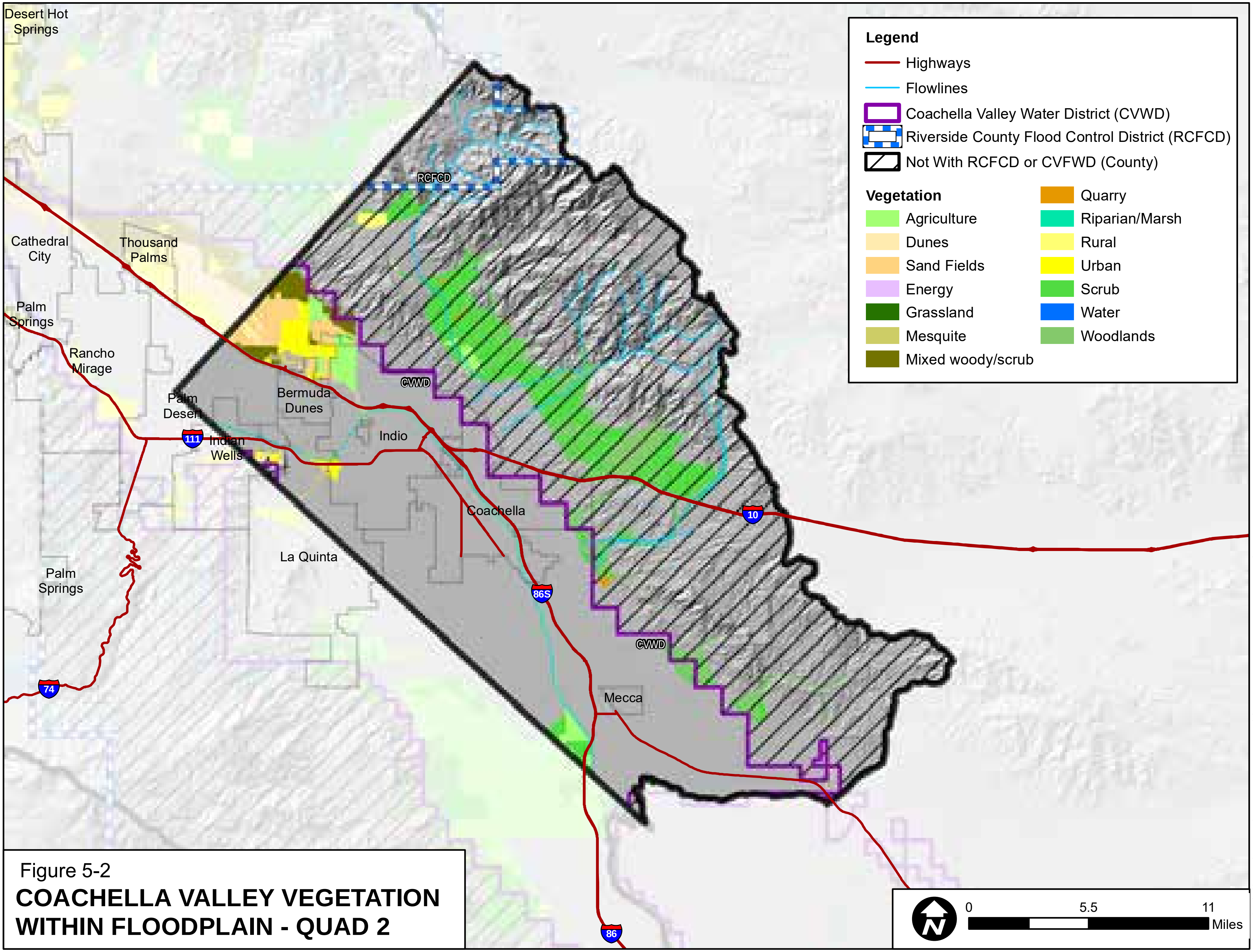

Figure 5-2
COACHELLA VALLEY VEGETATION WITHIN FLOODPLAIN - QUAD 2

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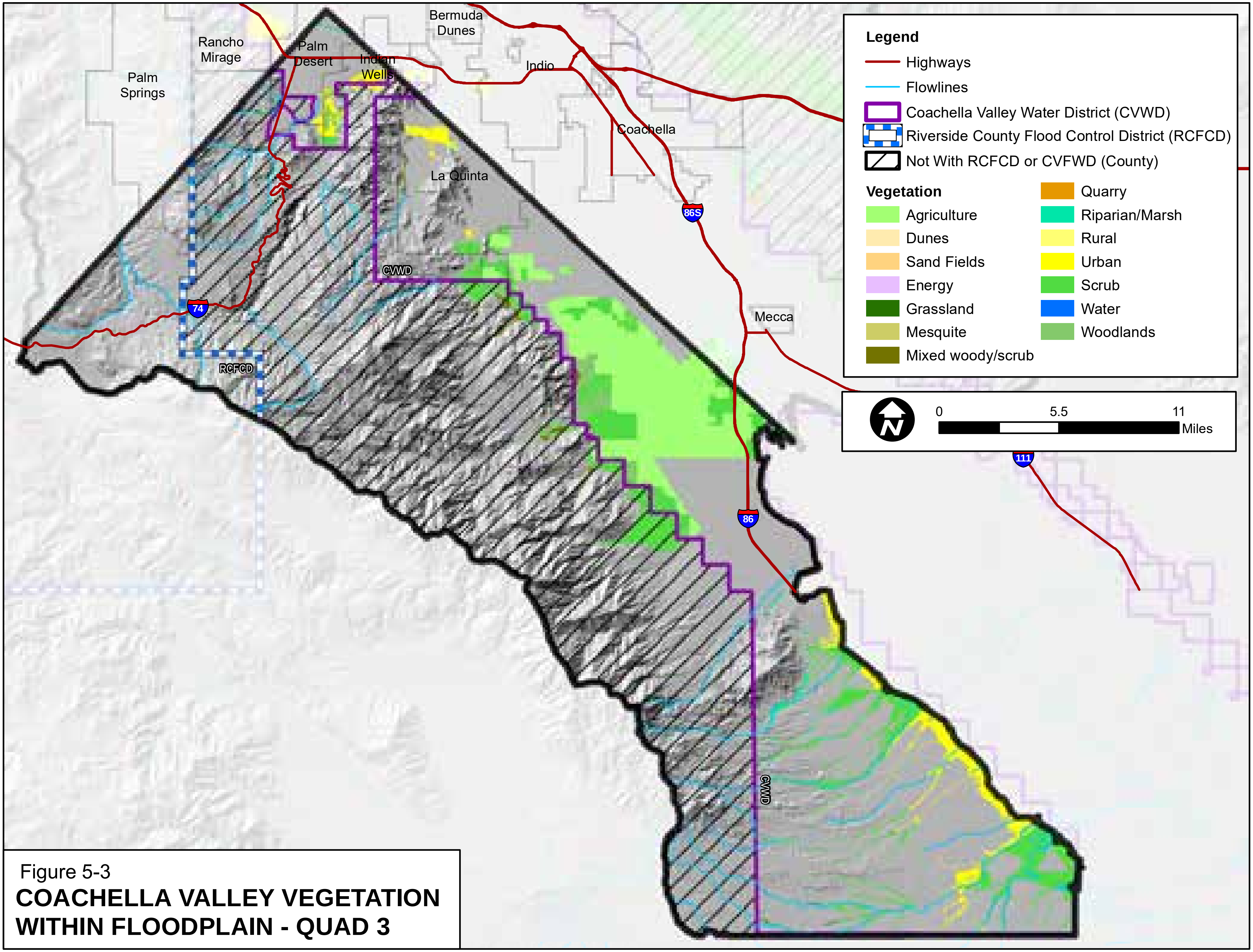

Figure 5-3
COACHELLA VALLEY VEGETATION WITHIN FLOODPLAIN - QUAD 3

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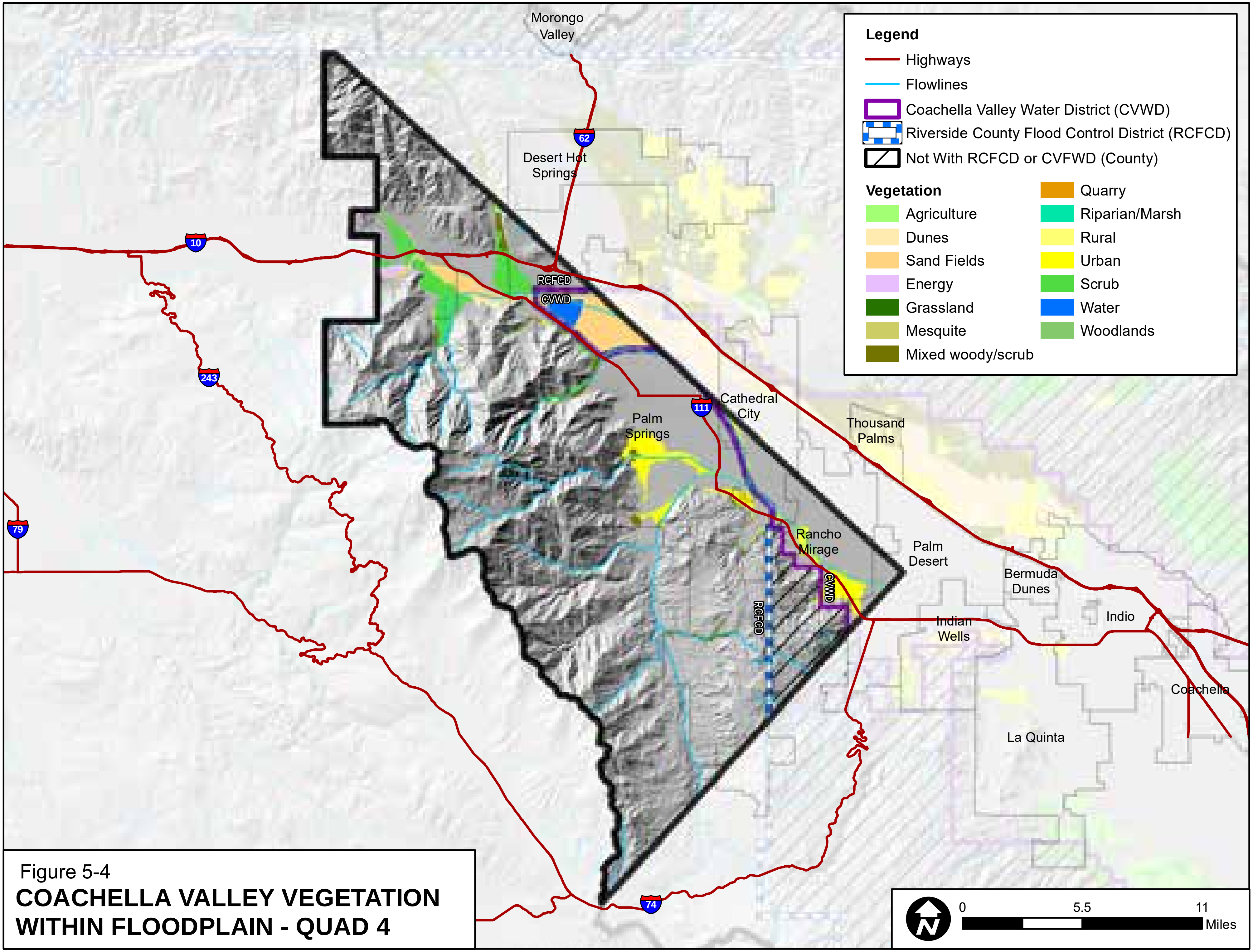

Figure 5-4
COACHELLA VALLEY VEGETATION WITHIN FLOODPLAIN - QUAD 4

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6 Formulation of IFM Strategies

6.1 Global IFM Strategies

IFM includes a broad range of management strategies and can be grouped into four general approaches— (1) Nonstructural Approaches, (2) Restoration of Natural Floodplain Functions, (3) Structural Approaches, and (4) Emergency Management. These approaches and the management actions within them serve as a toolkit of potential actions that local agencies can use to address flood-related issues, and advance IFM throughout the Region's watersheds. These actions range from policy or institutional changes to operational and physical changes to flood infrastructure. Such actions are not specific recommendations for implementation; rather, they serve as a suite of generic management tools that can be used individually or combined for specific application situations. A variety of management actions can be bundled together as part of a single flood management project to provide a multiple benefit outcome related to water resources.

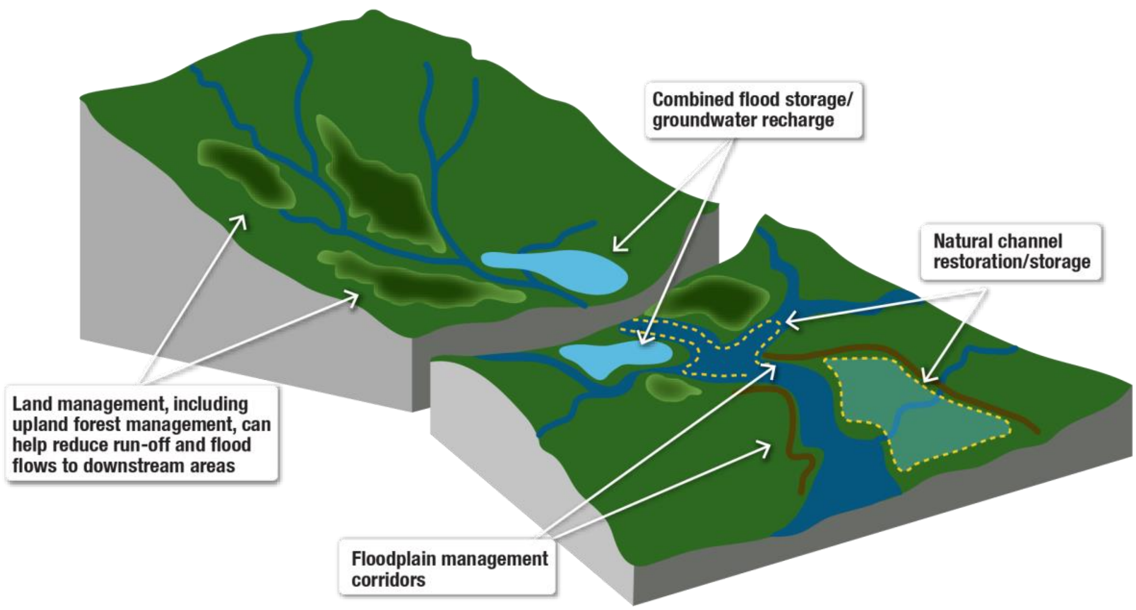


Figure 6-1: Example of IFM strategies applied at different locations on a watershed basis to achieve multiple water resources benefits

6.2 Nonstructural Approaches

6.2.1 Land Use Planning – Floodplain Basis

Land use planning employs policies, ordinances, and regulations to limit development in flood-prone areas and encourages land uses that are compatible with floodplain functions. This can include policies and regulations that restrict or prohibit development within floodplains, restrict size and placement of structures, prevent new development from providing adverse flood impacts to existing structures, encourage reduction of impervious areas, require flood-proofing of buildings, and encourage long-term restoration of streams and floodplains.

6.2.2 Land Use Planning – Watershed Basis

Land use controls on a watershed basis provide the opportunity to assist in controlling the response of the watershed and influence or correct potential problems through non-structural means. In addition, land use planning and regional water management can be coordinated between land management and water management authorities to achieve consistency and maximum benefits. Land use impacts different elements of the watershed including water quantity, water quality, and the processes of erosion/deposition. It is important to understand these linkages between land use and the watershed functions in order to develop collaboration to improve the watershed performance on a regional basis.

6.2.3 Floodplain Management

Floodplain management generally refers to nonstructural actions in floodplains to reduce flood damages and losses. Floodplain management actions include:

- **Floodplain Mapping and Risk Assessment –** Floodplain mapping and risk assessment serve a crucial role in identifying properties that are at a high risk to flooding. Accurate, detailed maps are required to prepare risk assessments, guide development, prepare plans for community economic growth and infrastructure, utilize the natural and beneficial function of floodplains, and protect private and public investments. Development of needed technical information includes topographic data, hydrology, and hydraulics of streams and rivers, delineation of areas subject to inundation, assessment of properties at risk, and calculation of probabilities of various levels of loss from floods.
- **Land Acquisitions and Easements** – Land acquisitions and easements can be used to restore or preserve natural floodplain lands and to reduce the damages from flooding by preventing urban development. Land acquisition involves acquiring full-fee title ownership of lands from a willing buyer and seller. Easements provide limited-use rights to property owned by others. Flood easements, for example, are purchased from a landowner in exchange for perpetual rights to periodically flood the property when necessary or to prohibit planting certain crops that would impede flood flows. Conservation easements can be used to protect agricultural or wildlife habitat lands from urban development. Both land acquisitions and easements generally involve cooperation with willing landowners. Although acquisition of lands or easements can be expensive, they can reduce the need for structural flood improvements that would otherwise be needed to reduce flood risk. Maintaining agricultural uses and/or adding recreational opportunities where appropriate provide long-term economic benefits to communities and the State.
- **Building Codes and Flood-proofing** – Building codes and flood-proofing include specific measures that reduce flood damage and preserve egress routes during high- water events. Building codes are not uniform; they vary across the state based on a variety of factors. Example codes could require flood-proofing measures that increase the resilience of

buildings through structural changes, elevation, or relocation and the use of flood resistant materials.

- **Retreat** – Retreat is the permanent relocation, abandonment, or demolition of buildings and other structures. Retreat can be used in a variety of settings from floodplains to coastal areas. In coastal regions, this action would allow the shoreline to advance inward, unimpeded in areas subject to high coastal flooding risks, high erosion rates, or future sea level rise. Integrating recreation uses into retreat areas along the shoreline provides economic uses for these buffer lands.
- **Flood Risk Awareness (Information and Education)** – Flood risk awareness is critical because it encourages prudent floodplain management. Flood hazard information is a prerequisite for sound education in understanding potential flood risks. If the public and decision makers understand the potential risks, they can make decisions to reduce risk, increase personal safety, and expedite recovery after floods. Effective risk awareness programs are critical to building support for funding initiatives and to building a connection to the watershed.
- **Flood Insurance** – Flood insurance is provided by the Federal government via the NFIP to communities that adopt and enforce an approved floodplain management ordinance to reduce future flood risk. The NFIP enables property owners in participating communities to purchase subsidized insurance as a protection against flood losses. If a community participates in the voluntary Community Rating System and implements certain floodplain management activities, the flood insurance premium rates are discounted to reflect the reduced flood risks

6.2.4 Restoration of Natural Floodplain Functions

This strategy recognizes that periodic flooding of undeveloped lands adjacent to rivers and streams is a natural function and can be a preferred alternative to restricting flood flows to an existing channel. The intent of natural floodplain function restoration is to preserve and/or restore the natural ability of undeveloped floodplains to absorb, hold, and slowly release floodwaters, to enhance ecosystem, and to protect flora and fauna communities. Natural floodplain conservation and restoration actions can include both structural and nonstructural measures. To permit seasonal inundation of undeveloped floodplains, some structural improvements (e.g., weirs) might be needed to constrain flooding within a defined area along with nonstructural measures to limit development and permitted uses within those areas subject to periodic inundation. Actions that support natural floodplain and ecosystem functions include:

- **Promoting Natural Hydrologic, Geomorphic, and Ecological Processes –** Natural hydrologic, geomorphic, and ecological processes are key components of promoting natural floodplain and ecosystem functions**.** Human activities (including infrastructure such as dams, levees, channel stabilization, and bank protection) have modified natural hydrological processes by changing the extent, frequency, and duration of natural floodplain inundation. These changes disrupt natural geomorphic processes such as sediment erosion, transport, and deposition, which normally cause channels to migrate, split, and rejoin downstream. These natural geomorphic processes are important drivers in creating diverse riverine, riparian, and floodplain habitat to support wildlife, and in providing natural storage during flood events. Restoration of these processes might be achieved through setting back levees, restoring channel alignment, removing unnatural hard points within channels, or purchasing lands or easements that are subject to inundation.

- **Protecting and Restoring Quantity, Quality, and Connectivity of Native Floodplain Habitats –** Quantity, quality, and connectivity of native floodplain habitats are critical to promote natural floodplain and ecosystem functions**.** In some areas, native habitat types and their associated floodplain have been lost, fragmented, and degraded. Lack of linear continuity of riverine, riparian habitats, or wildlife corridors, impacts the movement of wildlife species among habitat patches and results in a lack of diversity, population complexity, and viability. This can lead to native fish and wildlife becoming rare, threatened, or endangered. Creation or enhancement of floodplain habitats can be accomplished through setting back levees and expanding channels or bypasses, or through removal of infrastructure that prevents flood flows from entering floodplains.
- **Invasive Species Reduction –** Minimizing invasive species can help address problems for both flood management and ecosystems. Invasive species can reduce the effectiveness of flood management facilities by decreasing channel capacity, increasing rate of sedimentation, and increasing maintenance costs. Nonnative, invasive plant species often can out-compete native plants for light, space, and nutrients, further degrading habitat quality for native fish and wildlife. These changes can supersede natural plant cover, eliminate, or reduce the quality of food sources and shelter for indigenous animal species, and disrupt the food chain. Reductions in the incidence of invasive species can be achieved by defining and prioritizing invasive species of concern, mapping their occurrence, using BMPs for control of invasive species, and using native species for restoration projects.

6.3 Structural Approaches

Structural approaches to flood management include flood infrastructure, reservoir and floodplain storage and operations, and operations and maintenance (O&M).

6.3.1 Flood Infrastructure

Flood infrastructure varies significantly based on the type of flooding. There are many alternative components that can be applied to correct flood control deficiencies. These components can be used individually or in different combinations with other available alternative components. The alternative structural flood control infrastructure solutions that are available to select from for any type of flood control problem are limited to three major categories of solutions from which the individual components will generally fall within one of these categories and include (1) conveyance oriented, (2) storage, and (3) diversion. The major categories of structural solutions can be further expanded to define additional classifications of the primary components which include: (1) flow redirection, (2) structural rigid revetments, (3) other structural techniques, (4) biotechnical techniques, (5) channel geometry, (6) channel alignment, (7) diversion, (8) storage, and (9) other techniques. Flood infrastructure can include:

- **Levees and Floodwalls –** Levees and floodwalls are designed to confine flood flows by containing waters of a stream or lake. Levees are an earthen or rock berm constructed parallel to a stream or shore (or around a lake) to reduce risk from all types of flooding. Levees could be placed close to stream edges, or farther back (e.g., a setback levee). Ring levees could be constructed around a protected area, isolating the area from potential floodwaters. A floodwall is a structural reinforced-concrete wall designed and constructed to hold back floodwaters. Floodwalls have shallow foundations or deep foundations, depending on flood heights and soil conditions. Although Levees and Floodwalls are structural flood management approaches, they are not recommended. Due to strict FEMA regulations and intensive maintenance requirements, other alternatives are preferred within the County of San Diego.
- **Channels and Bypasses –** Channels and bypasses convey floodwaters to reduce the risk of slow rise, flash, and debris- flow flooding. Channels can be modified by deepening and excavating the channel to increase its capacity, or lining the streambed and/or banks with concrete, riprap, or other materials, to increase drainage efficiency. Channel modifications can result in increased erosion downstream and degradation of adjacent wildlife habitat, and often the modifications require extensive permitting. Bypasses are structural features that divert a portion of flood flows onto adjacent lands (or into underground culverts) to provide additional flow-through capacity and/or to store the flows temporarily and slowly release the stored water.
- **Retention and Detention Basins** – Retention and detention basins are used to collect stormwater runoff and slowly release it at a controlled rate so that downstream areas are not flooded or eroded. A detention basin eventually drains all of its water and remains dry between storms. Retention basins have a permanent pool of water and can improve water quality by settling sediments and attached pollutants.
- **Culverts and Pipes** – Culverts and pipes are closed conduits used to drain stormwater runoff. Culverts are used to convey stream-flow through a road embankment or some other type of flow obstruction. Culverts and pipes allow stormwater to drain underground instead of through open channels and bypasses.
- **Streambank Stabilization** –Streambank stabilization protects the banks of streams from erosion by installing different types of bank protection for armoring which include rock riprap, matting, vegetation or other materials to reduce erosion.
- **Debris Mitigation Structures** – For debris and alluvial flooding, debris fences and debris basins separate large debris material from debris flows, or the structures contain debris flows above a protected area. These structures require regular maintenance to periodically remove and dispose of debris after a flood. Deflection berms (or training berms) can be used to deflect a debris flow or debris flood away from a development area, allowing debris to be deposited in an area where it would cause minimal damage.

6.3.2 Floodplain Storage and Operations

Floodplain storage provides an opportunity to regulate flood flows by reducing the magnitude of flood peaks occurring downstream. Floodplain storage occurs when peak flows in a river are diverted to adjacent off-stream areas. Floodplain storage can occur naturally when floodwaters overtop a bank and flow into adjacent lands, or storage can be engineered using weirs, berms, or bypasses to direct flows onto adjacent lands.

- **Groundwater Recharge** – In some areas, opportunities may exist to provide recharge to the aquifer in order to capture surface water sources which would normally discharge to the ocean can enhance the water supplies. In addition, the opportunities for flood storage should be coordinated with recharge opportunities to ensure that these are located where optimum benefits occur, including recharge capabilities.

6.3.3 Operations and Maintenance

Operation and maintenance (O&M) is a crucial component of flood management. O&M activities can include inspection, vegetation management, sediment removal, management of encroachments and penetrations, repair or rehabilitation of structures, or erosion repairs. Because significant flood infrastructure constructed in the early to mid-twentieth century are near or have exceeded the end of their expected service lives, adequate maintenance is critical for this flood infrastructure to continue functioning properly.

6.4 Flood Emergency Management

Flood emergency management includes the following preparedness, response, and recovery activities:

- **Flood Preparedness** – Flood preparedness consists of the development of plans and procedures on how to respond to a flood in advance of a flood emergency, including preparing emergency response plans, training local response personnel, designating evacuation procedures, conducting exercises to assess readiness, and developing emergency response agreements that address issues of liability and responsibility.
- **Emergency Response** – Emergency response is the aggregate of all those actions taken by responsible parties at the time of a flood emergency. Early warning of flood events through flood forecasting allows timely notification of responsible authorities so that plans for evacuation of people and protection of property can be implemented. Emergency response includes flood fighting, emergency evacuation, and sheltering. Response begins with, and might be confined to, affected local agencies or operational areas (counties). Depending upon the intensity of the event and the resources of the responders, response from regional, State, and Federal agencies might be required.
- **Post-Flood Recovery** – Recovery programs and actions include restoring utility services and public facilities, repairing flood facilities, draining flooded areas, removing debris, and assisting individuals, businesses, and communities to protect lives and property. Recovery planning could include development of long- term floodplain reconstruction strategies to determine if reconstruction would be allowed in flood-prone areas, or if any existing structures could be removed feasibly. Such planning should review what building standards would be required, how the permit process for planned reconstruction could be

improved, funding sources to remove existing structures, natural habitat restoration, and how natural floodplains and ecosystem functions could be incorporated.

6.5 Application of Common IFM Strategies

The value of using an IFM approach within the watershed is in the results—improved public safety, enhanced environmental stewardship, and statewide economic stability. Localized, narrowly focused projects are not the best use of public resources and might have negative unintended consequences in nearby regions. The IFM approach can help deliver more benefits at a faster pace using fewer resources than what is possible from single-benefit projects. Table 6-1 provides examples of different recommended IFM strategies that have been utilized effectively throughout the state as background to assist in formulating alternatives within the different watersheds in order to produce high-value multi-benefit projects.

Table 6-1: Examples of applications of different IFM strategies and approaches

1. Increase hydraulic conveyance capacities and remove flow restrictions
2. Provide flood relief structures or bypass system to reduce downstream flows
3. Construct setback levees to preserve natural floodplain vegetation corridor
4. Preservation of natural active washes and floodplain corridors
5. Clearing of debris and snags within channel systems
6. Watershed and floodplain vegetation management plan including current levee requirements
7. Streambank stabilization to reduce sedimentation downstream
8. Update O&M procedures and methods to reflect other functions in the flood management system including ecosystem functions
9. Acquire floodplain areas to reduce flood damages and preserve natural floodplain corridors / ecosystem values
10. Sediment deposition removal projects to enhance hydraulic capacity and maintain fluvial processes
11. Update local flood management plans and coordinate with land use planning
12. Designate additional floodways based on current hydraulic and hydrologic conditions
13. Encourage compatible land use with flood management system and floodplain
14. Mange urban stormwater runoff to natural floodplain to reduce the potential for “hydromodification” impacts including flooding and stream stability
15. Improved accuracy of floodplain mapping/delineation, including urban areas, as well as better assessment of flood risks
16. Increased public information on floodplain hazards through access to floodplain hazard delineation with GIS tools on web based applications
17. Increased awareness and participation of FEMA Community Rating System (CRS) for flood insurance rate adjusting program
18. Identify locations and structures which have repetitive flood damage losses and eliminate
19. Land use planning and decision-making should be based on a more accurate assessment of flood risk from multiple hazards (i.e. influence of wildfires on flooding)
20. Construct new or enlarge existing temporary floodplain storage to attenuate peak flooding downstream
21. Increase flood control allocation by expanding existing or building new off-stream storage.
22. Implement advanced weather- forecast-based operations to increase reservoir management flexibility on a watershed basis such as with the County ALERT Network
23. Manage runoff through watershed management. Runoff from watershed source areas increases, in varying extents, due to increases in impermeable surfaces in developed areas, soil compaction from agriculture, reductions in vegetative cover, incision of stream channels, and losses of wetlands. Runoff flood
24. Remove unnatural hard points in or on the banks of streams (such as bridge abutments, rock revetment,

Table 6-1: Examples of applications of different IFM strategies and approaches

dikes, limitations on channel boundaries, or other physical encroachments into a channel or waterway) can affect the hydraulics of river channels, constraining dynamic natural fluvial geomorphologic processes of erosion.

25. Develop hazardous waste and materials management protocols to identify, contain, and remediate potential water quality hazards within floodplains
26. Operate reservoirs with flood reservation space to more closely approximate natural flow regimes
27. Reduce the incidence of invasive species in flood management systems
28. Remove barriers to fish passage
29. Encourage natural physical geomorphic processes, including channel migration and sediment transport
30. Floodplain and watershed improve the quality, quantity, and connectivity of wetland, riparian, woodland, grassland, and other native habitat communities
31. Develop regional advanced mitigation strategies and promote networks of both public and private mitigation banks to meet the needs of flood and watershed infrastructure projects.
32. An effective and sustainable flood/watershed management system encompass critical habitat and migration corridors through integration of public safety, water supply, and ecosystem function—managing flood infrastructure as a system
33. Coordinate flood response planning and clarify roles and responsibilities of the different flood management agencies/entities related to flood preparedness and emergency response
34. Use Building Code amendments to reduce consequence of flooding
35. Encourage multi- jurisdictional and regional partnerships on flood planning and improve agency coordination on flood management within watersheds to provide system wide planning

7 Coachella Valley IFM Guidance and Recommendations

7.1 Applicable IFM Strategies for Coachella Valley

A more detailed assessment was developed for commonly utilized IFM strategies that are applicable to the desert environment, focusing on the potential uses in the Coachella Valley. The "general approaches" for IFM explained in Chapter 6 were expanded to identify potential strategies for the valley setting. In addition, previously utilized IFM strategies that had been applied successfully throughout the state as well as in other arid areas of the southwest were also used an initial guide for selection. This initial formulation and screening resulted in a variety of the different specific strategies or projects that were generalized or lumped to 24 different general types of strategies or applications that could be utilized for this area (see Table 7-1). A series of fact sheets (see following sections) were developed for the different generalized application in order to assist in the guidance and formulation of specific projects.

Table 7-1: Summary of different recommended general categories of IFM Strategies

IFM Strategy No.	Benefit Category	IFM Approach
1	Water Supply	Increased floodplain infiltration
2	Habitat/Water	Increased Floodplain storage areas
3	Habitat	Setback levee systems from active floodplain
4	Habitat	Preservation of floodplain natural open space
5	Water Supply	Permeable flood control channel lining
6	Water Supply	Infiltration basins
7	Water Supply	Application of LID techniques for watershed development
8	Habitat/Water	Conversion of agriculture areas to increase vegetated floodplain fringe and habitat corridor
9	Policy	Watershed land use planning and regulations
10	Erosion/Quality	Stabilization of eroding earthen/natural channel systems
11	Quality	Urban stormwater quality treatment basins / infiltration
12	Quality	Debris basins
13	Policy	Floodplain land use regulations
14	Water Supply	Retention / detention storage basins
15	Quality	Watershed land erosion stabilization techniques
16	Stability	Hydromodification runoff management techniques
17	Transportation	Channel improvement projects with trails / bikeways
18	Water Supply	Parks with integrated flood storage / infiltration areas
19	Habitat	Floodplain land acquisition
20	Stability	Bridge invert channel stabilization
21	Quality	Agricultural runoff / excess irrigation water quality treatment
22	Water Supply	Recycle agriculture / urban non-stormwater discharges for non-potable water source
23	Policy	Coordination between programs/agencies for water management and flood management planning.
24	Watershed Database	Watershed / floodplain information management and data exchange

7.2 Coachella Valley IFM Strategies Fact Sheets

Strategy Application No. 1 - Increased Floodplain Infiltration Areas / Enhancement

IFM Objectives / Principles:

- Increased channel area
- Enhancement for infiltration
- Peak flow reduction
- Maintain natural hydrologic processes
- Flood volume reduction
- Flood water surface reduction

Description of Representative Actions / Elements:

Adjustment to the active floodplain or flood control channels to allow more infiltration to occur within the channel through different adjustments to the channel geometry / cross section. Enhancements to allow increased infiltration should occur in locations of the watershed which have (1) areas conducive to infiltration with high permeability, (2) located near production aquifers, (3) ensure that there are not any geotechnical barriers that would limit infiltration. Modifications to the floodplain can include (1) widening of the channel to increase the area of infiltration, (2) widening the active portion of the channel through lowering of adjacent overbank areas, (3) creating widened channel bottom that can be configured similar to cul-de-sacs adjacent to the channel bottom but allow surface water to freely communicate, (4) excavating depressions in the channel bottom below the normal channel flow line or invert to allow temporary retention storage enhancing infiltration. Additional enhancements can include construction of small low-height berms to create in-channel storage basins. In addition, other modifications of the channel to slow floodwaters and allow longer period of flow to be in the channel for to capture water through infiltration.

Potential Benefits:

- Enhanced groundwater supplies
- New water source
- Habitat enhancement and increased corridor
- Widened active floodplain areas

Strategy Application No. 2 - Enhanced Floodplain Storage Areas

IFM Objectives / Principles:

- Floodplain preservation
- Peak flow reduction
- Flooding reduction
- Maintain natural hydrologic processes

Description of Representative Actions / Elements:

Creative use of the floodplain to provide temporary in-channel storage to reduce peak flow rates downstream. The identification of potential flood storage within the floodplain involves integrating wetland and floodplain natural and beneficial functions into floodplain management planning. Integrate the protection and restoration of floodplain and wetland natural and beneficial functions into comprehensive land use planning, watershed planning, and floodplain management planning effort. Protection of floodplain and wetland vegetation to erosion is particularly important for high velocity areas

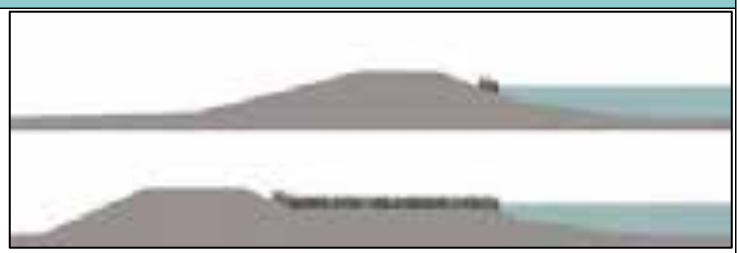
Potential Benefits:

- Enhanced groundwater supplies
- New water source
- Habitat enhancement and increased corridor

Strategy Application No. 3 - Setback Levee System from Active Channel / Floodplain

IFM Objectives / Principles:

- Increase floodplain reserved area
- Floodplain land acquisition
- Managed/restricted floodplain land use
- Flooding reduction and lower levels
- Larger vegetation corridor/habitat
- Flood storage
- Increased potential infiltration areas
- Maintain natural hydrologic processes



Description of Representative Actions / Elements:

Effective management of adjacent floodplain land use to increase floodplain areas through land acquisition to convert adjacent agricultural or undeveloped lands to floodplain. Structural levee systems can be constructed away from the active floodplain so the active channel has the ability to migrate and perform the natural hydrologic functions. The widened floodplain with these larger overbank areas will provide increased flood conveyance and flood water level reduction or confinement of the floodwaters. Creative use natural vegetative corridors in the new overbank areas acquired from farm lands which will also provide temporary in-channel storage to reduce peak flow rates downstream. Allows for the creation of additional habitat and wetlands or natural water quality treatment systems in the floodplain fringe or overbank area. There is the potential to continue to allow farming on the inboard side of the levees with the understanding that there is the potential for flooding and loss of the crop.

Potential Benefits:

- Enhanced groundwater supplies
- Habitat enhancement and increased corridor
- Land use planning
- Flood damage reduction of existing agricultural losses
- Increased floodplain flow capacity

Strategy Application No. 4 – Preservation Floodplain Open Space Habitat Corridor / Vegetation Buffer

IFM Objectives / Principles:

- Vegetation buffer
- Habitat preservation
- Stream corridor stabilization
- Floodplain management
- Land use planning

Description of Representative Actions / Elements:

Wetlands and floodplain vegetation can provide a hydrologic buffer to the watershed response through reduced velocity and increased time of watershed. The watershed vegetation can buffer the intensity of rainfall events and the corresponding watershed response which will reduce the flooding downstream. The preservation of natural vegetation reduced water flow connectivity by interrupting surface flows of water, for example, by water storage or planting buffer strips of grass or trees.

Potential Benefits:

- Reduction of streambank/streambed erosion through natural protection
- Enhanced wildlife habitat benefits
- Natural water quality biological uptake benefits

Strategy Application No. 5 - Permeable Flood Control Channel Lining / Replacement Impermeable Lining

IFM Objectives / Principles:

- Flood volume reduction
- Hydromodification
- Maintain natural hydrologic processes
- Increased groundwater infiltration
- Enhance groundwater supplies

Description of Representative Actions / Elements:

Utilize channel permeable type of channel linings for the channel invert systems to allow infiltration for groundwater recharge and potential treatment or capture of urban dry-weather flows.

Potential Benefits:

- Enhanced groundwater supplies
- New water source
- Enhance channel stability downstream
- Channel habitat enhancement
- Water quality

Strategy Application No. 6 - Infiltration / Groundwater Recharge Basins

IFM Objectives / Principles:

- Groundwater infiltration
- Floodplain preservation
- Peak flow and volume reduction
- Flooding reduction
- Maintain natural hydrologic processes
- Water quality treatment

Description of Representative Actions / Elements:

An infiltration basin is a shallow impoundment which is designed to infiltrate stormwater into the soil. This has high pollutant removal efficiency and can also help recharge the ground water, thus increasing base flow to stream systems. Infiltration basins can be challenging to apply on many sites, however, because of soils requirements. Soils and topography are strongly limiting factors when locating infiltration basins. Soils must be significantly permeable to ensure that the practice can infiltrate quickly enough to reduce the potential for clogging, and soils that infiltrate too rapidly may not provide sufficient treatment, creating the potential for ground water contamination. The infiltration rate should range between 0.5 and 3 inches per hour. In addition, the soils should have no greater than 20 percent clay content, and less than 40 percent silt/clay content. Vector control is another item that should be taken into account for the design of infiltration basins. The basins should be located in coordination with the groundwater management agency in order to maximize the benefits to the producing groundwater aquifer. The size and shape can vary from one large basin to multiple, smaller basins throughout a site. Ideally, the basin should avoid disturbance of existing vegetation. The key to promoting infiltration is to provide enough surface area for the volume of runoff to be absorbed. An engineered overflow structure should be provided for the larger storms. Infiltration Basins can be incorporated into new development. Ideally, existing vegetation can be preserved and utilized as the infiltration area. Runoff from adjacent buildings and impervious surfaces can be directed into this area, which will "water" the vegetation, thereby increasing evapotranspiration in addition to encouraging infiltration.

Potential Benefits:

- Flooding reduction
- Reduce downstream erosion
- Hydromodification mitigation
- Enhanced groundwater supplies
- New water source
- Water quality treatment

Strategy Application No. 7 - Application of LID techniques for New Development Projects

IFM Objectives / Principles:

- Water quality
- Land use planning
- Hydrologic cycle modification
- Maintain natural hydrologic processes
- Increase infiltration
- Runoff reduction

Description of Representative Actions / Elements:

LID techniques attempt to mimic a site's predevelopment hydrologic regime, using distributed landscape features and engineered devices such as bioretention, infiltration swales, rain barrels, and permeable pavements to reduce runoff, minimize pollutant discharges, decrease erosion, and maintain base flows of receiving streams. LID focuses on capturing and infiltrating the stormwater into the soil as close as possible to the point at which it hits the ground, thus reducing runoff. It differs from conventional stormwater management approaches, which typically aim to move water away from a site as quickly as possible via impervious surfaces An example of a LID technique is to substitute impervious materials with pervious or porous surfaces that can help reduce surface flow and increase infiltration. There are several types of surface covers that work well for this purpose. Porous cement concrete, porous asphalt concrete, gravel pavers, grass pavers, variations on different types of grids and blocks, and loose aggregate. These pervious surfaces can be used in a variety of areas including driveways, parking stalls, walkways, emergency vehicle access ways, alleys, highway shoulders and other non-high vehicle traffic areas. However, under the right circumstances these surface cover materials can be used, with caution, in roadways and other moderate traffic flow areas. Well-designed parking and roadways can include a mixture of various porosity densities, with the more dense material being located in high traffic areas, and less dense or pervious material located in low traffic areas, or areas where wheel turning is at a minimum (e.g., parking stalls). Pervious surfaces should not be used when the surface grade exceeds 5%.

Potential Benefits:

- Enhanced groundwater supplies
- New water source
- Urban water quality treatment
- Hydromodification mitigation
- Downstream flood reduction
- Reduced drainage system requirements

Strategy Application No. 8 - Conversion of Agriculture/Farmland to Increase Vegetated Floodplain Fringe & Habitat Corridor

IFM Objectives / Principles:

- Floodplain land management
- Floodplain development restrictions
- Increased floodplain conveyance area
- Maintain natural hydrologic processes
- Restoration altered floodplain
- Increase floodplain habitat corridor

Description of Representative Actions / Elements:

Acquisition of properties adjacent to the active river corridor, but are located within the 100-year floodplain or flood hazard area. This can include other land use and structures that are located within flood hazards. In particular, properties should be targeted that have incurred repetitive flood damage losses. Careful planning of the adjacent floodplain fringe lands should be performed with the use of the floodplain hydraulic models to understand the minimum corridor that is required on either side of the existing active river corridor in order to fully contain the flood hazards.

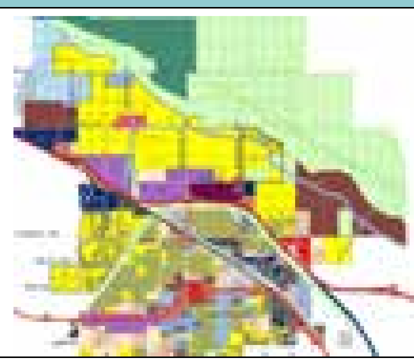
Potential Benefits:

- Habitat enhancement and increased corridor
- Flood damage loss reduction
- Floodplain land use management
- Minimizing flood control structures
- Restoring the natural floodplain processes.

Strategy Application No. 9 – Watershed Land Use Planning and Regulations

IFM Objectives / Principles:

- Land use planning
- LID policies
- Natural resource preservation
- Sustainable development
- Water quality
- Runoff management



Description of Representative Actions / Elements:

Apply core underlying watershed management planning guidelines in developing the proposed strategies and infrastructure for future development. These guidelines would ensure that development (i) mimics existing runoff and infiltration patterns within the project area, (ii) does not exacerbate peak flow rates or water volumes within or downstream of the project area, (iii) maintains the geomorphic structure of the major tributaries within the project area, (iv) maintains coarse sediment yields, storage and transport processes, and (v) uses a variety of strategies and programs to protect water quality. The principles refine the planning framework and identify key physical and biological processes and resources at both the watershed and sub-basin level. The Watershed Planning Principles focus also on the fundamental hydrologic and geomorphic processes of the overall watersheds and of the sub-basins.

These principles can be utilized to guide the initial planning of the development program relative to watershed resources and to minimize impacts thereto through careful planning by integrating the initial baseline technical watershed assessments. Non-structural watershed protection planning principles would include minimization of impervious areas/preservation of open spaces, prioritization of soils for development and infiltration, and establishment of riparian buffer zones. Examples of watershed planning principles that can be used include:

Principle 1 – Recognize and account for the hydrologic response of different terrains at the sub-basin and watershed scale.

Principle 2 – Emulate, to the extent feasible, the existing runoff and infiltration patterns in consideration of specific terrains, soil types and ground cover.

Principle 3 – Address potential effects of future land use changes on hydrology.

Principle 4 – Minimize alterations of the timing of peak flows of each sub-basin relative to the mainstem creeks.

Principle 5 – Maintain and/or restore the inherent geomorphic structure of major tributaries and their floodplains.

Principle 6 – Maintain coarse sediment yields, storage and transport processes.

Principle 7 – Protect water quality by using a variety of strategies, with particular emphasis on natural treatment systems such as water quality wetlands, swales and infiltration areas and application of Best Management Practices within development areas to assure comprehensive water quality treatment prior to the discharge of urban runoff into the floodplain corridor

Potential Benefits:

- Integrated land planning process with watershed functions
- Managed runoff from development and commercial watershed activities
- Maintain natural runoff process
- Minimize long term maintenance costs within floodplain

Strategy Application No.10 – Channel or Streambank Stabilization of Eroding Earthen Channel Systems

IFM Objectives / Principles:

- Sediment control
- Increased floodplain capacity
- Water quality
- Reduce sediment deposition downstream

Description of Representative Actions / Elements:

Channel erosion, with substantial stream incision can be a large contributor of sediment to downstream receiving waters and deposition in portions of channels that reduce flood capacity. In addition, increased sediment transport will baulk the runoff flows in the channel and further diminish the flood conveyance capacity. Watershed based regional studies/investigations of the fluvial processes and watershed sediment yields as well as geomorphic assessments/monitoring can evaluate those critical locations within the watershed that require stabilization. Stream erosion and sedimentation adversely impact water quality beneficial uses of both the stream and the receiving waters, and sediment TMDL. Stabilization of the natural alluvial channel system to eliminate future erosion of the streambed and streambank will assist in critical channel areas as a major sediment source as well as disrupting the loss of vegetative habitat within the floodplain. Detailed streambed stability assessments provide part of the technical support for the evaluation of the benefits of and opportunities for alternative stream stabilization / restoration techniques to ensure that the natural geomorphic and fluvial processes are maintained in balance.

Potential Benefits:

- Minimize maintenance in floodplains
- Reduce long term operations costs
- Reduce apparent peak discharge through reduced sediment bulking
- Reduce loss of land
- Improve recharge in streambed
- Reduce sediment deposition in riverine /estuarine habitat areas

Strategy Application No.11 – Urban Water Quality Treatment Facilities / Infiltration BMPs

IFM Objectives / Principles:

- Water reuse / recycling
- Groundwater recharge
- Natural floodplain protection
- Stream stabilization
- Water quality treatment
- Urban flood management

Description of Representative Actions / Elements:

Management of urban stormwater runoff and the associated water quality as well as increased runoff quantities impacting the natural floodplain corridors which result in a variety of impacts, not just increased flooding. Projects involving the capture of non-stormwater flows provide an opportunity for recycling this water source which was a waste-stream in the past

Potential Benefits:

- Improved water quality and reduce impact to downstream receiving waters
- Restore natural floodplain functions
- Reduce impacts of urban hydromodification

Strategy Application No. 12 - Debris Basins

IFM Objectives / Principles:

- Reducing potential sediment deposits downstream
- Peak flow reduction through reducing flow bulking
- Flooding reduction
- Water Quality
- Groundwater recharge

Description of Representative Actions / Elements:

Debris basins are constructed to treat either the loss of control of runoff and deterioration of water quality, or threats to human life and property. The design of debris basins must be to a standard that they provide immediate protection from flood water, floatable debris, sediment, boulders, and mudflows. They are usually constructed in stream systems with normally high sediment loads. Their purpose is to protect soil and water resources from unacceptable losses or to prevent unacceptable downstream damage. Debris basins must be designed with large vehicle access to the basins so they can be cleaned out periodically. Maintenance is a key factor in effectiveness of this treatment. Debris dams are structures placed across a well-defined channel to form a barrier that impedes the stream flow. The dams also form a basin that provides storage for deposits of detritus and floating debris. Debris dams and basins are used at sites that convey heavy debris loads where it is economically impracticable to provide a culvert large enough to convey the surges of debris. They are also used to trap heavy boulders or coarse gravel that would clog culverts, especially on low fills. In some locations, debris dams have been built to provide the added benefit of ground water recharge resulting from ponded water. An outlet structure should be provided to drain the floodwater temporarily stored behind the structure. The structure could be either a closed conduit consisting of a culvert with a riser set above the expected level of the debris deposit or an open channel acting as a weir structure. The design of the structure will have an influence on the design volume of the basin and embankment height. In general, an outlet structure designed to convey more of the runoff volume will reduce the design volume of the basin and lower the embankment height, but the cost of the structure will increase. Therefore, several different types and sizes of the outlet structure should be considered in the design of the structure to optimize the total cost of the debris dam

Potential Benefits:

- Enhanced groundwater supplies
- New water source
- Habitat enhancement and increased corridor

Strategy Application No. 13- Floodplain Management Land Use Regulations

IFM Objectives / Principles:

- Integrated land use planning
- Natural floodplain corridor preservation
- Sediment management / stream stability
- Natural streambed groundwater recharge

Description of Representative Actions / Elements: Facilitating improved alignment and coordination between land use and flood management would result in better understanding of flood risk and potential impacts to proposed developments, as well as improved decision making. Specifically, flood risk information has the potential to influence land use policy decisions related to developing and expanding communities within a floodplain, which would result in reductions to flood damage claims and long-term O&M costs on projects. At the planning stage, additional measures might be incorporated into the initial proposed projects that could provide community benefits, such as setback areas that act as greenways or trails, and greatly reduce the need to retrofit or replace undersized infrastructure in the future. Too often, regional and land use policymakers realize flood risk and economic losses only after a damaging flood event. Some of the additional actions associated with this item include defining increased floodways to limit development along the floodplain fringe, floodplain retreat through purchase of properties within the floodplain, ensuring that different land uses are compatible with the floodplain risks.
Potential Multiple Water Resource Benefits: • Reduction in flood damage subsidies to chronic flood locations

Strategy Application No. 14 – Multi-Function Retention / Detention Basin with Groundwater Recharge	
IFM Objectives / Principles: • Flood reduction • Groundwater recharge • Stormwater recycling / alternative water source	
Description of Representative Actions / Elements: Regional watershed evaluation and planning to provide flood peak flow attenuation through either off-channel or adjacent in-channel temporary flood volume storage. The reduction in peak flow rates will minimize downstream flooding in addition the stored flood runoff volumes can be recharged into the aquifer to enhance groundwater supplies. Coordination with groundwater management agencies should be performed on a watershed basis to determine the optimum location to ensure that maximum recharge can be provided to the aquifer since different areas of the watershed may not provide any benefit to groundwater supplies. Coordination of both groundwater and flood benefits is necessary as part of advance planning with multiple agencies. In addition, floodplain enlargement can result in increased habitat corridors as well as the in-channel flood storage capabilities.	
Potential Benefits: • Reduced flooding downstream • Stormwater recycling and additional water source capture	

Strategy Application No. 15 – Watershed Sediment Control / Surface Erosion Control / Stabilization Management Techniques

IFM Objectives / Principles:

- Land use planning
- Development sustainability
- Water quality enhancement

Description of Representative Actions / Elements:

Soil is considered a water pollutant because it can significantly affect water used for public consumption, recreation and habitat. Therefore, the most effective way to control soil erosion is at its source. Erosion control best management practices (BMPs) are required on all land disturbance sites to provide a defense against soil erosion in addition to different commercial activities within the watershed. Watershed planning implementing and requiring different BMPs can be applied as well as the modification of these commercial activities to minimize sediment disturbances. There are also natural areas which may be de-stabilized and be a significant sediment source which require specialized treatments to reduce the amount of sediment production.

Potential Benefits:

- Receiving waters improved water quality
- Reduce flooding through reduced sediment bulking of flows
- Reduction of sediment deposition in undesirable locations within floodplain

Strategy Application No. 16 - Hydromodification Runoff Management Techniques for New Developments

IFM Objectives / Principles:

- Maintain natural hydrologic processes
- Infiltration groundwater supplies
- Flood volume and peak flow reduction
- Land use planning requirements
- Modify hydrologic cycle
- Downstream channel stability
- Prevent downstream channel erosion

Description of Representative Actions / Elements:

Urbanizing watershed can cause an alteration of flow (hydromodification) that increases the volume of runoff and decreases the infiltration of rainwater, an important source of groundwater recharge. Figure 1 shows stormwater discharges in an urban watershed and a pre-urban watershed .The greater volume and increased rate of flow that are associated with urbanization results in degradation of aquatic habitat and increased flood risk. On solution for hydromodification is LID which is an alternative method of land development that seeks to maintain and mimic the natural hydrologic processes by infiltrating, retaining, and slowly releasing stormwater on a site by site basis. LID often begins with careful site planning that considers the location of natural features and incorporates them into the stormwater management plan whenever possible. This may include retaining a wide riparian corridor to allow for natural stream processes, identifying and preserving areas with coarse sediment, protecting locations suitable for groundwater recharge, and considering soil permeability and slope when siting bioretention areas. This approach is generally known as natural resource-based planning. Another solution is instream restoration practices (IRPs) modify the banks and beds of waterways using natural materials to return the stream to a less impacted condition and improves aquatic habitat. IRPs can affect two of the variables associated with hydromodification: the increased quantity of fine sediment (small particle size) and the increased slope (gradient) of streams and rivers. Bank erosion is a natural process, but is accelerated by the effects of hydromodification, which can have multiple negative effects on the aquatic ecosystem and riparian habitat. Intense stormwater flows associated with compacted soil and impervious cover are a major contributor to bank erosion. The rate of erosion varies, depending on existing vegetation type and location, soil composition, and the frequency and intensity of flows.

Potential Benefits:

- Channel stabilization
- Reduced channel erosion
- Maintaining the natural hydrologic process including hydrology quantities prior to urbanization
- Habitat enhancement and increased corridor

Strategy Application No. 17 - Channel Improvement Projects with Public Trails / Bikeways

IFM Objectives / Principles:

- Alternative public transportation
- Enhance circulation patterns
- Multi-use roadway
- Promote health and fitness by providing people the opportunity for active recreation
- promote economic development, specifically at trailhead locations
- Increase user safety by offering dedicated travel routes for pedestrians, bicyclists
- Offer viable and safe transportation alternatives
- Support the protection and preservation of natural resources

Description of Representative Actions / Elements:

The design of a multi-use roadway should be compatible with the maintenance requirements of the channel system and the structural section of the bike roadway should be designed to accommodate the large maintenance vehicles. Specialty features such as gates or bollards may be required to restrict other types of vehicles from access the trail system. The design section, including the width should be based on the AASHTO or Caltrans HDM which also includes the striping and signage.

Potential Benefits:

- Alternative transportation path
- Recreation
- Habitat enhancement and increased corridor

Strategy Application No. 18 - Parks with Integrated Flood Storage / Infiltration Areas

IFM Objectives / Principles:

- Groundwater recharge
- Peak and volume flow reduction
- Water quality treatment
- Maintain natural hydrologic processes

Description of Representative Actions / Elements:

Integrate groundwater recharge and retention of stormwater as part of active park system through the initial planning and layout of the part system so that this objective is an integral part of the overall design. Creative use of the engineered grading and topographic design for the park to ensure that surface drainage paths and storage volume is provided. The identification of potential flood storage within the park requires special planning to ensure that the beneficial functions of the park are still maintained for recreation and to minimize maintenance. The park provides an excellent opportunity to provide education benefits to the general public related to stormwater resources. Three interpretive signs were installed at the park to introduce visitors to LID, the specific functions of the LID elements in the park, and how LID can be used in a variety of development scenarios One of the objectives is to introduce use an alternative to the conventional "pipe and pond" approach to stormwater management - Low Impact Development (LID). LID is an ecologically-based approach to stormwater management that creates a hydrologically functional landscape that generates less surface runoff and less nonpoint pollution, which is especially important for development projects adjacent to sensitive resource areas. Additional recharge elements that can be integrated into the park include rain gardens, porous pavers, and bioretention swales.

Potential Benefits:

- Enhanced groundwater supplies
- New water source
- Urban water quality treatment
- Public education on water resources protection

Strategy Application No. 19 – Floodplain Land Acquisition

IFM Objectives / Principles:

- Floodplain preservation
- Land use managements
- Reduced flood losses

Description of Representative Actions / Elements:

Acquiring properties within the floodplain which are subject to "repetitive losses" is a non-structural adjustments to floodplain management. This is a cost effective method of reducing flood losses and better managing the land use with flood hazard zones. Generally the "fair market value" of the land is limited because of the restricted use within the floodplain. In addition this provides the ability to increase publically controlled areas of the floodplain and potential restore these areas back to the natural floodplain. However, land acquisition programs in urban areas is a complex process and encounter problems because they are seen to infringe on personal rights, adversely affect property values and restrict local tax bases when they lead to demolition of buildings and other structures considered to have historical or architectural value. The acquired land provides the ability to restore natural habitat and develop a habitat corridor within the floodplain, limiting manmade uses within the floodplain.

Potential Benefits:

- Increased public floodplain corridor
- Land use management and restricted uses within the floodplain
- Increased floodplain corridor
- Increased habitat corridor
- Economic flood loss reduction

Strategy Application No. 20 - Bridge/ Channel Invert Stabilization

IFM Objectives / Principles:

- Floodplain preservation
- Creek stabilization
- Erosion reduction
- Water quality
- Peak flow reduction through bulking factor
- Floodplain vegetation preservation

Description of Representative Actions / Elements:

Protection of flood channel structures and roadway bridge crossings from erosion and preventing failures of these structures. Stabilization of the channel invert

Potential Benefits:

- Floodplain structure protection / damage prevention
- Roadway (lifeline) protection
- Channel erosion reduction
- Water quality improvement

Strategy Application No. 21 - Agricultural Runoff Water Quality Treatment
IFM Objectives / Principles: • Water quality treatment 
Description of Representative Actions / Elements: Agricultural runoff and non-stormwater releases from excess irrigation, including "drain water" results in poor water quality. This can result in impaired water quality through high nutrients and salts as a few examples. The runoff and non-stormwater discharges can be treated through a variety of different types of BMPs targets to specific pollutants in the water. These facilities can be integrated into the overall operation and may require more specialized applications to accommodate physical constraints such as elevation differential associated with drain water outfall locations.
Potential Benefits: • Water quality treatment • Achieve water quality objectives and TMDLs • Improve receiving waters • Floodplain habitat and vegetation health

Strategy Application No. 22 - Recycle Agricultural/Urban Non-stormwater Discharge for Non-potable Water
IFM Objectives / Principles: • Water recycling • Secondary water supply • Water treatment • Water quality 
Description of Representative Actions / Elements: Collection, treatment, and reuse of excess agricultural water runoff associated with irrigation and drain water. Excess irrigation water as well as drain water from tile drain systems discharges a water source to the channels that can be recycled as a non-potable water source if the water quality is improved. The same is true of urban non-stormwater or dry-weather discharges can be captured and recycled. Generally, the urban discharges are relatively small and can be captured with infiltration and LID type applications. However, there is the potential in new residential and commercial construction to utilize "grey water" and recycle it for use as a potential irrigation water source for landscaping. The excess agricultural drain water and irrigation flows can be captured and recycled through larger scale natural treatment systems such as wetlands to remove nutrients. However, salt removal is more difficult and cannot be readily removed through natural treatment systems and would require different technologies in an engineered treatment system to achieve the desired pollutant removal.

Potential Benefits:

- Enhanced water supplies
- New water source
- Water quality
- Non-stormwater discharges

Strategy Application No. 23 - Coordination between programs/agencies for water management and flood management planning

IFM Objectives / Principles:

- Communication between agencies within watershed
- Watershed planning guidance / regulations
- Enhanced water supplies
- Water management

Description of Representative Actions / Elements:

Improving coordination between regional water management and flood management planning is a key strategy to increase implementation of IWM projects. Existing planning groups and forums should be utilized to the extent possible. By coordinating water and flood management planning with balanced representation, a common understanding of flood management, water supply, water quality, environmental stewardship, public safety, and economic sustainability factors would be developed. Where possible, policy changes that promote this holistic approach to IWM should be proposed and sponsored (for example, changes to existing IRWM legislation). In addition, coordination in watershed planning process provides the opportunity to optimize the benefits of joint-use regional facilities to maximize water resources as well as flood mitigation benefits.

Potential Benefits:

- Maintaining natural watershed response
- Increased groundwater replenishment
- Reduced flood damage
- Reduction in flood maintenance

Strategy Application No. 24 - Watershed / floodplain information management and data exchange
IFM Objectives / Principles: • Communication between agencies within watershed • Community involvement • Increased watershed monitoring 
Description of Representative Actions / Elements: Improving the watershed database to ensure that different watershed stakeholders have access to the different available information and studies being performed. The sharing and the exchange of data, information, knowledge among experts, general public, policy makers, and floodplain managers in a most transparent manner is essential for comprehensive planning and effective management. Significant studies and mapping information are being performed within the watershed on an individual basis with single users or sole functions, but could become a valuable asset is shared with other users as well as saving significant costs. Fragmentation of data is common and providing a common data repository as well as manager provides the technical foundation for comprehensive planning.
Potential Benefits: • Improved tracking and monitoring of watershed characteristics • Reduction in data acquisition • Enhanced community involvement in watershed, include active participation in data collection

7.3 Defining "Opportunities" for IFM

It is useful to consider the "opportunities" for the implementation of regional and sub-regional facilities utilizing IFM and the associated planning principles. These "opportunities" are watershed or floodplain characteristics which would define the potential suitable application of IFM at a particular location. There are certain watershed characteristics which would make IFM ideal at a particular location such as an area which has high infiltration capabilities above a water producing aquifer. The series of "opportunities" in GIS mapping layers that were considered in the initial development of this planning or screening tool to consider locations for IFM in the watershed included: (1) floodplain areas, (2) highly permeable soils (hydrologic soil type A), (3) groundwater basins, (4) riparian vegetation or sensitive habitat area, and (5) high sediment producing watershed areas. These initial mapping layers were overlaid to determine the locations where multiple occurrences of these five criteria occurred and were considered "opportunities." The more opportunities at a particular location then the more there was the possibility of achieving multiple flood management and water resources benefits. For example, in-stream groundwater recharge locations would be possible at location where there is (1) wide floodplain area, (2) permeable soil, and (3) groundwater basin in order to maximize the benefits to the aquifer. The "opportunity ranking" shown on the following exhibits identifies how many IFM opportunities occur at a particular location. The rankings scale is shown as 1 through 6 which indicates how many opportunities occur at a particular location. For example, a ranking of 4 would indicate that there are four different opportunities which would encourage the use of IFM at this particular location, so it would be very conductive for many different potential IFM strategies.

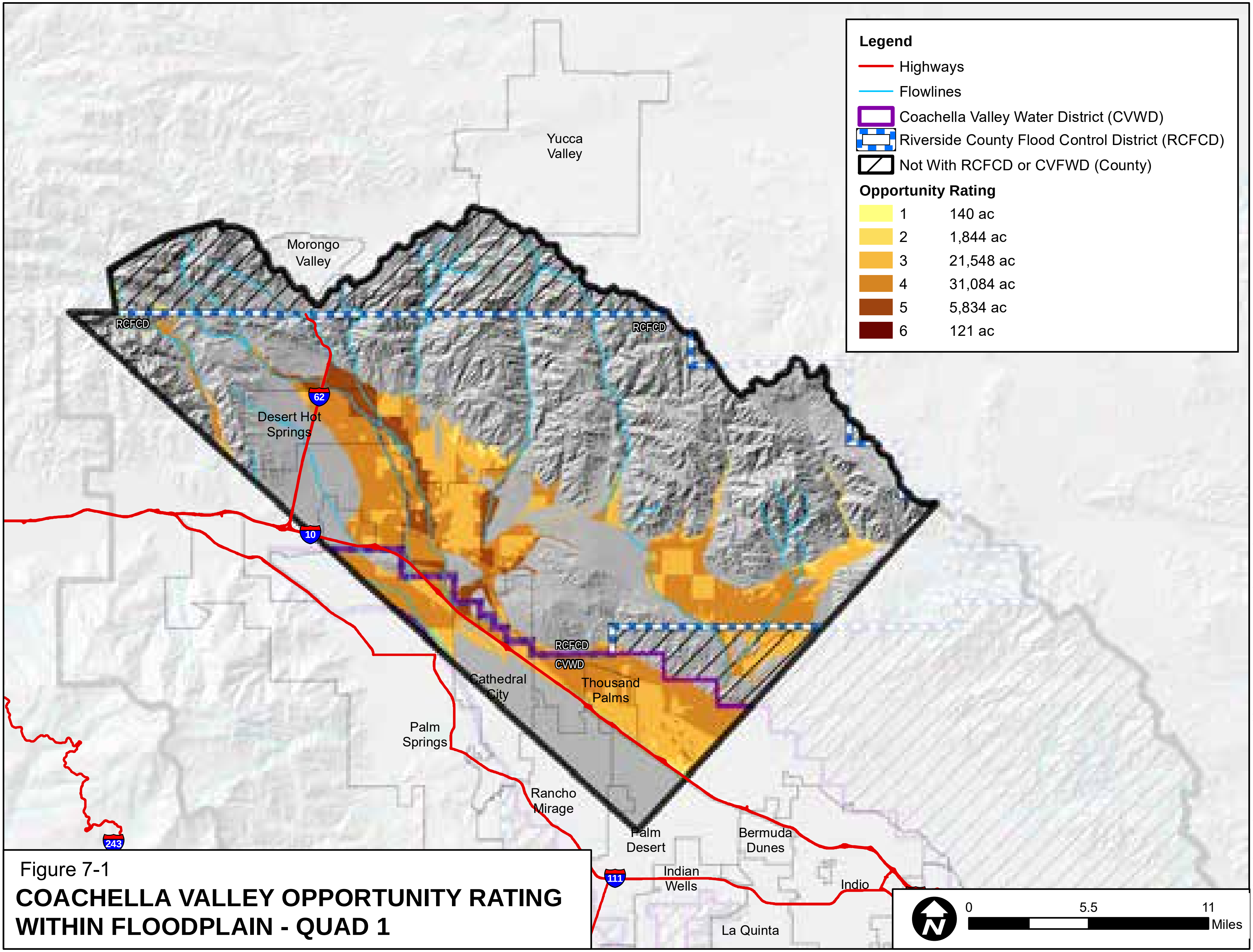


Figure 7-1

COACHELLA VALLEY OPPORTUNITY RATING WITHIN FLOODPLAIN - QUAD 1

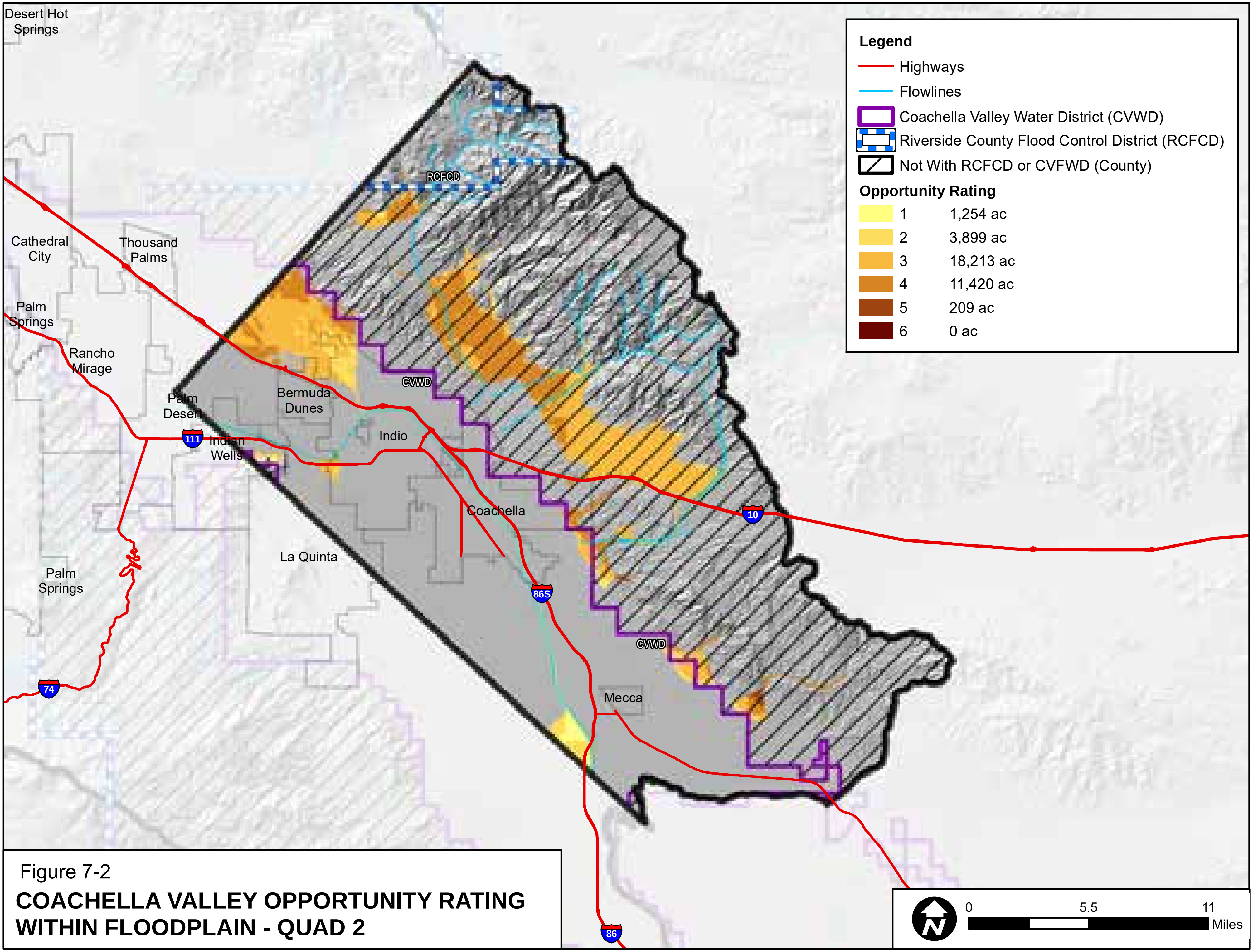


Figure 7-2

COACHELLA VALLEY OPPORTUNITY RATING WITHIN FLOODPLAIN - QUAD 2

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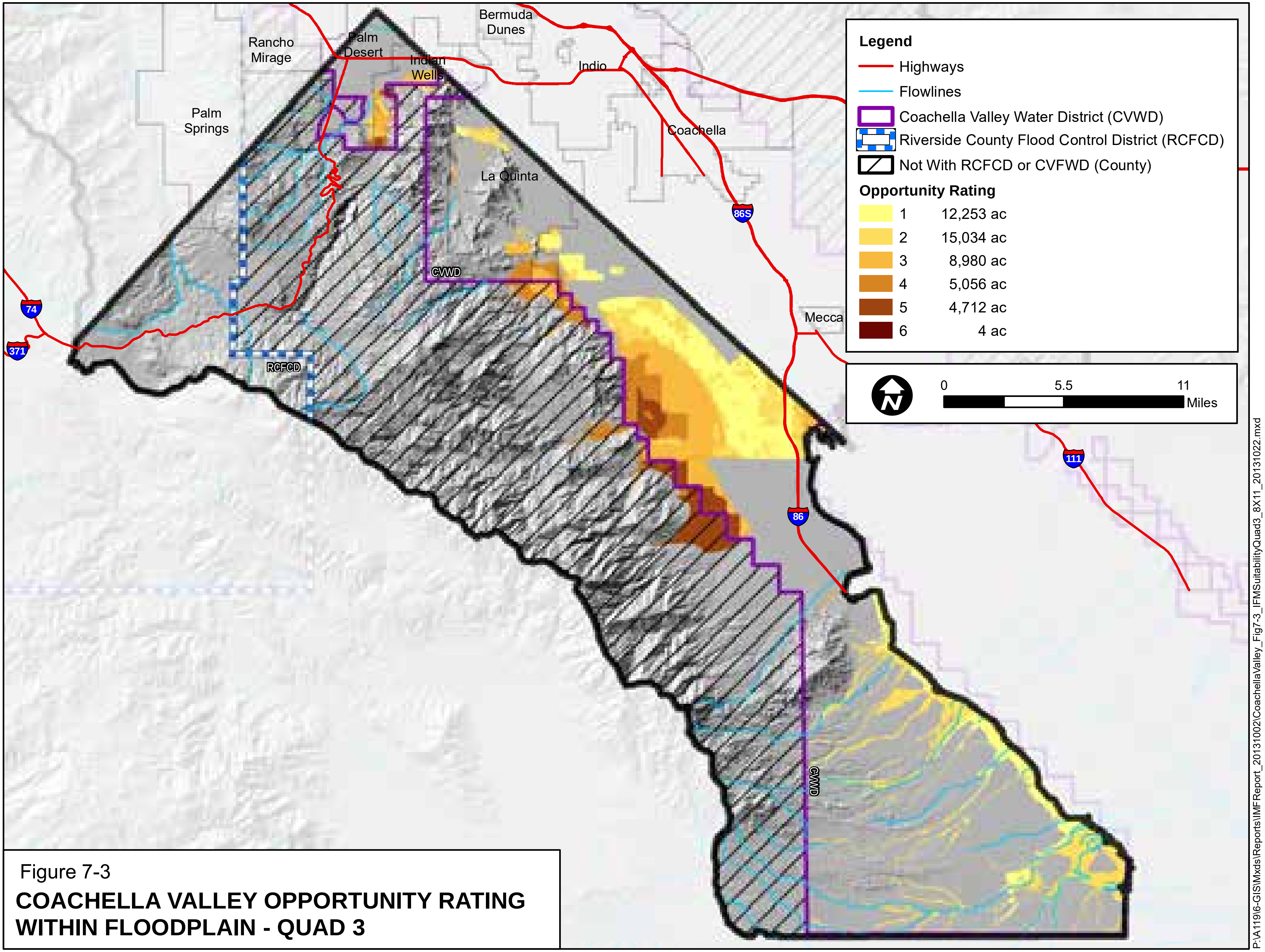

Figure 7-3

COACHELLA VALLEY OPPORTUNITY RATING WITHIN FLOODPLAIN - QUAD 3

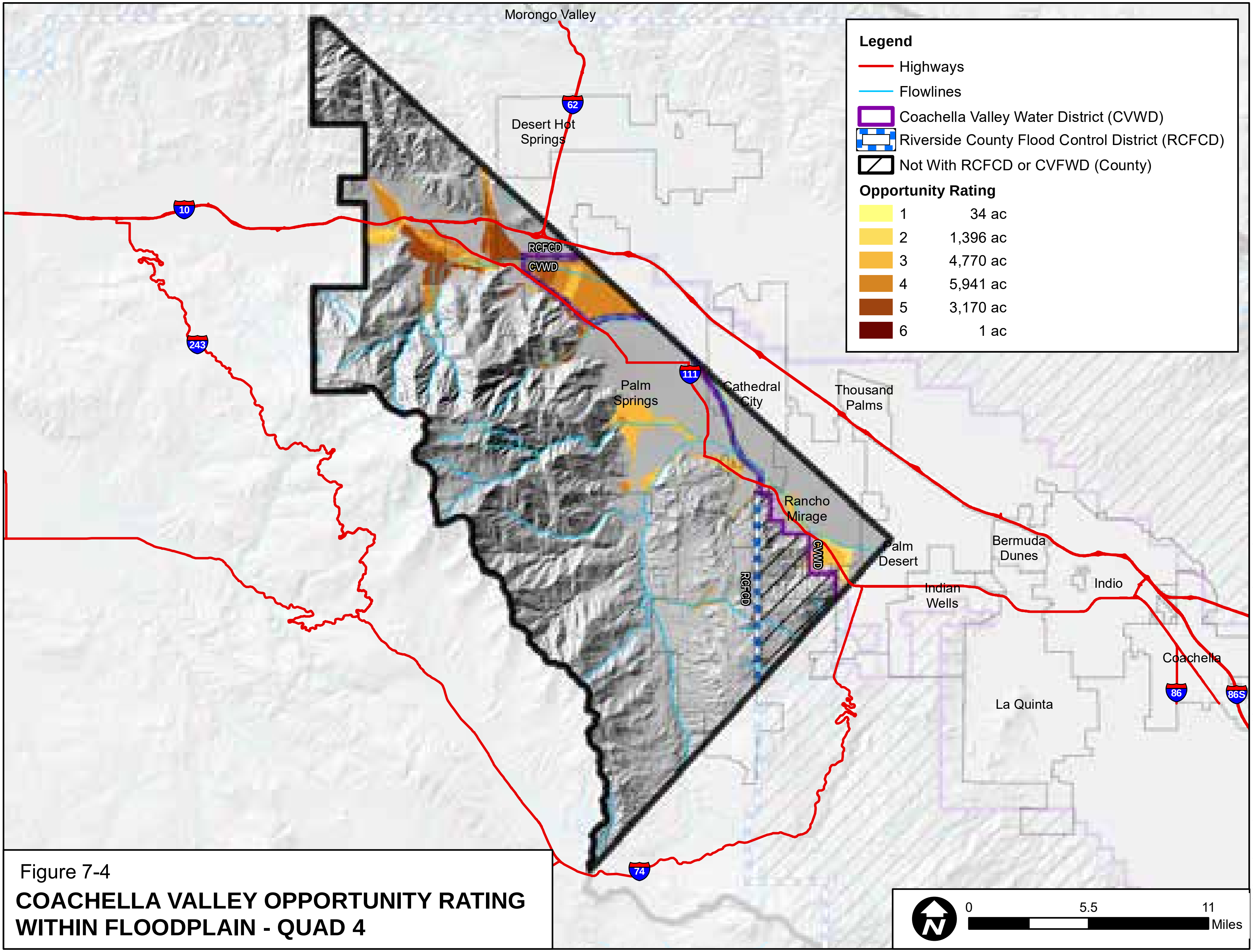

Figure 7-4

COACHELLA VALLEY OPPORTUNITY RATING WITHIN FLOODPLAIN - QUAD 4

7.4 Specialized GIS Mapping Watershed IFM Planning Tool

The actual implementation of different IFM strategies for specific project should ensure that (1) the maximum number of benefits is achieved, (2) optimum location within the watershed to achieve the maximum flood benefits is identified, (3) multiple flood hazard issues are addressed, and (4) the focus on different water resources objectives is achieved. In order to assist in developing these projects on a watershed basis, a watershed planning tool has been developed to define locations within the watershed or floodplain that would potentially be able to utilize a specific type of IFM strategy based on the different characteristics and opportunities. A mapping tool was developed to help identify the locations within the Coachella Valley where the different IFMs could be best applied as an "initial screening tool" in the planning process for IFM.

The planning tool was developed by correlating (1) watershed characteristics, and (2) IFM opportunity mapping to the different general categories of IFM strategies initially defined for the Coachella Valley. This initial screening process is best illustrated in the following figure which shows the overall process for developing the general IFM strategy locations within the Coachella Valley. The process included (1) defining the different benefits from the IFM approach, (2) limiting the IFM strategies to just the desert area, and (3) correlating the watershed characteristics required for a particular IFM strategy. The GIS database is available as well as the hardcopy exhibits so this planning technique can be applied manually through the use of this guidance document.

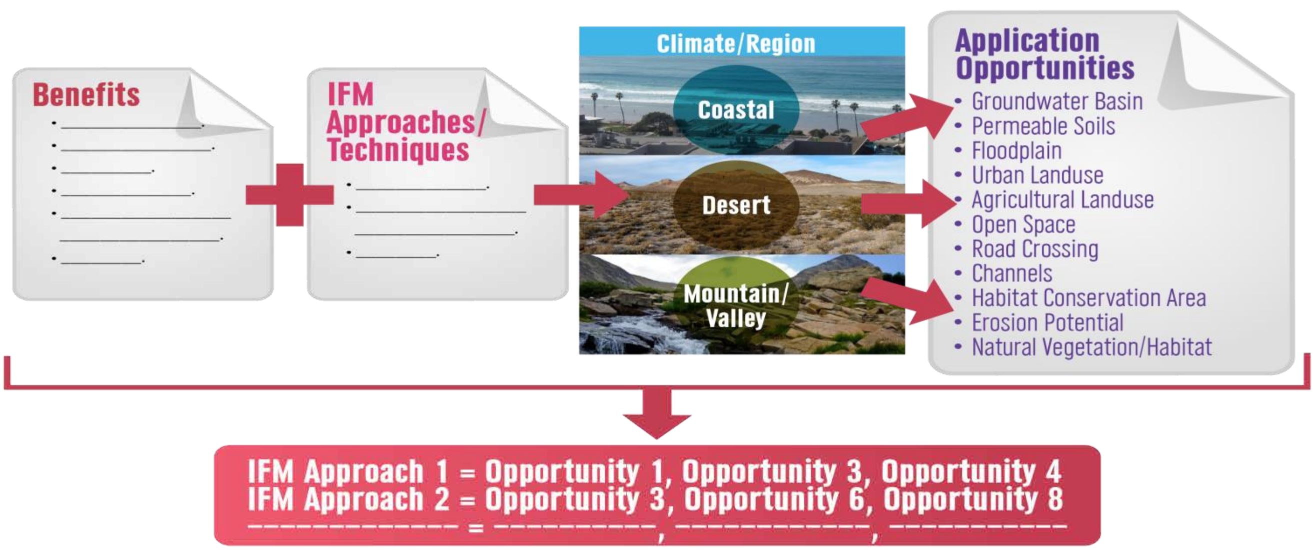

Figure 7-5: Methodology for developing IFM planning tool which correlated watershed characteristics/opportunities to specific IFM strategy requirements

This methodology for the planning tool development utilized 12 different watershed characteristics or opportunities typically associated with different IFM strategies which included: (1) permeable soils, (2) floodplain areas, (3) urban land use, (4) agricultural land use, (5) roadway channel crossing, (6) groundwater basin, (7) natural vegetation / habitat, (8) habitat conservation area, (9) recreation land use, (10) open space land use in floodplains, (11) channels, and (12) high erosion potential. These 12 different opportunities were compared to 22 different IFM approaches identified for the Coachella Valley. (24 IFM strategies have been identified for the Coachella Valley, but that last two were considered policy oriented IFMs so only 22 IFMs were used in the mapping tool).

This guidance/planning tool is intended to be used as background in the initial planning to identify the range of these different types of projects for implementation using multiple IFM strategies within the watershed. However, the intent of this document is not to limit the range of specific strategies. These potential projects depend in part on the lead agency or entity promoting the particular sub-watershed facility plan implementation and many other influential factors such as timing and opportunity. The objective in developing this initial planning tool is to provide as much flexibility as possible in order to allow responding to potential implementation/funding opportunities that may be available in the future that will allow the construction of different facilities. A feature of this planning is to identify feasible alternative regional and sub-regional facility locations based on specific feasibility selection screening criteria. The results of the alternative screening exercise based on feasibility of opportunities does not preclude the use of additional alternative sites in the future, as other different types of opportunities may be presented since the feasibility screening was based on a specific set of criteria. The resulting screening and correlation analyses developed a series of different categories of IFM approaches that required the use of different sets of IFM opportunities which were labeled as an "IFM Category." The following table indicates the results of the analyses as well as Figures 7-6 through 7-21 which represent the final planning tool to assist in the location of the IFM strategies.

Table 7-2: Results of Analysis Correlating IFM Strategy with Watershed Opportunities Generating and IFM Category

IFM No.	Opportunity Combinations	IFM Category
1	1, 2, 6, 11	A
2	2, 4, 7, 8	B
3	2, 4, 7, 8, 11	C
4	2, 4, 7, 8, 11	C
5	1, 2, 6, 10	D
6	1, 3, 6	E
7	3, 9	F
8	2, 4	G
9	3, 4, 9, 11	H
10	10	I
11	3	J
12	10, 12	K
13	2, 3, 4	L
14	3, 4, 9	M
15	3, 4, 7	N
16	3	J
17	5, 10	O
18	3, 9	F
19	2, 3, 4	L
20	5, 10	O
21	4	P
22	3, 4	Q

The GIS IFM watershed planning tool evaluated different types of "opportunities" that define water resource benefits and IFM planning requirements to define the most appropriate locations. There may be other IFM strategies that can be considered that are not in the identified list which allows flexibility in the tool. The list of identified strategies is intended to be complete as possible utilizing the more common approaches, but there is opportunity to expand. In the future, additional screening criteria can be added to the tool as well as additional features such as evaluating the amount of tributary watershed area to assess the potential benefit or understand facility sizing. The tool provides planning level information to assist in evaluating potential IFM features within the watershed to maximize the beneficial water resources use.

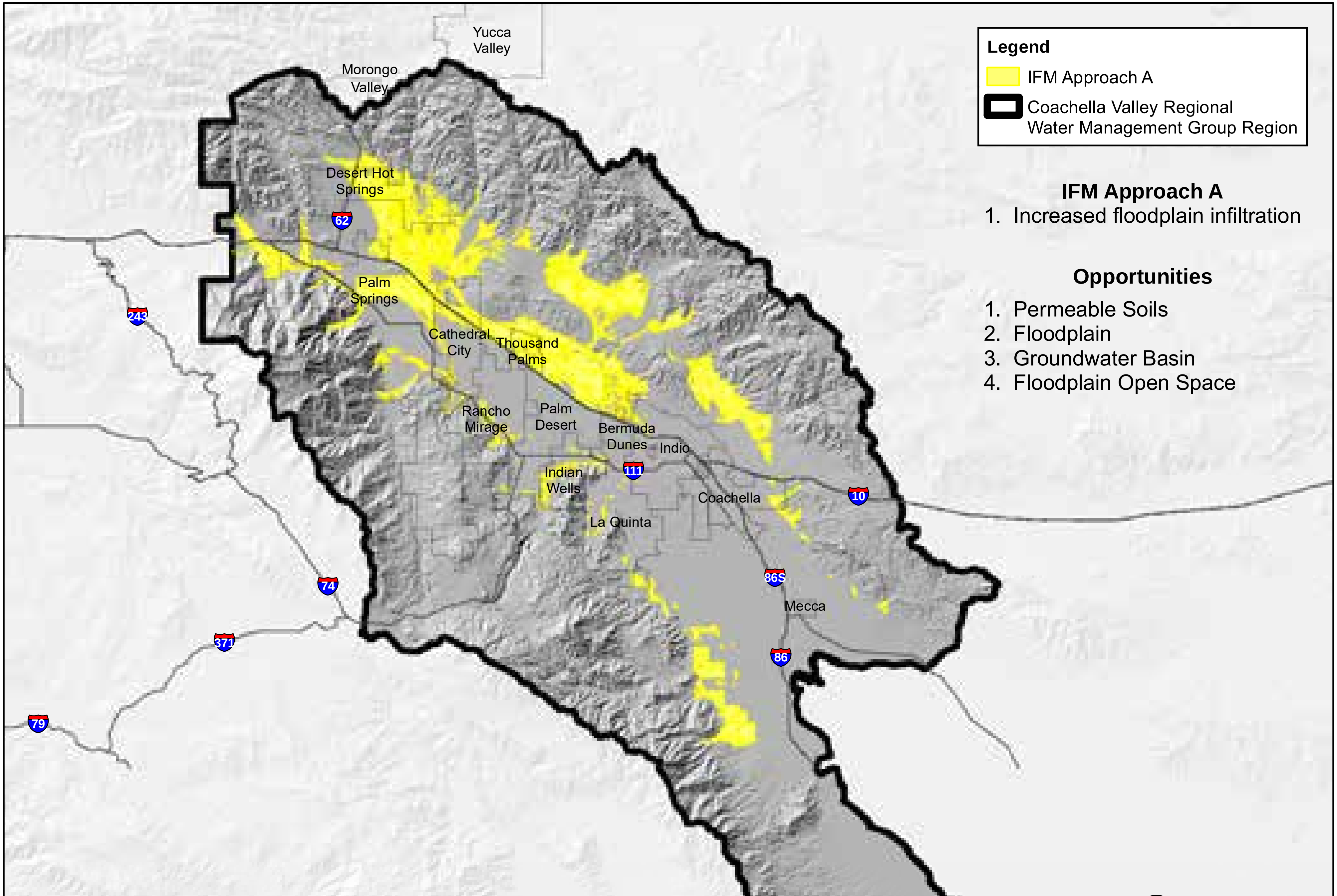

Figure 7-6

COACHELLA VALLEY IFM APPROACH A

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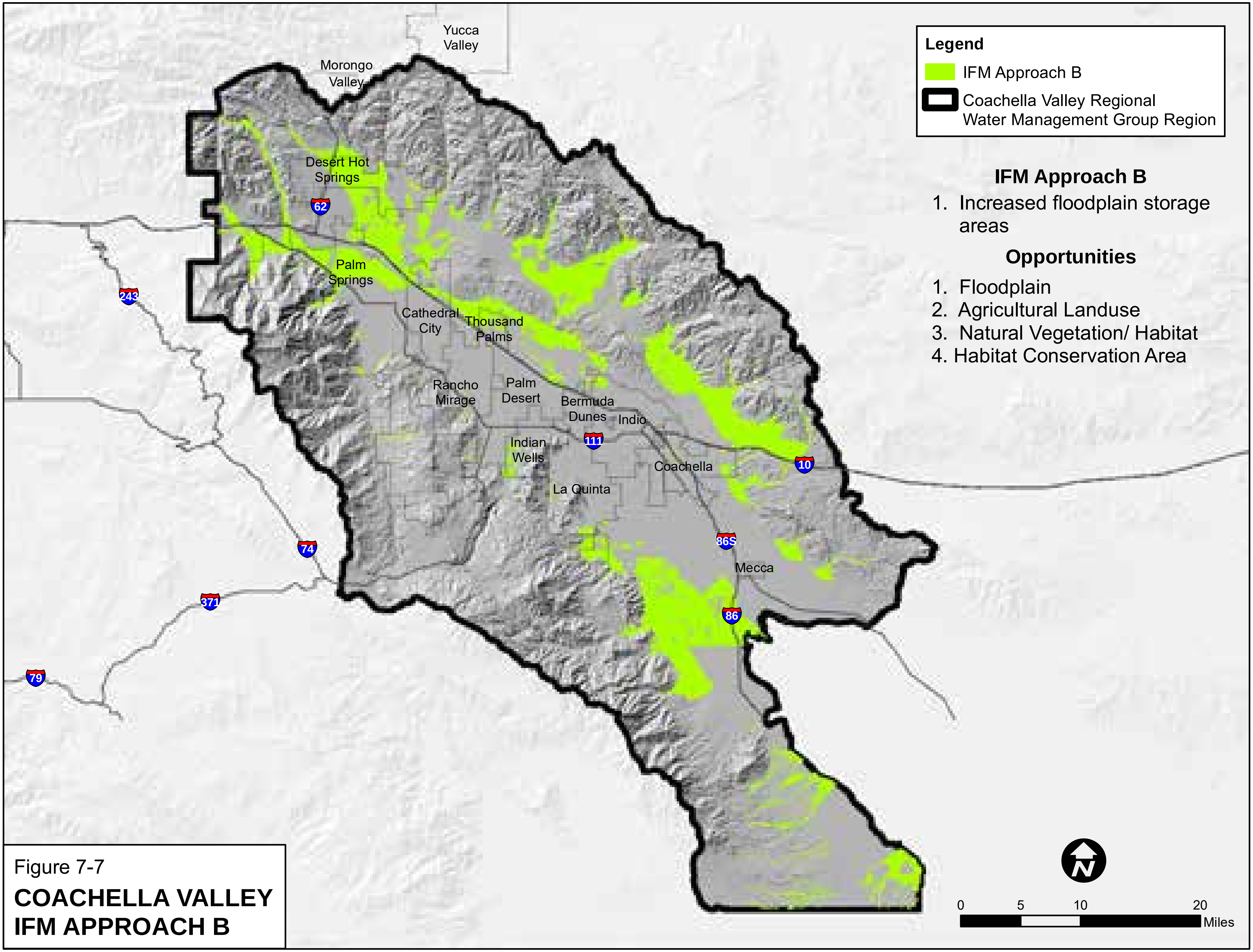

Figure 7-7
COACHELLA VALLEY IFM APPROACH B

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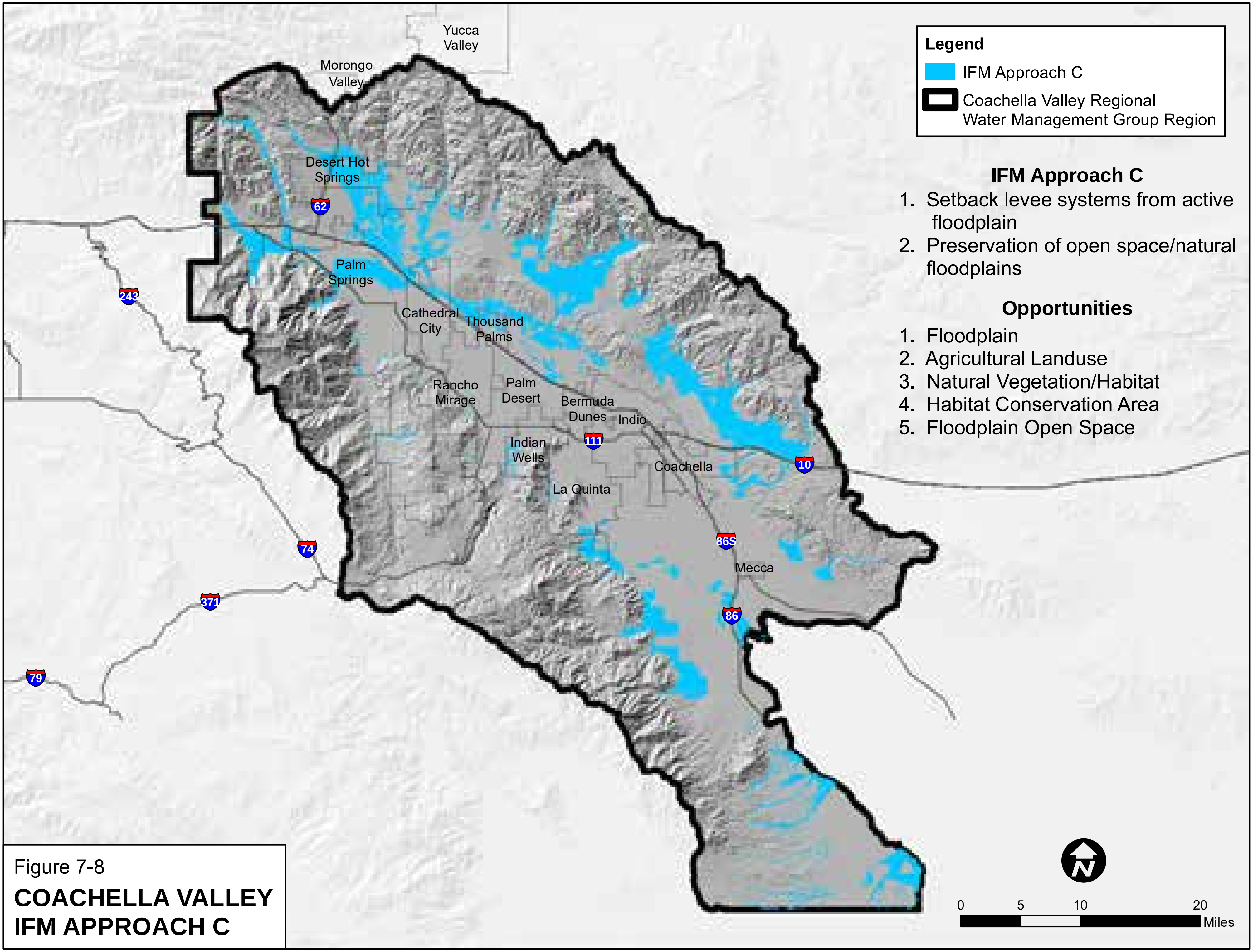

Figure 7-8

COACHELLA VALLEY IFM APPROACH C

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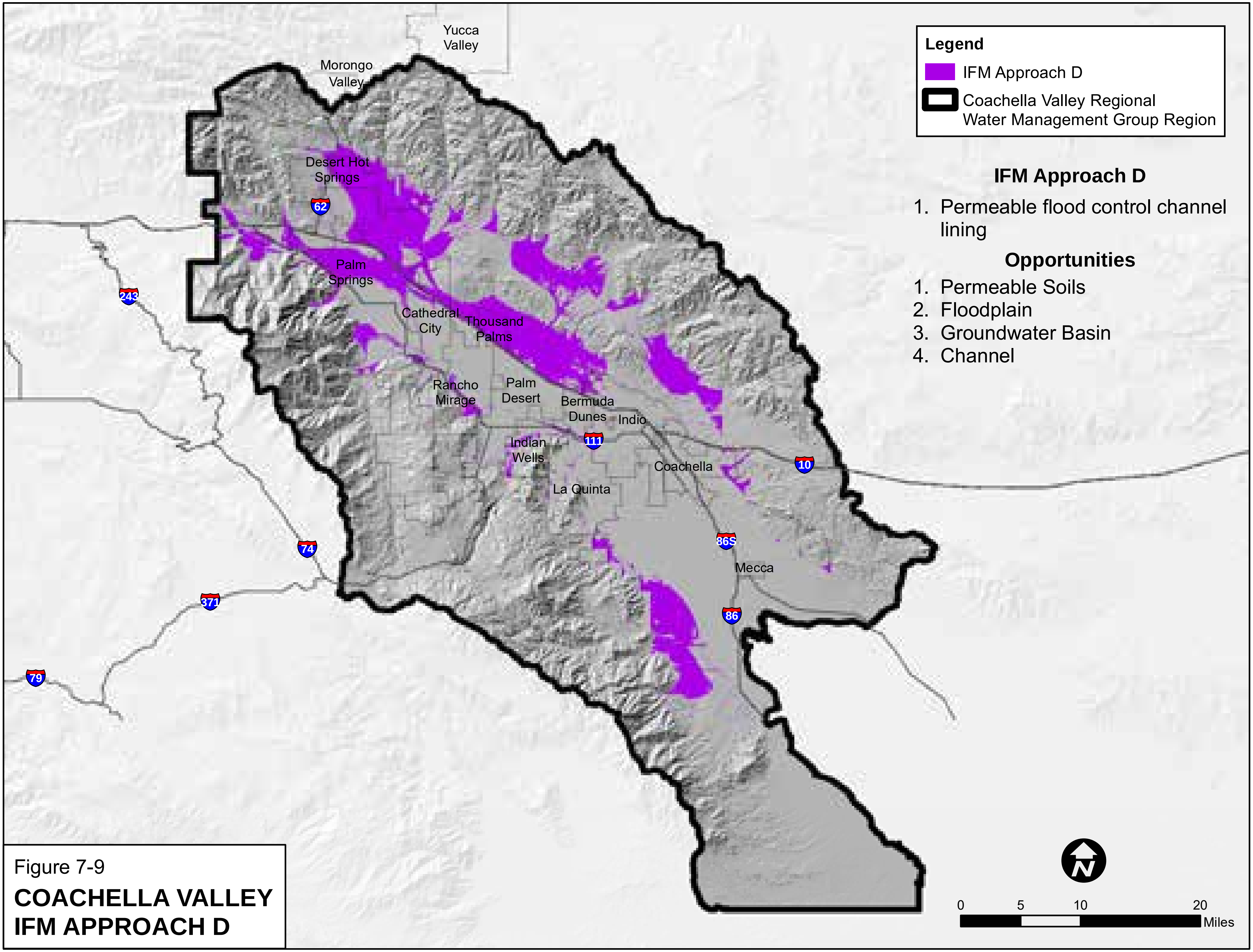

Figure 7-9

COACHELLA VALLEY IFM APPROACH D

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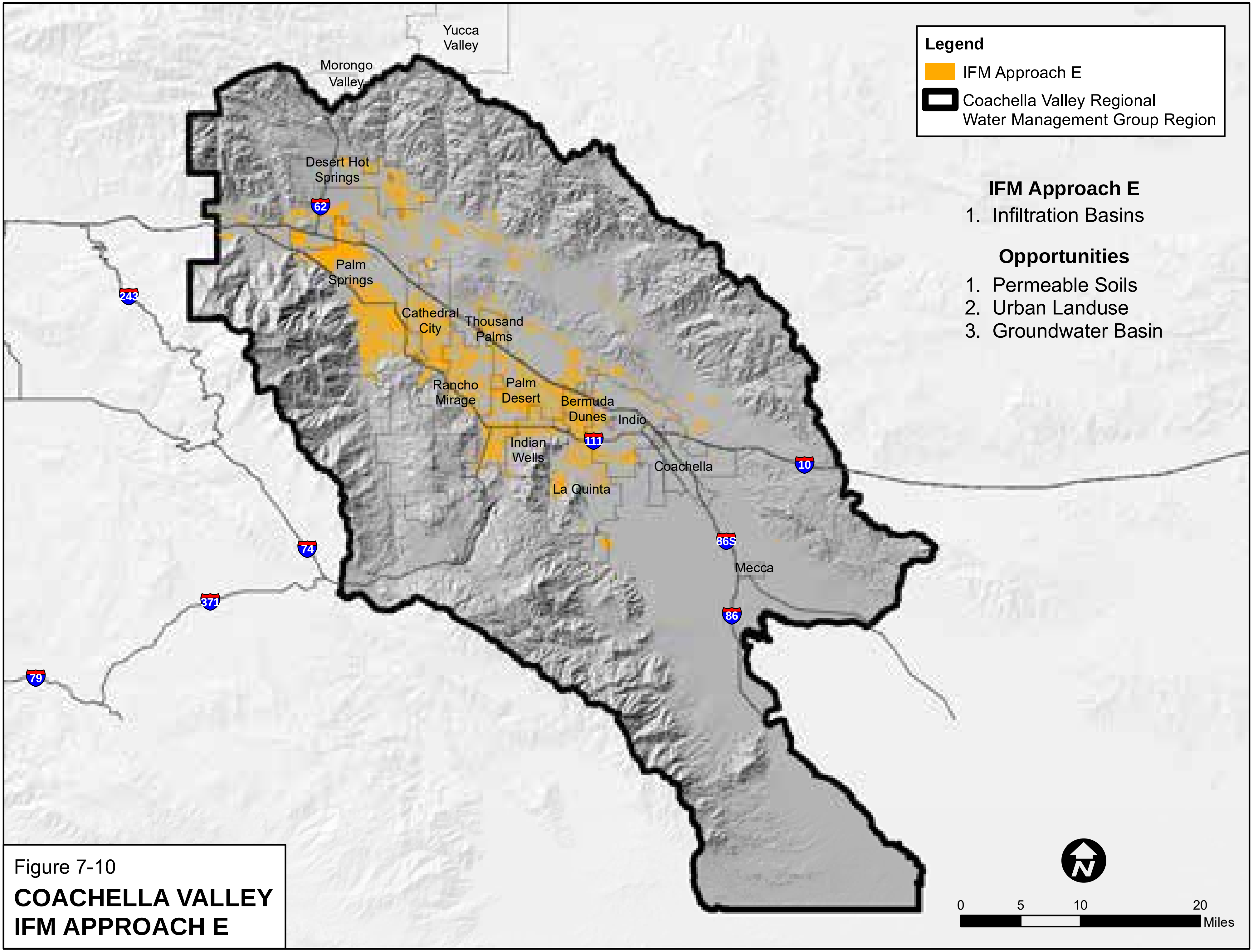

Figure 7-10
COACHELLA VALLEY IFM APPROACH E

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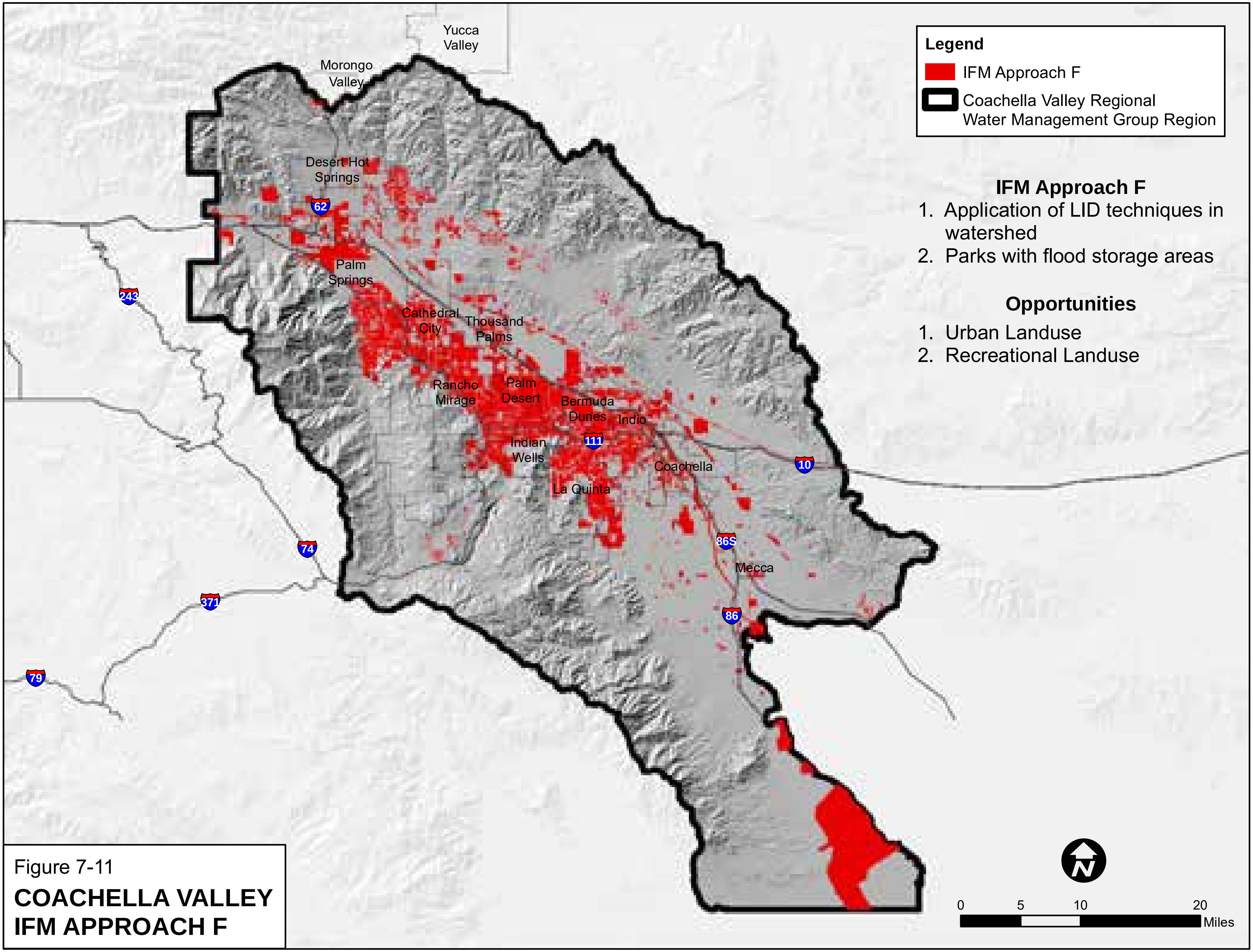

Figure 7-11

COACHELLA VALLEY IFM APPROACH F

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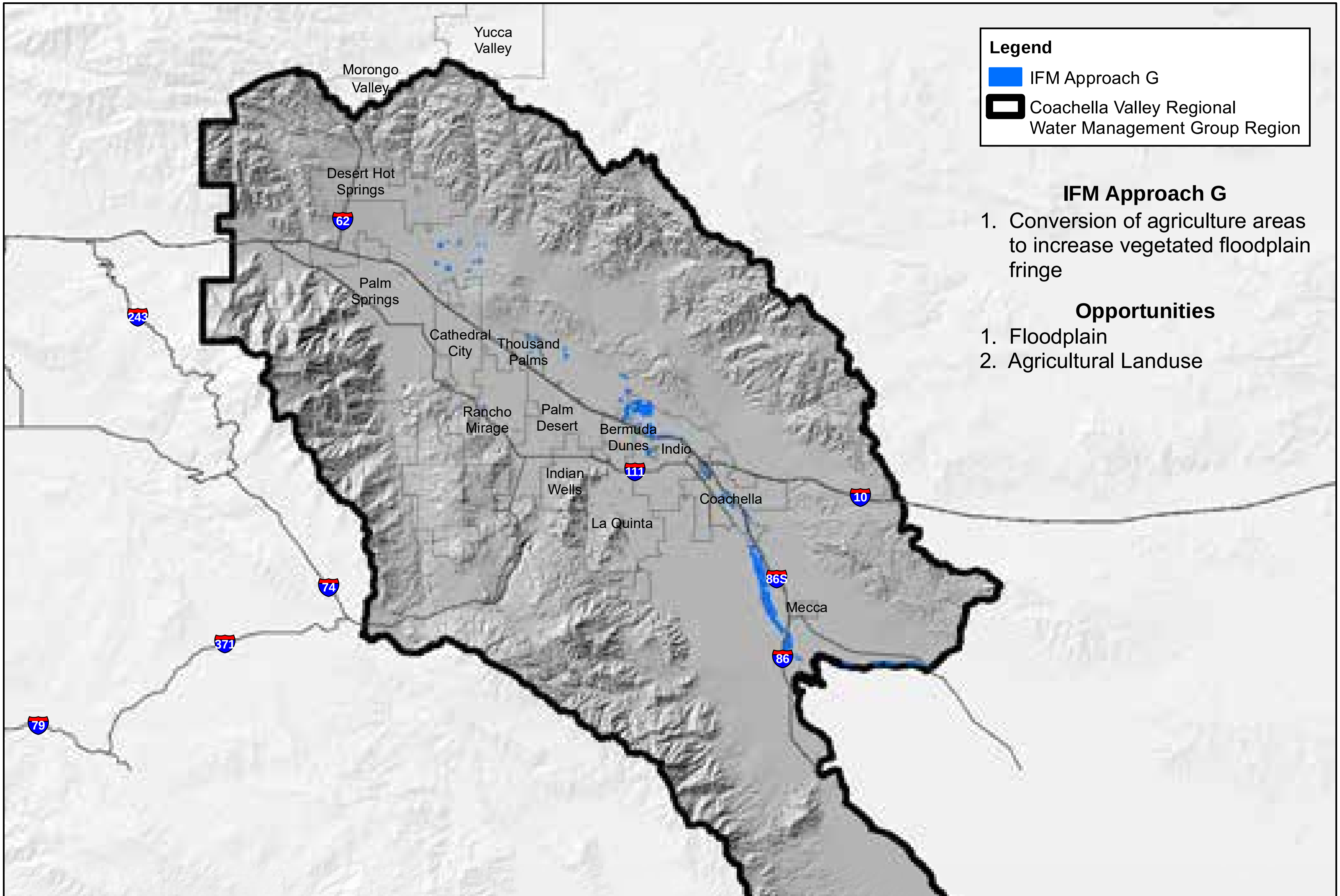

Figure 7-12

COACHELLA VALLEY IFM APPROACH G

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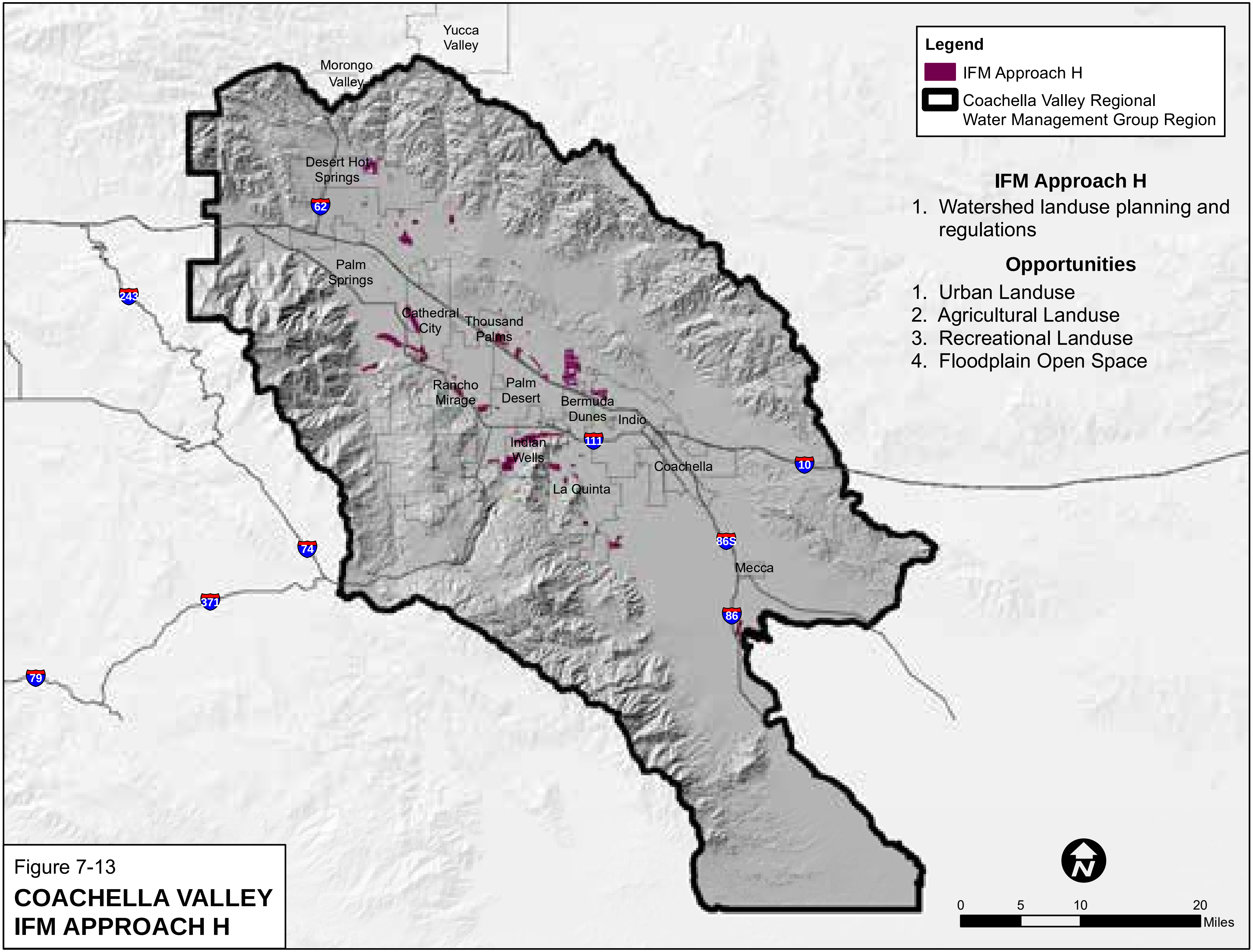

Figure 7-13

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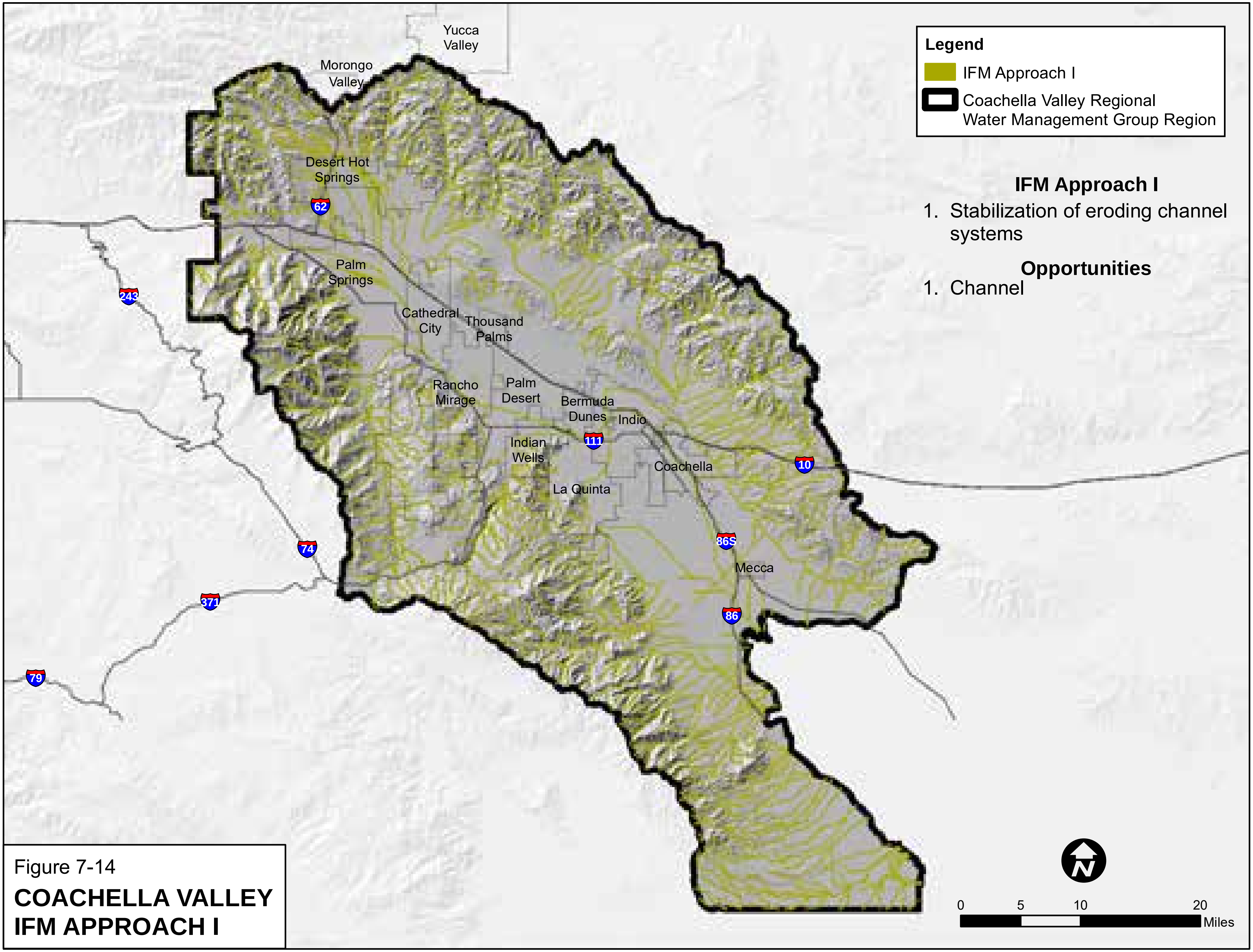

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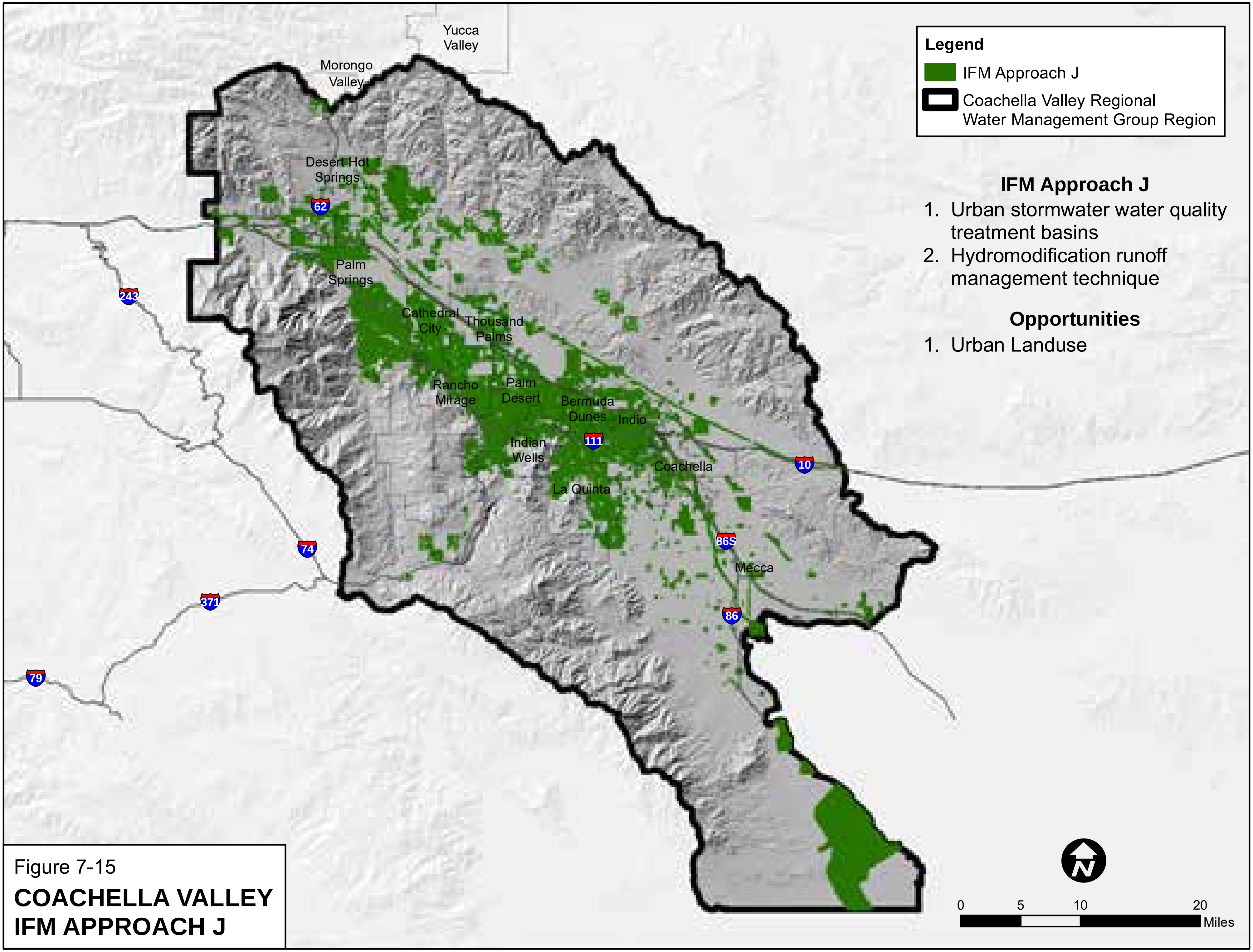

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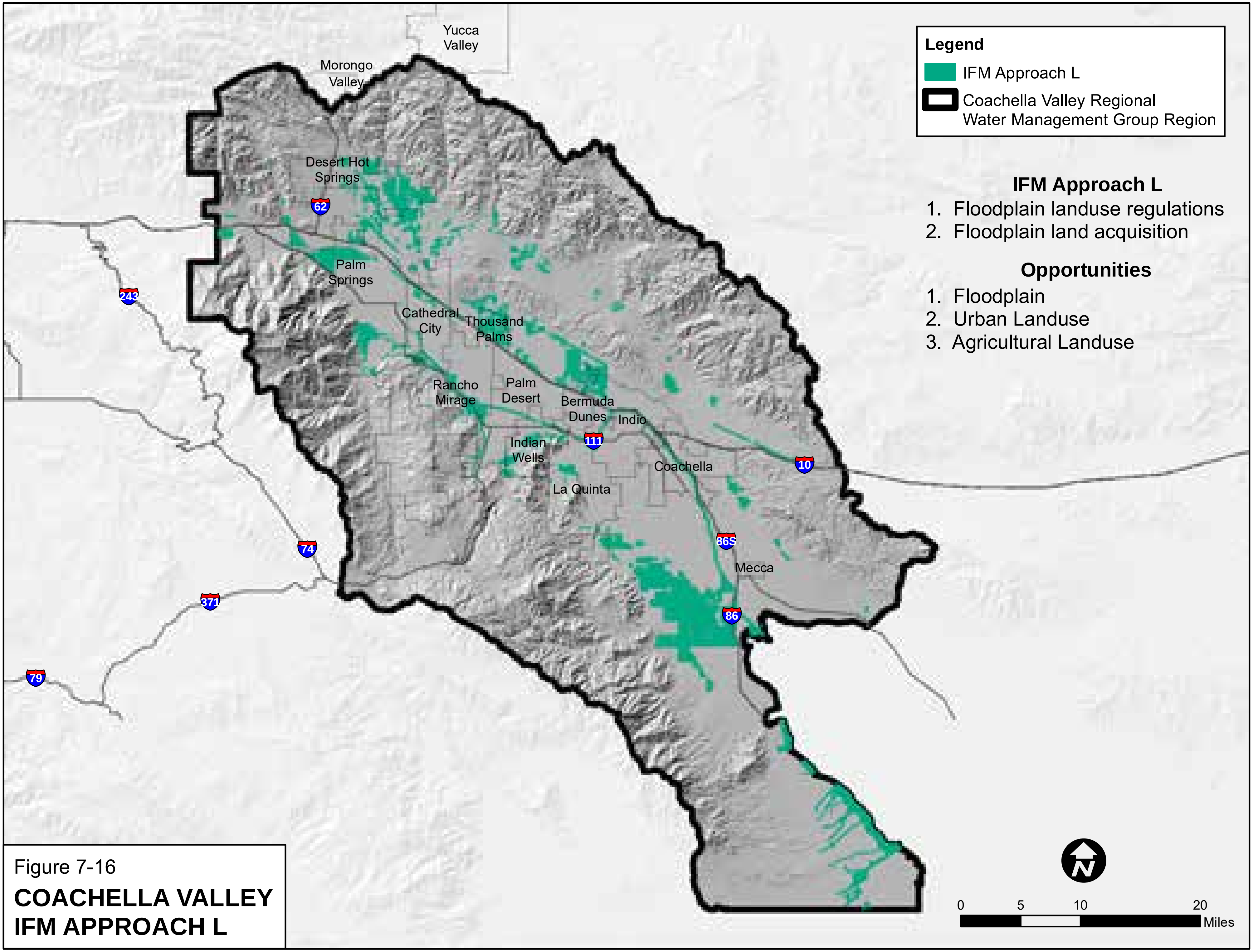

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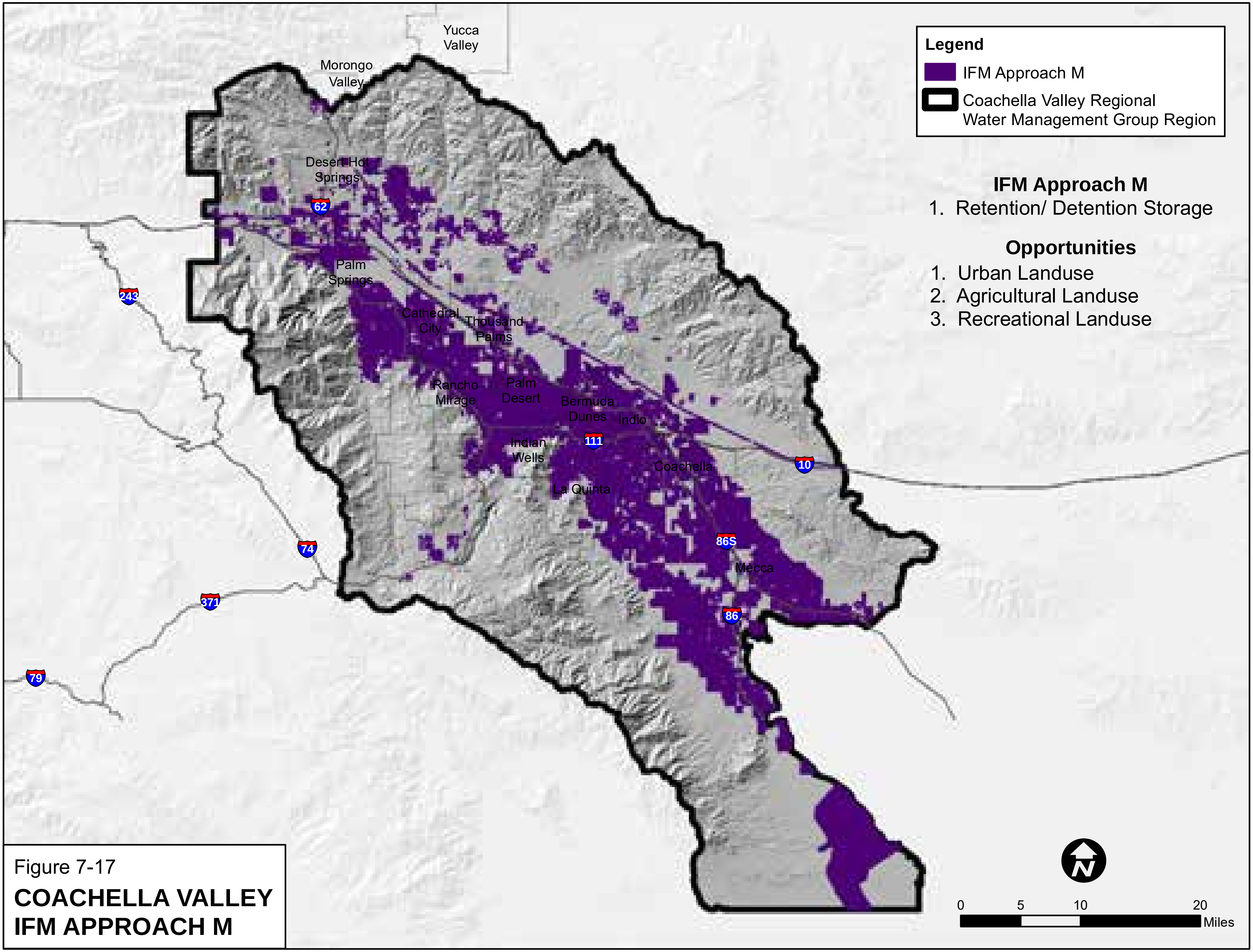

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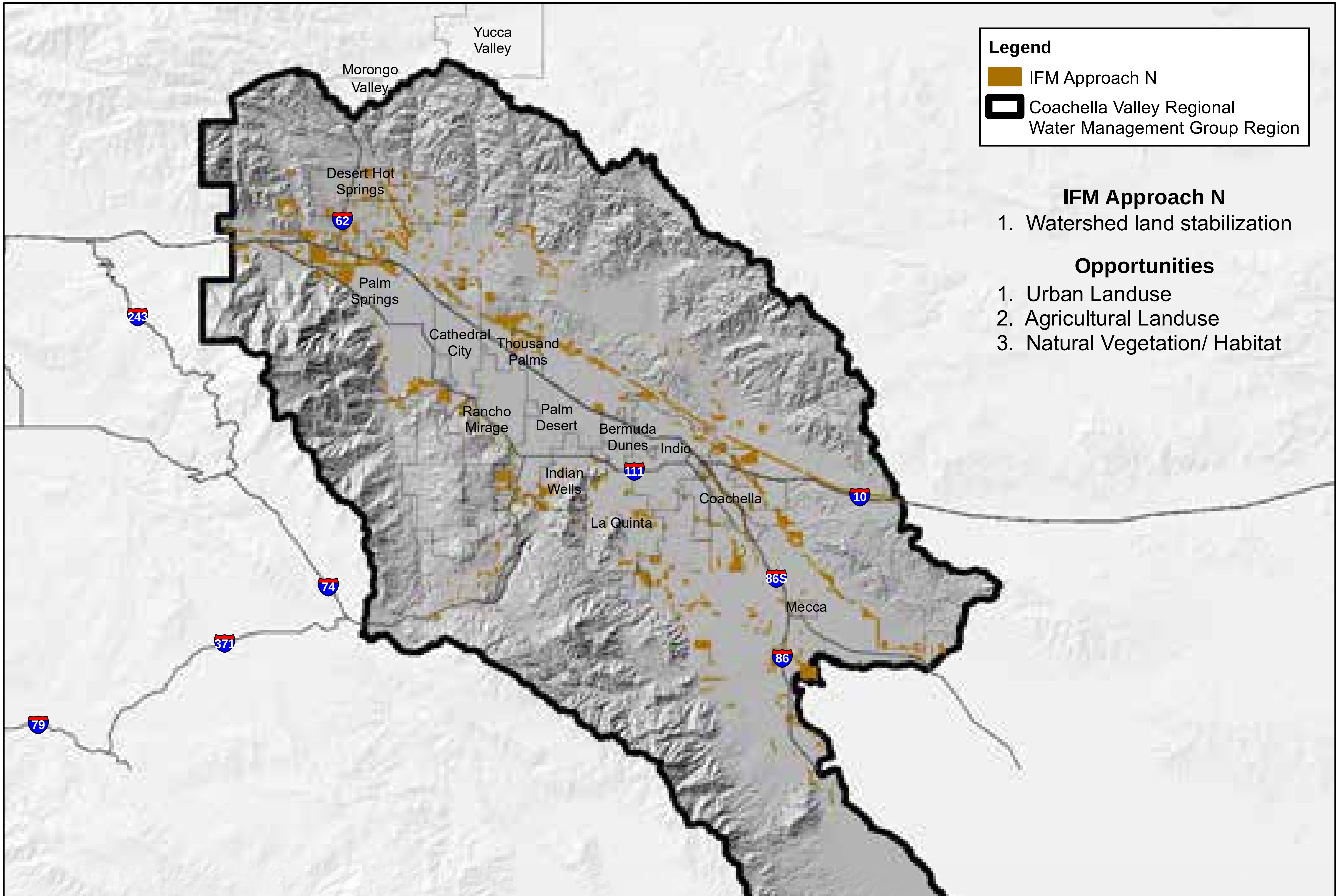

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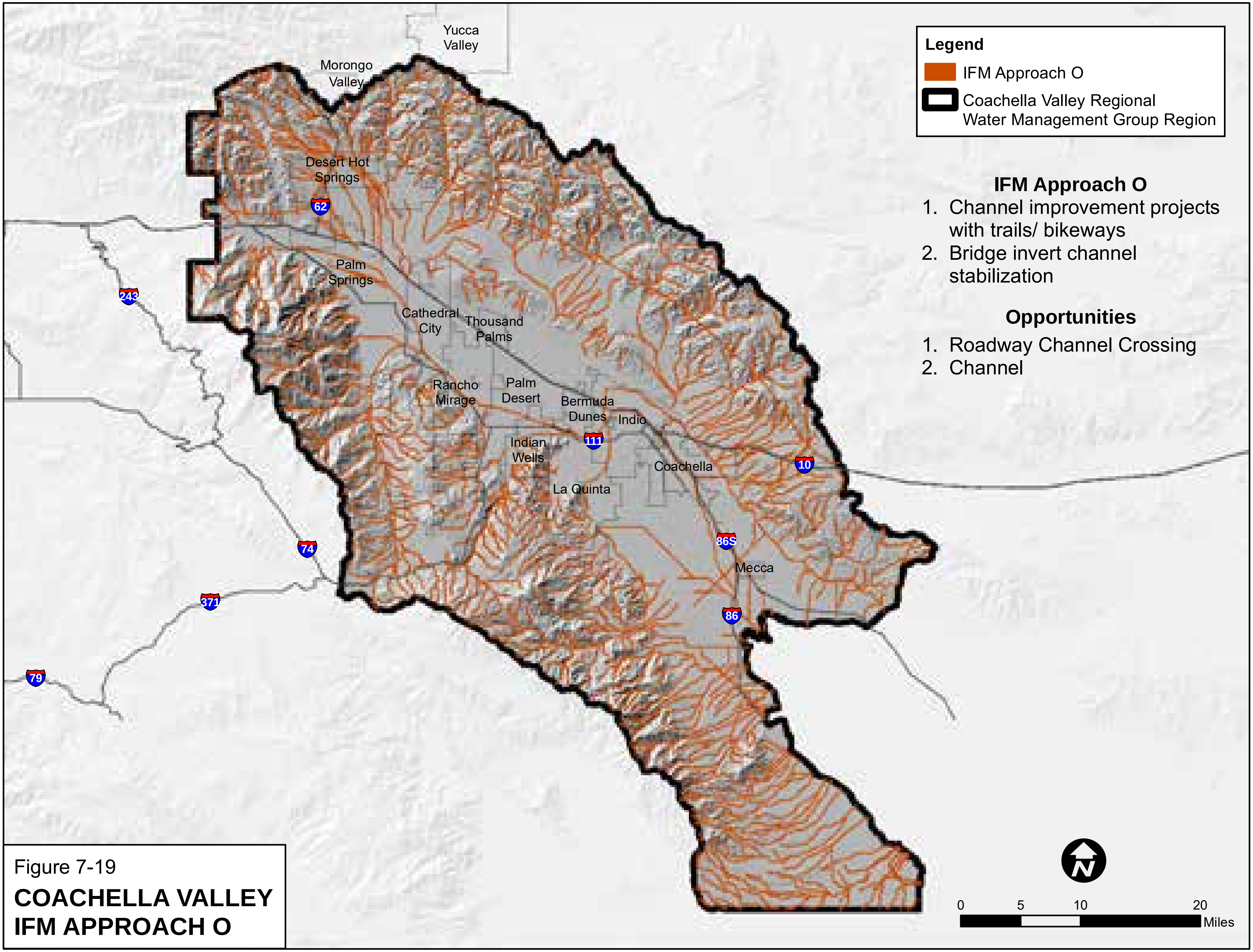

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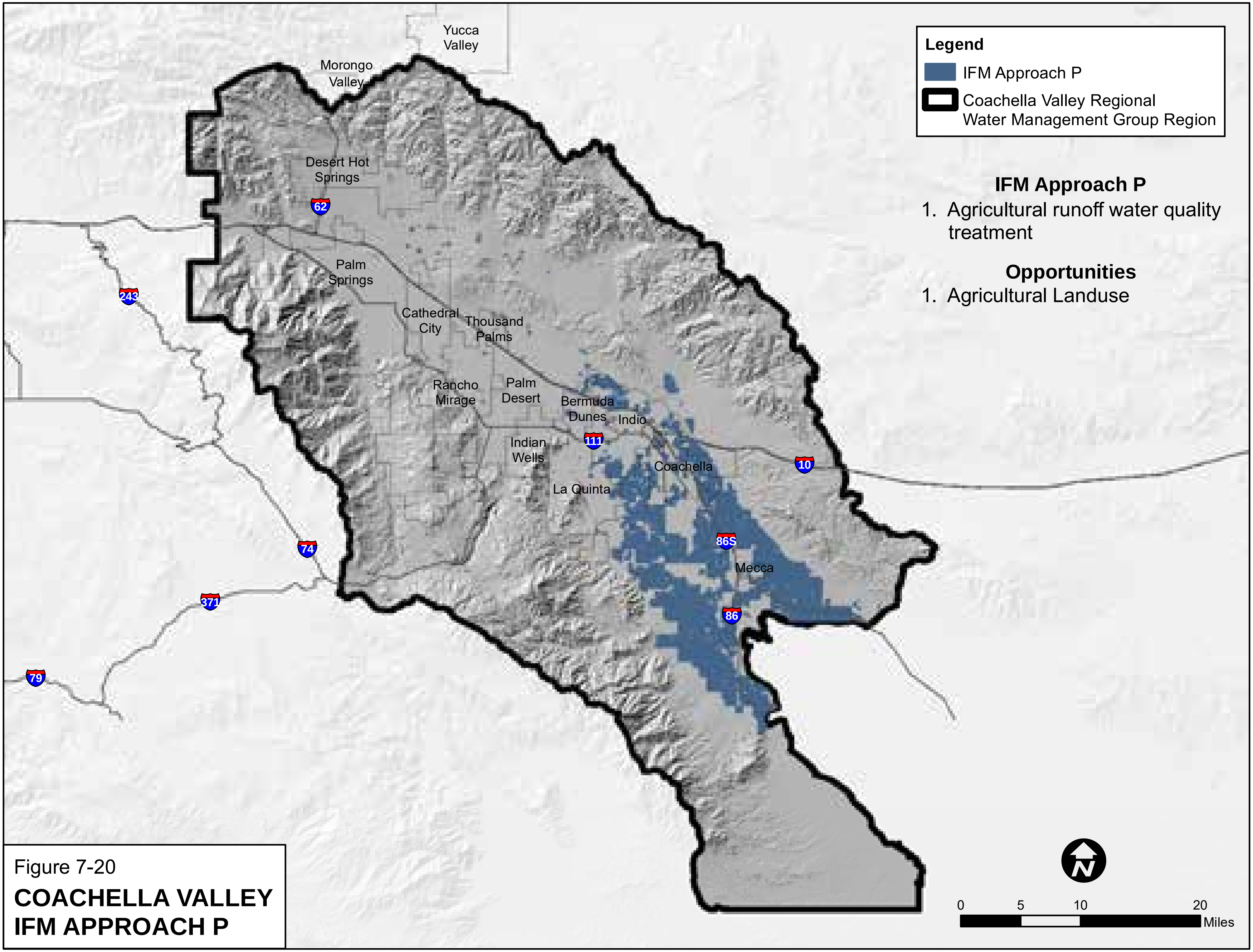

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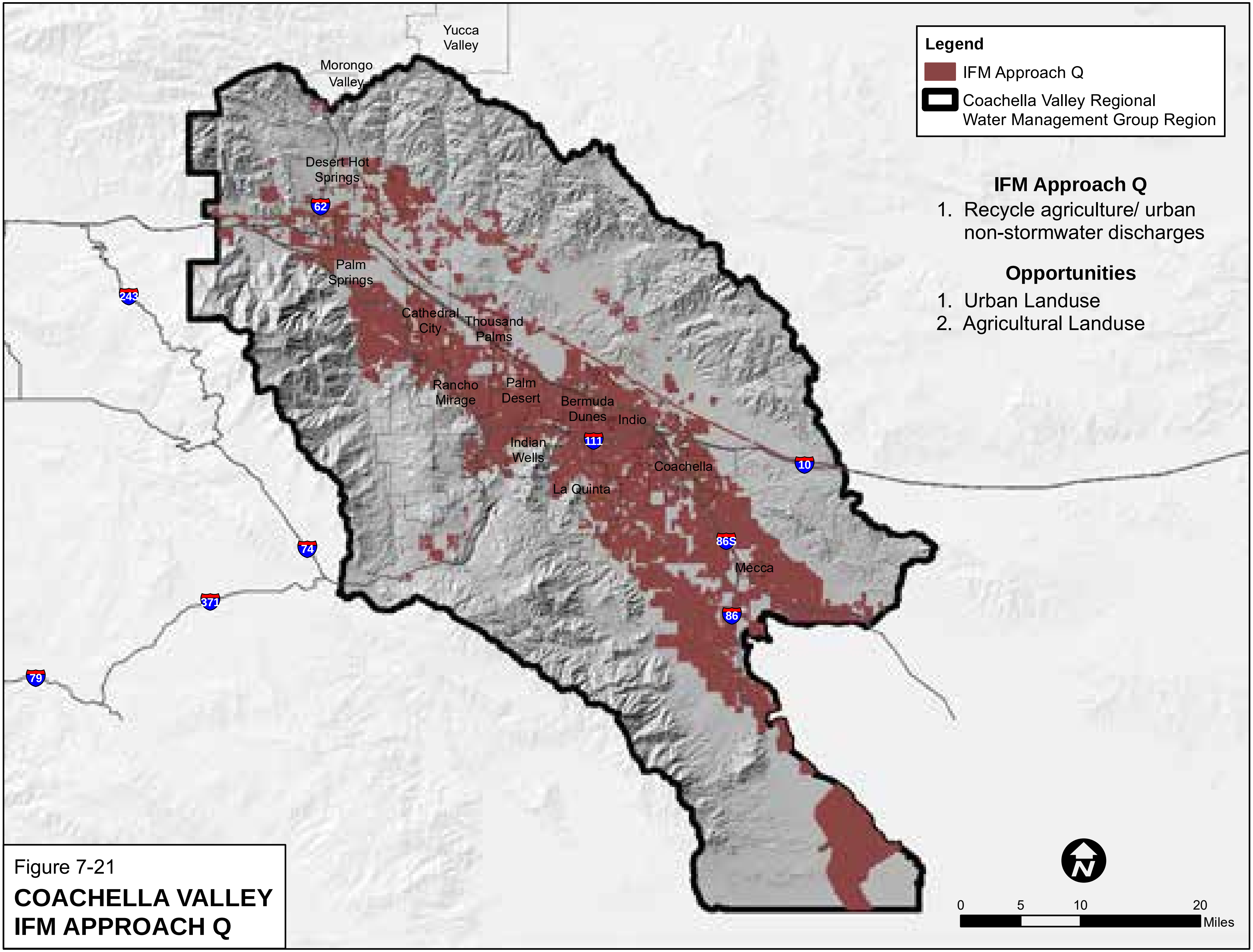

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COACHELLA VALLEY IFM APPROACH Q

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7.5 IFM Project Formulation

The initial project formulation process should provide numerous alternative general concepts or approaches that cover an entire range or spectrum of available potential IFM solutions or applications of strategies. The range of alternatives generated from this process should be of sufficient extent that it would satisfy an alternative analysis as part of the environmental documentation or regulatory permitting. These different options are developed through the application of a variety of available conventional tools and flood protection techniques that can be developed into different creative and effective solutions.

Conceptual design solutions are developed through an in-depth understanding of the problems and fundamental hydraulic/hydrologic processes. A hierarchy of design components is pieced together utilizing the engineering "toolbox" to develop creative alternatives that provide the desired hydraulic/hydrologic function. Techniques are selected with respect to the hydraulic conditions and fulfilling the objectives/design criteria. The intent of this process is to ensure that novel and innovative solutions are generated rather than focusing on routine alternatives.

An integral component is application of different techniques as part of these solutions that embrace the natural river function/ecology and preservation/enhancement of these resources. An important first step in formulating alternative plans is the process of creating measure of performance of evaluating each alternative since the performance measures often assist in defining potential alternatives. The performance measure must be easily understood and directly related to the planning objective. For example for the flood protection evaluation the change in water surface elevation within the floodplain will be a clear indicator of the alternative performance related to that particular primary objective.

There are many unique challenges associated with the selection and prioritization of watershed projects in order to ensure that the correct or optimum is selected that provides the maximum benefits while addressing multiple watershed objectives, or ensuring the needs of all the watershed stakeholders are adopted. It is desirable to have a planning tool to assist in the alternative screening process which can provide guidance in understanding the relative importance of many different objectives through a numerical weighting scale which can be used in ranking alternatives in forming the decision nexus.

7.6 Recommended Actions

This study is intended to identify a general framework for the application of an IFM approach throughout the Coachella Valley on a regional basis that will ensure maximizing water resources benefits. General principles and strategies are also provided as guidance to assist in watershed planning. Using an IFM approach provides significant benefits including high-value multi-benefit projects, which the community can leverage through broader access to funding sources. This report is intended as a "guidance document" to facilitate an integrated water resources approach to flood management. This assessment is based on readily available information to perform planning level risk assessment in order to provide high level recommendations.

Based on the findings, the following actions are recommended to advance the use of IFM on regional basis within the Coachella Valley or development of flood management solutions. The majority of these actions were taken by the CVRWMG during development of the IFM Study, those actions that are ongoing (such as collaboration and communication) are recommended to continue as applicable and necessary:

1. **Increase collaboration/communication of agencies responsible municipal and regional floodplain management which will increase effectiveness of flood management**
    - Develop framework and process for different level of communication for floodplain managers
    - Provide basis for a regional work-group forum of floodplain managers and watershed stakeholders that allows increased collaboration and future regular meetings. Utilize existing industry forums or regional planning agencies such as CVAG to establish these initial working groups.
2. **Improve understanding and accuracy of regional and local flood risks on a watershed basis**
    - Develop understanding of the different types of flooding from both regional level and local level and include specific flood problems for the different areas as well inventory of common "hot spots" of chronic problems
    - Provide methodology to define the magnitude of flood risks to better prioritize the level of flood risk which integrates potential flood damage
    - Review common recurring flood damage losses and evaluate the sources of these flood problems.
    - Improve the accuracy of the existing flood hazard mapping and extend mapping of these hazards to areas which are currently not mapped
3. **Develop regional watershed database to assist in flood management planning that will provide a data exchange of information for all watershed stakeholders as well as sharing of information between public agencies to foster collaboration**
    - Ensure that different watershed stakeholders have access to the different available information and studies being performed
    - Develop community based watershed groups to provide monitoring of floodplains and reduce costs of performing these services while increase the active field database
    - Collect and compile watershed mapping information related to flood hazards and watershed information in a GIS format as well as developing a schema for managing the data to benefit future watershed planning
    - Develop an updated GIS database of all the different flood control and flood management infrastructure
4. **Develop watershed based planning, which includes collaboration with all the different stakeholder groups to minimize conflicts and define specific watershed goals**
    - Develop understanding of the different priority goals of the watershed stakeholders based on the common recurring flooding issues/problems/hazards

- Involve environmental groups and agencies in the planning process as well as develop an understanding of additional environmental resources

5. **Initiate understanding and awareness of "integrated flood management" (IFM) for agencies and the community**
    - Prepare educational material and information on background of IFM to encourage better understanding of the required thought process
    - Provide examples of IFM projects to assist in understanding how to apply and the basis of the key planning principles which are different from conventional watershed planning
6. **Identify applicable IFM strategies on a watershed basis that can be utilized within the Coachella Valley to assist agency's understanding on how IFM can be implemented given the nature of the types of flood hazards within the Coachella Valley**
    - Define common types of IFM strategies which integrate different planning principles through different scales (1) watershed level, (2) city level, and (3) neighborhood/local level for the -arid climate
    - Develop regional mapping of both opportunities and constraints related to integrated flood management
    - Develop a specialized GIS based tool which assists in the defining locations of IFM projects at a regional scale and can provide maximum multiple benefits and provides method for prioritizing flood management projects
7. **Develop watershed planning guidance program implementing IFM through different land planning regulations and collaboration with agencies during the development planning process**
    - Develop watershed planning process framework with key planning principles for implementing IFM that focuses on linking sustainability, water resource management, and land use planning to flood management and the entire hydrologic cycle
    - Prepare guidance on integrating "land use planning" as central element of IFM and define how it can be utilized for different type of floodplain hazards issues
    - Develop overall guidance document that provides stakeholders the basis for watershed planning with IFM

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Appendix – GIS Mapping Database

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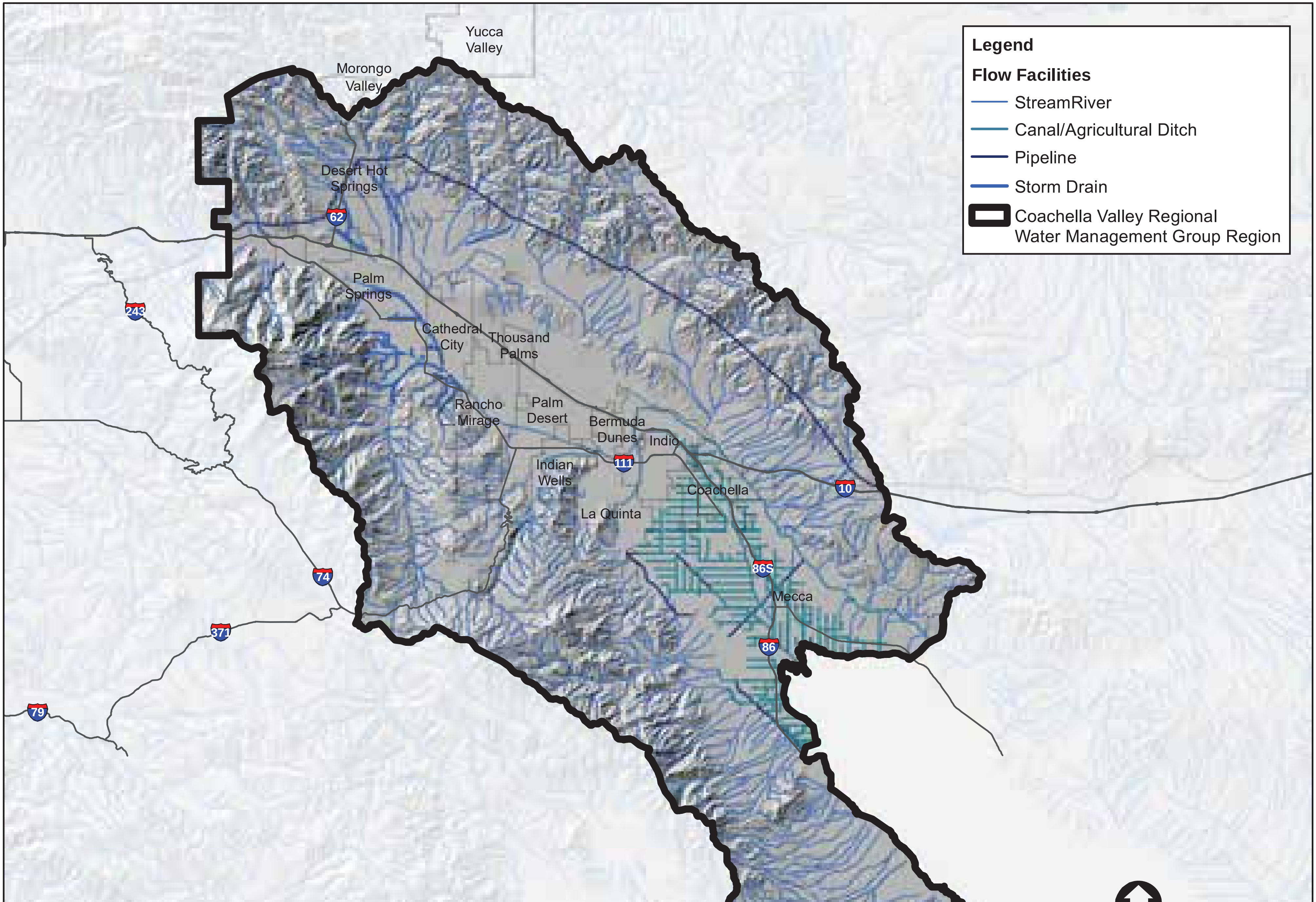

Figure A1

COACHELLA VALLEY FLOW FACILITIES

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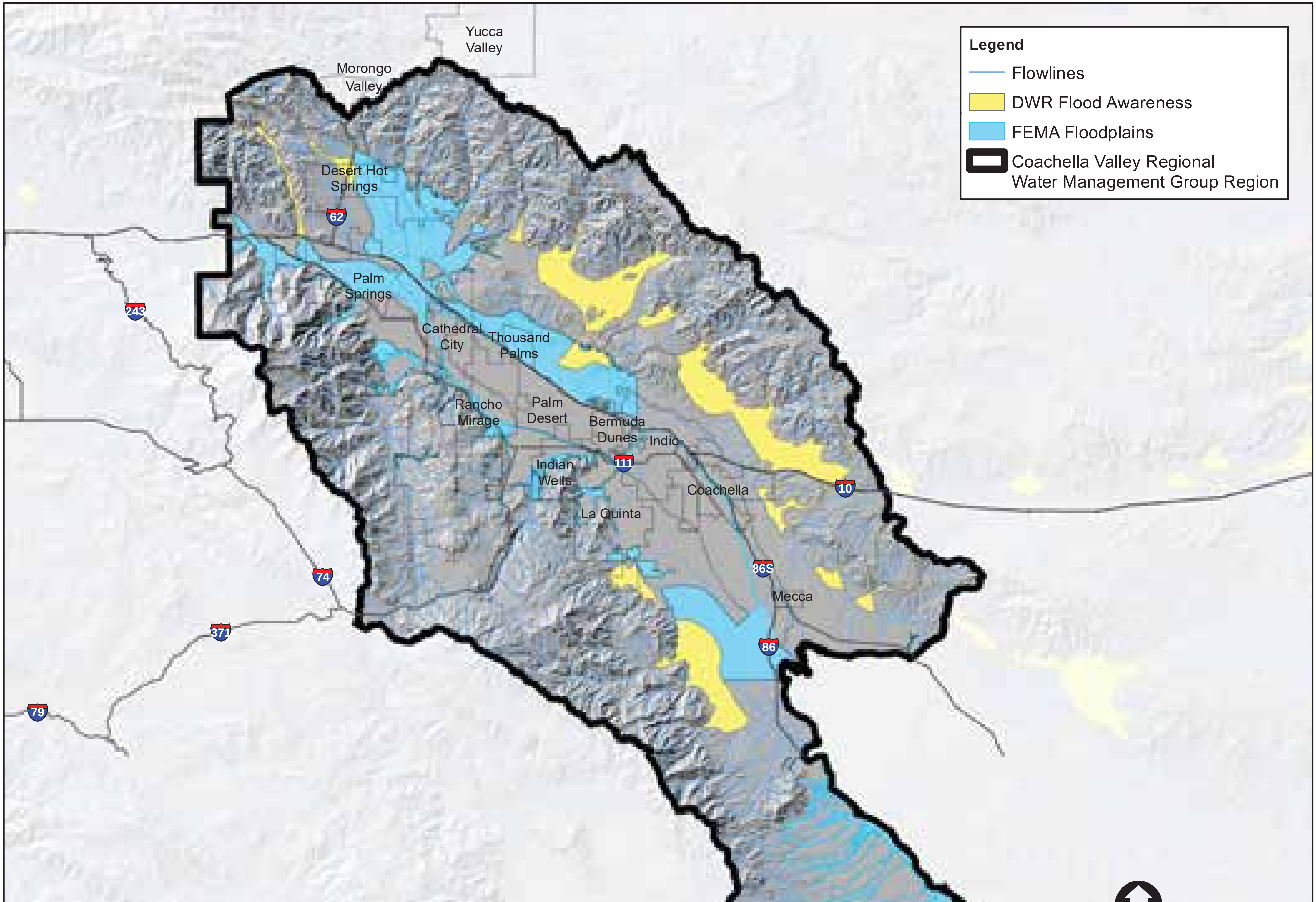

Figure A2

COACHELLA VALLEY FLOODPLAINS

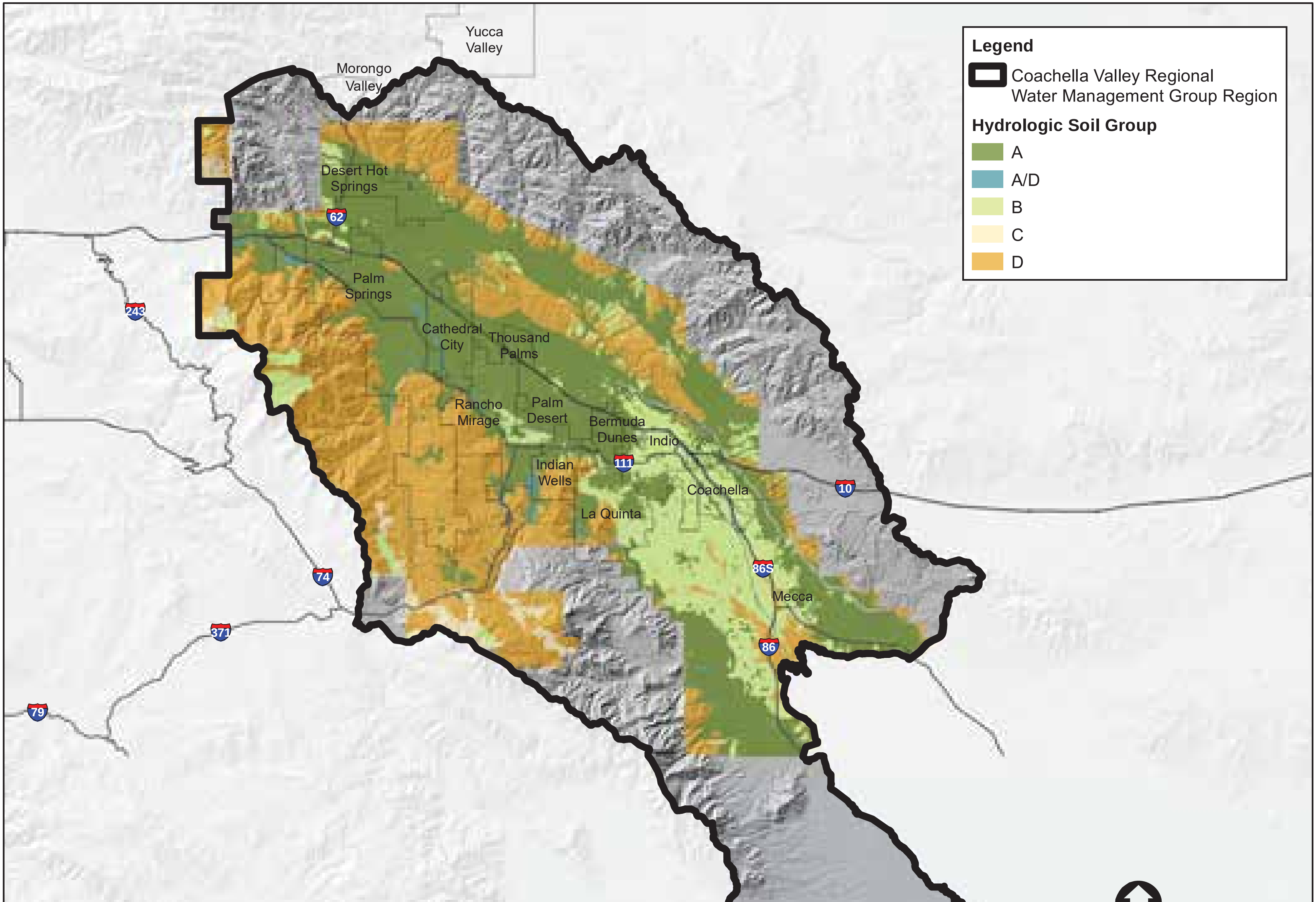

Figure A3

COACHELLA VALLEY HYDROLOGIC SOILS

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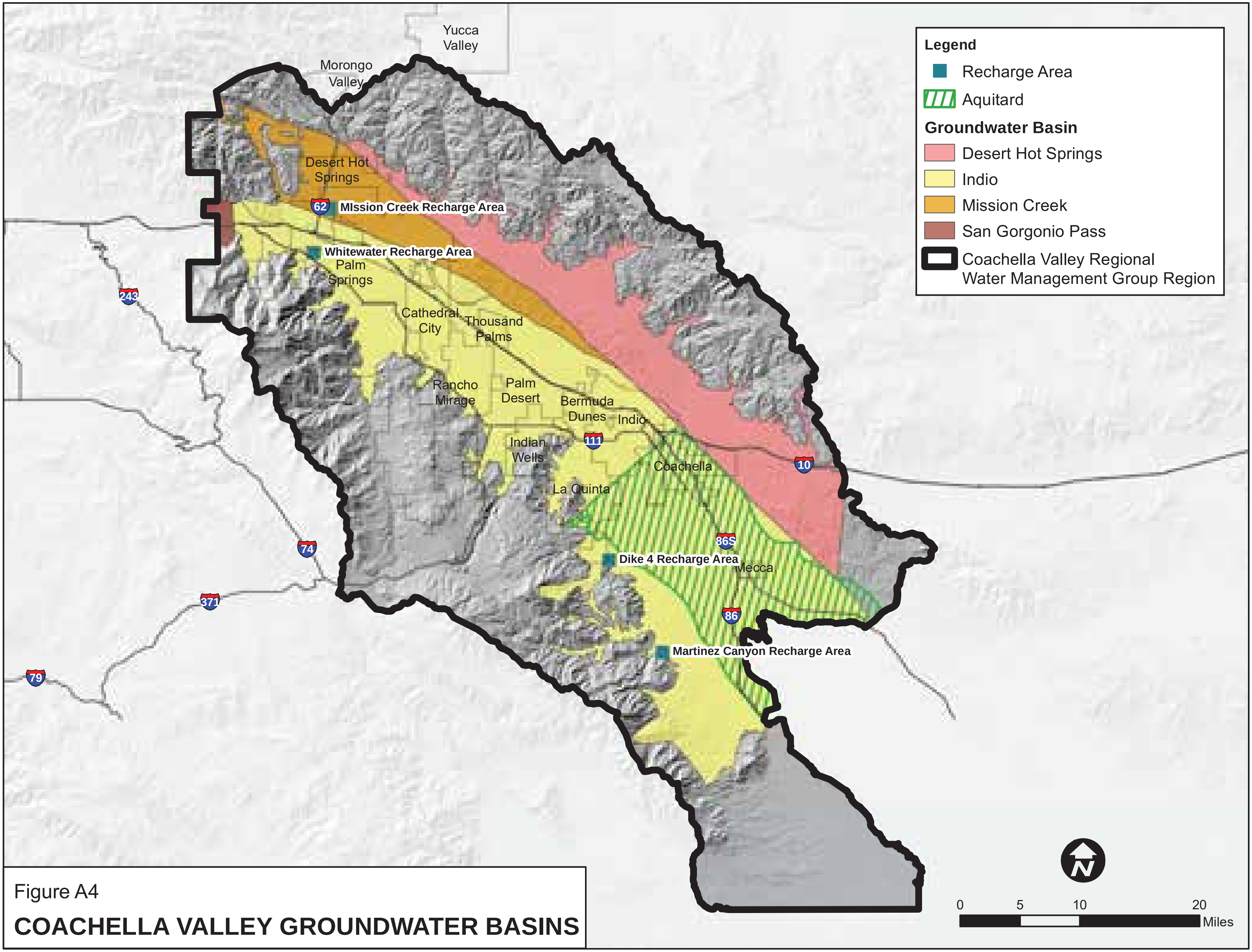

Figure A4

COACHELLA VALLEY GROUNDWATER BASINS

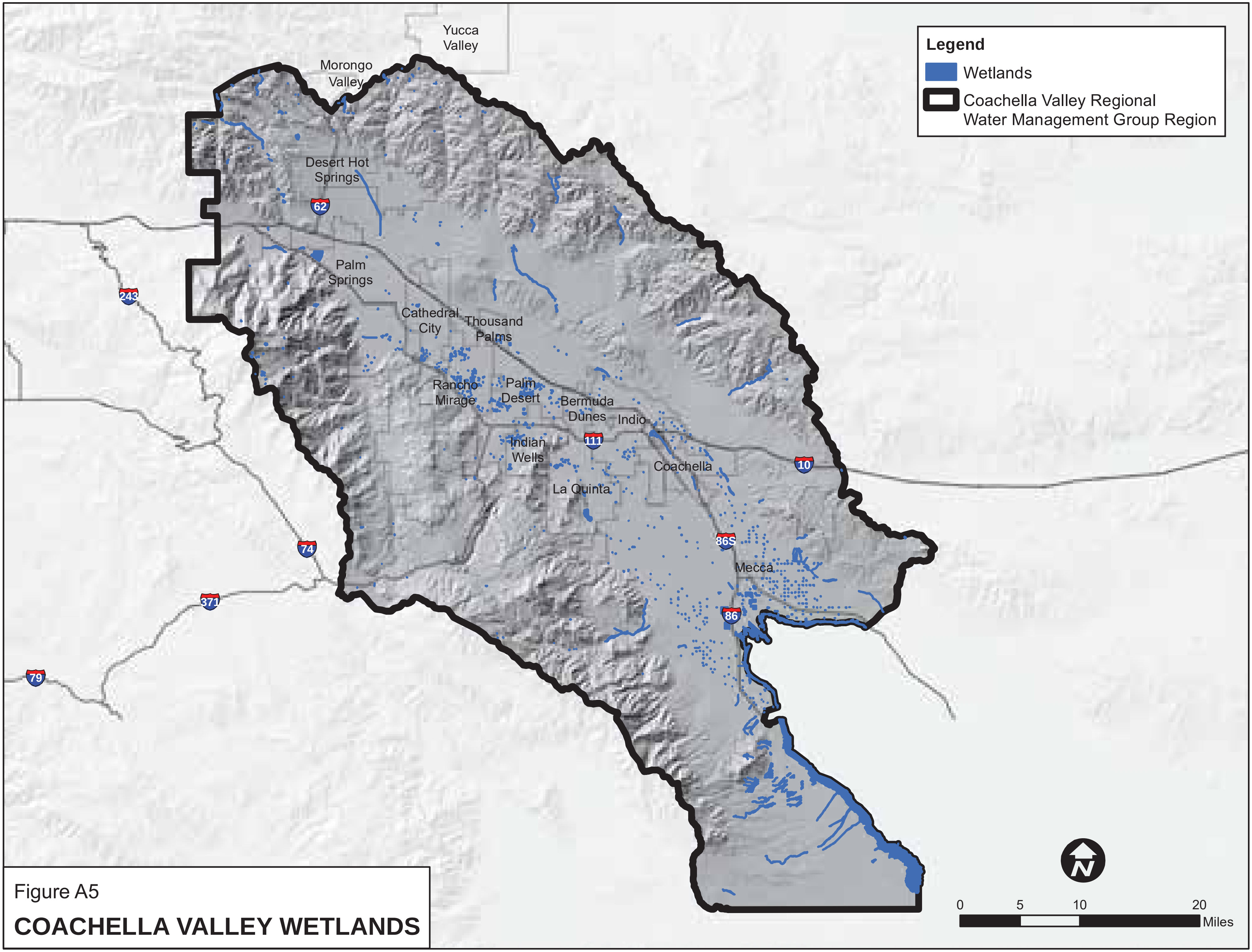

Figure A5

COACHELLA VALLEY WETLANDS

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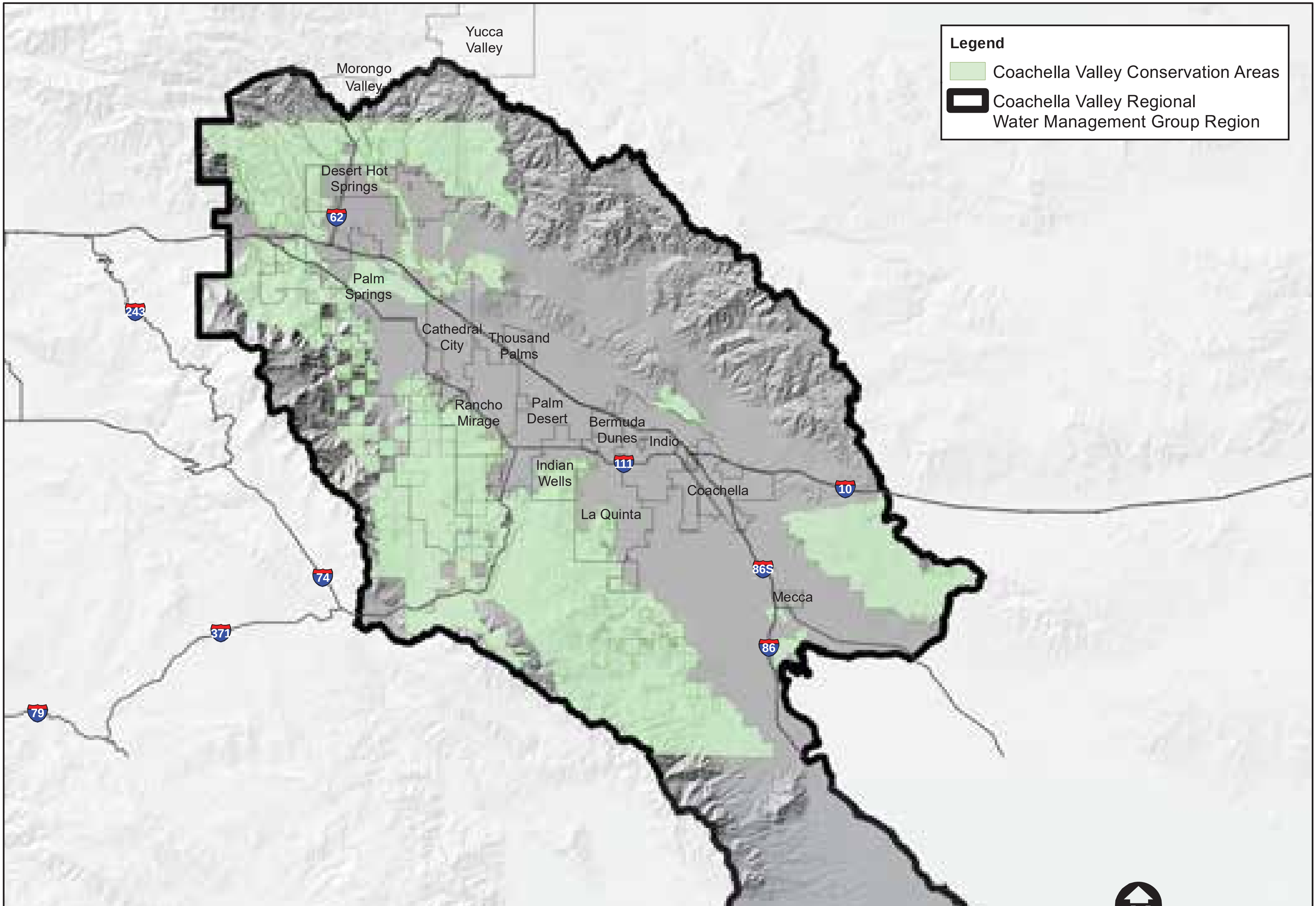

Figure A6

COACHELLA VALLEY CONSERVATION AREAS

Appendix VI-J: Evaluation of Valley-Wide Groundwater Monitoring Programs

This appendix includes the *Evaluation of Valley-Wide Groundwater Monitoring Programs* produced as part of the 2014 IRWM Plan Update process.

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Coachella Valley Integrated Regional Water Management Plan Update

Evaluation of Valley-Wide Groundwater Monitoring Programs

Final Report

Prepared by:

RMC
Water and Environment

January 28, 2013

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Attachments

Introduction

The Coachella Valley Regional Water Management Group (CVRWMG) – comprised of Coachella Valley Water District (CVWD), Mission Springs Water District (MSWD), Desert Water Agency (DWA), Coachella Water Authority (CWA), and Indio Water Authority (IWA) – are preparing an update of the Coachella Valley Integrated Regional Water Management (IRWM) Plan. The purpose of the Coachella Valley IRWM Plan is to accurately characterize the existing water resources conditions, issues, and needs of the Valley, and then to establish a project selection process for funding water management projects that help to meet those needs. During the scoping process for the IRWM Plan update, stakeholders identified the need to better understand and document groundwater monitoring practices in order to confirm whether current monitoring is providing the necessary data to answer ongoing groundwater overdraft and quality concerns. Based on this assessment, the study shall identify recommended modifications/additions to current monitoring that address those data needs.

1.1 Project Purpose

This technical memorandum (TM) describes recommended modifications/additions to existing groundwater monitoring programs currently being implemented in the Coachella Valley Groundwater Basin (CVGB). This TM builds off recommended monitoring program modifications and additions included as part of the *Disadvantaged Community (DAC) Water Quality Evaluation* work products (which can be found in Appendix S of the public draft 2014 Coachella Valley IRWM Plan at www.cvrwmg.org). Documents used in developing this TM include the following:

- Coachella Valley Water District (CVWD) *Groundwater Elevation Monitoring Plan for California Statewide Groundwater Elevation Monitoring (CASGEM) Program* (2011)
- CVWD *Coachella Valley Water Management Plan* (2010)
- CVWD *Coachella Valley Water Management Plan, 2010 Update*, *Administrative Draft Subsequent Program Environmental Impact Report*, SCH No. 2007091099 (2011)
- CVWD, Desert Water Agency (DWA), and Mission Springs Water District (MSWD) *Mission Creek and Garnet Hill Sub-basins Water Management Plan, Final Report* (2013)
- United Sates Geological Survey (USGS) and California State Water Resources Control Board (SWRCB) *Ground-Water Quality Data in the Coachella Valley Study Unit, 2007: Results from the California GAMA Program*. Data Series 373. (Prepared by Dara A. Goldrath, Michael T. Wright, and Kenneth Belitz, 2009)
- USGS and SWRCB *Status of Groundwater Quality in the California Desert Region, 2006 – 2008: California GAMA Priority Basin Project*. Scientific Investigation Report 2012-5040 (2012)

The purpose of this TM is to describe existing groundwater monitoring efforts in the Coachella Valley and to present recommended modifications and/or additions to existing monitoring programs for the CVGB as it relates to water quality constituents identified as impacting the basin. Specifically, this TM includes identification of groundwater sampling locations, sampling frequency, and constituents to be monitored. The entities responsible for monitoring and reporting are also described.

2 Existing Groundwater Monitoring Programs

To date, groundwater monitoring in the CVGB has been conducted by local water agencies, State and Federal agencies and through special interest studies. Some of these programs entail regular, on-going monitoring programs, while others provide one-time snapshots of groundwater conditions. These programs have provided both groundwater elevation and water quality data in all sub-basins of the CVGB, although more data are available in areas with more regular groundwater use (i.e. pumping).

2.1 Constituents of Concerns for Groundwater Quality Monitoring

As noted above, two water management plans and several other special studies have been prepared for the Coachella Valley; these documents include information regarding overdraft conditions and water quality issues in the CVGB. Using the information presented in these studies, along with data available in publically-accessible databases, key constituents of concern (COCs) were identified for the groundwater basin. Specifically, these COCs represent parameters whose concentrations in groundwater exceed either primary or secondary drinking water standards, as set forth by federal and state governments.

Water quality constituents of principal concern in Coachella Valley, as identified in the Coachella Valley Water Management Plan (WMP) are salinity, nitrate, fluoride, arsenic and perchlorate (CVWD, 2011a). COCs identified in the Mission Creek and Garnet Hill Sub-basins WMP include total dissolved solids (TDS), nitrate and uranium (MWH, 2013). Finally, most recently, elevated concentrations of naturally occurring chromium in groundwater in the CVGB have been considered cause for concern due to the development of a drinking water standard for hexavalent chromium (Cr^{+6}). Constituents of concern addressed by the monitoring program analysis described herein (arsenic, nitrate, uranium, fluoride, perchlorate and hexavalent chromium) were initially identified in the DAC Water Quality Evaluation project, conducted as part of the Coachella Valley IRWM Plan Update. This water quality evaluation focused on DAC communities using groundwater as their primary drinking water source and documents those constituents known to exceed primary drinking water standards in groundwater in those DAC areas. This list of COCs was then updated based on constituents identified in the aforementioned studies.

In recent years, the USGS (in cooperation with SWRCB) has investigated the groundwater quality in CVGB as a part of the Priority Basin Project of the Groundwater Ambient Monitoring and Assessment (GAMA) Program. The GAMA Priority Basin project was developed in response to the Groundwater Quality Act of 2001. Most constituents in groundwater samples for these USGS studies were at concentrations below drinking water thresholds. However, major constituents detected at concentrations above either primary or secondary drinking water standards or advisory levels in the studies included perchlorate, arsenic, boron, molybdenum, strontium, nitrite plus nitrate (as nitrogen), radon-222, chloride, fluoride, sulfate, manganese, and TDS (USGS, 2009).

Based on an analysis of available groundwater quality data, arsenic, nitrate, uranium, fluoride, perchlorate, and hexavalent chromium are considered to be key COCs (RMC, 2013). These COCs were identified based on the Coachella Valley WMP, Mission Creek-Garnet Hill WMP, and the DAC Water Quality Evaluation. A discussion of these constituents, including their drinking water standards (or maximum contaminant levels, MCLs), and their concentrations within the valley, are provided below.

2.1.1 Arsenic

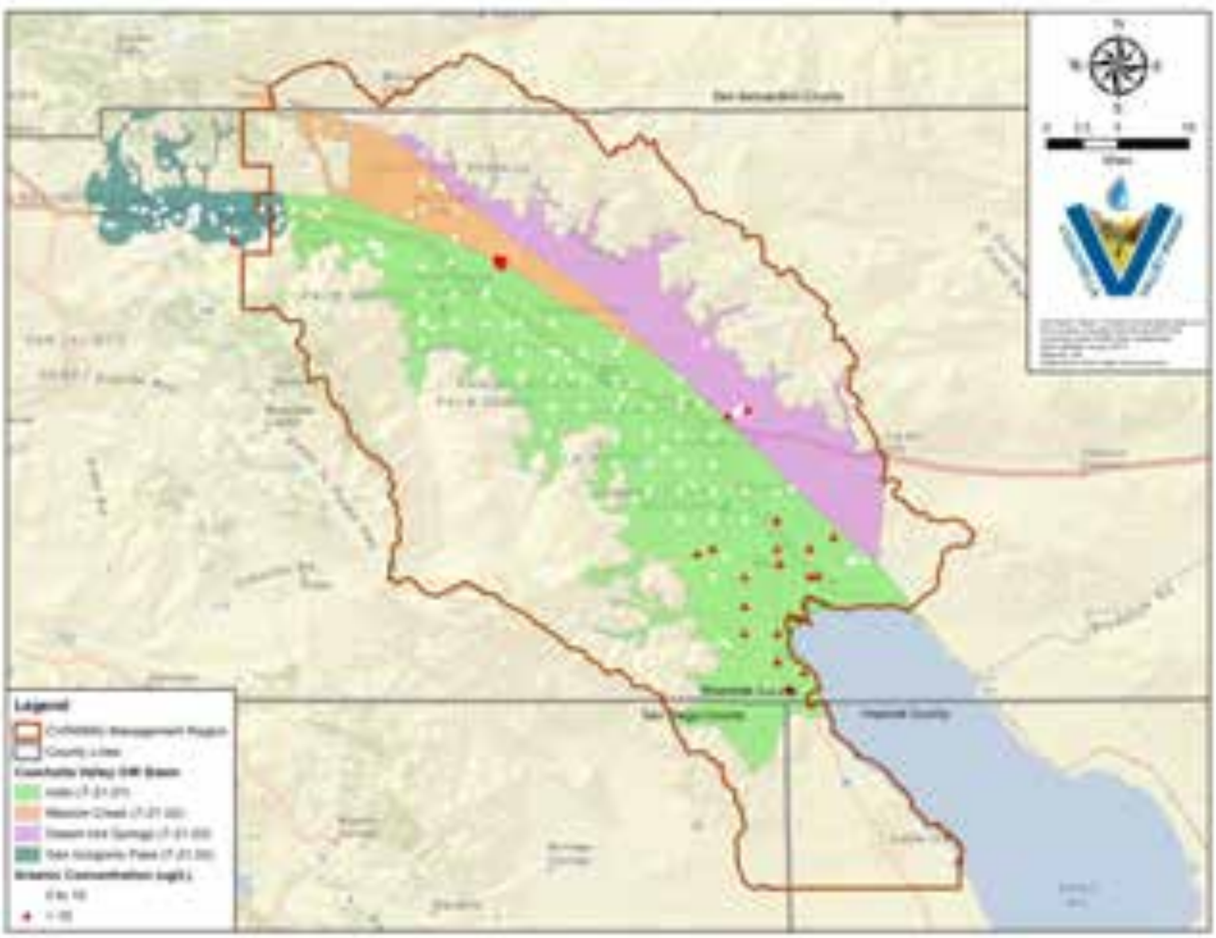
Arsenic occurs naturally in rock, soil and biota. California adopted the federal MCL for arsenic (10 μg/L) in 2006. In 2004, CVWD commenced studies to evaluate and design facilities to meet the new arsenic standard at several of its wells that exceeded the new requirements (CVWD, 2011a).

Figure 1 shows arsenic concentrations in Coachella Valley since 2000 as reported by GeoTracker-GAMA, a publically available database that includes data from public supply wells. Arsenic concentrations exceeding the primary MCL have been observed in some East Valley[1] municipal water supply wells; these wells have either been taken out of service or have been equipped with wellhead

[1]For purposes of the 2010 WMP Update, the Coachella Valley has been divided geographically into the West Valley and the East Valley. The West Valley, which includes the cities of Palm Springs, Cathedral City, Rancho Mirage, Indian Wells and Palm Desert, has a predominately resort/recreation-based economy that relies on groundwater as its principal water source. The East Valley, which includes the cities of Coachella, Indio and La Quinta and the communities of Mecca and Thermal, has an agricultural-based economy utilizing groundwater and Colorado River water imported via the Coachella Canal. The East Valley is southeast of a line extending from Washington Street and Point Happy northeast to the Indio Hills near Jefferson Street, and the West Valley is northwest of this line (CVWD, 2011a).

treatment systems. About 10 percent of wells with reported monitoring results exceeded the arsenic MCL, most of which are in the southern portion of the East Valley. Similar results were reported by the CVWD (2011a) and USGS (2007, 2009). Arsenic concentrations above the primary MCL were also detected east of Palm Springs around the border of Indio and Mission Creek Sub-basins. MWH (2013) reported that arsenic was detected in several groundwater wells in the Mission Creek Sub-basin. However, the measurements were below the primary MCL for arsenic in all cases except for one well for one measurement. There is limited information available on groundwater quality in the Garnet Hill Sub-basin. The available data are not sufficient to make any meaningful conclusions about temporal or spatial distribution of arsenic in this sub-basin.

Figure 1: Arsenic Concentrations in Coachella Valley Groundwater Basin



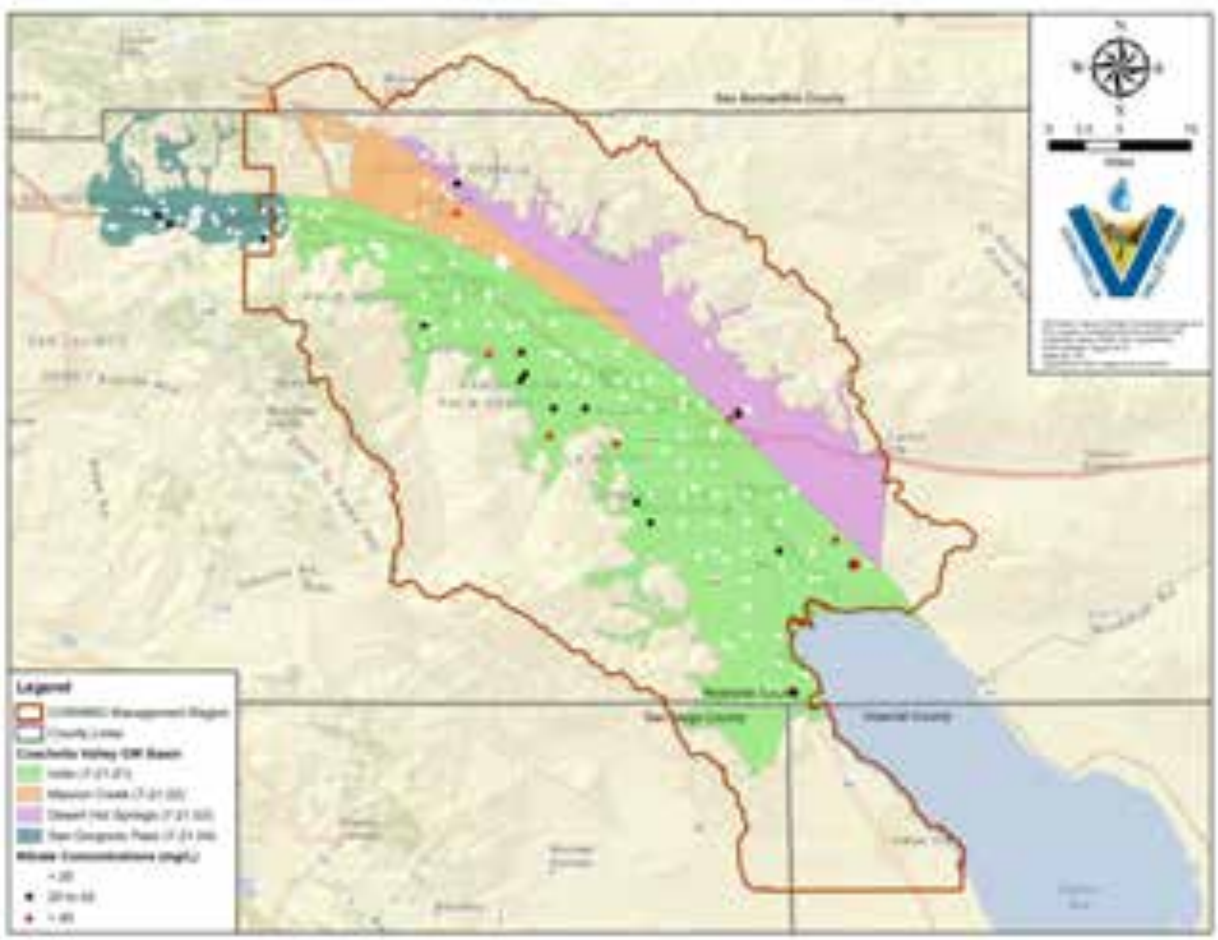
2.1.2 Nitrate

Potential sources of elevated nitrate in Coachella Valley groundwater include natural sedimentary deposits and leaching of decomposed plant materials high in nitrogen content (Huberty et al., 1948), fertilizers, and effluent from septic tanks. The state and federal primary MCL for nitrate is 45 mg/L as NO_3 (or 10 mg/L as N). Generally, nitrates exist in the unsaturated and shallow aquifer zones above 300 to 400 feet below the ground surface (bgs), and have not been observed in the deeper aquifer zones below depths of 500 feet (MWH, 2013; CVWD, 2010).

Figure 2 presents a map showing the distribution of nitrates for the period 2000 through 2012 using data from the GeoTracker-GAMA water quality database. Groundwater is currently sampled for nitrate annually following CDPH requirements. In areas with elevated nitrate concentrations, CDPH requires more frequent monitoring – quarterly for sources with nitrate levels above 50% of the MCL and monthly for sources above 75% of the MCL. This is a satisfactory approach for nitrate monitoring in the basin.

Clusters of wells around the North Palm Springs, Indio and Coachella areas show nitrate concentrations as high as 90 mg/L. Nitrate concentrations above the primary MCL have also been detected in the southern portion of the East Valley and along the southwest border of the Indio Sub-basin. Nitrate concentrations are below the MCL for all recorded public water supply samples in the Mission Creek Sub-basin; however, several private wells have recorded nitrate concentrations exceeding the primary MCL (MWH, 2013). There is limited information available on groundwater quality in the Garnet Hill Sub-basin. Nitrate concentrations have varied between 1 mg/L and 7 mg/L in that sub-basin (MWH, 2013).

Figure 2: Nitrate Concentrations in Coachella Valley Groundwater Basin



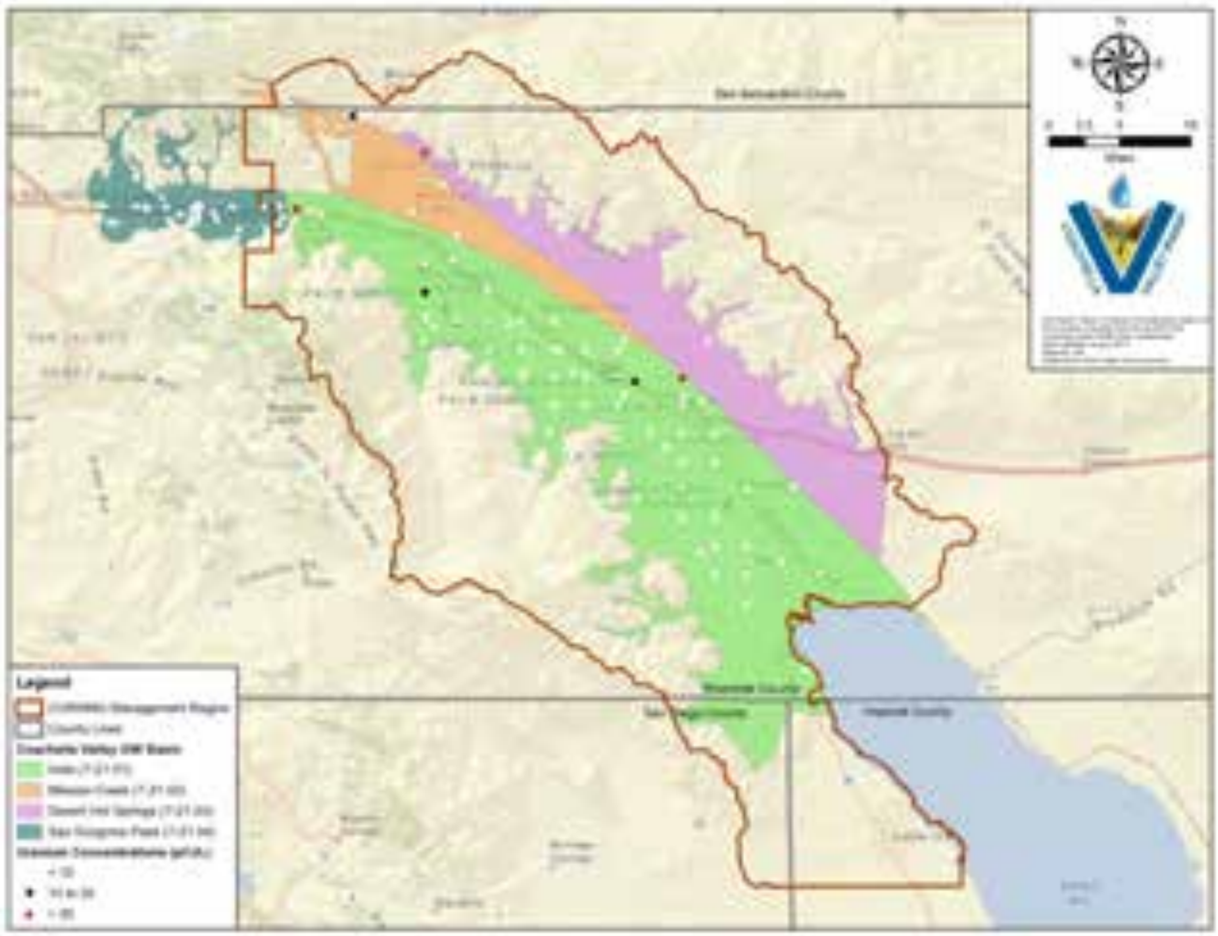
2.1.3 Uranium

The primary source of uranium in the Coachella Valley is naturally occurring uranium in the geologic formations of the basin. This uranium leaches into the groundwater basin under natural conditions. The primary MCL for uranium is 20 picocuries/liter (pCi/L) based on a four-quarter average.

Figure 3 shows uranium concentrations in the basin since 2000 as reported by GeoTracker-GAMA. Uranium has been detected above the MCL in several groundwater wells in the Indio Sub-basin based on data collected in 2012 and in one well in Desert Hot Springs based on samples collected in 2010. Samples collected in 2003 and 2004 show uranium concentrations above MCL north of Palm Springs, north of

Indian Wells, and east of Thermal. MWH (2013) reported that uranium was detected in several groundwater wells in the Mission Creek Sub-basin. Concentrations ranged from 4.4 pCi/L to 23 pCi/L, but none of the wells exceed the four-quarter average MCL of 20 pCi/L. There is limited information available on groundwater quality in the Garnet Hill Sub-basin.

Figure 3: Uranium Concentrations in Coachella Valley Groundwater Basin

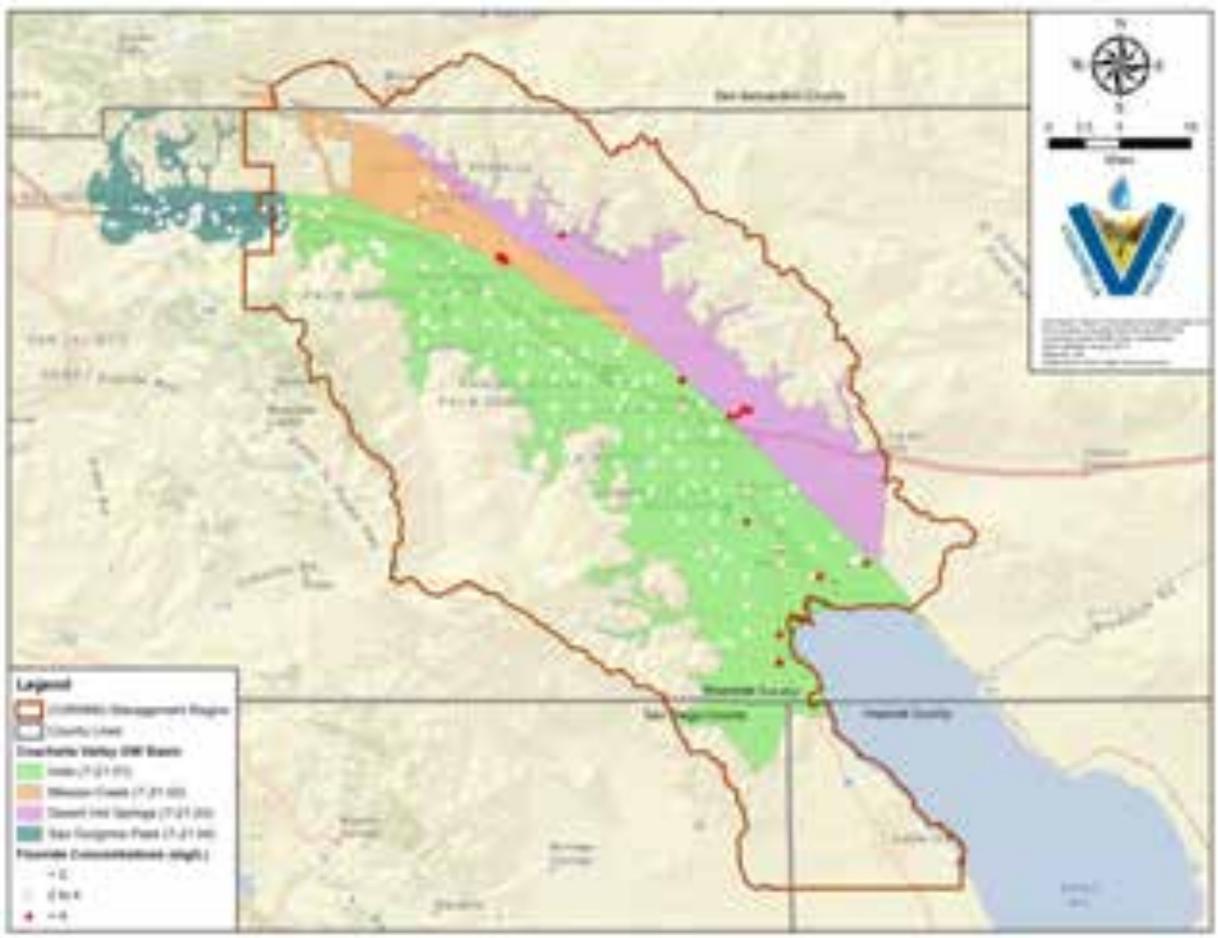


2.1.4 Fluoride

Low levels of fluoride naturally occur in most sources of drinking water, and are the result of leaching from rock formations. The state and federal primary MCLs for fluoride are 2 mg/L and 4 mg/L, respectively. State law requires water agencies to install fluoride treatment at water supply sources contingent upon the availability of funds. Currently, there is no fluoride treatment at drinking water wells in the Mission Creek or Garnet Hill Sub-basins (MWH, 2013).

Fluoride concentrations in Coachella Valley groundwater for the period from 2000 to 2012 based on data from the GeoTracker-GAMA water quality database are shown in Figure 4. High fluoride levels are found in the East Valley near the Salton Sea and near the San Andreas Fault. High levels of fluoride can also be found in several wells in Desert Hot Springs Sub-basin. There has been no apparent change in the distribution or concentration of fluoride in the past 10 years (CVWD 2011a).

Figure 4: Fluoride Concentrations in Coachella Valley Groundwater Basin



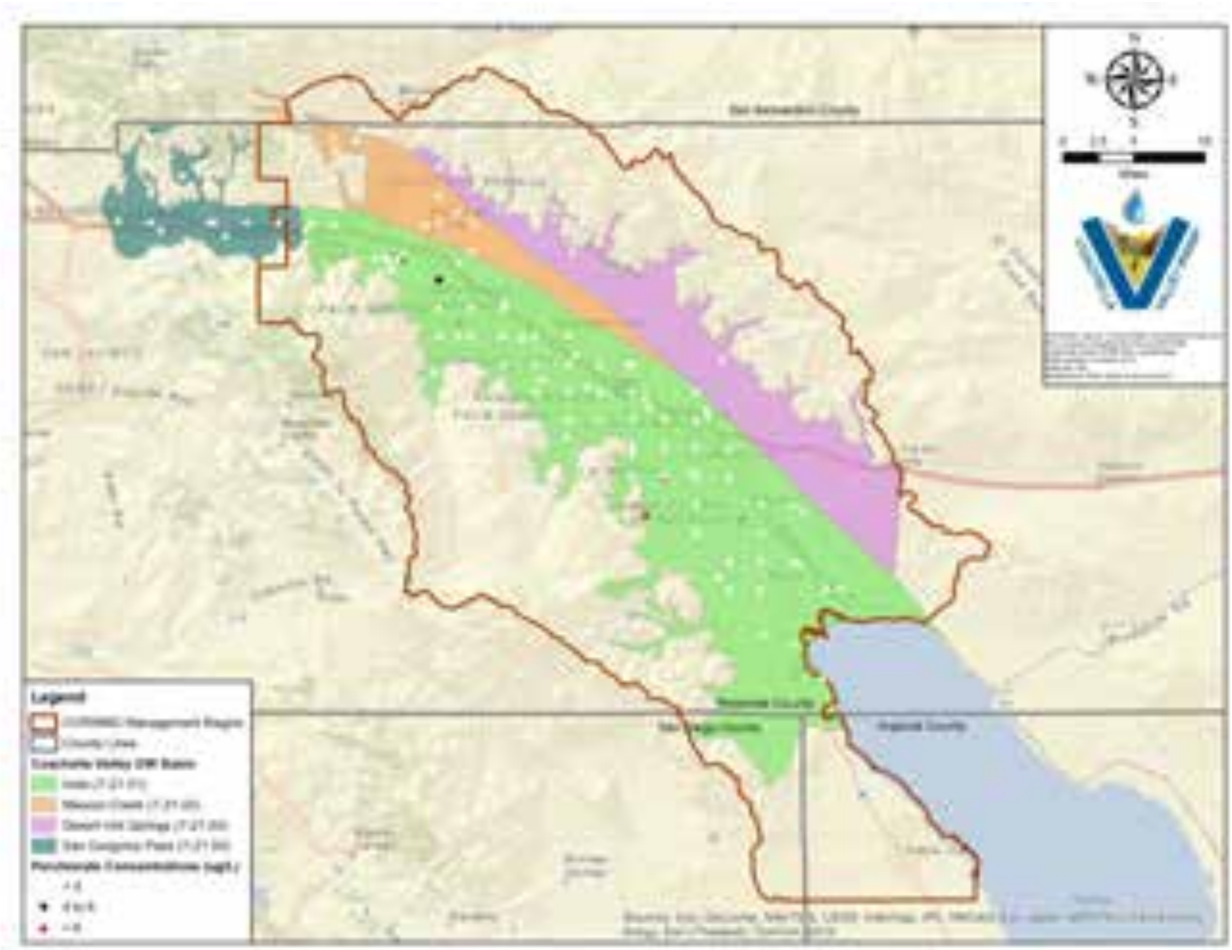
2.1.5 Perchlorate

Perchlorate is used for the ignition of solid rocket fuel and is a common solvent for dry-cleaning or other industrial operations. Perchlorate salts are also found in roadside flares, airbag inflators, and are used in the manufacturing of matches. Perchlorate has also been found in sodium nitrate fertilizers. Perchlorate is highly mobile in aqueous systems and can persist under typical groundwater and surface water conditions for decades. Perchlorate is highly soluble in water. The state primary MCL for perchlorate is 6 µg/L.

Perchlorate was detected in Colorado River water imported to the Coachella Valley at the Kerr-McGee plant in Nevada on Las Vegas Wash, upstream of Lake Mead, beginning in 1997. Since that time, extensive source control at Las Vegas Wash has reduced perchlorate concentrations in Colorado River water to less than the 4 µg/L reporting detection limit and the 6 µg/L California MCL (CVWD, 2010 and CVWD, 2011a).

Figure 5 shows perchlorate concentrations in Coachella Valley since 2000 as reported by GeoTracker-GAMA. Perchlorate levels in Coachella Valley groundwater since 2000 range from less than detectable to 12 µg/L, with 5 out of 257 wells having samples with concentrations above the 6 µg/L MCL. Most of the wells where perchlorate has been detected are shallow private wells in East Valley and northwest of Palm Springs. DWA has detected low levels of perchlorate (below the MCL) in some wells since 2001 (CVWD, 2011a). Perchlorate has not been detected in groundwater samples within the Mission Creek and Garnet Hill Sub-basins (MWH, 2013).

Figure 5: Perchlorate Concentrations in Coachella Valley Groundwater Basin



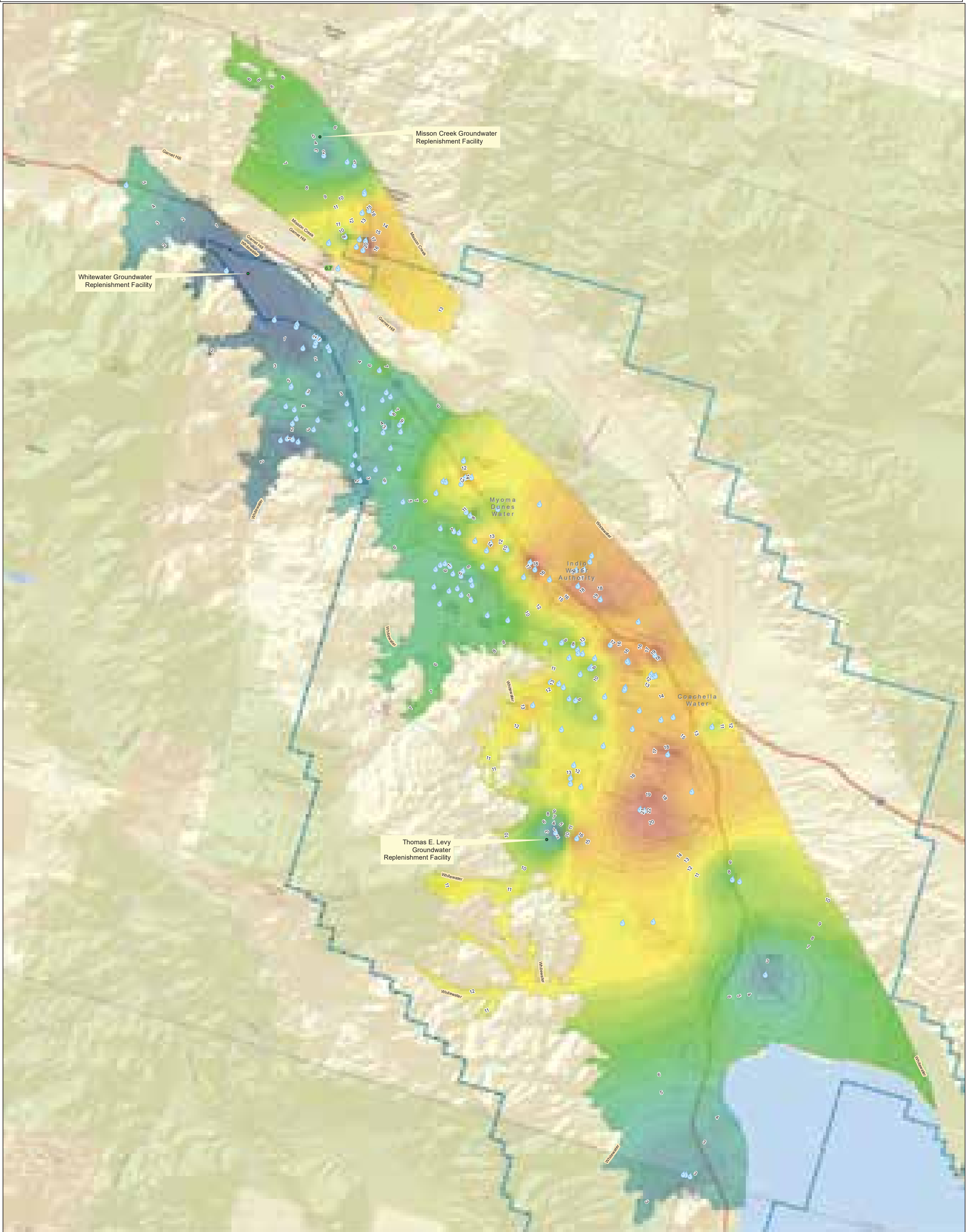
2.1.6 Hexavalent Chromium (Chromium 6)

Hexavalent chromium is a metallic chemical that can originate as a contaminant in the groundwater from the discharges of dye and paint pigments, wood preservatives, chrome-plating liquid wastes, and leaching from hazardous waste sites. Hexavalent chromium may also occur naturally in groundwater. Naturally occurring hexavalent chromium in groundwater is caused by the erosion of sediments containing elevated levels of chromium including serpentine-containing rocks commonly found near the margins of fault systems (CVWD 2013). Hexavalent chromium is currently regulated by the State as part of total chromium MCL of 50 µg/L; however, CDPH is currently proposing a primary MCL of 10 µg/L for hexavalent chromium which may be implemented in April 2014.

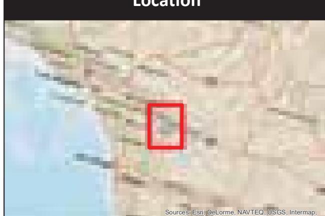
Currently, there are no wells in the Coachella Valley with hexavalent chromium groundwater concentrations that exceed the 50 µg/L. However, there are various wells in the Coachella Valley with concentrations that exceed the proposed primary MCL of 10 µg/L. For 39 unique well names within the available dataset, hexavalent chromium has been reported at concentrations higher than the proposed primary MCL.

Figure 6 shows CVWD-generated contours of chromium-6 levels within the Whitewater and Mission Creek groundwater basins. Contours that are represented in yellow, orange, or red show areas that are thought to exceed the proposed primary MCL of 10 µg/L (ppb).

Figure 6: Coachella Valley Groundwater Chromium-6 Occurrence



Location



Legend

Chromium-6 Levels

High : 24 ppb

10 ppb

Low :0 ppb

CVWD Boundary

Subbasin Boundary

Domestic Water Well

Contours

Coachella Valley Water District

75515 Hovley Lane East
Palm Desert, CA 92211
www.cvwd.org
Ph. (760) 398-2661
Fx. (760) 568-1789

Miles

0 0.75 1.5 3 4.5 6 7.5

2.2 Existing Monitoring Programs

Groundwater levels and quality in the Coachella Valley have been monitored by various entities for many years. These include ongoing programs implemented or required by:

- California Department of Water Resources (DWR)
- CDPH
- CVWD
- MSWD
- Other Agencies (CWA, DWA, IWA)

Additionally, there is currently ongoing groundwater elevation monitoring occurring in the groundwater basin to meet the requirements of the California Statewide Groundwater Elevation Monitoring (CASGEM) Program; and monitoring of water supply wells on tribal lands completed by tribes and reported to the Environmental Protection Agency (EPA). Several programs are described in the following sections.

2.2.1 DWR-Related Monitoring

Groundwater elevations in the Indio Sub-basin (also called Whitewater River Sub-basin), Mission Creek Sub-basin, and Desert Hot Springs Sub-basin have been monitored since the late 1920's. A network of 45 wells has been selected to demonstrate long-term and seasonal trends in groundwater elevations in these three sub-basins as part of DWR's CASGEM program[2] (see Figure 7). The groundwater elevations in the San Gorgonio Pass Sub-basin are not included in the CASGEM monitoring program as it is located outside the CVWD jurisdictional area. Two monitoring wells are located in Mission Creek Sub-basin (28 sq. mi.), four are located in the Desert Hot Springs Sub-basin (129 sq. mi.), and 39 are in the Indio Sub-basin (360 sq. mi.), (CVWD, 2011b). CVWD and MSWD have been designated as monitoring entities for the CVWD portion of the Desert Hot Springs and Mission Creek Sub-basins; CVWD has been designated as the monitoring entity for the CVWD portion of the Indio Sub-basin, and Desert Water Agency (DWA) has been designated as the monitoring entity for the DWA portion of the Indio Sub-basin. A list of these wells is shown in Attachment A. As described in the CVWD CASGEM monitoring plan, data gaps in the well network include the southeastern portion of the Mission Creek Sub-basin and the southeastern portion of the Desert Hot Springs Sub-basin; these data gaps exist due to lack of groundwater use in these areas.

The primary purpose of the CASGEM program is to monitor groundwater elevations. No groundwater quality data are obtained during monitoring activities. CASGEM monitoring occurs three times per year, or once per trimester, at each network well. The trimesters are 1) January through April, 2) May through August, and 3) September through December. Specific procedures and methods have been developed for this monitoring program, including establishing static groundwater conditions if sampling occurs at a production well rather than a monitoring well, establishing methods for recording measurements, taking measurements, conducting calculations, conducting quality assurance/quality control, and validating data.

In addition to the required CASGEM monitoring, DWR collects groundwater samples on separate wells to be analyzed for mineral, nutrient, minor element characteristics and contamination, as well as for

---

[2]In response to legislation, DWR developed the CASGEM program to establish a permanent, locally-managed program of regular and systematic groundwater elevation monitoring in all of California's groundwater basins. The CASGEM program relies and builds on the many, established local long-term groundwater monitoring and management programs. DWR's role is to coordinate the CASGEM program, to work cooperatively with local entities, and to maintain the collected elevation data in a readily and widely available public database.

overall quality and usage, as part of its regular statewide water management responsibilities. Table 1 shows the suite of constituents monitored by DWR, including arsenic, nitrate and fluoride which are COCs identified in the *DAC Water Quality Evaluation*.

DWR has 11 wells in Coachella Valley, all of which are located in the Indio Sub-basin. Figure 8 shows the approximate location of DWR monitoring wells. Construction information, well depth and screened interval for these wells are not readily available. Based on publically-available data, water quality samples were collected only in 2004.

Figure 7: CVWD CASGEM Well Network

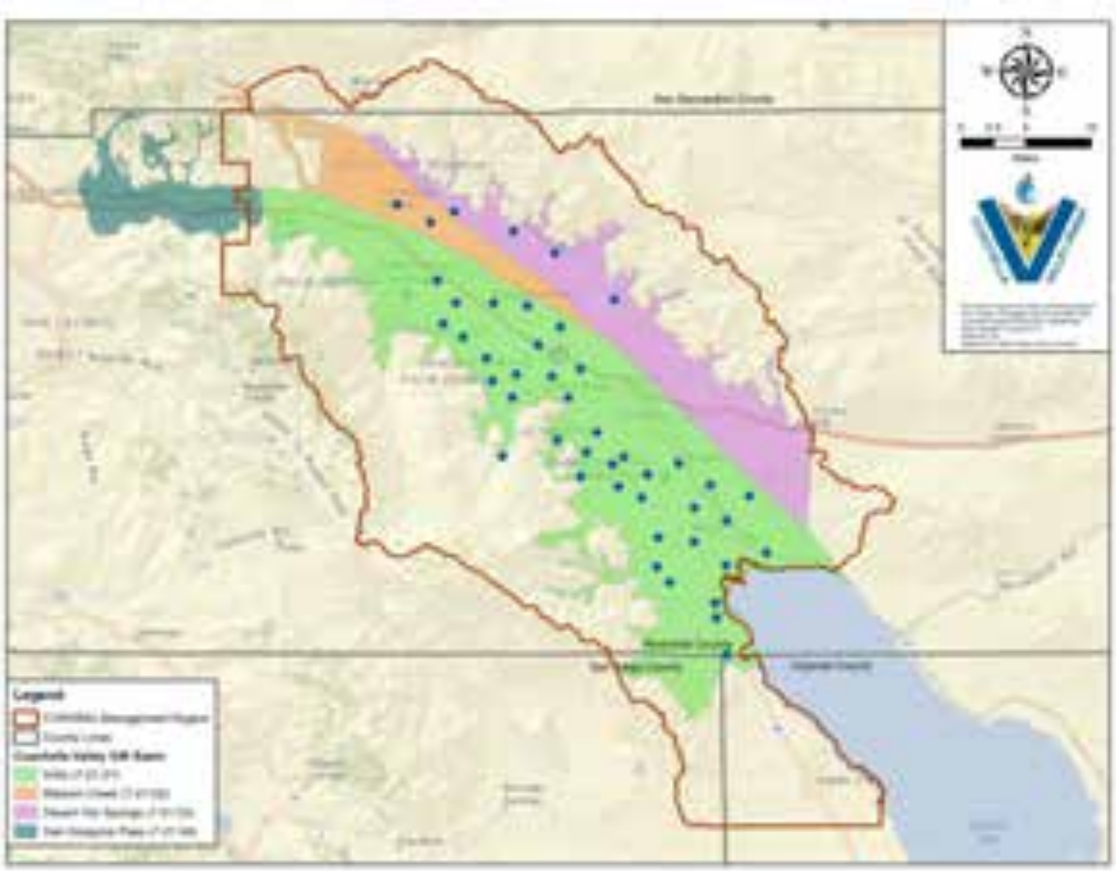


Table 1: Constituents Monitored by DWR

List of Constituents Monitored by DWR	
pH	Fluoride[1]
Specific conductance or electrical conductivity (EC) (field & lab)	Total dissolved solids (TDS)
Temperature	Chloride
Hardness	Sulfate
Calcium	Boron
Magnesium	Bromide
Potassium	Barium
Sodium	Iron
Alkalinity	Manganese
Bicarbonate	Arsenic[1]
Nitrate[1]	Stable Isotopes of Oxygen and Hydrogen

1 – Constituent of concern identified in the *DAC Water Quality Evaluation*

Figure 8: DWR Groundwater Quality Monitoring Wells

2.2.2 CDPH-Related Monitoring

The CDPH regulates public drinking water systems. A public drinking water system is defined as a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year. Private domestic wells and irrigation wells are not regulated by the CDPH. The CDPH regulates all public water systems in the State to ensure the delivery of safe drinking water from these systems.

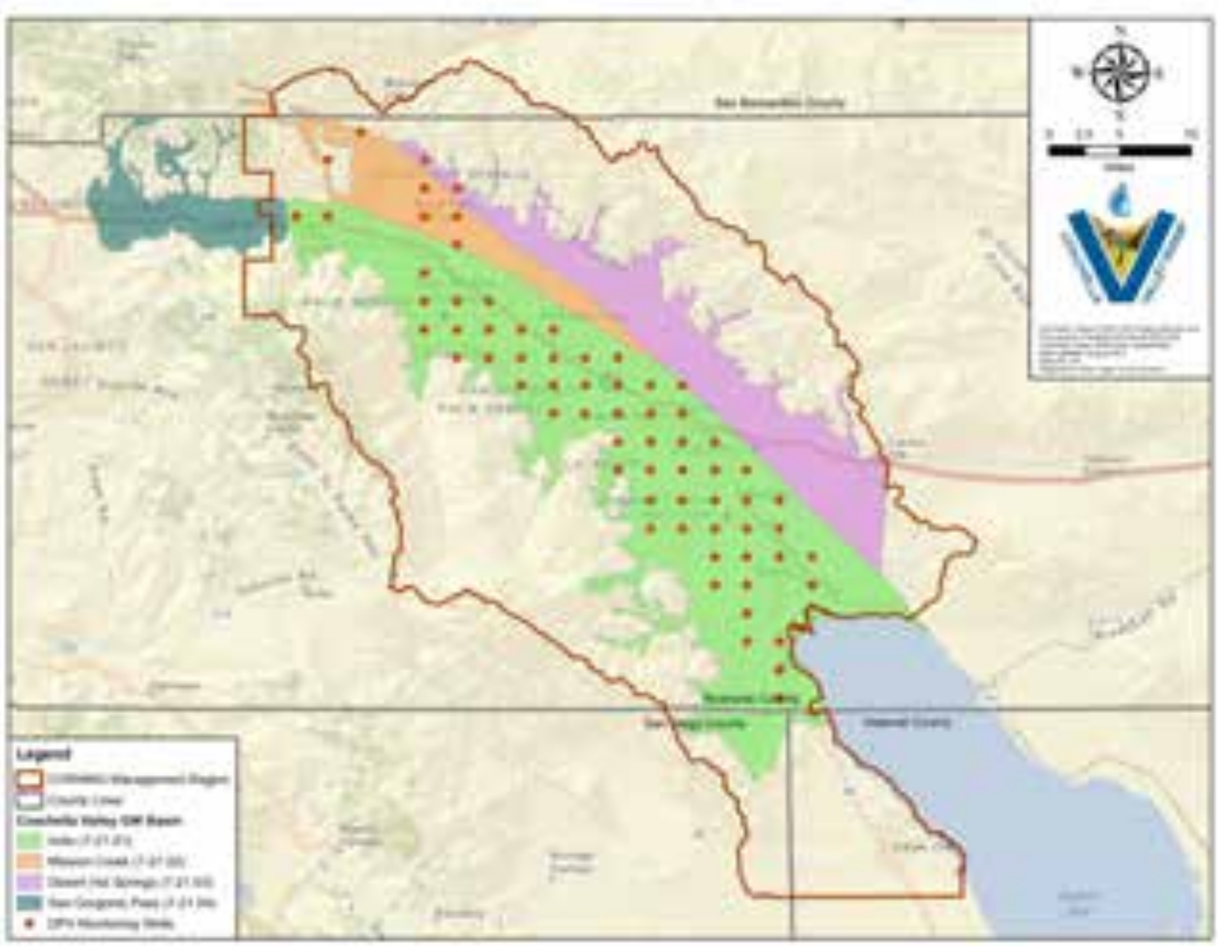
As part of their permit enforcement, CDPH establishes monitoring requirements for drinking water wells and all data collected must be reported to CDPH by the well owner. Production wells that supply drinking water are regulated under Title 22 of the California Code of Regulations (CCR). Title 22 also establishes the regulatory limits (i.e. MCLs) for volatile organic compounds, non-volatile synthetic organic compounds, inorganic chemicals, radionuclides, disinfection byproducts, and other general physical constituents in potable waters.

Public groundwater purveyors are obligated by their permits to collect groundwater samples to determine compliance with MCLs in accordance with monitoring schedules developed by CDPH, based on the size of the water system. Purveyors are required to submit data directly to CDPH via electronic transfer. The constituents monitored and the frequency of monitoring varies based on the well, size of the water system, and history of water quality monitoring results. CDPH provides water systems with monitoring plans to identify required contaminant monitoring frequencies. These are updated periodically and vary for each water system.

There are currently 93 wells with recent data (2000 to 2012) for at least one of the COCs within Coachella Valley; these data were reported to CDPH and were, in turn, included in the Geotracker-GAMA online database. Well data reported to CDPH may change in the future as wells are put on standby or abandoned and as new wells are drilled and brought online. Accordingly, the CDPH data included in the analysis documented in this TM may change over time. However, the general geographic distribution and sampling frequency is not anticipated to vary significantly.

Figure 9 shows the approximate locations of wells in the CDPH monitoring network. Two of these wells are located in Desert Hot Springs Sub-basin, while six of them are located in the Mission Creek Sub-basin and the rest of the wells are located in Indio Sub-basin. Attachment B provides a 10-year period of record for each of the COCs (2003-2013). All production wells are monitored for Title 22 constituents with the exception of waived synthetic organic chemicals and gross beta particle activity. Construction information, well depth and screened interval for CDPH wells are not available.

Figure 9: CDPH Groundwater Quality Monitoring Wells



2.2.3 CVWD-Related Monitoring

CVWD monitors groundwater elevations and quality within the Coachella Valley within its jurisdictional boundaries as required by CDPH and as needed to manage the groundwater supplies to its water system. The approximate locations of CVWD's monitoring wells are shown in Figure 10. All of the CVWD monitoring wells, except one in Mission Creek Sub-basin and one in Desert Hot Springs Basin, are located in Indio Sub-basin. Well depth and screened interval information is available for all the wells (see Attachment C). Attachment C also provides the period of record for COCs. Table 2 shows the suite of constituents monitored, including the COCs.

Figure 10: CVWD Groundwater Quality Monitoring Wells

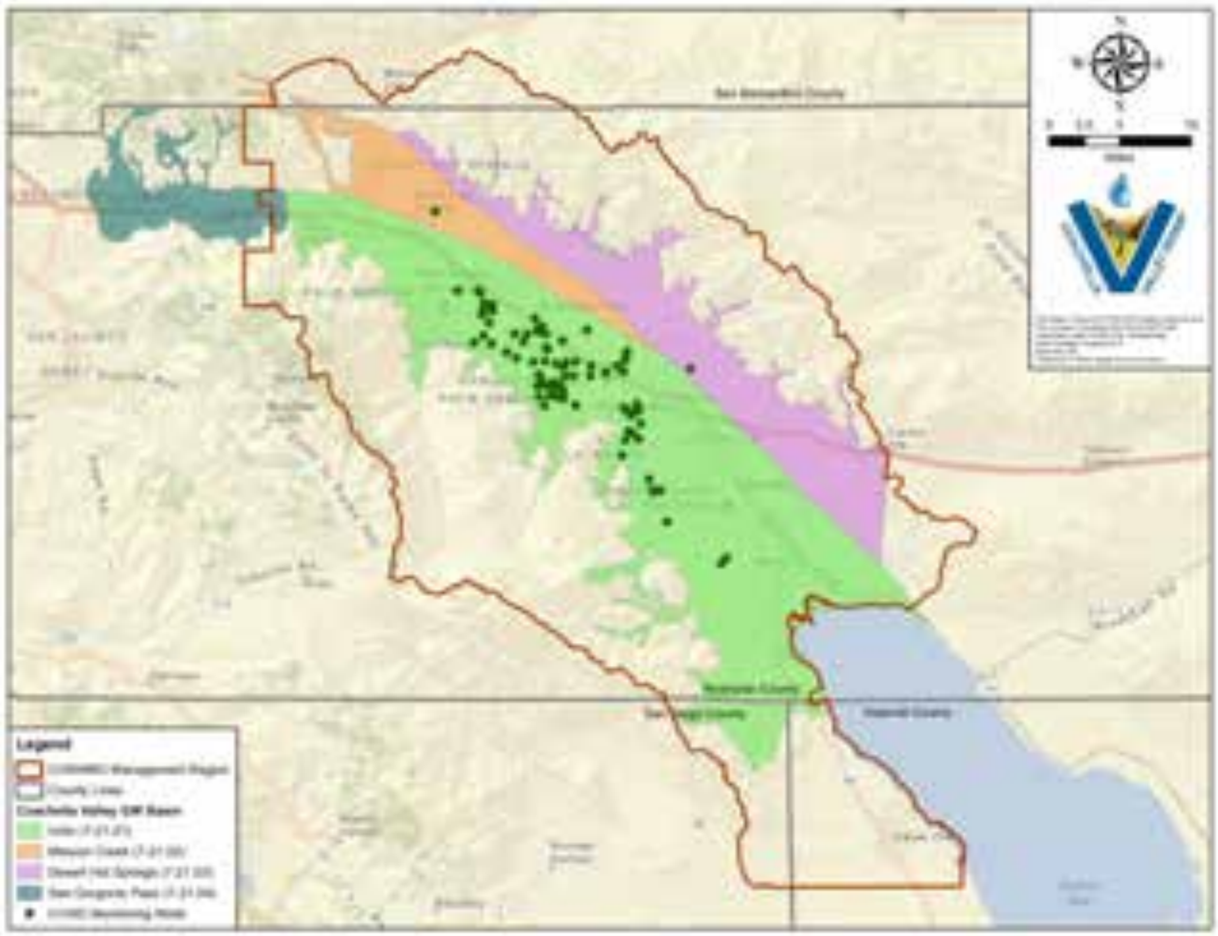


Table 2: Constituents Analyzed by CVWD

Inorganic Chemicals	General Minerals	General Physical	Radiological	Bacteriological	VOCs	SOCs
Aluminum Antimony Arsenic[1] Asbestos Barium Beryllium Cadmium Chromium (Total)[1] Copper Cyanide Fluoride[1] Iron Manganese Mercury Nickel Nitrate (as NO3)[1] Nitrite (as N) Perchlorate Selenium Silver Thallium Zinc	Total Hardness (as CaCO3) Bicarbonate Alkalinity Carbonate Alkalinity Calcium Magnesium Sodium Sulfate Chloride	Specific Conductance Turbidity pH Odor Threshold Foaming Agents Index	Gross Alpha Gross Beta Radium 226 Radium 228 Strontium-90 Tritium Uranium[1]	Total Coliform Fecal Coliform	Benzene Carbon Tetrachloride 1,2-Dichlorobenzene 1,4-Dichlorobenzene 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethylene CIS-1,2-Dichloroethylene TRANS-1,2-Dichloroethylene Dichloromethane 1,2-Dichloropropane 1,3-Dichloropropane (Total) Ethylbenzene Methyl-Tert-Butyl-Ether Monochlorobenzene Styrene 1,1,2,2,-Tetrachlororethane Tetrachlororethylene Toluene 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethylene Trichlorofluorometha ne 1,1,2-Trichloro-1,2,2-Trifluorethane 1,1,2-Trichloro-1,2,2-Trifluoroethane Vinyl Chloride Xylenes	Alachlor Atrazine Bentazon Benzo(a)pyrene Carbofuran Chlordane 2,4-D Dalapon Dibromochloropropane (DBCP) Di (2-Ethylhexyl) Adipate Di (2-Ethylhexyl) Phthalate Dinoseb Diquat Endothall Endrin Ethylene Dibromide (EDB) Glyphosate Heptachlor Heptachlor Epoxide Hexachlorobenzene Hexzachlorocyclo-Pentadiene Lindane Methoxychlor Molinate Oxamyl Pentachlorophenol Picloram Polychlorinated Biphenyls Simazine Toxaphene 2,3,7,8-TCDD (Dioxin) 2,4,5-TP (Silvex)

Source: CVWD
1 – Constituent of concern identified in the DAC Water Quality Evaluation Project

Inorganic chemicals, general minerals, general physical parameters and volatile organic compounds are monitored for all the wells in the CVWD monitoring network every three years. However, radiologicals, bacteriologicals and synthetic organic compounds (SOCs) are not tested in all the wells and the frequency of monitoring varies based on the well and history of water quality monitoring results. Therefore, all COCs except uranium are monitored regularly (every three years) for all wells in the network. Uranium monitoring frequencies vary depending on the level of gross alpha particle activity found in each well.

2.2.4 Monitoring in Mission Creek and Garnet Hill Sub-basins

CVWD, DWA and MSWD currently collect production, water level and water quality data from production and monitoring wells to monitor groundwater conditions in the Mission Creek and Garnet Hill Sub-basins (MWH, 2013). CVWD, MSWD and DWA monitor groundwater levels in wells within the Mission Creek and Garnet Hill Sub-basins. Ten wells are monitored in Desert Hot Springs Sub-basin, 22 wells are monitored in the Mission Creek Sub-basin, and six wells are monitored in the Garnet Hill Sub-basin as shown in Attachment D. MSWD monitoring is limited to District wells with levels taken monthly. CVWD monitors both its own wells and a number of private wells in these sub-basins with water levels taken three times per year (MWH, 2013).

CVWD and MSWD are monitoring the groundwater quality within the Mission Creek and Garnet Hill Sub-basins (at 21 wells) for physical constituents, general minerals, metals, radiological constituents and regulated organic compounds at least once every three years and annually for nitrate in accordance with current CDPH requirements. Attachment D provides the wells monitored for groundwater quality and the frequency of monitoring.

2.2.5 Other Agencies-Related Monitoring

IWA, CWA and DWA monitor the groundwater quality in their service areas in accordance with current CDPH requirements and schedules.

2.2.6 Special Studies

The USGS has also sampled and analyzed groundwater quality in CVGB as part of the GAMA Program (USGS, 2009). Groundwater quality in the approximately 820 square mile Coachella Valley Study Unit (COA) was sampled and analyzed in 2007 with the results compiled and analyzed in subsequent years. The COA for this study consisted of the San Gorgonio Pass Sub-basin, the Indio Sub-basin, the Mission Creek Sub-basin, and the Desert Hot Springs Sub-basin. The USGS well network consists of 31 wells in CVRWMG Management Region, including 17 "grid wells[3]" and 14 additional "understanding wells[4]".

The USGS well network is shown on Figure 11. Two of the USGS monitoring wells are located in Desert Hot Springs Sub-basin, while four are located in Mission Creek Sub-basin, and remainder are located in Indio Sub-basin. Samples were collected from these monitoring wells during February and March of 2007. Samples were collected in accordance with the protocols established by the USGS National Water Quality Assessment (NAWQA) program (Koterba and others, 1995) and the USGS National Field Manual (USGS, variously dated). Well depth and screened interval information is provided in Attachment E.

All wells sampled during the USGS study were analyzed for a standard set of constituents, including volatile organic compounds, pesticides and pesticide degradates, pharmaceutical compounds, perchlorate, and uranium, stable isotopes of hydrogen and oxygen of water, tritium, nutrients, hexavalent chromium, major ions, and trace elements. Groundwater samples were analyzed for up to 370 constituents, including the COCs.

The USGS, DWA, CVWD, and the Riverside County Flood Control and Water Conservation District also participate in basin monitoring through the Cooperative Water Resources Program. The Cooperative Water Resources Program includes stream monitoring (through stream gaging facilities), as well as a groundwater and surface water quality program.

[3]"Grid wells" were selected using a randomized grid-based method (Scott, 1990) - statistically unbiased, spatially-distributed assessment of the water quality. CDPH and USGS wells were plotted on a map; a grid of 20 equal-area cells were drawn on the unit, and wells were selected from at least one public-supply well per grid (wells in 18 of 20 cells were sampled).

[4]"Understanding wells" were selected to aid in the understanding of specific groundwater-quality issues in the COA Study Unit. These wells were not included in the statistical characterization of water quality

Figure 11: USGS Groundwater Quality Monitoring Wells

3 Identified Data Gaps

The Coachella Valley WMP identifies specific data gaps in basin groundwater monitoring, including the following:

- Lack of a centralized groundwater database that allows all water agencies to share data.
- Non-uniform water quality monitoring data for several COCs
- Existing groundwater models lack water quality predictive capabilities.

Similarly, the Mission Creek and Garnet Hill Sub-basins WMP identified the following data gaps in sub-basin data collection:

- Groundwater elevation canvass
- Private well canvass
- Groundwater quality (major ions)
- Garnet Hill Sub-basin monitoring well

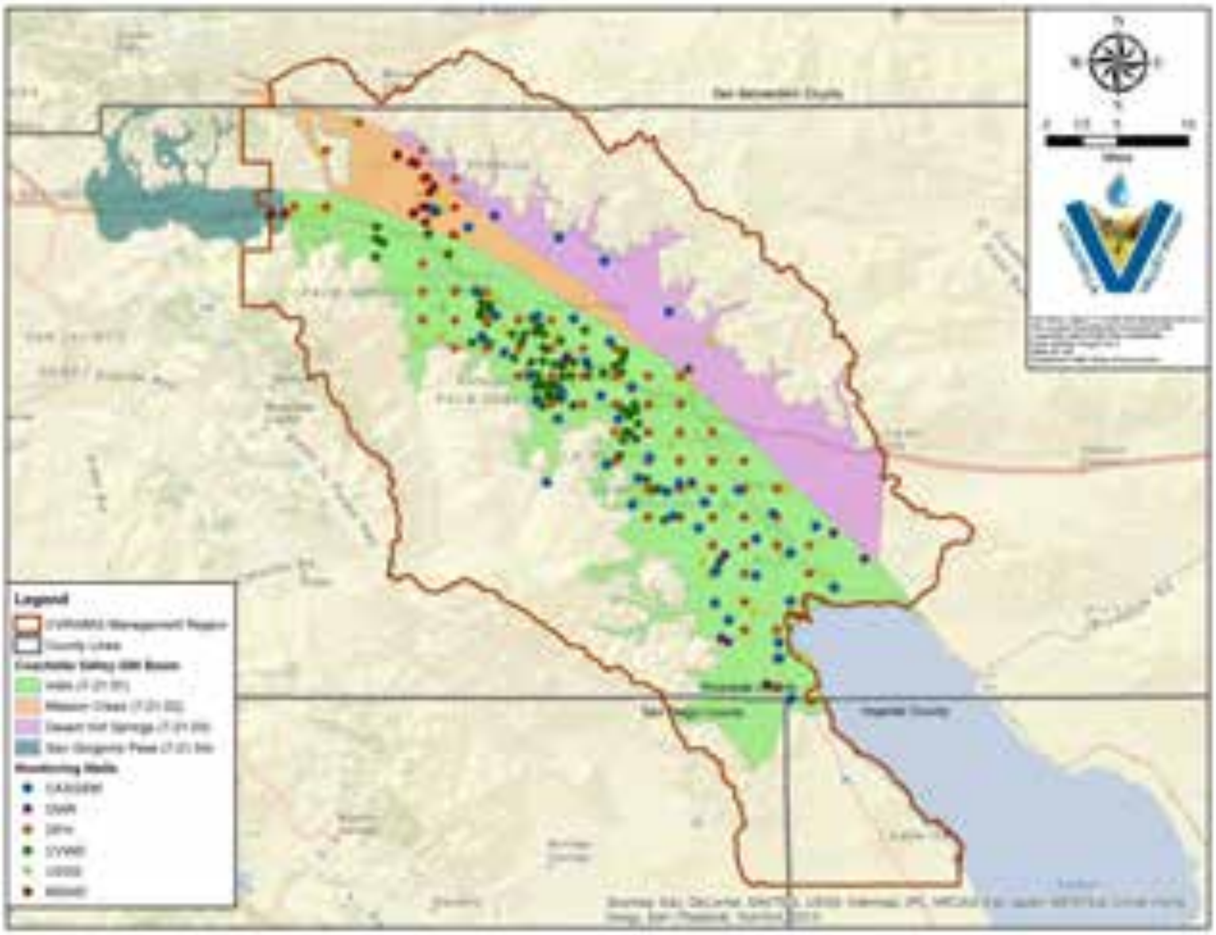
Finally, the *DAC Groundwater Quality Evaluation* identified several similar data gaps, grouping these data gaps into three categories:

- Category 1: Specific Well Locations in identified Areas of Concern - For this category, identified data gaps included identifying/confirming the well locations and owners/users, and confirming groundwater quality at those locations
- Category 2: Other Locations in identified Areas of Concern not yet Identified with Groundwater Concerns – For this category, identified data gaps included identifying existing wells in these areas, confirming well construction details, identifying possible locations for new monitoring wells, and confirming groundwater quality in these locations.
- Category 3: Basin-Wide Data Gaps – Data gaps identified for this category included confirming the construction details of existing wells, identifying where in the groundwater basin additional wells are recommended for spatial coverage, and developing a basin- sampling and analysis program to provide snapshot(s) of water quality conditions

Figure 12 shows all of the wells monitored within the CVGB. As shown on Figure 12, there are apparent spatial gaps that suggest monitoring is not taking place in certain places of the Coachella Valley. However, these apparent gaps generally occur in areas where monitoring is not necessary or appropriate such as the mountainous areas located at the edges of groundwater basins, areas that are prone to flooding, and areas where there is a lack of groundwater use. Spatial monitoring gaps are also discussed in the CVWD Groundwater Elevation Monitoring Plan for CASGEM which states that there are small data gaps in the southeastern portion of the Mission Creek Sub-basin and the southeastern portion of the Desert Hot Springs Sub-basin and that these data gaps exist due to lack of groundwater use in these areas.

However, the existing WMPs also discuss spatial monitoring data gaps and provide recommendations for modifications and additions to existing monitoring programs that could be made to improve knowledge of the region's groundwater basins. The WMPs specifically note that obtaining additional groundwater monitoring information in areas located at the edges of groundwater basins (generally along fault lines) could help with understanding groundwater basin recharge at the edges of the alluvial fans.

Figure 12: Wells Monitored in the CVGB



4 Recommended Modifications/Additions to Existing Monitoring Programs

The following sections comprise the recommended modifications and/or additions to existing groundwater monitoring programs presently being implemented in the CVGB. The suggested sampling locations, frequency of sampling, and monitoring parameters are described in Table 3.

The proposed monitoring program modifications and additions, described herein, acknowledge the recommendations and activities proposed by the Coachella Valley WMP and Mission Creek and Garnet Hill Sub-basins WMP.

Table 3: Recommended Sampling Program

Monitoring Type	Program	Implementing Agency	Monitoring Frequency	Additional Monitoring Wells?	Estimated Sampling and Analysis Cost per Well
Groundwater Level	CASGEM	CVWD, MSWD, DWA	3 times per year	No	$150[4]
	Agency Monitoring	CVWD, MSWD		Yes[2]	
Groundwater Quality[1]	CDPH	CDPH	Variable[3]	No	$550[4]
	Agency Monitoring	CVWD, MSWD, DWA	Variable[3]	Yes[2]	

1 – Monitoring should be done for all the constituents of concern (nitrate, arsenic, uranium, fluoride, perchlorate and hexavalent chromium)
2 – At proposed areas of concern
3 – Arsenic, perchlorate and fluoride should be sampled every three years. Wells should be sampled annually for arsenic if an increasing or decreasing trend is noted. Nitrate should be monitored consistent with CDPH recommendations and hexavalent chromium should be monitored consistent with forthcoming CDPH recommendations.
4 – Lab fees, per sample: metals (method 200.8) are $225, fluoride is $15, Chromium6 is $90, perchlorate is $70, and Nitrate is $15 for a total sample cost of $415. Assuming one labor hour for sampling per site at $125/hour for a total sampling and analysis cost of approximately $550/sample (round up to $550 to cover miscellaneous such as shipping, etc.). Assume water elevations collected at time of sampling.

4.1 Recommended Modifications to Existing Monitoring Programs per Mission Creek and Garnet Hill Sub-basins WMP

The Mission Creek and Garnet Hill Sub-basins WMP identifies the following recommended modifications to existing monitoring programs in the Mission Creek and Garnet Hill Sub-basins to address identified data gaps.

Groundwater Levels

The Mission Creek and Garnet Hill Sub-basins WMP identified a list of prospective additional wells within Mission Creek and Garnet Hill Sub-basins that could be included in the groundwater level monitoring program; these wells are summarized in Attachment F. Most of the recommended wells are existing wells whose status and physical condition should be evaluated for suitability for inclusion in the monitoring programs.

In addition to the selection of existing wells included in the monitoring network for improved distribution of water level measurements, the WMP recommends that several new dedicated monitoring wells be constructed. Additional wells near the Mission Creek Spreading Basin would provide a better indication of the extent of mounding due to recharge operations and allow for tracking of water quality changes to document the movement of imported recharge water in the aquifer (MWH, 2013). Additional monitoring wells near the basin boundaries and in identified spatial voids in the existing monitoring network will provide better data to document natural inflow to and outflow from the basin, changes in groundwater elevations and quality near the recharge basin, and to understand overall basin water levels and quality.

The WMP also recommends installation of transducers and data loggers on selected monitoring wells to collect more accurate groundwater level data on a regular basis during both static and pumping conditions.

Groundwater Quality

Since the current monitoring programs of MSWD and CVWD are sufficient for regulatory compliance, no major changes are recommended by the Mission Creek and Garnet Hill Sub-basins WMP. The WMP does have the following recommendations to improve groundwater quality monitoring in the Mission Creek and Garnett Hill Sub-basins:

- More frequent monitoring of private wells for temperature, TDS and general minerals to provide a better indication of water quality variations across the Mission Creek and Garnet Hill Sub-basins.
- Monthly analysis of the Mission Creek Monitoring Well and future monitoring wells near the recharge basins for TDS and possibly sulfate to track the movement of imported recharge water in the basin.
- Construction of nested monitoring wells to allow collection of water samples at varying depths. Nested wells may also provide information on uranium occurrence and movement with depth in the aquifer.
- Analysis of general minerals for the wells selected for monitoring of recharge water on annual basis.
- Analysis of radiological constituents for the wells previously identified with radiological constituents on an annual basis.
- Evaluations of water quality for general minerals for surface water sources, such as Mission Creek, at least on a triennial basis

Groundwater Use

The Mission Creek and Garnet Hill Sub-basins WMP recommends the following additional measures be implemented to improve groundwater production and use monitoring:

- Update the existing well database to determine well location, operational status, and metering status.
- Make arrangements for installation of production meters with routine production reporting on wells not currently metered.
- Evaluate unused wells for use as potential monitoring wells.
- For inactive wells whose physical condition prevents their use for monitoring, develop a program to cap or destroy the wells to prevent water quality degradation and/or safety hazards.

4.2 Recommended Modifications to Existing Monitoring Programs per Coachella Valley WMP

The Coachella Valley WMP identifies the following recommended modifications to existing monitoring programs to address identified data gaps in the CVWD and DWA service areas.

Groundwater Levels

In terms of monitoring groundwater elevations in the groundwater basin, the following five monitoring modifications/projects were recommended in the Coachella Valley WMP:

CVWD monitors water levels in 307 public and private wells in its service area three times per year on a rotating basis. These data are stored in a database and plotted as hydrographs. In accordance with SBx7-6, which created the CASGEM program, the CVRWMG agencies are currently working to meet the public reporting requirements of the CASGEM program. However, CVWD and DWA will need to compare data collected during CASGEM-related monitoring with modeled groundwater levels to ensure that the numerical model is accurately simulating basin conditions. To this end, it is recommended that an annual assessment of data be conducted, comparing measured water levels with modeled levels to document progress towards meeting the WMP and CASGEM objectives. And, as needed, the model should be updated and recalibrated to accurately reflect the new information collected.

Secondly, it is proposed that additional groundwater level hydrographs for wells in each sub-basin should be prepared to better indicate the changes in groundwater levels, and an annual accounting of the amount of water stored in the basin should be prepared. CVWD has already been creating such hydrographs, which are available in annual *Engineer's Reports* produced by the district.

Thirdly, areas in the Valley with identified spatial data gaps for existing wells should be surveyed to identify existing wells that could potentially be added to the existing monitoring network. For each identified well that may fill a monitoring void, the well location and operational status (active, inactive, abandoned, destroyed) should be determined, along with whether a meter is installed, whether production is being reported, and if any water level and/or groundwater quality data exist for that well.

Fourth, it is recommended that data loggers be installed on selected, dedicated monitoring wells in the groundwater basin to provide more continuous water level data. This will allow for real-time evaluation of groundwater elevation data, allowing for timely decision-making.

Finally, a lack of a centralized groundwater database presently inhibits the sharing of water elevation and quality data between agencies. To this end, it was recommended that a water resource database be developed for the Valley which will be used as a mechanism for data sharing among the participating water agencies and Tribes. At a minimum, this database should be capable of storing well ownership data, well logs, groundwater production, water level and water quality data. The database should be capable of interfacing with other outside databases, as needed, for reporting and utilizing common data.

Groundwater Quality

While surface and groundwater quality monitoring is performed by a number of agencies in the Coachella Valley and these data are reported to customers through annual consumer confidence reports, these activities need to be maintained and new requirements brought into the annual monitoring programs as required. The Coachella Valley WMP recommends assessment of groundwater quality due to lack of a comprehensive water quality monitoring program and database for the Valley. It is also recommended that water quality data be incorporated into the centralized groundwater database mentioned above.

The WMP also recommends CVWD work jointly with the water agencies and Tribes in the Valley to investigate if perchlorate exists in water supply wells due to a lack of data for private and Tribal wells.

Finally, the WMP recommends development and calibration of a water quality model capable of simulating the changes in salinity and possibly other conservative water quality parameters in conjunction with the salt/nutrient management plan.

Groundwater Use

As documented in the Coachella Valley WMP, a reporting threshold of 25 AFY is required for pumpers within the CVWD areas of benefit, while the same threshold in the DWA service area is 10 AFY. With the exception of wells in the Garnet Hill Sub-basin, all producers whose combined groundwater production is greater than 25 AFY are required to have a measuring device capable of measuring and registering the amount of water produced. However, not all wells in the Valley are metered. To address this deficiency, the following recommendations are made:

- Maintain up-to-date groundwater production records for the Coachella Valley groundwater basin to properly manage the basin and fairly allocated basin management costs. This includes conducting an updated survey of production wells, using power records and pump tests to develop more accurate estimates of pumping by unmetered wells, and requiring the installation of meters on wells where necessary to obtain accurate production information.
- Compile and document the amount of in-lieu recharge that takes place through delivery of recycled or imported water to reduce groundwater production on an annual basis.

4.3 Additional Recommendations for Data and Monitoring Program Modifications

The following are several additional recommendations for activities or projects beyond those recommended in the WMPs to address data gaps in the existing monitoring programs.

Spatial Monitoring Well Distribution

In general, the existing monitoring programs described above are adequate for monitoring the spatial variability in groundwater levels and quality in the CVGB, except in areas where there are existing spatial gaps in monitoring. As described in Section 3, it is recognized that installation of additional monitoring wells in these areas which are mountainous, prone to flooding, or where groundwater is not used is not necessary, and therefore not recommended. However, consistent with the Region's existing WMPs, obtaining additional groundwater monitoring information in areas located at the edges of groundwater basins (generally along fault lines) could provide additional insight on groundwater conditions at the margins of the groundwater sub-basins.

Vertical Monitoring Well Distribution

Well completion information for some wells is not available. Well completion information allows better characterization of the vertical distribution of groundwater levels and COCs in the Coachella Valley. To address the data deficiency in regards to the vertical distribution of monitoring wells, the following is recommended for wells without well completion information:

- Contact DWR, CDPH and well owners to ask for available well completion information.
- Review available DWR well logs for completion information on wells in the monitoring network.
- Analyze all wells in the monitoring networks to identify any data gaps in terms of the vertical distribution of data collected.

As needed, based on the results of this analysis, additional existing wells or new monitoring wells can be added to the monitoring networks to ensure that there is a vertical distribution in data collected. It should be noted, however, that well completion information is not necessarily public information and may not be obtained by the CVRWMG agencies in some cases.

Monitoring Program Documentation and Update

Formal documentation of on-going monitoring activities in the CVGB will ensure consistency in monitoring implementation and data analysis and reporting. It is therefore recommended that formalized monitoring program documentation be prepared, similar to that prepared for the CASGEM water level monitoring program, for each ongoing monitoring program in the groundwater basin. As part of this documentation preparation, opportunities for program integration and streamlining should be considered and discussed with the monitoring entities.

The afore-described monitoring program modifications/additions are based on publically available data existing at the time this document was prepared and at the time the region's existing WMPs were previously prepared. As such, it is recognized that, as additional data becomes available and is synthesized with existing databases, data gaps will be addressed and changes to the CVGB monitoring programs will be required. Therefore, it is recommended that all basin-wide monitoring programs be revisited in five years, and updated as appropriate given the information learned and programs implemented in the Coachella Valley.

5 References

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Attachment A: CVWD Network Wells for CASGEM

State Well No.	Sub-basin	Confined or Unconfined Aquifer	GSE (ft)	RPE (ft)	Well Use	Well Status	Total Well Depth (ft)
03S05E10R01S	Dst Hot Sprg	Unconfined	925.4	967.4	Monitoring Well	Inactive	210
03S06E21F02S	Dst Hot Sprg	Unconfined	1,026.2	1,069.2	Monitoring Well	Inactive	N/A
03S06E25Q01S	Dst Hot Sprg	Unconfined	898.8	942.8	Monitoring Well	Inactive	N/A
04S07E14E01S	Dst Hot Sprg	Unconfined	1,032.0	1,077.0	Irrigation	Inactive	N/A
04S05E09B01S	Indio	Unconfined	397.5	400.5	Monitoring Well	Inactive	806
04S05E15R02S	Indio	Unconfined	313.3	349.3	Irrigation	Active	N/A
04S05E27E01S	Indio	Unconfined	313.4	317.4	Monitoring Well	Inactive	400
04S05E35G03S	Indio	Unconfined	269.7	274.7	Monitoring Well	Inactive	N/A
04S06E18R01S	Indio	Unconfined	239.0	245.0	Monitoring Well	Inactive	518
04S06E22C01S	Indio	Unconfined	216.0	223.0	Monitoring Well	Inactive	328
04S06E25J02S	Indio	Unconfined	136.6	160.6	Irrigation	Inactive	350
04S06E35P01S	Indio	Unconfined	128.9	153.9	Irrigation	Inactive	600
05S06E06Q01S	Indio	Unconfined	214.6	222.6	Monitoring Well	Inactive	1,202
05S06E13G02S	Indio	Unconfined	151.1	160.1	Monitoring Well	Inactive	N/A
05S06E16A03S	Indio	Unconfined	140.8	181.8	Monitoring Well	Inactive	275
05S06E18R01S	Indio	Unconfined	185.1	195.1	Monitoring Well	Inactive	458
05S06E28C02S	Indio	Unconfined	246.9	257.9	Monitoring Well	Inactive	680
05S07E08Q01S	Indio	Unconfined	21.2	58.2	Irrigation	Active	N/A
05S07E30A01S	Indio	Unconfined	66.5	78.5	Monitoring Well	Inactive	1,000
06S06E12G01S	Indio	Unconfined	80.5	93.5	Monitoring Well	Inactive	377
06S06E17K01S	Indio	Unconfined	927.3	961.3	Irrigation	Active	N/A
06S07E04H01S	Indio	Confined	5.8	24.8	Monitoring Well	Inactive	740
06S07E13M02S	Indio	Confined	-75.3	-55.3	Monitoring Well	Inactive	387
06S07E16D02S	Indio	Confined	-9.6	4.4	Monitoring Well	Inactive	1,170
06S07E23F01S	Indio	Confined	-90.8	-52.8	Irrigation	Active	N/A
06S07E26Q01S	Indio	Confined	-106.8	-80.8	Irrigation	Inactive	N/A
06S07E29B01S	Indio	Unconfined	-0.6	26.4	Irrigation	Active	750
06S08E19R01S	Indio	Confined	-142.5	-103.5	Irrigation	Active	N/A
06S08E22D02S	Indio	Confined	-131.9	-116.9	Monitoring Well	Inactive	1,100
06S08E25Q01S	Indio	Confined	-150.9	-122.9	Irrigation	Active	648
06S08E31P01S	Indio	Confined	-150.3	-115.3	Irrigation	Active	575
06S09E33K01S	Indio	Unconfined	3.0	32.0	Irrigation	Active	430
07S08E02L03S	Indio	Confined	-191.4	-161.4	Irrigation	Active	N/A
07S08E14N01S	Indio	Confined	-203.1	-172.1	Irrigation	Active	N/A
07S08E17G01S	Indio	Confined	-94.3	-78.3	Monitoring Well	Inactive	750
07S08E29G01S	Indio	Confined	50.9	82.9	Irrigation	Active	N/A
07S08E31R01S	Indio	Confined	206.5	239.5	Monitoring Well	Inactive	800
07S09E07J01S	Indio	Confined	-203.2	-181.2	Monitoring Well	Inactive	880
07S09E23N01S	Indio	Confined	-199.6	-182.6	Monitoring Well	Inactive	865

State Well No.	Sub-basin	Confined or Unconfined Aquifer	GSE (ft)	RPE (ft)	Well Use	Well Status	Total Well Depth (ft)
07S09E30R04S	Indio	Confined	-221.8	-200.8	Monitoring Well	Inactive	395
08S08E24A01S	Indio	Confined	-191.0	-151.0	Irrigation	Active	N/A
08S09E07N04S	Indio	Confined	-225.7	-202.7	Monitoring Well	Inactive	1,380
08S09E31R01S	Indio	Confined	-33.6	-15.6	Monitoring Well	Inactive	442
03S04E12B02S	Mission Creek	Unconfined	884.6	885.6	Monitoring Well	Inactive	503
03S05E17J01S	Mission Creek	Unconfined	788.6	790.6	Monitoring Well	Inactive	N/A

Source: CVWD, 2011b

Notes: NA = Not Available; all elevations are relative to mean sea level

Attachment B: Wells Monitored for CDPH

CDPH Well No.	Depth Drilled (feet)	Depth Cased (feet)	Depth of Top Perf. (feet)	Depth of Bottom Perf. (feet)	Land Surface Elevation	Period of Data					
						Arsenic	Nitrate	Uranium	Fluoride	Perchlorate	Hexavalent Chromium
1310011						1987-2005	1987-2007	1998-2006	1987-2005	2000-2004	2000-2001
3301027						2012	2006-2012		2012	2012-2012	
3301031										2001-2010	
3301040						1999-2009	1999-2012	2005-2009	1999-2009	2008-2009	
3301046						2008	2002-2012	2002-2007	2008	2005-2012	2005
3301082						1993-2008	1993-2008		1993-2008		
3301103										2001-2001	2001
3301107						2001-2011	2001-2011	2008-2011	2001-2011	2008-2011	
3301147						2004-2009	2004-2012		2004	2008-2008	
3301148							2007-2012		2011		
3301149						2005-2011	2005-2012	2010	2005-2011	2005-2011	2005
3301152						2005-2009	2005-2008		2005-2009	2008-2008	
3301153						2005	2004-2012		2005	2004-2008	
3301155						2004-2008	2002-2012	2008-2009	2004-2008	2003-2008	2004-2005
3301170						1993-1998	1993-2000	1999	1993-1999		
3301206							2008-2012		2011-2012		
3301209						2009-2011	2009-2012	2010-2012	2009-2011	2009-2009	
3301220						1997-2006	1997-2007	1997-2006	1997-2006		
3301238						1987-2011	1987-2012	2005-2012	1987-2011	2000-2012	2000
3301241							2008-2011		2009	2008-2008	
3301247						2003	2003-2011	2001-2012	2003	2008-2009	
3301276						2004-2010	2004-2012	2010	2004-2010	2008-2011	
3301297							2006-2007				
3301305						2005	2005-2009	2009	2005	2008-2008	
3301372						2003-2007	2001-2007		2003-2007	2001-2008	2008

CDPH Well No.	Depth Drilled (feet)	Depth Cased (feet)	Depth of Top Perf. (feet)	Depth of Bottom Perf. (feet)	Land Surface Elevation	Period of Data					
						Arsenic	Nitrate	Uranium	Fluoride	Perchlorate	Hexavalent Chromium
3301373						2010	2004-2011		2008-2010	2010-2010	
3301380						2006-2012	2006-2011		2006-2010	2008-2009	
3301388						2006-2009	2005-2012	2010	2006	2008-2008	
3301445						1993-2009	1993-2004		1993-2009		
3301471						2008	2008	2008	2008		
3301476						2006-2009	2006-2010		2006-2009	2008-2009	
3301489						2002	2001-2004	2001	2002		
3301493							2001				
3301557							2006				
3301566							2002-2006				
3301618							2001-2003				
3301683							2006-2008				
3301717						1996-2010	1996-2012	2012	1996-2010	2004-2010	2004
3301734						2001	2001	2002	2001		
3301735						2003-2010	2003-2010		2003-2010	2004-2010	2004
3301746						2002-2005	2000-2008	2006	2002-2005	2008-2008	
3301750							2001-2012				
3301755						2007-2012	2002-2011	2006	2009	2008-2009	
3301758										2009-2010	
3301803						2010	2009-2012	2001-2010	2010	2008-2010	2009
3301834							2006-2012				
3301850						2001	2001		2001		
3301875						2003	2003	2003	2003		
3301888						2007-2010	2007		2007-2010		
3301933						1995-2001	1995-2002		1995-2001	2000-2001	2000-2001
3301935						2004-2012	2004-2012	2010	2004-2012	2012-2012	
3301937						2001-2009	2001-2011	2001-2011	2001-2009	2006-2009	2006

CDPH Well No.	Depth Drilled (feet)	Depth Cased (feet)	Depth of Top Perf. (feet)	Depth of Bottom Perf. (feet)	Land Surface Elevation	Period of Data					
						Arsenic	Nitrate	Uranium	Fluoride	Perchlorate	Hexavalent Chromium
3301939						2007-2010	2004-2010	2011	2007-2010	2008-2010	
3301965							2001				
3301980										2006-2009	
3301981							2003-2010				
3301989							2000				
3301990						2004	2004-2012		2004		
3301991							2001				
3302008						2001-2008	2001-2008	2002-2003	2001-2008	2008-2008	
3302009						2008	2008		2008	2008-2008	
3302027							2000-2012		2000		
3302034							2001				
3302069						2005-2009	2005-2009		2005-2009	2009-2009	
3302079						2007	2007		2007		
3302081						2001	2001		2001		
3302088									2010-2012		
3303002						2003-2009	2001-2012		2003-2009		
3303003						2002-2010	2002-2012	2009	2002-2010	2010-2010	
3303007						2007	2007		2007		
3303012							2003-2010				
3303025						2010			2008-2012		
3303026							2008	2008-2012	2011-2012		
3303028						2004	2002-2004		2004	2004-2004	2004
3303035							2010	2011		2009-2010	
3303041						2009-2012					
3303048						2009					
3303085							2003				
3303090							2004-2011				

CDPH Well No.	Depth Drilled (feet)	Depth Cased (feet)	Depth of Top Perf. (feet)	Depth of Bottom Perf. (feet)	Land Surface Elevation	Period of Data					
						Arsenic	Nitrate	Uranium	Fluoride	Perchlorate	Hexavalent Chromium
3303092						2009-2012	2012			2009-2009	
3303100						2004-2012	2004-2012	2011-2012	2004-2012	2008-2012	
3310001						1987-2012	1987-2012	1990-2012	1987-2012	2000-2012	2000-2011
3310006										2003-2012	
3310005						1986-2010	1985-2012	1989-2012	1985-2010	2001-2010	2001
3310007						1986-2010	1985-2012	1989-2012	1986-2010	2001-2012	2000-2012
3310008						1993-2011	1993-2012	1994-2012	1993-2011	2002-2011	2001-2005
3310020						1987-2011	1986-2012	1992-2012	1987-2011	2004-2011	2000-2011
3310047										2002-2012	
3310048						1987-2011	1987-2012	1992-2012	1987-2011	2000-2011	2000-2001
3310051						1987-2011	1987-2011	1998-2011	1987-2011	2002-2011	2000-2004
3310063						1987-2012	1987-2012		1987-2011	2000-2011	2000-2001
3310078						1993-2011	1993-2012	1999-2012	1993-2011	2002-2011	2000-2005
3310081										2002-2011	

Source: http://geotracker.waterboards.ca.gov/gama/

Attachment C: Wells Monitored by CVWD

CVWD Well No.	Depth Drilled (feet)	Depth Cased (feet)	Depth of Top Perf. (feet)	Depth of Bottom Perf. (feet)	Land Surface Elevation	Period of Data					
						Arsenic	Nitrate	Uranium	Fluoride	Perchlorate	Hexavalent Chromium
4502-1			315	627	251	1963-2011	1963-2011	2004	1963-2011	1963-2011	1963-2011
4504-1			600	1000	273	1971-2011	1971-2011		1971-2011	1971-2011	1971-2011
4507-2			540	850	325	2008-2011	2008-2011		2008-2011	2008-2011	2008-2011
4509-1			1030	1310	0	2003-2009	2003-2009	2006	2003-2009	2003-2009	2003-2009
4510-1			940	1300	350	2003-2011	2003-2011	2011	2003-2011	2003-2011	2003-2011
4519-1			500	925	318	1974-2011	1974-2011		1974-2011	1974-2011	1974-2011
4520-1			456	835	314	2008-2011	2008-2011		2008-2011	2008-2011	2008-2011
4521-1			500	800	357	2009-2011	2009-2011		2009-2011	2009-2011	2009-2011
4522-1			450	840	397	2009-2010	2009-2010	2009-2010	2009-2010	2009-2010	2009-2010
4523-1			430	660	372	2009-2010	2009-2010		2009-2010	2009-2010	2009-2010
4524-1			470	820	354	1991-2010	1991-2013		1991-2012	1991-2010	1991-2011
4525-1			650	1000	368	1993-2010	1991-2010		1991-2010	1991-2010	1991-2010
4526-1			950	1200	356	1999-2010	1999-2010		1999-2010	1999-2010	1999-2010
4527-1			850	1155	297	2002-2011	2002-2011		2002-2011	2002-2011	2002-2011
4562-2			500	900	396	1962-2010	1962-2010		1962-2010	1962-2010	1962-2010
4563-1			520	890	428	1982-2010	1982-2010		1982-2010	1982-2010	1982-2010
4564-1			410	670	397	1987-2010	1987-2010		1987-2010	1987-2010	1987-2010
4565-1			500	900	444	1987-2010	1987-2010		1987-2010	1987-2010	1987-2010
4566-1			500	990	350	2009-2010	2009-2010		2009-2010	2009-2010	2009-2010
4567-1			855	1150	375	2002-2011	2002-2011		2002-2011	2002-2011	2002-2011
4610-1			1000	1300	219	1999-2011	1999-2011		1999-2011	1999-2011	1999-2011
4611-1			840	1300	186	2000-2009	2000-2009		2000-2009	2000-2009	2000-2009
4613-1			780	1300	312	2004-2010	2004-2010		2004-2010	2003-2009	2004-2010
4614-2			780	1300	306	2004-2010	2004-2010		2004-2010	2004-2010	2004-2010
4628-2			755	1290	207	2003-2009	2003-2009		2003-2009	2003-2009	2003-2009
4629-1			496	796	173	1979-2010	1979-2010		1979-2010	1979-2010	1979-2010

CVWD Well No.	Depth Drilled (feet)	Depth Cased (feet)	Depth of Top Perf. (feet)	Depth of Bottom Perf. (feet)	Land Surface Elevation	Period of Data					
						Arsenic	Nitrate	Uranium	Fluoride	Perchlorate	Hexavalent Chromium
4630-1			480	990	243	1984-2010	1984-2010		1984-2010	1984-2010	1984-2010
4631-2			540	940	229	2000-2011	2000-2011		2000-2011	2000-2011	2000-2011
4720-1			500	840	86	1993-2010	1993-2010		1993-2010	1993-2010	1993-2010
4721-1			550	950	90	1993-2010	1993-2010		1993-2010	1993-2010	1993-2010
4722-1			570	1160	97	2002-2011	2002-2011		2002-2011	2002-2011	2002-2011
5620-1			445	965	180	1975-2009	1975-2009		1975-2009	1975-2009	1975-2009
5623-1			450	780	192	1979-2009	1979-2009		1979-2009	1979-2009	1979-2009
5624-1			650	920	203	2008-2009	2008-2009		2008-2009	2008-2009	2008-2009
5625-2			550	890	184	2007-2010	2007-2010		2007-2010	2007-2010	2007-2010
5629-1			570	970	246	1987-2010	1987-2010		1987-2010	1987-2010	1987-2010
5630-1			455	890	283	1985-2009	1985-2009		1985-2009	1985-2009	1985-2009
5631-1			740	1010	192	1985-2010	1985-2010		1985-2010	1985-2010	1985-2010
5632-2			820	1300	145	2002-2011	2002-2011		2002-2011	2002-2011	2002-2011
5639-1			548	872	151	2008-2011	2008-2011		2008-2011	2008-2011	2008-2011
5656-1			450	930	197	1987-2010	1987-2010		1987-2010	1987-2010	1987-2010
5657-1			420	720	118	1988-2009	1988-2009		1988-2009	1988-2009	1988-2009
5658-1			480	850	183	2009-2009	2009-2009		2009-2009	2009-2009	2009-2009
5659-1			550	890	180	1989-2009	1989-2009		1989-2009	1989-2009	1989-2009
5662-1			625	925	200	1996-2011	1996-2011		1996-2011	1996-2011	1996-2011
5664-1			500	930	151	2009-2009	2009-2009		2009-2009	2009-2009	2009-2009
5667-1			470	800	188	1993-2010	1993-2010		1993-2010	1993-2010	1993-2010
5668-1			520	900	173	1994-2009	1994-2009		1994-2009	1994-2009	1994-2009
5669-1			500	980	170	1993-2009	1993-2009		1993-2009	1993-2009	1993-2009
5670-1			570	930	195	1995-2010	1995-2010		1995-2010	1995-2010	1995-2010
5671-2			550	990	200	1994-2009	1994-2009		1994-2009	1994-2009	1994-2009
5672-1			680	1010	211	1997-2009	1997-2009		1997-2009	1997-2009	1997-2009
5673-1			740	1000	203	1997-2009	1997-2009		1997-2009	1997-2009	1997-2009

CVWD Well No.	Depth Drilled (feet)	Depth Cased (feet)	Depth of Top Perf. (feet)	Depth of Bottom Perf. (feet)	Land Surface Elevation	Period of Data					
						Arsenic	Nitrate	Uranium	Fluoride	Perchlorate	Hexavalent Chromium
5675-1			670	790	201	1999-2011	1999-2011		1999-2011	1999-2011	1999-2011
5676-1			1000	1300	0	2003-2009	2003-2009		2003-2009	2003-2009	2003-2009
5677-1			900	1260	267	1999-2011	1999-2011		1999-2011	1999-2011	1999-2011
5678-1			1000	1300	261	1999-2011	1999-2011		1999-2011	1999-2011	1999-2011
5679-1			900	1305	135	2000-2009	2000-2009		2000-2009	2000-2009	2000-2009
5680-1			1000	1300	215	2000-2009	2000-2009		2000-2009	2000-2009	2000-2009
5681-1			900	1200	164	2000-2009	2000-2009		2000-2009	2000-2009	2000-2009
5682-1			850	1300	242	2000-2003	2000-2003		2000-2003	2000-2003	2000-2003
5701-1			900	1270	46	1999-2011	1999-2011		1999-2011	1999-2011	1999-2011
5708-1			450	970	90	1989-2011	1989-2011		1989-2011	1989-2011	1989-2011
5709-1			480	840	77	1990-2011	1990-2011		1990-2011	1990-2011	1990-2011
5711-1			450	850	58	2002-2011	2002-2011		2002-2011	2002-2011	2002-2011
5714-1			900	1270	81	1999-2011	1999-2011		1999-2011	1999-2011	1999-2011
5715-1			840	1380	56	2000-2009	2000-2009		2000-2009	2000-2009	2000-2009
5716-1			900	1200	61	2003-2009	2003-2012		2003-2011	2000-2009	2003-2010
5717-1			915	1123	0	2003-2009	2003-2009		2003-2009	2003-2009	2003-2009
5718-1			940	1480	0	2003-2009	2003-2009		2003-2009	2003-2009	2003-2009
5720-1			540	860	111	1993-2010	1993-2010		1993-2010	1993-2010	1993-2010
5721-1			1010	1210	0	1999-2011	1999-2014		1999-2013	1999-2011	1999-2012
5725-1			1130	1430	0	2004-2010	2004-2010		2004-2010	2004-2010	2004-2010
5727-1			930	1440	0	2004-2010	2004-2010		2004-2010	2004-2010	2004-2010
6701-1			580	800	40	1982-2010	1982-2010		1982-2010	1982-2010	1982-2010
6723-1			350	800	-6	1989-2009	1989-2009		1989-2009	1989-2009	1989-2009
6724-1			350	740	-18	1991-2009	1991-2009		1991-2009	1991-2009	1991-2009
6725-1			360	840	0	2001-2010	2001-2010		2001-2010	2001-2010	2001-2010
6726-1			640	1160	-64	2003-2009	2003-2009		2003-2009	2003-2009	2003-2009
6728-1			500	750	-78	2003-2009	2003-2009		2003-2009	2003-2009	2003-2009

CVWD Well No.	Depth Drilled (feet)	Depth Cased (feet)	Depth of Top Perf. (feet)	Depth of Bottom Perf. (feet)	Land Surface Elevation	Period of Data					
						Arsenic	Nitrate	Uranium	Fluoride	Perchlorate	Hexavalent Chromium
6805-1			490	950	-95	1996-2011	1996-2014		1996-2013	1996-2011	1996-2012
7802-1			245	990	0	2002-2011	2002-2011		2002-2011	2002-2011	2002-2011
7803			250	710	119	2003-2009	2003-2009		2003-2009	2003-2009	2003-2009

Source: CVWD

Attachment D: Existing Wells Monitored within Mission Creek and Garnet Hill Subbasins

Sub-basin	Owner	Owner's Well Number	Monitored for Levels	Frequency	Monitored for Quality	Frequency
DHS	MSWD	8	Yes[1]	2 per year	?	--
DHS	MSWD	5	Yes[1]	2 per year	?	
DHS	Howard		Yes	3 per year	No	--
DHS	Dorothy & Orville Smith		Yes	3 per year	No	--
DHS	Erwin And Assoc.		Yes	3 per year	No	--
DHS	Johnson		Yes	3 per year	No	--
DHS	Tru Wall Const.		Yes	3 per year	No	--
DHS	Knudsen		Yes[1]	3 per year	No	--
DHS	William W. Tarbutton		Yes	3 per year	No	--
DHS	Manthei Bros.		Yes[1]	3 per year	No	--
DHS	Honig		Yes[1]	3 per year	No	--
DHS	M. J. Grieshaber		Yes	3 per year	No	--
MC	DWA	Mission Creek Monitoring Well	Yes	Monthly	No	--
MC	MSWD	23	Yes[1]	Monthly	Yes	Triennially[2]
MC	MSWD	30	Yes	Monthly	Yes	Triennially[2]
MC	MSWD	28	Yes	Monthly	Yes	Triennially[2]
MC	MSWD	34	Yes	Monthly	Yes	Triennially[2]
MC	MSWD	35	Yes	Monthly	Yes	Triennially[2]
MC	MSWD	22	Yes	Monthly	Yes	Triennially[2]
MC	MSWD	24	Yes	Monthly	Yes	Triennially[2]
MC	MSWD	29	Yes	Monthly	Yes	Triennially[2]
MC	MSWD	37	Yes	Monthly	Yes	Triennially[2]
MC	MSWD	32	Yes	Monthly	Yes	Triennially[2]
MC	MSWD	27	Yes	Monthly	Yes	Triennially[2]
MC	MSWD	31	Yes	Monthly	Yes	Triennially[2]
MC	CVWD	3406	No	--	No	--

Sub-basin	Owner	Owner's Well Number	Monitored for Levels	Frequency	Monitored for Quality	Frequency
MC	CVWD	3408	Yes[1]	3 per year	Yes	Triennially[2]
MC	CVWD	3405	Yes	3 per year	Yes	Triennially[2]
MC	CVWD	3410	Yes	3 per year	Yes	Triennially[2]
MC	CVWD	3409	Yes	3 per year	Yes	Triennially[2]
MC	KLATT		Yes	3 per year	No	--
MC	CVWD (?)	3518	Yes1	3 per year	No	--
MC	Desert Dunes Golf Course	1	Yes	3 per year	Yes	Every six years
MC	Cronholm		Yes	3 per year	No	--
GH	Duryea		Yes	3 per year	No	--
GH	Unknown		Yes	3 per year	No	--
GH	MSWD	33	Yes	Monthly	Yes	Triennially[2]
GH	Valley View MWC		Yes	3 per year	No	--
GH	Margolias		Yes	3 per year	Yes	Periodically
GH	Frank Mack		Yes	3 per year	Yes	Periodically
GH	Jack in the Box		No	--	Yes	Periodically

Source: MWH, 2013

DHS: Desert Hot Springs Sub-basin
MC: Mission Creek Sub-basin
GH: Garnet Hill Subbbasin

CVWD – Coachella Valley Water District
MSWD – Mission Springs Water District
DWA – Desert Water Agency

1 – CASGEM Well
2 – CDPH requires triennial monitoring for general minerals, metals, radiological and regulated organics (VOCs and SOCs) and annual monitoring of nitrate

Attachment E: Wells Monitored by USGS

USGS Well No.	Depth Drilled (feet)	Depth Cased (feet)	Depth of Top Perf. (feet)	Depth of Bottom Perf. (feet)	Land Surface Elevation	Period of Data					
						Arsenic	Nitrate	Uranium	Fluoride	Perchlorate	Hexavalent Chromium
COA-01						2007	2007	2007	2007	2007	
COA-02			230	480	-221	2007	2007	2007	2007	2007	
COA-03	1070				147	2007	2007	2007	2007	2007	
COA-04	1090		500	1060	79	2007	2007	2007	2007	2007	
COA-05	654		710	1090	237.23	2007	2007	2007	2007	2007	
COA-06	240		203	654	52.2	2007	2007	2007	2007	2007	
COA-07	342				2	2007	2007	2007	2007	2007	
COA-08			258	342	-16	2007	2007	2007	2007	2007	
COA-09					392	2007	2007	2007	2007	2007	
COA-10					106	2007	2007	2007	2007	2007	
COA-11					-110	2007	2007	2007	2007	2007	
COA-12	525		445	525	-173	2007	2007	2007	2007	2007	
COA-13						2007	2007	2007	2007	2007	
COA-14	820		420	820	232	2007	2007	2007	2007	2007	
COA-15	400		180	380	872	2007	2007	2007	2007	2007	
COA-16	650		300	650	477	2007	2007	2007	2007	2007	
COA-17					2475	2007	2007	2007	2007	2007	
COA-18	790		280	790	43	2007	2007	2007	2007	2007	
COA-19					1063	2007	2007	2007	2007	2007	
COAU-01	96		12	43	2218	2007	2007	2007	2007	2007	
COAU-02	600		288	600	382	2007	2007	2007	2007	2007	
COAU-03					332	2007	2007	2007	2007	2007	
COAU-04	400		280	400	2	2007	2007	2007	2007	2007	
COAU-05	909		306	906	1175	2007	2007	2007	2007	2007	
COAU-06						2007	2007	2007	2007	2007	

USGS Well No.	Depth Drilled (feet)	Depth Cased (feet)	Depth of Top Perf. (feet)	Depth of Bottom Perf. (feet)	Land Surface Elevation	Period of Data					
						Arsenic	Nitrate	Uranium	Fluoride	Perchlorate	Hexavalent Chromium
COAU-07	553		225	553	1353	2007	2007	2007	2007	2007	
COAU-08	730		476	726	499.42	2007	2007	2007	2007	2007	
COAU-09					183	2007	2007	2007	2007	2007	
COAU-10	1070		410	1050	1016	2007	2007	2007	2007	2007	
COAU-11	400		220	400	589	2007	2007	2007	2007	2007	
COAU-12						2007	2007	2007	2007	2007	
COAU-13					171	2007	2007	2007	2007	2007	
COAU-14	550		330	530	62	2007	2007	2007	2007	2007	
COAU-15	700		400	700	344	2007	2007	2007	2007	2007	
COAU-16					-3	2007	2007	2007	2007	2007	

Source: USGS, 2009

Attachment F: Proposed Wells for Monitoring by Mission Creek and Garnet Hill Subbasins WMP

Sub-basin	Owner[1]	Status	Purpose	Comment
MC	Will Claiborne	926 ft deep, drilled 1989	Subsurface inflow upstream of recharge basin	Mission Creek West of SR 62 and Indian
MC	TW Burnham	Unknown	Subsurface inflow from Mission Creek	Mission Creek 2 mi NW of SR 62
MC	Mrs A K Walters	Drilled 1965	Subsurface inflow from Mission Creek	Mission Creek 2 mi NW of SR 62
MC	TW Burnham	Unknown	Subsurface inflow from Mission Creek	Mission Creek 1 mi NW of SR 62
MC	Norman Lamaroux	Unknown	Improved water level contours between MSWD's Wells 35 and 24	Select one of these wells
MC	Edwards	Unknown, drilled 1966		
MC	Snellenberger (?)	Unknown; Not in CVWD records	Subsurface inflow and water level west of SR 62	West of SR 62 near Pierson
MC	Park West Mobil Park	Well deepened to 495 ft	Improved water level contours west of MSWD's Well 37	Select one of these wells
MC	MSWD – Well 13	May be dry – capped per CVWD records		
MC	MSWD Airport	?	CASGEM Well – improved water level contours	Recent MSWD acquisition, only levels are monitored monthly
MC	CPV Sentinel	New well; not in CVWD records	Improved water level contours west of Indian Ave.	Recently constructed; SWN unknown
MC	Dr Aiken/USGS[2]	Unknown	Improved water level contours near Mission Creek fault	May be monitored by USGS
MC	Klatt	Unknown	Improved water level contours near Mission Creek fault	Near Mission Creek fault
MC	Mr O Scarcelli	Unknown, drilled 1978	Improved water level contours near Banning fault	Select one of these wells
MC	Durst	Unknown, drilled 1978		
MC	Jay Schultz	Unknown, drilled 2003	Improved water level contours near Mission Creek fault in Willow Hole area	Select one well from this group
MC	Mary Herzog	Unknown, drilled 1970		
MC	Ron Studebacker	Unknown, drilled 1978		
MC	Charles Ross	Unknown, drilled 1978		
MC	James Stanley	Unknown		
MC	Blanche Kelly	Unknown, drilled 1991		
MC	Peterson	Unknown, old log		

Sub-basin	Owner[1]	Status	Purpose	Comment
MC	Leon Mason	Inactive per CVWD records	Improved water level contours in Willow Hole area	Select one well from this group
MC	Tom Svenneby	Unknown, drilled 1981		
MC	John Guldseth	Unknown, drilled 1983		
MC	William Stapely	Unknown, no log		
MC	William Stapely	Unknown		
MC	Keith McGraw	Unknown, drilled 2000		
MC	John Barker	Unknown, drilled 1981		
MC	M G Astleford	Unknown, drilled 1981		
GH	Bill Adams	Unknown, drilled 1997	Improved water level contours near Banning fault south of Devers Hills	
GH	Indigo Power Plant	Location uncertain, no log in CVWD records	Improved water level contours west of Indian Ave.	SWN unknown

Source: MWH, 2013

DHS: Desert Hot Springs Sub-basin
MC: Mission Creek Sub-basin
GH: Garnet Hill Subbbasin

CVWD – Coachella Valley Water District
MSWD – Mission Springs Water District

1 – Name of the well owner based on CVWD master well records for the Coachella Valley.
2 – Well shown in CASGEM database as monitored by USGS. No data available.

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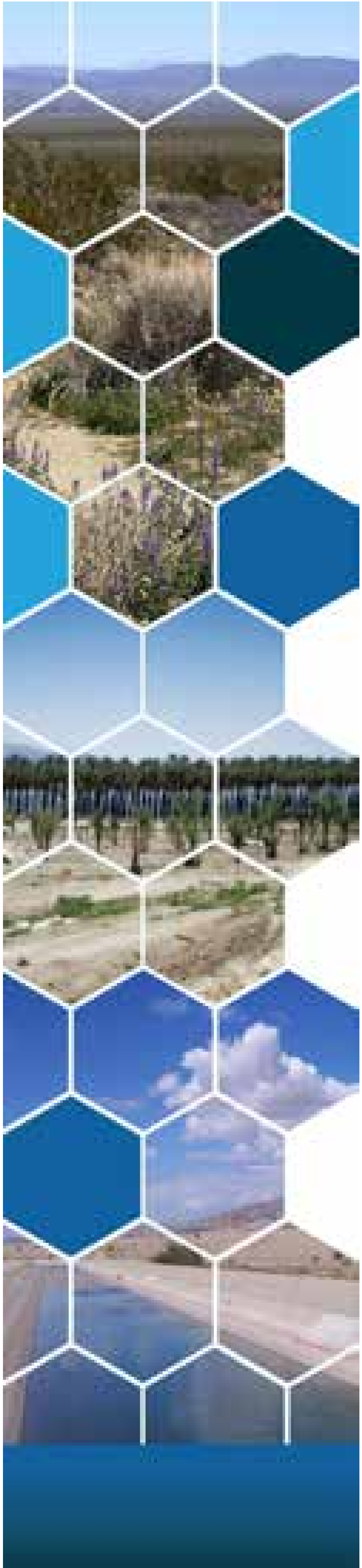

Appendix VI-K: Additional Stormwater Resource Plan (SWRP) Information

This appendix includes additional SWRP information and clarifications requested by the State Water Resources Control Board during the SWRP concurrence review.

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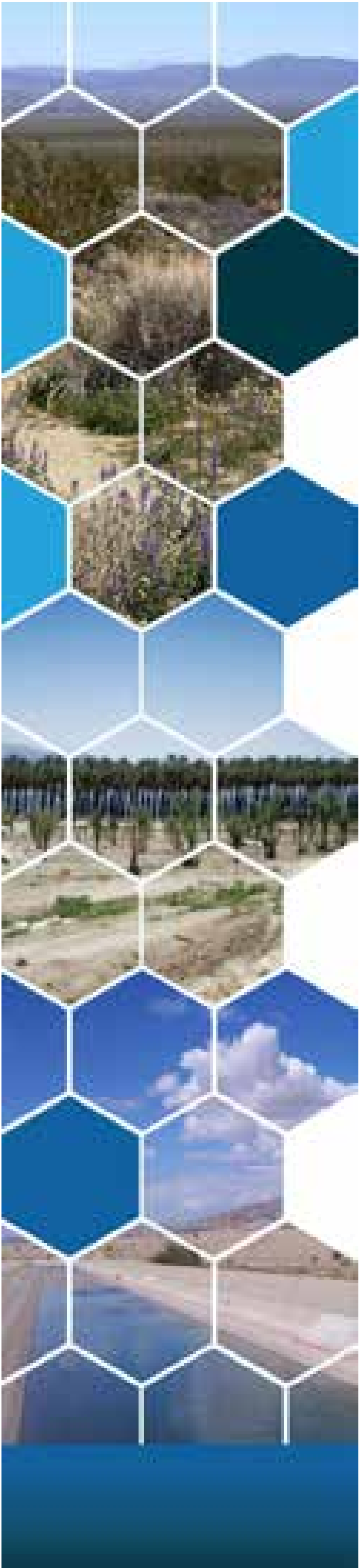

Additional Stormwater Resource Plan (SWRP) Information

The Coachella Valley Water District (CVWD) submitted the 2018 Coachella Valley Integrated Regional Water Management / Stormwater Resource Plan (IRWM/SWR Plan) to the State Water Resources Control Board (SWRCB) for concurrence review on June 8, 2020. This Appendix to the 2018 Coachella Valley IRWM/SWR Plan addresses additional information requested by the SWRCB to meet Water Code requirements for a Stormwater Resource Plan. The following sections are intended to clarify and/or supplement information described in the Coachella Valley IRWM/SWR Plan chapters.

Community Participation During SWRP Development

Stakeholder and public outreach and participation opportunities during the development of the IRWM/SWR Plan are described in detail in the Coachella Valley IRWM/SWR Plan. Coachella Valley communities have participated in development of IRWM program planning efforts since October 2009 during public workshops. The IRWM plan provides the basis for the updated 2018 Coachella Valley IRWM/SWR Plan. Specific opportunities for community participation during the 2018 Coachella Valley IRWM/SWR Plan development were provided during public workshops that supported adding new SWRP-focused sections to the existing IRWM plan and identifying SWRP priorities and project prioritization. Meeting materials are available on the CVRWMG website (http://www.cvrwmg.org/). The specific dates of these public workshops are listed below:

- September 28, 2017
- January 17, 2018
- August 29, 2018

Community Participation During SWRP Implementation

Community participation opportunities are provided during IRWM/SWR Plan implementation as projects are identified, developed, and implemented. The general public is able to attend and participate in Planning Partners meetings to discuss projects. Projects and project funding would need to be approved through the applicable governing body (e.g., City Council, Board of Supervisors) at a public meeting where the public may provide comment (including comment on technical and/or policy issues). In addition, when projects undergo CEQA review prior to implementation, an opportunity for public comment is provided. These mechanisms allow for community input during implementation of the SWRP projects. Additionally, the community is given opportunities to participate in IRWM/SWR Plan public workshops that support updating the IRWM/SWR Plan and project solicitations that discuss project development and prioritization.

To facilitate communications among planners and project proponents, the CVRWMG has developed an online project database aimed at providing universal access to information about IRWM/SWR Plan projects in the Region. The IRWM Opti database (Opti) coupled with the Public Workshops, is intended to connect stakeholders with one another to identify and enhance synergies among projects, hopefully leading to better integration and stronger partnerships (refer to *Chapter 9 Project Evaluation and Prioritization* of the 2018 IRWM/SWR Plan for more information).

SWRP Priority Project Opportunities

In accordance with Water Code Section 10562(d), a SWRP must identify opportunities to implement a variety of water resource management strategies. The SWRP Guidelines reference five strategies as summarized in Table 1. The table includes example projects, based on the project descriptions provided in the Opti. A full list of the SWRP projects identifying the priority project opportunities met by each is included as Table 2. Each priority project opportunity was included as part of the project solicitation form included in the online project database so project proponents could indicate whether their project would address the opportunity (either in the project SWRP benefit information or in supplementary questions). The detailed online project database form is included in Appendix A. The following questions were used in the project solicitation form to determine if the project would address priority project opportunities:

1. Does the project augment water supply by capturing storm water for recharging into a groundwater basin?
2. Does the project provide increased filtration, treatment, or reduction of pollution?
3. Does the project reestablish natural water drainage and treatment?
4. Does the project provide environmental habitat protection and improvement, including wetland enhancement/creation, riparian enhancement, and/or instream flow improvement?
5. Is the project located on public land? If not, does the project have an easement or right of way agreement with a local land owner?

SWRP Project Scoring

Projects are scored and ranked as described in the IRWM/SWR Plan. The detailed project scores and rankings for the SWRP project list as of November 18, 2020 are provided in **Appendix B**. These scores are based on answers to the project submittal questions in Opti.

Table 1: Addressing Priority Project Opportunities

Priority Project Opportunity	Ways to Address Opportunity through Stormwater Management	Addressing Opportunity in Coachella Valley IRWM/SWR Plan
Augment local water supply through groundwater recharge or storage for beneficial use of storm water and dry weather runoff	Stormwater projects can provide water supply benefits by capturing stormwater or dry weather runoff. Stormwater can be used directly after capture, or can be used after entering a groundwater basin. Project types that augment water supply could include retention basins, dry wells, and other on-site rainwater capture and infiltration.	A range of opportunities to augment water supply have been identified in the SWRP project list; these would primarily use stormwater to provide recharge to the groundwater basin. For example, the *Maxwell Installation* project would augment water supply by constructing dry wells to capture stormwater and infiltrate it into the local groundwater basin.
Provide source control for both pollution and dry weather runoff volume, onsite and local infiltration, and use of storm water and dry weather runoff	Source control of pollutants can be achieved through onsite and local infiltration using low impact development (LID) techniques, such as permeable pavement, retention planters, and biological treatment options. Stream buffers can be used to provide filtration of pollutants such as sediment. Use of stormwater can also reduce the need for landscape irrigation.	Projects that fit this description in the CV SWRP often provide pollution source control via flood control and onsite infiltration. For example, the Improvements for *Existing Dry Well Located South of 52 Ave* project would intercept urban runoff from residential areas and pretreat contaminants like suspended solids to reduce discharge offsite to the Coachella Valley Storm Channel.
Reestablish natural water drainage treatment and infiltration systems, or mimic natural system functions to the maximum extent feasible	Impermeable surfaces can alter natural drainage patterns and reduce the amount of natural treatment that occurs as stormwater flows to receiving waters. More natural drainage can be achieved by reducing runoff rate, improving infiltration, and establishing buffer areas around receiving waters. Projects that infiltrate stormwater into the groundwater basin would likely aid in reestablishing natural water treatment and infiltration.	Projects in the CV SWRP can support natural drainage treatment and infiltration system functions through supporting recharge areas. For example, the *Bel Air Greens Floodplain Project* would restore the Tahquitz Creek channel and associated riparian area and allow the Tahquitz Creek to access a portion of its historic floodplain to promote infiltration of the local groundwater basin.

Priority Project Opportunity	Ways to Address Opportunity through Stormwater Management	Addressing Opportunity in Coachella Valley IRWM/SWR Plan
Develop, restore, or enhance habitat and open space through storm water and dry weather runoff management, including wetlands, riverside habitats, parkways, and parks	Habitat restoration projects can provide many stormwater-related benefits, such as pollution control, flood protection, sediment management, recreational opportunities, and promotion of biodiversity. Strategies can include restoring natural stream flows and habitat functions.	Projects that fit this description in the CV SWRP involve restoring floodplains or water conveyance, and enhancing park space. For example, the *White Water Channel Extension to Connect with Current Salton Sea Water Level* project would convey water to the Salton Sea, thereby minimizing playa exposure and supporting habitat conservation for fish populations by reducing the salt concentration. Additionally, excess storm water may be rerouted to created swales to rehabilitate desert landscape.
Use existing publicly owned lands and easements, including, but not limited to, parks, public open space, community gardens, farm and agricultural preserves, school sites, and government office buildings and complexes, to capture, clean, store, and use storm water and dry weather runoff either onsite or offsite	In order to maximize efficiency of both space and cost, projects may be implemented on existing publicly owned lands or rights-of-way. This includes stormwater projects that can be implemented in areas such as parks, medians, parking lots, and other publicly-owned areas. This may also include stormwater projects that are implemented at existing municipal stormwater conveyance facilities.	Many projects in the CV SWRP involve use of publicly owned land and use of existing facilities without the need for purchases of land or establishment of new easements. Projects such as the *Jackson Avenue 50 retention Pond with Maxwells* project would implement a retention basin and maxwells on publicly owned land to maximize stormwater treatment before infiltrating the water supply into the basin.

Table 2: SWRP Priority Project Opportunities

Project Name	Augments local water supply through groundwater recharge or storage[1]	Provides source control of pollutants[2]	Reestablishes natural water drainage treatment and infiltration systems[3]	Develops, restores, or enhances habitat and open space[4]	Uses existing publicly owned land and easements[5]
Improvements for Existing Dry Well Located South of 52 Ave.	✓	✓			✓
St. Anthony Storm Water Capture Project	✓	✓		✓	
Bel Air Greens Floodplain Protection Project	✓	✓	✓	✓	
East Side Dike Improvement Project - Phase I	✓				✓
Thousand Palms Flood Control Project				✓	✓
North Cathedral City Storm Water Master Plan				✓	✓
Avenue 50 Storm Drain		✓			✓
Trash Capture Systems		✓			✓
White Water Channel Extension to Connect with Current Salton Sea Water Level		✓		✓	
City of Coachella Stormwater Master Plan	✓				✓
Storm Water Conveyance System 1	✓	✓			✓
Revitalize 20 existing dry wells	✓	✓			✓
Jackson and Avenue 50 Retention Pond with Maxwells	✓	✓			✓
Storm Water Conveyance System 3	✓	✓			✓
Pierce Community Storm Water Project	✓			✓	
Avenue 76 Community Storm Water Control Project	✓			✓	
Avenue 48 Storm Drain	✓	✓			✓
Storm Water Conveyance System 2	✓	✓			✓
Maxwell Installation	✓	✓			

Notes:
1. Box is checked if the project proponent answered yes to the following question in Opti: Does the project augment water supply by capturing storm water for recharging into a groundwater basin?
2. Box is checked if the project proponent selected the checkbox in Opti indicating that the project provides increased filtration, treatment, or reduction of pollution.
3. Box is checked if the project proponent selected the checkbox in Opti indicating that the project would reestablish natural water drainage and treatment.
4. Box is checked if the project proponent selected the checkbox in Opti indicating that the project provides environmental habitat protection and improvement, including wetland enhancement/creation, riparian enhancement, and/or instream flow improvement.
5. Box is checked if the project proponent responded yes to one of the following questions in Opti: Is the project located on public land? If not, does the project have an easement or right of way agreement with a local land owner?

Appendix A
Online Project Submittal Form

Coachella Valley IRWM Project Database

Project Name:

Description:

Contact:

Partner(s):

Google

This page can't load Google Maps correctly.

Do you own this website? OK

Map data ©2020 INEGI Imagery ©2020 TerraMetrics

Total Cost:

Last Update: Monday Nov 30, 2020

Description Objectives Strategies Feasibility SWRP Eligibility SWRP Benefits

Description Top

Project Info

Select the Program(s) for which you would like to enter your project (select IRWM, SWRP, or both):

☐ **Coachella Valley Integrated Regional Water Management Program**: Any project that would like to be considered for IRWM funding should select this program. Projects must meet at least one IRWM Plan Objective, one Resource Management Strategy, one Statewide Objective, and must be technically feasible in order to be considered for inclusion in the Plan and to be considered for IRWM funding. For more information about the IRWM grant program visit the CVRWMG website.

☐ **Coachella Valley Storm Water Resource Plan**: All storm water and dry weather runoff capture projects (e.g., Low Impact Development, Rainwater and storm water capture, storm water treatment facilities, and demonstration or pilot projects that are consistent with the eligibility requirements of Prop 1, Chapter 7) should select this program, regardless of whether they are seeking IRWM or Storm Water grant funding. Inclusion in the Storm Water Resource Plan is required for storm water and dry weather runoff capture projects seeking Proposition 1 funding. For more information about the Storm Water Grant Program (SWGP) visit the State Water Resources Control Boards website.

Projects that are not stormwater-related can skip the SWRP Eligibility and SWRP Benefits tabs (green). The Objectives, Strategies, and Feasibility tabs will be updated once the Prop 1, Round 1 under IRWM call for projects is active.

1. Project Title:*

Project Contact *

Eligible grant recipients include local public agencies, non-profit organizations, and tribal governments.

2. Name:*

3.Title:

4. Agency/Organization:*

5-1. Address 1:*

5-2. Address 2:

6. City, State, and Zip Code: *

City: State: CA Zip Code:

7. Phone: * Ext:

8. Email:*

9. Can your contact information be shared with other relevant agencies? Select

Project Location

10. Describe Project Location*

☐ 11-1. Project Acreage (Required for IRWM projects)

☐ 11-2. Regional Project

Project Coordinates: Enter decimal latitude and longitude below or

Latitude: * Longitude: *

Project Website

13. URL to Project Website (If Available)

Project Partners

☐ 14. List Project Partners (Agency/Organization):

Project Need

15. Describe Need for Project (1-2 paragraphs)

Project Type

16-1. Primary Functional Area: Select

16-2. Other:

17. Primary Project Type: Select

Primary Water Management Strategy

Please select the primary water management strategy (applicable to IRWM projects). Additional strategies used by the project can be selected on the Strategies tab.

18. Select

Project Description

19. Project Summary (2-3 sentences)*

20. Project Description (2-3 paragraphs)*

☐ 21. Identify Linkages with Other Projects:

☐ 22. Local/Regional Plans Which List the Project:

☐ 23. Creates New Water:

Readiness to Proceed (IRWM Projects Only)

Applicable to IRWM projects. To be updated once Round 1 of Prop 1 is active.

24. To be eligible for Prop 1 IRWM funds, project proponents must demonstrate that the project has a useful life of at least 15 years. Does your project have a useful life of at least 15 years? Select
If yes, please indicate the useful life of your project and the rationale.

25. Ready to be Considered for Prop 1 Round 1? Projects must yield multiple benefits for water supply, wastewater, flood control, stormwater, and/or natural resources and watersheds.
DWR's Prop 1 Round 1 grant guidelines are available. Will your project be ready to proceed in 2019? Select

26. Does the project provide direct water-related benefits to a disadvantaged community? Projects directly provide water-related benefits to disadvantaged communities if they directly address specific water-related needs of a disadvantaged community. If checked, please describe how your project provides direct water-related benefits to a disadvantaged community. Select

Describe How Project Directly Addresses Issues.
The State of California defines a DAC as a community with an annual median household income (MHI) that is less than 80% of the Statewide MHI. Using the 2010 U.S. Census American Community Survey data, 80% of the statewide annual MHI is $48,706. Refer to the DAC Map [Click Here] of the 2014 IRWM Plan to see if your project is in a designated DAC area.

☐ 27. Does the project effectively address long-term drought preparedness? If checked, please explain how the project provides at least one of the following drought-related benefits: 1) promote water conservation, conjunctive use, reuse, and recycling, 2) improve landscape and agricultural irrigation efficiencies, 3) achieve long-term reduction of water use, 4) provide efficient groundwater basin management, 5) establish system interties.

☐ 28. Does the project have quantifiable benefits? All construction projects must have two (2) benefits that can be physically quantified. Examples of project benefits include: amount of water produced, recycled, or saved, acres of habitat restored, types and amount of water quality improvement provided, area of floodplain managed, etc.

Project Budget

29. Estimated Project Cost (Required for IRWM projects):

30. Amount of Grant Funds Requested (Required for IRWM projects):

Note: 50% local cost share required by Prop 1; a funding match waiver may be available for projects that directly benefit disadvantaged communities.

Objectives Top

Contribution to IRWM Plan Objectives

Select all that apply. Provide a one sentence description of how the project meets the objective.

1. ☐ Objective A: Provide reliable water supply for residential and commercial, agricultural community, and tourism needs

2. ☐ Objective B: Manage groundwater levels to manage and reduce overdraft, manage perched water, and minimize subsidence

3. ☐ Objective C: Secure reliable imported water supply, including restoring/improving reliability of State Water Project supply and securing other imported water supplies

4. ☐ Objective D: Maximize local supply opportunities, including water conservation, water recycling and source substitution, and capture and infiltration of runoff

5. ☐ Objective E: Protect groundwater quality and improve, where feasible

6. ☐ Objective F: Preserve and improve surface water quality by maintaining integrity of agricultural drainage systems, protecting the quality of natural runoff used for potable supply, and reducing pollution in stormwater runoff

7. ☐ Objective G: Preserve local environment and restore, where feasible

8. ☐ Objective H: Manage flood risks, including current acute needs and needs for future development

9. ☐ Objective I: Objective I: Optimize conjunctive use of available water resources.

10. ☐ Objective J: Maximize stakeholder involvement and stewardship in water resource management

11. ☐ Objective K: Address water-related needs of local Native American culture

12. ☐ Objective L: Address water and sanitation needs of disadvantaged communities

13. ☐ Objective M: Maintain affordability of water

Affected Groundwater Basin(s)

14. Groundwater Basins - Select All That Apply (Click Here for Map)

To select more than one, hold the Ctrl key (PC) or ⌘ Command key (MAC) while clicking

15. One Sentence Description of How Groundwater Basin(s) Affected

Affected Beneficial Use(s)

16. Beneficial Uses - Select All That Apply (Click Here to Open the Colorado River Basin Plan)

To select more than one, hold the Ctrl key (PC) or ⌘ Command key (MAC) while clicking

17. One Sentence Description of How Beneficial Use(s) Affected.

Planning for Climate Change

18. Describe how the project will adapt to long-term climate change (warmer temperatures, extended drought, extreme storms, sea level rise)

19. Describe how the project will mitigate its contribution to climate change (energy efficiency, limits on greenhouse gas emissions, water conservation)

Strategies Top

Resource Management Strategies

Select all that apply. Provide a one sentence description of how project employs resource management strategy.

1. ☐ Agricultural Lands Stewardship

Promoting continued agricultural use of lands, strategies to reduce pollutants from agricultural lands, and strategies to maintain and create wetlands and wildlife habitat within agricultural lands.

2. ☐ Agricultural Water Use Efficiency

Increasing water use efficiency and achieving reductions in the amount of water used for agricultural irrigation. Includes incentives, public education, and other efficiency-enhancing programs.

3. ☐ Conjunctive Management & Groundwater

Using and managing groundwater supplies to ensure sustainable groundwater yields while maintaining groundwater-dependent beneficial uses. Includes coordinating management of groundwater and surface water supplies to enhance reliability

4. ☐ Conveyance - Delta

Maintaining, optimizing use of, and increasing the reliability of conveyance facilities associated with the Bay-Delta. Included within this strategy is Bay-Delta restoration efforts.

5. ☐ Conveyance - Regional/local

Maintaining, optimizing use of, and increasing the reliability of regional treated and untreated water conveyance facilities. Included within this strategy is maintaining the ability to obtain and convey imported water supplies into the Region.

6. ☐ Desalination

Municipal water treatment for the removal of salt from water for beneficial uses. Includes disposal of waste brine.

7. ☐ Drinking Water Treatment and Distribution

Improving the quality of the potable supply delivered to potable water customers by increasing the degree of potable water treatment. Strategy also may include conveyance system improvements that improve the quality of supply delivered to treatment facilities.

8. ☐ Economic Incentives (Loans, Grants and Water Pricing)

Implementing economic incentives (e.g. loans, grants, water pricing) to promote resource preservation or enhancement.

9. ☐ Ecosystem Restoration

Restoring impacted or impaired ecosystems, and may include invasive species removal, land acquisition, water quality protection, re-vegetation, and protection or restoration of natural flow hydrology. Also includes multiple species conservation programs, land conservation, wetlands creation and enhancement, habitat protection and improvement, and species monitoring.

10. ☐ Flood Risk Management

Decreasing the potential for flood-related damage to property or life through control or management of floodplain lands or physical projects to control runoff.

11. ☐ Forest Management

Improving the availability and quality of water for downstream users on both publicly and privately held forest lands.

12. ☐ Groundwater Remediation/Aquifer Remediation

Removing pollutants from contaminated groundwater aquifers through pumping and treatment, in situ treatment, or other means.

13. ☐ Matching Quality to Use

Optimizing existing resources by matching the quality of water supplies to the required quality associated with use.

14. ☐ Pollution Prevention

Preventing pollution, including public education, efforts to identify and control pollutant contributing activities, and regulation of pollution-causing activities. Includes identifying, reducing, controlling, and managing pollutant loads from non-point sources.

15. ☐ Precipitation Enhancement

Increasing precipitation yields through cloud seeding or other precipitation enhancing measures.

16. ☐ Recharge Area Protection

Implementing land use planning, land conservation, and physical strategies to protect areas that are important sources of groundwater recharge.

17. ☐ Recycled Municipal Water

Developing usable water supplies from treated municipal wastewater. Includes recycled water treatment, distribution, storage, and retrofitting of existing uses.

18. ☐ Salt and Salinity Management

Managing salt loading within surface and groundwater supplies, including basin planning efforts.

19. ☐ Surface Storage - CALFED

Developing additional CALFED storage capacity or more efficiently using existing CALFED storage capacity.

20. ☐ Surface Storage - Regional/local

Developing additional yield through construction or modification of local or regional surface reservoirs or developing surface storage capabilities in out-of-region reservoirs.

21. ☐ System Reoperation

Managing surface storage facilities to optimize the availability and quality of stored water supplies and to protect/enhance beneficial uses. Includes balancing supply and delivery forecasts, coordinating and interconnecting reservoir storage, and optimizing withdrawals.

22. ☐ Urban Runoff Management

Managing or controlling urban runoff, including intercepting, diverting, controlling, or managing stormwater runoff or dry season runoff.

23. ☐ Urban Water Use Efficiency

Increasing water use efficiency by achieving reductions in the amount of water used for municipal, commercial, industrial, irrigation, and aesthetic purposes. Includes incentives, public education, and other efficiency-enhancing programs.

24. ☐ Water Transfers

Contracting to provide additional outside sources of imported water to the Region over and above contracted State Water Project and Colorado River supplies

25. ☐ Waterbag Transport/Storage Technology

Diverting water in areas that have unallocated freshwater supplies, storing the water in large inflatable bladders, and towing them to an alternate region.

26. ☐ Water-dependent Recreation

Enhancing and protecting water-dependent recreational opportunities and public access to recreational lands.

27. ☐ Watershed Management and Planning

Comprehensive management, protection, and enhancement of groundwater and surface waters, natural resources, and habitat

28. ☐ Land Use Planning and Management

Implementing land use controls to manage, minimize, or control activities that may negatively affect the quality and availability of groundwater and surface waters, natural resources, or endangered or threatened species.

29. ☐ Other

Feasibility Top

Stakeholder Outreach and Involvement

1. Describe Public Outreach and Involvement Methods

2. Elaborate on Outreach Methods Used to Reach Disadvantaged Communities

Project Photos/Maps

3. Upload Project Photos and Maps

File Name	Description (relevancy,agency, weblink, date, etc.)	Type

Environmental Compliance

4. List Regulatory Permit(s)

Regulatory permits that may be required include: Clean Water Act Section 404 from U.S. Army Corps of Engineers, Clean Water Act Section 401 Water Quality Certification from San Diego Regional Water Quality Control Board, Streambed Alteration Agreement from California Department of Fish & Game, Endangered Species Act Section 7 Consultation with U.S. Fish & Wildlife Agency, National Historic Preservation

Action Section 106 Consultation with the State Historic Preservation Office, Construction General Permit coverage from State Water Resources Control Board, and various encroachment permits from local jurisdictions. Please identify and obtain the appropriate permits for your project.

5. List CEQA/NEPA Document(s)
Documentation in compliance with the California Environmental Quality Act (CEQA) may include: Categorical/Statuatory Exemption, Negative Declaration or Mitigated Negative Declaration, or Environmental Impact Report. Documentation in compliance with the National Environmental Policy Act (NEPA) may include: Categorical Exclusion, Environmental Assessment and Finding of No Significant Impact, or Environmental Impact Statement. Please identify and complete the appropriate documentation for your project.

Feasibility Documentation

6. List Feasibility Study(s)

7. Describe Need for Project (1-2 paragraphs)

Project Schedule

The proposed Project Schedule follows (Date format: (mm/dd/yyyy)):

8. Planning

Start Date: Finish Date:

9. Design/Engineering

Start Date: Finish Date:

10. Environmental Documentation

Start Date: Finish Date:

11. Construction

Start Date: Finish Date:

12. Upload Project Schedule (Browse/Upload)

File Name	Description (relevancy,agency, weblink, date, etc.)	Type

Project Budget

13. Estimated Project Cost $0.00

14. Grant Funds Requested $0.00

15. Estimated Local Match Amount

16. Describe Match Type (CIP funds, in-kind services, etc)

17. Annual Operations & Maintenance (O&M) Cost

18. Describe O&M Type:

19. Upload Project Budget (Browse/Upload)

File Name	Description (relevancy,agency, weblink, date, etc.)	Type

Project Eligibility

20. For urban water suppliers only: In compliance with Urban Water Management Plan (UWMP) Act? Select
UWMP Act (CWC 10610 et seq.) requires urban water suppliers to submit a complete UWMP to DWR for approval. Was your 2005 UWMP submitted and approved? (Provide explanation, if necessary)

21. Describe O&M Source Select
(Provide explanation, if necessary)

22. For groundwater management or recharge projects only: In compliance with a Groundwater Management Plan? Select
All groundwater management or recharge projects must be in compliance with a Groundwater Management Plan that meets the requirements of CWC 10753.7, or be in the process of developing one which will be completed within 1-year of the grant application submittal date. (Provide explanation, if necessary)

23. For all project sponsors: Adoption of 2018 Coachella Valley IRWM Plan? All project sponsors must have adopted the IRWM Plan or must commit to adopting by June 2019. Select

SWRP Eligibility Top

Project Tier:

SWRP Project Submission Instructions

In February 2017, the Coachella Valley Regional Water Management Group were awarded a Prop 1 IRWM Planning Grant from the Department of Water Resources to update the Coachella Valley IRWM Plan to serve as a Stormwater Resource Plan functional equivalent. The primary purpose of the SWRP is to identify and assess projects that promote stormwater as a resource, prioritizing those multi-benefit projects that can best meet the identified planning area and watershed priorities. As all stormwater and dry weather runoff capture projects must now be included in a SWRP to be eligible for state grant funding, the SWRP will be completed by August 2018, in time for projects included in the plan to be eligible to apply for upcoming funding opportunities.

If you have a project to be included in the SWRP, please complete the appropriate project information tabs and click the submit button.

Project Eligibility

Each Project must meet all of the following to be included in the SWRP.

Can the project be sponsored by an eligible applicant? ☐ No ☐ Yes
Is the project a storm water or dry weather runoff project? ☐ No ☐ Yes

Does the project meet 2 or more of the following SWRP main benefits? ☐ No ☐ Yes

Water Quality - Increased filtration and/or treatment of runoff Water Supply - Water supply reliability Water Supply - Conjunctive use Flood Management - Decreased flood risk by reducing runoff rate and/or volume Environmental - Environmental and habitat protection and/or improvement Environmental - Increased urban green space Community - Employment opportunities provided Community - Public education

Does the project provide at least one of the following SWRP Additional Benefits? ☐ No ☐ Yes

Water Quality - Nonpoint source pollution control Water Quality - Reestablished natural water drainage and treatment Water Supply - Water conservation Flood Management - Reduced sanitary sewer overflows Environmental - Reduced energy use, greenhouse gas emissions, or provides a carbon sink Environmental - Reestablishment of natural hydrograph Environmental - Water temperature improvements Community - Community involvement Community - Enhance and/or create recreational and public use areas

Is the project one of the following project types? ☐ No ☐ Yes

Planning project Implemention project at conceptual stage Implementation project

Coachella Valley Regional Watershed Priorities

☐ Coachella Valley Stormwater Channel Bacterial Indicators TMDL

Does the project reduce pollutant discharges into a 303(d) listed Impaired Water Body? (see 303(d) Listed Water Bodies layer on interactive map) ☐ No ☐ Yes
If yes, please list water body.

Does the project augment water supply by capturing storm water for recharging into a groundwater basin? ☐ No ☐ Yes

Does the Project provide a SWRP Main or Additional Benefit to a disadvantaged community or economically distressed area? (see DAC layer on interactive map) ☐ No ☐ Yes
If yes, please list communities.

Progress Towards Project Implementation

Is the project supported by entities that have created permanent, local or regional funding? ☐ No ☐ Yes
Is the project located on public land? ☐ No ☐ Yes
If not, does the project have an easement or right of way agreement with a local land owner? ☐ No ☐ Yes

What is the CEQA/Environmental Documentation and Permitting Status? (select one): Select

Has a permanent source of funding for capital costs been secured? ☐ No ☐ Yes

Has a permanent source of funding for O&M costs been secured? ☐ No ☐ Yes

Identify project readiness - what documentation and analysis has been completed for the project? (select one): Select

Is the project identified in an existing study/planning document? ☐ No ☐ Yes

SWRP Benefits Top

Project Tier:

Water Quality Benefits

Does the project provide any of the following benefits (check all that apply and provide applicable quantitative estimate, if available):

☐ Increased filtration, treatment, or reduction of pollution (SWRP Main Benefit)
Average annual pollutant load reduction:
TSS (lbs/yr)
TDS (lbs/yr)
Mercury (lbs/yr)
Diazinon (lbs/yr)
Chlorpyrifos (lbs/yr)
Selenium (lbs/yr)

Diuron (lbs/yr)

bacteria - fecal coli. / E. coli (MPN/yr)

pyrethroids (lb/yr)

trash (lb/yr)

Total Nitrogen (lb/yr)

Other constituent

Volume of water treated (mgd)

Volume of runoff infiltrated (af/year)

Other quantitative metric

☐ Nonpoint source pollution control (SWRP Additional Benefit)

Provide quantitative metric

☐ Reestablished natural water drainage and treatment (SWRP Additional Benefit)

Provide quantitative metric

☐ Treat more than one pollutant

List pollutants

Describe how the project will achieve these benefits.

Identify method used to quantify this benefit: Select

Describe the method or study used to quantify the benefits described above.

Water Supply Benefits

Does the project provide any of the following benefits (check all that apply and provide applicable quantitative estimate, if available):

☐ Water supply reliability (SWRP Main Benefit)

Increase in water supply through direct groundwater recharge (af/year)

Increase in water supply through direct use (af/year)

Other quantitative metric

☐ Conjunctive use (SWRP Main Benefit)

Increase in water supply through in lieu recharge/conjunctive use (af/year)

Other quantitative metric

☐ Water conservation (SWRP Additional Benefit)

Reduction in water use (af/year)

Other quantitative metric

Describe how the project will achieve these benefits.

Identify method used to quantify this benefit: Select

Describe the method or study used to quantify the benefits described above.

Flood Management Benefits

Does the project provide any of the following benefits (check all that apply and provide applicable quantitative estimate, if available):

☐ Decreased flood risk by reducing runoff rate and/or volume (SWRP Main Benefit)

Reduction in peak flow discharge (cfs)

Reduction in volume of potential flood water (af/year)

Other quantitative metric

☐ Reduced sanitary sewer overflows (SWRP Additional Benefit)

Reduction in sewer overflow volumes (af/year)

Other quantitative metric

Describe how the project will achieve these benefits.

Identify method used to quantify this benefit: Select

Describe the method or study used to quantify the benefits described above.

Environmental Benefits

Does the project provide any of the following benefits (check all that apply and provide applicable quantitative estimate, if available):

☐ Environmental habitat protection and improvement, including wetland enhancement/creation, riparian enhancement, and/or instream flow improvement (SWRP Main Benefit)

Size of habitat protected or improved (acres)

Amount of instream flow rate improvement (cfs)

Other quantitative metric

☐ Increased urban green space (SWRP Main Benefit)

Size of increase in urban green space (acres)

Other quantitative metric

☐ Reduced energy use, greenhouse gas emissions, or provides a carbon sink (SWRP Additional Benefit)

Amount of energy consumption reduced (KWH/year)

Amount of GHG emissions reduced (tons/year)

Other quantitative metric

☐ Reestablishment of natural hydrograph (SWRP Additional Benefit)

Provide quantitative metric

☐ Water temperature improvements (SWRP Additional Benefit)

Amount of temperature improvement (degrees F)

Describe how the project will achieve these benefits.

Identify method used to quantify this benefit: Select

Describe the method or study used to quantify the benefits described above.

Community Benefits

Does the project provide any of the following benefits (check all that apply and provide applicable quantitative estimate, if available):

☐ Employment opportunities provided (SWRP Main Benefit)

Number of employment opportunities provided

Other quantitative metric

☐ Public education (SWRP Main Benefit)

Number of outreach materials provided or events conducted

Other quantitative metric

☐ Community involvement (SWRP Additional Benefit)

Number of participants per year

Other quantitative metric

☐ Enhance and/or create recreational and public use areas (SWRP Additional Benefit)

Estimated visits per year

Other quantitative metric

Describe how the project will achieve these benefits.

Identify method used to quantify this benefit: Select

Describe the method or study used to quantify the benefits described above.

* Minimum Required Information for Project Submission

Contact Us

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- -

Appendix B
Coachella Valley SWRP Project Scoring Table

Appendix B - SWRP Project Scoring Table
Coachella Valley SWRP Project List as of November 18, 2019

Project Name	Project Proponent	Benefits and Quantification			Funding		Additional Scoring				Score	Tier
		Main Benefits	Additional Benefits	Sources of Quantitative Benefits	Permanent Source of Funding for Captial Costs Secured	Permanent Source of Funding for O&M Costs Secured	Project located on Lands in Public Ownership	Project Readiness	Project Identified in an Existing Study/Planning Document	Project Addresses More than One Pollutant		
Improvements for Existing Dry Well Located South of 52 Ave.	City of Coachella	4	2	2	0	1	1	5	1	1	17	1
St. Anthony Storm Water Capture Project	Pueblo Unido CDC	4	2	4	0	0	0	5	1	0	16	1
Bel Air Greens Floodplain Protection Project	The Trust for Public Land	5	4	1	0	1	0	1	0	0	12	1
East Side Dike Improvement Project - Phase I	Coachella Valley Water District	3	0	4	0	0	1	2	1	0	11	2
Thousand Palms Flood Control Project	Coachella Valley Water District	2	0	4	0	0	1	2	1	0	10	2
North Cathedral City Storm Water Master Plan	Coachella Valley Water District	2	0	4	0	0	1	2	1	0	10	2
Avenue 50 Storm Drain	City of Coachella	2	1	0	0	1	1	4	1	0	10	2
Trash Capture Systems	City of Indio	2	1	4	0	0	1	0	0	1	9	2
White Water Channel Extension to Connect with Current Salton Sea Water Level	Torres Martinez Desert Cahuilla	2	2	4	0	0	0	1	0	0	9	2
City of Coachella Stormwater Master Plan	City of Coachella	2	1	0	1	1	1	1	1	0	8	2
Storm Water Conveyance System 1	City fo Indio	3	1	0	0	1	1	1	0	0	7	2
Revitalize 20 existing dry wells	City of Indio	3	1	0	0	1	1	1	0	0	7	2
Jackson and Avenue 50 Retention Pond with Maxwells	City of Indio	3	1	0	0	1	1	1	0	0	7	2
Storm Water Conveyance System 3	City of Indio	3	1	0	0	1	1	1	0	0	7	2
Pierce Community Storm Water Project	Pueblo Unido CDC	5	2	0	0	0	0	0	0	0	7	2
Avenue 76 Community Storm Water Control Project	Pueblo Unido CDC	5	2	0	0	0	0	0	0	0	7	2
Avenue 48 Storm Drain	City of Indio	3	1	0	0	1	1	1	0	0	7	2
Storm Water Conveyance System 2	City of Indio	3	1	0	0	1	0	1	0	0	6	2
Maxwell Installation	City of Indio	3	1	0	0	0	0	0	0	0	4	3
Desert Hot Springs MDP Line E-5 Stg 1	Riverside County Flood Control and Water Conservation District	1	0	4	1	1	1	4	1	0	*TBD* [3]	*TBD* [3]
Palm Springs MDP line 41	Riverside County Flood Control and Water Conservation District	1	0	4	1	1	1	0	1	0	*TBD* [3]	*TBD* [3]
Verbena Channel	Riverside County Flood Control and Water Conservation District	0	0	0	1	1	1	1	1	0	*TBD* [3]	*TBD* [3]
Implementation of the Palm Springs MDP	Riverside County Flood Control and Water Conservation District	1	0	0	0	0	1	2	1	0	*TBD* [3]	*TBD* [3]
Implementation of Total Maximum Daily Load Best Management Practices	Riverside County Flood Control and Water Conservation District	0	0	0	0	0	0	0	0	0	*TBD* [3]	*TBD* [3]

[1] Projects in the SWRP must have at least 2 Main Benefits
[2] Score: Tier 1 = 12-23 points; Tier 2 = 6-11 points; Tier 3 = 0-5 points
[3] Projects require submittal of additional information to be ranked

Prepared by:

WOODARD & CURRAN

10509 Vista Sorrento Pkwy
Suite 205
San Diego, CA 92121
858.875.7400

Appendix VII-A: Disadvantaged Communities Tapestry Mapping

This appendix contains complete tapestry mapping, which was completed as part of the DAC Outreach Program.

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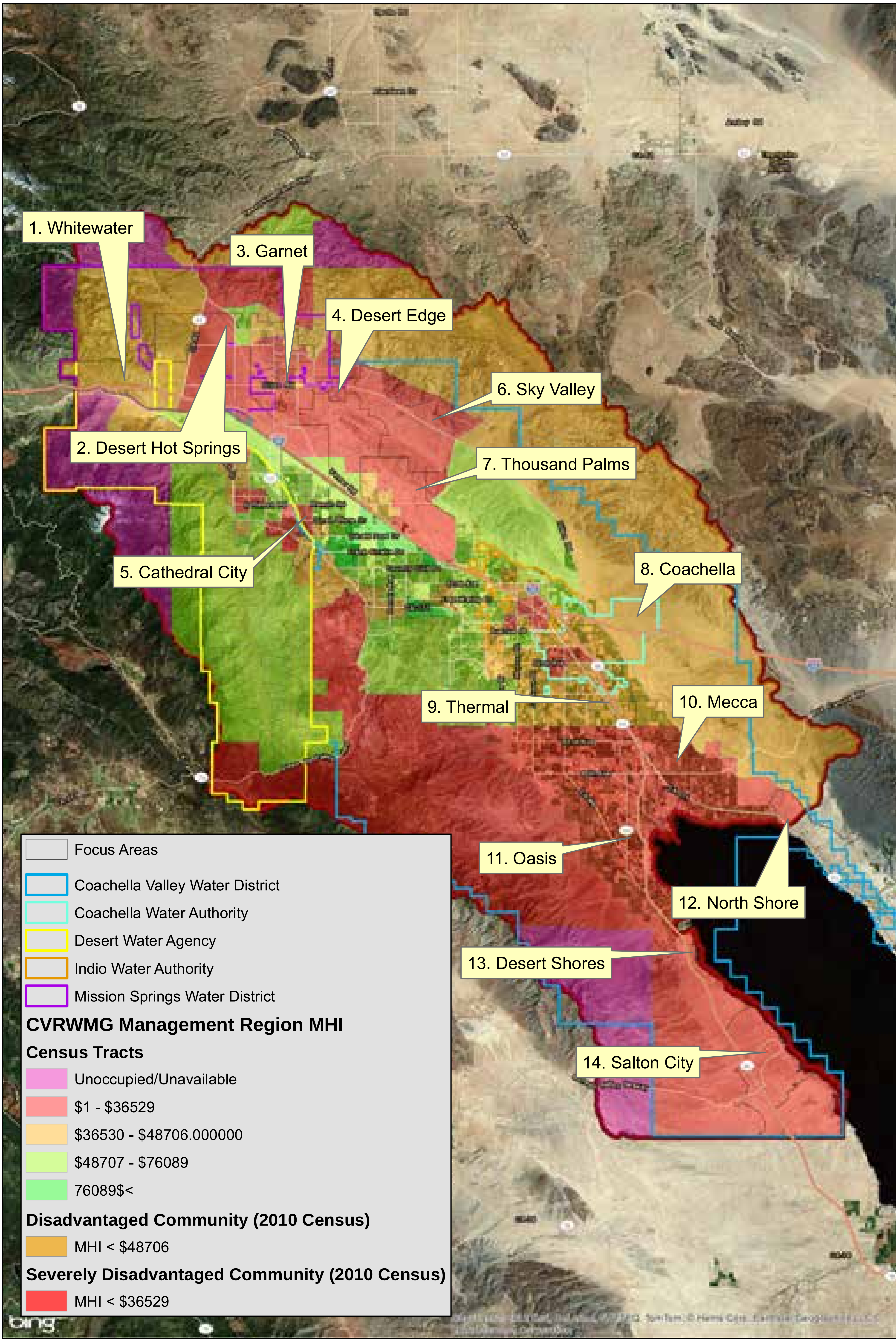
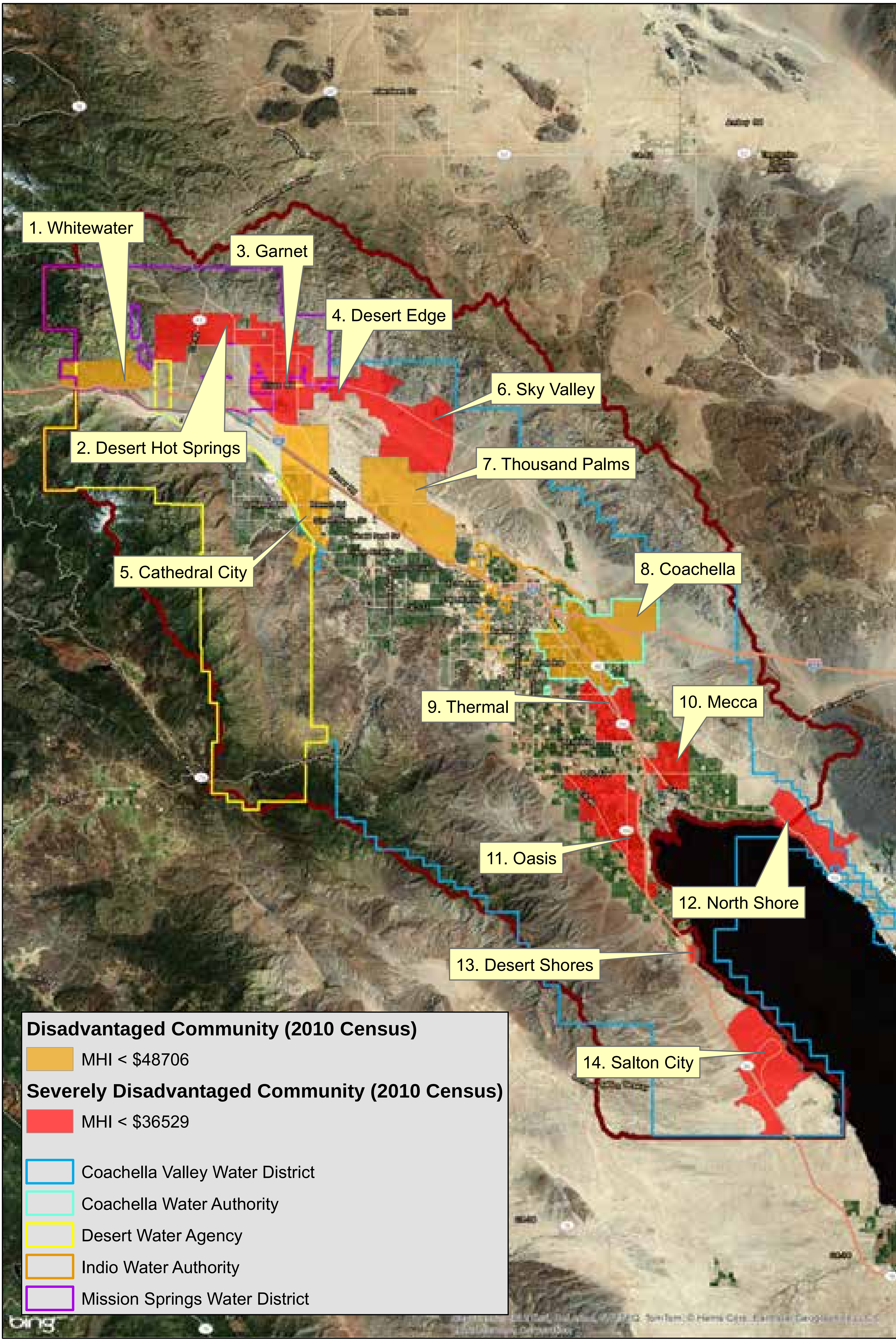
CVRWMG Median Household Income by Tract



CVRWMG Disadvantaged Community Index



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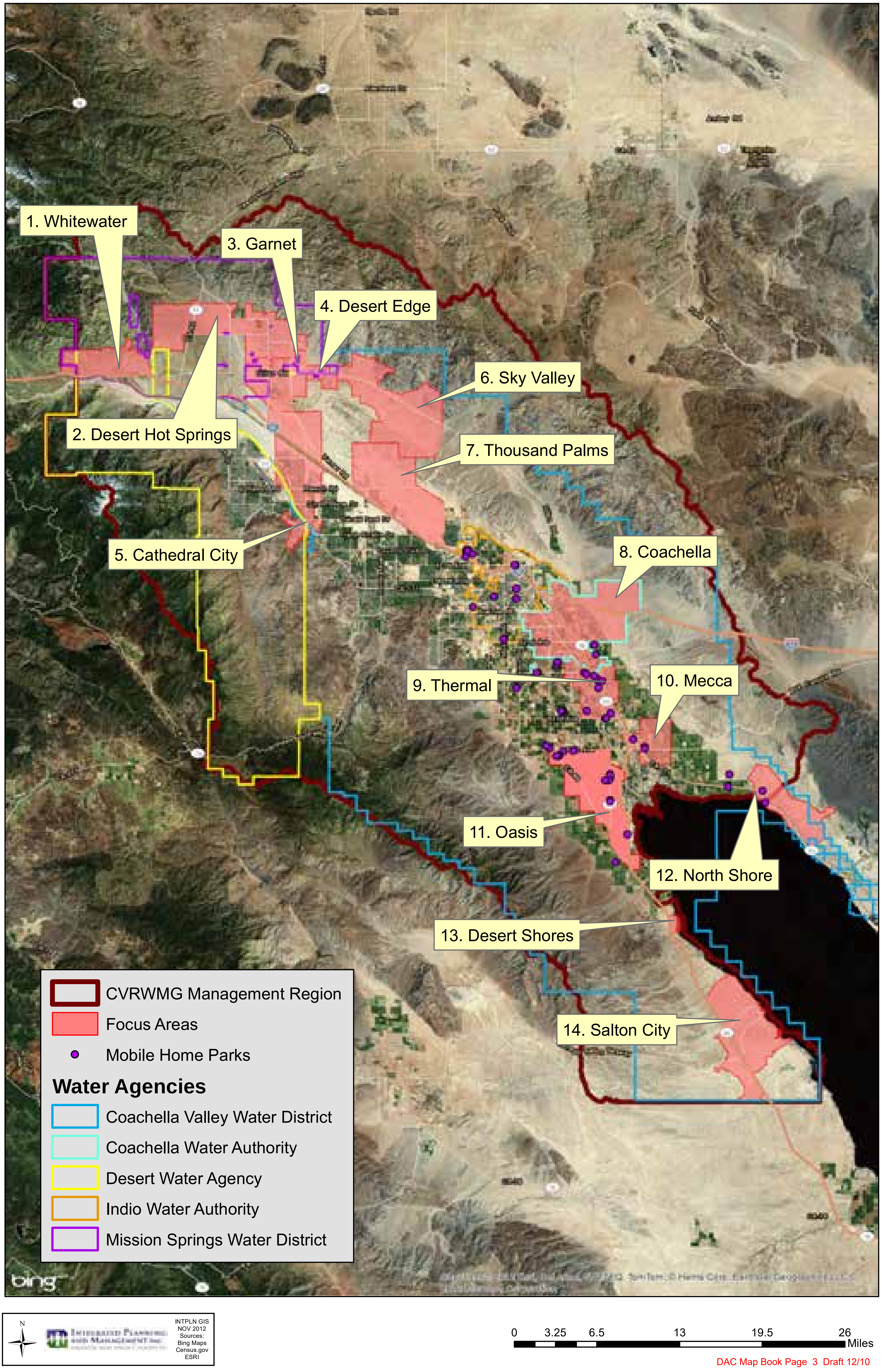
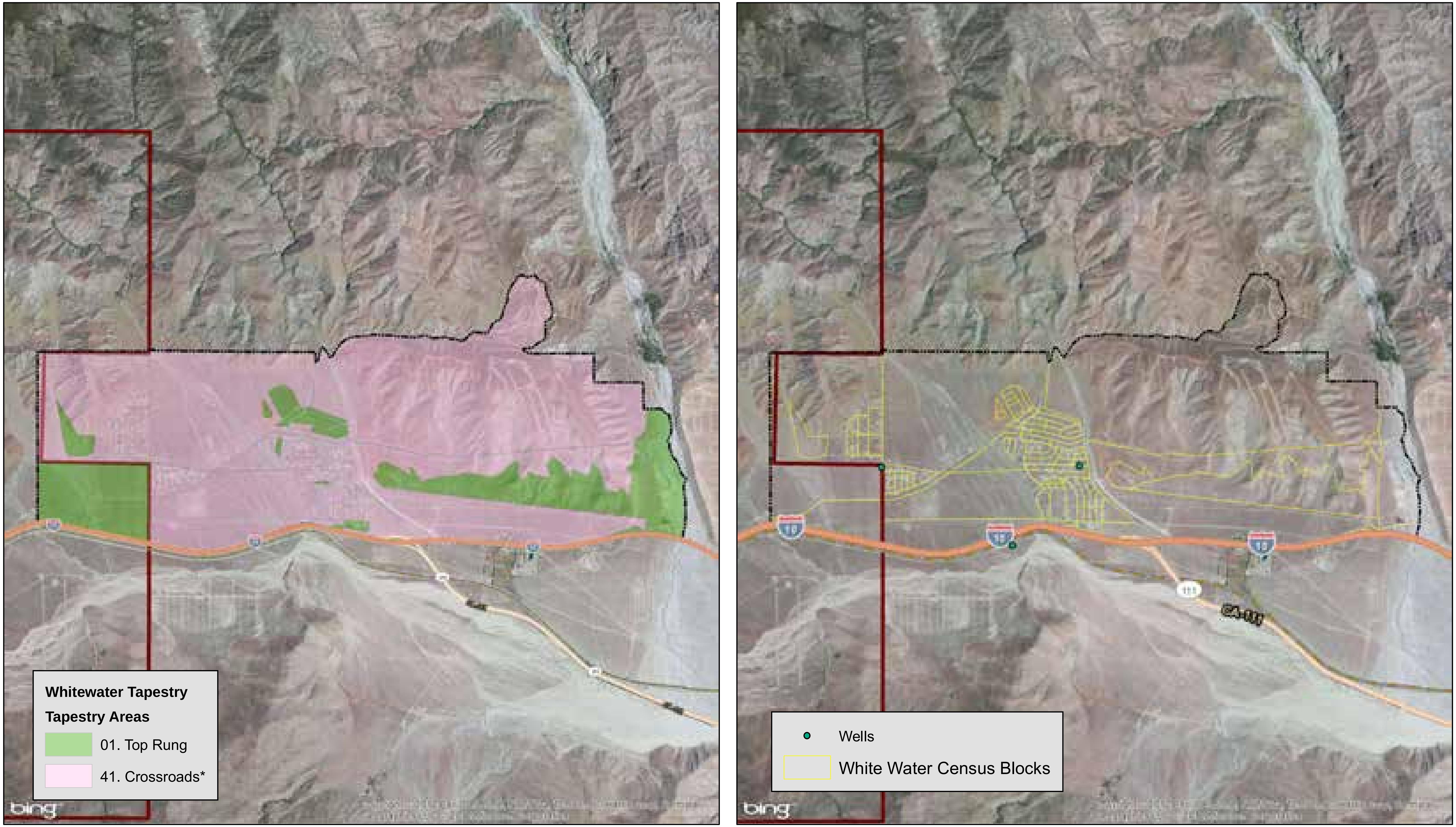
INTPLN GIS
NOV 2012
Sources:
Bing Maps
Census.gov
ESRI

0 3.25 6.5 13 19.5 26 Miles

CVRWMG Focus Area Index



1. White Water Focus Area



* = DAC Characteristics

0 0.5 1 2 3 4 Miles

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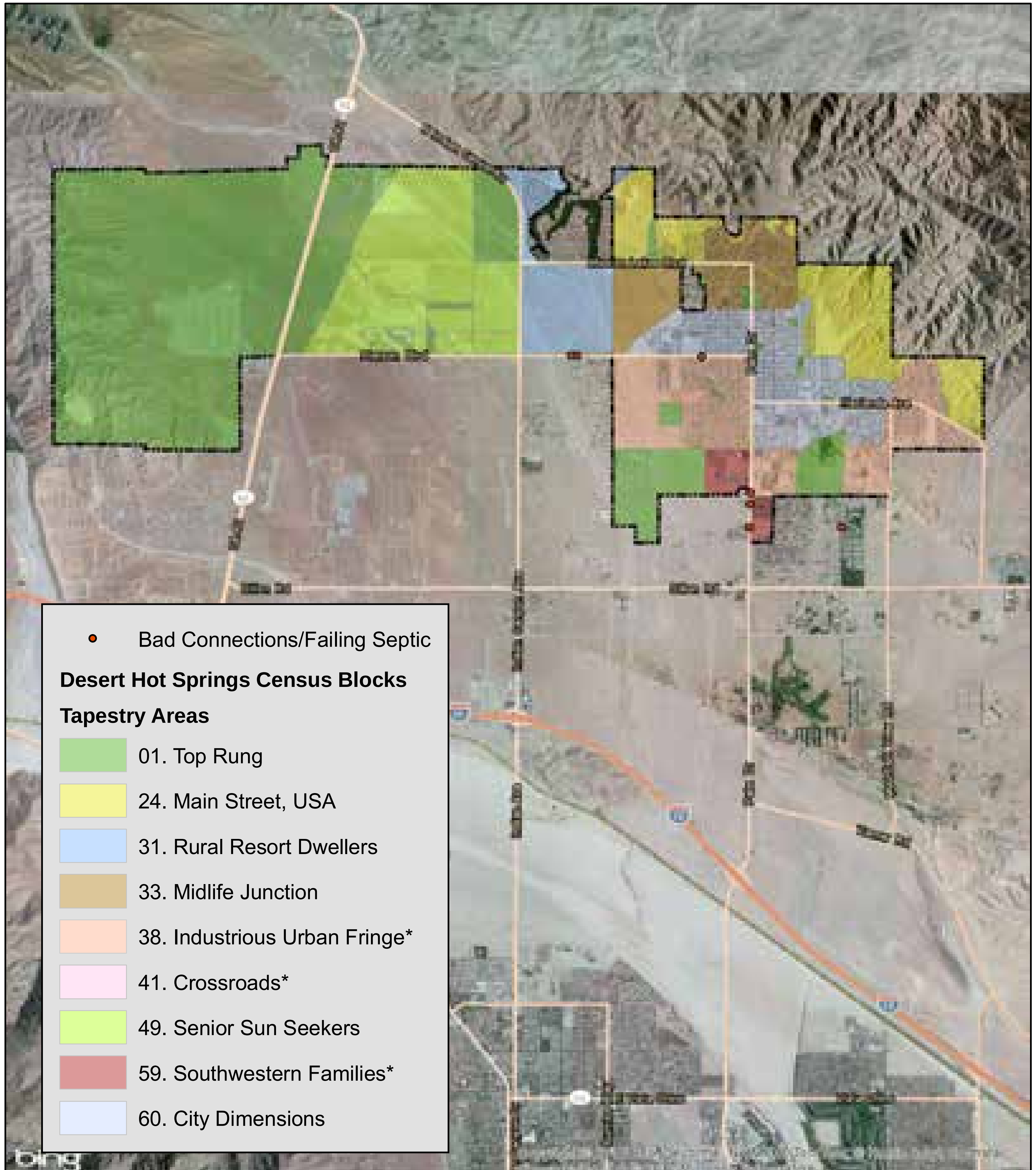
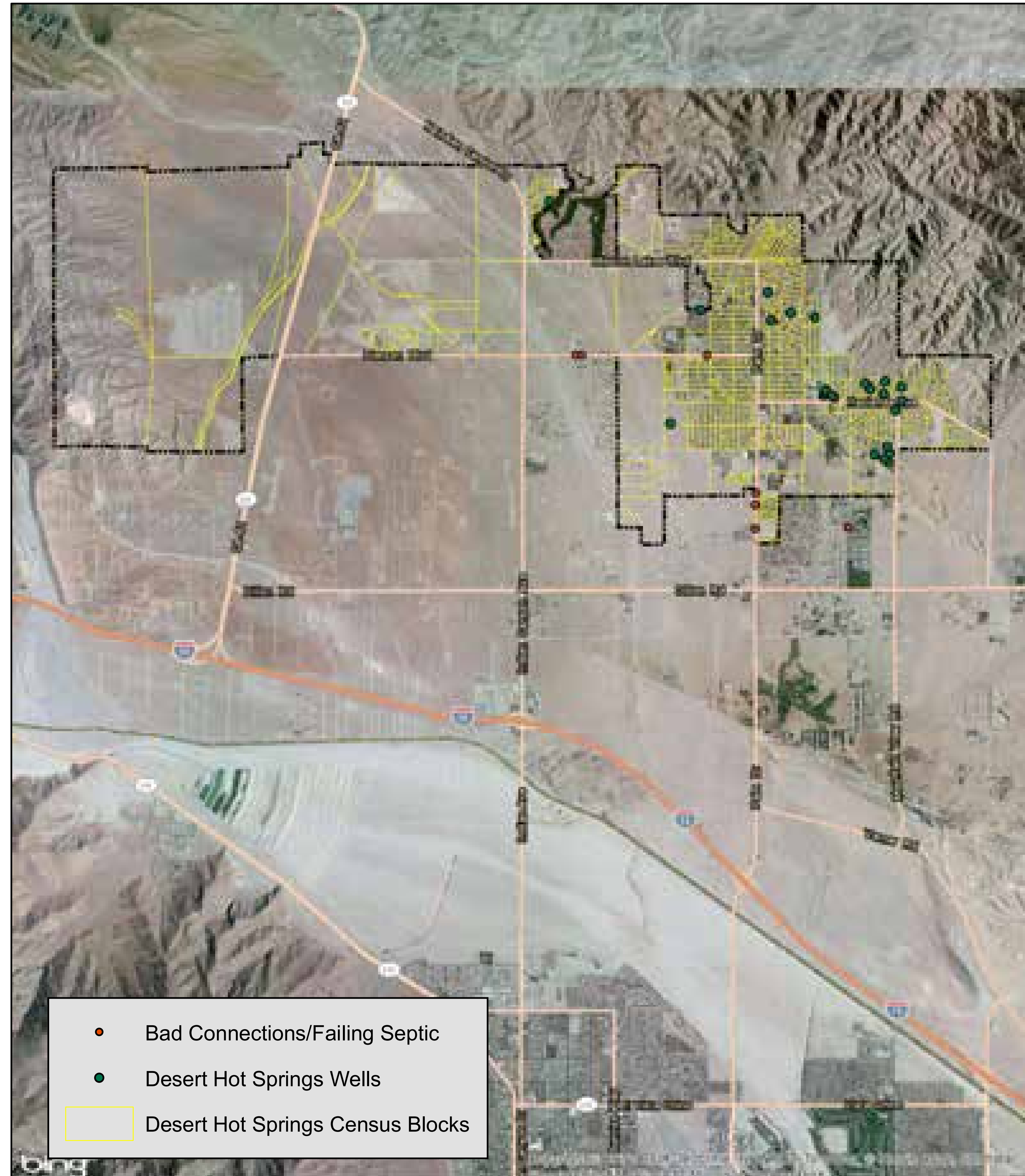
INTPLN GIS NOV 2012 Sources: Bing Maps Census.gov ESRI

CVRWMG Management Region
White Water DAC

2. Desert Hot Springs Focus Area





* = DAC Characteristics

0 0.75 1.5 3 4.5 6 Miles

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NOV 2012
Sources:
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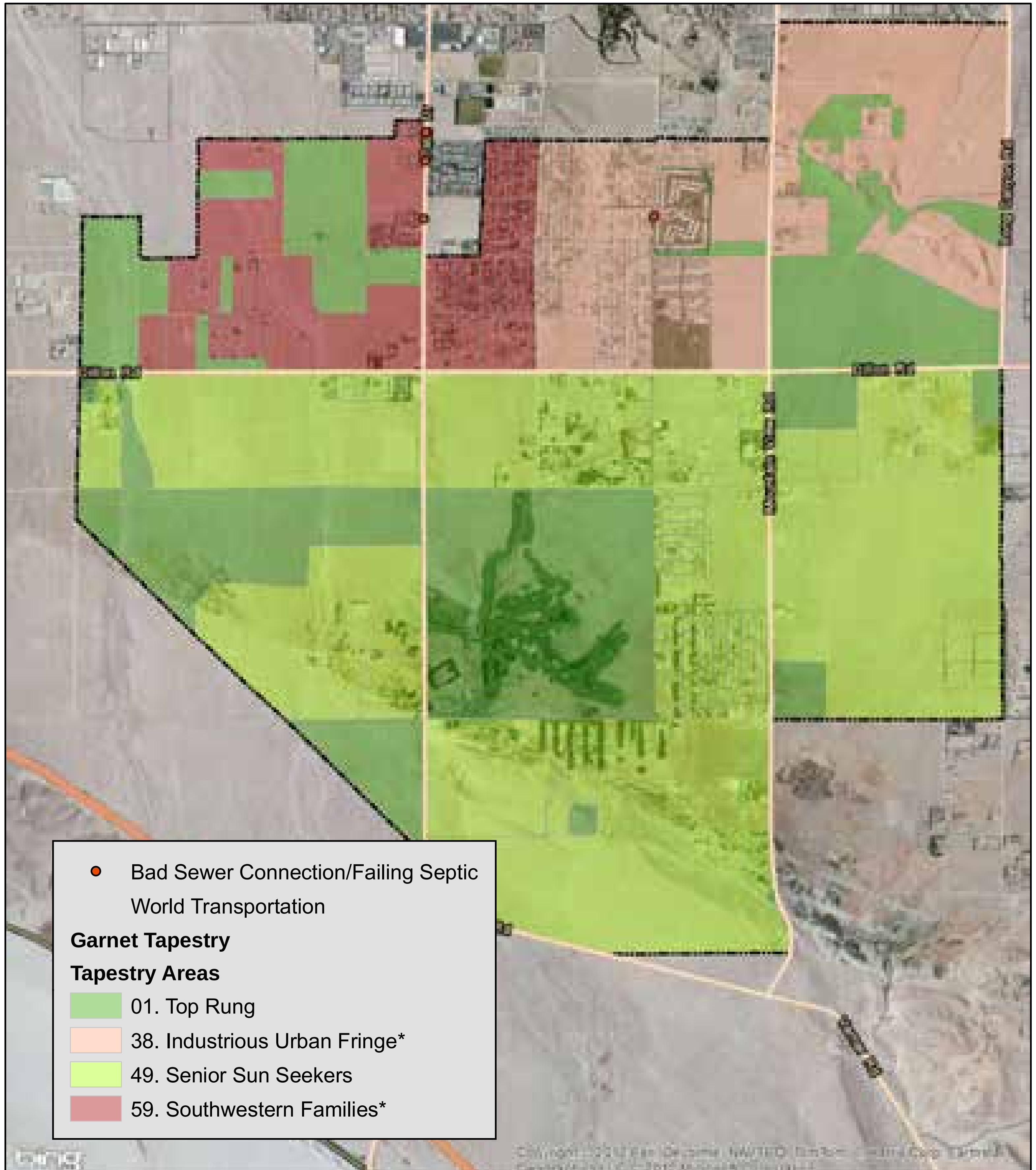
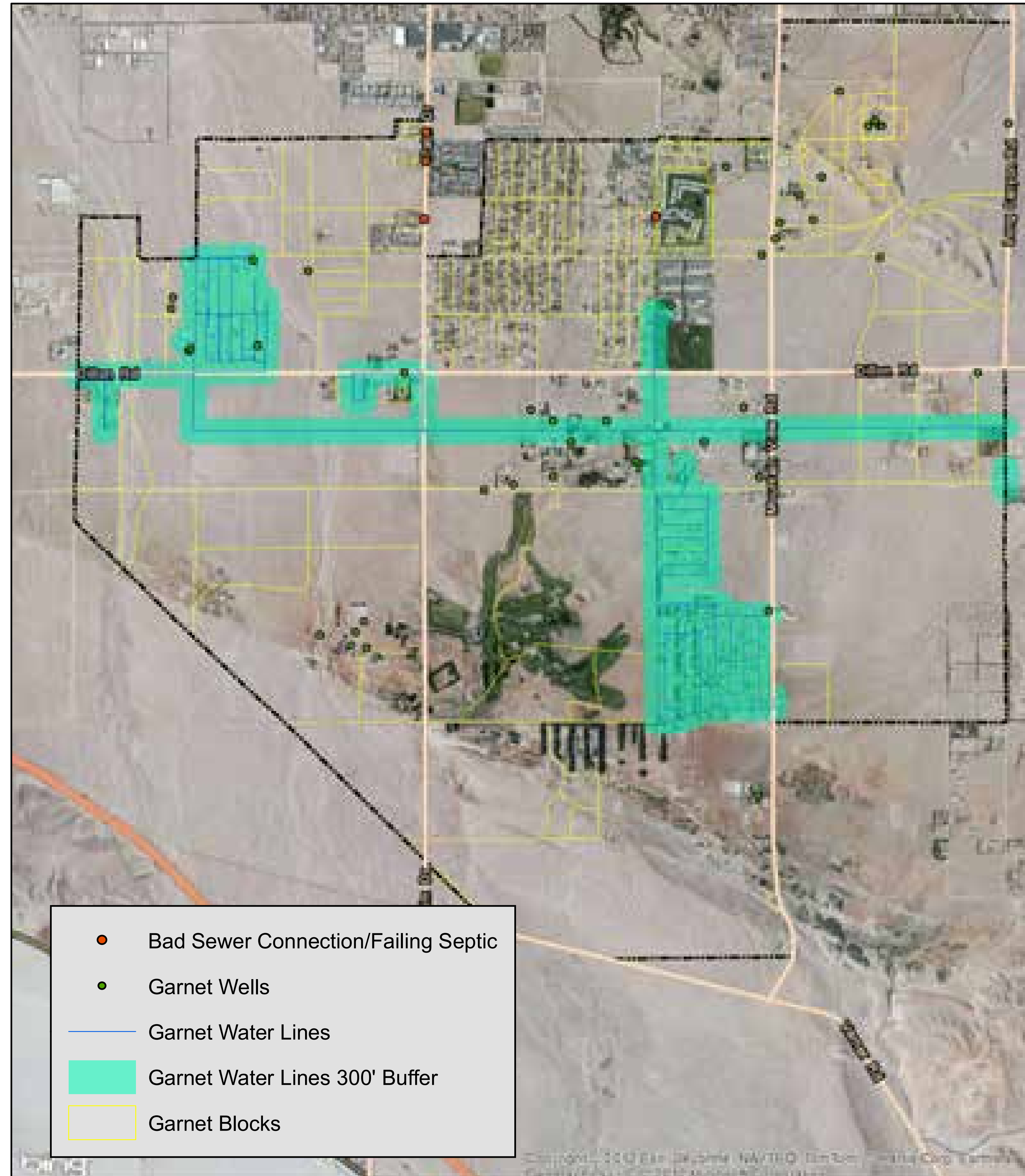
Census.gov
ESRI

Desert Hot Springs Focus Area

3. Garnet Focus Area





* = DAC Characteristics

0 0.375 0.75 1.5 2.25 3 Miles

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Sources:
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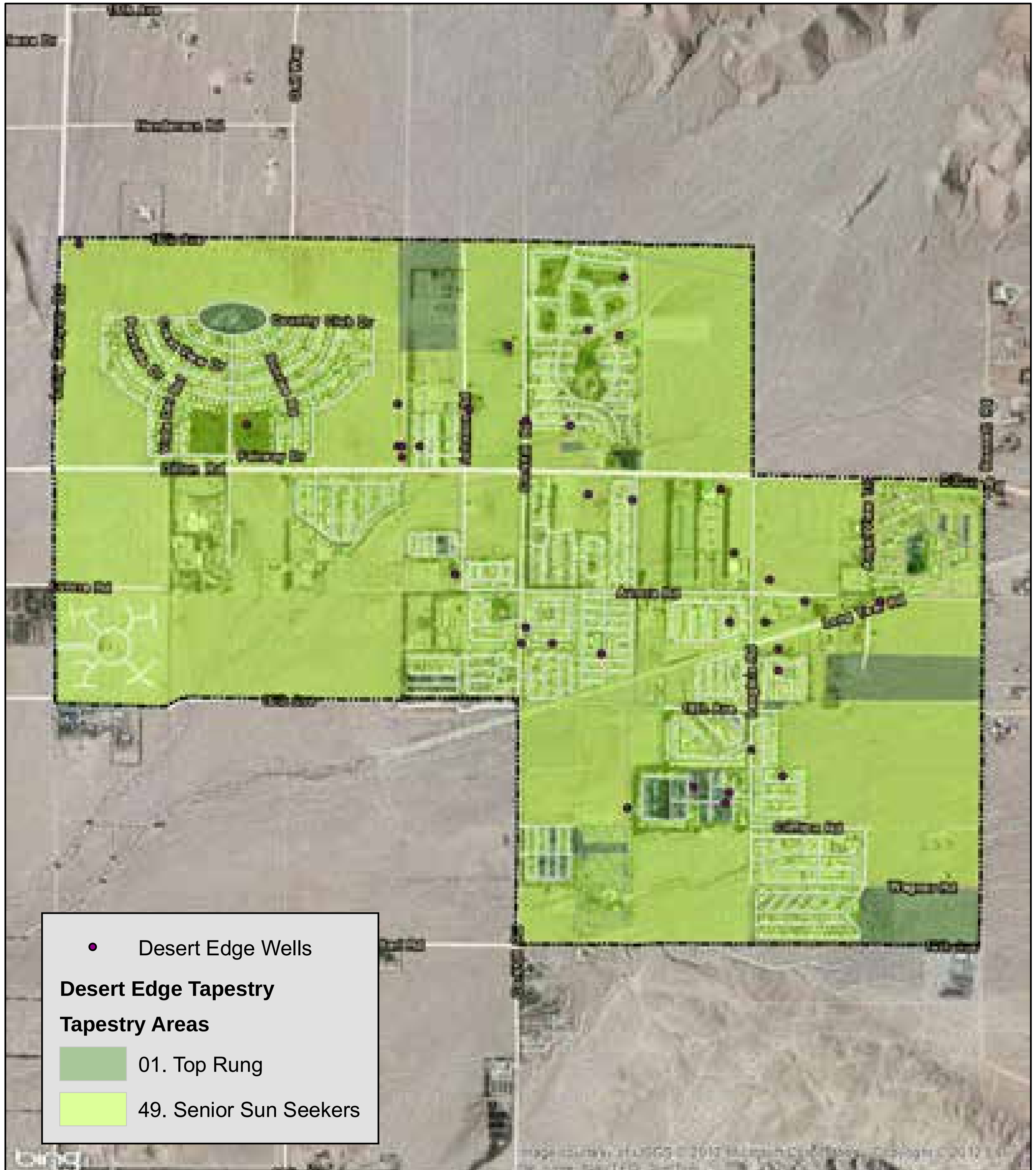
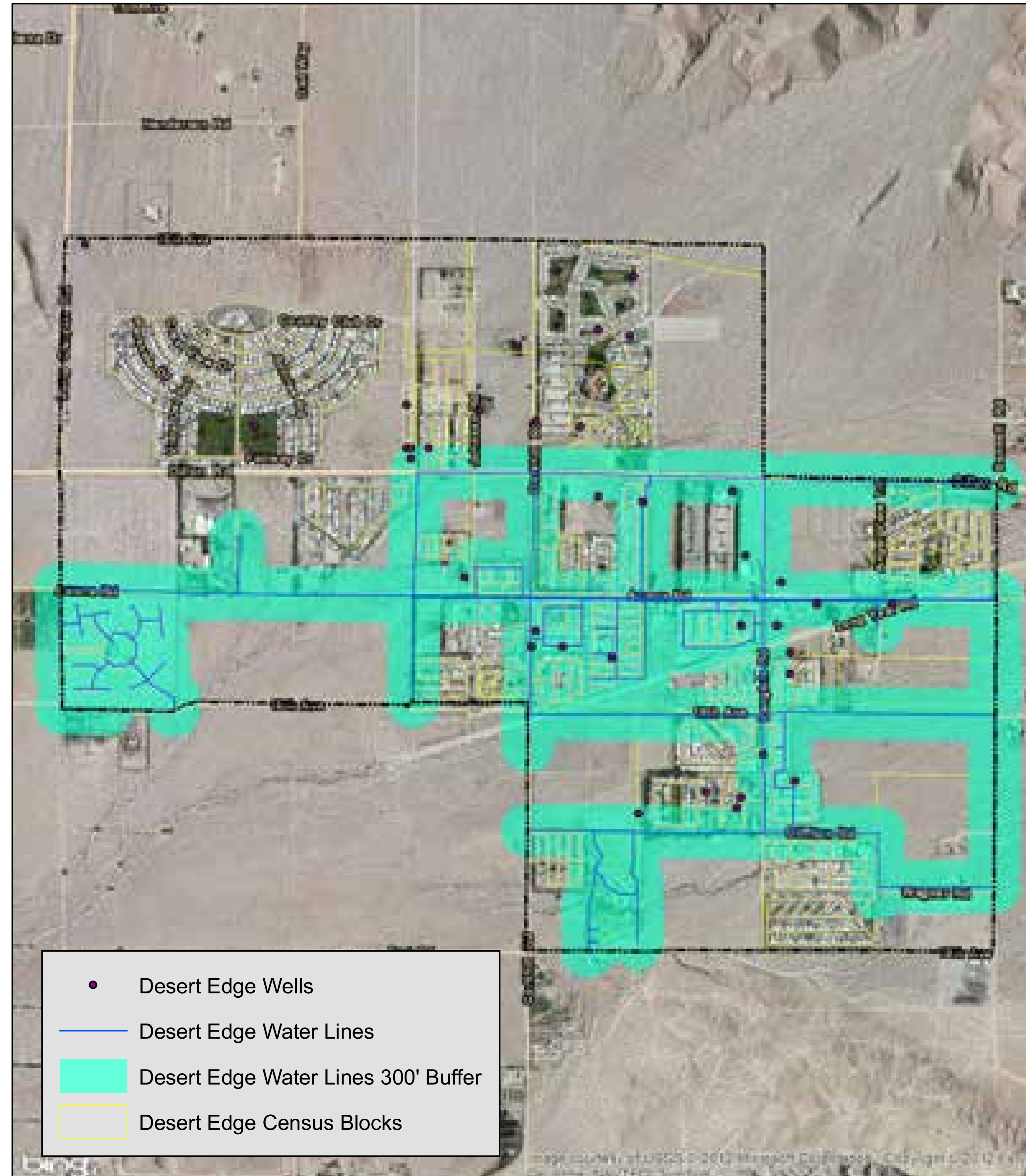
Census.gov
ESRI

Garnet

4. Desert Edge Focus Area





0 0.125 0.25 0.5 0.75 1 Miles

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Sources:
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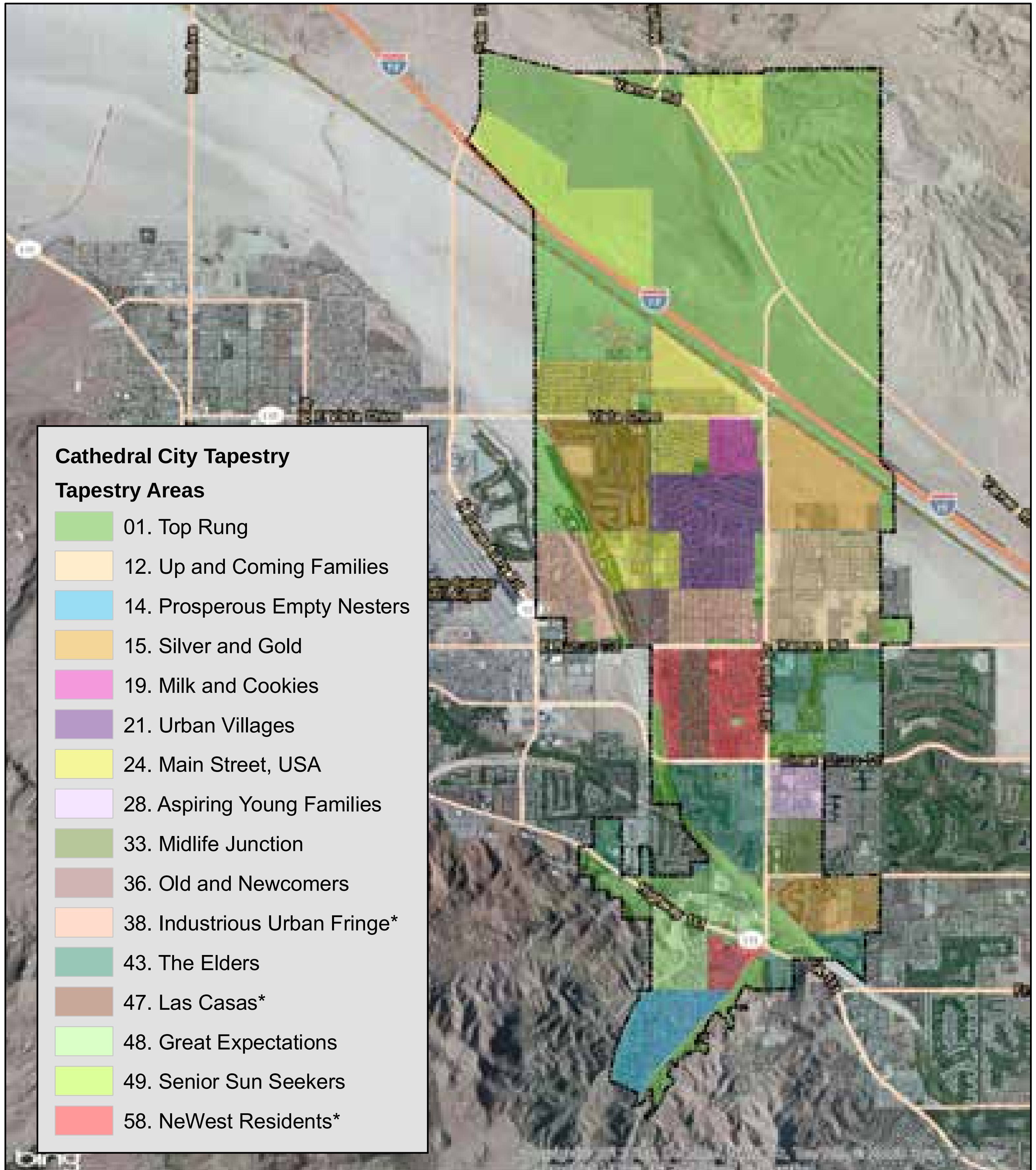
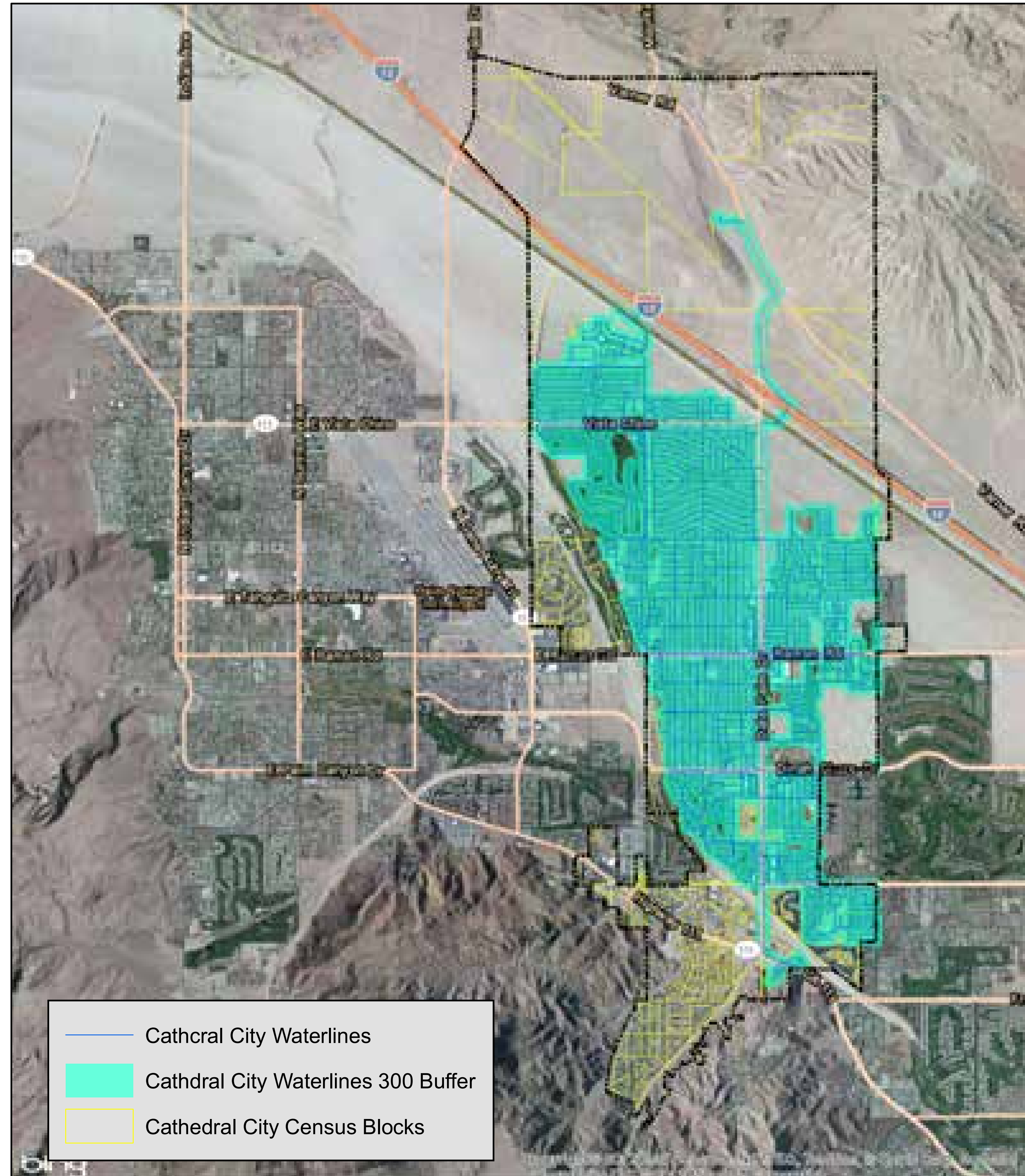
Census.gov
ESRI

Desert Edge CDP

5. Cathedral City Focus Area





* = DAC Characteristics

0 0.5 1 2 3 4 Miles

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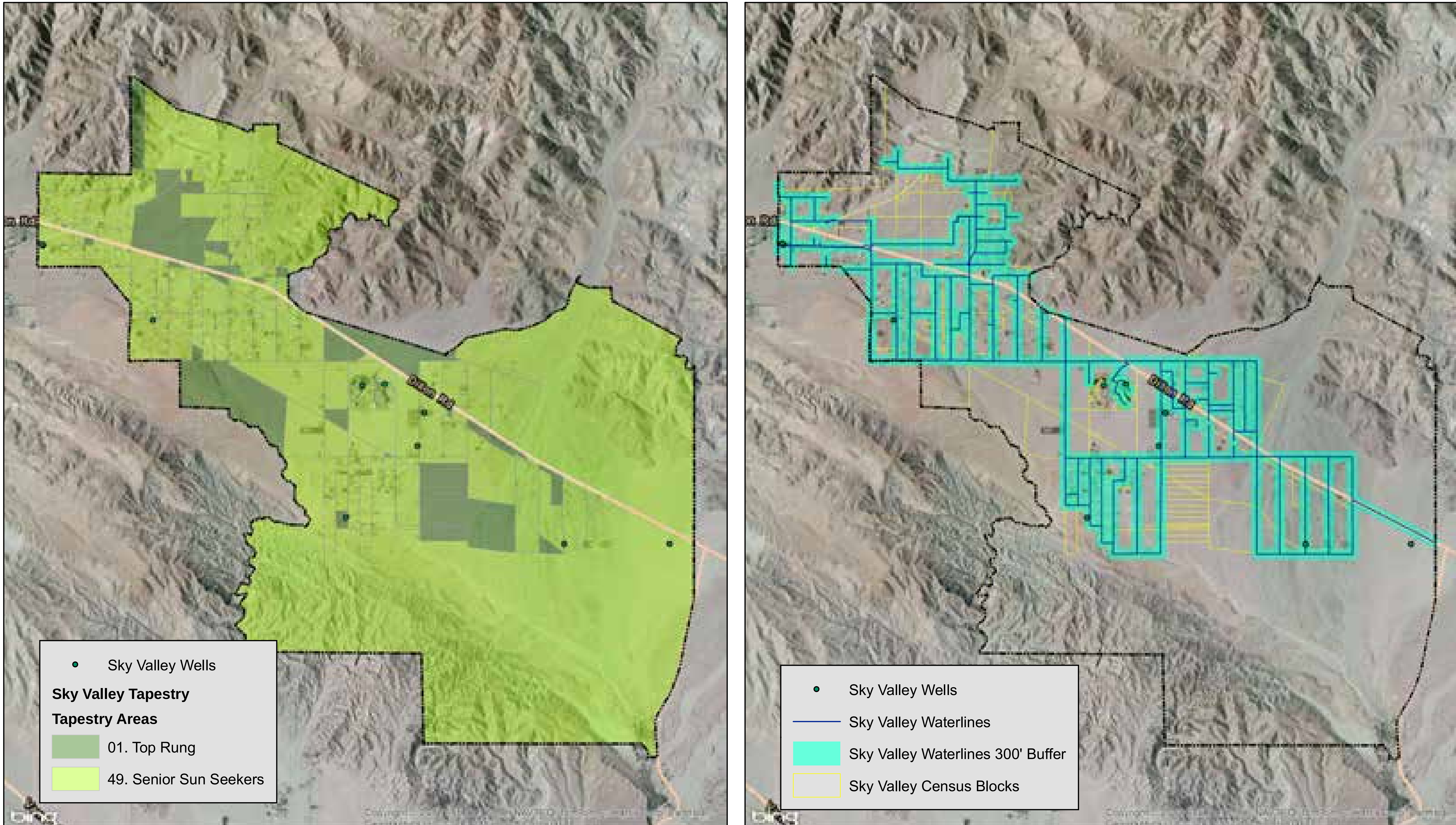
Sources:
Bing Maps
Census.gov
ESRI

— Cathedral City DAC

6. Sky Valley Focus Area



0 0.5 1 2 3 4 Miles

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NOV 2012
Sources:
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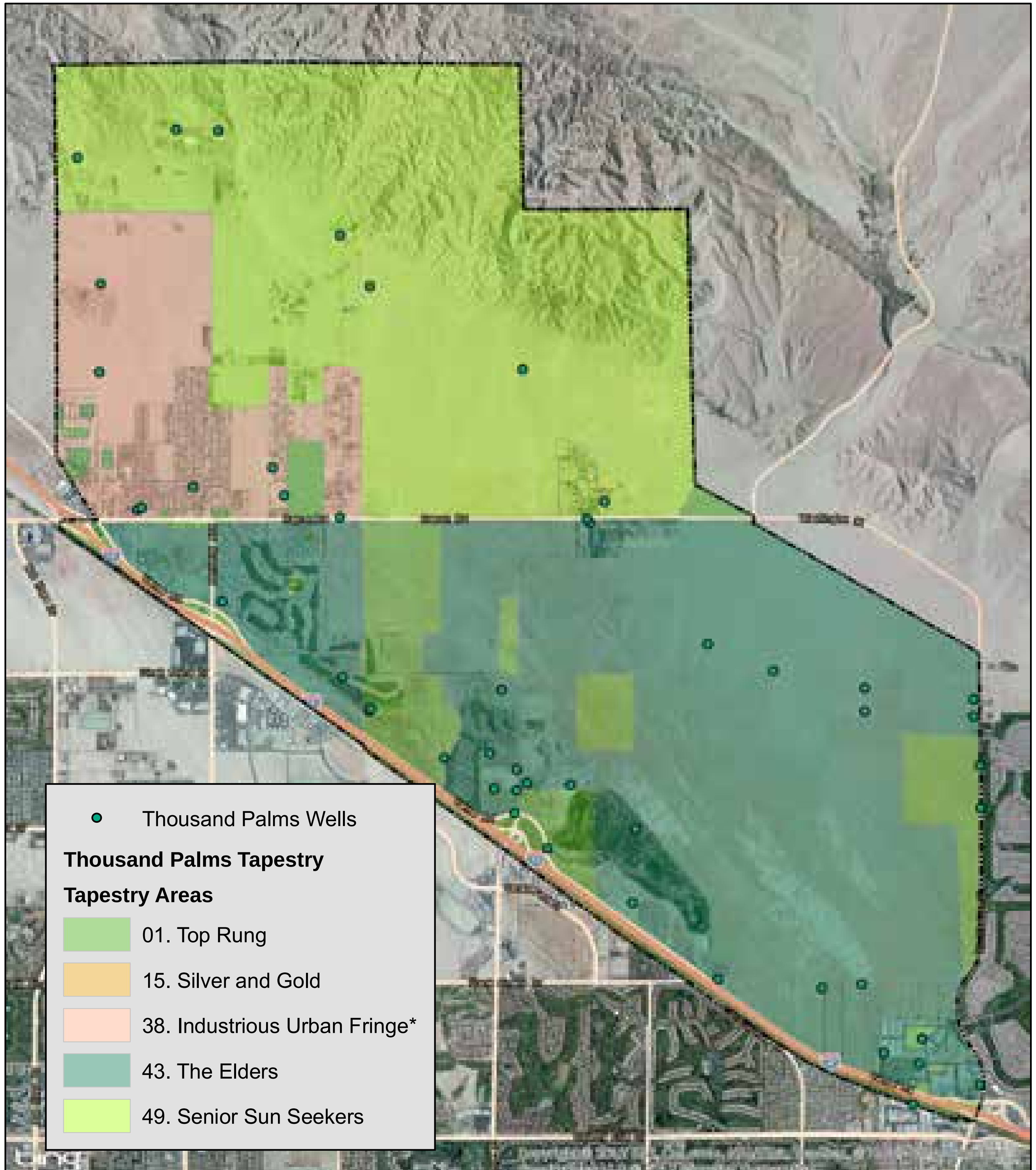
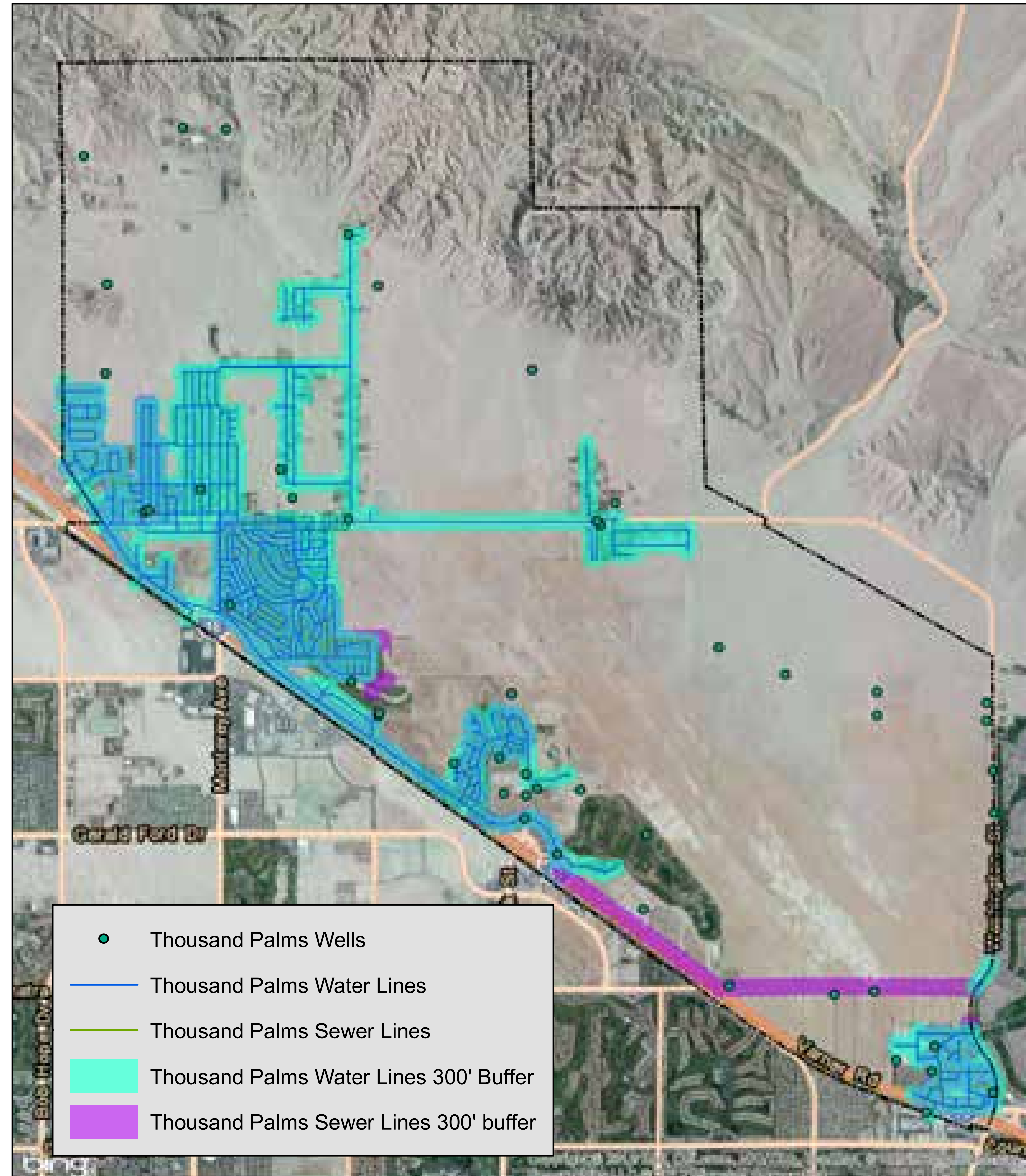
Census.gov
ESRI

Sky Valley CDP

7. Thousand Palms Focus Area





* = DAC Characteristics

0 0.5 1 2 3 4 Miles

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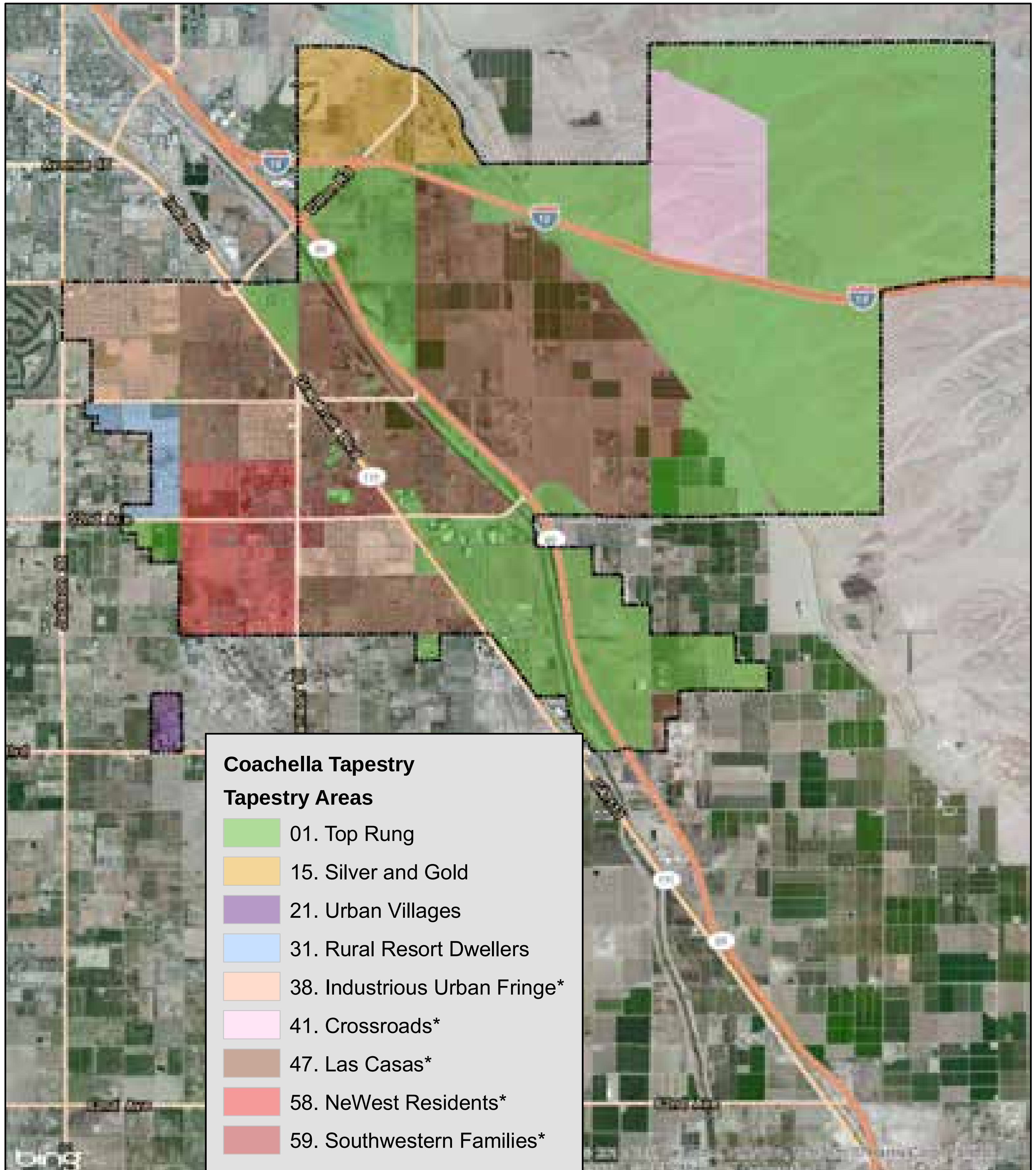
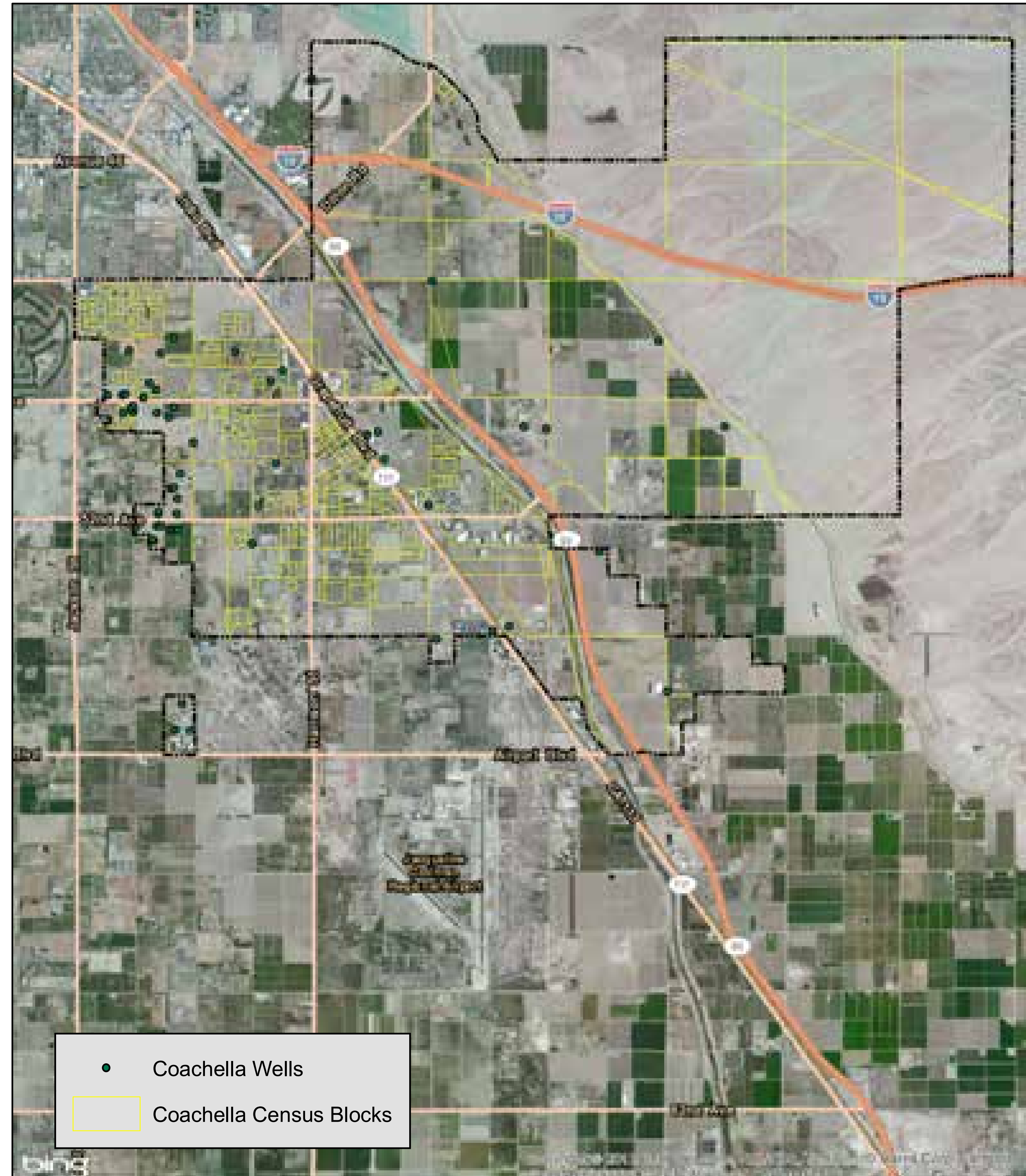
INTPLN GIS NOV 2012 Sources: Bing Maps Census.gov ESRI

Thousand Palms

8. Coachella Focus Area





* = DAC Characteristics

0 0.5 1 2 3 4 Miles

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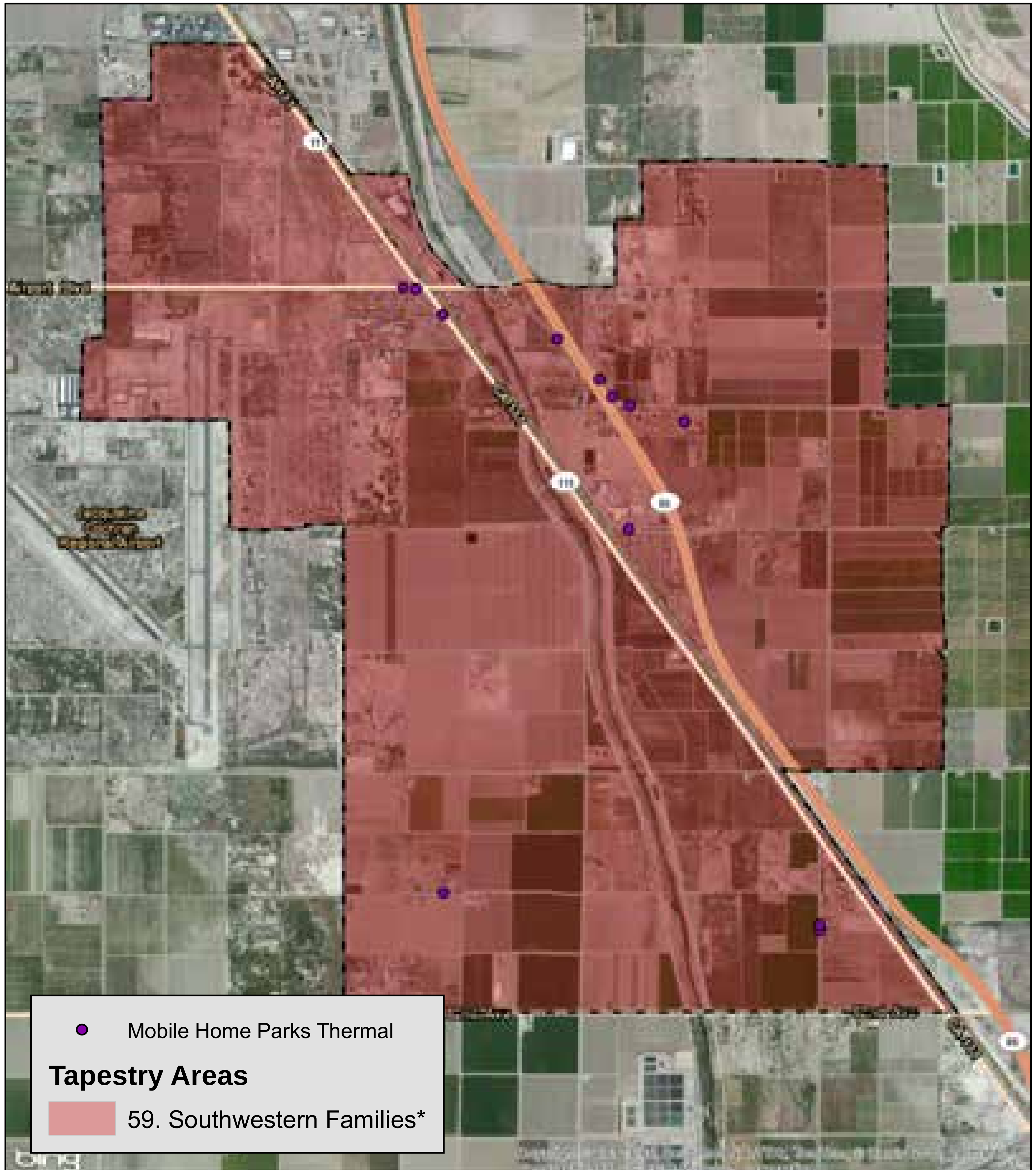
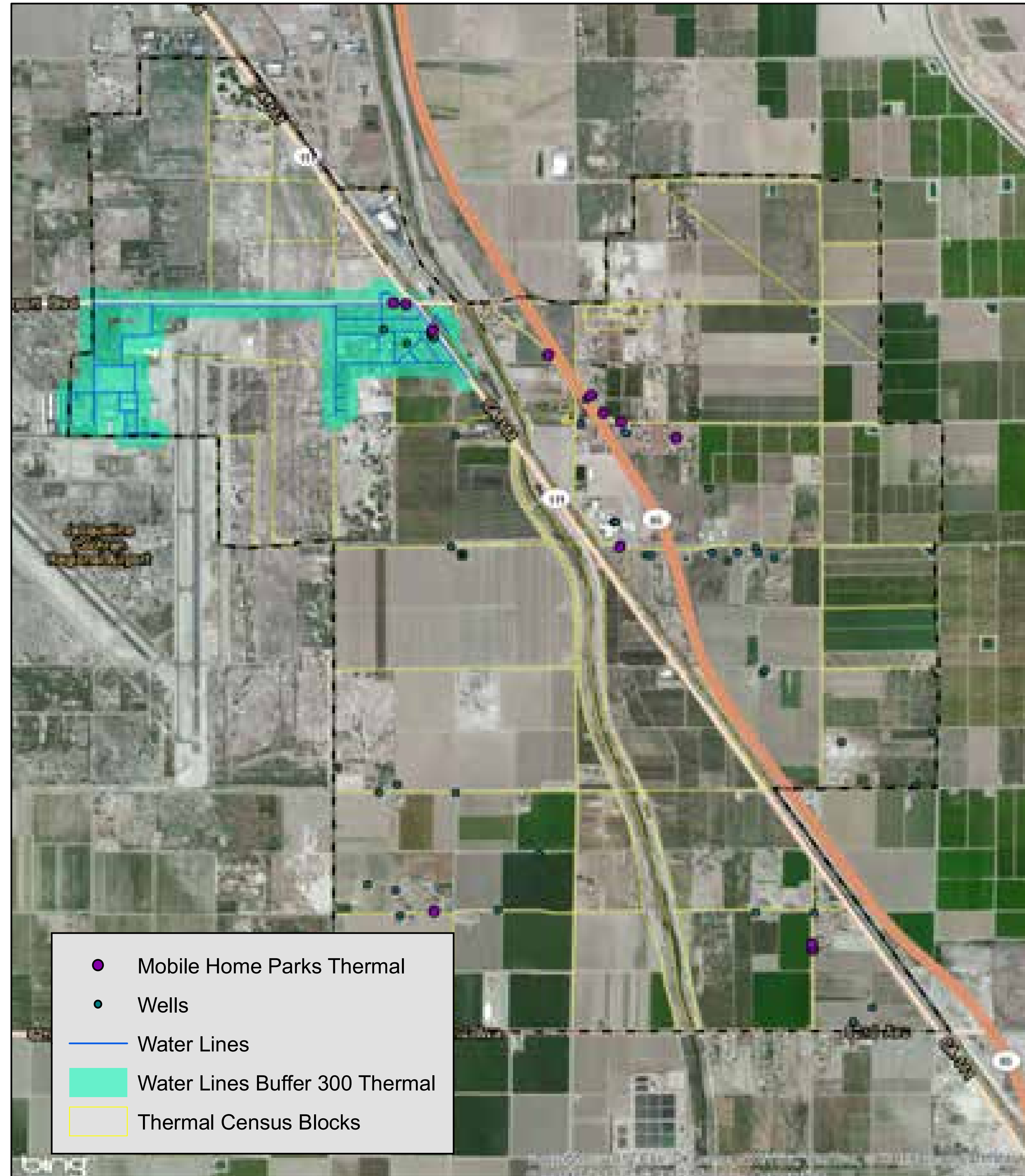
Coachella DAC

9. Thermal Focus Area





* = DAC Characteristics

0 0.375 0.75 1.5 2.25 3 Miles

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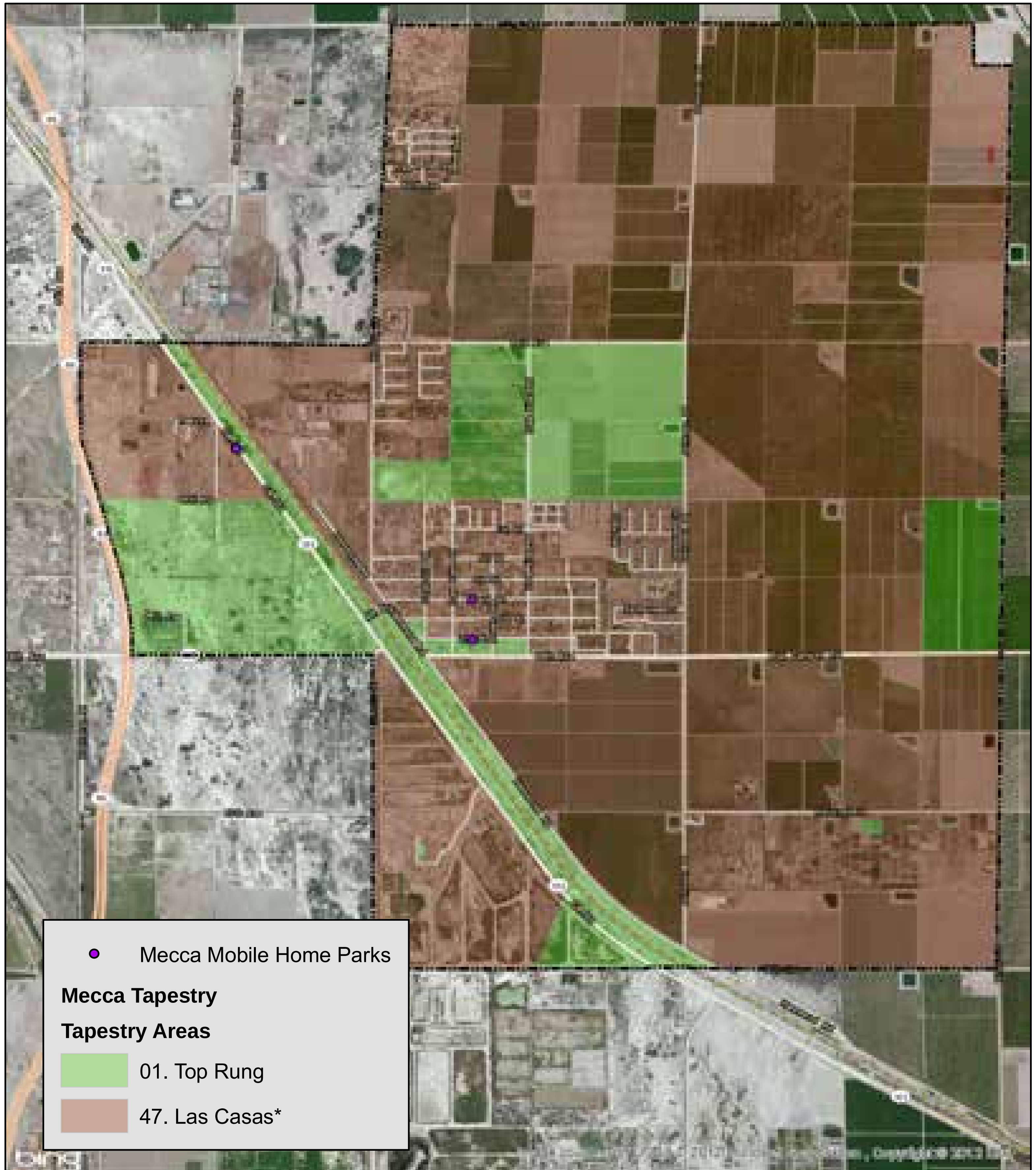
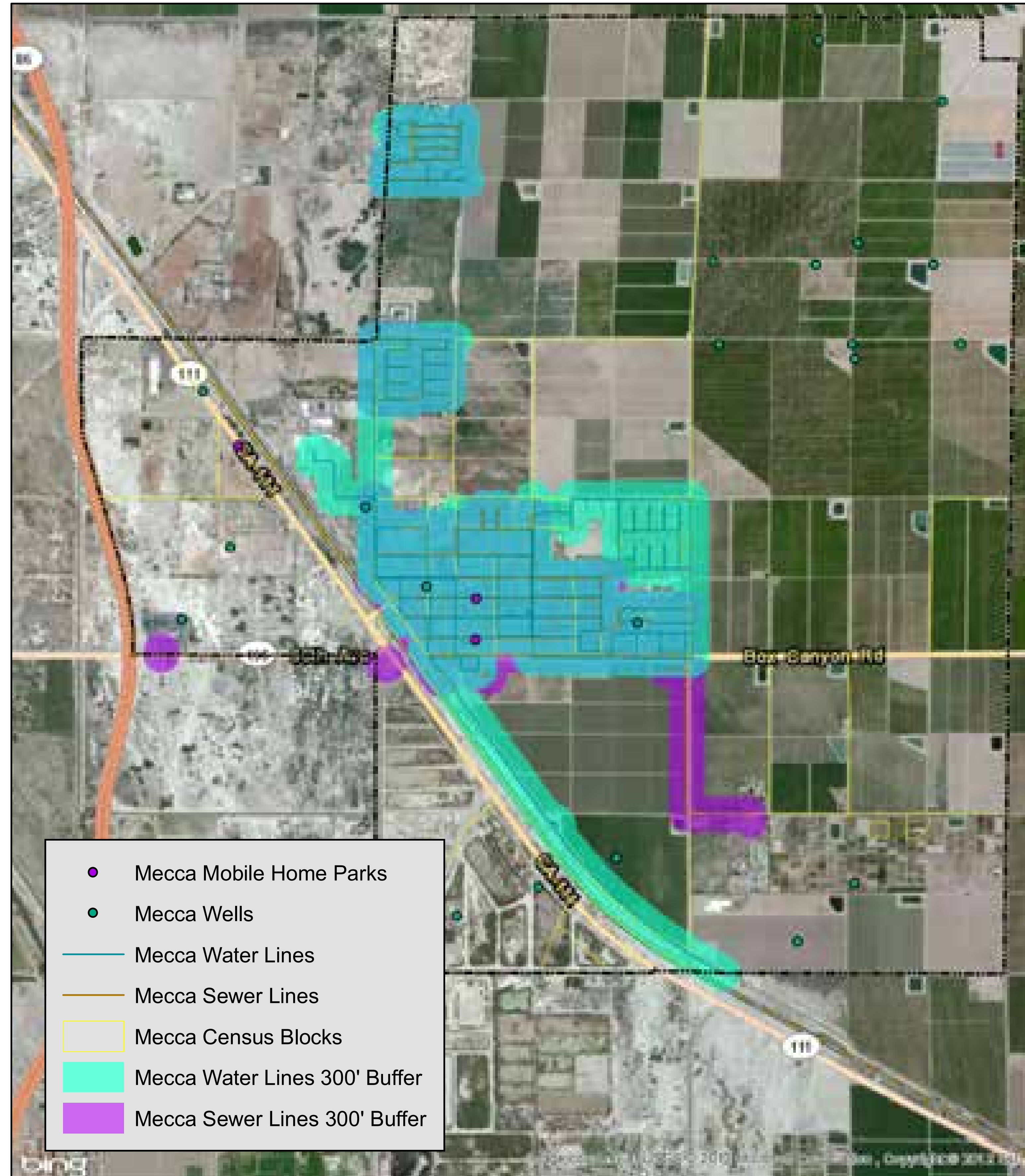
INTPLN GIS
NOV 2012
Sources:
Bing Maps
Census.gov
ESRI

Thermal Focus Area

10. Mecca Focus Area





* = DAC Characteristics

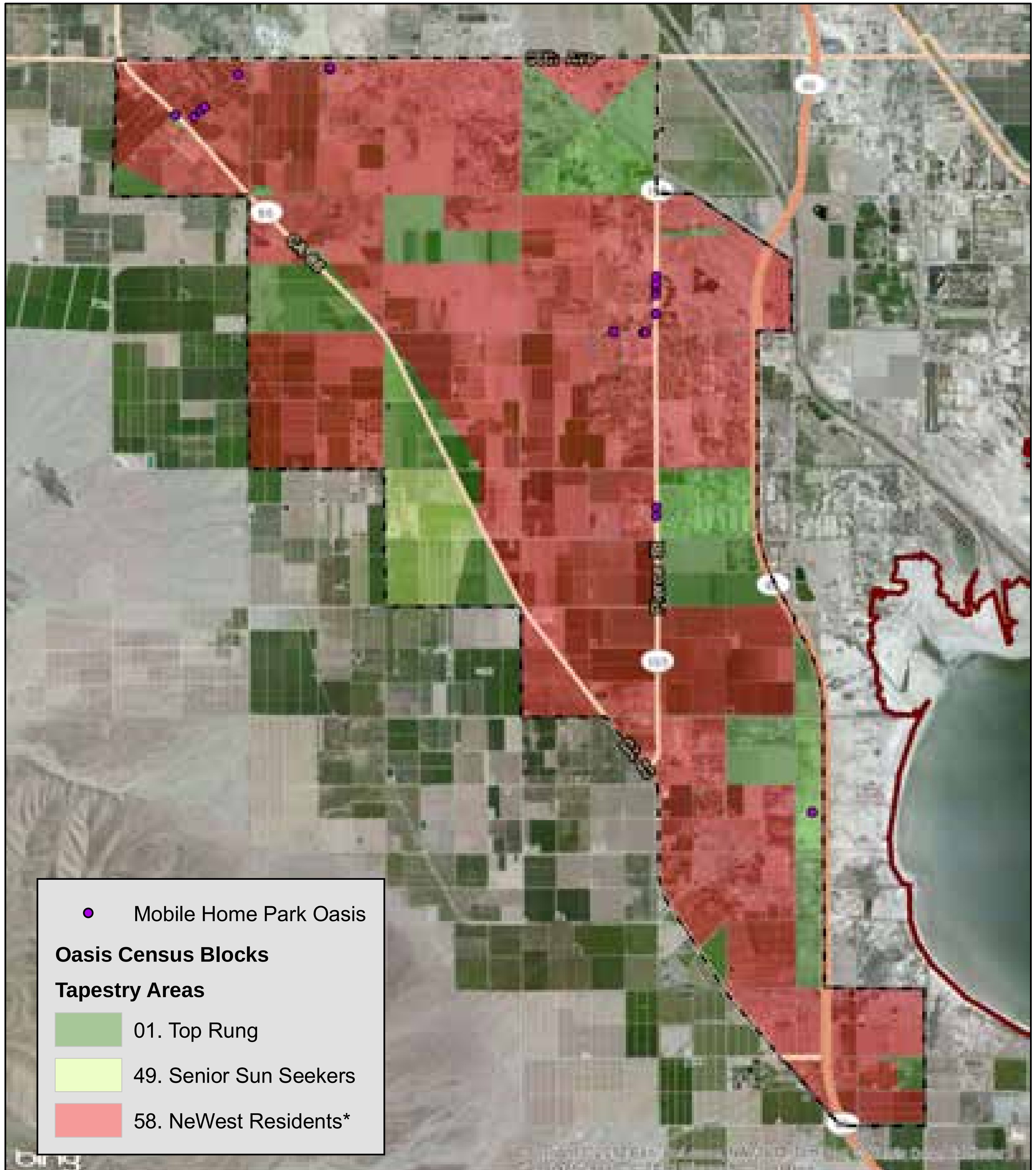
0 0.25 0.5 1 1.5 2 Miles

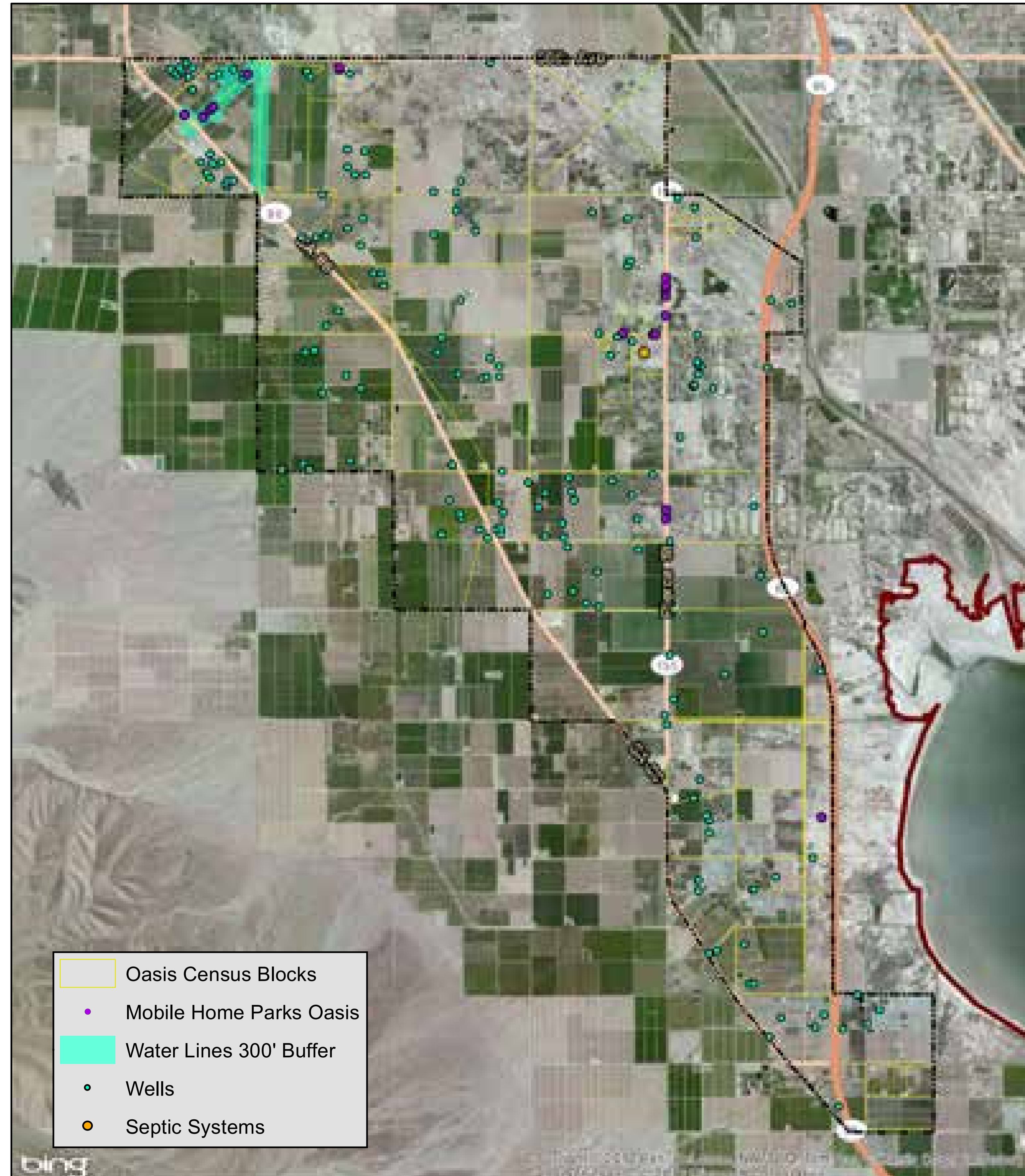
Integrated Planning and Management Inc.

INTPLN GIS
NOV 2012
Sources:
Bing Maps
Census.gov
ESRI

Mecca

11. Oasis Focus Area





* = DAC Characteristics

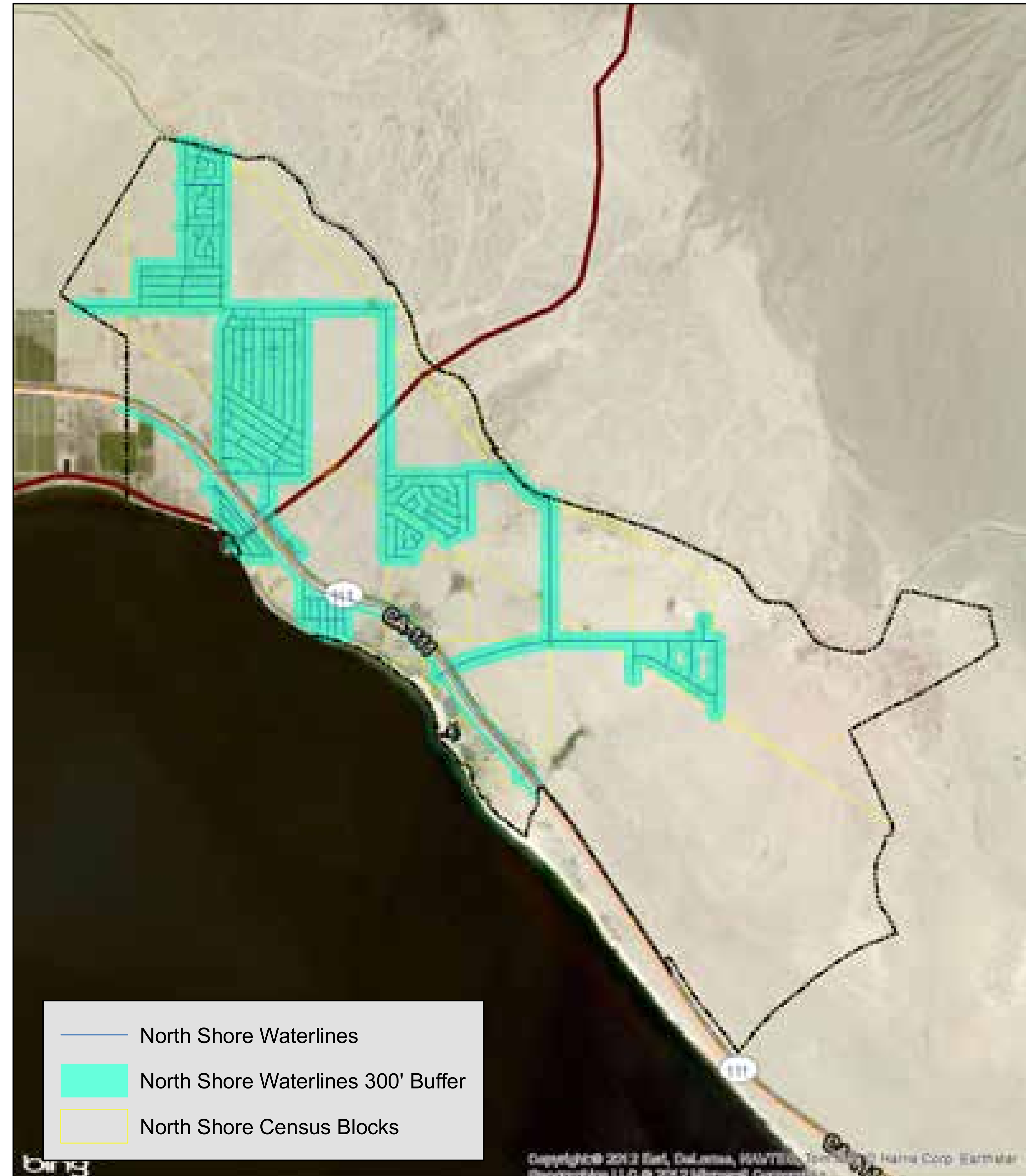
0 0.5 1 2 3 4 Miles

INTEGRATED PLANNING AND MANAGEMENT INC.

INTPLN GIS NOV 2012 Sources: Bing Maps Census.gov ESRI

CVRWMG Management Region
Oasis Focus Area

12. North Shore Focus Area



* = DAC Characteristics

0 0.375 0.75 1.5 2.25 3 Miles

N

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INTPLN GIS
NOV 2012
Sources:
Bing Maps
Census.gov
ESRI

North Shore
CVRWMG Management Region

13. Desert Shores Focus Area

* = DAC Characteristics

0 0.075 0.15 0.3 0.45 0.6 Miles

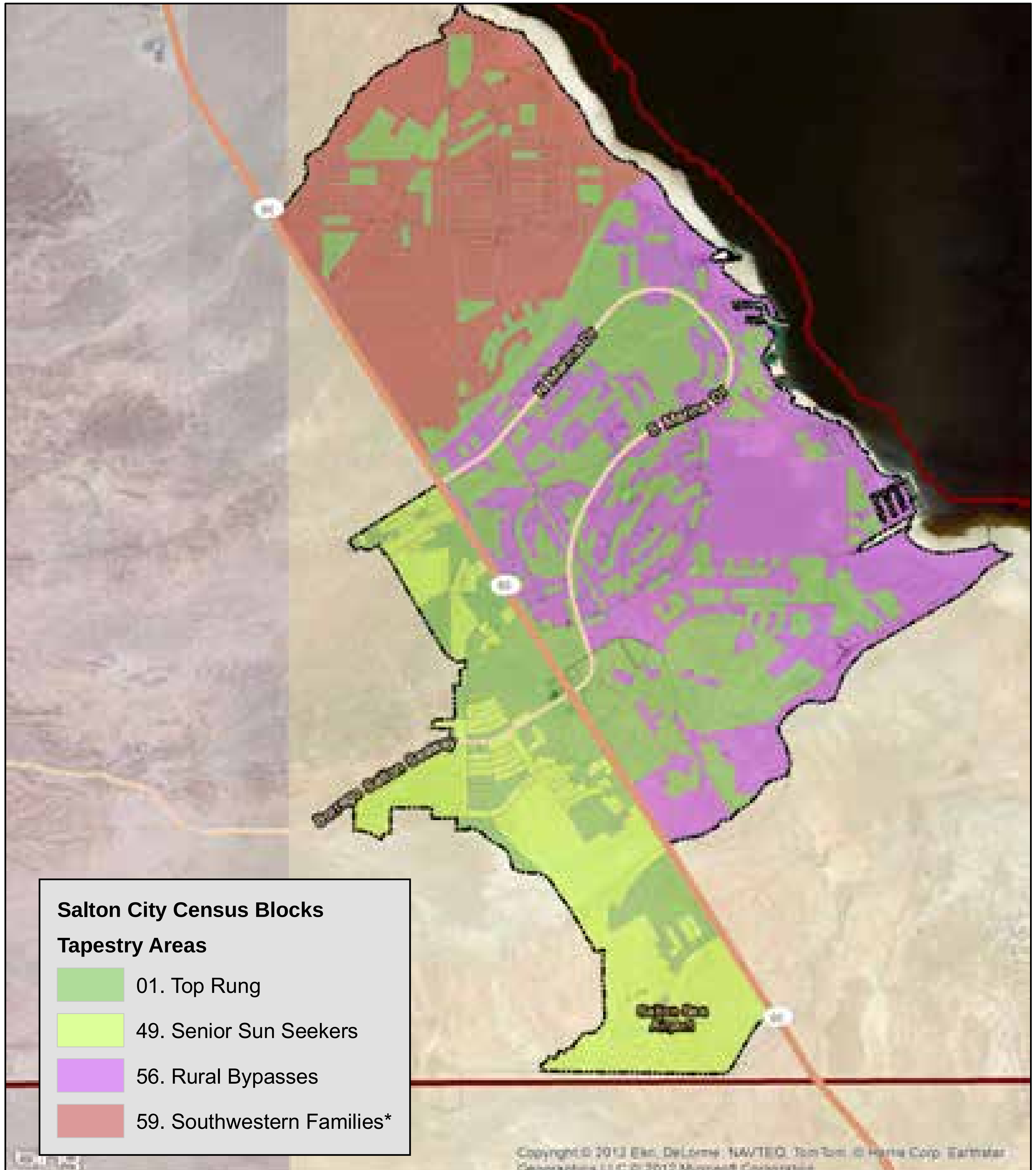
INTEGRATED PLANNING AND MANAGEMENT INC.

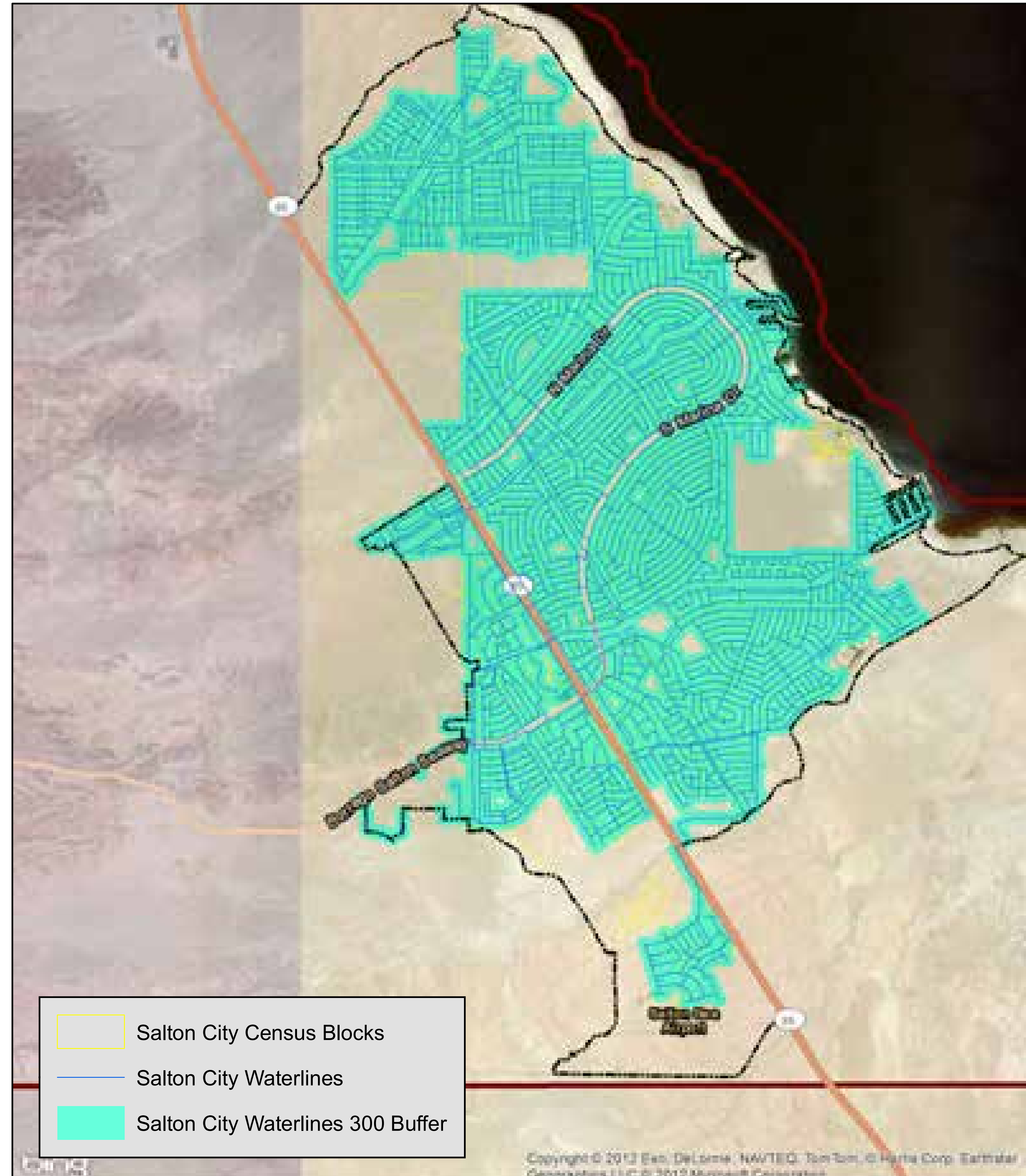
INTPLN GIS
NOV 2012
Sources:
Bing Maps
Census.gov
ESRI

Desert Shores CDP
CVRWMG Management Region

**No Water Line Buffer Due To Proximity

14. Salton City Focus Area





* = DAC Characteristics

0 0.5 1 2 3 4 Miles

Integrated Planning and Management Inc.

INTPLN GIS
NOV 2012
Sources:
Bing Maps
Census.gov
ESRI

Salton City
CVRWMG Management Region

Appendix VII-B: Disadvantaged Communities Mapping and Characterization Project Report

This appendix contains the draft results of the Disadvantaged Communities Mapping and Characterization Project, which administered surveys to DACs in the Region to help characterize the nature and needs of the DACs.

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Coachella Valley Disadvantaged Community Outreach Program

Draft Report

Disadvantaged Communities (DAC) Mapping and Characterization Project

for the

Coachella Valley Integrated Regional Water Management Plan

Prepared by Ryan G. Sinclair

of the

Loma Linda University School of Public Health Department of Environmental Health

for

RMC Water and Environment

and

The Coachella Valley Regional Water Management Group

November 25, 2013

1 Introduction

This report summarizes the results from outreach and mapping activities conducted by Loma Linda University (LLU) on behalf the Coachella Valley Integrated Regional Water Management (IRWM) Disadvantaged Community (DAC) Outreach Program. LLU worked in concert with the Coachella Valley Regional Water Management Group (CVRWMG) to complete this project for the Coachella Valley Disadvantaged Community (DAC) Outreach Demonstration Program. The Coachella Valley Water District (CVWD), representing the CVRWMG, contracted with the Department of Water Resources (DWR) to develop a DAC Outreach Demonstration Program (DAC Outreach Program) for the Coachella Valley Integrated Regional Water Management Region (Region).

Through the DAC Outreach Program, LLU conducted DAC outreach, completed DAC mapping and community characterization, identified challenges that have historically prevented or discouraged DAC involvement in IRWM planning, and made recommendations about techniques to overcome challenges and promote participation in the IRWM process. The goal of the Coachella Valley DAC Outreach Program was to develop and implement methods to improve DAC participation in the Coachella Valley IRWM Program.

The objectives of outreach activities included identifying new DAC individuals or groups, coordinating workshops and meetings in the eastern and western portions of the Coachella Valley, and identifying successful outreach techniques and approaches. The objective of mapping and community characterization activities was to conduct outreach in known or previously unknown DAC areas that would pinpoint the location of DACs and identify those communities' water-related issues and problems. The objective of employing select outreach techniques was to identify the most effective techniques for characterizing those DACs and their water-related problems.

1.1 DAC Outreach

The outreach activities required documenting the groups and individuals with known interest in water-related planning efforts and DAC-related issues and engaging with those individuals to participate in the Coachella Valley IRWM Program. Given that the non-profit organizations (refer to Section 2 below) that took part in this process had extensive experience working with individuals and other organizations in the Coachella Valley, the IRWM project team asked non-profit partners to provide contact names of additional persons that had not been previously contacted as part of the Coachella Valley IRWM effort and would have potential interest in participating. Once a comprehensive list of potential DAC stakeholders was compiled, outreach was conducted to those individuals to ask for participation in a variety of outreach workshops that took place between 2012 and 2013. Two community-focused workshops were conducted with support from the non-profit team in June of 2013; those workshops were held sub-regionally (one in the East Valley and one in the West Valley).

An expanded technical memorandum (TM) is available to compliment this report; it is titled "Outreach to Disadvantaged Communities in the Coachella Valley: Findings, Challenges, and Achievements." The TM summarizes the technical challenges that have historically discouraged DAC participation in the Coachella Valley IRWM Program and includes details about the outreach methods that were implemented for the DAC Outreach Program. The TM discusses how the survey and outreach team overcame challenges through outreach and DAC stakeholder engagement. The TM also makes recommendations for other mechanisms that could be implemented to overcome challenges to DAC participation in the Coachella Valley IRWM Program. The second part of the technical memorandum details the outreach process undertaken for the DAC Outreach Program, including information about the people who were contacted, methods that were implemented for outreach, and information about the sub-regional DAC workshops that took place in June of 2013.

1.2 DAC Mapping and Characterization

The DAC mapping and characterization process included three principle work activities:

1. Identification of DAC locations
2. Identification and perceived characterization of drinking water, wastewater management, and flood risk issues within the identified DACs
3. Input of new data to update of the existing GIS database and DAC focus area maps

A survey questionnaire was the primary tool used to gather information in communities considered severely economically disadvantaged and economically disadvantaged (Appendix 1 contains the compiled list of questions administered during the survey). Workshops in disadvantaged communities allowed LLU to gather additional information to add to survey results. The three principle work activities resulted in new information that informed the development of four projects funded by the Coachella Valley IRWM process to address key issues in DACs. Work activities are summarized in Table 1 (Appendix 2 contains the Scope of Services).

1.3 Study Goal and Objectives

1.3.1 Study Goal

The study goal and description was provided to the LLU team in the Scope of Services. The goal and description of the project is described as follows:

> *"The goal of the Coachella Valley DAC Outreach Program is **to develop and implement methods to improve Disadvantaged Community (DAC) participation in the Coachella Valley IRWM Program**"… "DAC areas are defined by the State of California as having an income of 80% of the Statewide median household income (MHI) or $48,706 according to 2010 US Census statistics. The DAC Outreach Program is a DWR model program that will be used to shape DAC outreach efforts throughout California. As such, it is important that the DAC Outreach Program include substantial local input from entities and individuals that are most familiar and closely associated with the region's impacted disadvantaged communities. Therefore, part of the DAC Outreach Program includes contracting with local non-profit organizations in the Coachella Valley to provide support on specific tasks associated with outreach, mapping, and the larger regional IRWM effort."*

1.3.2 Study Objectives

Output objectives from the overall Study goal (see Section 1.3.1) are to further characterize DACs in the Coachella Valley. Specifically, these output objectives are to:

- Map "pocket" DACs. This is to show the location of communities that the CVRWMG team knew about and to officially map new pockets of DACs identified through the survey and research process. The term "pocket" is used, because these DACs are often located in small clusters and are generally not included in large-scale socioeconomic mapping efforts such as the United States Census survey due to their small and isolated nature.
- Characterize the DACs. This work objective includes defining the DACs, characterizing their demographics, flood management, water, and wastewater practices. Please note that because the nature of this research was based on interviews and a survey questionnaire, DAC characterizations are based on perceived issues and conditions rather than actual conditions; opinions collected through the survey were not validated through the survey process.
- Provide GIS data. LLU provided geocoded survey data so that the survey data could be overlaid on existing maps of the Coachella Valley water resources.

- Characterize existing data. This includes previous work on DACs provided by the larger Coachella Valley IRWM effort and the Tapestry Community data, previous DAC working meetings, and previous projects of the authors of this report.

1.3.3 Process objectives

Process objectives that were implemented to meet the overall goals and objectives described in previous sections are to:

- Complete a rapid field assessment. After a 5-month postponement period (due to grant funding delays from DWR), the team had a short 6-week period of time to complete on-the-ground research and DAC characterizations.
- Compile a “Main Report”. The main report would include an overall summary of the DAC mapping and characterization process as well as outcomes from that process.
- Prepare additional memorandum. In addition to the main report, an additional memorandum was prepared to address two topics. The first topic included a documentation of outreach activities and a description of the challenges that have historically discouraged or prevented DAC involvement in the Coachella Valley IRWM process. The second topic included information about actions that were taken to overcome the identified challenges as well as other actions that could be taken to increase DAC involvement in the Coachella Valley IRWM process in the future.

Table 1: Work Activities

Work Activity	Description
Survey questionnaire and household observations	Field surveyors visited over 350 homes in the Coachella Valley with questions about their concerns and experiences with water resources, wastewater management, and flooding.
Geocoding and map development	Analysts geocoded the household data to the ESRI ARCMAP format.
DAC workshops and community mapping	DAC workshops were held in the eastern and western Coachella Valley to allow residents a forum to provide input for the IRWM process
Communications with residents	Other interviews and communications with local residents about the IRWM process or the issues addressed through previous efforts in the Coachella Valley.

2 Survey Questionnaire and Surveying Techniques

The survey questionnaire and DAC workshops were administered by three non-profit organizations. The non-profit team was selected by the CVRWMG in early 2013 as a result of a formal solicitation and interview process. The non-profit team was led by Loma Linda University. El Sol Neighborhood Educational Center (El Sol) and Pueblo Unido Community Development Corporation (Pueblo Unido) were the organizations responsible for administering surveys in the western Coachella Valley and eastern Coachella Valley. LLU students assisted in this task. The non-profits and the non-profit leaders are listed below:

1. The Loma Linda University School of Public Health Department of Environmental Health in Loma Linda, CA: Dr. Ryan G. Sinclair
2. The El Sol Neighborhood Educational Center - active in the western and eastern DACs in the Coachella Valley: Alexander Fajardo and Susie Del Toro.
3. The Pueblo Unido Community Development Corporation - active in DACs in the eastern Coachella Valley: Sergio Carranza and Rodolfo Piñon.

2.1 Survey Questionnaire

A survey questionnaire approach was used to gather household-reported information about water/wastewater knowledge, usage, and practices. The survey was administered in-person by representatives from El Sol, Pueblo Unido, and LLU students. The on-site and in-person format has many benefits over other types of surveys for this situation (i.e. phone, internet, or mailed survey forms). The following methods increased the statistical validity of the survey:

- Allow surveyors to ask questions and make observations about the physical structures on-site
- Ensure a higher response rate with unscheduled in-person visits to people who would not normally respond to surveys in any other way
- Allow the opportunity for return visits when a selected household was unable to participate on the first visit
- Allow a rigorous spatial sampling method to ensure quality control and an overall higher statistical significance
- Allow surveyors to visit randomly-selected households based on proximity alone. Many of the randomly-selected households are not otherwise registered or represented by formal demographic or population estimates such as those conducted by the United States Census Bureau
- The surveyors from local organizations (known as promoters or “promotores” in Spanish) have a unique regional knowledge of the area and sometimes have already established rapport with the neighborhoods or mobile home park community organizations. For this reason, conducting in-person surveys with such participants increases access to areas that other “outsider” surveyors may not be able to access
- Through the survey process, the promotores grow to have a new understanding of the water-related challenges and resources in their home community. They are now more likely to see the priority of water-related development and advocate for community-driven change
- The promotores can use their own expertise to contribute to the survey process and the DAC characterization. The initial meetings of this survey project allow a thorough review of the questionnaire and assessment methods. The survey review workshops allowed the questionnaire items to be made relevant to the local stakeholders who have a different perception from the survey authors
- The sampling process was setup with 232 required survey locations and about 100 additional survey sites that the local promotores had to select. They were allowed to go beyond the pre-selected households and survey locations that they prioritized. Many promotores have already worked in the community and know where the DACs are located

Other methods were used to supplement the survey questionnaire process. These were two community workshops, outreach methods, and a crowdsourcing method from a previously funded project. The crowdsourcing project trained area youth to use smart phone technology to report occurrences of wastewater failure. The crowdsourcing project was successful in reporting concerns but was limited to those community members who attended training sessions or otherwise knew about the free and accessible phone technology available for the project. The crowdsourcing project found an age-based restriction in that most residents who were over college-age reported that they would prefer to report occurrences of wastewater failure verbally rather than using a phone application. Because of this major restriction of crowdsourcing, the DAC characterization relied heavily on the data from the survey questionnaire.

2.2 Sampling Methods

The goal of the survey questionnaire was to assess water, wastewater, and flood conditions and issues from the perspective of the severely economically disadvantaged population in the Coachella Valley. To obtain this data a probability-proportionate-to-size (Trochim 2006) sampling methodology was used. This sampling methodology allowed the investigator to make reliable estimates of community characteristics without surveying each household in the target area. For this method to be effective, it is important to give each household an equal and positive chance of potentially being in the survey. A random household selection criterion was used based on DWR's definition of severely disadvantaged communities(DWR 2006). DWR defines a "severely disadvantaged community" as a community with "a median household income of less than 60 percent of the statewide average". For the time of this survey, the severely disadvantaged communities were any community reporting less than an annual income of $37,000. The Loma Linda University group obtained median household income data and parcel data from the Riverside County publically available map resources. A sample size number was input into a geographic-based mapping program (Hawths Toolbar of ESRI ARCGIS).

The sample size calculation was made using the EPINFO 6 STATCALC program from the US Centers for Disease Control (USCDC, Atlanta). The sample size calculation assumes a normal distribution, 80% power and a 95% confidence interval. This provided a survey questionnaire number of 132 based on the assumption that 10% of all households have a failing wastewater system. A count of 100 was added to this number to consider the non-response and refusals, resulting in a total preliminary target sample size of 232. The number of 232 was fed into the HAWTHS tools for random selection of households based on the Riverside County publically available housing information. An additional 109 households were selected by local non-profits and added to the overall survey number, which was 341 in total, to characterize the communities that local non-profit personnel believed are especially in need. These communities are shown on the DAC location maps in Appendix 4.

The sample site locations were selected using parcel and census block information. These parcels sometimes represent a single house and sometimes may include over 100 mobile homes. Multi-stage sampling was conducted in situations where a parcel represented more than one single residence. The first sample selection stage is the household random selection using the software above. The second stage is done manually via satellite images or pre-survey visits to count the number of living quarters or outbuildings located on one parcel. The third stage is to use a systematic random method within the parcel outbuildings based on the total amount of households estimated for the single random point. The LLU team controlled for multiple surveys at single mobile home park addresses by identifying clusters in SPSS v.20 (IBM, USA).

Sample size: The original sample size of 132 was the minimum required number for a simple cross-sectional analysis. The actual sample size of 341 allowed for stratification of variables and provided an improved statistical accuracy. Refusals or absences were documented as blank survey forms. All surveyors were instructed to go to specific home addresses and were given print-outs of satellite images with labels on the houses to survey. If the respondent was not home, the surveyor was to revisit the house three times and move on to the next assigned survey house after three visits. The surveyor was never allowed to "substitute" a home with a nearby resident who may have been available for a survey.

2.3 Mapping Methods

Integrated Planning and Management, Inc. (Redlands, CA) generated the initial focus area maps of the Coachella Valley as part of the overall Coachella Valley IRWM Program effort related to DAC mapping and characterization. These focus area maps defined the DACs in the Coachella Valley and provided a brief community description using the ESRI Community Analyst Tapestry Segmentation (Redlands, CA).

These tapestries and the income information were used as part of the multi-stage sampling process described in the sampling methods above.

Maps were generated for this project using the ARCGIS program with ESRI-supplied base maps and municipal border information from Riverside County. All survey questionnaires were geographically-referenced and linked to the map for a spatial view of the survey questionnaire. Surveyors were equipped with tablet computers to validate the pre-selected spatial data of the participant households. This allowed the survey questionnaire data and results to be plotted spatially. The maps in Appendix 3 show the selected questions from the opinion survey by individual and/or clusters of household locations.

2.3.1 Additional DAC Clusters

The field surveyors identified additional disadvantaged community clusters during the survey process; those additional disadvantaged community clusters are included in the maps located in Appendix 4. The Appendix 3 Map 1 shows the mobile home park (MHP) areas as red circles. The green circles are mobile home parks that were validated during a previous project's work in 2012 (Ibrahim, Diana et al. 2013).

2.4 Survey Results

As stated previously, the "results" of the survey include responses obtained by those residents who received administered surveys. None of the information presented below indicates actual demographic, water, wastewater, flood, or other conditions. The data obtained through the survey questionnaire process is self-reported. The survey respondents reported their opinions; none of the failure reports have been physically confirmed by the study team.

2.4.1 Demographics: Survey Administration

There were 341 survey questionnaires and observational checklists administered to 273 households in 25 mobile home park clusters and 68 "stick built" households of the Coachella Valley. Of these, refusals or absences were documented as blank survey forms in 21 households. Only one mobile home household respondent of Oasis Mobile Home Park was a documented refusal. The remaining absences or refusals occurred in single family home neighborhoods in Indio and Salton City or were documented as refusals due to surveyor access problems in the mobile home parks of Desert Edge (Table 2a and Table 2b). Overall, the mobile home park household survey visit benefited from a high response rate (93%) where surveyors were able to access 320 out of the 341 randomly selected households. LLU kept the 11 survey variables where observations were taken but no response was recorded for the survey questionnaire. There were also several occasions where respondents refused to provide an answer. For this reason, it is important to keep in mind the total number of surveys or the "N" varies for each question and is reported separately in each table of this report that contains statistics pertaining to the survey.

Table 2a. Opinion Survey: Number of Surveys Conducted and Total Sample Size

Parameter	Number
Total Number of households Selected	341
No response or refusal	-21
Missing answers in each question	variable
"N" Total Sample Size (Maximum)	320

Table 2b. Opinion Survey: Selected Sites That Could Not Be Accessed by Surveyors in the Summer 2013 Coachella Valley IRWM DAC Characterization Survey

Site	Number of Surveys	City	Reason
Desert Crest Country Club	3	Desert Edge	Security guards did not allow surveyors to continue
Desert Springs Spa and RV park	2	Desert Edge	Locked gate
Miracle Acres	1	Desert Edge	Locked gate
Almar Acres	1	Desert Edge	Locked gate and manager did not allow after survey supervisor requested access
Sparkling waters	1	Desert Edge	Security guards did not allow surveyors to continue
Joshua Springs	1	Desert Edge	Locked gate and manager did not allow after survey supervisor requested access
Single Family Homes	6	Thermal (Salton City)	Refusal by respondent
Single Family Homes	6	Indio	Refusal by respondent
Total	**21 households refused or absent**		

2.4.2 Demographics: Household information

Most respondents were considered severely disadvantaged based on their self-reported annual income (DWR 2006) and reported an annual income of less than $37,000 (see Table 3). Many of these disadvantaged households reported to own or have mortgaged their current home (n=142, 44%). In addition, there were 57 respondents (18%) who reported that they own their home but pay for mobile home space rental fees. The average amount of rent paid by those who rent their home was reported as $534 per month.

Table 4 shows that the amount respondents reported to pay for mortgage or rent was significantly different across three housing types (mobile homes, single family homes, or apartments), but was not significantly different geographically (East Valley vs. West Valley). The amount paid for mortgage or rent was significantly higher in single family homes ($836 per month) than in mobile homes ($484 per month) across the entire Coachella Valley. Figure 1 shows a bar chart of the comparative income data between different housing types as well as between different geographic areas of the Coachella Valley.

Table 3. Opinion Survey: Household Information about Home Ownership and Identification of DAC Status

Item	n	%	N
Identified as severely disadvantaged with less than $37,000 per year as income	267	97. 8%	273
Reported to own or mortgage their current home	142	44%	320
Reported to own their home, but pay a space rental fee	57	17.8%	320

Table 4. Opinion Survey: Survey Household Information

(Presented with the mean (μ), standard deviation (sd), minimum (min), maximum (max) and total surveys collected (N))

Item	μ	sd	Min	Max	N
Amount paid per month for mortgage or rent	$534	$225	$0	$1,351	254
Amount paid per month in Eastern MHPs	$528**	$248	$0	$1,351	116
Amount paid per month in Western MHPs	$539**	$203	$0	$1,350	138
Amount paid per month for all Mobile Homes	$484*	$142	$3	$900	217
Amount paid per month for all Single Family Homes	$836*	$348	$0	$1,350	29
Amount paid per month for all Apartments	$799*	$435	$0	$1,351	8

Group of 2 (western vs. eastern) **is not significantly different (independent t-test F=2.378, p=0.124)
*Group of 3 house types **is significantly** different (ANOVA F=51.532, p=0.00)

Figure 1. Opinion Survey: Histogram Chart with Error Bars of Amount Paid per Month in Mortgage or Rent

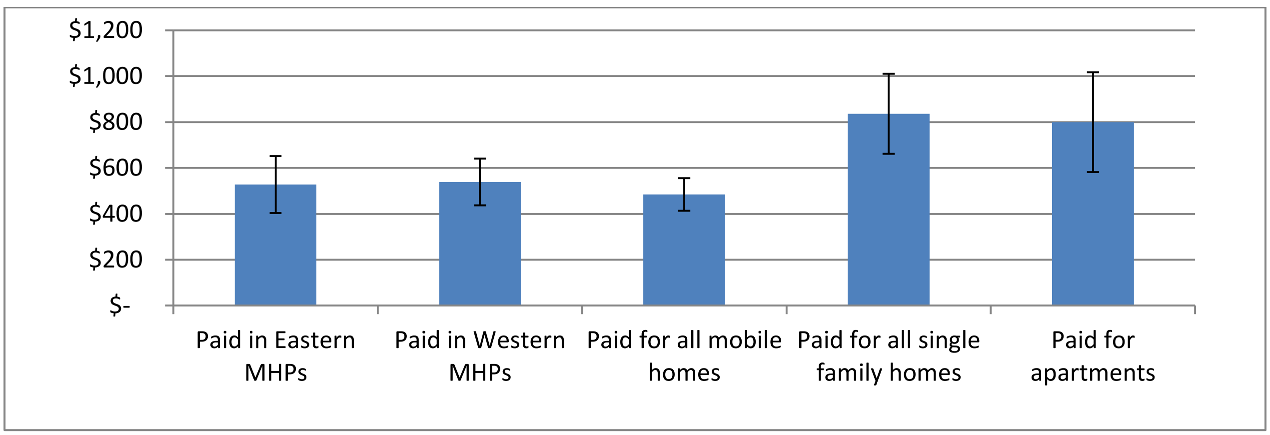


Table 5 shows that respondents reported that there are about 4.2 people per household in the Coachella Valley homes that were surveyed. The number drops down to 3.7 people per household for single family homes and 4.3 people per household for mobile homes. The number of people per household was significantly different across the eastern and western portions of the Coachella Valley, increasing from 4.1 in the West Valley to 4.5 in the East Valley (see Figure 2).

Table 5. Opinion Survey: Survey Household Information

(Presented with the mean (μ), standard deviation (sd), minimum (min), maximum (max) and total surveys collected (N))

Item	μ	sd	Min	Max	N
Number of people in the household	4.21	1.56	1	10	278
Number of people in household for Mobile Homes	4.30	1.59	1	10	229
Number of people in household for Single Family homes	3.68	1.42	1	6	41
Number of people per household in the eastern area	*4.52	1.04	1.55	2	10
Number of people per household in the western area	*4.11	1.25	1.61	1	10

*T-tests show a significant difference between the number of people per household in the east and west valley.

Figure 2. Opinion Survey: Histogram Chart with Error Bars of Number of Residents per Household

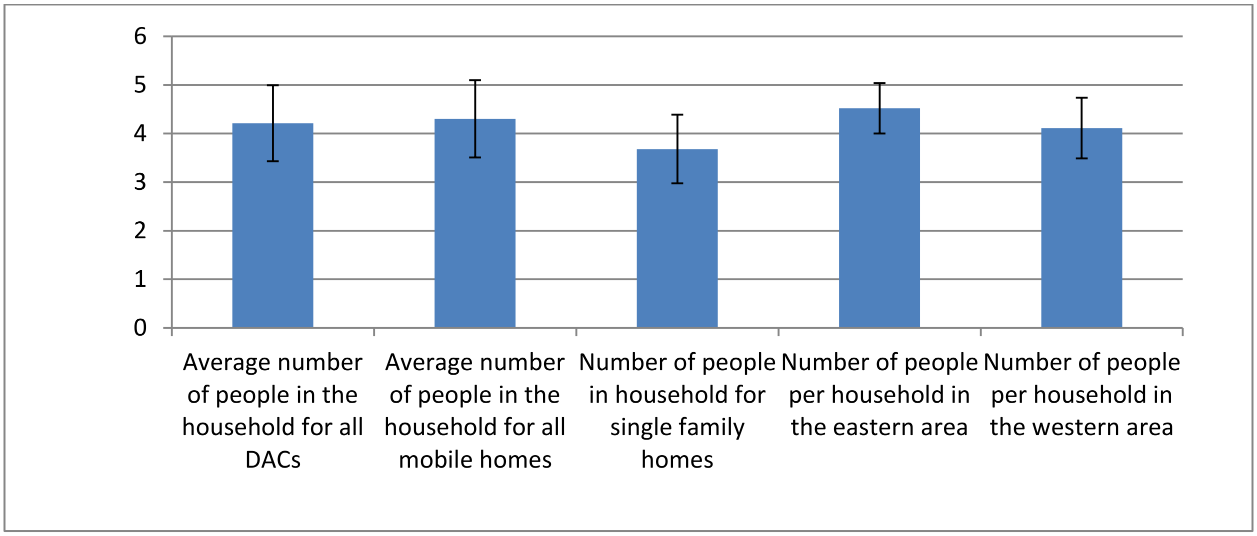


Table 6 shows the reported education, language and literacy of the household's primary wage earner. Most families in this survey report speaking, reading, or writing Spanish (76.9%), which is greater than those who report speaking, reading, or writing English (33.8%). 85% of all survey respondents reported basic reading and writing literacy in either Spanish or English.

Table 6. Opinion Survey: Education, Language, and Literacy of the Household's Primary Wage Earner

(Presented with the mean (μ), standard deviation (sd), minimum (min), maximum (max) and total surveys collected (N))

Item	*μ*	*sd*	*Min*	*Max*	*N*
Highest grade in school completed	8.24	3.70	0	16	278
Item			**n**	**%**	**N**
Reads, writes and speaks English			108	33.8%	320
Reads, writes and speaks Spanish			246	76.9%	320
Reads, writes and speaks another language			12	3.8%	253
Reads and writes in Spanish or English			271	84.7%	320

2.4.3 Water

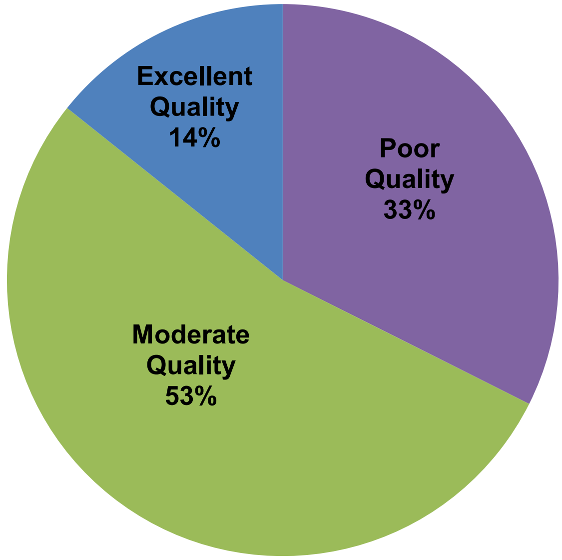
58 respondents indicated that they believe there is some kind of contamination in their drinking water. This group was made up of 45 mobile homes, 12 single family homes, and 1 apartment home (refer to Table 7). The self-reported information collected in the survey questionnaire was not validated by our study team; the information presented below pertaining to water and water quality only shows opinions of respondents and does not represent actual water or water quality conditions.

Table 7. Opinion Survey: Reported Drinking Water Variables Shown with Row Percentages
(*Calculated by Number of "yes"(n) / Total number assessed (N))*

Item		n	%	N
Respondents' perceived quality of tap water	Poor quality	93	32.4%	287
	Moderate quality	153	53.3%	
	Excellent quality	41	14.3%	
Respondents perceived poor quality of tap water in eastern valley		63	47.0%	134
Respondents perceived poor quality of tap water in western valley		30	19.6%	153
Respondents belief of who should maintain their tap water	Landlord/park owner/manager	136	48.2%	282
	The water district	99	30.9%	282
Reported use of water	For keeping the dust down on the road	245	76.6%	320
	For the lawn	153	47.8%	320
	For children or swimming	123	38.4%	320
	For domestic animals	185	57.8%	320
Reports that they sometimes run out of drinking water (purchased or tap)		115	46.7%	246
For those that report running out of drinking water, they would drink tap water when they run out.	Yes	59	37.3%	158
	No	99	30.9%	
Reported source of drinking water in the home	The tap in the home	46	16%	287
	Disposable plastic bottles	112	39%	
	Delivered large containers	32	11.1%	
	Self-filled large containers	97	30.3%	
Reports that they purchase drinking water		247	77.2%	320
Reports that they drink tap water without boiling or filtering		77	28.5%	270
Reports that they drink tap water without boiling or filtering in the eastern valley		25	19.8%	126
Reports that they drink tap water without boiling or filtering in the western valley		52	36.1%	144
Reports that they drink any kind of tap water (direct, POU, or from well)**		113	35.3%	320
Reports that there is some kind of contaminant in water***	Overall	58	18%	320
	In mobile home parks	45	17.2%	262
	In single family homes	12	4.58%	262

* Point-of-Use water filters were reported in 34 of the 320 households.
** Combined result from those reporting that they drink from their tap, use a POU, or drink tap without treatment.
*** This variable was defined by text comments that indicated one of the following terms: "arsenic", "dirty" water, water with a color, "cloudy" water, sick, trust, parasites, unhealthy or "filth". Comments with "Clorox", "chlorine", "bad taste" or "bad smell" were excluded.

Figure 3. Opinion Survey: Perceived Water Quality Reported as Percentages



Those who reported perceived contamination in their water were mostly located in the south part of Coachella Valley. The area located in and around the Salton Sea reported the highest amount of perceived water contamination (see Map 5 in Appendix 3). Those respondents who ranked their drinking water quality as poor are also largely located in the southeastern Coachella Valley in mobile home parks and in single family homes near the Salton Sea. The highest reported user-satisfaction for water quality was in the Desert Hot Springs and Palm Springs area (see Map 5 in Appendix 3).

About one third of all respondents (35.5%, n=113) in this survey report drinking water from the tap. This survey used three questions to assess the practice of drinking tap water. The three questions were worded differently, as a survey questionnaire validation method (Guralnik 2007). A new variable for "drinks tap water" was generated if respondents answered "yes" to any of the three questions intended to illicit a response regarding drinking water consumption (see questions 14, 17, and 22 in Appendix 1).

Figure 4. Opinion survey: Percentages of Respondents Who Report Drinking Their Tap Water

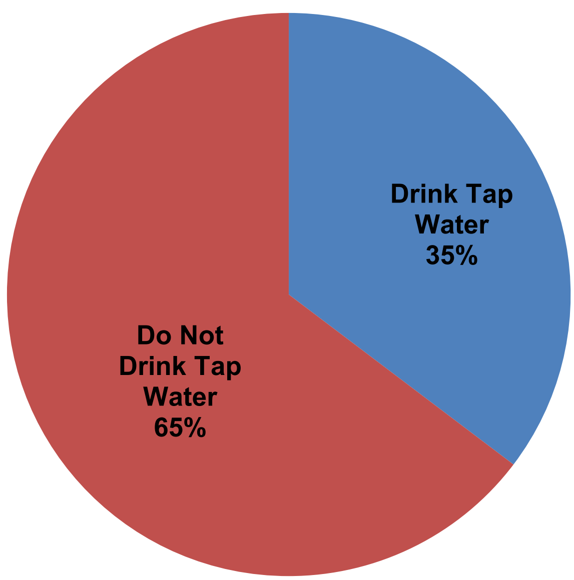


Table 8. Opinion Survey: The Average Reported Price Paid for Water

Item	*μ*	*sd*	*Min*	*Max*	*N*
Amount paid per month for tap water	$31.08	$26.76	$0	$160	267
Amount paid per month for water in mobile homes	$27.4	$22.9	$0	$130	213
Amount paid per month for water in single family homes	$46.5	$37.2	$0	$160	44

2.4.4 Wastewater

The survey questionnaire revealed Onsite Wastewater System (OWS) failures as a serious potential public health problem in many of the DACs of the Coachella Valley, because many survey respondents reported wastewater problems. The two areas of the Region (East vs. West valley) reported differences with regards to wastewater, because more of the eastern DAC clusters reported "ever" having a wastewater failure event while the western DAC clusters reported that their OWS failed more often (Tables 9, 10a and 10b). None of the respondents mentioned knowing of a community group that helps with wastewater problems.

Residents who reported that they have an OWS are shown in Map 6 of Appendix 3. The pink dots are those who reported that they have access to a centralized sewer system, while the green dots are those who reported that they have an OWS. The data obtained through the survey questionnaire process is self-reported and represents opinions relating to residents' onsite wastewater systems.

Several variables from the survey questionnaire were combined to form a new assessment that considered if the areas surveyed have access to a centralized sewer system. The primary variable used for this assessment was from question 24 (Appendix 1) where the respondent listed that they have a type of OWS (originally coded as 1-7) or a centralized sewer (originally coded as 8). Question 71 was used to indicate what kind of wastewater system the residents' neighbors have.

Table 9. Opinion Survey: Wastewater Related Variables shown with Row Percentages

(*Calculated by Number of "yes"(n) / Total number assessed (N)*)

Item		n	%	N
Have wastewater problems where the respondent reports:	toilet doesn't flush and sink drain doesn't drain	118	36.9%	320
	grass is growing where septic tank is located	6	1.9%	
	smells sewage in the morning and at night when people are taking showers	54	16.9%	
	The ground is often muddy, spongy or wet around the septic tank / distribution field	17	5.3%	
	There are puddles in my yard when it has not rained for weeks	17	5.3%	
Have had some kind of reported wastewater problem:	Total	142	44.4%	320
	Western valley	61	38.4%	159
	Eastern valley	81	50.3%	161
How often did the problem happen (per respondents' opinion) in the eastern valley?	Once per year	27	37%	73
	Once every 6 months	14	19%	
	At least every 2 months	2	3%	
	At least once per month	6	8%	
	Often/sometimes daily	2	3%	
	During the Rainy season	2	3%	
	Never	20	27%	
How often did the problem happen (per respondents' opinion) in the western valley?	Once per year	21	24%	86
	Once every 6 months	24	28%	
	At least every 2 months	9	10%	
	At least once per month	8	9%	
	Often/sometimes daily	15	17%	
	During the Rainy season	3	3%	
	Never	6	7%	

Figure 5. Opinion Survey: Percentages of Respondents Who Reported Some Type of Wastewater Problem in the Past Year

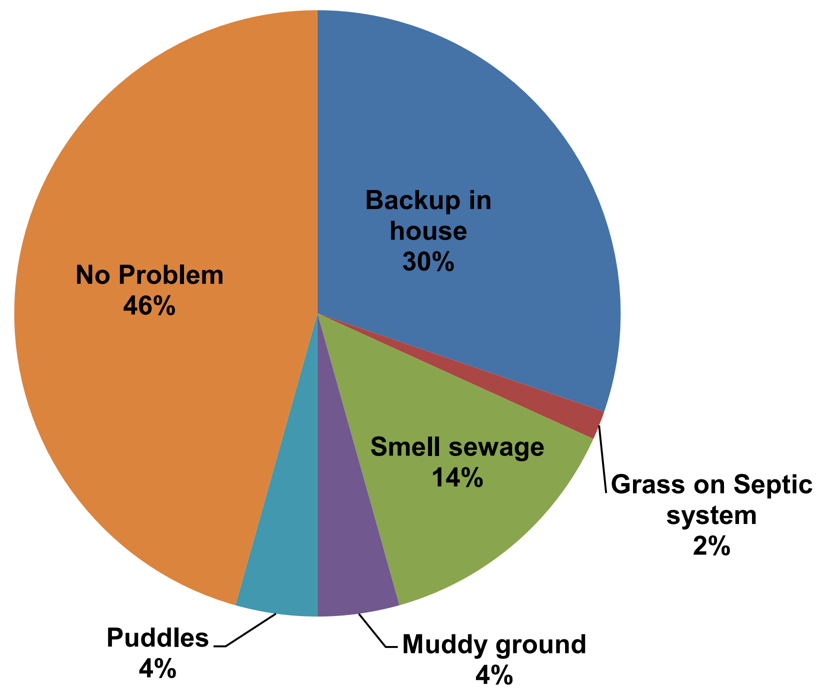


Table 10 shows that reported wastewater problems happen most often in the western Coachella Valley mobile home parks. To help explain this trend, the survey team members conducted informal non-survey reports from a few respondents of mobile home parks in the Desert Hot Springs and Desert Edge community. One respondent of the Mountain View Park said her park manager frequently dumps their park's excess wastewater in the desert outside of their park. Concerning frequent failures of OWS, a resident of the Casa Del Sol Park said "there are only 5 or 6 septic tanks for the entire park of 50 mobile homes".

The following bullet points summarize the survey questionnaire's findings about wastewater management:

- 38.4% of western valley households and 50.3% of eastern valley households reported their wastewater systems as occasionally failing (Table 9)
- The national OWS failure rate is 10-20%. California's reported failure rate is 1-4%. These failure rates are defined as wastewater surfacing, premise plumbing backup, or other problems (USEPA 2002)
- Table 9 shows the most common type of failure in the Coachella Valley is the user noticing that the toilet does not flush and the sink does not drain (n=118, 36.9%, N=320)
- Of those reporting failed wastewater systems, most stated that the problem will happen once per year (24% and 37% for the eastern and western portions of the Valley, respectively)
- In the western valley, there are many mobile home parks reporting a serious OWS problem. Many report that wastewater systems fail "often, sometimes daily"
- The Desert Hot Springs mobile home parks with respondent-reported frequent OWS failure are highlighted in bold on Table 10a

Table 10a. Opinion Survey: The Number of Respondents Per Park Stating That A Wastewater Problem Happens From "At Least Every Two Months" To "Very Often And Sometimes Daily"

This category was built to represent those DACs with severe wastewater problems. Mobile Home Park names in bold are those believed by surveyors and promotores to experience the most frequent wastewater failures in comparison to other parks

Mobile Home Park Name*	City	Total Number of Surveys in Park	Surveys Reporting Severe Problem
Casa Del Sol Mobile Home Park	**Desert Hot Springs**	**17**	**5 (29%)**
Corkhill Park	**Desert Hot Springs**	**20**	**5 (25%)**
Golden Sands Park	**Palm Springs**	**19**	**6 (32%)**
Mountain View Park	**Desert Hot Springs**	**15**	**5 (33%)**
Oasis Trailer Park	Thermal	42	2 (5%)
Palm Drive Mobile Estates	Desert Hot Springs	31	6 (19%)
A Polanco park on 88510 69th Ave	Thermal	5	1 (20%)
A Polanco park on 76250 Pierce St.	Thermal	2	1
Saint Anthony's mobile home park	Mecca	10	3 (30%)
Single family home 12900 Cuando Way	Desert Hot Springs	1	1
Single family home 13212 el Rio Ln.	Desert Hot Springs	1	1
Single family home 1330 Beacon Dr.	Thermal	1	1
Sky Ridge Mobile Home Park	Cathedral City	6	2 (33%)
Whispering Sands Mobile Home Park	Desert Hot Springs	15	1 (7%)

*The mobile home parks that are indicated in bold are those that meet two criteria: they were identified by promotores to have an identified water-related need and they had a large number of self-reported failing OWS.

Table 10b. Opinion Survey: Characterizing the Onsite Wastewater Systems in the Eastern Vs. Western Coachella Valley

OWS Event	Eastern	Western
Any type of reported OWS failure	81 out of 161 surveys (50.3%)	61 out of 159 surveys (38.4%)
OWS Reported to Fail often and sometimes daily	2 out of 73 surveys (3%)	15 out of 86 surveys (17%)
OWS Reported to Fail at least every two months	2 out of 73 surveys (3%)	9 out of 86 surveys (10%)

2.4.5 Flooding

The survey questionnaire assessed flood risk and flood preparedness through three inquiries: knowledge of floods in the area, experiences during floods, and family preparedness. 15.5% of all respondents indicated that they experienced a flood in the last year and an additional 6.5 % indicated that they experienced a flood in the last 5 years (Table 11). Table 12 lists the text that respondents used to describe their flood experience. The floods were reported to have happened in the locations of the Oasis Mobile Home Park on Avenue 70 of Thermal and in the Saint Anthony Mobile Home Park of Mecca (Table 13), the same areas affected by a known documented flood on September 11, 2012 (Associated Press 2012). Additional locations where respondent-reported flooding occurred are some addresses in

Coachella, Palm Drive Mobile Estates in Desert Hot Springs, and Bermuda Palms Apartments in Indio (Table 13 and Map 9 of Appendix 3).

Most families (86.9%, n=238) agreed to a statement of “preparation, planning and emergency supplies will help me handle the situation” (with regards to flooding). 10% of participants agreed with the statement that read “nothing I do to prepare will help me handle the situation”. This assessment question was taken from a Federal Emergency Management Agency (FEMA) Community Preparedness and Participation Survey (FEMA 2009). The FEMA study found that 81% of respondents agreed with the statement about natural disasters stating, “preparation, planning and emergency supplies will help me handle the situation”. Similarly, 7% of participants in the FEMA survey said that “nothing I do to prepare will help me handle the situation”.

Table 11. Opinion Survey: Reported Flood-Related Variables

<table>
<tr><th colspan="2">Item</th><th>n</th><th>%</th><th>N</th></tr>
<tr><td rowspan="3">Statement about how families can handle a flood situation</td><td>I can handle the situation without any preparation</td><td>4</td><td>1.5%</td><td rowspan="3">274</td></tr>
<tr><td>Preparation, planning and emergency supplies will help me handle the situation</td><td>238</td><td>86.9%</td></tr>
<tr><td>Nothing I do to prepare will help me handle the situation</td><td>32</td><td>11.7%</td></tr>
<tr><td rowspan="3">House is described as on a flood plain or at flood risk</td><td>Yes</td><td>51</td><td>18.3%</td><td rowspan="3">279</td></tr>
<tr><td>No</td><td>152</td><td>54.5%</td></tr>
<tr><td>I don’t know</td><td>76</td><td>27.2%</td></tr>
<tr><td colspan="2">Reports a nearby flood in the past year</td><td>31</td><td>15.5%</td><td>279</td></tr>
<tr><td colspan="2">Reports a nearby flood in the past 5 years</td><td>10</td><td>6.5%</td><td>153</td></tr>
<tr><td colspan="2">Reports to have known about floods in this area before moving here</td><td>17</td><td>6.9%</td><td>247</td></tr>
</table>

Table 12. Opinion Survey: Text of How Respondents Handled Flood Situations

- I had to “battle out”
- “I couldn’t take my kids to school”
- “We had water up to my knees”
- “Much mud”
- “Much mud on the streets”
- “We could not go out with the car”
- “We were unable to leave home”
- My children “lost days in school”
- It affected me “psychologically”
- “We couldn’t leave”
- “It only affected us in passing but the puddles were bad”
- “The roads were affected”
- “The sewage backed up”
- “Trauma”
- “Insects”

Table 13. Opinion Survey: The Names of Mobile Home Parks Where Respondents Indicated That Floods Occurred In the Last Year or Five Years

Mobile Home Park name	City	Total Number of answers about flood	Surveys reporting flood problem
Bermuda Palms Apartment Homes	Indio	6	3
Casa Del Sol Mobile Home Park	Desert Hot Springs	14	2
Corkhill Park	Desert Hot Springs	15	1
Gamez Trailer Park	Thermal	2	2
Los Gatos Mobile Home Park	Mecca	1	1
Oasis Mobile Home park	Thermal	21	7
Palm Drive Mobile Estates	Desert Hot Springs	22	6
Polanco parks in Thermal	Thermal	13	2
Saint Anthony's mobile home park	Mecca	7	6
Single Family Homes*	DHS and Coachella	31	3
Whispering Sands Mobile Home Park	Desert Hot Springs	9	1
Mountain View Park	Desert Hot Springs	10	1

*Addresses of SFH: 13735 Verbena Street, Desert Hot Springs; 83988 Fiesta Ave, Coachella; 83994 Fiesta, Coachella.

2.4.6 Community Group Assistance

A series of questions was asked to survey respondents that were designed to assess the level of contact that the DACs have with various community organizations. There was an overall minimal rate of contact reported by survey respondents. There were 28 respondents (out of 272) that said they knew of community groups that help with health, water, or other problems. The mentioned names of those community groups were only a few and were combined from questions 54 and 55 (refer to Appendix 1). The names mentioned by respondents (with the number of times mentioned in parentheses) include:

- "El Sol" (6)
- "Pueblo Unido" (5)
- "Clinicas De Salud De Pueblo"(2)
- "Medicos Voladores" (1)
- "Program del agua" (1)[1]
- "SSI aid" (1)
- "The Desert Cancer society" (1)
- "La Iglesia"(1) [1]

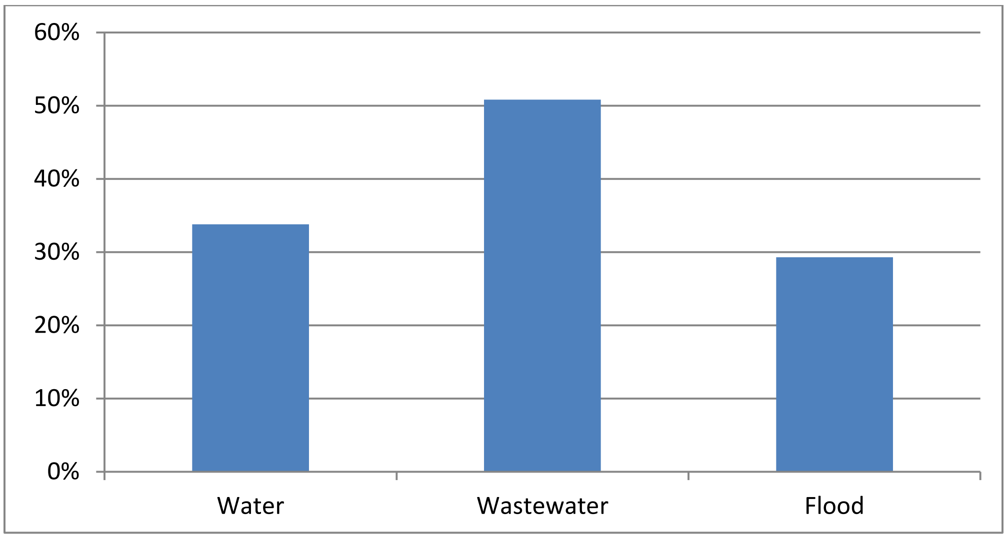
Another question assessed the method of contact with community organizations. The few responses were "visits" (3); "letters"(3); and "telephone"(3). There was no mention of internet, brochures, or flyers as a method of communication with the few respondents that answered this question.

[1] The English translation for "La Iglesia" is "The Church". The English translation for "Program del agua" is "water program". The other Spanish language terms are names of organizations with "Medicos Voladores" meaning the "Flying Doctors", which is an established organization.

3 Recommendations and Discussion

Survey respondents were asked a general question about IRWM projects and funds. The question was, "what type of water, wastewater, or flood control project can be built with funding from the California Department of Water Resources?" Residents who participated in this survey requested help with combinations of all three types of projects; wastewater related projects were recommended more than water or flood related projects (see Figure 6). The sections below provide details about recommendations for water, wastewater and flood projects based on community data gathered through the survey. The recommendations were developed during the survey, mapping and community outreach process.

Figure 6. Opinion Survey: Type of Project Requested by Respondents at Least One Time During the Survey Questionnaire.



3.1 Water

Drinking Water Education: About one third of all respondents (35.5%, n=113) in this survey reported that they drink water from the tap (Table 7) with or without treatment. Due to the location of many of the surveyed residences within local water agency jurisdictions, it is possible that many of the surveyed residences receive municipal water supplies that may be safe to drink if the residents' onsite plumbing system is properly maintained. Applicable water agencies and water districts ensure that the quality of drinking water meets all regulated drinking water standards up to their water meters. Any onsite water infrastructure within mobile home parks or private residences is the responsibility of the land owner and is not regulated by water agencies or water districts.

Despite the presence of municipal water supplies, many residents included in the survey reported that they do not drink tap water, and 77% reported a preference to purchasing drinking water rather than drinking water from the tap (Table 7). The practice of purchasing water represents a potentially unnecessary economic expenditure for already economically disadvantaged communities as well as an overall loss in potential revenue and public value for the Coachella Valley's water districts. To change this practice, drinking water education projects are recommended for the Region's DACs. The education curriculum could promote drinking water as a positive health choice and provide education on the water treatment resources that are provided for water from the Region's water agencies and districts. This type of education program should be synchronized with a water testing service to show residents that the water is safe to drink. An educational program should also consider that onsite plumbing systems (beyond water agency or water district-regulated water meters) may not be properly maintained and may have cross-connection issues or other problems that are beyond the jurisdiction of the water district.

An education curriculum could reference the water education programs offered by the nearby Eastern Municipal Water District out of their Hemet/San Jacinto Water Reclamation Facility. There are also drinking water educational curricula available from the federal government due to the first lady Michelle Obama's drinking water promotion campaign (Office of the First Lady 2013). The Coachella Valley area non-profits such as El Sol and the Pueblo Unido are well-equipped to coordinate educational programs in the Region's DACs. The El Sol group suggested that they are capable of providing these services during the DAC western workshop and the Pueblo Unido group suggested that they can expand their current education programs during the eastern workshop. Pueblo Unido currently meets with Mobile Home Park owners to educate them with a curriculum on water conservation, wastewater management, and water quality improvements for mobile home residents.

These types of educational programs could be promoted for the entire Coachella Valley, but findings from the survey and the differences between the eastern and western Coachella Valley knowledge about drinking water should be considered when designing educational programs. One of the most important findings from the survey is that more respondents in the eastern Coachella Valley rate their water quality as poor (47.0% in the East Valley vs. 19.6% in the West Valley). The western Coachella Valley respondents who rated the water quality as poor are also generally located in the mobile home parks that surveyors and local non-profits described as communities in-need. Communities in-need were identified by the non-profit surveyor promotores through their community networks (refer to Appendix 4). As discussed in Section 2, the surveyors were given an opportunity to add communities and areas to the survey area that they believed were a priority due to a known need in one of the three areas of wastewater, water or flood. The mobile home parks in Table 10a that are indicated in **bold** are those that meet two criteria: they were identified by promotores to have an identified water-related need and they had a large number of self-reported failing OWS.

Drinking Water Treatment: Some residents of the Coachella Valley do not have access to drinking water from a municipal system, and therefore rely upon private onsite wells for water. During the process of this assessment there were some enforcement actions from the US Environmental Protection Agency (USEPA) to a Coachella Valley mobile home park owner (James 2013; USEPA 2013). The citation was issued, because the owner provided water from onsite groundwater wells that did not meet water quality criteria for arsenic to an estimated 300 mobile home park residents in the eastern Coachella Valley. There were four households interviewed during this June 2013 assessment who live in that community. All four residents surveyed in that park had knowledge that their tap water did not meet drinking water quality standards. These four respondents also stated that they do not have a water filter or other treatment system in their house, but that they drink the water from their tap even though they understand that their water did not meet drinking water standards. This mobile home park and similar mobile home parks in the area need priority for drinking water treatment and education.

Some local non-profits are already addressing drinking water treatment needs; Pueblo Unido has a new program where they are working with a consortium of the smaller mobile home parks around Pierce and Avenue 70 cross streets in Thermal, California. Pueblo Unido's goal with their new program is to improve the water, wastewater and electrical infrastructure in these parks and address the local park owners' needs. The program has already implemented many household point-of-use (POU) water filters and some local wastewater management solutions. These solutions have already benefited many residents in over 30 small mobile home parks. The mobile home parks currently being served by Pueblo Unido are typically the smaller privately owned "Polanco parks" with less than 12 units (KTGY Group 2010). Many of the Polanco parks in the eastern Coachella Valley have already received a small household POU water treatment system through support from Pueblo Unido, the Desert Alliance for Community Empowerment (DACE), and the Rotary Club.

Other residents living in the larger mobile home park clusters have not received POUs and need assistance with their drinking water treatment. Those households in the mobile home parks such as the Avenue 70 cluster or the D&D mobile home park need improved drinking water quality (see Map A in Appendix 4). There is data from the USEPA (laboratory results) that validates knowledge of water contamination in the D&D Mobile Home Park. The Avenue 70 cluster's need for improved water quality has not been validated by water quality testing, but is from self-reported opinions of the water quality (Table 7) and from an interview with a local non-profit (Caranza and Pinon 2013).

A feasible solution for these parks is to replicate an already successful program in the area. Pueblo Unido now has a fully operational pilot of a cost-effective Point-of-Entry system for a small park that is large enough to require compliance with regulations that preclude the use of POU systems. This pilot project is located at the San Jose Community Learning Center near the cross streets of Pierce Street and Avenue 69. The San Jose Community Learning Center is now operational and its water system is set-up for tours of the drinking water and wastewater treatment processes. The learning center is conveniently located near the Avenue 70 larger mobile home parks (also commonly referred to as "La Chicanitas" or "Oasis Park") located on the Torres-Martinez tribal lands.

3.2 Wastewater and Flood Control

The most common type of wastewater failure reported by respondents in the survey is that "the toilet doesn't flush and the sink doesn't drain"; this type of issue is generally indicative of a hydraulic failure and usually indicates the need for system pumping. An OWS is in serious need of maintenance or repair when the wastewater is noticed by the resident in the house; this issue is considered serious due to its potential health risk. Residents reported noticing wastewater over a wide area in the eastern Coachella Valley, but this situation was described as a more common problem in the western Coachella Valley communities listed in Table 10a. Wastewater is described as part of the flooding problem in this section of the report, because when rains come, the OWS will often overfill and backup into the house. The following recommendations are presented for the western and eastern portions of the DACs in the Coachella Valley based on the wastewater and flood information collected during the survey effort.

Community consortium for a sewer line: It was suggested by an attorney with a local non-profit organization (California Rural Legal Assistance) that a consortium of small and large mobile home parks should be formed around the Sunbird Mobile Home Park cluster (Map C: Appendix 4).The cluster of DAC mobile home parks near the Sunbird cluster should form a community consortium and apply for funding to be connected to the municipal sewer system. That area would include approximately 134 mobile homes. The Sunbird park concept was addressed during the last Coachella Valley IRWM grant funding round (Round 2 of Proposition 84 Implementation Grant funding), but this concept had not yet formally come to fruition and the area small parks were not yet in place. The reason for creating a cluster of mobile home parks that could all connect to a single sewer line is to make the area more competitive for connection to a centralized sewer from a cost perspective; the amount of connections to a single sewer line reduces the overall cost to connect on a per connection basis. This type of consortium could be modeled after the recently successful community consortium for a sewer in the Enchanted Heights park of Perris, CA (Sinclair et al. 2011).There are additional areas and neighborhoods in the Coachella valley that could benefit from a coalition to approach funding sources. The Corkill Park and Casa Del Sol Park of the Desert Edge community or the Mountain View Park of Desert Hot Springs are some communities that could potentially benefit from forming a consortium that would apply for funding to be connected to a sewer line (Map E of Appendix 4).

Water District Rural Community Education and Data Center: Pueblo Unido recommends that a community liaison office be created by a water agency, water district, or other local jurisdiction to coordinate outreach and advocacy for DAC water and wastewater management. The office would coordinate education and outreach directly with communities and with the community-based non-profit organizations such as El Sol and Pueblo Unido. The government-sponsored office could also help establish economically disadvantaged communities as a recognized and acknowledged population, which is important because DACs need recognition to be eligible to receive external funding for infrastructure or other forms of support. The Riverside County supervisor's community councils are the only current organizations that represent DACs in the East Valley. Local entities have expressed preference for government sponsorship and support from local water districts or agencies (compared to the County or local cities) and have suggested that local water districts or agencies could explore external funding options to establish a community liaison within the DAC areas.

Flood Control and Disaster Preparedness: Most families (86.9%, n=238) agreed to a statement of "preparation, planning and emergency supplies will help me handle the situation", and 10% of survey participants agreed with the statement that read "Nothing I do to prepare will help me handle the situation". The responses to the aforementioned questions in the Coachella Valley are slightly different from responses to similar questions across the United States. The assessment questions described above were taken from a Federal Emergency Management Agency (FEMA) Community Preparedness and Participation Survey (FEMA 2009). The FEMA study found that 81% agreed with the statement about natural disasters where "Preparation, planning and emergency supplies will help me handle the situation" (compared to 86.9% in the Coachella Valley). Similarly, 7% of participants in the FEMA survey said that "Nothing I do to prepare will help me handle the situation" (compared to 10% in the Coachella Valley). Ethnicity can help explain the differences in responses in the Coachella Valley survey when compared to the national FEMA survey. The FEMA survey analyzed the data by ethnicity and found that "Hispanic individuals (17%) were significantly more likely to believe that nothing they do would help them prepare for a natural disaster, as compared to non-Hispanic individuals (6%)." This is an important consideration for the disadvantaged populations of the eastern Coachella Valley which are reported to be considered 94% people of color, a 14% unemployment rate and be 65% below the poverty line (London, Greenfield, and Zagofsky 2013). Health disparities and social vulnerability is another important factor for post-disaster recovery. The ability to rebuild has been linked to ethnicity, social economic status, class, income and gender (Finch, Emrich, and Cutter 2010; Gamboa-Maldonado et al. 2012; Mutter 2005).

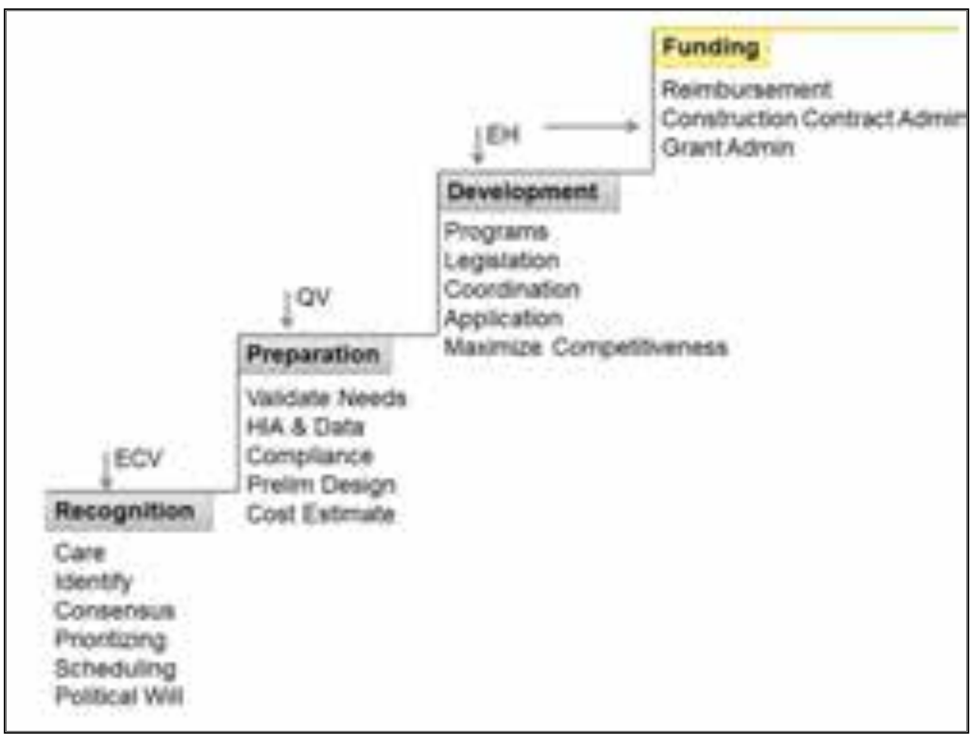
Advocacy for severely disadvantaged communities is urgent; many DAC residents rent their homes in mobile home parks and report issues associated with aging and/or expired infrastructure. The community liaison can potentially assist these neighborhoods to develop a water, wastewater, and flood master plan. Many mobile home parks in the eastern Coachella valley are established in agricultural zones that are not ideal for families with young children. The community liaison can help these areas become more livable for families who would normally fear any external help due to a fear of enforcement, "red-tagging", and displacement. In addressing this problem, one community member in the eastern DAC workshop said "my 15 year old water tanks are now totally corroded". Mr. Rodolfo Piñon of Pueblo Unido says most communities would welcome a community liaison from a water agency or water district, because now the only people that could potentially help the community with infrastructure issues are also those who could issue citations and enforcement actions (Carranza and Piñon 2013). *Linkages:* A grass-roots approach for a municipal system extension (water or wastewater) represents the start of a long process, but an answer to all three water-related infrastructure problems (water, wastewater, and flooding). It took six years after the community organized for the Enchanted Heights Community in Perris, CA to break ground on their central sewer line (City of Perris 2012). The nearby community of Quail Valley is still working on the process. Figure 8 below shows the steps required for a community to break ground on a sewer line project.

Municipal system extensions can provide a foundation for other types of infrastructure projects and the Enchanted Heights case study shows that a sewer line extension helped grow all aspects of the neighborhood. A central sewer line can also help the community's concern with flood control as rain events are correlated with septic system failures.

Figure 7. The enchanted heights case study.
"The city realized early on that public education and outreach was a critical factor in ensuring the success of the project. The city launched a multimedia campaign which included Public Service Announcements in both Spanish and English, formal community meetings at the local elementary school, one on one conversations with the residents of Enchanted Heights, a bilingual media campaign and a dedicated bilingual webpage on the City's website. The residents of Enchanted eagerly embraced the sewer project and directly engaged in the outreach efforts. The children of Enchanted Heights also begin to take notice of the outreach campaign. It was not unusual to see them also engage in the outreach process. The children began to pass out flyers in the neighborhood. Those same children also explained to their Spanish-speaking parents how the City of Perris and its partners planned to improve the quality of life in their community and encouraged them to support the project."(City of Perris, 2012)

The largest concern for the disadvantaged communities of the Coachella valley is sewage failure (Figure 6). Sewer line extensions not only provide infrastructure to communities, but are also symbolic of successful and cohesive community organizing. The grass roots approach used in the Enchanted Heights and Quail Valley areas are successful models, but need modification to the widespread wastewater problems in the Coachella Valley. Many areas in the Coachella Valley may be too far from any sewer line with too few residents to justify the investment. Other communities may be in close proximity, but have a different type of park ownership structure or community culture (e.g. the Tribal lands). These differences are expected and grass-roots organizing will require some unique solutions specific to the Coachella Valley.

Figure 8. Steps Required for a Community to Organize Towards a Central Sewer System *The Status Towards Development Is Shown On The Figure For The Eastern Coachella Valley (ECV), Quail Valley (QV), And Enchanted Heights (EH)*



Based on the recommendation above and as part of the DAC Outreach Program project, the CVRWMG developed four projects to address DAC issues associated with drinking water quality and OWS failure and potential connections to sewers. Those projects are described below:

Project 1: Educational Materials

This project includes the development of bilingual (English and Spanish) educational materials for economically disadvantaged communities located within areas that are experiencing substantial water quality or wastewater issues. The materials will include general information about water and wastewater systems within the Coachella Valley and will also provide information to residents about who to contact when experiencing a variety of water and wastewater system issues.

This project directly addresses issues identified through the surveys and the DAC Workshops, because both outreach processes revealed a need to provide educational materials for residents. These outreach efforts revealed a substantial knowledge gap regarding water and wastewater systems in the Coachella Valley, and also found that local non-profit organizations such as El Sol and Pueblo Unido would benefit from having materials available to provide to residents to increase educational opportunities for various water-related concerns.

The ultimate purpose of this project is to provide resources to residents to help them resolve issues that can be addressed by local agencies, and provide local non-profit organizations with the information necessary to empower local DACs. The portion of this project that required development of educational materials was completed through the DAC Outreach Program, and those materials are available as an appendix to the 2014 Coachella Valley IRWM Plan Update. The next steps for project implementation will require outreach and engagement with local non-profit groups to disseminate materials to local stakeholders and provide residents with the materials they need to understand water and wastewater systems in the Coachella Valley and secure code compliance for applicable water and wastewater issues. It is anticipated that implementation via the non-profit partners will begin in late 2013 or early 2014 and will continue to be implemented through these groups into the future.

Project 2: Determining Connection Opportunities

This project involves detailed mapping to help locate municipal service connection opportunities. The idea for this project was developed as a result of DAC outreach efforts and is based upon the sewer consortium idea initiated by the California Rural Legal Assistance Foundation (see above for more details). Connecting residents that do not currently receive municipal services (water and wastewater) to the municipal system is a common request that has been expressed by DAC and other Coachella Valley IRWM stakeholders throughout the duration of the Coachella Valley IRWM Program.

While the demand for municipal connections is high, it has been found that many of the connection projects submitted for IRWM grant funding are not technically or economically feasible. Due to the dispersed and rural nature of portions of the Region (particularly the East Valley), sewer extension and connection projects may not be cost-effective if they require construction of large lengths of pipeline for relatively few users. From a technical point of view, sewer connections are not feasible if property owners are unwilling to participate or residents are unable to provide requisite sewer connection fees.

Because many factors are involved in selecting potential sewer connection projects in the Coachella Valley IRWM Region, this project aims to provide technical information to help prioritize future connection projects from both technical and economic perspectives. In order to accomplish this goal, the project includes multiple steps, including: mapping, analysis, and feasibility analysis.

The ultimate goal of this project will be to identify potential municipal system connection projects for Round 3 of Proposition 84 funding that are feasible from an economic and a technical perspective.

Regional Program for Septic Rehabilitation

This project was developed to address the large amount of reports of failing OWS throughout the Coachella Valley DACs. In addition to the amount of OWS failures reported during the survey process, outreach conducted for the DAC Outreach Program also found that one of the non-profit partners that participated in the program, Pueblo Unido, who has been working in the East Valley for several years, has already been focusing on addressing wastewater issues and OWS failures in particular. Due to Pueblo Unido's experience with local mobile home park owners and residents and their technical experience with septic systems, it was determined that they would be the most appropriate partner to work with on program design and engineering for this project.

With the resources available to the DAC Outreach Program, the team determined that it would be preferable to develop a regional program that clarifies the process by which septic rehabilitation can be undertaken for local mobile home parks. In particular, this project was meant to provide support for those residents that cannot realistically or feasibly connect to a municipal wastewater system, and therefore would benefit from upgrading their OWS. As a demonstration component of this program, the project team completed preliminary engineering and design work, including onsite soils percolation testing, for several mobile home parks. This project aims to provide the following:

- A framework for future efforts to rehabilitate septic systems in the Coachella Valley as it would be able to demonstrate how to appropriately design septic systems for a range of different site conditions such as elevation, soil conditions, number of residents, etc. and
- Actual design and engineering plans for a number of mobile home parks, which would make these sites potentially eligible to receive funding for implementation (construction and permitting) from a variety of grant programs.

The technical team worked with Pueblo Unido to locate the mobile home parks where onsite percolation testing, design, and engineering would be conducted. During this process it was determined that Polanco Parks in the East Valley would be appropriate to target, because they have reduced permitting requirements and there are hundreds of Polanco Parks within the East Valley, making future replication more feasible. There were a number of reported failing and overflowing septic systems in the West Valley, however non-profit partners in this area did not have the established relationships with mobile home park owners or residents that were deemed necessary for successful future project implementation.

Four Polanco Parks in Thermal, CA were selected for this project: Valenzuela (Harrison between Avenues 81 and 82), Don Jose (Avenue 64 west of SR-86), Cisneros (Avenue 77 between Fillmore and Harrison), and Gutierrez (Harrison between Avenues 80 and 81). Soil testing was conducted at the three sites that had not yet been tested, design plans were drafted for all four sites, and regulatory requirements and processes were identified. Three wastewater alternatives were assessed for each site: conventional, nitrogen removal, and centralized and decentralized options. Following these assessments, the four sites are now positioned to apply for or receive funding for construction and permitting.

These efforts resulted in a framework for future rehabilitation of septic systems at small sites similar to Polanco parks. This framework includes consideration of a range of different conditions, including elevation, soil conditions, and number of residents. Final results of this project are included as an appendix to the 2014 Coachella Valley IRWM Plan Update.

Project 4: Regional Program for Onsite Water Treatment

This project was developed to address water quality concerns, particularly in the East Valley where mobile home parks are in remote, low-density areas and also rely upon private groundwater that may have elevated levels of constituents such as arsenic.

Collaboration with Pueblo Unido, DACE, and the Rotary Club has identified two key aspects necessary for an effective water treatment program in the East Valley: technical needs (water treatment) and community organization. The technical component includes evaluating and identifying the appropriate point of entry and/or point of use water treatment facilities for mobile home parks in the East Valley setting. The community organization component includes distribution of O&M manuals and emergency procedures, and development of rental agreements with park tenants for a monthly user fee to cover O&M costs (such as filter replacement). This project includes development of a regional program that includes both of these program components, for use in accelerating the existing efforts to install treatment systems in both permitted and unpermitted mobile home parks that have documented drinking water quality exceedances. The program focuses on installation of appropriate, commercially-available reverse-osmosis under-counter treatment units for tenants at the mobile home parks. Materials developed for this program are provided as an appendix to the 2014 Coachella Valley IRWM Plan Update.

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5 List of Appendices

- Appendix 1: Survey questionnaire
- Appendix 2: Scope of Services
- Appendix 3: Survey Maps
- Appendix 4: Additional DAC Cluster Maps

Appendix 1: Survey Questionnaire and Observation Form

Coachella Valley Regional Water Management Group

Pueblo Unido CDC
EASTERN COACHELLA VALLEY

El Sol

LOMA LINDA UNIVERSITY
School of Public Health

COACHELLA VALLEY IRWM DISADVANTAGED COMMUNITY PROGRAM

DAC MAPPING AND CHARACTERIZATION QUESTIONNAIRE

Participant Information Sticker **(Address, house ID, Region)**

Interviewer Information	**Data Entry**
Interviewer Initials____________________ ___________ Interviewer ID: _______ _______	Date: _______/______/______ (month /day/ year) Initials: ______________________________________

Date First Visited Household	_______/______/______ (month) (day) (year) **Start:** ___ ___: ___ ___ □ a.m. □ p.m. **End:** ___ ___: ___ ___ □ a.m. □ p.m □ Respondent not home
Second Attempt at survey questionairre	_______/______/______ (month) (day) (year) **Start:** ___ ___: ___ ___ □ a.m. □ p.m. **End:** ___ ___: ___ ___ □ a.m. □ p.m □ Respondent not home
Third Attempt at survey questionairre	_______/______/______ (month) (day) (year) **Start:** ___ ___: ___ ___ □ a.m. □ p.m. **End:** ___ ___: ___ ___ □ a.m. □ p.m □ Respondent not home

Introduction Statement:

I am conducting a survey to collect information about water and wastewater for the California Department of Water Resources. There is a California state budget to address water quality and wastewater management issues in this region. We would like to find out from you what actions or projects the state should consider in these topics. Would you like to answer some questions and give us your input? The information you provide will be used to help guide funding decisions in the Coachella Valley.

Q1 What kind of dwelling is this?
(Observe)
- ❍ Mobile home single (1)
- ❍ Mobile home double wide (2)
- ❍ Smaller Trailer or RV (3)
- ❍ Single family house (4)
- ❍ Apartment (5)

Q2 Are you this household's primary wage earner (PWE)?

- ❍ Yes (1)
- ❍ No (2)

Q3 What is your relationship to this household's primary wage earner?

- ❍ Spouse (1)
- ❍ Mother (2)
- ❍ Father (3)
- ❍ Grandmother (4)
- ❍ Grandfather (5)
- ❍ Daughter (6)
- ❍ Son (7)
- ❍ Uncle (8)
- ❍ Aunt (9)
- ❍ Niece (10)
- ❍ Nephew (11)
- ❍ Other (12)

Q4 Gender of Respondent
(Observe)
- ❍ Male (1)
- ❍ Female (2)

Q5 What is your occupation? *(write answer)*

____________________ ____________________ ____________________

Answer Q6 if Q3 indicates that they are not the PWE

Q6 What is the primary wage earner's occupation?

Q7 Who do you pay for your water bill?
(If they say water district, ask the name of the water district)

- ❍ My landlord / park owner / manager / with my space rental (1)
- ❍ My water district. (2) ____________________
- ❍ The US Federal government (3)
- ❍ The CA state government (4)
- ❍ My County government (5)
- ❍ My City government (6)
- ❍ My Tribal Council government (7)
- ❍ I have my own water source (8)
- ❍ Other (9) ____________________

Q8 Where does the water in your kitchen sink come from?
(Probe: What is the SOURCE of the water before it is piped to you?) *(Read answers and if a well is specified, ask for location)*

- ❍ A water treatment plant (1)
- ❍ A private well near this house (2)
- ❍ A water district owned well (3)
- ❍ Rainwater (4)
- ❍ Other (5) ____________________
- ❍ The All American Canal or Colorado River (6)
- ❍ The Irrigation District (7)
- ❍ The Salton Sea (8)
- ❍ Don't know / Pay landlord (9)

Comment

Q9 How much do you pay per month for water?

__________________________ ____________________

Q10 Where does the majority of your household drinking water come from?

(Read answers)

- ❍ The tap in the home (1)
- ❍ Plastic bottles from a grocery store or convenience store (2)
- ❍ In large containers from a commercial delivery method (3)
- ❍ In large containers that I fill at a vending machine or other sources (4)

Answer Q11 If Q10 above “The tap in the home” Is Not Selected

Q11 Do you ever run out of water that you purchase for drinking?

- ❍ Yes (1)
- ❍ no (2)

Answer Q12 If above Q11 is “yes”

Q12 If you ran out of the water supply that you normally drink, would you drink your tap water?

- ❍ yes (1)
- ❍ No (2) *(why not?)*

Comment

Q13 What source of water do you use for the following?
(Read answers and probe: Watch for quizzical face and better explain if necessary)

	Water straight from the tap (1)	In home filtered water (2)	Purchased water (bottled water, water store, or vending machines) (3)
Drinking (1)	❑	❑	❑
Cooking (2)	❑	❑	❑
Washing Clothes (3)	❑	❑	❑
Brushing Teeth (4)	❑	❑	❑
Hand washing or Bathing (5)	❑	❑	❑

Q14 Which of the following do you use your water for?
(Read answers)

- ❑ Keeping dust down on dirt road or driveway (1)
- ❑ Gardening (2)
- ❑ Watering the lawn (3)
- ❑ Swimming or children playing (4)
- ❑ Domestic animals (5)
- ❑ Other (6) ____________________

Q15 Do you drink the water from your tap without filtering it or boiling it?

- ❍ yes (1)
- ❍ no (2)

Q16 Please rate the quality of your tap water. Would you rate your water as Excellent, moderate or poor quality?

	Poor Quality (1)	Moderate Quality (2)	Excellent Quality (3)
Quality of Tap Water (1)	❍	❍	❍

Answer Q17 If Q16 was described as poor or moderate quality:

Q17 You rated your water quality as "moderate quality" or less. Please detail the factors that contribute to this.

Q18 Is there a Point of Use water system in the house? What kind is it? Can we photograph the filter?
(Ask if the observer can photograph the water filter)

- ❑ A Brita filter or similar pitcher style carbon filter (1)
- ❑ An under-sink filter system (2)
- ❑ A whole house filter system such as a water softener (3)
- ❑ Other (4) ____________________
- ❑ No filter (5)

Q19 Who do you think should maintain and manage delivery of safe drinkable water to your household?
(Read answers)
- ❍ My landlord / park owner / manager (1)
- ❍ My water district (2)
- ❍ The US Federal government (3)
- ❍ The CA state government (4)
- ❍ My city government (5)
- ❍ My county government (6)
- ❍ My tribal council government (7)
- ❍ myself (8)
- ❍ Other (9) ____________________

Q20 What kind of wastewater disposal system does this house use?
(Read Answers)
- ❍ Septic system (1)
- ❍ Shared septic system with other houses (2)
- ❍ Cesspool (3)
- ❍ Shared cesspool with other houses (4)
- ❍ Drainage ditch (5)
- ❍ Onsite, but don't know details (6)
- ❍ Nearby lagoon (7)
- ❍ A sewer line that flows to a wastewater treatment plant (8)

Q21 If your community has a septic tank or cesspool, is the system shared with other residents in your community? If so, how many houses?
- ❍ Yes *(how many houses?)* (1) ____________________
- ❍ No (2)
- ❍ Don't Know (3)

Q22 Most homes in this community are:
(Read answers) (Community is defined as mobile home park or other not more than 1 mile away)
- ❍ Connected to a sewer line that flows to a wastewater treatment plant (1)
- ❍ Connected to a septic system (2)
- ❍ Have a lagoon system (3)
- ❍ Other (4) ____________________

Q23 For septic systems which of the following are OK to drain or flush down the kitchen sink?
(Read answers)
- ❑ Food waste from a food waste disposal system (1)
- ❑ Fats and Grease (2)
- ❑ Bleach and Chemicals (3)
- ❑ Dirty Dish Water (4)

Q24 For septic systems, which of the following are OK to flush down the toilet?
(Read answers)
- ❑ Urine and Feces (1)
- ❑ Toilet Paper(2)
- ❑ Sanitary Napkins(3)
- ❑ Small garbage items (4)

Comment

Q25 Who do you think should maintain and manage your household's wastewater disposal system?
(Read answers if necessary)
- ❍ My landlord / park owner / manager (1)
- ❍ My water district (2)
- ❍ The US Federal government (3)
- ❍ The CA state government (4)
- ❍ My city government (5)
- ❍ My county government (6)
- ❍ My tribal council government (7)
- ❍ myself (8)
- ❍ Other (9) ____________________

Q26 Have you ever had any problems with your wastewater or septic system? If so, what was it?
(Do not read answers)(Complete questions 32-35 if they answer 1-7 below)
- ❑ Toilet doesn't flush and sink drain doesn't drain (1)
- ❑ Grass is growing where septic system is located (2)
- ❑ I smell sewage in the morning and at night when everyone is taking showers (3)
- ❑ The ground is often muddy, spongy or wet around the septic tank/distribution field (4)
- ❑ There are puddles in my yard when it has not rained for weeks (5)
- ❑ Other (6) ____________________
- ❑ No problems (7)

Answer Q27 – Q28 if respondent named a sewage problem for Q26

Q27 For how many days did that problem last?
(Probe how long does the problem last)

________________ ____________________

Q28 How often does the problem happen? Would you say it....
(Read answers)
- ❍ Once per year (1)
- ❍ Once every 6 months (2)
- ❍ At least every 2 months (3)
- ❍ At least once every month (4)
- ❍ Very often and sometimes daily (5)
- ❍ Only during the rainy season (6)
- ❍ Never happens (7)

Q29 Which of the following would indicate a reason to get your wastewater system checked by a professional?
(Read answers)
- ❑ Toilet doesn't flush and sink drain doesn't drain (1)
- ❑ Grass is growing where septic system is located (2)
- ❑ I heard we have cesspools and no septic tanks (3)
- ❑ I smell sewage in the morning and at night when everyone is taking showers (4)
- ❑ The ground is often muddy, spongy or wet around the septic tank/distribution field (5)
- ❑ There are puddles in my yard when it has not rained for weeks (6)
- ❑ It has been 3 years since the last time it was inspected (7)
- ❑ Are there any other reasons? (8) ____________________

Q30 How are most of your neighbor's wastewater systems performing in this area?
(Read answers)
- ❍ Performing well without problems (1)
- ❍ Some problems but mostly OK (2)
- ❍ There are m any problems, but also many without problems (3)
- ❍ Almost everyone has a problem with septic systems failing (4)
- ❍ Comment
- ❍

Answer Q31 if Q30 is answered with a problem indicated (2, 3, 4)

Q31 Could the Wastewater system problems in this area be fixed by a program that could help residents affordably pump septic tanks?
- ❍ Yes (1)
- ❍ No (2)

Q36 Is your house in a flood plain or at flood risk?

- ❍ Yes (1)
- ❍ No (2)
- ❍ Don't know (3)

Q37 Have there been any floods in this area in the past ?

	Yes (1)	No (2)
Year (1)	❍	❍
Last 5 years (2)	❍	❍

Answer Q38 if Q37 indicates that they had floods in the past year or 5 years

Q38 How did the flood impact you, your property or your family? What items did it damage? What is the value of those items?

	Specify the impact (1)	What was damaged? (2)	Value of items lost? (3)
Impact you (1)			
Impact your property (2)			
Impact your family (3)			

Q39 Did you know about floods in this area before you moved here?

- ❍ Yes (1)
- ❍ No (2)

Q40 What could be done to prevent flooding if it happened in your community?

________________________ ________________________ ________________________ ________________________

Q41 Do you have a community network to provide your warning and preparation support for floods or other natural disasters?

- ❍ Yes (1)
- ❍ No (2)

Q42 In a natural disaster such a s a flood, which of the following statements best represents your belief about how you are able to handle the situation?

- ❍ I can handle the situation without any preparation (1)
- ❍ Preparation, planning and emergency supplies will help me handle the situation (2)
- ❍ Nothing I do to prepare will help me handle the situation (3)

Q43 This question is about project funding from the California Department of Water Resources. What type of water, wastewater, or flood control project should be built with this money? Please be specific.
(Do not give examples)

____

____

Q44 Can the PWE read, write and speak in the English, Spanish or other languages? What other language?

	Read (1)	Write (2)	Speak (3)
English (1)	❑	❑	❑
Spanish (2)	❑	❑	❑
Other 1 (3)	❑	❑	❑
Other 2 (4)	❑	❑	❑

Q45 Is the PWE a native American?

- ❍ Yes (1)
- ❍ No (2)

Q46 How long has the PWE lived in this community? How long has the PWE lived in this house?

	How long has the PWE lived in this community? (1)	How long has the PWE lived in this house? (2)
Years (1)		
Months (2)		

Q47 What is the highest grade in school that the PWE completed?
(Write a number for the different grades)   Do not enter text.
Example grades are: ([Primaria = 01-06; Secundaria = 07-09; Preparatorio = 10-12; GED = 12th grade; Finished college = grade 16; NEVER WENT= 00; DK= 88; REF= 99])

____

Q48 How many people live in this household?

____

Q49 Does the PWE own the house?   Does the PWE:

(Read answers)
- ❑ Owns or mortgaged (1)
- ❑ Pays Rent (2)
- ❑ Owns but pays mobile home park dues (3)
- ❑ Owned by relative (4)
- ❑ Other (5) ____________________

Q50 How much do you pay per month for your house payment (mortgage or rent)?

-
____
_

Q51 Have you had a problem with rat, mouse, insect or other pest infestation?
- ❍ Yes (1)
- ❍ No (2)

Q52 How much money does your household make each year?
- ❍ Less than $37,000 per year (1)
- ❍ Less than $49,305 per year but greater than $37,000 (2)
- ❍ Greater than 49,305 (3)

Q53 Are you aware of any community groups or organizations that help to organize to address health, water, or other problems in your community? If so, who are they?

- ❍ yes (1) ____
- ❍ No (2)

Answer if the respondent indicates "yes" for the answer of the above question Q53.

Q54 Who do they typically work with?

____________________ ____________________ ____________________ ____________________

Q54 How do they communicate with you?

____________________ ____________________ ____________________ ____________________

Q55 Do they deal with water issues of any kind? If yes, please describe.

- ❍ yes (1) ____________________
- ❍ No (2)

Thank you for completing this survey.

OBSERVATION SHEET

Q1 Surveyor and Observer

Surveyor Name: ________________________

Observer Name: _______________________

Date (5)

Q2 What is the location of this house?

Address Unit Number ___________________________________

Address street number ___________________________________

Address street name ___________________________________

Address City ___________________________________

Q3 What kind of dwelling is this?

- ❍ Mobile home single (1)
- ❍ Mobile home double wide (2)
- ❍ Trailer or RV (3)
- ❍ Single family house (4)
- ❍ Apartment (5)
- ❍ Other (Specify) (6) ____________________

Q4 Are there other inhabited outbuildings on this household's property?

- ❍ yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To How many vehicles are parked in the h...

Q5 What kind of outbuildings are these?

- ❍ apartments (1)
- ❍ barracks (2)
- ❍ Small houses (3)
- ❍ Trailers (4)

Q6 What source of water do you use for the following? (read answers and probe) Watch for quizzical face and better explain if necessary

______ Number of non-commercial vehicles (1)
______ Number of motorized mobile homes (2)
______ Number of work related trucks, buses or tractors (3)

Q7 Do you see the following in the yard of this household?

	Yes/No		DK
	yes (1)	No (2)	Could not observe (1)
Standing pools of water nearby that last over a day after it rains. (1)	❍	❍	❍
Washing machine greywater piped to soil surface or garden (2)	❍	❍	❍
Standing pools of sewage near the household (within 100 feet) (3)	❍	❍	❍
A visible septic tank or cesspool (4)	❍	❍	❍
A well for fresh water (5)	❍	❍	❍
An outhouse or latrine (6)	❍	❍	❍
The house is located on a dirt road (unpaved) (7)	❍	❍	❍
The yard is neat and orderly and landscaped (8)	❍	❍	❍

Q8 Please upload pictures to characterize any of the above items in the yard. Do not photograph any items or locations that Include a person, a vehicle license plate, an address sign, or any other information which could be used to identify the respondent.

Q11 Are domestic livestock animals housed nearby? (Chickens, Cows, Goats, etc.)

- Yes (1)
- No (2)
- Could not observe (3)

If No Is Selected, Then Skip To Agricultural Field Proximity

Q12 Where is the livestock housing located?

- In house (1)
- Adjacent to house (2)
- Visible but not adjacent to house (3)
- Could not observe (4)

Q13 When you are in the yard, can you smell the livestock?

- yes (1)
- No (2)

Q14 Is there an agricultural field near the house?

- Adjacent to house (add photo below) (1)
- Visible but not adjacent to house (add photo below) (2)
- No fields (3)
- Could not observe (4)

Q15 Photo 3: Ag Field

Q16 What kind of air cooling system does this house have?

- Central air conditioning (1)
- Window based air conditioning (2)
- Evaporative cooler (3)
- Fans only (4)
- None (5)

Q17 What kind of wastewater disposal system does this household have?

- ❍ Septic system (1)
- ❍ Cesspool system (2)
- ❍ Lagoon or pond system (3)
- ❍ small wastewater treatment plant (4)
- ❍ Centralized sewerage (5)
- ❍ Ditch or trench system with open wastewater (6)
- ❍ Other (Specify) (7)

Q19 What kind of wastewater disposal system do most households in this area, community, neighborhood or park have?

- ❍ Septic system (1)
- ❍ Cesspool system (2)
- ❍ Lagoon or pond system (3)
- ❍ small wastewater treatment plant (4)
- ❍ Centralized sewerage (5)
- ❍ Ditch or trench system with open wastewater (6)
- ❍ Other (specify) (7)

Q20 Does the wastewater system appear to be shared with other residents in the same neighborhood or community cluster? (Ask after survey if possible)

- ❍ yes (1)
- ❍ No (2)

Answer If What kind of wastewater disposal system does this househo... Septic system Is Selected Or What kind of wastewater disposal system does this househo... Cesspool system Is Selected Or What kind of wastewater disposal system does this househo... Ditch or trench system with open wastewater Is Selected

Q21 Does the septic system appear to:

	yes (1)	no (2)
Overflowed recently (1)	❍	❍
Have an open access or service port (2)	❍	❍
Have excess vegetation growing on drainfield (3)	❍	❍
Have water puddled around tank location (4)	❍	❍
have spongy moist dirt or puddles near drainfield (5)	❍	❍
Have a visible clean-out plug or access hatch (6)	❍	❍
to be open and a fall hazard (7)	❍	❍

Answer If What kind of wastewater disposal system does this househo... Lagoon or pond system Is Selected

Q23 How many feet is the lagoon from the nearest residence?

Answer If What kind of wastewater disposal system does this househo... Lagoon or pond system Is Selected

Q24 How many families use the lagoon for wastewater management?

Answer If What kind of wastewater disposal system does this househo... Lagoon or pond system Is Selected

Q25 Does the lagoon appear to

	yes (1)	No (2)
have overgrown vegetation (1)	❍	❍
have a pump system to bring sewage in (2)	❍	❍
have a noticeable foul odor (3)	❍	❍
be secured (locked) against access for unauthorized visitors (4)	❍	❍
be full of water (5)	❍	❍

Answer If What kind of wastewater disposal system does this househo... Lagoon or pond system Is Selected

Q26 Could the septic system problems in this area be fixed by a program that could help residents afford-ably pump septic tanks?

Q27 Is the PWE a native American?

- ❍ Yes
- ❍ No

Q28 How does the outdoor air feel to you when you breathe it in?

- ❍ fresh (1)
- ❍ Slightly dusty but still fresh (2)
- ❍ Very dusty (3)
- ❍ Thick with dust and odor (4)

Q29 What is the outdoor air temperature?

Q30 What is the indoor air temperature?

Q31 Is there trash cans or recycling receptacles present outside?

- Yes (1)
- No (2)

If No Is Selected, Then Skip To How many dogs live in this household?

Q32 Are trash receptacle lids tight-fitting enough to protect contents?

	Yes (1)	No (2)
Trash receptacle lids are tight-fitting to protect contents (1)	❍	❍
Trash or refuse is littered outside of trash receptacles (2)	❍	❍
Residents have collected many empty bottles and cans outside (3)	❍	❍

Answer If Are trash receptacle lids tight-fitting enough to protect... Trash receptacle lids are tight-fitting to protect contents - No Is Selected Or Are trash receptacle lids tight-fitting enough to protect... Trash or refuse is littered outside of trash receptacles - Yes Is Selected Or Are trash receptacle lids tight-fitting enough to protect... Residents have collected many empty bottles and cans outside - Yes Is Selected

Q33 Photo 7: Trash

Answer If Are trash receptacle lids tight-fitting enough to protect... - Yes Is Selected

Q34 Is there water pooling in the empty bottles and cans?

- Yes (1)
- No (2)

Q35 How many dogs live in this household or around the house?

Q36 Is dog waste visible in the household yard?

- Yes (1)
- No (2)

Q37 Are there feral dogs or cats nearby?

- ❑ Feral dogs (1)
- ❑ Feral cats (2)
- ❑ Other wild animals (3)

Q38 What is the source of tap water for this house?

- ❑ Municipal tap water (1)
- ❑ Water from a water well (2)
- ❑ other (3) ____________________

Q39 Are there water jugs in the house for drinking water?

- ❑ Yes, for filling at a water vending machine (1)
- ❑ Yes, from a commercial water delivery service (2)
- ❑ Yes, for storing tap water (3)
- ❑ No (4)

Q41 Do you see more than 1 commercial disposable water bottle full or empty? (e.g. Dasani, Arrowhead)

- ❍ Yes (1)
- ❍ No (2)

Q42 Is there a Point of Use water system in the house?

- ❑ A Brita filter or similar pitcher style carbon filter (1)
- ❑ An under sink filter system (2)
- ❑ A whole house filter or water softener (3)
- ❑ Other (4) ____________________
- ❑ No (5)

Q44 Does this house appear to:

	yes (1)	no (2)
be located near a wash or drainage ditch? (1)	❍	❍
show evidence of flooding? (2)	❍	❍
be safe from minimal floods because of stormwater flow control infrastructure built on the streets and in community? (3)	❍	❍
be located on a dirt road where owners spray water daily? (4)	❍	❍

Q45 Browser Meta Info

Browser (1)
Version (2)
Operating System (3)
Screen Resolution (4)
Flash Version (5)
Java Support (6)
User Agent (7)

Q10 Photo 2: Yard

Q9 Photo 1: Yard

Answer If Is there a Point of Use water system in the house? No Is Not Selected

Q43 Photo of the home water filter device or other water filter device from above question

Q18 Photo 4: Wastewater

Answer If What kind of wastewater disposal system does this househo... Septic system Is Selected Or What kind of wastewater disposal system does this househo... Cesspool system Is Selected

Q22 Photo 5: Septic

Answer If Are there water jugs in the house for drinking water? No Is Not Selected

Q40 Photo 8: Water Jug

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Appendix 2: Scope of Services

EXHIBIT A

SCOPE OF SERVICES

SERVICES INCLUDED

The professional services provided by the CONSULTANT for the above-described project shall include the following tasks, and all related services necessary to complete such tasks:

The goal of the Coachella Valley DAC Outreach Program is to develop and implement methods to improve Disadvantaged Community (DAC) participation in the Coachella Valley IRWM Program. The DAC Outreach Program is coordinated with the update of the Coachella Valley IRWM Plan, which is currently underway and being separately managed by the CLIENT in coordination with RMC. DAC areas are defined by the State of California as having an income of 80% of the Statewide median household income (MHI) or $48,706 according to 2010 US Census statistics.

The DAC Outreach Program is a DWR model program that will be used to shape DAC outreach efforts throughout California. As such, it is important that the DAC Outreach Program include substantial local input from entities and individuals that are most familiar and closely associated with the region's impacted disadvantaged communities. Therefore, part of the DAC Outreach Program includes contracting with local non-profit organizations in the Coachella Valley to provide support on specific tasks associated with outreach, mapping, and the larger regional IRWM effort. Specific work items and deliverables associated with each of those specific tasks are included below.

The professional services provided by the CONSULTANT for the above-described project shall include the tasks of outreach activities, DAC mapping and characterization, and IRWM Plan participation. The tasks, and all related services necessary to complete such tasks, are described below.

The CONSULTANT will be responsible for attending weekly conference calls to be scheduled by RMC. The CONSULTANT will also be responsible for bi-weekly (every other week) progress reports. RMC will provide the template for the progress reports. RMC will prepare, and CONSULTANT will adhere to, a schedule that will identify the due dates of the deliverables listed below.

CONSULTANT shall keep accurate records of the time expended by CONSULTANT's personnel. Accurate records include documentation of billing rates, hourly time expenditures, and any applicable expenses in accordance with standards required by DWR and expressly explained to the CONSULTANT by RMC.

[illegible]
Revised [illegible]

Outreach Activities

The purpose of outreach activities is to expand upon the previous DAC outreach efforts and identify additional organizations and groups that are working with DACs in the Region on water-related issues. By increasing participation, the opportunity is provided to identify needs and issues of DACs relating to water management and potential projects that may be included in the IRWM regional process.

The DAC outreach effort to date has developed a database for all known organizations and individuals interested in DAC issues and conducted outreach using email, letter, phone calls, and in-person meetings. The database allows the program to track the progress of all interactions and develop profiles of organizations and individuals that include organizational history, affiliations, assessment of regional water issues and needs, participation in water resource projects, and interest in or work on potential IRWM-related needs, issues, and projects.

The CONSULTANT will work expand outreach into DACs by identifying and documenting communications with interested individuals and organizations.

Deliverables:

- List of new DAC individuals or groups who have been contacted and who have shown an interest in the IRWM program. List should include name, organizational affiliation, address, telephone, and email address and profile information (past DAC-related activities, areas of interest, assessment of priority issues, needs, and projects, etc.).
- Coordination of overall DAC outreach in both the western and eastern portions of the Valley
- Record of calls or emails encouraging attendance at meetings or workshops
- List of new contacts that have attended meetings or workshops as documented in meeting sign-in sheets
- Attendance at DAC workshops and regional IRWM Plan update meetings
- Assistance in organizing DAC workshops, including one workshop in the eastern valley and one workshop in the western valley. Assistance will include workshop meeting notes and assistance with preparation of meeting materials.
- Memorandum summarizing the outreach effort that describes outreach techniques that were successful, new contact information, problems encountered, how problems were resolved, and suggested outreach approaches for the future. The final memorandum shall incorporate supporting information from the other non-profits hired to work on this project.

DAC Mapping and Characterization

The RMC team has developed 14 Coachella Valley IRWM DAC focus area maps with demographic and Tapestry Community data that identifies and characterizes DAC areas. The CONSULTANT will utilize the assistance of community *promotores* and LLU university students to develop additional spatial and descriptive mapping data. This information will update the focus area maps. In addition, the CONSULTANT will provide information characterizing the community and its members, key issues and challenges facing the community, and potential projects that address issues and challenges. The CONSULTANT will focus on DACs that are not provided with water or wastewater services by local agencies or municipalities. Deliverables include the following:

Deliverables:

- Selection, development, organization, and coordination of Loma Linda University students and *promotora* teams
- Training of Loma Linda University students and *promotora* teams in GIS use and GPS field methods at LLU geoinformatics laboratory and other training sites in the east and west Coachella Valley
- Revisions to the RMC team focus area maps that pinpoint the location of mobile home parks, locations of on-site wastewater systems (OWS), characterization of OWS that may be failing, locations of groundwater wells with any available data regarding groundwater contaminants, and use of other database to identify locations of areas subject to the risk of flooding
- Direction of observational surveys by student and *promotores* teams
- Engagement of local DAC residents and other stakeholders during informal interviews to validate, verify, and locate attributes of OSWs
- Development and updating of the GIS database and maps from satellite imaging and other relevant databases
- Development of interview instrument that includes a standard set of data gathering questions and response forms to be uniformly used for all DAC community/member interviews
- Conduct training classes in assessment, GPS data gathering, and GIS mapping
- Deliver final report summarizing the data gathering and mapping process. The final report shall incorporate supporting information from the other non-profits hired to work on this project.

Identification of Challenges and Recommendations to IRWM Program

The RMC team and CONSULTANT will develop a list of challenges that have historically prevented or discouraged DAC involvement in IRWM planning activities. Outreach techniques will be recommended to overcome those challenges and promote DAC involvement in IRWM planning. The CONSULTANT will develop this information through the outreach and mapping processes. CONSULTANT will help identify solutions and potential projects to address challenges and issues.

Deliverables:

The final memorandum shall incorporate supporting information from the other non-profits hired to work on this project. The memorandum shall include the following:

- Challenges that have historically discouraged or prevented DAC involvement in the IRWM process
- Water management challenges and issues facing DACs, including specifics about mapped sites
- Potential projects or project concepts to address water management challenges and issues
- Successful techniques that increased DAC involvement in the IRWM process (meetings, development of projects, etc.)

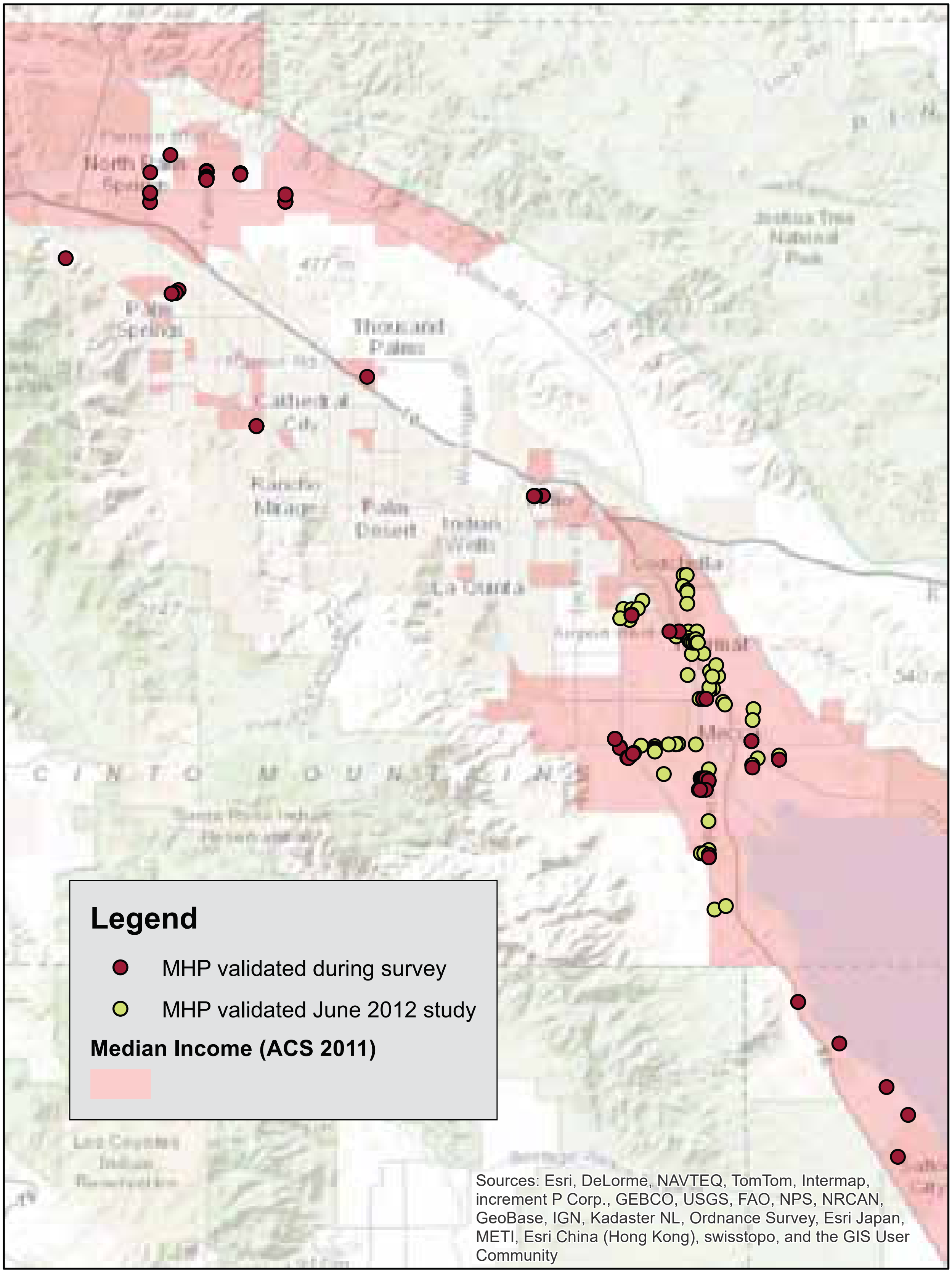
- Recommendations to increase IRWM participation and address issues and challenges

Appendix 3: Survey Maps

Map 01

CV Disadvantaged Communities Characterization

Opinion Survey May 2013 Questionnaire
DAC Locations

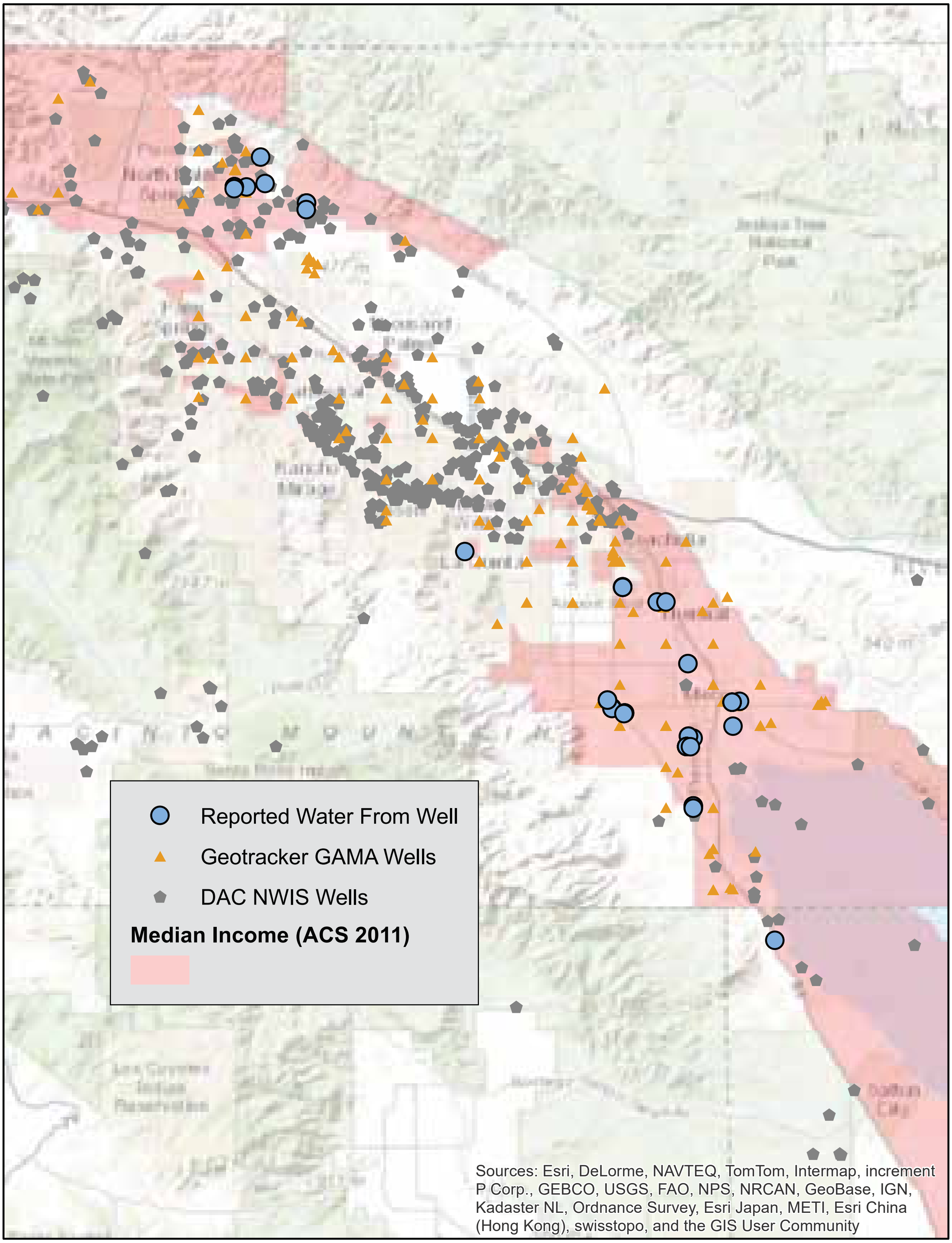


Loma Linda University School of Public Health, RMC and CVIRWMG

Map 02

CV Disadvantaged Communities Characterization

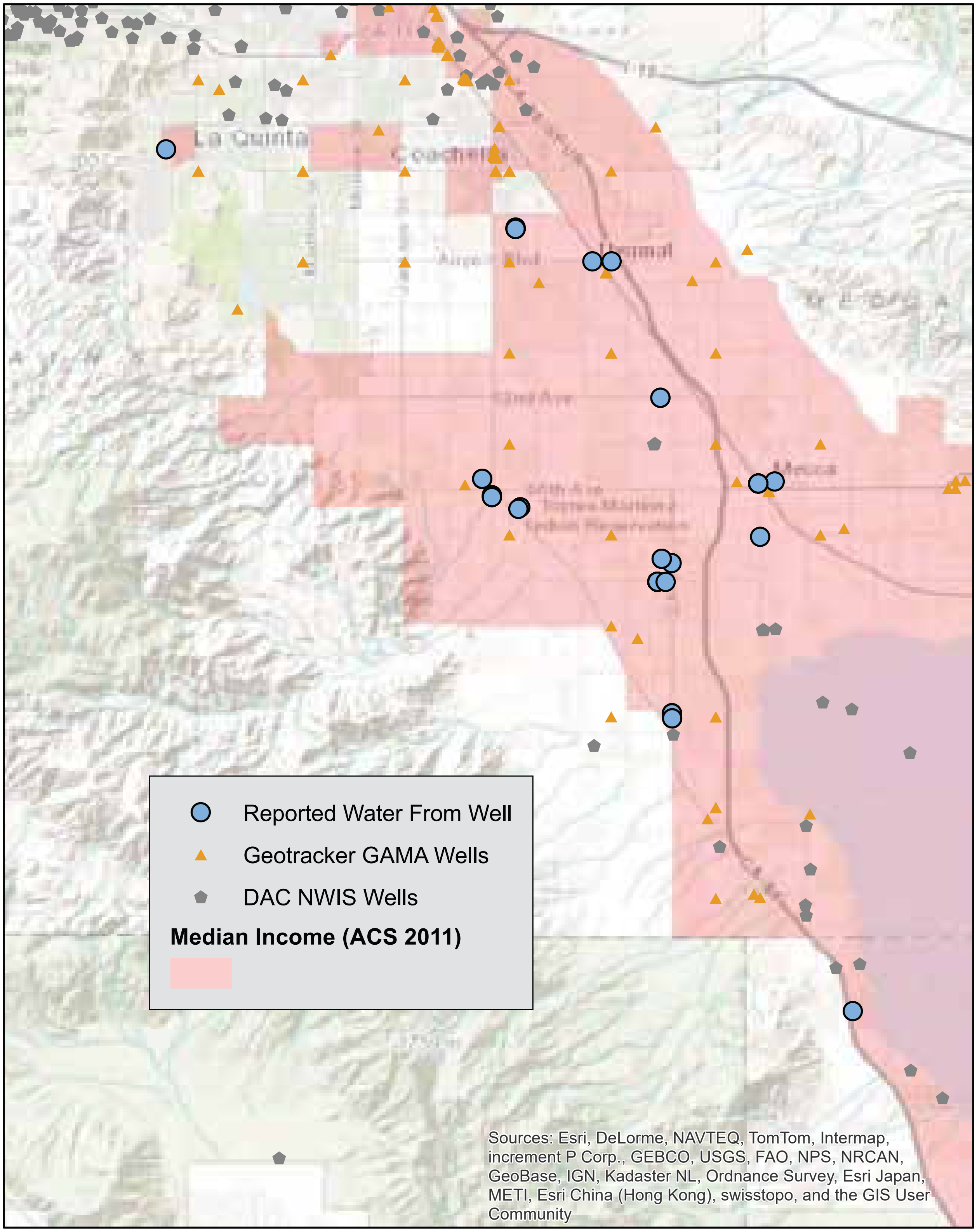
Opinion Survey May 2013 Questionnaire
Respondents Receiving Water From Well



Loma Linda University School of Public Health, RMC and CVIRWMG

CV Disadvantaged Communities Characterization

Opinion Survey May 2013 Questionnaire
Respondents Receiving Water From Well – Eastern Valley

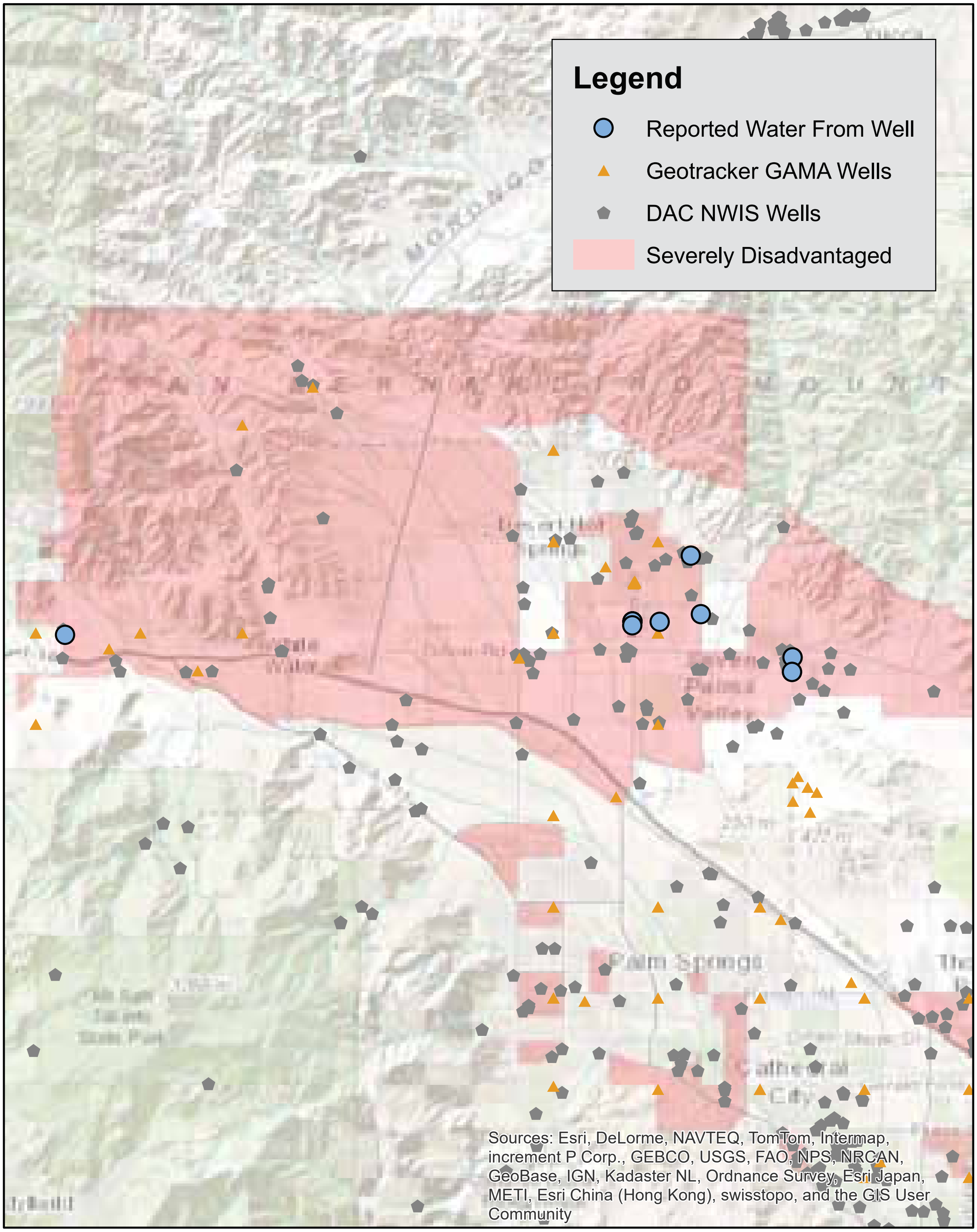


Loma Linda University School of Public Health, RMC and CVIRWMG

Map 04

CV Disadvantaged Communities Characterization

Opinion Survey May 2013 Questionnaire
Respondents Receiving Water From Well - Western Valley



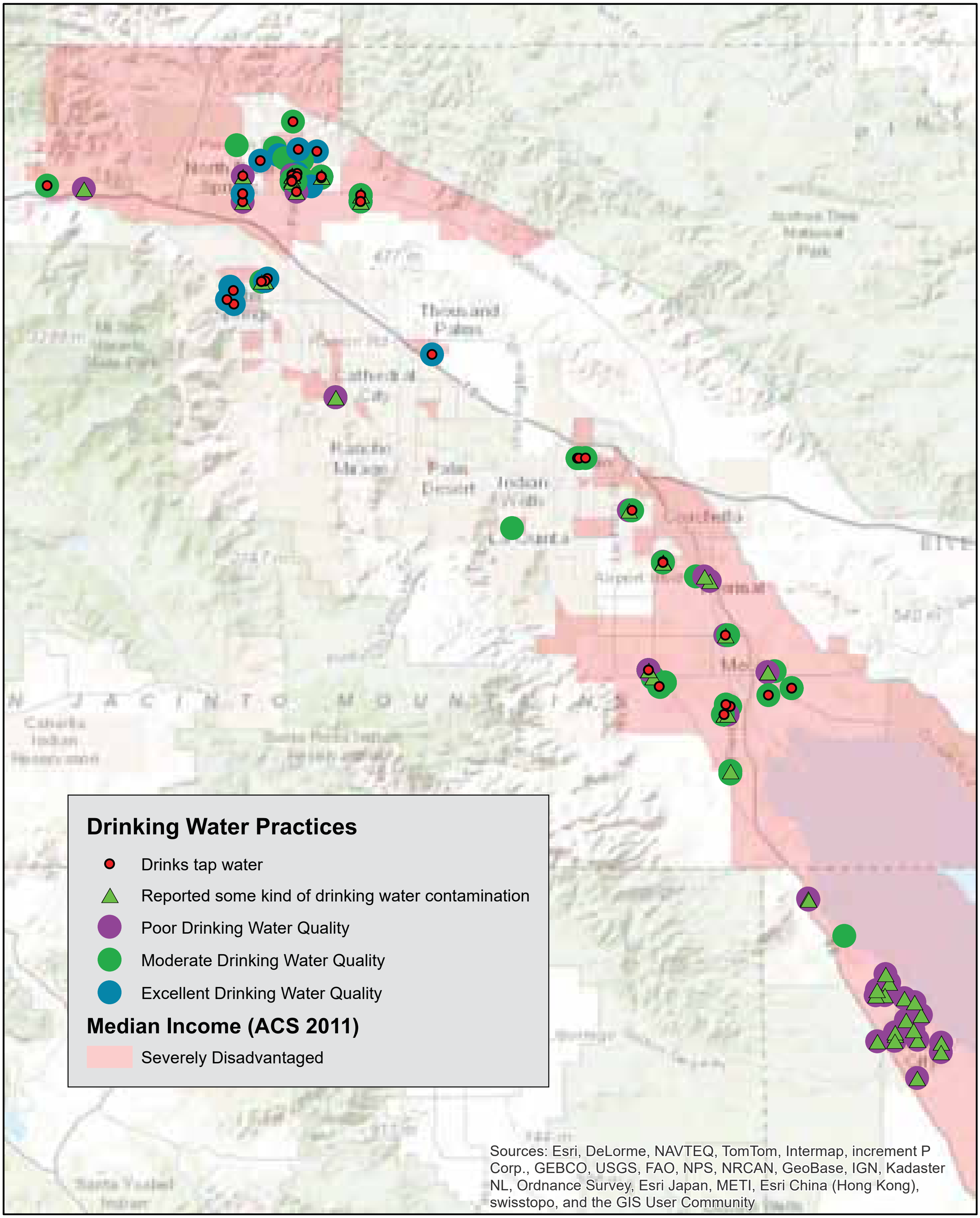
Loma Linda University School of Public Health, RMC and CVIRWMG

Map 05

CV Disadvantaged Communities Characterization

Opinion Survey May 2013 Questionnaire

Respondent-reported drinking water practices



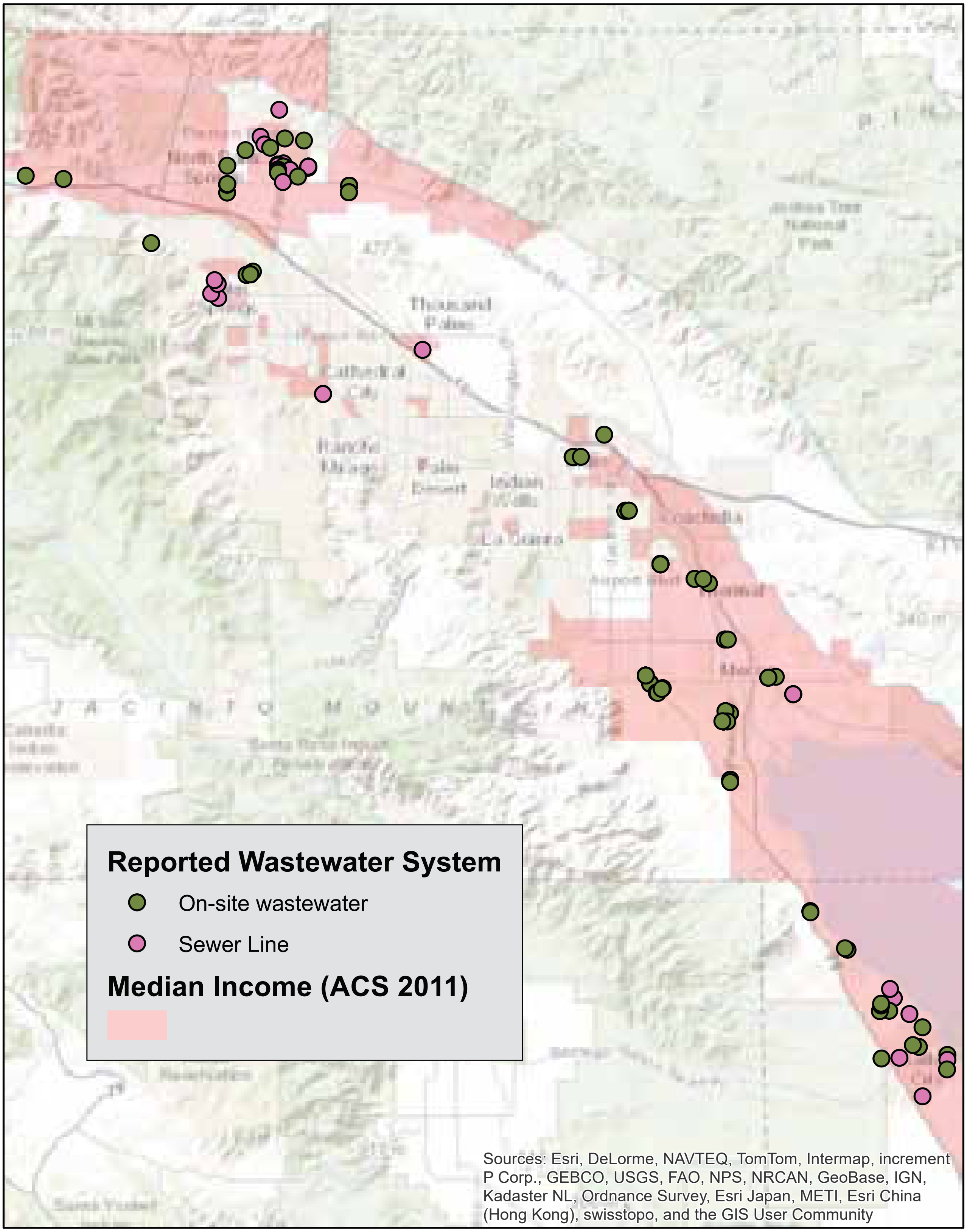
Loma Linda University School of Public Health, RMC and CVIRWMG

Map 06

CV Disadvantaged Communities Characterization

Opinion Survey May 2013 Questionnaire

On-site Wastewater

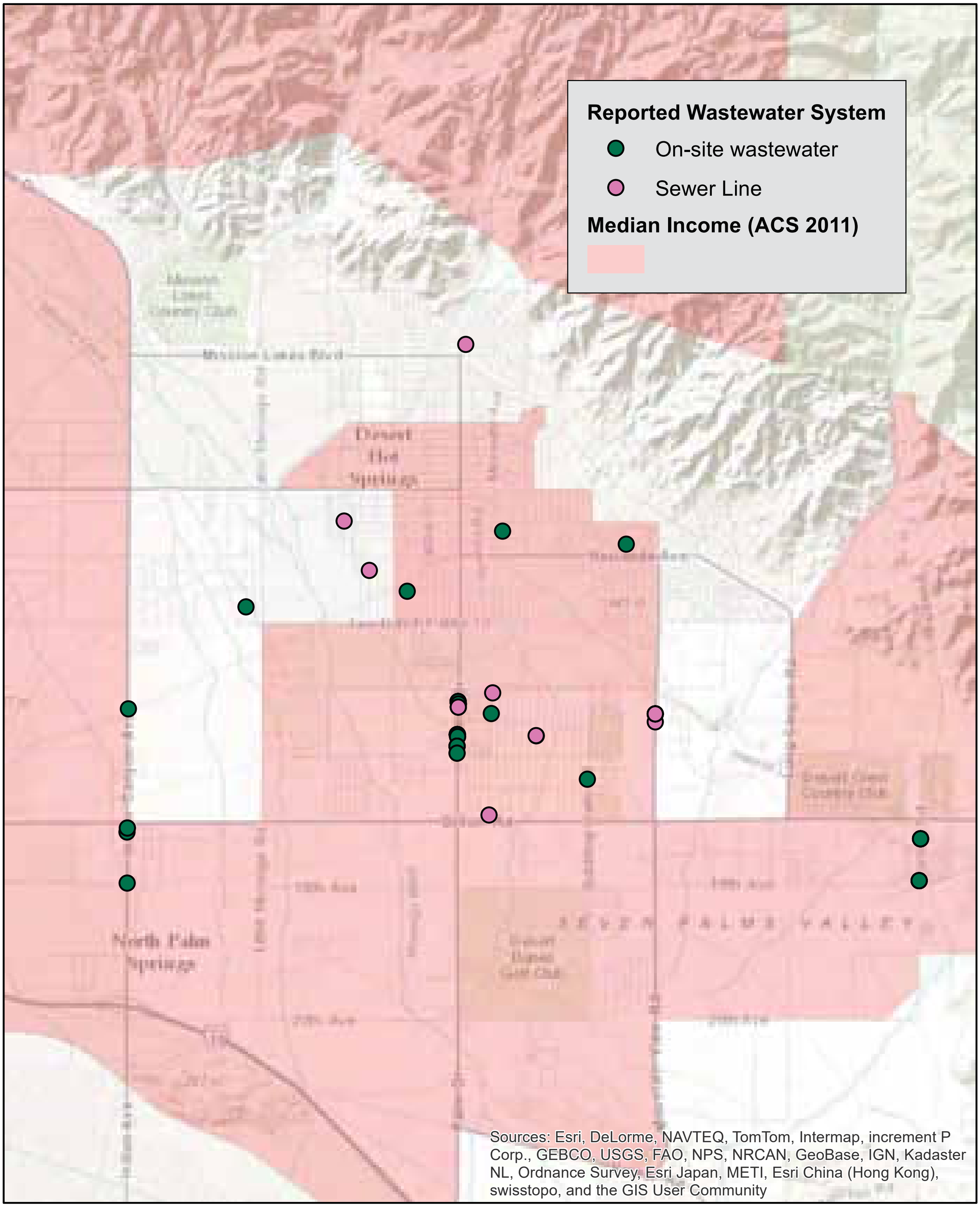


Loma Linda University School of Public Health, RMC and CVIRWMG

Map 07

CV Disadvantaged Communities Characterization

Opinion Survey May 2013 Questionnaire
On-site Wastewater/ Desert Hot Springs

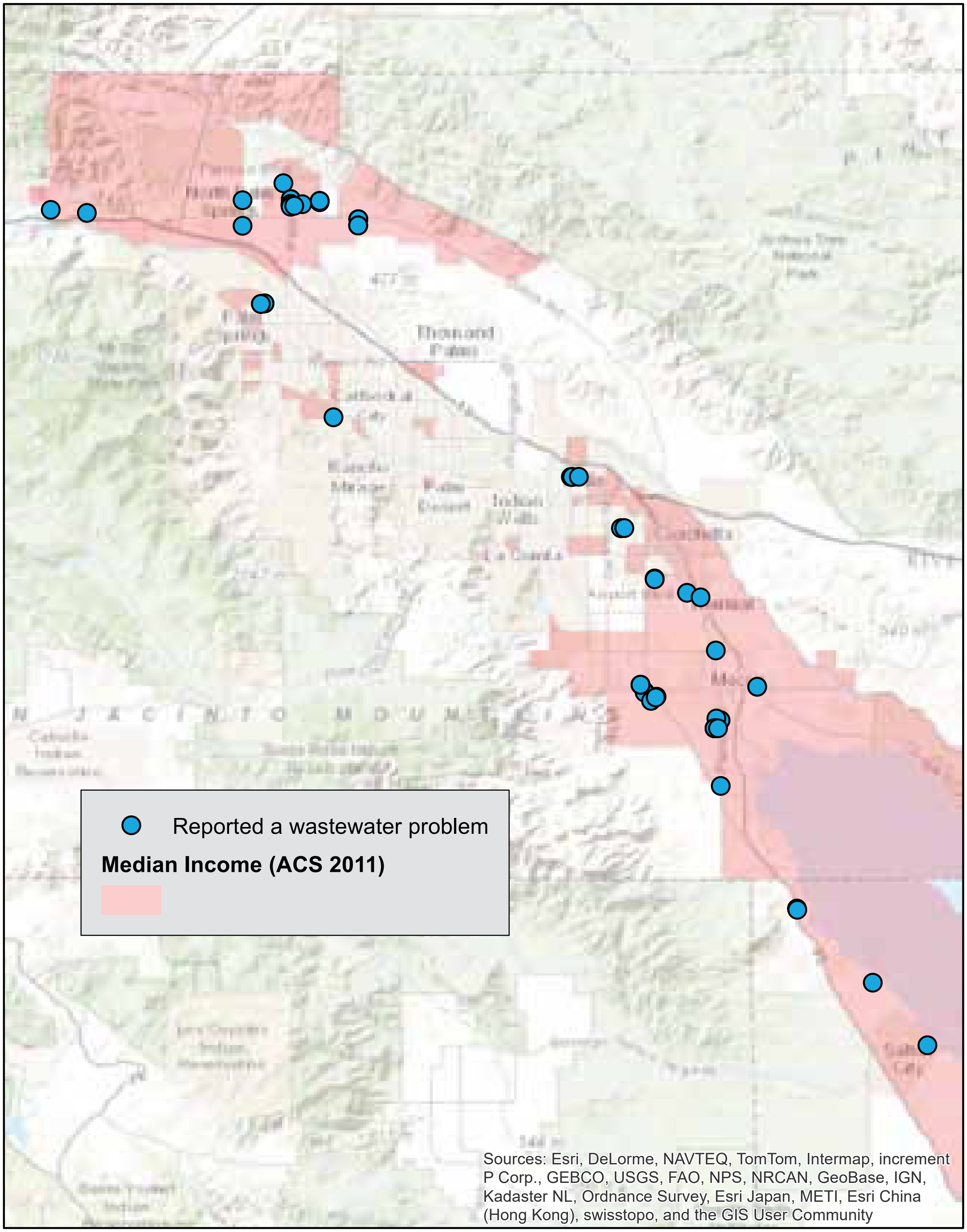


Loma Linda University School of Public Health, RMC and CVIRWMG

Map 08

CV Disadvantaged Communities Characterization

Opinion Survey May 2013 Questionnaire
Reported Experiencing a Failed OWS

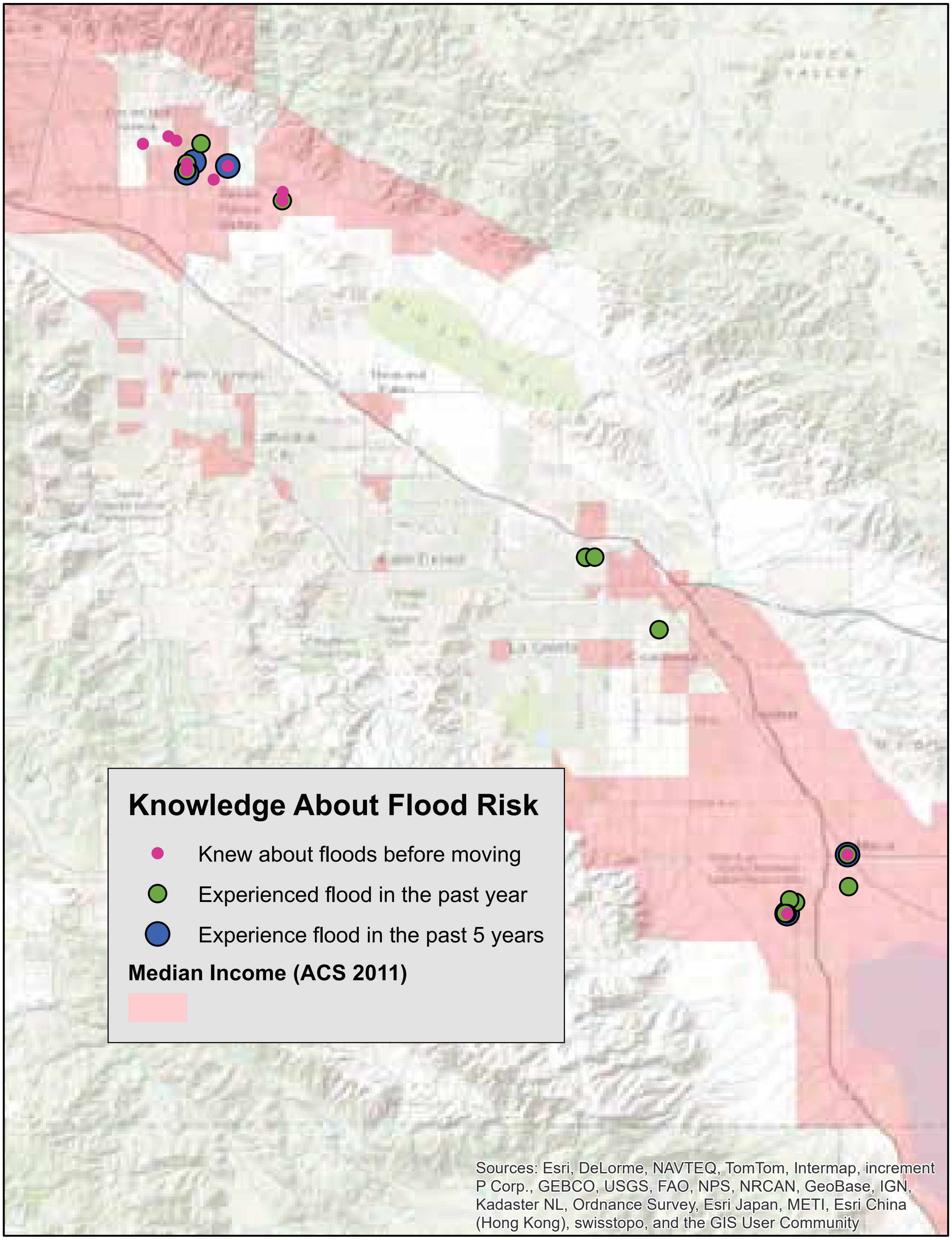


Loma Linda University School of Public Health, RMC and CVIRWMG

Map 09

CV Disadvantaged Communities Characterization

Opinion Survey May 2013 Questionnaire
Experience And Prior Knowledge About Flood Risk



Loma Linda University School of Public Health, RMC and CVIRWMG

Appendix 4: Additional DAC Cluster Maps

Map A

CV Disadvantaged Communities Characterization

Severely DAC Mobile Home Park Clusters in the Eastern Coachella Valley

Chicanitas, Ave 70 polanco, D&D group

Loma Linda University School of Public Health, RMC and CVIRWMG

Map B

CV Disadvantaged Communities Characterization

Severely DAC Mobile Home Park Clusters in the eastern Coachella Valley

Saint Anthony Mobile Home Park area

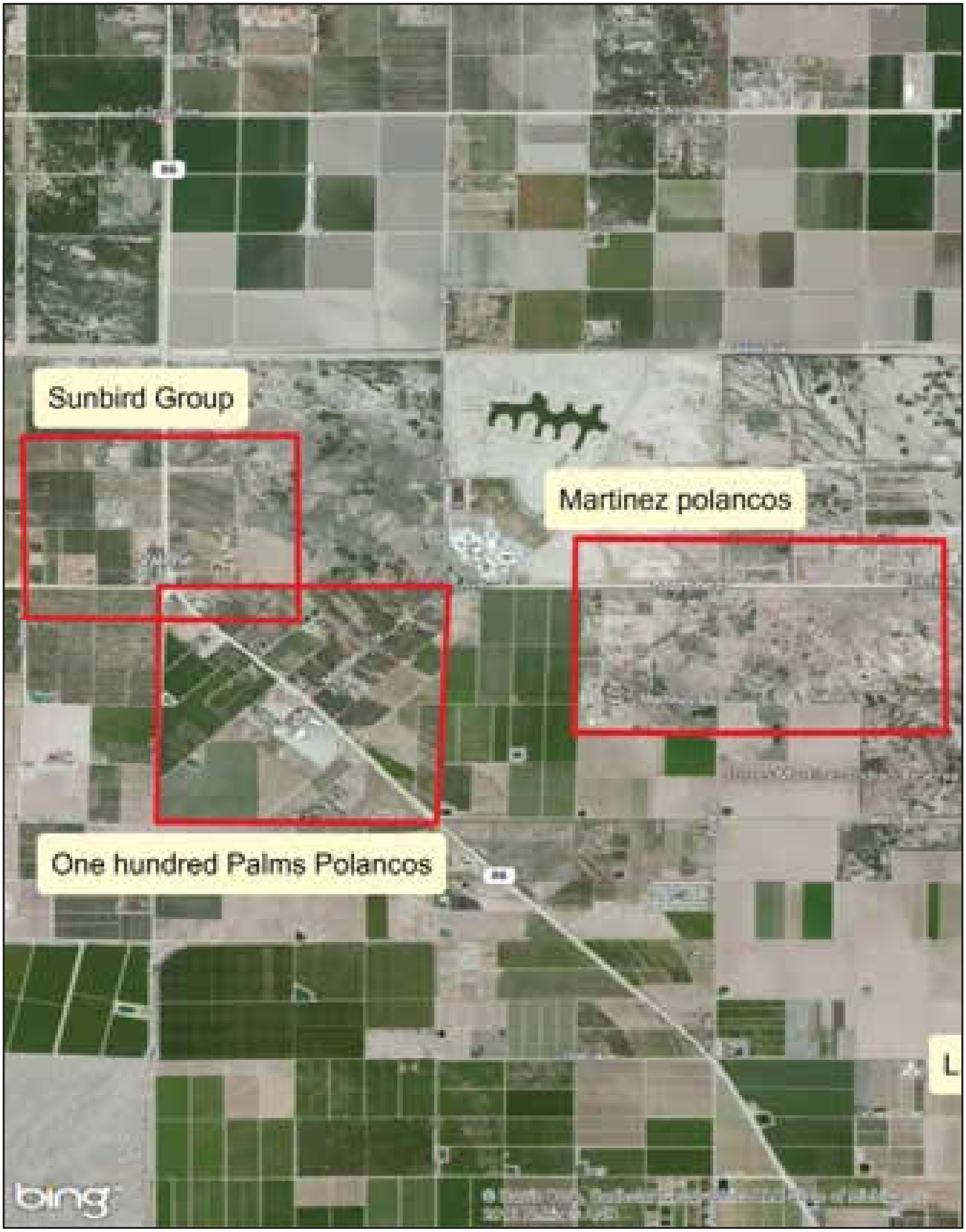
Loma Linda University School of Public Health, RMC and CVIRWMG

Map C

CV Disadvantaged Communities Characterization

Severely DAC Mobile Home Park Clusters in the eastern Coachella Valley

Sunbird group, Martinez polancos, One Hundred Palms polancos



Loma Linda University School of Public Health, RMC and CVIRWMG

Map D

CV Disadvantaged Communities Characterization

Severely DAC Mobile Home Park Clusters near the Salton Sea, Coachella Valley

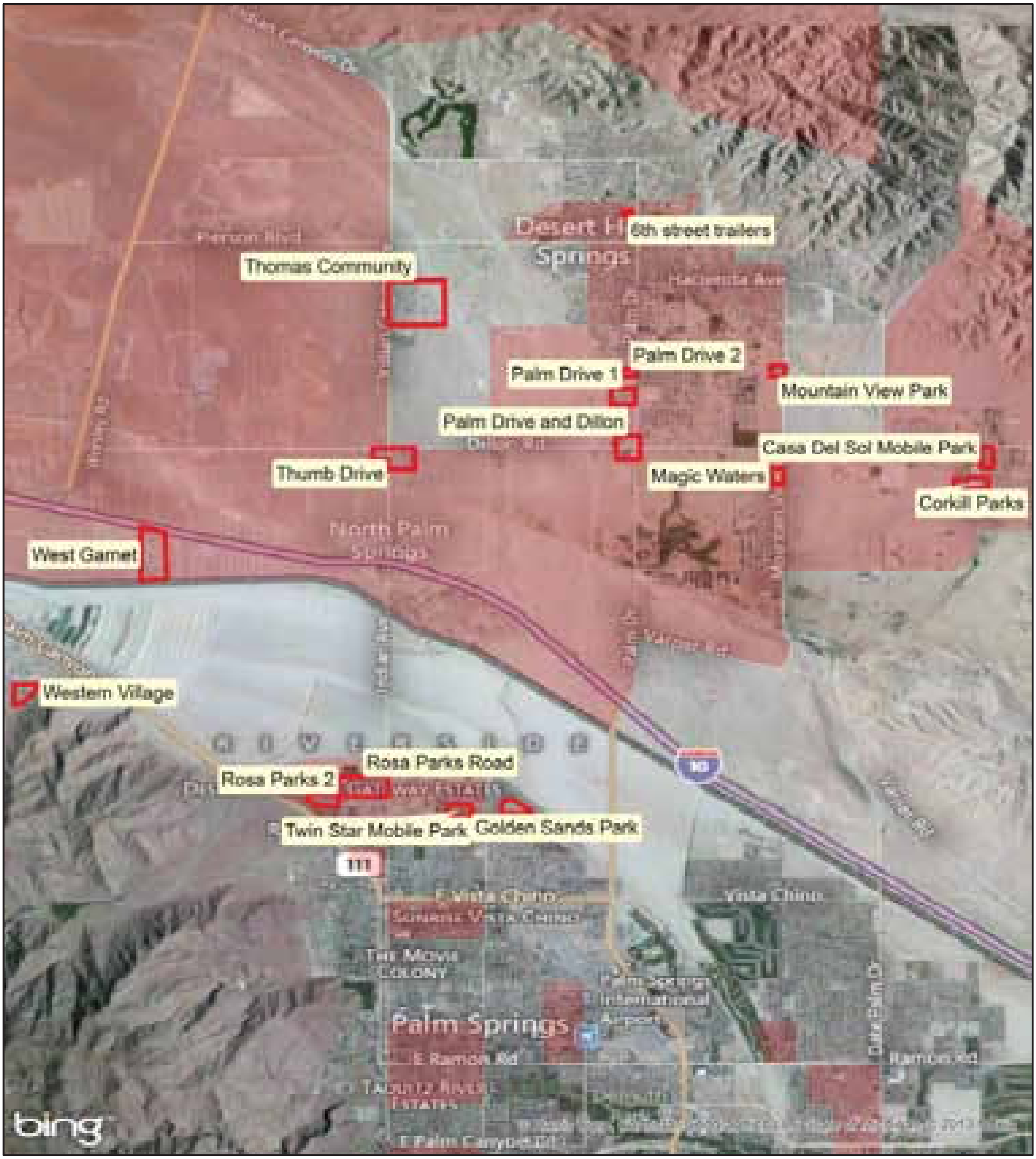
Salton Sea Beach and Desert Shores

Loma Linda University School of Public Health, RMC and CVIRWMG

Map E

CV Disadvantaged Communities Characterization

Severely DAC Mobile Home Park Clusters in Desert Hot Springs and Palm Springs



Loma Linda University School of Public Health, RMC and CVIRWMG

Map F

CV Disadvantaged Communities Characterization

Severely DAC Mobile Home Park Clusters in Indio and Thermal

Filmore Street, Indio, Thousand Palms, Cathedral City, and Shady Lane

Loma Linda University School of Public Health, RMC and CVIRWMG

Appendix VII-C: Disadvantaged Communities Water Quality Evaluation and Residential Groundwater Treatment Program

This appendix includes the report from the DAC Water Quality Evaluation technical study conducted as part of the 2014 Coachella Valley IRWM Plan update process. As a result of the DAC Water Quality Evaluation, DAC Project 4 – Residential Groundwater Treatment Program was developed. This program is one of four demonstration projects for the DAC Outreach Program, and is included in this appendix following the DAC Water Quality Evaluation report.

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Coachella Valley Integrated Regional Water Management Plan Update

Disadvantaged Community (DAC) Water Quality Evaluation

Final Report

Prepared by:

RMC
Water and Environment

February 2014

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1 Introduction

The Coachella Valley Regional Water Management Group (CVRWMG) – composed of Coachella Valley Water District (CVWD), Mission Springs Water District (MSWD), Desert Water Agency (DWA), Coachella Water Authority (CWA), and Indio Water Authority (IWA) – are preparing an update of the 2009 Coachella Valley Integrated Regional Water Management (IRWM) Plan. The purpose of the Coachella Valley IRWM Plan is to accurately characterize the existing water resources conditions, issues, and needs of the Valley, and then to establish a project selection process for funding water management projects that help to meet those needs. During the scoping process for the IRWM Plan update, stakeholders identified the need to better understand and document water quality conditions in the region's disadvantaged communities so that projects can be developed to ensure safe drinking water for those populations.

1.1 Project Purpose

The Coachella Valley Groundwater Basin (CVGWB or basin) is of critical importance to the local community – it provides the majority of water used in the Valley, including nearly all that is used for domestic purposes. In areas of the region that lay outside of municipal water suppliers' distribution systems, private wells pump groundwater from varying depths for use as drinking water. Elevated concentrations of fluoride, arsenic, chromium, uranium, nitrate, and total dissolved solids (TDS) are present in some areas of the groundwater basin; these constituents are presenting concerns about the quality of drinking water supplies.

The State of California defines a Disadvantaged Community (DAC) as a community with an annual median household income (MHI) that is less than 80% of the Statewide MHI. Using this standard, four of the nine cities in the Coachella Valley IRWM Region would qualify as DACs: Cathedral City, Coachella, Desert Hot Springs, and Palm Springs. Smaller DACs are also present in other areas of the Valley. Because groundwater is their only source of water, these communities are potentially impacted by poor groundwater quality.

To best manage the local groundwater resource to meet needs of all Valley residents, this study was conducted to assess groundwater quality issues in and around DAC areas outside of the water purveyor's municipal service areas. This study, documented herein, identified chemical constituents with concentrations that are near or exceed drinking water standards in groundwater in DAC areas, and developed and screened possible solutions for addressing any impacts resulting from these elevated concentrations in groundwater in these identified areas. This study also identified significant gaps in water quality data coverage in the basin, and presents a plan for addressing these data gaps. A groundwater quality monitoring plan was developed as part of the IRWM Program to assess local monitoring activities; that report, the *Evaluation of Valley-Wide Groundwater Monitoring Programs*, is included as Appendix VI-J to the 2014 Coachella Valley IRWM Plan Volume I.

2 Data Collection and Analysis

Data collected for this *DAC Water Quality Evaluation* were used to complete several key steps in the study:

- To identify the areas of concern (AOCs) within the groundwater basin;
- To identify the constituents of concern (COCs) within the groundwater basin;
- To determine where there are AOCs with COCs in groundwater above the primary drinking water standards;
- To identify projects that can address those COCs found in AOCs; and

- To aid in developing a groundwater quality monitoring plan to both fill data gaps and allow for ongoing assessment of DAC water quality issues.

For this analysis, only federal and state primary drinking water standards (referred to as Maximum Contaminant Levels or MCLs) were considered as these standards are set to protect human health. Secondary MCLs, also issued both the federal government and the State of California, are set based on esthetics, such as taste, odor or staining potential, but do not present human health hazards. As such, Secondary MCLs were not considered in this analysis.

2.1 Data Collection and Review

Data used in the *DAC Water Quality Evaluation* were collected from publically-available sources and from IRWM stakeholders. A formal request for data was submitted to the CVRWMG and the region's stakeholders on August 17, 2012. Subsequent requests for data were made to the stakeholders, via email, in late August and early September 2012. Requested data sets included:

- Groundwater quantity data, such as groundwater elevations, DAC and/or municipal supply well locations, and well construction details.
- Groundwater Quality data, such as water quality and monitoring data, information to establish water-bearing zones correlating with the water quality data, geostatistical analyses, plume delineations (for both natural and anthropogenic plumes), and information regarding groundwater treatment systems.
- Monitoring information, including information regarding ongoing monitoring programs, the location and screened depths of wells being monitored, water quality sampling and analysis parameters, the frequency of sampling/data evaluation, and reporting methodologies.
- Other information, such as the location of septic systems, groundwater management plans (GWMPs) and groundwater-specific studies.

Water quality data were received from CVWD, and well construction logs were received from the California Department of Water Resources (DWR). Additional GIS-based data sets were received from CVWD, including a shapefile of their potable water service area.

Supplemental groundwater quality data were collected from two publically-available online databases – GAMA-Geotracker and the Water Quality Portal. GAMA-Geotracker is an online groundwater information system maintained by the State Water Resources Control Board that allows access to water quality data from multiple sources, including the State and Regional Water Boards, California Department of Public Health, Department of Pesticide Regulation, Department of Water Resources, U.S. Geological Survey (USGS), and Lawrence Livermore National Laboratory. The Water Quality Portal (WQP) is located on the National Water Quality Monitoring Council (NWQMC) website. NWQMC is an organization composed of representatives from the USGS and U.S. Environmental Protection Agency (USEPA) created to develop collaborative, comparable and cost-effective approaches for monitoring and assessing the Nation's water quality. The WQP is a cooperative service by the USGS, the USEPA, and the NWQMC that integrates publicly-available water quality data from the USGS National Water Information System (NWIS) and the EPA STOrage and RETrieval (STORET) Data Warehouse.

2.2 Data Analysis

Data sets used in this DAC Water Quality Evaluation are as follows:

- Groundwater basin designation/delineation – DWR
- Geology/Hydrogeology – DWR, USGS
- Potable water service areas – CVWD, DWA, IWA, MSWD, and CWA
- DAC designation/delineation – U.S. Census Bureau
- Well construction information – DWR
- Water Quality Data – USGS, USEPA, SWRCB, RWQCBs, Department of Public Health, Department of Pesticide Regulation

The data sets were manipulated in a GIS environment, with data layers overlain to identify intersections. Figures 1 through 6 show some of the GIS layers that were developed and applied during the data evaluation.

Over 20 chemical constituents or classes of constituents were evaluated during the data analysis. These are as follows:

- Dissolved oxygen
- pH
- Alkalinity
- Turbidity
- Volatile Organic Compounds (VOCs)
- Polar Pesticides and degredates
- Pesticides and degredates
- Pharmaceutical Compounds
- Dissolved Organic Carbon
- Wastewater Indicator Compounds
- Perchlorate
- 1,2,3-trichloropropane
- Nutrients
- Major and Minor Ions and Trace Elements
- Arsenic
- Chromium
- Iron
- Hydrogen and Oxygen Isotopes
- Carbon and Carbon 14 Isotopes
- Uranium
- Radioactivity
- Noble Gases
- Bacterial Indicators
- Viral Indicators

In addition, a SWRCB document entitled *Communities that Relay on Contaminated Groundwater* (February 2012) was examined to determine how the results of that study correlated with the findings of the data analysis. As documented in this study, 22 of the 36 identified community water systems in Riverside County were found to be 100% reliant on groundwater, and eight communities were found to have MCL violations. Of these eight communities, all were 50% to 100% reliant on groundwater as their principal water supply. Finally, the study identified 10 principal contaminants in these water system; these constituents were arsenic, nitrate, gross alpha radioactivity, perchlorate, perchlorethylene (PCE), trichloroethylene (TCE), uranium, dibromochloropropane (DBCP), fluoride, and carbon tetrachloride. The report did not, however, provide a sufficient level of detail to allow direct correlation to the Coachella Valley (versus all of Riverside County as a whole).

Figure 1: Coachella Valley Groundwater Basin

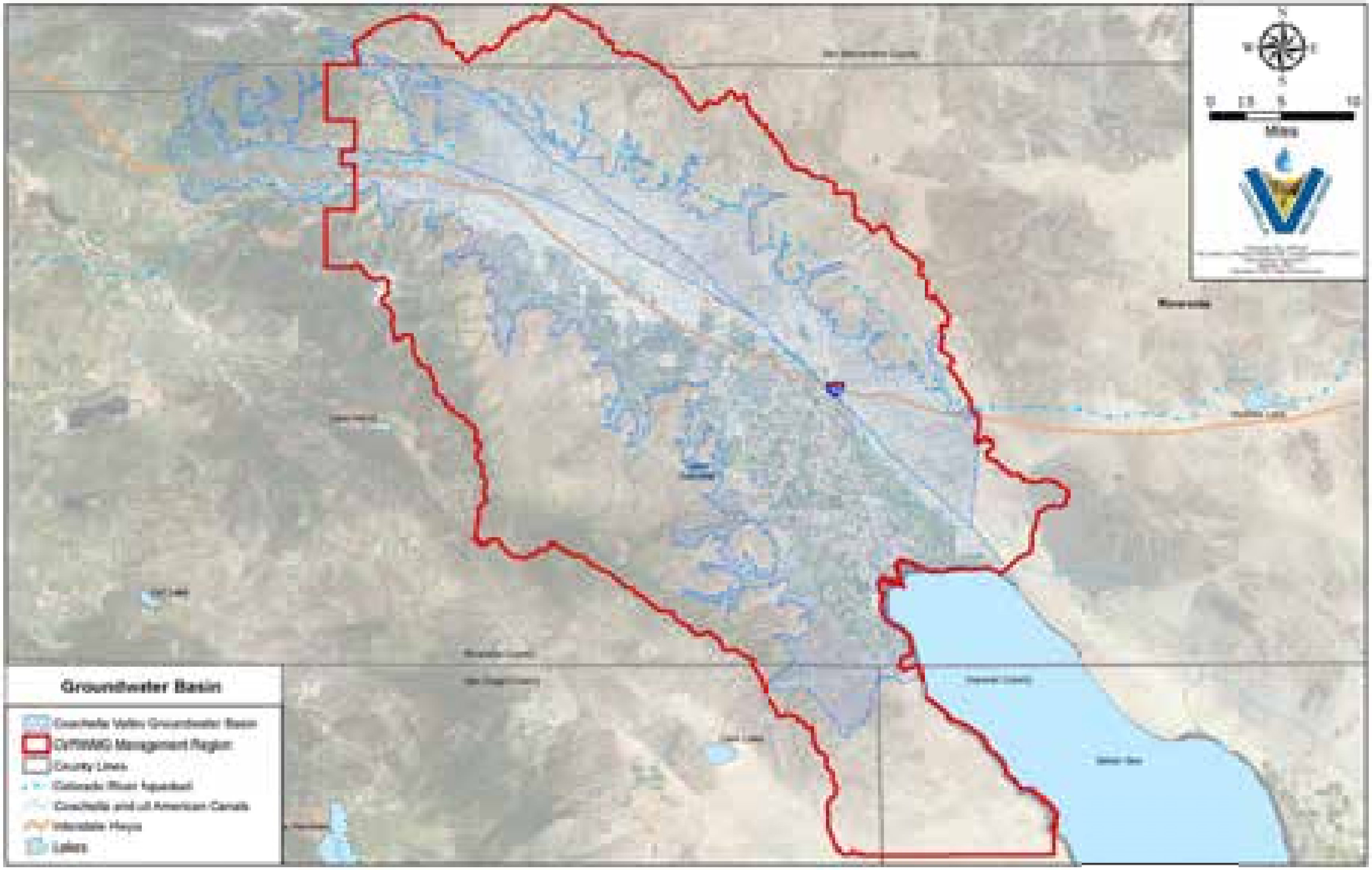


Figure 2: Public Water Service Areas in the Coachella Valley Groundwater Basin

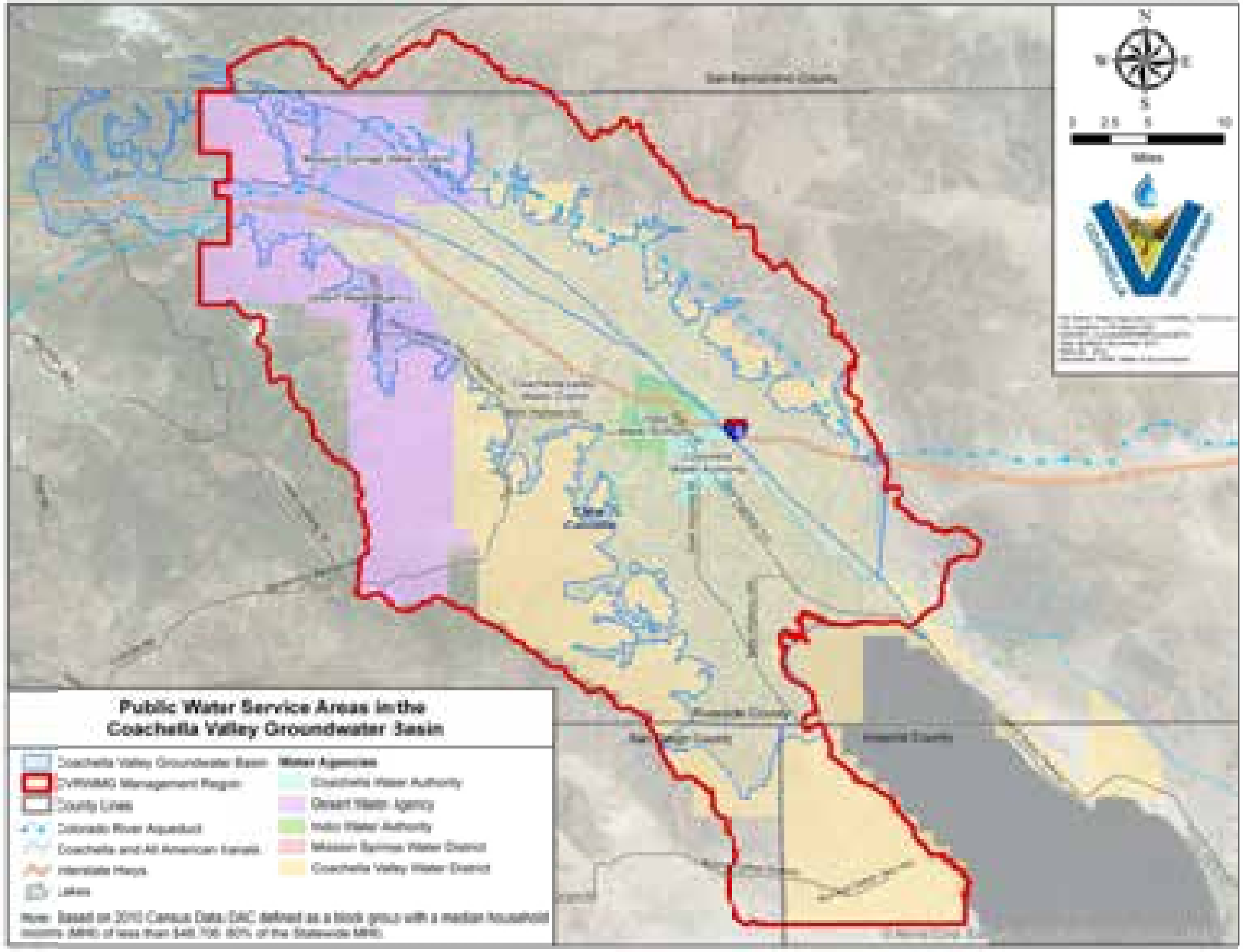


Figure 3: Disadvantaged Communities in the Coachella Valley Groundwater Basin

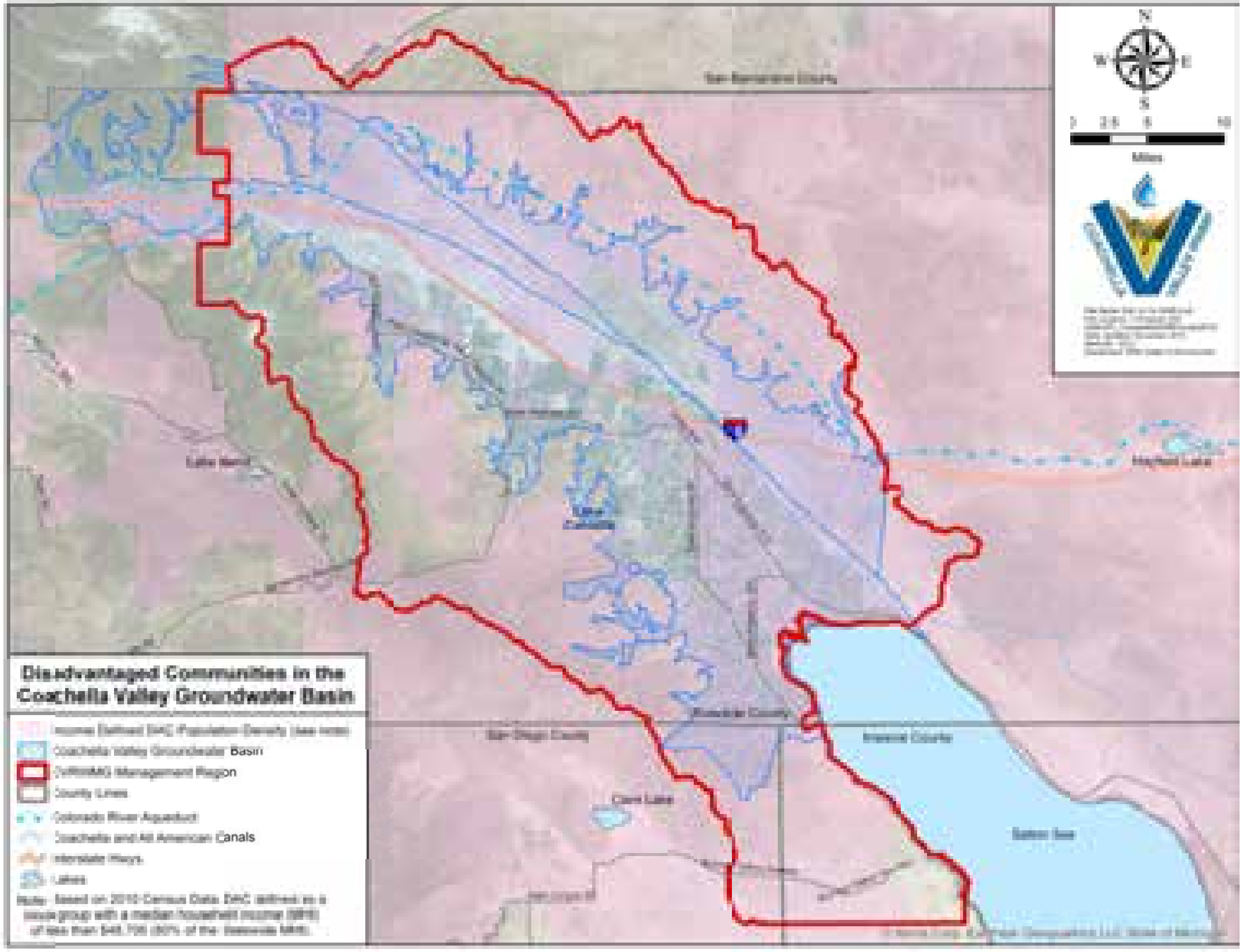


Figure 4: Screenshot of GeoTracker-GAMA Data Set

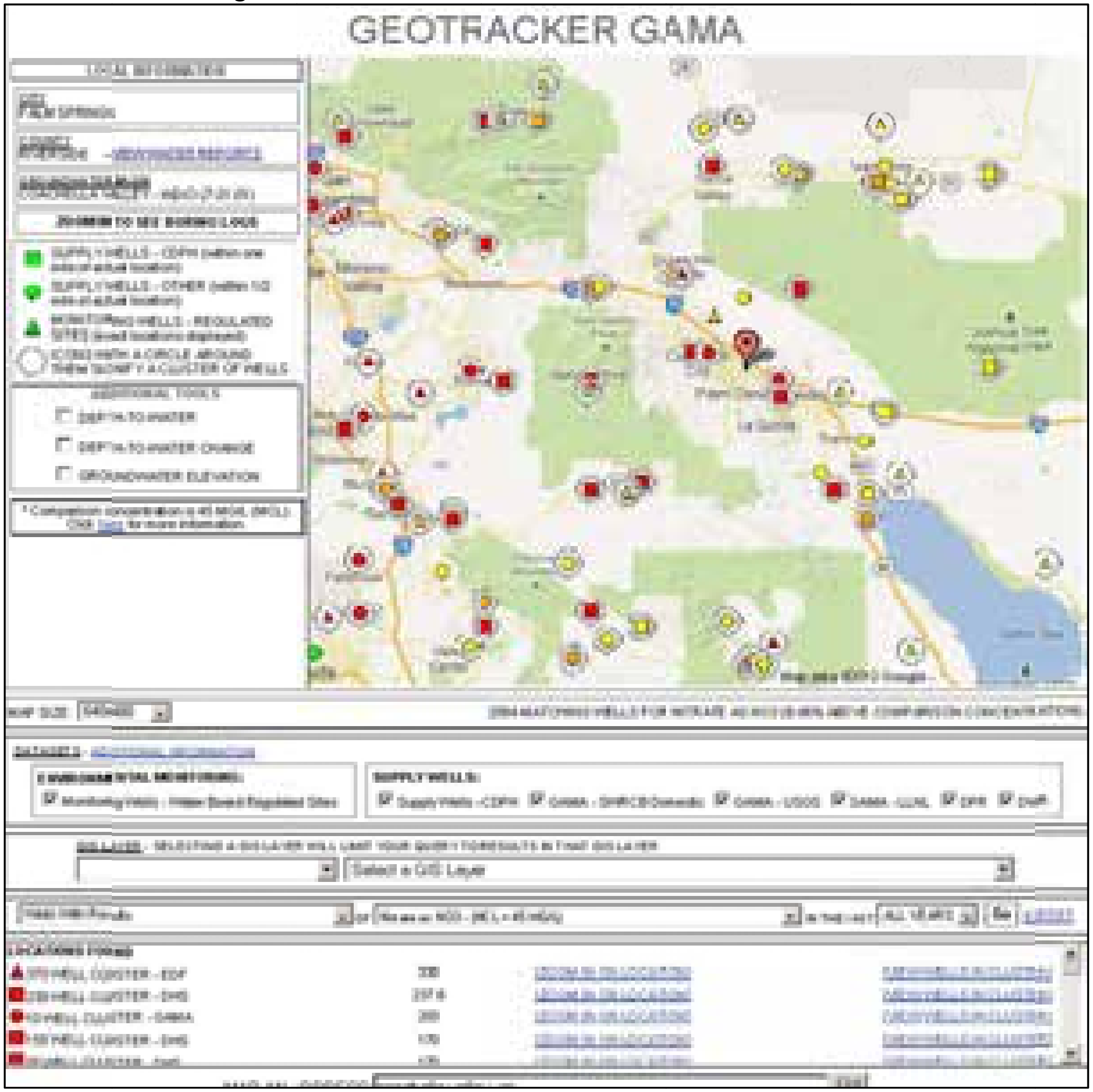


Figure 5: Screenshot of Data Set from Water Quality Data Portal

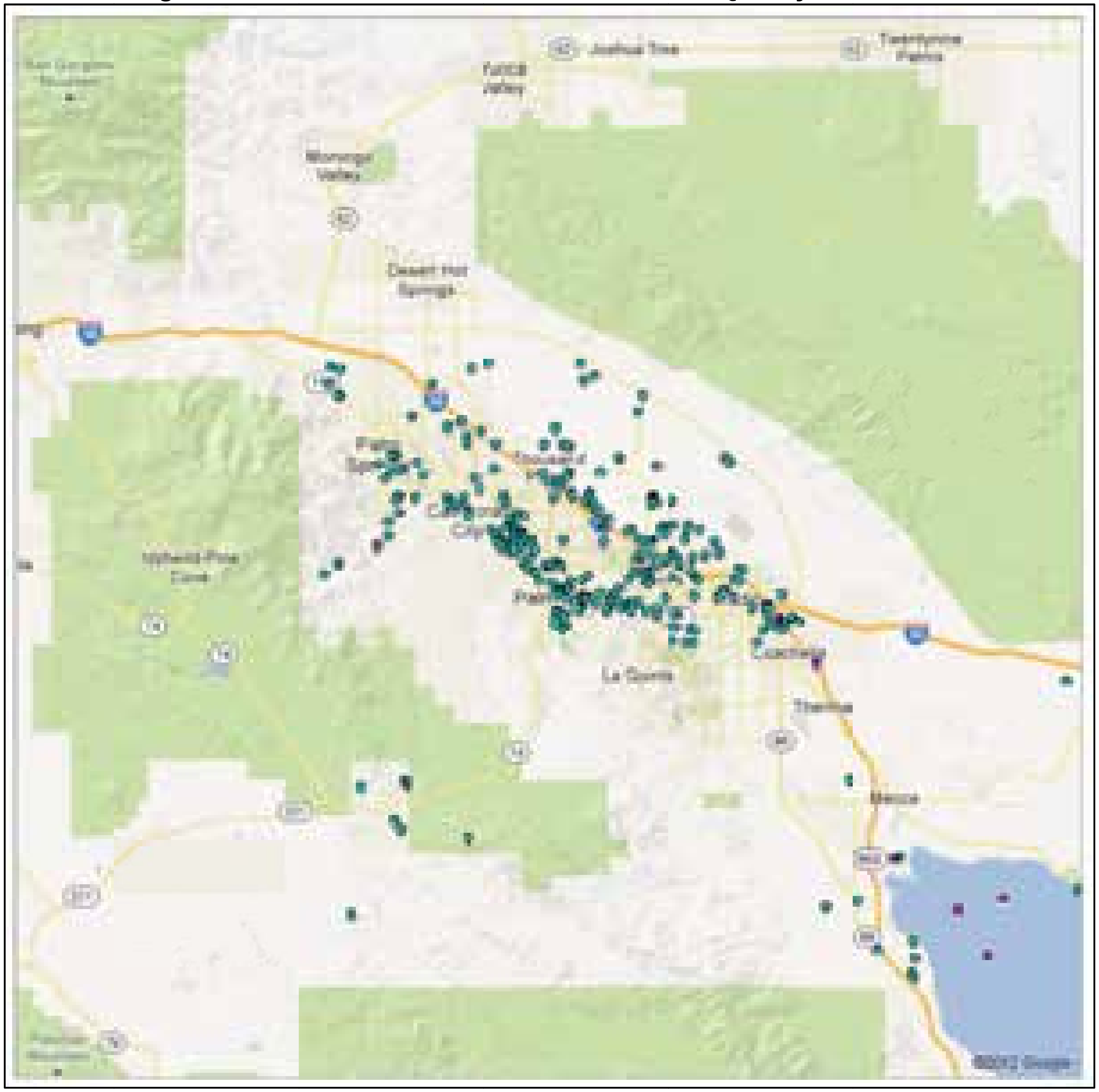
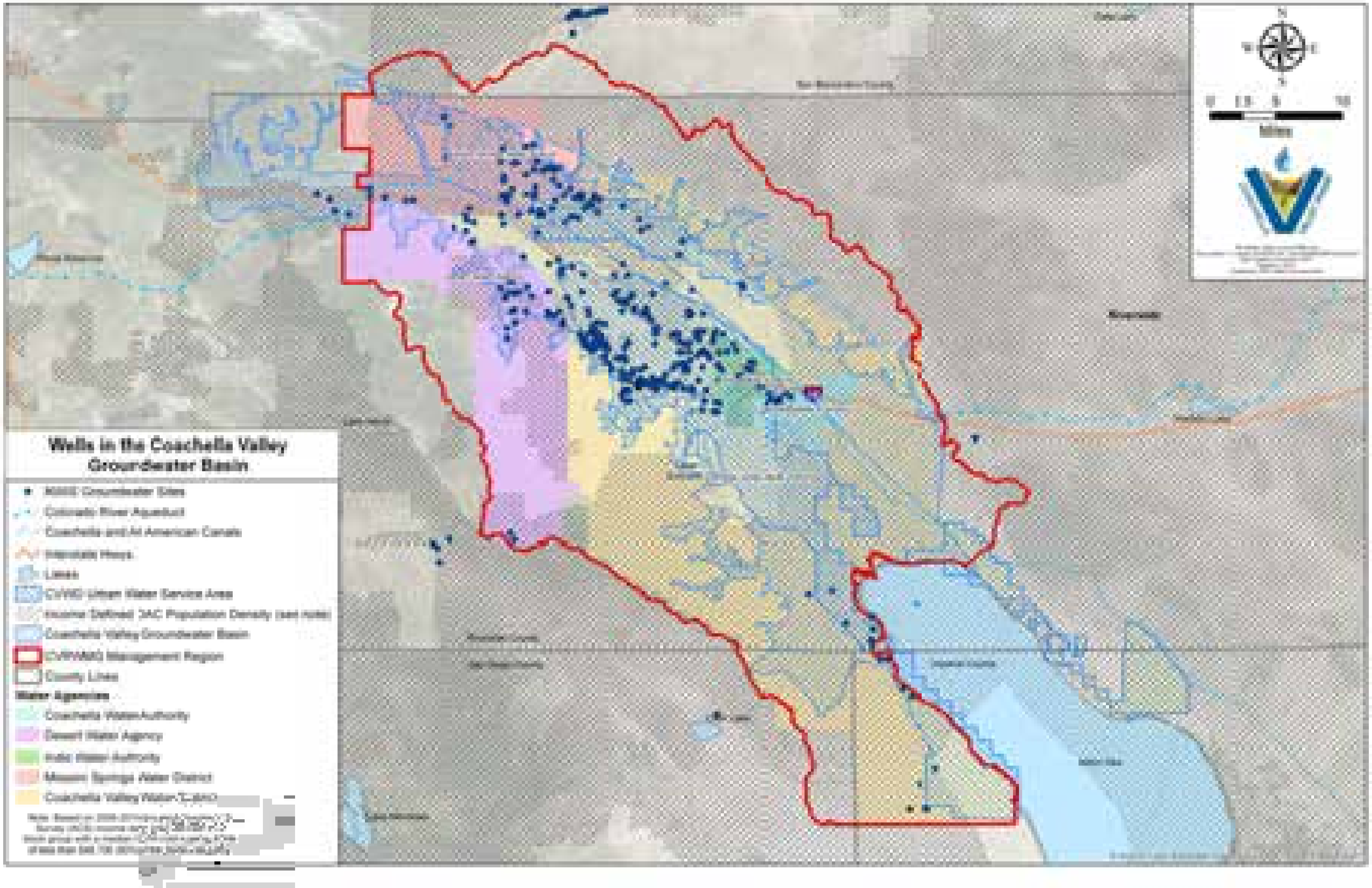


Figure 6: Wells in the Coachella Valley Groundwater Basin



3 Problem Identification and Solution Development and Evaluation

The following section describes how the data collected above were used to identify problem areas in the groundwater basin and to develop solutions to drinking water supply impacts.

3.1 Identification of Areas of Concern (AOCs)

Areas of concern (AOCs), for the purpose of this analysis, are defined as areas overlying the groundwater basin, outside of an established public potable water service area, containing DACs. Additionally, these areas contain wells that have groundwater quality data exceeding the Primary Maximum Contaminant Level (MCL) of drinking water standards for specific constituents (called Constituents of Concern or COCs). Key to this definition is the assumption that public water agencies, such as CVWD, DWA, IWA, MSWD and CWA, regularly monitor their delivered water quality and have taken actions, as needed to date, to ensure that the potable water they deliver meets drinking water standards. Therefore, the AOCs are those areas that depend on individual or small community water supply wells for their service, and the assumptions that these wells are infrequently tested and groundwater from these wells is not treated.

To identify these AOCs, the water quality data were combined with other existing database/GIS information, such as the delineation of the Coachella Valley IRWM Region and the CVGB and the location of the water agency potable water service areas. These layers were then overlain by the identified DACs to identify the AOCs. Figure 7 shows the locations of AOCs within the CVGB, while Figures 8 through 11 highlights the individual areas of concern.

3.2 Identification of Constituents of Concern (COCs)

The water quality data previously described were evaluated to identify those constituent in the groundwater basin that had one or more exceedences of their respective primary MCLs. The AOCs, as described above, were then overlain on these data to determine/confirm if the AOCs overlie these areas of known groundwater quality exceedences. In summary, four constituents of concern (or COCs) were identified for the Coachella Valley Groundwater Basin: arsenic, fluoride, nitrate, and uranium. Table 1summarizes the COCs and the average observed concentrations.

Table 1: Identified Constituents of Concern

Constituent of Concern	Primary MCL	Average Concentration in AOCs	Number of Sampling Points
Arsenic	10 μg/L	237 μg/L	8
Fluoride	2 mg/L	6.6 mg/L	200
Nitrate – N	10 mg/L	30.2 mg/L	302
Uranium	30 mg/L or 20 pCi/L	28.6 pCi/L	52
Hexavalent Chromium	10 μg/L	9.1 μg/L	392

Recently, elevated concentrations of chromium in groundwater in the Coachella Valley Groundwater Basin have been considered cause for concern due to the development of a drinking water standard for hexavalent chromium (Cr^{+6}). In August of 2013, the California Department of Public Health (CDPH) issued a draft primary MCL of 10 μg/L for hexavalent chromium. As some groundwater samples collected in east of Palm Springs around the border of Indio and Mission Creek Subbasins, north of North Palm Springs and around La Quinta, Indian Wells, Indio and Coachella show hexavalent chromium concentrations above the proposed primary MCL, hexavalent chromium was added to the list of COCs to be addressed in this study.

Figure 7: Areas of Concern (AOCs)

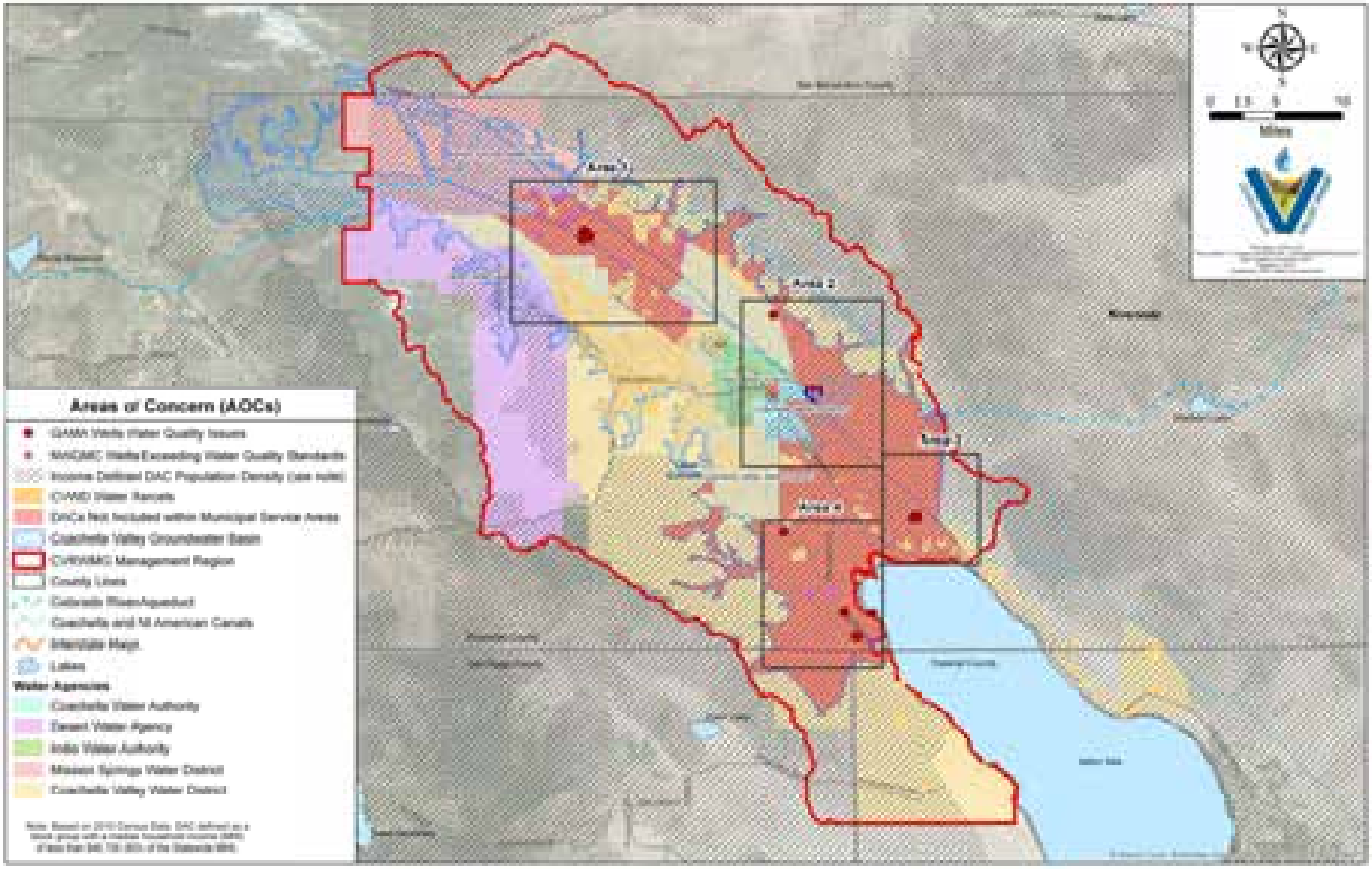


Figure 8: Areas of Concern – Area 1

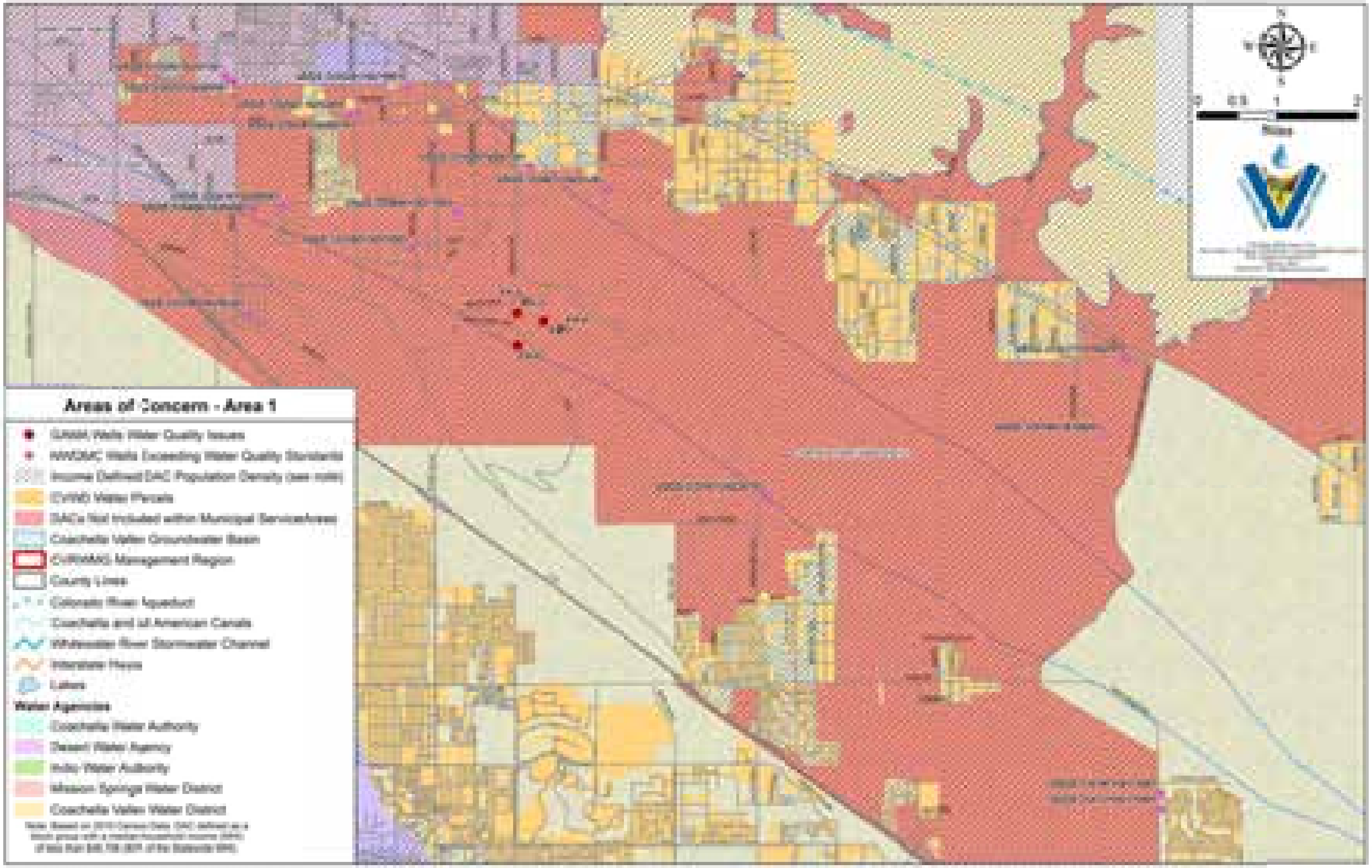


Figure 9: Areas of Concern – Area 2

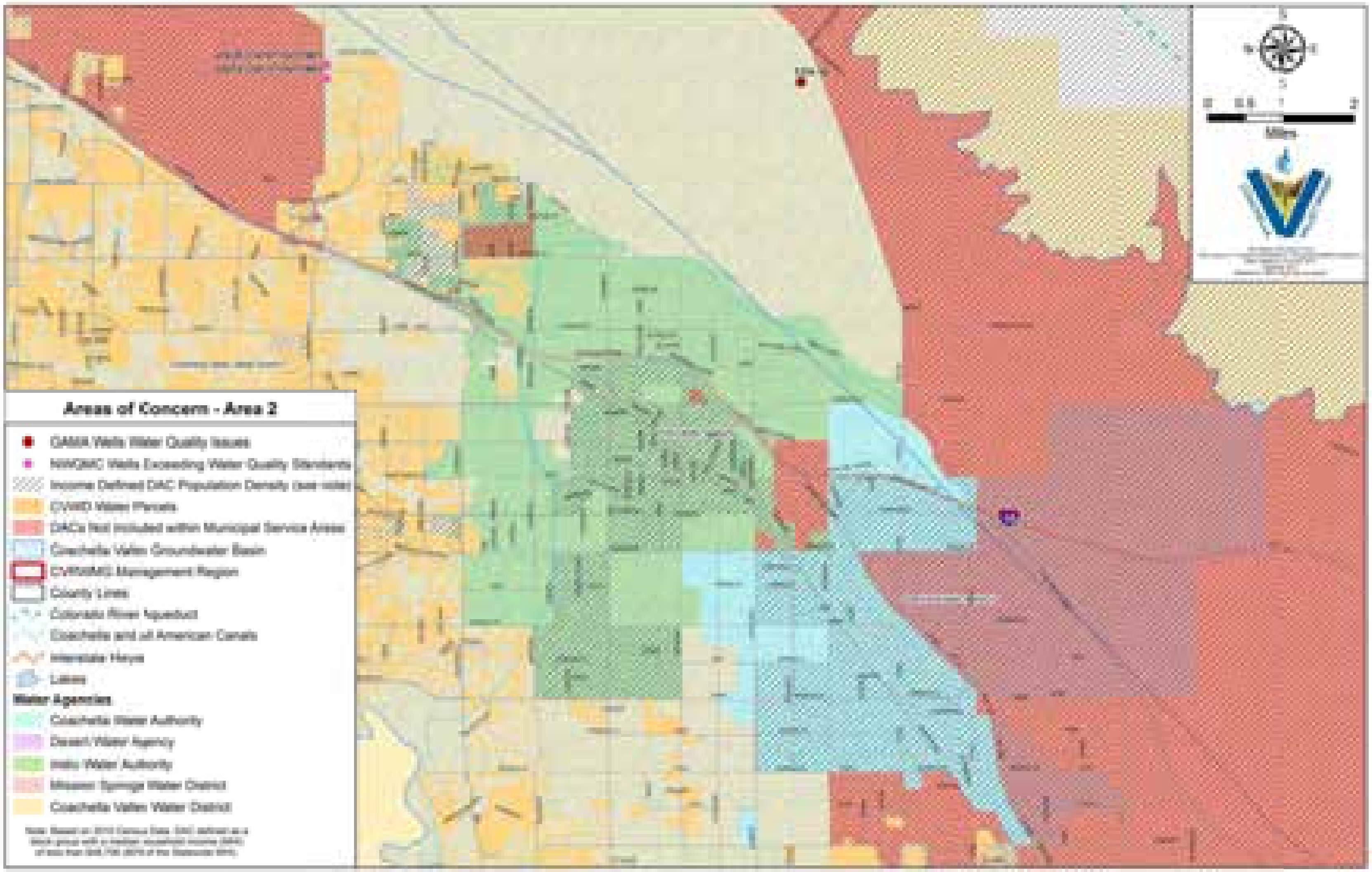
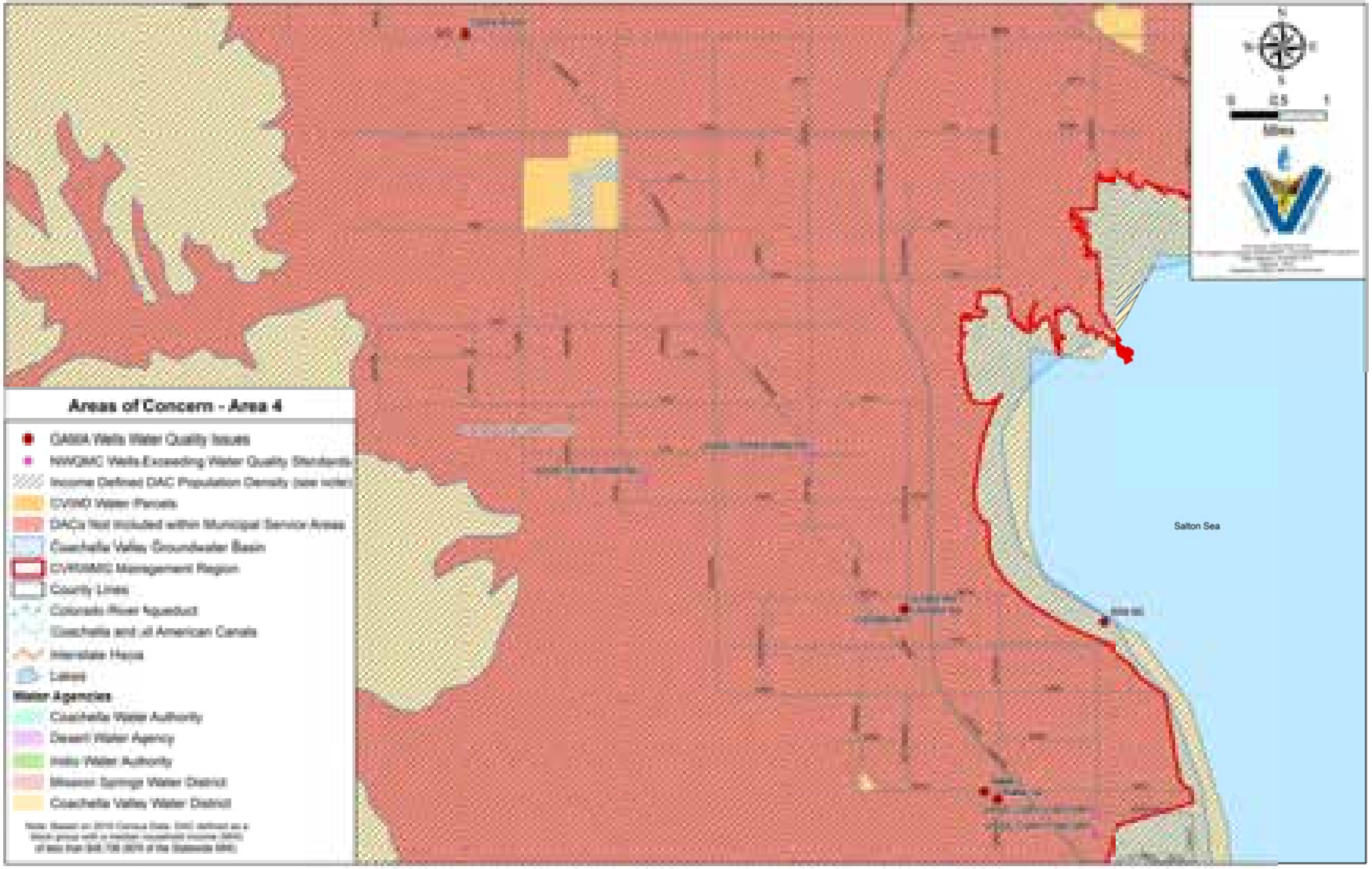


Figure 10: Areas of Concern – Area 3

Figure 11: Areas of Concern – Area 4



3.3 Management/Treatment Alternatives

In order to address groundwater concentrations of COCs above drinking water, possible treatment/management alternatives and delivery methods were identified and considered for use in the AOCs. These management and treatment alternatives are discussed in more detail below.

3.3.1 Treatment Methods

Publically-available resources were used to evaluate potential treatment technologies for removing the COCs from groundwater. One key source utilized was the USEPA's Drinking Water Treatability Database, found at http://iaspub.epa.gov/tdb/pages/general/home.do. This database presents referenced information on the control of contaminants in drinking water gathered from thousands of literature sources. The database includes more than 25 treatment processes used by drinking water utilities, and presents literature from peer-reviewed journals and conferences, other conferences and symposia, research reports, theses, and dissertations, in addition to bench-, pilot- and full-scale studies of groundwater treatment.

Table 2 summarizes the various treatment methods available for the selected COCs, and provides a relative ranking of the effectiveness of those methods. Table 3 identifies which treatment methods are considered Best Available Technology (BAT) for the identified COCs.

Treatment Methods for Arsenic

Arsenic occurs naturally in rock, soil and biota. Arsenic in groundwater exists in one of two oxidation states, depending on local oxidation-reduction conditions: as Arsenite (or As(III)) or Arsenate (or As(V)). Under anaerobic (low oxygen) conditions, as often found in deep groundwater, arsenic exists predominantly as As(III). Under aerobic (fully oxygenated conditions), such as observed in surface water or shallow groundwater, arsenic exists primarily as As(V). The effectiveness of groundwater treatment systems for arsenic often are affected by the oxidation state of the arsenic in groundwater. In many cases, pretreatment is included as part of the treatment process to oxidize the As(III) to transform it to As(V) in order to improve removal efficiencies.

Arsenic has been linked to cancer and has been shown to have non-carcinogenic cardiovascular, pulmonary, neurological and endocrine effects. As a result, the USEPA and the State of California set a Primary MCL of 10 micrograms per liter (µg/L) in drinking water. Methods for treating/removing arsenic from groundwater includes:

- Adsorptive Media
- Aeration and Air Stripping
- Biological Filtration
- Chemical Treatment
- Chloramine
- Chlorine
- Chlorine Dioxide
- Conventional Treatment
- Direct Filtration
- Granular Activated Carbon
- Ion Exchange
- Membrane Filtration
- Membrane Separation
- Ozone
- Permanganate
- Precipitative Softening
- Slow Sand Filtration
- Ultraviolet Irradiation (UV)

These processes are described in more detail below and are predominantly from the USEPA's drinking water treatability database (USEPA, 2012b).

Table 2: Treatment Alternatives

Constituent	Adsorptive Media	Aeration/Air Stripping	Biological Filtration	Biological Treatment	Chemical Treatment	Chloramine	Chlorine	Chlorine Dioxide	Conventional Treatment	Direct Filtration	Electrodialysis	GAC	Ion Exchange	Membrane Filtration	Membrane Separation	Ozone	Permanganate	PAC	Precipitative Softening	Slow Sand Filtration	Ultraviolet Irradiation
Arsenic	++	●	+		+	–	PT	–	++	++		●	++	++	++	++	++		++	++	–
Fluoride	++			+	+				+				+		++			++	+		
Uranium	++			+					++			++	++	–	++				++		
Nitrate				+	+						++		++		++						
Hexavalent Chromium	+								++			●	++		++				++		

Notes: + Effective treatment alternative
++ Very effective treatment alternative
– Not effective treatment alternative
● Somewhat effective treatment alternative

Table 3: Best Available Technology

Constituent	Adsorptive Media	Conventional Treatment	Direct Filtration	Ion Exchange	Membrane Separation	Precipitative Softening
Arsenic	✓	✓	✓	✓	✓	✓
Fluoride	✓				✓	
Uranium	✓	✓		✓	✓	✓
Nitrate				✓	✓	
Hexavalent Chromium		✓		✓	✓	✓

Adsorptive Media

Adsorption can be very effective for removing arsenic from groundwater - up to greater than 99 percent removal - and is a commonly used method for arsenic treatment. Arsenic removal by adsorptive media is largely dependent on the initial concentration, oxidation state, adsorbent type, and water chemistry (pH and competing anions). Adsorption can be achieved through the use of aluminum and iron oxide/hydroxides (amorphous or granular); however, adsorption on activated alumina is listed by the USEPA as one of the BATs for arsenic removal.

Aeration and Air Stripping

Effect of aeration on the removal of arsenic was studied in full-scale on a well water sample. Aeration was used as a pre-treatment for the oxidation of arsenic (As) prior to removal. Aeration was found to be largely ineffective in oxidizing As(III) to As(V). Forced draft aeration performance was slightly better than staged bubble aeration, with up to 25 percent of As(III) oxidation was observed with forced draft aeration.

Biological Filtration

Biological filtration using biological activated carbon (BAC) was found to be highly effective in the removal of arsenic from groundwater based on data available from one study. The high removal of arsenic through the BAC filter was due to the presence of iron oxidizing bacteria in the BAC filter. Iron present in the raw water was oxidized by the bacteria, and arsenic was removed by co-precipitation with biologically-oxidized iron.

Chemical Treatment

Removal of arsenic by chemical treatment can be effective under appropriate conditions. In one EPA study, Filox, a manganese dioxide-based media, was effective for As(III) oxidation. When dissolved oxygen (DO) was not limiting, complete oxidation was observed under all conditions studied. However, when DO was reduced, incomplete oxidation was obtained in the presence of interfering reductants. The adverse effect of interfering reductants was completely eliminated by supplying enough DO or increasing the contact time. In addition to oxidizing As(III), the Filox media also removed some arsenic by adsorption, which diminished greatly as the media came into equilibrium with the As(III)-spiked synthetic water.

Chloramine

The effect of chloramines on the oxidation/removal of arsenic was studied in two bench-scale experiments. One study used formulated challenge water similar in composition to surface and ground waters. In that study, a monochloramine dose of 0.10 milligrams per liter was added to the oxidation reactor and a 40 percent oxidation of As(III) to As(V) was observed. In the other study, a real surface water sample was used, and a high chloramine residual was obtained. Both studies indicated that chloramines are not very effective in the conversion of As (III) to As(V).

Chlorine

Chlorine is very commonly used as a pre-treatment for arsenic removal. If As(III) is present, the water is chlorinated in order to oxidize As(III) to As(V). Removal efficiencies of most arsenic treatment processes are higher with As(V) than with As(III). Greater than 95 percent of As(III) was oxidized to As(V) with the application of chlorine for both ground waters and surface waters.

Chlorine Dioxide

Oxidation of As(III) to As(V) using chlorine dioxide was studied in one bench-scale experiment. The water used in the test was formulated challenge water similar in composition to surface and ground waters. A low dose (0.27 mg/L) of chlorine dioxide was not very effective in the oxidation of As(III). However, when the chlorine dioxide dose was increased to 0.90 mg/L, greater than 95 percent oxidation of As(III) was achieved.

Conventional Treatment

Removal of arsenic by conventional treatment processes can be very effective under appropriate treatment conditions. Removal efficiencies are higher for As(V) (up to greater than 99 percent removal) than for As(III). Conventional treatment for arsenic removal can consist of oxidation/ filtration, or coagulation/ filtration, both of which are considered BATs by the USEPA.

Oxidation/filtration is also known for iron (Fe) removal and refers to a precipitative process that is designed to remove naturally occurring iron and manganese from water. Arsenic can also be removed by this process using two mechanisms: adsorption and coprecipitation. In this treatment process, an oxidant is first added to the water to oxidize soluble iron and As(III). Then As(V) adsorbs on to the iron hydroxide and precipitates out. The resulting solution is then filtered to remove the precipitates. Oxidation/filtration works well when the Fe:As ratio exceeds 20:1.

Coagulation/ filtration processes are more commonly used than oxidation/ filtration processes for arsenic removal. Coagulation/ filtration is a precipitative process that can be optimized to remove dissolved inorganic As(V) from water. The mechanism involves adsorption and co-precipitation of As(V) to a coagulant precipitate. Both alum and ferric coagulants have been shown to successfully remove As(V) below the maximum contaminant level (MCL) during the coagulation/ filtration process, even though removal efficiencies achieved with ferric were higher than alum. Performance of a coagulation/ filtration process is improved when the addition of Fe elevates the Fe:As ratio to above 20:1. Both alum and ferric coagulants may require pH adjustment to achieve optimal arsenic removal for most water sources.

Direct Filtration

Removal of arsenic by direct filtration can be very effective (75 percent to greater than 99 percent removal of As(V)), especially with the addition of a coagulant. Direct filtration for arsenic removal can constitute of oxidation/ filtration, or coagulation/ filtration, both of which are considered BATs by the USEPA and were described above under conventional treatment. In field applications, arsenic removal via direct filtration is primarily applied to groundwater sources with low turbidity. Sand is primarily used as filter media in direct filtration for the removal of arsenic. The use of manganese greensand is presented in the description of Ion Exchange, provided below.

Granular Activated Carbon

Removal of arsenic by granular activated carbon was documented in one pilot study, which ran for 60 days. The waters tested were surface water, well water, and well water spiked with arsenic. Granular Activated Carbon (GAC) filters were placed after dual-media filters, and the GAC bed depth was 30 inches. Additional arsenic removal (varying between 11 and 99 percent) was observed when water was treated by the GAC filters. The mechanism of arsenic removal by GAC was hypothesized to be filtration (particle removal) not adsorption.

Ion Exchange

Ion exchange is among the BATs listed by the USEPA for arsenic treatment. Ion exchange processes can remove arsenic from water very effectively (greater than 99 percent removal), when arsenic is in the As(V) oxidation state. If As(III) is present in the raw water, a concurrent oxidation is usually applied to convert As(III) to As(V). The removal efficiency is dependent upon the resin type, regeneration frequency, initial arsenic concentration, and competing ions in the water (especially sulfate). Strong base anion exchange resins in either the chloride form or the hydroxide form are most consistent in the removal of arsenic. The chloride form is preferred because regeneration is accomplished with a salt rather than caustic solution.

Membrane Filtration

Membrane filtration is generally very effective for the removal of arsenic, with up to 50 percent to 99 percent removal. The process typically consists of the addition of an iron-based coagulant to water. Arsenic-Iron (As-Fe) complexes are formed which precipitate from the solution and are filtered out by the membrane. So the arsenic removal process is through filtration rather than size exclusion (as is the case for membrane separation, described below). For effective removal, arsenic present in the water should be in the As(V) oxidation state. Any As(III) present in the water should be preoxidized with chlorine or other oxidants for effective removal. Lowering the water's pH prior to the addition of coagulant also lowers the coagulant dose necessary (thereby lowering solids loading on the membrane, increasing membrane flux and improving the operational life of the system) and increases arsenic removal efficiency.

Membrane Separation

Removal of As(V) from water by membrane separation processes can be very effective (50 percent to greater than 90 percent removal). Literature data suggest that removal of As(III) by membrane separation is not as effective. Reverse osmosis (RO) has been identified by the USEPA as a BAT for arsenic removal, while nanofiltration has also been used in some cases. RO is a pressure-driven membrane separation process capable of removing arsenic from water by means of particle size, dielectric characteristics, and hydrophilicity/ hydrophobicity. Factors such as applied pressure on the membranes, feedwater temperature, influent arsenic concentration, and source water chemical composition, have strong influence on the efficiency of membrane processes.

Ozone

Oxidation of As(III) to As(V) can be very effective with ozone. Ozone pre-treatment can be used prior to removal of As(V) by other treatment technologies. In two bench-scale studies, greater than 95 percent conversion of As(III) to As(V) was observed for both surface water and formulated challenge water (with composition similar to ground water and surface water) samples. The ozone doses in these experiments varied from 0.1 to 0.8 milligrams per liter and the contact times were between 0.0033 and 2.2 minutes.

Permanganate

Oxidation of As(III) to As(V) can be very effective with potassium permanganate, as observed in one bench-scale study. The water used in the test was formulated challenge water similar in composition to surface and ground waters. The permanganate dose tested ranged from 0.16 to 3.20 milligrams per liter. The permanganate contact times ranged from 0.25 to 0.85 minutes. Greater than 95 percent oxidation of As(III) to As(V) was observed even at the lowest permanganate dose and the shortest contact time.

Precipitative Softening

Precipitative softening is considered a BAT for arsenic removal by the USEPA. Removal of arsenic by precipitative softening can be effective under certain conditions. In several bench-scale studies, it was shown that arsenic removal by softening varied greatly (between less than 5 and greater than 95 percent) in synthetic groundwater. For optimal performance in removing both As(III) and As(V), the pH range used in softening experiments varied between 9 and 12. When softening is performed with lime at pHs higher than 10.5, magnesium hydroxide is formed and As(V) is removed by co-precipitation with magnesium hydroxide.

Slow Sand Filtration

Removal of arsenic from water by slow sand filtration was shown to be very effective (95 percent removal) in one pilot study. The source water was groundwater with a total arsenic concentration of 17.4 micrograms per liter. Iron was oxidized and precipitated from the water, and arsenic was removed by co-precipitation with iron.

Ultraviolet Irradiation

Oxidation of As(III) to As(V) using ultraviolet irradiation was tested in one bench-scale study. The water used in the test was formulated challenge water similar in composition to surface and ground waters. For the majority of the experiments, UV was largely ineffective in oxidizing As(III) to As(V), with conversions lower than 50 percent. The UV intensity tested varied between 32 and 41.2 milliWatts per square centimeter with UV contact times varying between 60 and 1440 minutes.

Treatment Methods for Fluoride

Fluoride is a naturally occurring element found in groundwater. Low levels of fluoride occur naturally in most sources of drinking water, and are the result of leaching from rock formations. In drinking water, fluoride may be applied at low levels to aid in dental and skeletal health; however, elevated concentrations can lead to bone or dental disease. As a result, the USEPA and the State of California established a Primary MCL of 4 mg/L for fluoride.

Methods for removing fluoride from groundwater include the following treatment processes:

- Adsorptive Media
- Biological Treatment
- Chemical Treatment
- Conventional Treatment
- Ion Exchange
- Membrane Separation
- Other Treatment
- Powdered Activated Carbon
- Precipitative Softening

Each of these methodologies is described in more detail below (USEPA, 2012b).

Adsorptive Media
Removal of fluoride in water by adsorptive media can be very effective (up to 100% removal depending on the type of media used) and is the most common defluoridation method used. Adsorptive media available for removal of fluoride in water includes activated alumina (AA), which has been designated BAT for fluoride control. In general, the adsorption process is typically highly pH dependent and generally is most effective at a slightly acidic pH. The fluoride removal capacity generally increases directly with fluoride concentration and inversely with pH of the water. Removal of fluoride is also highly dependent on the amount of adsorptive media used and on the contact time between provided between fluoride and the adsorptive media.

Biological Treatment
Batch studies demonstrated that algal biosorbents were somewhat effective for the removal of fluoride from the aqueous phase (depending on the species), and not effective for others. Removal was shown to be affected by the initial fluoride concentration, pH, adsorbent concentration, and temperature. Greater fluoride removal was observed with: lower initial fluoride concentration, lower pH, and greater adsorbent concentration.

Chemical Treatment
Removal of fluoride in water by the Nalgonda technique can be effective (52-86% removal), where the effectiveness is primarily dependent on fluoride concentration, pH, and alum/lime dosages. The Nalgonda technique involves mixing of alum and lime solution with the raw water in a two-step process to remove fluoride. High alum dosages are typically required to reduce fluoride levels enough for drinking water applications and can therefore result in exceedances of safe levels of aluminum and sulfate in the treated water. This process also generates a significant quantity of sludge.

Removal of fluoride in water by various calcium phosphates was found to be effective for one study (>90% removal). The effectiveness of fluoride removal was primarily dependent on pH, amount of fluoride in the raw water and amount of calcium phosphates added. One study also reported the removal of fluoride (>86 percent) with magnesium oxide. The removal was independent of the initial fluoride concentration. Removal of fluoride in water by alum alone was found to be marginally effective for several bench-scale studies (30% to >80% removal). However, the doses required for removal were higher than what is typically used in water treatment.

Conventional Treatment

Fluoride removal from groundwater by conventional treatment (i.e., alum coagulation, flocculation, sedimentation and filtration) was found to be moderately effective in one study (between 50% and 71% removal achieved) in both batch and pilot scale experiments. Alum dosages used were higher than what is typically used in drinking water treatment. Percent removals with and without granular activated carbon at the pilot scale were not significantly different.

Ion Exchange

Removal of fluoride from water can generally be effective (typically >85% removal) with ion exchange resins. Fluoride removal can occur with either cation or anion exchange resins. In anion exchange resins, fluoride removal occurs when fluoride ions replace chloride ions of the resin. This process continues until all sites on the resin are occupied. The removal efficiency of ion exchange resins is dependent upon the resin type, regeneration frequency, initial fluoride concentration, and competing ions in the water. Strong base anion exchange resins in the chloride form are most consistent in the removal of fluoride. Regeneration of this type of resin is accomplished with a sodium chloride salt.

Membrane Separation

Membrane separation is effective for removing fluoride. Studies reported close to 95 percent removal with nanofiltration, reverse osmosis, and electrodialysis. RO was designated BAT by the USEPA for control of fluoride, and studies generally showed removals in the high 80s to 100 percent. Removal via membrane separation is influenced by membrane porosity, initial fluoride concentration, feed water composition, flow rate, and the applied pressure. In membrane separation involving potential differentials (electrodialysis and Donnan dialysis), the fluoride separation is also affected by the voltage applied. The electrodialysis studies reported greater removal with higher voltage and initial fluoride concentration.

Other Treatment

Removal of fluoride from water using the electrocoagulation process with aluminum electrodes was found to be very effective (>95% removal) without co-existing anions for one study. The types and concentrations of co-existing anions can have a significant impact on the defluoridation capacity of the electrocoagulation system. Another study found that the hydroxide and fluoride molar ratio had a significant impact on the defluoridation capacity of the electrocoagulation system. The study found that the efficiency of defluoridation was close to 100% when the sum of the hydroxide and fluoride molar ratios was close to 3.

Powdered Activated Carbon

Removal of fluoride with powdered activated carbon (PAC) was found to be very effective in one study (up to 100% removal achieved). However, the process is pH dependent with effective removals obtainable only at a pH of 3.0 or less. At a pH of 8.0, very little fluoride removal is achieved (<5% removal). The use of PAC for fluoride removal in drinking water applications may be limited given the low pH that is necessary to achieve effective fluoride removals.

Precipitative Softening

Removal of fluoride through lime softening has been found to be marginally effective (0 - 80% removal) in both bench and full scale applications, but is highly dependent on the amount of magnesium removed during the softening process. If sufficient amounts of magnesium are not present in water, a magnesium salt would need to be added to provide the desired level of fluoride removal. This method may be adaptable to low-fluoride-high-magnesium waters requiring softening. The effectiveness of lime softening on fluoride removal is highly dependent on source water quality conditions.

Treatment Methods for Nitrates

Nitrates are regulated in drinking water to protect public health. While some nitrogen compounds are naturally found in groundwater, elevated concentrations of nitrate in groundwater may be the result of anthropogenic (man-induced) causes such as fertilizer use. Nitrates in humans have been shown to cause shortness of breath and blue baby syndrome, and result in serious illness or death in infants below six months. In order to protect human health, the USEPA and the State of California established a Primary MCL of 10 mg/L for nitrates measured as nitrogen (Nitrate-N).

Method for removing nitrates from groundwater include the following:

- Biological Treatment
- Chemical Treatment
- Electrodialysis
- Ion Exchange
- Membrane Separation

Each of these treatment methodologies is described further below.

Biological Treatment
Microbe-induced nitrate reduction can be accomplished using organic carbon electron donors such as methanol or acetic acid, or inorganic electron donors such as hydrogen or reduced sulfur. For this to occur, however, dissolved oxygen content in the water must be lowered to about 0.1 mg/L for the reduction to occur.

Biological treatment typically occurs in reactors that use plastic media, buoyant polystyrene beads, sand media or hollow-fiber membranes. Recent advances in hollow-fiber membranes allow autotrophic bacteria to brow on the outside of the membrane in nitrate-laden water while hydrogen gas is slowly supplied from within the membrane. Nitrate and oxygen permeate into the biofilm growing on the membrane and are reduced in the anoxic environment within the biofilm.

Chemical Treatment
Chemical denitrification can use metals such as platinum, palladium, tin, and copper to chemically reduce nitrate to other forms, but these typically require a low pH and often need additional hydrogen gas or another strong reductant along with added heat to perform well. Zero-valent iron (Fe^0) has gained recent attention as a nitrate-reductant system. This treatment methodology can occur both in-situ and in above-ground system and has been shown to be promising. In this methodology, oxidation of iron frees electrons which are then available for nitrate reduction. Like biological denitrification systems, these systems require low levels of dissolved oxygen to proceed favorably. While the precise reactions for zero-valent iron and other chemical reduction processes are not well known for groundwater matrices, in most cases, nitrate reduction does not proceed to innocuous gas as it does in distilled water or in biological denitrification systems. Instead, the majority of the nitrogen transforms to ammonia, which can pose other water quality challenges (Westerhoff and Doudrick, 2009).

Electrodialysis
Electrodialysis (ED) treatment of groundwater is similar to that of other membrane separation technologies. In ED-based systems, electric current is used to pass positive ions (cations) or negative ions (anions) through a semi-permeable membrane. The current can be adjusted to pass only cations and reject anions such as nitrate. Contaminant removal by electrodialysis is dependent upon membrane type, electrical current, recovery, and initial contaminant concentrations.

Ion Exchange
Nitrate removal from groundwater by ion exchange is the most frequently used treatment technology and is considered a BAT by the USEPA for the control of nitrates. In this process, groundwater is passed

through a resin where nitrate ions are exchanged for other ions, most often chlorides in the resin. Nitrate-selective resins may also be used. Ion exchange is dependent upon the resin type, regeneration frequency, competing ions, and initial concentration.

Membrane Separation
Removal of nitrates from groundwater by membrane separation (specifically reverse osmosis or RO) can be very effective (85 to 95 percent) (Siemens, 2012). Reverse osmosis is considered a BAT for control of nitrate in groundwater. The RO process uses semi-permeable membranes to selective remove various inorganics from the groundwater. The membranes do not exhibit high selectivity for any given contaminant, and therefore the RO process results in the removal of many contaminants, including nitrates. Contaminant removal by reverse osmosis is dependent upon membrane type, system pressure, recovery, and initial contaminant concentration.

Treatment Methods for Uranium

Some groundwater sources have low levels of naturally-occurring radionuclides (radioactive elements) that result from leaching from rocks. Uranium has three radionuclides that have been detected in groundwater and which are regulated. U-238 is an alpha emitter and the parent compound in the uranium-238 series. U-235 is also an alpha emitter and the parent compound in the actinium series. U-234 is a beta emitter and the third-member decay product in the uranium-238 series.

Emitted particles from uranium ionize or destabilize atoms as they pass through the body's cell, damaging chromosomes which can lead to cancer. In addition, exposure to elevated uranium levels in drinking water can lead to kidney failure. As a result, the USEPA and State of California established a Primary MCL of 30 μg/L or 20 picocuries per liter (pCi/L). Treatment technologies that can remove uranium from groundwater include (USEPA, 2012b):

- Adsorptive Media
- Biological Treatment
- Conventional Treatment
- GAC Isotherm
- Ion Exchange
- Membrane Filtration
- Membrane Separation
- Precipitative Softening

Each of these treatment methodologies is described in more detail below (USEPA, 2012b).

Adsorptive Media
As indicated from batch isotherm tests, adsorption can be very effective (up to greater than 99 percent removal) for uranium removal. Data for full-scale water treatment were not available. Uranium removal by adsorptive media is largely dependent on the initial concentration, oxidation state, adsorbent type, and water chemistry (pH and competing anions). Best removals were achieved in the pH 4 to 7 range. Iron-based media, particularly zero valent iron, were most effective at uranium removal. Most of the studies acknowledged that adsorption was not the only mechanism that played a role in uranium removal. Uranium reduction from U(VI) to U(IV) and co-precipitation also played a role in removing uranium. Other polymer-based media were also effective at removing uranium in batch isotherm tests.

Biological Treatment
One study found biological treatment to be effective at removing uranium (25 to 88 percent) in situ bioremediation and in a bench-scale soil column test. The study indicated that both adsorption and reduction likely played a role in uranium removal. In both cases, acetate was used to develop the

microorganism population. Uranium removal continued after acetate addition. Sterilized soil columns were not effective at uranium removal.

Conventional Treatment
Removal of uranium by conventional treatment processes can be very effective (up to 95 percent) under appropriate treatment conditions. Conventional treatment has been identified by the USEPA as a BAT for uranium removal.

Coagulation/ filtration processes are commonly used for uranium removal. The mechanism involves adsorption and co-precipitation of U(VI) to a coagulant precipitate. Both alum and ferric coagulants have been shown to successfully remove uranium below the MCL during the coagulation/ filtration process. Both alum and ferric coagulants may require pH adjustment to achieve optimal uranium removal for most water sources; a pH in the range of 6.0 was shown to be ideal for uranium removal.

GAC Isotherm
Based on isotherm studies, adsorption of uranium in water by granular activated carbon (GAC) can be very effective. One study showed that treating the GAC with hydrophobic aerogels would enhance GAC adsorption.

Ion Exchange
Removal of uranium from water by ion exchange can be very effective (greater than 99 percent removal in most cases). Ion exchange is considered a BAT by the USEPA for the control of uranium. It is dependent upon the resin type, regeneration frequency, competing ions, and initial concentration. The most common resin used was an anionic resin. Limited regeneration studies were available, but based on the limited data, uranium removal appears to be unaffected by multiple regenerations.

Membrane Filtration
Membrane filtration alone is generally not very effective for the removal of uranium (less than 60 percent depending on the membrane type and pH). One study found 0.45 micron membrane filtration to remove 50 to 60 percent of uranium between pHs 6.5 and 9. The article suggested that the hydrolyzed uranyl complexes were polymerized and thus were retained on the membrane. Typically, however, membrane filtration followed coagulation/flocculation methods, which were suspected to be responsible for most of the uranium removal.

Membrane Separation
Removal of uranium from water by membrane separation (specifically reverse osmosis) can be very effective (greater than 90 percent in most cases). Reverse osmosis is considered a BAT for control of uranium. Contaminant removal by reverse osmosis is dependent upon membrane type, pH, recovery, and initial contaminant concentration.

Precipitative Softening
Removal of uranium from water by precipitative softening can be very effective (up to 99 percent). Removal rates were largely dependent on the equilibrium pH, chemical doses and concentrations, charge of the uranium species, and competing ions. The presence of free carbonate ions appeared to shift the optimum pH for removal and reduce uranium removal 20 percent or more for a given pH. Lime softening is considered a BAT for uranium control.

Treatment Methods for Hexavalent Chromium

Hexavalent chromium is a metallic chemical that can originate as a contaminant in the groundwater from the discharges of dye and paint pigments, wood preservatives, chrome-plating liquid wastes, and leaching from hazardous waste sites. Hexavalent chromium may also occur naturally in groundwater, associated with serpentinite-containing rock or chromium-containing geologic formations.

Hexavalent chromium is currently regulated by the State as part of total chromium MCL of 50 μg/L. In August of 2013, the California Department of Public Health (CDPH) proposed a state primary MCL of 10 μg/L for hexavalent chromium; the final MCL is still pending.

Methods for removing hexavalent chromium from groundwater include the following:

- Adsorptive Media
- Convention Treatment
- GAC Isotherm
- Granular Activated Carbon
- Ion Exchange
- Membrane Separation
- Precipitative Softening

Each of these treatment methodologies is described further below

<u>Adsorptive Media</u>

Hexavalent chromium removal by adsorption can be effective and is strongly dependent on the adsorbent dose, influent pH, and initial concentration. Hexavalent chromium adsorption is favorable in the acidic pH range for carbon and iron based sorbents. Iron based resins, carbon nanotubes, limestone, river bed sand are known to remove hexavalent chromium under appropriate treatment conditions in lab scale experiments.

<u>Conventional Treatment</u>

Coagulation/filtration is considered a BAT for chromium control in drinking water. Removal of hexavalent chromium in water by conventional processes can be very effective under appropriate treatment conditions. One study evaluated chromium removal by reduction using ferrous sulfate, coagulation assisted by aeration, followed by medial filtration with removal efficiencies up to 100 percent achieved under optimized treatment conditions. Reduction pH and aeration/filtration pH was also found to be influential factor for chromium removal.

<u>Granular Activated Carbon (GAC) Isotherm</u>

Granular Activated Carbon can remove hexavalent chromium. Numerous studies have reported GAC isotherms for various carbon materials. Hexavalent chromium adsorption capacity was higher in the acidic pH range.

<u>Granular Activated Carbon (GAC)</u>

Hexavalent chromium removal by granular activated carbon can be very effective under the acidic pH range; however the average GAC service life is limited (between 0.14 and 0.39 days).

<u>Ion Exchange</u>

Ion exchange is a one of the BATs for hexavalent chromium removal. Ion exchange can effectively remove hexavalent chromium up to 100 percent under favorable water quality conditions. Anionic resins appear to work best for hexavalent chromium removal with removal efficiency varying based upon the choice of resin, regeneration frequency, competing ions, and their concentrations, initial concentrations, influent pHs and contact time. Popular resins in literature used for hexavalent chromium removal includes zeolite, zeolite modified with iron, cellulose based ion exchange resins, strong base anion exchange resins and weak base anion exchange resins.

Membrane Separation

The USEPA has identified reverse osmosis as BAT for chromium control in drinking water. Hexavalent chromium removal is a function of applied potential difference, contact time, and initial solution pH.

Precipitative Softening

USEPA has also identified precipitative softening as BAT for chromium control in drinking water. Based on one desktop study (that looked at 273 groundwater and surface water samples), precipitative softening is up to 98.8 percent effective for the removal of hexavalent chromium for the conditions evaluated.

3.3.2 Delivery Methods

Just as there are multiple ways of treating groundwater to remove the COCs, there are multiple ways of delivering that treatment technology. These include:

- Blending
- Point of use
- Point of entry
- Wellhead treatment
- In-situ treatment
- Public water system

Each of these delivery methods is described further below.

Blending

Blending is a means of managing constituent concentrations in drinking water and is achieved largely by blending (mixing) groundwater with surface water containing lower concentrations of the constituent of concern. This approach is common for drinking water treatment for larger municipalities and requires the availability of a second water source with lower concentrations and facilities to thoroughly mix the water before use.

Point of Use (POU)

Point of Use (POU) systems typically treat water in batches and deliver water to a single tap in the house, such as a kitchen sink faucet or an auxiliary faucet mounted next to the kitchen sink. POU systems can include:

- Personal water bottles – These systems typically consist of a bottle and filter, with the filter integrated into the bottle cap or integrated into a straw.
- Pour through systems – In these systems, water is poured into a shallow basin and gravity is used to drip the water through the filter into a pitcher or other vessel.
- Faucet mounted system – This type of filter is typically mounted on an existing kitchen sink faucet. A diverter is then used to direct the water through the system when treated drinking water is desired.
- Counter-top manual fill - This system is usually placed on a counter and filled by pouring water into the system and activating it for a batch of water.
- Counter-top connect to sink faucet - This product is usually placed on a counter and connected by tubing to an existing kitchen sink faucet. The treated water dispenses out of a return tube from the kitchen faucet, or the treated water is dispensed from a spout on the system.
- Plumbed-in - This type of system is usually installed under the sink and requires a permanent connection to an existing water pipe. The filter water is dispensed through the existing sink faucet.

- Plumbed-in to separate tap - This product installs in the same manner as plumbed-in systems (above); however, the filter water is dispensed through an auxiliary faucet mounted next to the kitchen sink.

Point of Entry (POE)
Point of Entry (POE) systems are systems that typically treat most of the water entering a residence. Point-of-entry systems, or whole-house systems, are usually installed after the water meter. An example of a POE system is a water softener.

Wellhead Treatment
Wellhead treatment systems place the treatment technology at the location of the well, and treats groundwater before it enters the distribution system. This treatment delivery method is typically applied where there are large quantities of water to treat, with separate treatment systems on each well or using a centralized treatment system to treat groundwater from several, closely located wells. Wellhead treatment systems typically require more space than those previously mentioned, and often require the presence of equalization tanks in order to ensure smooth continuous service.

In-situ Treatment
In-situ treatment of groundwater utilizes naturally-occurring and/or introduced bacteria or chemicals to treat groundwater before it leaves the aquifer. Chemicals, oxygen and/or other materials are introduced into the subsurface in a manner that accounts for groundwater movement, biological and chemical process reaction times and local hydrogeologic conditions to 'manage' the contaminant in the aquifer such that the groundwater extracted contains reduced concentrations of the constituents of concern.

Connection to Public Water Systems
While groundwater treatment may be feasible, it is not always economical. In some cases, connecting a residence to a nearby public water system is the most effective means of delivering drinking water that meets federal and state standards.

3.3.3 Evaluation of Alternatives

Treatment Methodology

Given that the objective of the study is to identify a method of treating groundwater for DACs, and that these DACs have been identified as being at various locations within the groundwater basin, it is reasonable to identify one or more treatment methodologies that will effectively treat multiple COCs. Additionally, those treatment methods identified as being BATs have been shown to be effective in removing the COCs and as being cost-effective under a variety of circumstances. Based on these criteria, only one treatment method, membrane separation by reverse osmosis (RO), was effective at treating all five identified COCs, and was considered BAT for all five COCs. PUCDC has had success with this technology in removing arsenic and other water quality concerns through their STAT project, which was successfully implemented through a Proposition 84 Round 1 grant. One additional advantage of RO is that it will also treat for microbes, radium and other salts (such as sulfate, calcium, magnesium, potassium and phosphorus). However, this treatment methodology requires an advanced operator skill level and often is more costly than other treatment options.

Adsorptive Media, primarily by activated alumina, was found to be effective for three of the five COCs. (Activated alumina is not considered a good treatment methodology for nitrates or hexavalent chromium.) Ion exchange was also found effective for four of the five COCs (all but fluoride). In both cases, adsorptive media and ion exchange have been found to be cost-effective, easy to operate and requires minimal operator attention. However, if either of these technologies are selected, a secondary treatment technology would be required to treat households with concentrations of nitrate, fluoride and/or hexavalent chromium greater than the primary MCL. Anion exchange could potentially be an alternative ion exchange technology as this method has been identified as a BAT for arsenic, nitrate, hexavalent chromium and uranium, and has been shown to be effective in treating fluoride (though is not a BAT for fluoride). One issue with this treatment technology (anion exchange) is, however, that an intermediate skill level is required to operate the system.

Delivery Methodology

Of the six treatment delivery methods that were evaluated, two methods were removed from further consideration. Blending was removed as a second source of potable water is not readily available to small communities and individuals for blending. Additionally, in-situ treatment was removed from further consideration as it has not been found effective for all the COCs, nor was it considered practical given the dispersed nature of the DACs.

POU, POE and wellhead treatment systems, and connection to existing public water systems remained as viable options for delivering treated drinking water to DACs. The advantages and disadvantages of each of these four delivery systems are summarized in Table 4.

Table 4: Advantages/Disadvantages of Treatment Delivery Methods

Delivery Method	Description	Advantages	Disadvantages
Point of Use (POU)	Treats water as it enters the faucet or other distribution location	• Treats water where it's used	• Only delivers treated water at one location (typical for consumption)
Point of Entry (POE)	Treats water as it enters the house (in-line or plumbed to single tap)	• Treats water for all uses in the house	• Most costly than POU • Water at all taps treated
Wellhead Treatment	Treats water as it leaves the wells and prior to entering the distribution system	• Efficient for single or multiple wells • Cost-effective • Centralized monitoring and maintenance	• Not as cost-effective for single wells
Public Water System	Connect resident(s) to existing public potable water systems	• No treatment required by residents • Ongoing monitoring and maintenance	• Cost of connection to system may be expensive • Location of resident relative to system is a key factor

Assessment

Given that the AOCs are, by definition, outside the location of established public water agencies, these areas are served water by either individual private wells or small community wells. By their design, treatment systems will therefore need to be either POU or POE systems or small wellhead treatment systems. Where feasible, however, individual residences in the AOCs should be connected to the existing public potable water systems.

A key goal of this study is to identify a region-wide program that can be implemented to effectively address drinking water quality violations in DACs using groundwater. As these DACs are, for the most part, spread out throughout the region, centralized treatment systems are not cost-effective. Therefore, the program offered needs to be able to address households on individual wells, and households on small community systems (i.e. trailer parks). To this end, either POU systems or small wellhead treatment systems should be identified and offered as treatment delivery methods. And as these AOCs are spread out throughout the IRWM region and will likely have varying water quality, whatever treatment methods are offered should be able to address all five of the COCs. Given this criteria, reverse osmosis was the only treatment technology that was designated as a BAT for all five COCs. Anion exchange is, however, another possible treatment methodology as this methodology was identified as a BAT for four of the five COCs and found to be effective (though not a BAT) for the fifth (fluoride).

Recommendation

A regional program designed to address the drinking water quality of DACs in identified AOCs should provide either POU, POE and/or wellhead treatment of groundwater via reverse osmosis or anion exchange.

3.3.4 Recommended Program

Based on the assessment conducted above, this *DAC Water Quality Evaluation* recommended development of a regional program (titled the *Disadvantaged Communities Residential Groundwater Treatment Program*) that provides either POU, POE and/or wellhead treatment of groundwater via reverse osmosis or anion exchange. Appendix A contains the *Disadvantaged Communities Residential Groundwater Treatment Program* work plan.

The *Disadvantaged Communities Residential Groundwater Treatment Program* is similar in form to the Short-Term Arsenic Treatment (STAT) Project that was funded under a Proposition 84-Round 1 Implementation Grant and has implemented by Pueblo Unido since 2010. The fact that the *Disadvantaged Communities Residential Groundwater Treatment Program* parallels the STAT Project is indicative of the technical feasibility and reasonableness of the proposed approach. The *Disadvantaged Communities Residential Groundwater Treatment Program* is, however, intended to address DAC groundwater quality concerns on a regional scale and to incorporate similar recently-developed programs by the Rotary Club and Desert Alliance for Community Empowerment (DACE). This program was designed to support DACs scattered throughout the IRWM region, to treat groundwater for multiple COCs (rather than just arsenic), and to create a program to allow for the long-term sustainability of the systems in providing potable water meeting drinking water standards.

To this end, the recommended approach for developing and implementing a program to address the drinking water quality of DACs in identified AOCs was designed to be a phased approach for implementation, addressing mobile home parks with fewer than 16 connections separately from those with 16 or more connections.

The first phase of a program that would be implemented to address water quality concerns in DACs should consist of two key tasks:

1. Confirming the location of the AOCs and the presence of the COCs in their drinking water.
2. Identifying DACs in AOCs that are situated such that they can reasonably be connected to an existing public potable water system.

Site-specific projects can then be developed for those systems identified during these two steps.

For trailer parks and neighborhoods with 16 or more connections (the regulatory cut-off for small water systems), it is recommended that each site be addressed on an individual basis, with the STAT Project used as a model for developing, permitting, and implementing a site-specific wellhead treatment and potable delivery system. Additionally, it is recommended that NSF 61 certification of small-system wellhead treatment units continue to be pursued in order to streamline the development and installation of these RO-type treatment units on park systems.

For trailer parks with fewer than 16 connections, a coordinated (and approved) program with Riverside County DEH, Pueblo Unido, Rotary Club, and DACE should be developed to purchase, install and maintain commercially-available under-counter POU RO treatment systems in individual trailers and homes. Items to be developed/addressed as part of this program include:

- Development of a guidebook for purchasing, installing and testing the commercially-available under-counter POU RO treatment systems.
- Development of an operations and maintenance (O&M) manual for monitoring and maintaining treatment systems.
- Training of local trailer park/neighborhood personnel in the testing and maintenance of the selected treatment units.
- Pursuit and award of State grant funding to purchase and install POU RO treatment systems on those trailer parks/neighborhoods not yet retrofitted.
- Development of an investment/long-term funding program/strategy for O&M with Rotary Club using Rotary grant funding as 'seed money' to ensure the sustainability of the program.

Preliminary work towards developing such a program (the DAC Residential Groundwater Treatment Program) is described in more detail in Appendix VI-A of the 2014 Coachella Valley IRWM Plan Volume I.

4 Data Gap Analysis

As part of the data analysis step previously described, gaps in water quality data distribution were identified. Additionally, due to the public nature of the databases used, specific data could not be attributed to specific wells; therefore, identified data gaps include the specific locations of individual and small community wells located within the AOCs. While a preliminary analysis has been completed using available data and ArcGIS, more detailed information is necessary to better understand the users located in the AOCs and to confirm that these areas are, in fact, using groundwater that exceeds primary drinking water standards. Specific locations of the individual and small community wells require identification and more water quality and quantity data are required in order to develop the best program for addressing these concerns. Therefore, site-specific and depth-specific water quality data at the wells has also been identified as a data gap.

In general, data gaps are divided into three categories:

1. **Specific Well Locations in AOCs:** the evaluation described in Section 2 characterized the wells in the AOCs that pump groundwater with COCs based on data provided by CVWD and DWR, as well as groundwater quality data collected from two publically-available online databases – GAMA-Geotracker and the Water Quality Portal. To confirm the water quality of the identified wells and gather more useful data, specific wells need to be identified and water samples collected and analyzed from those wells to confirm that they meet the program requirements.
2. **Other Locations in AOCs Not Yet Identified with Groundwater Concerns:** it is possible that there are existing groundwater wells that did not have available data in the databases used for this analysis, or which had no or insufficient reported data. An evaluation should be conducted to see if these areas exist.
3. **Basin-wide Data Gaps:** There are areas within the groundwater basin with limited groundwater quality data. A basin-wide collection and analysis of a pre-determined set of water quality constituents can provide a one-time snapshot of baseline groundwater quality.

Site-specific groundwater data will be needed for each category. These are described in the following sections.

4.1 Specific Well Locations in AOCs

As described in Section 2, a preliminary analysis was completed to identify the DACs (both communities and individuals) relying on groundwater, outside of public water agencies' service areas, with groundwater quality in which constituents exceed the primary drinking water standards. This analysis was completed by identifying the wells in the AOCs that pump groundwater with COCs based on data provided by CVWD and DWR, as well as groundwater quality data collected from two publically-available online databases – GAMA-Geotracker and the Water Quality Portal. Except for the agency-specific data, all water quality data were attributed to specific wells with approximate location information (latitude and longitude). The exact location of these wells, and the specific users who consume groundwater from these wells or wells in the immediate area, remains to be determined, as does the economic status of those users. Therefore, one key data gap category to be addressed is identifying specific DAC persons and/or communities with groundwater wells at identified locations, and to collect water samples from these wells to confirm that they meet the program requirements (that is, groundwater from those wells exceeds primary drinking water standards and is presently being consumed by DAC community members).

This data gap can be addressed by working with the DAC Issues Group to identify the specific DAC community members and the locations of their wells. Permission would then be obtained from the well owner for groundwater sampling and analysis. Samples collected from the wells would be analyzed at a State-certified laboratory for a pre-determined list of constituents to confirm drinking water quality violations. Data regarding the volume of water being pumped and its uses would also be compiled, if available.

4.2 Other Locations in AOCs Not Yet Identified with Groundwater Concerns

There may be existing groundwater wells that did not have sufficient or available water quality data for use in the preliminary analysis. In order to identify these wells, well construction diagrams obtained from DWR would be examined, along with anecdotal information, to identify where unsampled wells may be located and to assess if data from these wells would be of benefit to the study. For areas that do not have existing wells, and therefore no available data, it would be valuable to first confirm that there are no wells in that area and second, to potentially add a monitoring well to gather quality data. The well construction reports received from DWR can be examined to confirm well locations and the resulting analysis cross-checked with the Riverside County DEH. If there are unsampled wells, water samples can be collected and analyzed with the permission of the well owners. If there are no wells, a recommendation for the addition of a monitoring well in that area may be made to provide permanent monitoring locations for data collection and evaluation allowing for long-term evaluation of groundwater quantity and quality trends in the AOCs.

4.3 Basin-Wide Data Gaps

Figure 6 shows the wells that were included in the preliminary water quality data analysis; these data were obtained from the basin's water agencies and from the GAMA-Geotracker and Water Quality Portal databases. As can be seen, there are areas in the groundwater basin that do not appear to have reported groundwater quality data. The use of existing data may exclude unpermitted mobile home parks, other unregulated water systems, and private wells, a data gap that should be addressed to fully understand the extent of the Areas of Concern and their issues. In order to improve basin-wide groundwater quality understanding, well construction reports obtained from DWR can be compared against the wells included in this analysis to identify any wells that may exist within the basin for which water quality data are not available. The continued existence of these wells would then need to be verified, and the owner's permission obtained before groundwater sampling and analyses can occur. This data gap category can, however, be addressed by conducting a basin-wide sampling and analysis program on a periodic (quarterly to annual) basis on a selected series of wells to confirm constituents of concern and trends in groundwater quality.

5 Monitoring Program Assessment

An assessment of existing groundwater monitoring programs in the Coachella Valley was conducted to understand the impacts of groundwater quality on the potable supplies of DACs in the Coachella Valley. The purpose of the assessment was to describe existing groundwater monitoring efforts in the Coachella Valley and to present recommended modifications to existing groundwater monitoring programs for the CVGB as it relates to water quality constituents identified as impacting the drinking water of DACs. Appendix VI-J of the 2014 Coachella Valley IRWM Plan Volume I (see www.cvrwmg.org) contains the *Evaluation of Valley-Wide Groundwater Monitoring Programs*.

Recommendations proposed in the monitoring program assessment include:

- Continue groundwater elevation and water quality monitoring as is currently being implemented by water agencies in the Coachella Valley for compliance with the State's CASGEM program and as required by the CDPH and Riverside County DEH.
- Installation of additional monitoring wells, specifically in the southeastern portion of the Mission Creek Sub-basin and the southeastern portion of the Desert Hot Springs Sub-basin.
- Collect addition groundwater level information in the areas with data gaps, namely in Garnet Hill Sub-basin and areas of Mission Creek and Desert Valley Sub-basins.
- Implementation of suggested modifications to the frequency of water quality sampling in the groundwater basin for the COCs.

This assessment is described in more detail in Appendix VI-J of the 2014 Coachella Valley IRWM Plan Volume I (see www.cvrwmg.org).

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Appendix A - Disadvantaged Communities Residential Groundwater Treatment Program

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Coachella Valley Integrated Regional Water Management Program

Disadvantaged Community Outreach Demonstration Project

Disadvantaged Communities Residential Groundwater Treatment Program

Final Report

Prepared by:

RMC Water and Environment

February 2014

Table of Contents

Appendices

List of Abbreviations

AOC	Area of Concern
CDPH	California Department of Public Health
COC	Constituent of Concern
CVRWMG	Coachella Valley Regional Water Management Group
CVWD	Coachella Valley Water District
CWA	Coachella Water Authority
DAC	Disadvantaged community
DWA	Desert Water Agency
DWR	California Department of Water Resources
IRWM	Integrated Regional Water Management
IWA	Indio Water Authority
MCL	Maximum Contaminant Level
MHI	Median household income
POE	Point-of-entry
POU	Point-of-use
PUCDC	Pueblo Unido Community Development Corporation
RO	Reverse osmosis
TM	Technical Memorandum

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1 Introduction

The Coachella Valley Regional Water Management Group (CVRWMG) – comprising Coachella Valley Water District (CVWD), Coachella Water Authority (CWA), Desert Water Agency (DWA), Indio Water Authority (IWA), and Mission Springs Water District (MSWD) – are preparing an update of the Coachella Valley Integrated Regional Water Management (IRWM) Plan. The purpose of the Coachella Valley IRWM Plan is to accurately characterize the existing water resources conditions, issues, and needs of the Coachella Valley, and then to establish a regional process for prioritizing potential water management projects that can be implemented to help address those needs. During development of the original IRWM Plan (adopted in 2010), stakeholders identified a need for improved understanding of water quality and supply issues and needs of particular importance to economically disadvantaged communities (DACs). One of the issues of concern for DACs, as identified by stakeholders, was the quality of groundwater used for drinking water in DACs. As a result of this identified need, the 2014 IRWM Plan Update process involved a separate technical evaluation, the *DAC Water Quality Evaluation*, which was prepared to address groundwater-related drinking water quality issues in DACs. The *DAC Water Quality Evaluation* is included as Appendix VII-C of the 2014 Coachella Valley IRWM Plan (see www.cvrwmg.org)

DACs are defined by the California Department of Water Resources (DWR) in its 2012 IRWM Grant Program Guidelines as areas with an annual median household income (MHI) of 80% or less than the Statewide MHI. Per the 2012 IRWM Grant Program Guidelines, DACs were areas with an MHI of less than $48,706. Areas identified and mapped as DACs in the Coachella Valley are presented and discussed in Chapter 4 of the 2014 Coachella Valley IRWM Plan Volume I (see www.cvrwmg.org).

1.1 Project Purpose

This technical memorandum (TM) presents a scope of work that represents the recommended program resulting from the *DAC Water Quality Evaluation*. The proposed program has been designed with a phased implementation approach, allowing for program formulation and development to be conducted before actual implementation. This approach was selected because it maximizes the ability to obtain outside funding for program implementation, provides for development of an approach to ensure the sustainability of the program, and allows for the time necessary to address institutional issues that may arise as a result of the program. The program is based on the work of Pueblo Unido Community Development Program (PUCDC) to install point-of-use (POU) treatment systems in DACs in the eastern Coachella Valley, and is presented here as a potential work plan, for use by other organizations looking to implement such a program themselves. The program as presented here has been recommended by PUCDC and vetted by local non-profits with experience working in local DACs for feasibility as a short-term solution to address drinking water needs of DACs located in remote locations where it is currently unfeasible to connect to the municipal potable water system.

1.2 Background

As part of the Coachella Valley IRWM Plan Update, the *DAC Water Quality Evaluation* was conducted to assess groundwater quality in DACs where privately-pumped (non-municipal) groundwater was the primary source of drinking water, and to address stakeholder concerns about the quality of those drinking water supplies. The *DAC Water Quality Evaluation* identified four Areas of Concern (AOCs) in the Coachella Valley IRWM Region. AOCs were defined as areas that: 1) qualified as DACs based on documented MHI that 2) lie outside of an established public potable water service area, and 3) utilize groundwater that contains constituents of concern (COCs) above State and Federal Primary Maximum Contaminant Levels (MCLs). Because the AOCs lie outside of water supply agency service areas, it was assumed that the identified AOCs depend on private groundwater supply wells for their drinking water, and that water produced by these wells are untreated prior to delivery at the tap. Five primary COCs were identified in the groundwater underlying the AOCs: arsenic, fluoride, nitrate, uranium, and hexavalent chromium. Though MCLs have only formally been established for four of these COCs, a draft MCL of 10 µg/L was issued for hexavalent chromium in August 2013, which is below levels found in some wells in the Region. The *DAC Water Quality Evaluation* also considered appropriate methods that could be implemented to treat all five identified COCs, including treatment methodologies and varying modes for treatment delivery. Finally, the *DAC Water Quality Evaluation* recommended that a program be developed to address the COCs found in the AOCs, and ensure treatment of drinking water supplies for DACs in the East Valley. The recommended program, formally referred to as the *DAC Residential Groundwater Treatment Program*, is contained within this TM.

PUCDC's work in the eastern Coachella Valley, including the Short-Term Arsenic Treatment (STAT) program, funded through the Proposition 84 - Round 1 Implementation Grant, served as the model for the *DAC Residential Groundwater Treatment Program*. The STAT program was used as a model because analysis of the various treatment methods and location of DACs in relation to existing infrastructure, amongst other factors, found the STAT program model to be the most effective for addressing drinking water concerns in DACs on a short-term, immediate basis. Concerns over the potential O&M costs of on-site water treatment systems for DACs and the potential financial impact of the proposed financing plan (see *Subtask 4.3* and **Appendix H**) were vetted through PUCDC, who felt that the monthly costs used to fund the program on an on-going basis were reasonable.

1.3 Using the Technical Memorandum

This TM contains guidance and information that can be used to include an onsite residential groundwater treatment program in a grant application package for future DWR IRWM grant programs, or other similar funding opportunities. Remembering that the specific requirements will vary from opportunity to opportunity, and that DACs are not all identical, the contents of this work plan are intended to act as a detailed general template. A similar program should be vetted by residents, local non-profits, or other organizations and agencies with experience working with local DACs for feasibility and reasonableness. Included in this TM is an example Work Plan, Budget, and Schedule. These materials can be used in grant applications or as a guideline for initial planning purposes. This TM contains information specific to the Coachella Valley DAC Water Quality Program, but text that will be or is likely to require modifications is indicated with **[brackets]**. The template is based on the requirements of the 2012 Proposition 84 Implementation Grant – Round 2 Proposal Solicitation Package. It is anticipated that future IRWM grants will have similar requirements.

2 Work Plan

2.1 Introduction

[The Introduction provides the background and drivers for the project – What is the project? Why is it necessary? How does it support and complement IRWM?]

2.1.1 Project Sponsor

[Lead Project Sponsor] is the sponsor for the *Disadvantaged Community (DAC) Residential Groundwater Treatment Program* **[Project Title]**.

2.1.2 Project Need

The *DAC Residential Groundwater Treatment Program* was developed to fulfill the recommendation of the *DAC Water Quality Evaluation* to create an on-site water treatment program for small DAC mobile home parks that could be implemented by interested parties.

2.1.3 Project Purpose

The purpose of the *DAC Residential Groundwater Treatment Program* **[Project Title]** is to provide households in DACs a safe supply of drinking water through installation of Point-of-Use (POU) systems that will address the constituents of concern (COCs) for the local area.

2.1.4 Project Abstract

[Use project abstract consistent with other locations in the application calling for the project abstract]

In the Coachella Valley **[Region]** there is documented contamination of tap water in localized areas of the Region dependent on groundwater. While these issues can be found in localized areas regardless of income, the ability to address these issues is greatly diminished in disadvantaged communities (DACs). DACs are defined by DWR as communities with a Median Household Income (MHI) 80% or less of the statewide MHI. In 2010 **[year]**, DACs were those communities earning $48,706 **[DAC MHI]** or less. In the Coachella Valley, many DACs are outside water supply agency service areas, and are too remote to make connecting to an existing municipal water supply system feasible on a short-term basis. While the Region would like to be able to connect most, if not all, communities to municipal water and sewer systems, it is unable to do so immediately, so a solution must be implemented to protect the health of residents.

Residents using contaminated groundwater may not be aware what concerns there might be with their tap water. Unlike non-DACs, DACs may not have the resources or capacity to purchase alternative treatment for their tap water that effectively treats constituents of concern (COCs). COCs of greatest concern in the Region are arsenic, fluoride, nitrate, uranium, and hexavalent chromium. Through an assessment of various treatment options, it was determined that the most cost-effective method for treating all of these COCs in DACs is installation of a Point-of-Use reverse osmosis (RO) system. These systems are installed under the sink and treat the water in the home. The *DAC Residential Groundwater Treatment Program* will install **[number of systems]** Point-of-Use systems in households within DACs identified as having water quality issues. To ensure continued proper maintenance of these systems, the program proposes to conduct a series of training workshops and manuals designed to teach residents how to care for their systems, how to test their water to check for problems in the system, when to replace filters and other parts, and how to find answers to common questions regarding their individual system. **[Project sponsor]** anticipates the *DAC Residential Groundwater Treatment Program* to train up to **[number]** of individuals in system care, and expects to install enough systems to serve **[number]** people.

2.1.5 Project Partners

[Lead Project Sponsor] is the primary project sponsor for the *DAC Residential Groundwater Treatment Program* **[Project Title]**. Project partners for this project include: **[Interested NGOs, County Department of Public Health, City Public Health Department, Environmental Justice Coalition on Water, California Rural Legal Assistance Foundation, include any and other appropriate partners]**. These groups have **[previous work/experience/interest in or related to project]**.

2.1.6 Project Timing and Phasing

This program is a multi-phased project consisting of five phases:

1. Identify the most cost-effective onsite, residential POU RO system to address the five identified COCs;
2. Conduct pilot testing of treatment systems if necessary;
3. Develop the necessary program documentation to ensure consistency of implementation (including a Testing and Installation Manual, a Monitoring and Maintenance Manual and other related training materials);
4. Train local community members to install, monitor, and maintain the POU systems; and then do the installation; and
5. Design a finance model to fiscally sustain the program, thereby ensuring that, once the POU systems have been installed, a forum exists to ensure that members within the identified DACs will continue to have access to safe drinking water.

Phases [1 through 5] are included in this project, though other phases of the project could potentially occur in other locations throughout the Region.

2.1.7 Project Map

[Figure X] is a map showing the location of proposed individual communities that will receive the POU systems. It also shows DAC boundaries, the groundwater basin, and the extent of the existing nearby municipal connections.

[Insert project map]

2.1.8 Project Objectives

The *DAC Residential Groundwater Treatment Program* **[Project Title]** includes the following project objectives:

- Offer cost-effective and reliable technology to remove high levels of COCs
- Provide short-term alternatives to deliver quality drinking water for disadvantaged communities
- **[other objectives, as appropriate]**

[Table X] provides an overview of the Coachella Valley **[Region]** IRWM Plan objectives that are expected to be indirectly (○) or directly (●) achieved through implementation of the *DAC Residential Groundwater Treatment Program* **[Project Title].**

Table X: Contribution to IRWM Plan Objectives
[Complete table and explanation below using objectives from local IRWM Plan]

Proposal Project	Contribution to IRWM Plan Objectives												
	A	B	C	D	E	F	G	H	I	J	K	L	M
DAC Residential Groundwater Treatment Program **[Project Title]**	●	-	-	-	○	-	○	-	-	●	-	●	●

● = directly related; ○ = indirectly related

The project contributes to the IRWM Plan Objectives in the following ways:

- ***A: Provide reliable water supply.*** This project intends to improve the quality of local water supplies, thereby reducing the need for communities to rely on other, less reliable water supplies such as hauled water.
- ***E: Protect groundwater quality and improve, where feasible.*** This project will indirectly protect groundwater quality by reducing constituents of concern from entering the wastewater supply, and therefore preventing this water from percolating into the groundwater.
- ***J: Maximize stakeholder involvement.*** This project provides education and training in water management operations, thereby increasing the number of stakeholders involved and increasing their level of involvement.
- ***L: Address water and sanitation needs of disadvantaged communities.*** This project directly addresses water quality issues of DACs within the Coachella Valley.
- ***M: Maintain affordability of water.*** This project will provide a cost-effective solution to local water quality issues within a DAC. In addition, by improving drinking water quality within these communities, this project will reduce the need for residents to rely on other, more expensive water supplies such as bottled water.

2.1.9 Project Integration

The program complements existing projects and programs in the Coachella Valley IRWM Region **[Region]** seeking to address water quality needs in DACs, such as the *Short Term Arsenic Treatment (STAT) Program*, funded through a Proposition 84 Implementation Grant – Round 1 **[Discuss other related projects]**. It also includes partnerships between water agencies, local non-profits, and DACs that will foster and strengthen new and existing relationships between these groups. The project meets multiple IRWM Plan objectives and provides multiple benefits.

2.1.10 Linkages and Synergies with Other Projects in the Proposal

[If applicable:]This program will install POU systems in DACs using contaminated groundwater. Several other projects in this proposal aim to protect groundwater quality or address water supply needs of DACs. **[Discuss these projects briefly]**. The Coachella Valley IRWM Plan identifies the critical need to serve the Region's DACs (IRWM Plan Objective L) and this funding application helps the Region to accomplish that goal.

[If not applicable:] Though this program will support IRWM Plan objectives and complements efforts of previous IRWM projects in the region **[list other projects]**, it does not have linkages or synergies with other projects in this application package.

2.1.11 Completed Work

[Any work completed prior to grant application that directly supports the project]

- DAC Water Quality Evaluation – CVRWMG completed a DAC Water Quality Evaluation in 2013 that identified COCs in localized areas of groundwater used by DACs
- Contract Documents – **[Project sponsor]** completed design for the project in **[DATE]**
- Environmental Compliance – **[Project sponsor]** completed environmental compliance processing in **[DATE]**
- **[other completed work, could include design work, or any of the tasks listed in the work plan that have been completed prior to application]**

2.1.12 Existing Data and Studies

This project type, scope, and focus are identified in the following plans and studies:

- Rural Community Assistance Corporation. January 21, 2010. Drinking Water Assessment Final Report: San Antonio del Desierto Mobile Home Park.
- Rural Community Assistance Corporation. March 2010. *Coachella Valley Water Systems Assessments.*
- Coachella Valley Regional Water Management Group. March 2014. *Coachella Valley Integrated Regional Water Management Plan Update*.
- **[Other Plans could include General Plans, UWMPs, IRWMs, Feasibility Studies, etc.]**

2.2 Project Work

[Project Work includes the specific tasks required to complete the project and the anticipated schedule for each activity]

The proposed program has been divided into four key tasks for development and implementation, with additional tasks for grant administration, permitting, project administration, and construction administration **[add other tasks as necessary]**. Each task is described below and has associated deliverables, and costs. It is important to note that the program defined below is only applicable to DACs with fewer than 15 connections and fewer than 25 users. Water systems serving 15 or more connections or serving 25 or more people are considered community water systems and are regulated by the California Department of Public Health (CDPH). While POU systems are allowed for these larger systems, they are considered to be an interim measure and are only allowed for three years as a permanent treatment solution is identified, designed and installed.[1] For these larger DACs, groundwater treatment will need to be addressed on a site-by-site basis.

Grant Administration

CVWD **[Grant application package lead agency or other responsible party]** will be responsible for administration and processing of the Implementation Grant contract, including tasks associated with compiling and submitting project invoices, quarterly reports, and completion reports for DWR.

Direct Project Administration Costs

Task 1: Project Administration – This project will involve project administration before and after the Implementation Grant Agreement is formalized (**[date]**). Based on administration costs from the STAT project, it is estimated that the project will require 500 **[number]** hours of effort from a Project Manager to coordinate with CVWD **[Grant Package Administrator identified above]**, produce invoices and reports, and fulfill all other necessary administrative tasks associated with the project. This estimation is

[1] California Department of Public Health, Division of Drinking Water and Environmental Management, *Point of Use Compliance*. (March 2013).

based on the anticipated schedule of 3 years and would likely need to increase if a project will take longer to implement.

Task 1 Deliverables:

- Quarterly invoices
- **[List other deliverables – could include approvals]**

Task 2: Labor Compliance Program – Not applicable. Construction associated with this project will not involve significant ground disturbing activities, or any other construction activities that would necessitate a Labor Compliance Program.

Task 2 Deliverables:

A labor compliance program is not applicable to this project, so no deliverables for Task 2 are required. **[If applicable: list deliverables.]**

Task 3: Reporting – All reporting for this project will occur after the Implementation Grant Agreement is formalized (after **[Start date of grant]**). In order to assess progress and accomplishments of the project, the following submittals will be completed by each indicated date.

Task 3 Deliverables:

- Quarterly progress reports, including required deliverables
- Project Assessment and Evaluation Plan (PAEP)
- Project Completion Report

Table X: Direct Project Administration

Activity or Deliverable	Schedule	Status	Completion of Task	
			Before [grant start date]	After [grant start date]
Task 1: Project Administration				
Project Coordination	**[Grant start date – end of project]**	Not yet begun		X
[If applicable]: Task 2: Labor Compliance Program				
[If applicable:] Labor Compliance Program, including field interviews, reviewing contractor payroll, preparing deficiency notifications, and preparing final report	**[Construction dates of project]**	Not yet begun		X
Task 3: Reporting				
Compile PAEP, Invoices, and Progress Reports	**[Grant start date – end of project]**	Not yet begun		X
Prepare Quarterly Reports	**[Grant start date – end of project]**	Not yet begun		X
Prepare Final Report	**[Six months prior to end of project – end of project]**	End of work		X

Land Purchase/Easement

No easement acquisitions and/or right-of-ways will be required for implementation of this project.

Land Purchase Easement Deliverables:

No work related to land purchase easements will be completed for the project, therefore deliverables are not applicable.

Planning/Design/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation - This task involves preparation of all studies designed to assess and evaluate the project, as well as planning designed to create a sustainable program. For the *DAC Residential Groundwater Treatment Program* **[Project title]**, this task will involve three subtasks:

- Market research and identification of preferred water treatment system
- Pilot testing **[Only required if recommended POU treatment system from Subtask 4.1 is not currently in use in Region]**
- Long-term financing plan

Subtask 4.1: Market Research and Identification of Preferred Water Treatment System

The *DAC Water Quality Evaluation* **[previous study]** determined that a membrane separation (commonly referred to as reverse osmosis or RO) POU water treatment system would be best implemented given the rural and semi-rural nature of the AOCs, the potential for one or more COCs to be present in groundwater, and past experiences in the Coachella Valley with systems of this nature. In this task, an analysis will be conducted to identify affordable, commercially-available RO treatment systems for possible use within the AOCs. This analysis will include collection of publically-available data regarding the system specification operations (both directly from the manufacturer and third-party sources), information on the performance of RO systems currently in use in the Coachella Valley, and capital, monitoring and maintenance costs. Budget and RO system requirements will be established so as to best understand the type of system and number of systems required by the AOCs. Based on the results of the analysis, a commercially-available water treatment system will be selected for long-term application in the program. **[Project sponsors should consider prioritizing systems already in use in the region to avoid the need for Subtask 4.2: Pilot Testing. Sponsors should also contact CDPH for guidance on system and permit requirements.]**

Subtask 4.1 Deliverables:

[A sample document for the Subtask 4.1 deliverable is included as Appendix A to this TM.]

- Technical memorandum documenting the analysis of possible water treatment systems and presentation of a recommended system

Subtask 4.2: Pilot Testing

[If the recommended POU treatment system identified in Subtask 4.1 is not currently in use in the Coachella Valley:]A pilot testing program will be conducted to demonstrate compliance with the CDPH objectives of such a program. The pilot program will consist of the installation, testing and monitoring of the selected POU systems in one DAC in the valley **[project area]**. In keeping with CDPH protocols, the pilot testing will be conducted for at least two months to demonstrate successful treatment of area groundwater. The POU treatment units will be installed on five units **[appropriate number]**, with tap water tested immediately before and following installation and weekly thereafter for a period up to two months.

Subtask 4.2 Deliverables:

[A sample document for Subtask 4.2 is included in this TM as Appendix B.]

- Pilot testing work plan

- Pilot testing summary report

Subtask 4.3: Long-Term Financing Plan

The goal of this program is to create an economically self-sustaining model for providing safe drinking water to DACs in the Coachella Valley. To this end, ongoing financing will be required for the purchase of replacement parts and materials, ongoing training of community members, system monitoring and data management. As it is recognized that State funding will not support system maintenance, this subtask will develop a long-term financing program that will provide funding for long-term support.

It is assumed that the Long-Term Financing Plan to be developed under this subtask will require a one-time infusion of local funds as ‘seed money’ and will create a program requiring a nominal monthly fee from those utilizing the program units to both offset long-term maintenance and provide capital for program expansion. Specifically, this subtask envisions development of a program similar to those used by Rotary Club and other sustainable charitable programs, incorporating elements of sustainability presently being considered under the STAT Program. As envisioned, this will include a nominal monthly fee charged for system use, collected and deposited into an account, which will be used to fund the long-term monitoring and maintenance of the treatment systems. The financing plan will consider and recommend a specific management model for the program (including identification of an oversight agency and agreement format) and suggested investment methods to ensure that the seed money and collected funds are properly managed and protected against financial pitfalls. Any proposed long-term financing plan will be vetted for the ability of residents to afford the necessary O&M costs, and remain in compliance with California Civil Code §798.

Subtask 4.3 Deliverables
[A sample document for Subtask 4.3 is included in this TM as Appendix H.]

- *Long-Term Financing Plan*

Task 5: Final Design – Once a POU treatment unit has been selected, as part of final design prior to installation of the selected system, the following three subtasks will be completed to produce the documents necessary to create a sustainable program:

- Develop installation manual and methodology
- Develop protocols for program operations and maintenance
- Develop monitoring and maintenance manual

Subtask 5.1: Develop Installation Manual and Methodology

Prior to installing the treatment units, an Installation Manual will be developed. The purpose of this manual will be to document the appropriate protocols for system installation and testing, and for use in training local community members in how to install the selected water treatment systems. The manual will include, but is not limited to, procedures for system installation, common troubleshooting, the importance of and process for pre- and post-installation water quality testing, and manufacturer contact information.

Subtask 5.1 Deliverables
[A sample document for Subtask 5.1 is included in this TM as Appendix C, which is the annotated outline for an installation manual]

- *Installation Manual*

Subtask 5.2: Develop Protocols for Program Operations and Maintenance

Under this subtask, protocols will be developed for the method/mode by which the POU treatment units will be purchased, stored, distributed and tracked, and the means for tracking installed units, including, but not limited to, equipment and records tracking and management. As needed, forms for recording information will be developed and a simple EXCEL-based database developed for maintaining all data collected.

Subtask 5.1 Deliverables

[Two sample documents for Subtask 5.2 are included in this TM as Appendix D and Appendix E, which are an annotated outline for program operations protocols and a sample program tracking spreadsheet]

- *Program Operations Protocols (for equipment purchase, maintenance, distribution and tracking)*

Subtask 5.3: Develop Monitoring and Maintenance Manual

In Subtask 5.3, a Monitoring and Maintenance Manual will be completed, providing the necessary protocols for maintaining the selected POU treatment units. Also included in the manual will be manufacturer information for replacement parts and recommended testing procedures. This information will be included in the training program provided to community members in Task 9, below. The manual will include information such as system specifications, process for purchasing and installing replacement filters, maintenance and replacement schedules, annual testing, and manufacturer contact information.

Subtask 5.3 Deliverables

- **[A sample document for Subtask 5.3 is included in this TM as Appendix F, which is the annotated outline for a monitoring and maintenance manual]***Monitoring and Maintenance Manual*

Task 6: Environmental Documentation – Environmental documentation for this project is not required as it will not be of the size, scale, or impact as to trigger CEQA, NEPA, or other environmental regulations. **[If project is expected to trigger one of these regulations, describe as appropriate here.]**

Task 7: Permitting – Permitting for this project will occur before and after initiation of the grant agreement **[insert grant start date]**. **[Project sponsor]** in collaboration with **[other agencies]**, will secure all necessary permits for installation of the selected systems. Preparation of permit applications is not included in this work plan **[if included, delete this statement and include in table below]**. Permits required for the project include a treatment permit from Riverside County Department of Environmental Health **[use appropriate agency]** and an onsite construction permit from the Riverside County Building Department **[use appropriate agency]**. **[Other permits may include treatment or construction permits from cities, project sponsors should check local regulations.]**

Table X: Planning/Design/Engineering/Environmental Documentation

Activity or Deliverable	Schedule	Status	Completion of Task	
			Before [grant start date]	After [grant start date]
Task 4: Assessment and Evaluation				
Subtask 4.1 Market Research and Identification of Preferred Water Treatment System				
Potential RO systems analysis, including data collection, analysis of systems	**[Grant start date – start date + 4-6**	Not yet begun		X

currently in use, determination of costs, budget and system requirements, **[locally applicable regulations]**	**months]**			
[If required]*Subtask 4.2 Pilot Testing*				
Installation of 5 **[appropriate #]** POU systems	**[End of subtask 4.1 – end of subtask 4.1+1 months]**	Not yet begun		X
Tap water testing	**[End of subtask 4.1 + 2 months]**	Not yet begun		X
Monitoring of POU systems	**[Installation of 5 POU systems – installation of systems + 2 months]**	Not yet begun		X
Subtask 4.3 Long-term Financing Plan				
Develop funding plan	**[End of subtask 4.1 – end of subtask 4.1+6 months]**	Not yet begun		X
Implement funding program	**[End of develop funding plan – end of project]**	Not yet begun		X
Task 5: Final Design				
Subtask 5.1 Develop Installation Manual and Methodology				
Write Installation Manual	**[End of Subtask 4.2 – end of Subtask 4.2 + 4-6 months]**	Not yet begun		X
Subtask 5.2: Develop Protocols for Program Operations and Maintenance				
Develop protocols	**[End of Subtask 4.2 – end of Subtask 4.2 + 4-6 months]**	Not yet begun		X
Develop forms for recording information	**[End of Subtask 4.2 – end of Subtask 4.2 + 1-6 months]**	Not yet begun		X
Develop database for collected data	**[Start of Task 4 – Start of Task 4 + 6 months-1year]**	Not yet begun		X
Write Program Operations Protocols	**[End of Subtask 4.2 – end of Task 4.2 + 4-6 months]**	Not yet begun		X
Subtask 5.3 Develop Monitoring and Maintenance Manual				
Write Monitoring and Maintenance Manual	**[End of Subtask 4.2 – end of Task 4.2 + 4-6 months]**	Not yet begun		X
[If required]Task 6: Environmental Documentation				
[if required, could include CEQA (Neg. Dec./MND/EIR), NEPA (FONSI/EIS), or other]	**[Start of activity +6-18 months]**	Not yet begun		X
[If including in work plan] Task 7: Permitting				

Obtain treatment permit	**[End of Task 5 – End of Task 5 + 4 months]**	Not yet begun		X
Obtain environmental health permit	**[End of Task 5 – End of Task 5 + 4 months]**	Not yet begun		X
Obtain construction permit	**[End of Task 5 – End of Task 5 + 4 months]**	Not yet begun		X

Construction/Implementation

Task 8: Construction Contracting – All construction contracting will occur after initiation of the Grant Agreement. Once final plans are approved, **[Project sponsor]** will be the lead agency in preparing bid documents to retain construction contractors. **[If pilot project was conducted, and bidding occurred during this process: During the pilot project (Project Sponsor) obtained bids to retain a general contractor and subcontractor for required onsite work at (project site). Because (project sponsor) has already been through the bidding process, they do not anticipate the need to re-bid this part of the (project name)].** Construction contracting is not included as part of this application. **[if included, delete this sentence and include it in tasks table.]**

Task 9: Construction – The project proposes to install POU RO treatment systems in DACs using contaminated groundwater for their source of tap water. The project will address a critical water supply need for DACs currently unable to connect to municipal supply systems. To prepare residents for system installation, training will be provided as part of site preparation.

Subtask 9.1 Mobilization and Site Preparation: *Train Local Community Members to Conduct Installation, Monitoring and Maintenance*

In Subtask 9.1, a training program will be developed to train local community members in how to install the water treatment systems. The training is part of site preparation activities because it prepares residents for installation of the treatment systems as well as preparing them for how to monitor and maintain the systems to ensure they remain functioning through the life of the project. This program will build off similar programs conducted to date, and will include, but is not limited to, the identification and solicitation of community members for inclusion in the training program, and preparation of training materials (presentation, script, etc.). Training workshops will be held for the community members, and will include modules on treatment unit installation, monitoring, maintenance and troubleshooting. Once members have completed the training program, the water treatment systems will be installed at previously identified DACs as described in Subtask 9.2.

Subtask 9.1 Deliverables

[A sample document with an outline for training presentation for Subtask 9.1 is included as Appendix G to this TM]

- *Training presentation and handouts*
- *Up to five (5)**[appropriate number]** training workshops held for community members*
- *List of trained community members*

Subtask 9.2 Project Construction: *Install Treatment Units*

Following completion of Subtask 9.1, the POU treatment units will be purchased in bulk, with the number of units purchased dependent on funds available. Using the protocol developed in Task 5, all purchased units will be managed and tracked, and a master list of all installed units compiled, including documentation of installer name, installation date and location, owner(s) name and contact information, pre- and post-installation water quality data, and installation notes. It is assumed that pre- and post-installation water quality sampling will be conducted for each installed treatment unit.

Subtask 9.2: Deliverables

- *EXCEL database (developed in Subtask 5.2 and completed here)*

***Subtask 9.3 Performance Testing and Demobilization**: Follow-up with residents*
This task will include return visits to residences who installed POU treatment systems under the program. On these visits, **[Project sponsor]** will test tap water to ensure systems are working and inspect systems for maintenance issues.

Subtask 9.3: Deliverables

- Performance testing results

Table X: Construction/Implementation

Activity or Deliverable	**Schedule**	**Status**	**Completion of Task**	
			Before [grant start date]	**After [grant start date]**
[If included]Task 8: Construction Contracting				
[If included]Construction bidding and contracting activities	**[Start of Grant +1 month – Start of Grant + 6 months]**	Not yet begun		X
Task 9: Construction				
Subtask 9.1 Mobilization and Site Preparation				
Develop training materials	**[End of Task 5 – end of Task 5 + 3-6 months]**	Not yet begun		X
Identify and invite community members to participate in training	**[One month prior to completion of training materials – one month after completion of training materials]**	Not yet begun		X
Hold 5 **[appropriate #]** training workshops	**[Following invitation to community members – 3 months later]**	Not yet begun		X
Subtask 9.2 Project Construction				
Install **[number]** POU treatment systems	**[End of Subtask 9.1 – end of Subtask 9.1 +1 month per site]**	Not yet begun		X
Subtask 9.3 Performance Testing and Demobilization				
Revisit installation sites and test systems	**[Revisit 1 yr after installation]**	Not yet begun		X

Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement – This project will not trigger requirements of CEQA, NEPA, or other environmental regulations and will therefore not require environmental compliance, mitigation, or enhancement. **[If project triggers one of these things, describe here.]**

Task 10 Deliverables:

As there are no project activities for Task 10, no deliverables are required. **[If Task 10 is required, deliverables might include EIR, EIS, Mitigation Monitoring Program, etc. If Task 10 is required, include table similar to those for other tasks]**

Construction Administration

Task 11: Construction Administration – This task involved administration, coordination, and review of the construction contract and all other related construction tasks, and will occur **[before and]** after initiation of the formal grant agreement. A project manager will be needed to coordinate with contractors, complete invoicing and billing, and other construction administration tasks as needed.

Table X: Construction Administration

Activity or Deliverable	Schedule	Status	Completion of Task	
			Before Sept 2013	After Sept 2013
Task 11: Construction Administration				
Management of Construction Contractor	**[Award date of construction contract – completion of construction (Subtask 9.2)]**	Not yet begun		X

3 Budget

The *DAC Residential Groundwater Treatment Program* **[Project title]** will involve tasks designed to identify and install appropriate POU RO treatment systems in DACs in the Coachella Valley **[Region]**. To create a sustainable program and ensure the systems work through the end of the project life, training will be provided to residents on proper testing and maintenance, and a financial program developed to create a long-term funding solution to help cover ongoing training, maintenance, and data collection and management expenses. This project will address a critical water supply quality issue for DACs that will protect health of residents by providing access to safe tap water. Funding for this program involves project administration, planning, and implementation.

The total cost associated with the *DAC Residential Groundwater Treatment Program* **[Project title]** is **[Total project cost]**. Of these total costs, **[grant request]** is being requested for grant funding through the IRWM Grant Program **[name of grant program]**. The remaining **[remaining costs]** will be provided by the project sponsor **[partner agencies] [and other grants]**. In total, the non-State share of the total project (funding match) is **[funding match]**% for this program. The funding match will be provided by the **[source of funding match]** of the operating funds of the **[project sponsor/partner agencies]**.

[Table X], below, provides a more detailed break-down of the total project budget.

Table X: Project Budget

Proposal Title: Coachella Valley IRWM Implementation Grant Proposal – Round 2					
Project Title: Non-Potable Water Use Expansion Program					
Project serves a need of a DAC?: ☒ Yes ☐ No					
Funding Match Waiver request?: ☐ Yes ☒ No **[check appropriate box]**					
		(a)	**(b)**	**(c)**	**(d)**
Category		**Requested Grant Amount**	**Cost Share: Non-State Fund Source* (Funding Match)**	**Cost Share: Other State Fund Sources***	**Total**
(a)	Direct Project Administration				
(b)	Land Purchase/ Easement				
(c)	Planning/ Design/ Engineering/ Environmental Documentation				
(d)	Construction/ Implementation				
(e)	Environmental Compliance/ Mitigation/ Enhancement				
(f)	Construction Administration				
(g)	Other Costs				
(h)	Construction/ Implementation Contingency				
(i)	**Grand Total**				
** Sources of funding: The non-state funding match will be provided by the* ***[funding source]****.*					

This proposal is requesting funding for **[appropriate #]** project tasks identified within the *DAC Residential Groundwater Treatment Program* **[Project title]** work plan (refer to **[add reference]**). The sections below provide detailed descriptions of each of the row and task budgets (where applicable). In addition, each section describes how cost estimates for each of the tasks or rows were calculated.

Table X: Cost Breakdown by Work Plan Task and Subtask

Row/Task	Category	Total
GA	Grant Administration	
Row (a)	Direct Project Administration Costs	
Task 1	*Project Administration*	
	[If applicable: Task 2 Labor Compliance]	
Task 3	*Reporting*	
Row (c)	Planning/Design/Engineering/Environmental Documentation	
Task 4	*Assessment and Evaluation*	
Task 5	*Final Design*	
	[If applicable: Task 6 Environmental Documentation]	
Task 7	*Permitting*	
Row (d)	Construction/Implementation	
	[If applicable: Task 8 Construction Contracting]	
Task 9	*Construction*	
	[If applicable: Row (e) Environmental Compliance/Mitigation/ Enhancement]	
	[If applicable: Task 10 Environmental Compliance/Mitigation/ Enhancement]	
Row (f)	Construction Administration	
Task 11	*Construction Contracting*	
Row (g)	Other Costs	
Row (h)	Construction/Implementation Contingency	
Row (i)	**Grand Total**	

Grant Administration

[Describe how grant administration will be handled] Local project sponsors shall dedicate a portion of their grant funds to CVWD **[agency responsible for grant administration]** for administration and processing of the Implementation Grant. The *DAC Residential Groundwater Treatment Program* **[Project title]** will contribute **[amount for grant administration]** to this administration cost. **[Describe who will be doing what for this task:]** Costs for grant administration include labor costs for a planning manager to coordinate receipt of quarterly progress reports and an analyst who will receive and reconcile invoices for grant reimbursables and funding match from project sponsors to create a grant invoice for DWR. The costs are based on hourly rates for these positions, and effort based on **[justification]**. **[Note: in the past, Coachella Projects have allocated between 2% and 3% of project cost for Grant Administration]**

Table X: Grant Administration

Activity	Discipline	Hourly Wage ($/hr)	Number of Hours	Total	Funding Match	Grant Request
Grant Administration						
Grant administration	Planning Manager	$85		120		
	Analyst	$60		180		
Grant Administration Total						

Direct Project Administration

[If applicable] The total direct project administration costs for the project are **[total direct project administration costs]** and will be spent by **[responsible party]** for administration and processing of the IRWM Implementation Grant.

Task 1: Project Administration – [Project sponsor] will assume all direct project administration costs for this project. This task involves administration of the *DAC Residential Groundwater Treatment Program* **[Project title]**, and include costs for a Project Manager and equipment and supplies associated with project administration. These costs are estimated to be **[costs]**. Cost estimates are based on project administration requirements of the STAT project, and adjusted for efficiencies and differences between the STAT project and the *DAC Residential Groundwater Treatment Program* **[provide appropriate reasoning for costs]**.

Task 2: Labor Compliance Program – Not applicable. **[If applicable, include who will incur costs, what they will be doing (refer to Work Plan), and how costs were determined.]**

Task 3: Reporting – [If not already included under Task 1:] Costs for Task 3 include those incurred by preparing the Project Assessment and Evaluation Plan, quarterly progress reports and invoices, and a Project Completion Report for the *DAC Residential Groundwater Treatment Program* **[Project title]**. Task 3 costs are estimated to be **[cost]**.

Table X: Direct Project Administration Budget

Activity	Discipline	Hourly Wage ($/hr)	Number of Hours	Total	Funding Match	Grant Request
Task 1: Project Administration						
Project Coordination	Project Manager	$100	240			
			Task 1 Total			
[If applicable:] Task 2: Labor Compliance Program						
Field Interview Project Labor Force	Consultant	$120	72			
Review Contractor Certified Payroll	Consultant	$120	48			
Prepare Deficiency Notification	Consultant	$120	48			
Prepare Final Report Summarizing Labor Compliance	Consultant	$120	24			
			Task 2 Total			
Task 3: Reporting						
PAEP	**[job title]**					
Compile invoices and work summary	Consultant	$120	40			
Prepare Quarterly Reports	Consultant	$120	120			
Prepare Final Report	Consultant	$120	80			
			Task 3 Total			
			Row (a) Total [Sum of this table]			

Land Purchase/Easement

Not applicable. **[if applicable, include description of WHO will do WHAT, any materials needed, total cost estimate, justification for estimate, and summary table]**.

Planning/Design/Engineering/Environmental Documentation

The total planning/design/engineering/environmental documentation costs for this project are **[costs]**. **[Table X]** provides a detailed listing of all applicable costs. This cost total is based on the following:

Task 4: Assessment and Evaluation – This task includes the costs for completing the market research and identification of preferred water treatment system, pilot testing **[if required]** (costs to include water testing and any construction costs for the pilot project, and costs for pilot project analysis **[insert brief description of activities from work plan for pilot project]**), and development of the long-term financing plan.. These costs are estimated to be **[cost]**, based on previous experience with water testing and similar pilot projects, as well as the **[justification for cost estimate for financing plan]**.

Task 5: Final Design – This task includes costs for development of the installation manual, protocols for program operations and maintenance, and monitoring and maintenance manual, estimated to total **[cost]**. Costs will be incurred by **[responsible party job title]**, and are estimated based on hourly rates and effort. Effort was estimated based on past experience creating similar sample documents, and adjusted for the additional detailed effort required for full implementation **[add justification]**.

Task 6: Environmental Documentation – Not applicable. **[If applicable: include costs for CEQA, NEPA, etc. as guided by the Work Plan]**

Task 7: Permitting – **[Project Sponsor]** has applied **[will apply]** for and received a treatment permit from the Riverside County Department of Environmental Health **[regulating agency]** for the project. **[Project sponsor]** will also apply for an Environmental Health Permit and a Building Department Permit for implementation of the *DAC Residential Groundwater Treatment Program*. Staff and other costs required to finalize this permitting is anticipated to be **[cost]**, based on prior experience submitting and receiving permits from the County of Riverside **[regulating agency]**.

Table X: Planning/Design/Engineering/Environmental Documentation Costs

Activity	Discipline	Hourly Wage ($/hr)	Number of Hours	Total	Funding Match	Grant Request
Task 4: Assessment and Evaluation						
Subtask 4.1: Market Research and Identification of Preferred Water Treatment System						
RO systems analysis						
[Add analysis activities to correspond with Work Plan]						
[If applicable:]*Subtask 4.2: Pilot testing*						
Water testing	Hydrologist		100			
Installation of 5 POU systems	**[job title]**					
	POU system	$125**[unit cost]**	5 **[# of systems installed]**	$625		
System monitoring	**[job title]**					
Subtask 4.3: Long-term Financing Plan						
Development of long-term financing plan	Financial Analyst					
	Consultant					
Funding Program						
			Task 4 Total			
Task 5: Final Design						
Subtask 5.1: Develop Installation Manual and Methodology						
Develop installation manual						
Subtask 5.2: Develop Protocols for Program Operations and Maintenance						
Develop protocols						
Develop recording forms						
Develop database						
Write program operation protocols						
Subtask 5.3: Develop Monitoring and Maintenance Manual						
Write monitoring and maintenance manual						
[if applicable: engineering and design]						
			Task 5 Total			
[If applicable:] Task 6: Environmental Documentation						
[NEPA/CEQA/etc.]						
			Task 6 Total			
Task 7: Permitting						
Treatment permit						
Environmental health						

permit						
Building permit						
[If applicable: encroachment permit, etc.]						
			Task 7 Total			
			Row (c) Total [Sum of this table]			

Construction/Implementation

The total construction/implementation costs for the *DAC Residential Treatment Program* **[Project title]** is **[cost]**. This cost total is based on the following:

Task 8: Construction contracting – Not applicable. **[Construction contracting will be conducted prior to any construction activities, but are not included as part of this application] [if applicable: describe activities – WHO will do WHAT (match Work Plan), provide cost estimates and justification]**

Task 9: Construction – Construction/implementation costs for this project are necessary to complete subtasks 9.1 through 9.3, as described in the Work Plan (**[reference work plan]**).

The total Task 9 cost estimate is **[cost]**, and is based on **[cost justification]**. Costs for this task are divided into three categories: Materials, Equipment, and Labor **[appropriate categories]**.

- Materials: Materials that will be required for construction/implementation of this project include training materials (handouts, manuals, **[other training materials]**), **[construction materials]**. Estimated cost for materials is **[cost]**.
- Equipment: Anticipated equipment costs for the project include costs for the POU systems, **[other equipment]**. Total equipment cost is anticipated to be **[cost]**.
- Labor: Labor costs for this project include costs for a trainer, general contractor, masonry, an electrician, and a plumber **[use appropriate labor based on Work Plan]**. Total labor costs are estimated at **[cost]**.

Table X: Construction/Implementation costs

Materials						
Activity	**Materials**	**Unit Costs ($)**	**Number of Units**	**Total ($)**	**Funding Match**	**Grant Request**
5 **[appropriate #]** Training	Training manual	**[do not include cost to develop – just cost to print/materials to print]**				
	Handouts	**do not include cost to develop – just cost to print/materials to print]**				
	[other training materials]					
			Subtotal			
Equipment						
5 **[appropriate #]** Training	Training Space		**[# of meetings]**			
	[other equipment for training – projectors, etc. if not included in space]					
POU installation	POU system	$125				
	[other equipment]					
			Subtotal			
Labor						
Activity	**Discipline**	**Hourly Wage ($/hr)**	**Number of Hours**	**Total**	**Funding Match**	**Grant Request**
5 **[appropriate #]** Training	**[Job title for trainer]**		40 **[# of meetings x time per meeting]**			
	[other persons necessary to conduct training]		40			
POU Installation	General Contractor		800			
	Masonry		160			
	Electrician		160			
	Plumber		280			
	General Labor		160			
	[Other labor]					
			Subtotal			
			Row (d) Total [Sum of this table]			

Environmental Compliance/Mitigation/Enhancement

This project will not trigger requirements of CEA, NEPA, or other environmental regulations and will therefore not require environmental compliance, mitigation, or enhancement or incur costs for such activities. **[if applicable, describe WHO will do WHAT, total costs, justification of costs, etc. and add a table summarizing costs]**

Task 10: Environmental Compliance/Mitigation/Enhancement – Not applicable.

Construction Administration

Total estimated construction administration costs for the *DAC Residential Groundwater Treatment Program* is **[cost]**.

Task 11: Construction Administration – Costs for this task include the cost for a Project Manager to oversee a contractor for construction and POU system installation, and to oversee the training program.

Table X: Construction Administration

Activity	Discipline	Hourly Wage ($/hr)	Number of Hours	Total	Funding Match	Grant Request
Task 11: Construction Administration						
Training administration	Project Manager	$85	40			
Construction/installation administration	Project Manager	$85	476			
			Row (f) Total			

Other Costs

Other costs for the project are **[costs]**. These costs include **[describe what these other costs are – may include environmental health dept. fees, costs for certified operator for monitoring, others costs incurred based on previous experience]**. Other costs incurred will be provided by the project proponent as matching funds **[unspecified costs unlikely/unable to be covered by grant]**.

Construction/Implementation Contingency

Based on past experience with similar projects, approximately 10% of construction/implementation funds are generally required for unexpected expenses related to construction. As such, the project has budgeted **[10% of construction/implementation costs]** for constriction/implementation contingency.

Grand Total

The Grand Total for the *DAC Residential Treatment Program* (**[total cost]**) was calculated as the sum of rows **[first row]** through **[last row]** for each column.

Table X: Grand Total Costs

Row	Budget Category	Total Costs
GA	Grant Administration	
(a)	Direct Project Administration Costs	
(b)	Land Purchase/Easement	
(c)	Planning/Design/Engineering/ Environmental Documentation	
(d)	Construction/Implementation	
(e)	Environmental Compliance/ Mitigation/Enhancement	
(f)	Construction Administration	
(g)	Other Costs (Including Legal Costs, Permitting and Licenses)	
(h)	Construction/Implementation Contingency	
(i)	**Grand Total**	

4 Schedule

The project schedule for the *DAC Residential Groundwater Treatment Program* **[Project title]** was developed from the Work Plan (**[reference work plan location]**), and includes anticipated start and end dates, as well as milestone for each work plan task. **[Note: grant application may require actual dates, not just lengths of time from grant start date; schedule included here is to provide the minimum time required to complete each task. Timing will vary depending on specific tasks, site characteristics, number of sites, and project sponsor's ability to front the funding to complete each task. Project sponsor may choose to add time to tasks to provide for unexpected delays]**

	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 5	Qtr 6	Qtr 7	Qtr 8	Qtr 9	Qtr 10	Qtr 11	Qtr 12
Task	1 2 3 4	5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20	21 22 23 24	25 26 27 28	29 30 31 32	33 34 35 36	37 38 39 40	41 42 43 44	45 46 47 48
Grant Administration												
Task 1: Project Administration												
[If applicable:] Task 2: Labor Compliance												
Task 3: Reporting												
Compile PAEP, Invoices, and Progress Reports												
Quarterly Grant Reporting and Invoices												
Final Report												
Task 4: Assessment and Evaluation												
Potential system analysis												
Pilot study installation												
Pilot study water testing												
Pilot study monitoring												
Develop Funding Plan												
Implement Funding Plan												
Task 5: Final Design												
Installation Manual												
Develop protocols												
Develop recording forms												
Develop database												
Write Program Operations Protocols												
Write Monitoring and Maintenance Manual												
[If applicable:] Task 6: Environmental Documentation	Potentially start before grant											
Task 7: Permitting												
Obtain treatment permit												
Obtain env. health permit												
Obtain construction permit												
[If applicable:] Task 8: Construction Contracting												
Task 9: Construction/Implementation												
Develop training materials												
Identify and invite training participants												
Hold training workshops												
Install POU systems												
Follow-up testing												
[If applicable:] Task 10: Environmental Compliance/Mitigation/Enhancement												
Task 11: Construction Administration												

Appendix A - Commercially-Available Point of Use (POU) Reverse Osmosis (RO) Treatment Units (as of October 15, 2013)

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Task 1 Sample Document:

Commercially-Available **Point of Use (POU) Reverse Osmosis (RO) Treatment Units**

(as of October 15, 2013)

	System Information					Capital Cost		Replacements	
	Manufacturer	**Model Name**	**Model No.**	**Stages**	**Flow (gpd)**	**List Price**	**Online Price**	**Parts**	**Cost**
On-line	iSpring		RCC7	5	75	$300	$170	filter pack	$32.00
	iSpring		RCC7AK	6	75	$340	$210	filter pack	$74.67
	iSpring		RCC7AK-UV	7	75	$460	$276		
	Watts Premier	RO-Pure	531411	4	50	$400	$200	filter pack	$50.00
	New Wave	Enviro	796515300000	10		$119	$87		
	Aquatic Life	RO Buddie	540016	3	50	$80	$69	sediment cartridge, carbon cartridge	$28.57
	Aquatic Life	RO Buddie	540017	3	100	$120	$83	sediment cartridge, carbon cartridge	$57.14
	Hydro-Logic	Stealth-RO100	HLRO100		100	$225	$175	sediment filter, carbon filter	$34.21
	Purenex		RO-5-50	5	50	$150	$143	filter replacement set	$30.00
	US Water Systems	Aquapurion	APRO-4050	4	50	$150	$234		
	US Water Systems	Aquapurion	5050 (-5050A, -5050F, -5	5	50 - 75	$190-$290	$297-$500		
	US Water Systems	Aquapurion Plus	APRO-5075	5	75	$280	$437		
	US Water Systems	Aquapurion Re-Mineralization	APRO-6050	6	50	$340	$531		
	US Water Systems	Aquapurion Permate Pump	APRO-5050P	5	50	$350	$547		
	US Water Systems	Aquapurion High Pressure Permat	APRO-5100-P-14	5	100	$550	$859		
	US Water Systems	Whole House RO	USWHRO	6	500, 1500 & 4000 units	$3,995	$6,242		
	EcoWater	EcoWater ERO 375	ERO 375	3					
	EcoWater	EcoWater ERO 175	ERO 175	3					
	Coralife	Pure-Flo	5692	4	50	$275	$148	filter pack	$50.00
	Coralife	Pure-Flo	76000	3	24	$200	$120		
Home Depot	Perfect Water Technologies	Tap Master Artesian	TMAFC	7		$419	$419		
	Perfect Water Technologies	Tap Master Ultra	TMULTRA	6		$459	$459		
	General Electric	RO Water Filtration System	GXRM10RBL	3	11	$149	$149	filter set	$47.23
	DuPont	QuickTwist RO System	WFRO60X	3		$279	$279		
	EcoPure		ECOP309	3		$170	$170		
Lowe's	Whirlpool		WHER25	3		$131	$131	filter set	$77.00
	Krystal Pure		KR15	3	30	$320	$320	filter set	$34.90
	Krystal Pure		KR10	3	30	$220	$220	filter set	$26.77

Appendix B - Example Sampling and Analysis Plan (SAP) for POU Treatment Unit Pilot Testing

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1 Introduction

As part of the Coachella Valley IRWM Plan 2013 Update, a Disadvantaged Community (DAC) Water Quality Evaluation was conducted to assess groundwater quality in DACs where groundwater was the primary source of drinking water and to address stakeholder concerns about the quality of those drinking water supplies. This study identified Areas of Concern (AOCs), defined as areas of DACs that are utilizing groundwater containing constituents of concern (COCs) above State and Federal drinking water standards or Maximum Contaminant Levels (MCLs). Primary COCs identified in the underlying groundwater were arsenic, fluoride, nitrate, uranium, and hexavalent chromium. Additionally, as part of this earlier study, methods for treating the groundwater were considered, including treatment methodologies and varying modes for delivery of that treatment. Finally, projects to address the COCs found in the AOCs were identified and a monitoring plan developed to fill identified data gaps.

The DAC Residential Groundwater Treatment Program was one of the projects identified during the DAC Water Quality Evaluation as a means of addressing poor drinking water quality in AOCs. This program identified commercially-available point of use (POU) reverse osmosis (RO) treatment units as the most cost-effective way to treat drinking water in DACs in outlying areas (areas distant from existing public water systems). Outlined in the program are several steps or tasks for development of a program for selecting, installing, monitoring and maintaining POU RO units in DACs. These steps are:

Task 1 – Identify Possible Water Treatment System

Task 2 – Pilot Test Recommended Systems

Task 3 – Prepare Program Documentation (including installation manuals and monitoring and maintenance manuals)

Task 4 – Train Local Community Members and Install Systems

Task 5 – Develop Financing Strategy for Sustainable Monitoring and Maintenance

This document presents a summary of key elements to be included in a POU water treatment pilot test and an example sampling and analysis program for addressing Task 2, development and implementation of a pilot testing program. The pilot testing should be conducted to aid in the selection of a POU treatment device and to demonstrate compliance with the objective of providing safe drinking water to DACs. This plan will support the pilot program by providing a guide for establishing the current tap water quality conditions relative to tap water quality post-installation of under-sink POU treatment systems. Specifically, the objectives of this plan are to:

- Identify key elements of the pilot testing as a guide to testing protocol development;
- Provide guidance in collecting and analyzing water quality samples to support selection of a POU RO water treatment device; and
- Outline elements of treatment unit installation, monitoring and maintenance to be considered in overall program development.

2 Elements for Inclusion in Pilot Testing Program

Using the information contained in this section, a pilot testing program should be developed to support overall program development. Specifically, the following steps are recommended to be conducted in outlining the pilot testing program.

2.1 System Identification and Surrogate Selection

Three to five POU RO treatment units should be selected for the pilot program. RO systems were identified as the best available technology for removing identified COCs (arsenic, fluoride, nitrate, uranium, and hexavalent chromium) from groundwater underlying DACs in the Coachella Valley. Similarly, three to five households should be identified for participation in the testing program.

Prior to initiation of the pilot testing, the system manufacturer should be contacted about possible surrogate analyses to be considered during pilot testing. A surrogate parameter is one that can be easily measured at the testing site and can be correlated directly with performance of the treatment unit. Typical surrogates include specific conductance/electrical conductivity (EC) and turbidity. Field testing equipment should be obtained and calibrated for the selected surrogate parameter.

Finally, the pilot testing protocol should be documented in a pilot testing workplan. Parameters to be addressed by the testing are summarized in Section 2.5, below, and should be considered in work plan preparation.

2.2 Pre-Installation Testing

Prior to POU treatment system installation, tap water samples should be collected from the pilot households per the protocols documented herein. While each DAC may have an identified COC, it is recommended that both pre- and post-installation sampling be conducted for the full array of COCs.

During pre-installation water quality testing, split (two) samples should be collected at the tap, with one sample analyzed using the field testing equipment for the surrogate of choice, temperature and pH, and the other sample tracked and sent to the selected state-certified analytical laboratory for analysis. Visual observations of water quality should also be made at the time of sampling, and recorded in field notebook or file.

2.3 Treatment Unit Installation

Following pre-installation water quality samples, the POU treatment systems should be installed per the manufacturer's instructions on separate household taps in the identified DAC(s). System startup should also follow the manufacturer's instruction, with all steps documented in a field notebook or file. Post-installation water quality samples should be collected immediately following start-up per sampling and analysis protocols documented herein. As with the pre-installation sampling, split samples should be collected, with one sample analyzed at the testing site for the selected surrogate parameter, temperature and pH, and the second sample sent to the selected analytical laboratory. Visual observations of water quality should also be made at the time of sampling, and recorded in field notebook or file.

2.4 Pilot Testing

Pilot testing (POU treatment system use) should continue for a minimum of two months, with weekly water quality samples collected from each system. As before, split samples should be collected, with one sample analyzed at the testing site for the selected surrogate parameter, temperature and pH, and the second sample sent to the selected analytical laboratory. Visual observations of water quality should also be made at the time of sampling, and recorded in field notebook or file.

2.5 Pilot Testing Data Analysis

The results of the pilot testing should be analyzed to address several key parameters/issues. The results of the analyses should then be used to guide the overall program development. The following are descriptions of the key parameters to be addressed.

Contaminant Removal Efficiency

During pilot testing, the COCs which are being removed by each unit must be identified and the percent removal of each constituent calculated for each POU device tested. Operating extremes should be considered. At a minimum, data should be plotted over time to identify trends in measured conditions, such as production and contaminant removal efficiency over time.

Service Life

The pilot testing should run long enough to determine when routine or common operations and maintenance will required given the varying water quality at the testing sites.

Performance Indication Devices

Pilot testing should evaluate the effectiveness of mechanical warnings or other performance indication mechanisms on the selected treatment units. Warning or mechanism tests must correlate the alarms to measured data indicating functionality in accordance with manufacturer's specifications.

Waste Characterization

The resulting wastes from each treatment unit considered in the pilot testing program must be evaluated to determine how waste from the device will be characterized and disposed. Anticipated wastes include used filters and membranes. The County Department of Environmental Health may be consulted in determine the best disposal method for resultant wastes.

Device Location(s)

During installation of the pilot testing units, consideration should be given the device location. Factors to consider when choosing installation locations are accessibility to devices, pilot test run time or volume of treated water needed to collect sufficient data and variability of water characteristics in the distribution system or customer's home. Documentation of justification and/or reasoning for site selection and setup should be prepared.

Device Specifications

In selecting the treatment units to be tested, the unit type, make and model of device(s) to test should be based on treatment needs, flow rates, COCs, costs, device capability, appurtenances needed, manufacturer's support, etc.

Raw Water Quality/Constituents of Concern

A key objective of pre-installation water quality testing will be to establish raw water quality, including which constituents of concern need to be addressed by the treatment unit.

Measured Parameters

Prior to pilot testing, parameters will be sampled in the field versus analyzed by the laboratory must be identified, plus methods for sample collection, transport and analysis. Characteristics to measure performance of the devices, setup and appurtenances must be considered, along with performance characteristics, including quality of treated water, time to surrogate or contaminant breakthrough, time of failure, device cycle life before service or replacement, treated water production rate, waste produced, overall device integrity, effectiveness of device failsafe or warning indicators and effectiveness of appurtenances. The data and results from the pilot testing program should then be used to optimize POU device and setup.

Device Setup Procedures

It is recommended that pilot testing and setups be conducted under different conditions. Several treatment technologies may need to be incorporate into a single POU treatment system to address certain water quality problems. For example, pre-filtration may extend the life of the RO membrane, while post-filtration activated carbon filter may improve aesthetics of treated water.

System Conditions and Variability

Pilot testing should test the performance characteristics of the POU treatment devices under a range of conditions, including low incoming pressure.

Surrogate Monitoring

Pilot testing should also evaluate if a surrogate parameter (such as specific conductance) can be used to accurately predict device performance. Ideally, surrogate parameters selected can be measured in the home with handheld devices. Pilot testing should establish a strong correlation between the surrogate and the constituents of concern using split samples with both field measurements and water quality analyses by a state certified laboratory. To minimize testing errors, the field testing device should be able to be calibrated, verified with a known standard, and include temperature correction, if appropriate.

Pre/Post Treatment (if necessary)

Pre- and/or post-treatment processes should be considered, if necessary, to improve customer satisfaction or to extend the life of the treatment device.

3 Example Sampling and Analysis Plan

This example Sampling and Analysis Plan (SAP) will discuss the following key elements of a SAP:

- Sampling locations
- Sampling methodology
- Sampling documentation

3.1 Sampling Locations

Sampling locations for the pilot program are the taps on which the POU RO treatment units will be installed, most likely the kitchen faucets. Both baseline (pre-installation) and post-installation sampling will occur at the same location following the same sampling methodology in order to provide comparable data. Water samples from the treated taps will be analyzed for the five identified constituents of concern: arsenic, uranium, fluoride, nitrate, and hexavalent chromium. Field (in-home) measurements should also be made using handheld devices for temperature, pH, specific conductance and/or turbidity .

3.2 Sampling Methodology

This section presents the sampling methods to be followed during pre- and post-installation pilot testing.

No sampling methods are presented here for field (in-home) measurements as the sampling protocols will be dependent on the devices selected. It is recommended that the manufacturer's instructions be followed for device calibration prior to sampling and for sample collection and analysis.

3.2.1 Sampling Methods and Frequency

There are three sampling phases in the POU RO treatment unit pilot program: a baseline (pre-installation) phase, an installation phase, and a post-installation phase. Each of these phases is described in more detail below.

Baseline Sampling Phase

Baseline water quality will be established by collecting water samples prior to the installation of the water treatment unit. During the baseline phase, water samples will be collected from the tap on which the treatment unit will be installed. It is recommended that each of these samples, for each location, be collected on the same day of the week and at roughly the same time to remove any natural temporal variations in water quality. Field (in-home) analyses of surrogate parameters should also be conducted and recorded to correlate to the analytical laboratory samples.

Installation Phase

During installation of the water treatment unit, two samples will be collected: one immediately prior to the installation of the treatment unit and one immediately following the installation. Field (in-home) measurements of surrogate parameters should indicate an immediate improvement in water quality. Laboratory analysis of the samples collected will confirm the treatment unit's successful application.

Post-Installation Sampling Phase

In the weeks following installation of the water treatment unit, samples will be collected from the same tap as was used during baseline sampling. Sampling will occur weekly after installation for a period of at least two months. As before, it is recommended that post-installation sampling at each location occur on the same day of the week and within the same general time of day as the baseline sampling at that same location so as to remove any natural temporal variation in water quality. Field (in-home) analyses of surrogate parameters should also be conducted and recorded to correlate to the analytical laboratory samples.

All Sampling Phases

For all three sampling phases, grab water samples for analytical laboratory analyses will be collected in unpreserved bottles for analysis. Prior to sample collection, the tap must be turned on and left running for at least one minute before the water sample is collected. Visible characteristics of the samples, including color, smell, and clarity, will be noted at the time of sampling using in a field sheet or log book, similar to the one presented in Appendix A. Samples will be placed in a cooler with ice for shipment to laboratory within 24 hours and must be kept under 46°F (8°C).

3.2.2 Equipment

Sampling Containers

Sampling for laboratory analyses will require two 500 mL sterile plastic bottles and one 250 mL sterile plastic bottle. Water samples for field (in-home) analyses should be collected following manufacturer's instructions for the selected measurement device.

Field Equipment

The following equipment will be required for sample collection:

- Disposable gloves (polyethylene, nitrile, or non-talc latex gloves recommended); a new pair should be worn at each sample site
- Appropriately-sized coolers with cube ice, blue ice or dry ice
- Pre-labeled sample containers
- Unpreserved bottles for sampling from sink taps
- Deionized water for equipment blanks
- Data sheets and chain of custody forms for recording sample information and field measurements

Equipment Preparation

Prior to sampling, bottles should be prepared with pre-printed labels with the information discussed in Section 3.3 of this Plan.

Decontamination

Water sampling and field analysis equipment will be cleaned before use, between measurements, and before leaving the site. For bottles used in field measurements, wash using soapy water consisting of Liqui-nox™ or Alconox™ followed by one rinse of clean tap water and then two rinses of distilled water. All buckets will be decontaminated before use on the site.

3.3 Documentation

Sample Name and Type

Each sample collected will be identified by its sampling location using the following code: *Location Code-Sample Type-Sample Number*. Location codes are numerically assigned for each unit installed. Sample types are outlined in Table 1 below. Sample numbers are assigned based on the number of the sample type. For instance, the third sample taken post-installation at the second sampling location would be labeled 2-PI-3.

Table 1: Sample Types

Sample Type	Code
Baseline	BL
Post-Installation	PI
Quality Control (field blanks)	MISC

Sample Labels

Sample labels are necessary to prevent misidentification of samples. Labels shall be filled out using indelible ink with the following information:

- Sample identification number (see above naming convention)
- Date and time of collection
- Analyses to be performed
- Sampling personnel

Labels will be affixed to all sample containers at the time of sampling.

Chain of Custody

Each laboratory used for this study has a Chain of Custody form that will be used when transferring samples to the lab. This form identifies the sampler's name, date and time of collection, matrix, sample ID, sample location, sample preservation technique (if applicable), the analysis requested, and the date and time of transfer. Signatures are required on the chain of custody forms each time the samples change hands (i.e. from sampler to courier, from courier to laboratory). A sample chain of custody form is included in Appendix A. A list of state-certified analytical laboratories in the Coachella Valley area which may be used is presented in Appendix B.

Water Monitoring Field Sheet/Field Log Book

All information pertinent to the sampling effort will be recorded on a field sheet, log book, or an equivalent standardized form, similar to the one shown in Appendix A. Each page/form will be consecutively numbered. All entries will be made in indelible ink and all corrections will consist of line-out deletions that are initialed and dated. Entries in this field sheet or log book may include the following:

- Purpose of sampling
- Location and description of the sampling point
- Name and address of field contact
- Documentation of procedures for preparation of reagent or supplies which become an integral part of the sample (e.g., field blanks)
- Type of sample (e.g., tap water)
- Number and volume of sample taken
- Sample type taken (e.g., primary sample, replicate, field blank)
- Sampling methodology
- Sample preservation
- Date and time of collection
- Weather conditions
- Sample distribution and how transported (e.g., name of the laboratory and shipping agent)
- Reference such as maps of the sampling site
- Field observations
- Any field measurements made
- Signature and date by the personnel responsible for observations
- Decontamination procedures

Sampling situations vary widely. No general rules can specify the extent of information that must be entered into a log book or standardized form. However, records will contain sufficient information so that the sampling activity can be reconstructed without relying on the collector's memory.

A sample numbering system (as previously described) will be used to identify each sample collected. This system will provide a tracking number to allow retrieval and cross-referencing of sample information. A listing of the sample identification numbers will be maintained in the field sheet or log book.

4 Analytical Methodology

For the purposes of the pilot program, all pre-installation and installation-related water samples should be analyzed in the laboratory for the five COCs, and in the field (in-home) for temperature, pH, and any selected surrogate parameters (such as specific conductance or turbidity). Table 2, below, summarizes the laboratory analyses to be conducted for the five COCs, holding times and sampling container information.

All samples will be collected in unpreserved bottles. For those analytes requiring a preservative, the appropriate preservative will be added in the laboratory. During laboratory testing, arsenic and uranium analysis will occur from the same bottle and nitrate and fluoride analysis will occur from the same bottle. Hexavalent chromium testing requires a separate 250 mL bottle sample.

For post-installation sampling at any given sampling location, only those analytes found in the baseline analysis will be tested for by the analytical laboratory. Water samples collected will be sent to a pre-determined analytical laboratory. This laboratory should be contacted in advance of the sampling as they will provide the bottles, coolers (for transportation of the samples) and chain of custody forms at no cost. A list of nearby analytical laboratories is included in Appendix B.

Table 2: Parameters and Sampling Information

Parameter	Analytical Method	Hold Time	Container Type	Preservative	Volume	Reporting Limit
Arsenic	EPA 200.8	180 days	Plastic	HNO3	500 mL	1.0 µg/L
Uranium	EPA 200.8	180 days	Plastic	HNO3	500 mL	1.0 µg/L
Fluoride	EPA 300.0	28 days	Plastic	None	500 mL	0.11 mg/L as N 0.5 mg/L as NO3
Nitrate	EPA 300.0	48 hours	Plastic	None	500 mL	0.27 mg/L
Hexavalent Chromium	EPA 218.7	14 days	Plastic	Ammonium Sulfate & Ammonium Hydroxide	250 mL	0.03 µg/L

5 Quality Assurance/Quality Control (QA/QC) Measures

Quality assurance (QA) and quality control (QC) measures are followed to verify the accuracy of the samples collected and analyzed.

Quality control samples will be collected at various times and sites during sampling events. Equipment blanks will be taken to assess potential sample contamination levels that occur during field sampling activities while field duplicates are collected to verify laboratory procedures and accuracy. The QA/QC procedures documented here are adapted from the State Water Resources Control Board's *Quality Assurance Program Plan* for the Surface Water Ambient Monitoring Program.

5.1 Field QA/QC

Field duplicates will be collected to provide precision information as it pertains to the sampling process. The duplicate sample must be collected in the same manner as the primary sample and as close in time as possible to the original sample. This will allow examination of field homogeneity and sample handling. One field duplicate sample should be taken during each sampling event. Table 3 shows the frequency of analysis and measurement quality objectives for each of these quality control methods.

Equipment blanks (also known as rinse blanks) are recommended if sampling equipment is pre-cleaned or cleaned in the field. Equipment blanks are not required for disposal or one-time use equipment. Equipment/rinse blanks are collected by first cleaning the equipment, and then collecting the final rinse water (analyte-free) as it is rinsed on or through the sampling equipment (whether pre-cleaned or field cleaned). The final rinse water is placed in the appropriately preserved containers, and stored and transported with the other water samples.

Equipment (or rinse) blanks are used to determine the effectiveness of field cleaning procedures as well as to reveal those sources of contamination that may be found in field blank samples. Equipment/rinse blank samples will collected and analyzed for all parameter groups and matrices. When less than five samples of a similar matrix are collected, one equipment blank sample is recommended for pre-cleaned or field-cleaned equipment for each parameter analyzed. For sampling events involving ten or more samples, one blank should be collected on field-cleaned equipment for every 10% of the samples in each analyte group.

Table 3: Field Quality Control Methods

Quality Control Method	Frequency of Analysis	Measurement Quality Objective
Field Duplicate	10% of total project sample count	Relative Percent Difference <25%
Equipment Blank	Per method/per sampling event	< Reporting Limit for target analyte

5.2 Lab QA/QC

All samples collected during this project will be analyzed for the selected parameters in accordance with standard methods found in U.S. Environmental Protection Agency manuals, *Standard Methods for the Examination of Water and Wastewater*, or other standard accepted methods. Upon receipt, the temperature of samples will be recorded by laboratory personnel.

Each analytical laboratory has a slightly different QA/QC program. Laboratory QA/QC programs should be examined prior to selecting an analytical lab to be used for sampling analysis. A list of state-certified analytical labs within the area is included in Appendix B.

5.3 Calibration

All analytical equipment used in the field for in-home sampling and analyses should be calibrated prior to use, verified with a known standard, and include temperature correction, if appropriate. All calibration results should be recorded in the field log or notes.

6 Data Reduction, Validation, Analysis and Reporting

Accurate data reduction, validation, and reporting methods are essential in summarizing information to support conclusions. The objective of these procedures is to provide a documented history of a sampling or measurement activity and to achieve the data quality objectives. Proper techniques for both field and laboratory activities are described in this section.

6.1 Data Reduction

Data reduction methods can include the computation of summary statistics, their standard errors, and confidence intervals or limits. Reduction of analytical data will be performed using the format specified in the USEPA- or CLP-approved method.

6.2 Data Validation

Data validation techniques include reviewing, accepting, rejecting, or qualifying data on the basis of sound criteria. Data validation is based on the following criteria:

Field Criteria

- Preservation
- Chain of custody
- Sample integrity
- Confirmation

Laboratory Criteria

- Initial calibration
- Continuing calibration
- Holding times
- Blank sample results
- Other QC sample results

Data values that are significantly different from the population are referred to as “outliers.” Outliers can result from improper sampling or analytical methodology, matrix interferences, errors in data transcription, and real but extreme changes in analytical parameters. Outliers resulting from errors found during data validation will be identified and corrected, and those that cannot be attributed to analytical, calculation, or transcription errors will be retained in the database for further evaluation. The validation methods for field and laboratory activities are described below.

Field Data

QA personnel will validate field data through reviews of data sets to identify inconsistencies or anomalous values. Any inconsistencies discovered will be resolved immediately, if possible, by seeking clarification from those personnel responsible for data collection. All field personnel will be responsible for following the sampling and documentation procedures described in the sampling protocols and this QA/QC Plan to ensure that defensible and justifiable data are obtained.

Laboratory Data

Laboratory personnel will assess data at the time of analysis and reporting through reviews of the raw data for any nonconformances of the analytical method protocols. Data validation will be performed by a QA Specialist.

Initially, 10% of the analytical data will be randomly selected for full validation. Full validation not only includes review of data sheets, initial and continuing calibrations, MS/MSD, LCS, method blanks, and surrogates, but it also includes raw data review. This percentage may be increased if substantial data quality issues are raised during the initial assessment. Additionally, all background samples will be selected for full validation. All data will undergo a cursory review. A cursory review includes examination of the items found in a full validation, but it does not include raw data evaluation.

6.3 Data Analysis

All data collected during the pilot testing program should be analyzed to establish necessary programmatic and operational parameters. See Section 2.5 of this document for the information to be determined from data analysis.

6.4 Reporting

Following data validation, both field and laboratory data should be reported according to procedures described in this subsection.

Field Data

Field data recorded during the sampling activities will be compiled and reported in summary tables for review. Corresponding descriptions and units will also be provided to accurately reflect the field conditions.

Laboratory Data

The following items are included by the laboratory in presentation of data in laboratory analytical reports:

- The final data presentation will be checked in accordance with data verification requirements and approved and certified by the laboratory manager
- Data will be presented in a tabular format whenever possible
- Each page of data will be identified with the project number and name, date of issue, and project name
- Reported data will include the sample identification number, laboratory sample identification number, analytical method, associated QC reported value, unit of measurement, and quantification limits

- Field QC results will be reported in the same format as real samples
- Footnotes will be referenced to specific data if required to explain reported values
- The laboratory will provide case narratives that include any problems that occurred at the laboratory in reference to the samples

Laboratory data packages and reports should be archived at a pre-determined location.

Analysis Report

Data analysis will be completed by compiling and analyzing the data collected in the sampling phase of the project. This analysis should be documented in a report or memorandum format, and should include a summary of the pilot testing program, sampling conducted, data collected, conclusions, and findings. This should include, but is not limited to, a summary of baseline water quality data collected and preliminary analysis of the data, including overall observed water quality conditions and potential sources contributing parameters of concern, the recommended POU RO treatment unit for use in the program, and proposed operating parameters for the recommended treatment unit.

7 References

State Water Resources Control Board. 2008. *Quality Assurance Program Plan*. Surface Water Ambient Monitoring Program. http://www.swrcb.ca.gov/water_issues/programs/swamp/qaprp.shtml.

Appendix A: Example Sampling and Field Forms

DQM Field Data Sheet for Water Quality Monitoring

Date ________ Page ________

of ________

Waterbody Name: ________________________________

Project Name and/or ID: ____________________________

Station ID: ____________________

Group/Organization name and/or ID: ____________________

Station Name: ______________________

Team Name: ____________________________________

Station Habitat (*circle one*: Pool, Run, Riffle)

Trip ID _______ Station Visit ID ________

Leader (name & phone #): Members: *(list additional names on back)*	Date of last rain

Observations: *Circle one underlined option:* **Observations Time:** ________________

Cloud cover	no clouds; partly cloudy; cloudy sky
Precipitation	none ; misty; foggy; drizzle; rain;
Wind	calm; breezy; windy;
Water Murkiness	clear water; cloudy water (>4" visibility), murky (<4" visibility). *[this pertains to the water itself, not to scum]*
Flow conditions	dry creekbed; isolated pools; trickle (< 0.25 gal/sec); < 5 gal/sec; > 5 gal/sec; full waterway no observed flow
Sample color	none; amber; yellow; green; brown; gray; other:
Sample odor	none; fresh algae smell; chlorine; rotten eggs; sewage; other
Other (presence:)	algae or water plants; oily sheen; foam or suds; litter; trash; other

Measurements

Instrument ID	Parameter	Unit	Result	Repeated Measurement Result	Bracket/ Resolution	Measurement Time	Measurement Depth*	Comments
	Total Depth (at Station) or Staff Gage readout	cm					not applicable	
	Specific conductivity	uS/cm						
	Dissolved oxygen (DO)	mg/l (ppm)						
	Temperature, water	°C						
	pH .	pH						
	Transparency	cm						

***Measurement Depth**: *(Select)* surface; mid-column; near-bottom; (*or provide measured number and unit*)

Sampling Device: *(for observations, measurements, and Samples)*: none; pole&beaker; bucket& rope; Kemmerer; other:

Sample ID *(for offsite analyses)*	Collection Time	Collection Depth	Sample Containers

Analytical Sciences
P.O. Box 750336, Petaluma, CA 94975-0336
110 Liberty Street, Petaluma, CA 94952
(707) 769-3128
Fax (707) 769-8093

CHAIN OF CUSTODY

Lab Project Number: ____________
Client's Project Name: ____________
Client's Project Number: ____________

CLIENT INFORMATION

Company Name: **RMC Water and Environment**
Address: **2001 North Main St, Suite 400**
Walnut Creek, CA 94596
Contact: **Leslie Dumas**
Phone #: **(925) 627-4100**
Fax #: **(925) 627-4101**
e-mail: ldumas@rmcwater.com

GeoTracker Required Yes No
GeoTracker Number:

TURNAROUND TIME (check one)

Same Day ______
48 Hours ______ 24 Hours ______
5 Days ______ Normal ______

Page ______ of ______

Item	Client Sample ID	Date Sampled	Time	Matrix	# Cont.	Presrv Y/N	ANALYSIS: Total Coliform & E. Coli	Enterococcus	TSS	TDS	Biological Oxygen Demand	Total Phosphorus	Dissolved Phosphorus	Fecal Coliform MPN	TKN as N	Nitrate as N	Nitrite as N	Ammonia as N	Total Nitrogen as N	Orthophosphate as P	Comments	Lab Sample #
1																						
2																						
3																						
4																						
5																						
6																					CC:	
7																					[illegible]@rmcwater.com	
8																						
9																						
10																						

SIGNATURES

Sampled By: ____________

Relinquished By: ____________ Received By: ____________

Signature ____ Date ____ Time ____ Signature ____ Date ____ Time ____

BioVir Laboratories ®

SAMPLE DATA SHEET

SHIPPING ADDRESS: BIOVIR LABORATORIES, INC., 685 STONE ROAD, UNIT 6, BENICIA CALIFORNIA 94510
1-800-GIARDIA (442-7342) FAX: 707-747-1751
Business Hours: Monday through Friday - 8:30 AM to 5:00 PM

COMPANY OR UTILITY: TELEPHONE# DATE FAX	DATE OF SAMPLING: PURCHASE ORDER #
NAME OF SAMPLER: (Please print and sign - REQUIRED)	Matrix: Drinking Water Wastewater Biosolid OTHER: ____________ **Regulatory Drinking Water Sample(s) Yes ☐ No ☐** **CA DHS Contact Person and Phone Number:**

SAMPLE ID#	TIME	VOLUME	TREATMENT	SAMPLING LOCATION	ANALYSIS REQUESTED

RELINQUISHED BY (SIGNED)	DATE/TIME	RECEIVED BY (SIGNED)	DATE/TIME

Appendix B: Analytical Labs within the Area

ELAP/NELAP Accredited Laboratory List (as of June 19, 2012)

The list is based on information available at the time, and is subject to change.
Should you have any questions about a specific laboratory or need further information, please call ELAP at (510) 620-3155.

Fee Exempt	Type	Lab Name	Street	City	State	Zip	County	Phone	Cert No.	Program
	Commercial	ATS Analytical Laboratories	104 South 8th Street	Brawley	CA	92227	Imperial	(760) 344-2532	1632	ELAP
	Industrial	Calenergy Operating Corporation	7030 Gentry Road	Calipatria	CA	92233	Imperial	(760) 348-4000	2612	ELAP
	City	City of Calexico	298 W. 2nd Street	Calexico	CA	92231	Imperial	(760) 768-2167	2447	ELAP
	Public Wastewater System	City of El Centro Wastewater Treatment Plant	2255 La Brucherie Road	El Centro	CA	92243	Imperial	(760) 337-4562	2063	ELAP
	Industrial	El Centro Generating Station	485 East Villa Avenue	El Centro	CA	92243	Imperial	(760) 339-0506	1125	ELAP
Y	County	Imperial County Public Health Laboratory	935 Broadway	El Centro	CA	92243	Imperial	(760) 482-4437	1773	ELAP
	Commercial	Imperial Valley Environmental Laboratory	501 East 3rd Street	Calexico	CA	92231	Imperial	(760) 357-8764	2524	ELAP
	Public Wastewater System	Niland Sanitary District	125 West Alcott Road	Niland	CA	92257	Imperial	(760) 359-0454	1442	ELAP
	Industrial	Ormat Nevada, Inc.	895 Pitzer Road	Heber	CA	92249	Imperial	(760) 353-8200	2680	ELAP
	Commercial	ABC Environmental Laboratories	1640 South Grove Avenue, Suite B	Ontario	CA	91761	Los Angeles	(562) 413-8343, (909) 923-8628	2584	ELAP
	Commercial	ABN Environmental Laboratories, Inc.	10926 Rush Street, Suite A-168	South El Monte	CA	91733	Los Angeles	(626) 575-5137	1507	ELAP
	Commercial	Acculabs, Inc.	118 La Porte St, Unit C and D	Arcadia	CA	91006	Los Angeles	(626)447-1888	2778	ELAP
	Commercial	Advanced Technology Laboratories	3275 Walnut Avenue	Signal Hill	CA	90755	Los Angeles	(562) 989-4045	02107CA	NELAP
	Commercial	Advanced Technology Laboratories	3275 Walnut Avenue	Signal Hill	CA	90755	Los Angeles	(562) 989-4045	1838	ELAP
	Industrial	AES Alamitos LLC Laboratory	690 North Studebaker Road	Long Beach	CA	90803	Los Angeles	(562) 493-7384	2470	ELAP
	Industrial	AES Redondo Beach Unit 7&8 Laboratory	1100 North Harbor Drive	Redondo Beach	CA	90277	Los Angeles	(310) 318-7470	2498	ELAP
	Commercial	Alpha Scientific Corporation	16760 Gridley Road	Cerritos	CA	90703	Los Angeles	(562) 809-8880	2633	ELAP
	Commercial	American Analytics	9765 Eton Avenue	Chatsworth	CA	91311	Los Angeles	(818) 998-5547	1894	ELAP
	Commercial	American Analytics	9765 Eton Avenue	Chatsworth	CA	91311	Los Angeles	(818) 998-5547	2621	ELAP

Fee Exempt	Type	Lab Name	Street	City	State	Zip	County	Phone	Cert No.	Program
	Commercial	American Analytics Inc.	9765 Eton Avenue	Chatsworth	CA	91311	Los Angeles	(818) 998-5547	1471	ELAP
	Commercial	American Environmental Testing Laboratory, Inc.	2834 and 2908 North Naomi Street	Burbank	CA	91504	Los Angeles	(818) 845-8200	1541	ELAP
	Commercial	American Scientific Laboratories, LLC	2520 N San Fernando Road	Los Angeles	CA	90065	Los Angeles	(323) 223-9700	2200	ELAP
	Commercial	Amerisci Los Angeles	24416 S Main Street Suite 308	Carson	CA	90745	Los Angeles	(310) 834-4868	2322	ELAP
	Commercial	Anachem Laboratories, LLC	140 Standard Street	El Segundo	CA	90245	Los Angeles	(310) 322-4993	1164	ELAP
	Public Water System	Antelope Valley-East Kern Water Agency	6500 West Avenue N	Palmdale	CA	93551	Los Angeles	(661) 943-3201	1460	ELAP
	Commercial	Applied Microbiological Services	1538 West Gaylord Street	Long Beach	CA	90813	Los Angeles	(562) 495-9500	1257	ELAP
	Commercial	Bioscreen Testing Services, Inc.	3904 Del Amo Blvd., Suite 801	Torrance	CA	90503	Los Angeles	(310) 214-0043	1565	ELAP
	Industrial	BP Operation Laboratory	1801 East Sepulveda Boulevard	Carson	CA	90745	Los Angeles	(310) 816-8719	2473	ELAP
	City	City of Burbank Water Reclamation Plant Laboratory	740 North Lake Street	Burbank	CA	91502-1642	Los Angeles	(818) 972-1115	1819	ELAP
	Public Wastewater System	Burbank City Water and Power	2030 North Hollywood Way	Burbank	CA	91502	Los Angeles	(818) 238-3500	1464	ELAP
	Commercial	C & E Laboratories, Inc. (Chemical & Environmental Laboratories, Inc.)	14148 East Firestone Boulevard	Santa Fe Springs	CA	90670	Los Angeles	(562) 921-8123	2268	ELAP
	Commercial	Caltech Environmental Laboratories, Inc.	6814 Rosecrans Avenue	Paramount	CA	90723-3146	Los Angeles	(562) 272-2700	2424	ELAP
	Public Water System	Castaic Lake Water Agency	27234 Bouquet Canyon Road	Santa Clarita	CA	91350-2173	Los Angeles	(661) 297-1600x223	2104	ELAP
	Commercial	Chem Pro Laboratory, Inc.	941 West 190th Street	Gardena	CA	90248	Los Angeles	(310) 532-8611	1265	ELAP
	Commercial	Chemtek Environmental Laboratories Inc.	13554 Larwin Circle	Santa Fe Springs	CA	90670	Los Angeles	(562) 926-9848	2629	ELAP
	Commercial	Chemtek Environmental Laboratories, Inc.	13554 Larwin Circle	Santa Fe Springs	CA	90670	Los Angeles	(562) 926-9848	1435	ELAP
	City	City of Avalon Wastewater Treatment Facility Laboratory	123 Pebbly Beach Road	Avalon	CA	90704	Los Angeles	(310) 510-0731	1899	ELAP
	Commercial	Clean Earth Environmental Testing Laboratory	1639 11th Street, Suite 114	Santa Monica	CA	90404	Los Angeles	(310) 399-4447	2622	ELAP
	Industrial	Clean Harbors Environmental Services, Inc.	5756 Alba Street	Los Angeles	CA	90058	Los Angeles	(323) 277-2501	2560	ELAP
	Industrial	Conoco Phillips Company Los Angeles Refinery Laboratory	1660 West Anaheim Street	Wilmington	CA	90744	Los Angeles	(310) 952-6178	2497	ELAP

Fee Exempt	Type	Lab Name	Street	City	State	Zip	County	Phone	Cert No.	Program
	Industrial	Crosby & Overton Analytical Laboratory	1655 Canal Street	Long Beach	CA	90813	Los Angeles	(562) 432-5445x273	1568	ELAP
	Commercial	Demenno / Kerdoon	2000 North Alameda Street	Compton	CA	90222	Los Angeles	(310) 537-7100	2037	ELAP
	In-house	DS Waters of America, Inc.	1449 N Avenue 46	Los Angeles	CA	90041	Los Angeles	(323) 551-5716	2578	ELAP
	Commercial	EMAX Laboratories, Inc.	1835 West 205th Street	Torrance	CA	90501	Los Angeles	(310) 618-8889	02116CA	NELAP
	Commercial	EMAX Laboratories, Inc.	1835 West 205th Street	Torrance	CA	90501	Los Angeles	(310) 618-8889	2672	ELAP
	Commercial	EMS Laboratories, Inc.	117 West Bellevue Drive	Pasadena	CA	91105	Los Angeles	(626) 568-4065	1119	ELAP
	Commercial	Enviro-Chem, Inc.	1214 East Lexington Avenue	Pomona	CA	91766	Los Angeles	(909) 590-5905	1555	ELAP
	Public Wastewater System	Environmental Monitoring Div. (EMD) Lab at LA/G Water Reclamation Plant (LA/GWRP)	4600 Colorado Blvd	Los Angeles	CA	90039	Los Angeles	(213) 972-1307	1451	ELAP
	Public Wastewater System	Environmental Monitoring Division (EMD) Lab. at Dct Water Reclamation Plant (DCTWRP)	6100 Woodley Avenue	Van Nuys	CA	91406	Los Angeles	(818) 778-4217	1477	ELAP
	Public Wastewater System	Environmental Monitoring Div. (EMD) Lab. at Terminal Island Water Reclamation Plant (TIWRP)	445 Ferry Street	San Pedro	CA	90731	Los Angeles	(310) 732-4712	1546	ELAP
	Public Wastewater System	Environmental Monitoring Div. Lab. at Hyperion Treatment Plant	12000 Vista Del Mar	Playa Del Rey	CA	90293	Los Angeles	(310) 648-5262	1723	ELAP
	Commercial	Exova, Inc. (fka Bodycote Testing Group & fka West Coast Analytical Service)	9240 Santa Fe Springs Road	Santa Fe Springs	CA	90670	Los Angeles	(562) 948-2225	2652	ELAP
	Industrial	Exxon Mobil Oil Corporation Torrance Refinery Water Laboratory	3700 West 190th Street	Torrance	CA	90504-5733	Los Angeles	(310) 212-2829	1695	ELAP
	Commercial	Forensic Analytical Laboratories, Inc	2959 Pacific Commerce Drive	Rancho Dominguez	CA	90221	Los Angeles	(310) 763-2374	1366	ELAP
	Commercial	Frog Environmental - Lab Services	800 East Ocean Boulevard suit #105	Long Beach	CA	90802	Los Angeles	(310) 241-1367	2692	ELAP
	Commercial	Hygeia Laboratories, Inc.	82 West Sierra Madre Boulevard	Sierra Madre	CA	91024-2434	Los Angeles	(626) 355-4711	1269	ELAP
	City	City of Los Angeles Dept of Water & Power Environmental Lab.	1630 North Main Street, Building 7	Los Angeles	CA	90012	Los Angeles	(213) 367-7270	2553	ELAP
	City	City of Los Angeles Dept of Water & Power	1630 North Main Street, Building 7	Los Angeles	CA	90012	Los Angeles	(213) 367-7270	1207	ELAP

Fee Exempt	Type	Lab Name	Street	City	State	Zip	County	Phone	Cert No.	Program
	City	City of Los Angeles - Standards Testing Laboratory	2319 Dorris Place	Los Angeles	CA	90031	Los Angeles	(213) 485-2242	1292	ELAP
	County	Water Pollution Control Laboratory	1102 North Eastern Avenue	Los Angeles	CA	90063	Los Angeles	(323) 267-2333	1825	ELAP
	County	Los Angeles County Agricultural Commissioner / W&M	11012 Garfield Avenue, Building B	South Gate	CA	90280	Los Angeles	(562) 622-0437	1430	ELAP
	Public Wastewater System	Joint Water Pollution Control Water Quality Lab	24501 South Figueroa Street	Carson	CA	90745	Los Angeles	(310) 830-2400	1034	ELAP
	Public Wastewater System	Lancaster Treatment Plant Laboratory	1865 West Avenue D	Lancaster	CA	93534	Los Angeles	(661) 723-8537	1051	ELAP
	Public Wastewater System	Long Beach Treatment Plant Laboratory	7400 Willow Street	Long Beach	CA	90815	Los Angeles	(562) 421-8612	1033	ELAP
	Public Wastewater System	Los Coyotes Treatment Plant Laboratory	16515 Piuma Avenue	Cerritos	CA	90701	Los Angeles	(562) 860-2390	1031	ELAP
	Public Wastewater System	Pomona Treatment Plant Laboratory	295 Humane Way	Pomona	CA	91766	Los Angeles	(909) 623-6721	1068	ELAP
	Public Wastewater System	San Jose Creek Analytical Plant Laboratory	1965 South Workman Mill Road	Whittier	CA	90601	Los Angeles	(562) 908-4288	1032	ELAP
	Public Wastewater System	San Jose Creek Water Quality Laboratory	1965 South Workman Mill Road	Whittier	CA	90601	Los Angeles	(562) 908-4288	1052	ELAP
	Public Wastewater System	Saugus Treatment Plant Laboratory	26200 Springbrook Avenue	Saugus	CA	91350	Los Angeles	(661) 259-6846	1040	ELAP
	Public Wastewater System	Valencia Treatment Plant Laboratory	28185 The Old Road	Valencia	CA	91335	Los Angeles	(661) 257-2575	1041	ELAP
	Public Wastewater System	Whittier Narrows Treatment Plant Laboratory	301 North Rosemead Boulevard	El Monte	CA	91733	Los Angeles	(626) 443-2954	1036	ELAP
	Commercial	LA Testing - South Pasadena Laboratory	520 Mission Street	South Pasadena	CA	91030	Los Angeles	(800) 303-0047	2283	ELAP
	Public Water System	Las Virgenes Municipal Water District Laboratory	731 Malibu Canyon Road	Calabasas	CA	91302	Los Angeles	(818) 251-2333	1533	ELAP

Fee Exempt	Type	Lab Name	Street	City	State	Zip	County	Phone	Cert No.	Program
	City	Long Beach Water Department Water Quality Laboratory	2950 Redondo Avenue	Long Beach	CA	90806	Los Angeles	(562) 570-2482	1409	ELAP
Y	City	Long Beach Public Health Laboratory	2525 Grand Avenue, Room 260	Long Beach	CA	90815	Los Angeles	(562) 570-4075	2368	ELAP
Y	County	Los Angeles County Public Health Laboratory	12750 Erickson Avenue	Downey	CA	90242	Los Angeles	(562) 658-1330	1398	ELAP
	Public Water System	Los Angeles Dept. of Water & Power	555 East Walnut Street	Pasadena	CA	91101-1658	Los Angeles	(213) 367-8487	1336	ELAP
	County	Malibu Mesa Water Reclamation Plant Lab	3863 South Malibu Country Drive	Malibu	CA	90265	Los Angeles	(310) 456-1470	2135	ELAP
	Commercial	Michelson Laboratories, Inc.	6280 Chalet Drive	Commerce	CA	90040-3761	Los Angeles	(562) 928-0553	1198	ELAP
	Commercial	Micron Environmental Labs, Inc.	3565 Lexington Avenue	El Monte	CA	91731	Los Angeles	(626) 454-4782	2297	ELAP
	Commercial	Mobile American Environmental Testing Laboratory (MAETL)	2834 & 2908 North Naomi Street	Burbank	CA	91504	Los Angeles	(818) 845-8200	2402	ELAP
	Public Water System	Metropolitan Water District of So. Ca. - F.E. Weymouth WTP Laboratory	700 Moreno Avenue	La Verne	CA	91750	Los Angeles	(909) 392-5294	1615	ELAP
	Public Water System	Metropolitan Water District of So. Ca. - Henry J. Mills WTP Lab	550 East Alessandro Boulevard	Riverside	CA	92508	Los Angeles	(909) 392-5294	1069	ELAP
	Public Water System	Metropolitan Water District of So. CA.- Joseph Jensen WTP Lab.	13100 Balboa Boulevard	Granada Hills	CA	91344	Los Angeles	(909) 392-5065	1367	ELAP
	Public Water System	MWD - La Verne Water Quality Laboratory	700 Moreno Avenue	La Verne	CA	91750	Los Angeles	(909) 392-5065	1618	ELAP
	Commercial	MWH Laboratories, a Division of MWH Americas, Inc.	750 Royal Oaks Drive, Suite 100	Monrovia	CA	91016	Los Angeles	(626) 386-1100	01114CA	NELAP
	Commercial	MWH Laboratories, a Division of MWH Americas, Inc.	750 Royal Oaks Drive, Suite 100	Monrovia	CA	91016	Los Angeles	(626) 386-1100	1422	ELAP
	Industrial	Nestle Waters Quality Assurance Laboratory	1544 East Washington Boulevard	Los Angeles	CA	90021	Los Angeles	(213) 763-1350	1698	ELAP
	Industrial	New Cure, Inc.	2550 Greenwood Avenue	Monterey Park	CA	91755	Los Angeles	(323) 720-9775	1901	ELAP
	Commercial	Pacific Coast Analytical Services	15751 Roxford Street, Unit F	Sylmar	CA	91342	Los Angeles	(818) 364-7470	2667	ELAP
	Public Wastewater System	Palmdale Treatment Plant Laboratory	39300 30th Street East	Palmdale	CA	93550	Los Angeles	805-723-8537	2802	ELAP
	Public Water System	Palmdale Water District	700 East Avenue S	Palmdale	CA	93550	Los Angeles	(661) 947-4111x306	1776	ELAP
	City	City of Pasadena Water Quality Laboratory	245 West Mountain Street	Pasadena	CA	91103	Los Angeles	(626) 744-4411	1473	ELAP

Fee Exempt	Type	Lab Name	Street	City	State	Zip	County	Phone	Cert No.	Program
	Private WW System	Point Dume Club Water Reclamation Plant Laboratory	29500 Heathercliff Road	Malibu	CA	90265	Los Angeles	(310) 457-1481	2230	ELAP
	City	Port of Los Angeles Testing Laboratory	514 Pier A Street - Berth 21	Wilmington	CA	90744	Los Angeles	(310) 372-3588	2707	ELAP
	Commercial	Positive Lab Service	781 East Washington Boulevard	Los Angeles	CA	90021	Los Angeles	(213) 745-5312	1131	ELAP
	Commercial	Positive Lab Service	781 East Washington Boulevard	Los Angeles	CA	90021	Los Angeles	(213) 745-5312	2534	ELAP
	In-house	Raytheon Company	2000 E. El Segundo Blvd, E1/Room 1344	El Segundo	CA	90245	Los Angeles	(310) 647-4370	1016	ELAP
	Public Water System	City of Santa Monica Water Quality Laboratory	1228 South Bundy Drive	Los Angeles	CA	90025	Los Angeles	(310) 826-6712	1469	ELAP
	Industrial	Siemens Industry, Inc.	5375 South Boyle Avenue	Vernon	CA	90058	Los Angeles	(323) 277-1500	2313	ELAP
	Commercial	Siemens Water Technology Corp.	5375 South Boyle Avenue	Los Angeles	CA	90058	Los Angeles	(323) 277-3083	2325	ELAP
	In-house	Southern California Gas Company	8101 South Rosemead Boulevard	Pico Rivera	CA	90660	Los Angeles	(562) 806-4344	1744	ELAP
	Commercial	Strata-Analysts Group, Inc	3302 Industry Drive	Signal Hill	CA	90755	Los Angeles	(562) 426-0199	2052	ELAP
	Public Water System	Three Valleys Municipal Water District	1021 East Miramar Avenue	Claremont	CA	91711	Los Angeles	(909) 621-5568	1581	ELAP
	Federal	NAVFAC Southwest San Clemente Island Laboratory	Building 60195 (located apprx. 60 miles off the Coast of San Diego	San Clemente Island	CA	92135	Los Angeles	(619) 524-9380	2796	ELAP
	Public Water System	Walnut Valley Water District	271 South Brea Canyon Road	Walnut	CA	91789	Los Angeles	(909) 595-1268	2644	ELAP
	Commercial	Weck Laboratories, Inc.	14859 East Clark Avenue	City of Industry	CA	91745	Los Angeles	(626) 336-2139	04229CA	NELAP
	Commercial	Weck Laboratories, Inc.	14859 East Clark Avenue	City of Industry	CA	91745	Los Angeles	(626) 336-2139	1132	ELAP
	City	West Basin Water Quality Laboratory	1935 South Hughes Way	El Segundo	CA	90245	Los Angeles	(310) 414-0183	2111	ELAP
	Commercial	A & R Laboratories	1401 Research Park Drive, Suite 100	Riverside	CA	92507	Riverside	(951) 779-0310	2789	ELAP
	City	City of Banning WWTP Laboratory	2242 East Charles Street	Banning	CA	92220	Riverside	(951) 922-3310	2499	ELAP
	Public Wastewater System	Coachella Sanitary District	87-075 Avenue 54	Coachella	CA	92236	Riverside	(760) 391-5008x101	2472	ELAP
	Public Water System	Coachella Valley Water District Laboratory	85-995 Avenue 52	Coachella	CA	92236	Riverside	(760) 398-2651	1780	ELAP
	Recycling Facility	Desert Water Agency	1200 Gene Autry Trail South	Palm Springs	CA	92264	Riverside	(760) 323-4971	1370	ELAP

Fee Exempt	Type	Lab Name	Street	City	State	Zip	County	Phone	Cert No.	Program
	Public Wastewater System	E.V.M.W.D. Regional Laboratory	14980 Strickland Avenue	Lake Elsinore	CA	92531	Riverside	(951) 674-3146	2169	ELAP
	Public Water System	Eastern Municipal Water District	2270 Trumble Road	Perris	CA	92570	Riverside	(951) 928-3777	1379	ELAP
	Commercial	Edward S. Babcock & Sons, Inc.	6100 Quail Valley Court	Riverside	CA	92507	Riverside	(951) 653-3351	02101CA	NELAP
	Commercial	Edward S. Babcock & Sons, Inc.	6100 Quail Valley Court	Riverside	CA	92507	Riverside	(951) 653-3351	2698	ELAP
	Commercial	Microbac Laboratories	1401 Research Park Drive, Suite 100	Riverside	CA	92507	Riverside	(951) 779-0310	2747	ELAP
	Public Wastewater System	Mission Springs Water District	14601 Verbena Avenue	Desert Hot Springs	CA	92240	Riverside	(760) 329-6278	1093	ELAP
	Public Water System	Metropolitan Water District of So. Ca. - Robert A. Skinner WTP Lab	33740 Borel Road	Winchester	CA	92396	Riverside	(909) 392-5294	1042	ELAP
	Public Wastewater System	Palm Springs Wastewater Treatment Plant	4375 Mesquite Avenue	Palm Springs	CA	92264	Riverside	(760) 323-8166	1089	ELAP
	City	City of Riverside - Laboratory Services	5950 Acorn Street	Riverside	CA	92504	Riverside	(951) 351-6016	1311	ELAP
Y	County	Riverside County Public Health Laboratory	4065 County Circle Drive	Riverside	CA	92503	Riverside	(951) 358-5070	2715	ELAP
	Public Ww	Santa Rosa Water Reclamation Facility Laboratory	26266 Washington Street	Murrieta	CA	92562	Riverside	(951) 296-6900	2555	ELAP
	Public Wastewater System	Valley Sanitary District	45-500 Van Buren Street	Indio	CA	92201	Riverside	(760) 347-2356	1053	ELAP
	Commercial	Analytical Chemical Labs, Inc.	1123 West Morena Boulevard	San Diego	CA	92110-3853	San Diego	(619) 276-1558	2505	ELAP
	Commercial	Clarkson Laboratory and Supply, Inc.	350 Trousdale Drive	Chula Vista	CA	91910	San Diego	(619) 425-1993	1055	ELAP
	Commercial	D-Tek Analytical Laboratories, Inc.	2722 Loker Avenue West, Suite B	Carlsbad	CA	92010	San Diego	(760) 930-2555	2344	ELAP
	Commercial	EMSL Analytical Inc.	7916 Convoy Court	San Diego	CA	92111	San Diego	(858) 499-1302	2713	ELAP
	Industrial	Encina Power Station Laboratory	4600 Carlsbad Boulevard	Carlsbad	CA	92008	San Diego	(760) 268-4070	2547	ELAP
	Public Wastewater System	Encina Wastewater Authority Laboratory	6200 Avenida Encinas	Carlsbad	CA	92011	San Diego	(760) 268-8861	1441	ELAP
	Commercial	Enviromatrix Analytical, Inc.	4340 Viewridge Avenue., Suite A	San Diego	CA	92123	San Diego	(858) 560-7717	2564	ELAP

Fee Exempt	Type	Lab Name	Street	City	State	Zip	County	Phone	Cert No.	Program
	Commercial	Environmental Engineering Laboratory, Inc	3538 Hancock Street	San Diego	CA	92110	San Diego	(619) 298-6131	2616	ELAP
	City	City of Escondido Water Quality Laboratory	1521 South Hale Avenue	Escondido	CA	92029-3052	San Diego	(760) 839-6274	1625	ELAP
	Public Wastewater System	Fallbrook Public Utility District	1425 South Alturas	Fallbrook	CA	92028	San Diego	(760) 728-1125x2106	2005	ELAP
	Commercial	H&P Mobile Geochemistry, Inc.	2470 Impala Drive	Carlsbad	CA	92010	San Diego	(760) 804-9678	2743	ELAP
	Commercial	H&P Mobile Geochemistry, Inc.	2470 Impala Drive	Carlsbad	CA	92010	San Diego	(760) 804-9678	2745	ELAP
	Commercial	H&P Mobile Geochemistry as Mobile One Laboratories	2470 Impala Drive	Carlsbad	CA	92010	San Diego	(760) 804-9678	2742	ELAP
	Commercial	H&P Mobile Geochemistry, Inc. - Lab 6	2470 Impala Drive	Carlsbad	CA	92010	San Diego	(760) 804-9678	2744	ELAP
	Commercial	H&P Mobile Geochemistry Inc.	2470 Impala Drive	Carlsbad	CA	92010	San Diego	(760) 804-9678	2740	ELAP
	Commercial	H&P Mobile Geochemistry, Inc.	2470 Impala Drive	Carlsbad	CA	92010	San Diego	(760) 804-9678	2741	ELAP
	Commercial	H&P Mobile Geochemistry Inc.	2470 Impala Drive	Carlsbad	CA	92010	San Diego	(760) 804-9678	2754	ELAP
	Commercial	H.M. Pitt Labs, Inc.	2434 Southport Way, Suite L	National City	CA	91950	San Diego	(619) 474-8548	2481	ELAP
	Public Water System	Helix Water District	9550 Lake Jennings Park Road	Lakeside	CA	92040	San Diego	(619) 667-6248	1610	ELAP
	Commercial	JMR Environmental Services, Inc.	4560 Alvarado Canyon Road, Suite 2D	San Diego	CA	92120	San Diego	(619) 858-7260	2468	ELAP
	Public Water System	John C. Bargar Water Treatment Plant	505 Black Canyon Place	Ramona	CA	92065	San Diego	(760) 788-2236	1135	ELAP
	Commercial	Motile Laboratory Services	537 Vine Street	Oceanside	CA	92054	San Diego	(760) 840-0577	2720	ELAP
	Commercial	Nautilus Environmental, LLC	4340 Vandever Avenue	San Diego	CA	92120	San Diego	(858) 587-7333	1802	ELAP
	City	City of Oceanside Water Utilities Department Laboratory	3950 North River Road	Oceanside	CA	92054	San Diego	(760) 435-5948	1740	ELAP
	Recycling Facility	Otay Water District	11901 Singer Lane	Spring Valley	CA	91978	San Diego	(619) 670-2294	1658	ELAP
	Commercial	Pacific Chemical Labs, Inc	905 South 33rd Street	San Diego	CA	92113	San Diego	(619) 218-4191	2774	ELAP
	Recycling Facility	Padre Dam Water Recycling Laboratory	12001 North Fanita Parkway	Santee	CA	92701	San Diego	(619) 258-4692	1045	ELAP
	Public Water System	R.E. Badger Filtration Plant	18535 Aliso Canyon Road	Rancho Santa Fe	CA	92067	San Diego	(858) 756-2569	1553	ELAP
	Public Wastewater System	Alvarado Wastewater Chemistry Lab.	5530 Kiowa Drive	La Mesa	CA	91942-1331	San Diego	(619) 668-3213	1609	ELAP
	City	City of San Diego's Industrial Waste Laboratory	5530 Kiowa Drive	La Mesa	CA	91942	San Diego	(619) 668-3256	1985	ELAP

Fee Exempt	Type	Lab Name	Street	City	State	Zip	County	Phone	Cert No.	Program
	City	City of San Diego - Marine Microbiology Laboratory	2392 Kincaid Road	San Diego	CA	92101-0811	San Diego	(619) 758-2311	2185	ELAP
	Public Wastewater System	Metro Biosolids Center Wastewater Chemistry	5240 Convoy Street	San Diego	CA	92111	San Diego	(619) 668-3213	2478	ELAP
	City	City of San Diego Public Utilities Dept. Toxicology Laboratory	2392 Kincaid Road	San Diego	CA	92101	San Diego	(619) 758-2341	1989	ELAP
	Public Wastewater System	North City Wastewater Chemistry Lab	4949 Eastgate Mall	San Diego	CA	92121	San Diego	(619) 668-3213	2477	ELAP
	Public Wastewater System	Point Loma Wastewater Chemistry Lab	1902 Gatchell Road	San Diego	CA	92106	San Diego	(619) 668-3214	2474	ELAP
	Public Wastewater System	South Bay Wastewater Chemistry Laboratory	2411 Dairy Mart Road	San Diego	CA	92173	San Diego	(619) 668-3215	2539	ELAP
	City	City of San Diego Water Quality Laboratory	5530 Kiowa Drive	La Mesa	CA	91942-1331	San Diego	(619) 668-3232	1058	ELAP
Y	County	San Diego County Public Health Laboratory	3851 Rosecrans Street, Suite 716	San Diego	CA	92110-3115	San Diego	(619) 692-8500	1730	ELAP
	Utility	San Diego Gas & Electric Environmental Analysis Laboratory	6555 Nancy Ridge Road, Suite 300	San Diego	CA	92121-3221	San Diego	(619) 260-5747	1289	ELAP
	Public Wastewater System	San Elijo Joint Powers Authority Laboratory	2695 Manchester Avenue	Cardiff by the Sea	CA	92007	San Diego	(760) 753-6203	1104	ELAP
	Utility, Power Plant	San Onofre Nuclear Generating Station	5000 Pacific Coast Highway	San Clemente	CA	92674	San Diego	(949) 368-9597	1917	ELAP
	Public Water System	Sweetwater Authority	100 Lakeview Avenue	Spring Valley	CA	91977	San Diego	(619) 409-6813	1412	ELAP
	Public Water System	Twin Oaks Valley Water Treatment Plant	3566 North Twin Oaks Valley Road	San Marcos	CA	92069	San Diego	(760) 752-7320	2708	ELAP
	Commercial	Ultimate Labs Inc	5940 Pacific Mesa Court #209/210	San Diego	CA	92121	San Diego	(858) 677-9297	2783	ELAP
	Commercial	UMB Analytical, Inc	6153 Fairmount Ave, Suite 104	San Diego	CA	92120	San Diego	(619) 501-7698	2771	ELAP
	Federal	SPAWAR Systems Center San Diego Bioassay Laboratory	53475 Strothe Road, Building 111 Room 116	San Diego	CA	92152	San Diego	(619) 553-0886	2601	ELAP

Fee Exempt	Type	Lab Name	Street	City	State	Zip	County	Phone	Cert No.	Program
	Public Wastewater System	Valley Center Municipal Water District Laboratory	8711 Circle R Drive	Escondido	CA	92026	San Diego	(760) 749-1600	2736	ELAP
	Public Water System	Vista Irrigation District	1391 Engineer Street	Vista	CA	92081	San Diego	(760) 597-3143	1761	ELAP
	Commercial	Weston Solutions, Inc.	2433 Impala Drive	Carlsbad	CA	92010	San Diego	(760) 795-6900	2613	ELAP

Appendix C - Annotated Outline for Program Protocols

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1 Introduction

As part of the 2014 Coachella Valley IRWM Plan Update, a Disadvantaged Community (DAC) Water Quality Evaluation was conducted to assess water quality in DACs where groundwater was the primary source of drinking water. Out of this evaluation came the Coachella Valley Disadvantaged Community Residential Groundwater Treatment Program, which provided a work plan for entities seeking to implement an effective point-of-use (POU) treatment system program. Sample documents were created for each task outlined in the DAC Residential Groundwater Treatment Program that could be used as templates or guides for entities implementing similar programs.

This sample document was developed to provide an outline of the recommended Program Operations Protocols that would be required for a successful DAC Residential Groundwater Treatment Program, as described in the *Coachella Valley IRWM DAC Residential Groundwater Treatment Program*. These protocols should be specific to the method and mode by which the POU treatment systems will be purchased, stored, distributed, and tracked, and include the means for tracking installed units. The outline provided here should be completed with the information described in each bullet, as appropriate to the individual region, program, and selected treatment system(s).

2 Program Operations Protocol Outline

1.0 Program Purpose

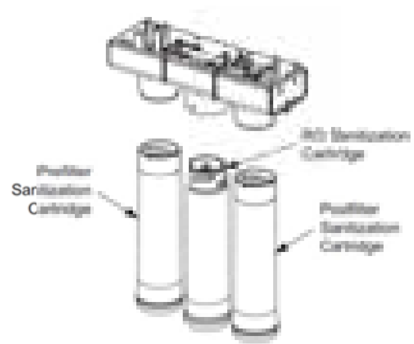
- Assist local disadvantaged communities (DAC) in eliminating public health issues as it relates to drinking water quality.
- Provide Point of Use (POU) reverse osmosis (RO) residential water treatment units to homeowners for a nominal fee.
- Maintain the POU RO units for homeowners as part of the rental agreement.
- Ensure treated water quality meets drinking water standards.

2.0 System Identification

- Identify which POU RO treatment system you want to use
    - Systems are available from major retailers such as Lowe's, Home Depot, and online (via Amazon, for example)
    - Systems may also be obtained through direct contract with manufacturer
    - Systems currently used by non-governmental organizations doing similar programs in the Coachella Valley include Nimbus Water Systems used by Pueblo Unido Community Development Corporation (PUCDC) and a General Electric (GE) unit used by Desert Environmental for Community Empowerment (DACE)

Manufacture	Model Number	Stages	Warranty
ISPRING	RCC7, RCC7AK, RCC7AK-UV	5-7	1
Perfect Water Technologies	TMAFC, TMULTRA	6-7	5
Purenex	RO-5-50	5-7	1
Nimbus Water Systems	WM5-50	5	1
Krystal Pure	KR10, KR15	4	4-5
Watts Premier	531411	4	3
Whirlpool	WHER25	3	1
DuPont	WFRO60X	3	3
EcoPure	ECOP309	3	1
General Electric	GXRM10RBL	3	1
Hydro-Logic	HLRO100	3	1

- System configuration
  - Most treatment units have are a 3-stage system with pre- and post-filters plus the main RO membrane.
  - Some units have additional stages (up to 6) with the additional stages providing treatment for improved odor and taste, disinfection, softening and stabilization.
- Need to match treatment system with local water quality; look at the system requirements as part of your selection criteria.



3.0 Program Management

- Figure out how many units to order.
- Figure out how much replacement materials to purchase and what types (filters, membranes, valves, plumbing fixtures, etc.).
- Determine where equipment and materials will be stored and how it will be distributed/checked out (for monitoring equipment).
- Determine if surrogate monitoring will be conducted (recommended)
  - What surrogate will be used?
  - How will you monitor for it in the field?
  - What equipment and meters do you need to measure the surrogate accurately?
  - How are you going to correlate surrogate levels to constituent levels in water quality samples?
- Tracking/Recordkeeping
  - Who's going to maintain the records? Where and how?
  - EXCEL spreadsheet for keeping track of all activities related to the program
    - Purchase, Storage, and Installation of Treatment Units
      - Record number of treatment units purchased and received
      - Assign a unique number to each purchased unit
      - Make sure that the unit number is on all documentation relating to the treatment system
      - Make sure the unit number is linked to the installed location and unit renter
      - Track volume of materials in warehouse
    - System Service Tracking
      - Record installation date, installer, and maintenance record

        - Update at least once per year
        - Track number of units due for replacement and/or maintenance in any period
    - Water quality data monitoring records
        - Record water quality data both pre- and post- installation; link to unit number and in-field surrogate analyses
        - Monitor both feed water and product water quality to ensure system performance
        - Annual comparison of water quality to determine if there is any system degradation
- Plan out training
    - How are you going to solicit volunteers for installation and/or maintenance?
    - Where will the training sessions be held?
    - How often will the training sessions be held?
    - Will there be refresher courses?
    - How will you track who's trained?
    - How will you fund any training-related expenses (site and/or equipment rental, copies, refreshments, etc.)?

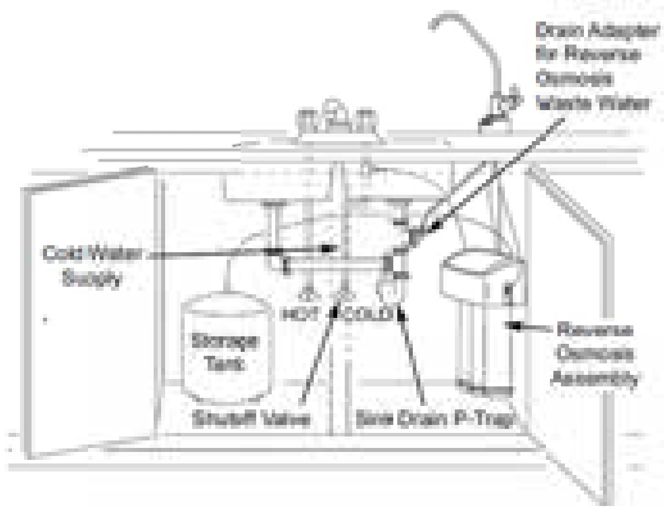
4.0 Water Quality Testing

- Pre-installation water quality testing
    - Establish baseline water quality
    - Make sure feed water condition meets manufacture's requirements
        - Hardness is too high - add ion exchange unit
        - Organic content is high – add CTO unit (block carbon filter)
        - Pathogens are present - add UV disinfection unit
        - pH is too low - add alkaline unit

Feed Water Parameters	Requirements
Temperature	40 F – 100F
Pressure	40 psi – 80 psi
[Cl]	<1.0 mg/L
Hardness @ 6.9 pH	10 gpg
TDS	<2,000 mg/L
pH	4-8
Turbidity	<1.0 NTU
SDI	< 5
Nitrate as N	<27 mg/L
Nitrite as N	<3mg/L
Others	Free from iron, manganese or hydrogen sulfide

- Post-installation water quality test
    - After system purging
    - Regularly monitor feed and product water
    - Determine if proposed installation provide safe drinking water for DAC communities
- Routine monitoring
    - Regularly monitor feed water and product water to ensure system performance
    - For product water, test for arsenic, uranium, fluoride, nitrate and hexavalent chromium meet drinking water standards
    - Post-maintenance standards to establish continued performance to meet required standards
- Recordkeeping – introduced in program management (above)

- Installation record, document manufacture/unit selected, installer's name, installation date and location
- Owner name and contact information, pre- and post-installation water quality data.
- Renters agreements
- Financial records (basic bookkeeping)
- Annual comparison of water quality data



5.0 System Installation

- Preparation
  - Make sure all parts and manual are included in the package
  - Make sure have all the required tools (knife, scissors, electric drill and drill bits, screwdrivers, Teflon tape, file, hammer, pinchers, pliers or pipe wrench)
  - Plan all parts visually so that connection tubes won't loop or dip after installation
- Adaptors
  - Install feed water adaptor to cold water supply
  - Install drain saddle to sink drain pipe
- RO assembly
  - Install filter and membrane cartridges on the assembly
  - Mount/set in place
- Storage Tank
  - Connect and seal tubing to storage tank
  - Mount/set in place
- Faucet
  - Find best place for Faucet as planned, drill hole on sink/countertop if necessary.
  - Connect tubing for product water and drain
  - Set up any electronic tracking device for filter replacements
- Finish Connections
  - Connect tubes for feed water, drain, storage tank and product water to the RO assembly
- Sanitize the system
  - Using household bleach
  - Essential for initial disinfection of the system
- Purge the system
  - Depend on manufacture's recommendation, Purging for 24 hours may be required.
  - Remove air bubbles and carbon particles from filter
- Post-installation monitoring – check for links, drops in system performance

6.0 Maintenance

- Replace filters and disinfect system annually per manufacture's requirement. In general, filters need to be replaced every 6 – 12 months.
- Monitor RO membrane performance. Typically needs to be replaced every 3 years.
- Collect water quality samples regularly (annually at minimum); conduct both in-field (surrogate) measurements and laboratory analyses
- Maintain system more frequently depending on monitoring and performance results

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Appendix D - Annotated Outline for Installation Manual

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1 Introduction

As part of the 2014 Coachella Valley IRWM Plan Update, a Disadvantaged Community (DAC) Water Quality Evaluation was conducted to assess water quality in DACs where groundwater was the primary source of drinking water. Out of this evaluation came the Coachella Valley Disadvantaged Community Residential Groundwater Treatment Program, which provided a work plan for entities seeking to implement an effective point-of-use (POU) treatment system program. Sample documents were created for each task outlined in the DAC Residential Groundwater Treatment Program that could be used as templates or guides for entities implementing similar programs.

This sample document was developed to provide an outline of a potential installation manual that should be developed as part of Task 3: Program Documentation Preparation. An installation manual should be developed prior to installation of treatment units, and should include information specific to the system and region on the appropriate protocols for system installation and testing, and can be used to train local community members how to install the selected water treatment systems. Content of the installation manual should, at a minimum, include: 1) procedures for system installation, 2) common troubleshooting, 3) the importance of and process for pre- and post-installation water quality testing, and 4) manufacturer contact information. The outline provided here should be completed with the information described in each section, as appropriate to the individual region, program, and selected treatment system(s).

2 Installation Manual Outline

1.0 Introduction/Background

- Describe program, including where units will be installed (include map)
- Describe general installation and testing of units

2.0 System Selection

<u>2.1 Point of Use (POU) Reverse Osmosis (RO) System Description</u>

- Name of selected RO unit
- Unit specifications, including manufacturer, model number, number of stages, NSF certification, flow rate and any other relevant information

<u>2.2 Feed Water Requirements</u>

Point of Use RO treatment systems are functional under certain water supply constraints. The feed water (water coming into the house) must be from a potable water resource that's free from iron, manganese or hydrogen sulfide.

If feed water quality is lower than that specified in Table 1, additional pre-treatment may be required. Some manufacturers provide additional pre-treatment modules as optional upgrades to the POU treatment system.

The feed water pressure to the unit should be no less than 40 psi and no greater than 80 psi. Feed water pressure out of this range may require an additional booster pump or pressure regulator to provide enough pressure/pressure reduction to allow it to fall within the operational range.

All of the systems require that if water is microbiologically unsafe or unknown quality, then disinfection must be added to the system. Some treatment units offer added disinfection steps as optional upgrades.

Table 1: Feed Water Specifications

Feed Water Parameters	Requirements
Temperature	$40^oF – 100^oF$
Pressure	40 psi – 80 psi
Cl^-	<1.0 mg/L
Hardness @ 6.9 pH	10 gpg
TDS	<2,000 mg/L
pH	4-8
Turbidity	<1.0 NTU
SDI	< 5
Nitrate as N	<27 mg/L
Nitrite as N	<3 mg/L
Others	Free from iron, manganese or hydrogen sulfide

Note: These requirements cover most of the commercially-available products. The manufacture's installation and maintenance manual for the selected system may allow for different operational ranges.

3.0 System Installation

3.1 Site Preparation

Before installation of POU RO system, check to confirm that all the contents from product package is included by comparing contents with the manufacture's packaging list. Typical POU RO treatment system includes the following materials in the package:

- Reverse Osmosis assembly with pre-filter and post-filter units
- Product water storage tank
- Air gap faucet assembly
- Tubing connections and valves for feed water, product water and drain
- Accessories, such as batteries, fittings, adapters, connectors and brackets
- Manufacture's installation manual.

General tools required for installation include:

- Knife
- Scissors
- Electric drill and drill bits

- Screwdrivers
- Teflon tape
- File
- Hammer
- Pinchers
- Pliers or pipe wrench,

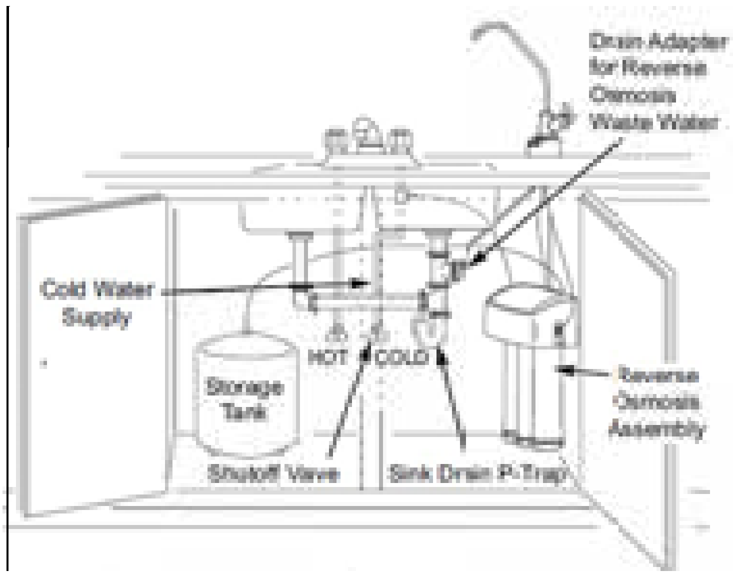
Note that additional plumbing materials, such as PVC piping, piping glue, valves and drains, may be required to correct substandard plumbing at the installation location. A variety of general plumbing materials should also be brought to the installation site on a contingency basis.

In preparation for unit installation:

1. Close the hot and cold water shutoff valves.
2. Temporarily place the tank and filter assembly into the planned location.
3. Check the position of items and space required for proper installation and for accessibility.
4. Remove tank and filter from planned location and set aside.

It is important to note that compliance is maintained with all local plumbing codes.

Below is an example of the location of various plumbing items.



<u>3.2 Install Feed Water Connection</u>

Feed water should be connected to the existing cold-water (potable) pipe. Before installing the feed water connection, make sure that water supply is turned off and open a faucet to drain the pipe.

Remove the nut that connects the cold-water faucet to cold-water plumbing, and thread water supply fitting onto the pipe. Reconnect the nut to the bottom of fitting.

3.3 Install Drain Connection

A drain point is needed for discharging the RO reject water. Most treatment products provide fittings for the sink drain pipe under the sink and above the P-trap. The connection between the sink P-trap and the sink tailpiece needs to be removed first.

After cleaning the tailpiece, the drain adapter could be installed directly onto the sink tailpiece. The adapter needs to be positioned such that the drain tubing from the RO faucet will run straight to the adapter, with no dips, loops, or kinks.

3.4 Install RO Unit

Some units ship the RO filter assembly directly, while others require the user to assemble them before mounting under the sink. The units will generally include the following:

- Sediment trap
- Granulated Activated Carbon (GAC) filter unit
- CTO (Chlorine, Taste, Order) cartridge (often also referred to as Block Carbon Filter)
- RO membrane

Booster pumps or pressure reducing values are added if required to ensure that the system water pressures remain within the specified range. Some treatment units also include optional stages, such as:

- Mineralized Ball Filter
- UV Sterilizer
- Magnetization Filter

It should be noted that the RO assembly can also be mounted on hanger washers.

3.5 Install Storage Tank

The treatment system storage tank is typically prefilled with air to provide the pressure needed for normal usage. To install, apply thread sealing tape to the threads on the nipple at the top of the tank and then tighten the tubing connector onto the tank nipple, but don’t connect the tube yet. This connection is made later.

3.6 Install Faucet

To install the faucet, first a location for the faucet must be selected. Typical options include:

- Using the existing sink top hole for the spray hose or soap dispenser.
- Drilling a new hole for the faucet location.

Note that the air gap faucet has three pipes connecting to the faucet, therefore the hole needs to be 1-3/8” in diameter (confirm with the manufacturer’s installation instructions). In addition, the tubing needs to be connected to the RO assembly, storage tank and drain pipe without kinking.

Visually review the routing of the tubes and make sure there is adequate tube routing space. Make sure that RO faucet will mount flat against the mounting surface. If necessary, drill a new hole in the sink or in the countertop next to the sink. Drilling should only be performed by an installer who is qualified for drilling such materials.

After the faucet and connections have been located, connect the product water tube, drain tube and tub from tank to the bottom of the faucet. Refer to manufacture's guide on exact connection of these three tubes. Make sure all of the fittings are connected firmly.

Insert the tubes into the sink hole until the faucet is mounted flat against the sink or base, with a rubber gasket installed between the surface and the faucet base.

Finally, some faucets are equipped with batteries to include a timer that tracks usage. Please read the manufacture's manual to make sure that the batteries are installed correctly to indicate when filters need to be replaced.

3.7 Connect Tubes

Referring to the manufacture's manual, make the following main connections for the RO assembly. These include connecting the feed water tube, product water tube, tube for the drain saddle and tubing to the storage tank.

3.8 Additional Treatment Stages

Some treatment units offer additional treatment stages either as post-filters or as optional upgrades. These may include:

- Pre-filters such as chlorine/taste/odor (CTO) units and deionization (DI) units
- Post-filters such as alkalinity units or ultraviolet (UV) disinfection units

The manufacturer's installation instructions should be followed for connecting these units

3.9 Sanitize the Treatment System

After installation, the treatment system should be sanitized. This can be done by adding home bleach to the system before its first use. The manufacturer's instructions should be followed for system sanitizing.

3.10 System Purging

After sanitizing, the treatment system should be purged. This is accomplished by implementing the following general tasks:

1. Turn on cold water supply valve and feed water valve, but close the tank ball valve.
2. Open the faucet and check for system leaks.
3. Water should start dripping out from faucet in 5 to 20 minutes. Let the water drip for 10 minutes. Some blackening of the water may occur due to loss of carbon from the GAC filter being flushed out. The water should run clear after approximately 10 minutes.
4. Close the faucet and fill up the pressure tank. This may take 2-1/2 to 3-1/2 hours, depending on local water pressure.
5. Water production will stop when tank is full. Drain the tank completely by opening the faucet again.

6. Close the faucet and start RO treatment again to refill the tank (this should take around 2-1/2 hours).
7. After the second tank is filled, the system can be used.
8. Check the system daily for leaks during the first week of operation and periodically thereafter.
9. If treated water has a milky color, this is due to air bubbles in the water; it is safe to drink.
10. Remember, don't push and release the air valve on the pressure tank

Some manufacturers require adding bleach to the system after installation (see step 3.9, sanitizing the system, above). Please follow the manufacturer's recommendations as some manufacturers require the system to be flushed once while others recommend purging the system for 24 hours after pressure build up.

4.0 Monitoring Protocols

- Water samples to be collected both prior to and after system installation.
- Samples should be collected from the tap per approved procedures. Describe the sampling procedures
- Water samples to be analyzed per EPA-approved methods at a pre-determined State certified analytical lab. (See sample Pilot Sampling and Analysis Plan for recommended analytical methods and information.)
- Onsite surrogate monitoring may be approved for routine monitoring (but not for establishing compliance with MCLs). These surrogate monitoring parameters should also be analyzed both before and following treatment system installation.
- Surrogate sampling involves using a water parameter that can be measured in the home with a handheld device. Typical surrogate parameters include electrical conductivity (EC) and/or turbidity.
  - In sampling surrogate parameters, use calibrated field (handheld) devices to ensure POU devices are working adequately between compliance samples and to help anticipate and plan for device replacement or service
  - Results of field samples should be recorded in maintenance logs kept by trained personnel
  - Type of field sampling depends on the constituents of concern and the type of POU treatment device
  - Pilot testing can evaluate and consider the most effective surrogate and test methodology based on factors such as accuracy, precision, cost-effectiveness, test device portability, ease of use, calibration needs, operator training, etc.
  - Include manufacturer's recommendation and calibration method for field-testing equipment in appendices of the Monitoring and Maintenance Plan.

5.0 Troubleshooting Guide

- This section of the manual may have limited information initially. This manual should be updated regularly as information is gained regarding system installation.
- Typical troubleshooting problems are as follows:

Table 2: Typical Installation Problems

Problem	Cause
Low/slow production	Low water pressure Crimps in tubing Clogged pre-filters Fouled membrane
Milky colored water	Air in system
Water constantly running; unit will not shut off	Low water pressure Crimp in supply tube High water pressure High pressure in storage tank Low pressure in storage tank
Water from faucet vent hole or noise from drain	Crimp or restriction in drain line Drain tube clogged
Small amount of water in storage tank	System is starting up Low water pressure Too much air in storage tank

6.0 Record Keeping & Reporting

- Records regarding the installation of POU systems should be maintained for at least five years.
- Also maintained should be any and all records associated with any contracts, lease agreements, maintenance records, logs of installed devices, legal documents, educational materials, and sampling results.
- At a minimum, the following information should be recorded for each POU unit installed:
  - Where, when, and by whom the equipment was installed
  - Problems encountered during installation
  - Sampling collection for monitoring (both pre- and post-installation)
  - Results of lab analyses (both pre- and post-installation)
  - Customer billing
- If any devices are not in compliance, notes should be made as to what the problem was and actions taken to return the device to compliance.
- Riverside County Department of Environmental Health or others may require reporting pertaining to testing of installed POU devices.

Appendices

- Manufacturer’s Installation instructions
- Manufacturer’s recommendation and calibration method for field-testing equipment
- Installation logs

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Appendix E - Annotated Outline for Monitoring and Maintenance Manual

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1 Introduction

As part of the 2014 Coachella Valley IRWM Plan Update, a Disadvantaged Community (DAC) Water Quality Evaluation was conducted to assess water quality in DACs where groundwater was the primary source of drinking water. Out of this evaluation came the Coachella Valley Disadvantaged Community Residential Groundwater Treatment Program, which provided a work plan for entities seeking to implement an effective point-of-use (POU) treatment system program. Sample documents were created for each task outlined in the DAC Residential Groundwater Treatment Program that could be used as templates or guides for entities implementing similar programs.

This sample document was developed to provide an outline of a potential Monitoring and Maintenance Manual, a Task 3 deliverable. Such a manual should include the protocols for maintaining the selected point-of-use (POU) treatment system, as well as manufacturer information for replacement parts and recommended testing procedures. Manual contents should include: 1) system specifications, 2) process for purchasing and installing replacement filters, 3) maintenance and replacement schedules, 4) annual testing, and 5) manufacturer contact information. This manual should be used during training sessions for community members (see Task 4 for the DAC Residential Groundwater Treatment Program). The manual outline provided here should be completed with the information described in each section, as appropriate to the individual region, program, and selected treatment system(s).

2 Monitoring and Maintenance Manual Outline

1.0 Introduction/Background

- Describe program, including where units will be installed (include map).
- Describe general installation and testing of units.

2.0 Point of Use (POU) Reverse Osmosis (RO) System Description

- Name of selected RO unit
- Unit specifications, including manufacturer, model number, number of stages, NSF certification, flow rate and any other relevant information

3.0 RO Treatment System Maintenance

Long-term success of POU treatment systems will depend on regular, aggressive yet practical maintenance program. POU maintenance issues typically include routine maintenance, replacement of parts or devices, emergency maintenance. In compiling/preparing a maintenance program, one must consider the following:

- Manufacturer's recommended maintenance program
- Location of POU unit as this will affect how easy it is to inspect and service the unit (and therefore the costs and frustrations associated with maintaining the unit)
- Life expectancy of POU unit. The manufacturer should recommend a maintenance schedule that includes replacement of the device and/or components. Costs associated with replacement parts needs to be considered and planned for

- Plan for changes/adjustments to the maintenance program as experience with the system is gained

Key parts of the maintenance system should include the following:

3.1 Scheduled Maintenance

- A substantial factor of customer safety should be built into the maintenance schedule. Plan to conduct the maintenance before the system requires it (preventive maintenance)
- Regular maintenance of the system will help to stave off small problems (i.e. leaks) before they become large problems and will build up customer confidence
- Routine maintenance should be scheduled to coincide with routine compliance sampling
- Provide a maintenance schedule for an 'average' household. This schedule should be based on the results of the pilot testing and the vendor/manufacturer recommendations. Include the manufacturer maintenance instructions in an appendix and reference it here
- General scheduled maintenance measures should include:
    1. Changing filters at least once a year
    2. Checking treated water with field devices (such as conductivity monitoring) once per year
    3. Checking conductivity sensor and alarm once a year
    4. Disinfecting the entire system once a year
    5. Changing the RO membrane element when necessary (approximately every 2 to 5 years – again, reference the manufacturer maintenance manual)

3.2 Unscheduled Maintenance

- Urgent or emergency maintenance is required whenever:
    - a device's mechanical warning mechanism is activated
    - if a device fails to deliver water
    - if a leak occurs, or
    - if the water has an unusual taste or odor
- A technician should be available for unscheduled maintenance calls
- A stock of replacement parts and additional devices should be maintained in case emergency maintenance is necessary

3.3 Replacing Filters and RO Membrane

- List information regarding treatment capacity of filters and membrane; reference manufacturer maintenance information
- List expected life of activated carbon filters (which can be measured during pilot testing) and RO membranes. Effective life of RO membranes can be difficult to predict when serious scaling or fouling problems occur, like scaling caused by precipitation of minerals on the membrane. Reference manufacturer maintenance information
- Provide any useful information regarding membrane operations that can be obtained from homeowners and water treatment companies in areas with that use similar equipment (i.e. how often do they have to replace the RO membranes)

- All replacement filters and membranes used should be certified by NSF International or equivalent organization

3.4 Disinfection

- Due to the possibility of bacteria growth on the system, the entire system should be disinfected annually. Reference manufacturer maintenance information as appropriate.
- Change carbon filters when doing annual disinfection
- General disinfection steps are as follows:
    1. Replace activated carbon filters and inspect membrane
    2. Fill filter and membrane housing with a 3% hydrogen peroxide solution
    3. Reconnect the filter and membrane housing
    4. Turn on water to the system and allow storage tank to fill
    5. Allow hydrogen peroxide solution to remain the system for several hours
    6. Open the faucet and drain the storage tank

3.5 Estimating Maintenance Costs

- A scheduled maintenance call should be made to every POU unit at least once a year to change activated carbon filters, disinfect the system, change the RO element (if necessary) and do compliance testing. Each of these, and other identified yearly maintenance activities, should be included in maintenance cost estimates.
- Maintenance is largest single cost component and affected by labor, maintenance time, maintenance schedule, replacement parts, and travel and lab costs.
- Each yearly scheduled maintenance activity, including sampling, should be conducted during the same scheduled visit. This will minimize the burden associated with gaining access to individual residences and reduce administrative costs and travel time.

4.0 Routine Compliance Sampling

- Water samples to be collected from the tap per approved procedures. Describe the sampling procedures
- Water samples to be analyzed per EPA-approved methods at a pre-determined State certified analytical lab. (See sample Pilot Sampling and Analysis Plan for recommended analytical methods and information)
- Onsite surrogate monitoring may be approved for routine monitoring (but not for establishing compliance with MCLs). Consider establishing these surrogate monitoring procedures jointly with Riverside County Department of Environmental Health.
- Surrogate sampling involves using a water parameter that can be measured in the home with a handheld device. Typical surrogate parameters include electrical conductivity (EC), turbidity and/or total dissolved solids (TDS)
    - In sampling surrogate parameters, use calibrated field (handheld) devices to ensure POU devices are working adequately between compliance samples and to help anticipate and plan for device replacement or service

- Results of field samples should be recorded in maintenance logs kept by trained personnel
- Type of field sampling depends on the constituents of concern and the type of POU treatment device
- Pilot testing can evaluate and consider the most effective surrogate and test methodology based on factors such as accuracy, precision, cost-effectiveness, test device portability, ease of use, calibration needs, operator training, etc.
- Include manufacturer's recommendation and calibration method for field-testing equipment in appendices of the Monitoring and Maintenance Plan.

5.0 Waste Handling

- The Monitoring and Maintenance Plan must have a method for disposal of the POU devices.
- POU devices generate solid and liquid waste residuals. Although the USEPA's guidance document on POU and POE devices state that 'residuals generated by POU or POE devices installed in residences are considered household waste and exempt from being regulated as a hazardous waste under the Resource Conservation and Recovery Act (RCRA)' other regulations or ordinances may apply; consultation with the Riverside County Department of Environmental Health is recommended.

6.0 Record Keeping & Reporting

- Records regarding the maintenance of POU systems should be maintained for at least 5 years.
- Also maintained should be any and all records associated with any contracts, lease agreements, maintenance records, logs of installed devices, legal documents, educational materials, and sampling results.
- At a minimum, the following information should be recorded for each POU unit installed and maintained:
  - Where, when, and by whom the equipment was installed
  - All scheduled and unscheduled maintenance visits
  - Sampling collection for monitoring
  - Results of lab analyses
  - Customer billing
- If any devices are not in compliance, notes should be made as to what the problem was and actions taken to return the device to compliance.
- Riverside County DEH or others may require reporting pertaining to monitoring and maintenance of POU devices.

Appendix F - POU RO Program Logistics Tracking Table

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POU RO Program Logistics Tracking Table

Tracking Serial Number	Manufacture	Model Number	Date of Purchase	Storage Location	Date of Installation	Installation Location

POU RO System Service Tracking Table

Model Number:
Date of Purchase:
Date of Installation:
Installed By:
Maintenance Record:

Dates (Maximum Time Interval = 6 Months)	**Inspection/Replacement Frequencies**		
	6 Months	12 Months	2 years and above
	Parts Name	Parts Name	Parts Name
	(*Parts Number*)	(*Parts Number*)	(*Parts Number*)

POU RO System Water Quality Tracking Table

Model Number:

Date of Purchase:

Date of Installation:

Installed By:

Maintenance Record:

Dates (Maximum Time Interval = 6 Months)	Feed Water										Product Water				
	Temperature	pH	Pressure	chlorine	hardness	TDS	Turbidity	Iron	Manganese	Hydrogen Sulfide	Arsenic	Uranium	Fluoride	Nitrate	Cr^{6+}
	^{0}F	-	psi	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	µg/L	µg/L	mg/L	mg/L	mg/L
Pre-installation															
Post-installation															
Every 6 months															

POU Parts Replacement Record

Service Record
Model Number:
Date of Purchase:
Date of Installation:
Installed By:

Manufacture	Model Number(s)	Stages	Inspection/Replacement Frequencies			Warranty
			6 Month	12 Month	2 years and above	
			Parts Name (Parts Number)	Parts Name (Parts Number) [Parts with Specific Period]	Parts Name (Parts Number) [Parts with Specific Period]	Years
ISPRING	RCC7, RCC7AK, RCC7AK-UV	5-7	1st Stage Sediment (FP15), 2nd Stage GAC (FG15), 3rd Stage CTO (FC15), 6th Stage DI (FD15), 6th Stage Alkaline (FA15)	5th Stage Inline Carbon (FT15), 6th or 7th Stage UV Lamp (UVB11)	4th Stage Membrane (MC7/ MC1) [2 Years]	1
Perfect Water Technologies	TMAFC, TMULTRA	6-7	-	Sediment Filter, Carbon Filter(s), IRON Filter, UV Bulb, Artesian Filter	Membrane [3-5 Years]	5
Purenex	RO-5-50	5-7	PP Spun Filter	Carbon Filter Block Carbon Filters Post Carbon Filters	RO Membrane [2-3 Years]	1
Nimbus Water Systems	WM5-50	5	4-Stage Cartridge (104592) including: Sediment Pre-filter, GAC Prefilter, RO membrane, GAC postfilter	GAC post-filter (104803)	TBD	1
Krystal Pure	KR10, KR15	4	Battery, Sediment Pre-filter (P1 #136-1110-1)	Carbon Pre-filter (CB05 #135-1210-1), Carbon Post-Filter (CB #135-1210-2), /Carbon M.A.P (CB-A #135-1210-2)	RO Membrane (TFC-24 #138-124-1) [2-5 Years]	4-5
Watts Premier	531411	4	Battery, Sediment Filter (105311), Carbon Pre-Filter (105351)	Sediment Pre-filter (105311), Carbon Pre-filter (105351), Carbon Post-Filter (105341)	Membrane (105331) [2-5 Years]	3
Whirlpool	WHER25	3	Battery, Pre-filter (WHEERF), Post-Filter (WHEERF)	RO Cartridge (WHEERM) [6 mo - 18 mo]	TBD	1
DuPont	WFRO60X	3	Battery, Pre-filter (WFQTC30001), Post-Filter (WFQTC30001)	RO Cartridge (WFROM1000) [6 mo - 18 mo]	TBD	3
EcoPure	ECOP309	3	Battery (7314183), Pre-filter (ECOROF), Post-Filter (ECOROF)	RO Cartridge (ECOROM) [6 mo - 18 mo]	TBD	1
General Electric	GXRM10RBL	3	Battery, Pre-filter Cartridge (FX12P), Post-Filter Cartridge (FX12P)	RO Cartridge (FX12M) [?]	TBD	1
Hydro-Logic	HLRO100	3	Sediment Filter (22125) [6 mo - 12 mo] Carbon Filter (22110) [1,250 gal of purified water]	Membrane Element (22120) [6 mo - 24 mo]	TBD	1

Appendix G - POU RO Treatment Program Training Template

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COACHELLA VALLEY DISADVANTAGED COMMUNITY (DAC) RESIDENTIAL GROUNDWATER TREATMENT PROGRAM

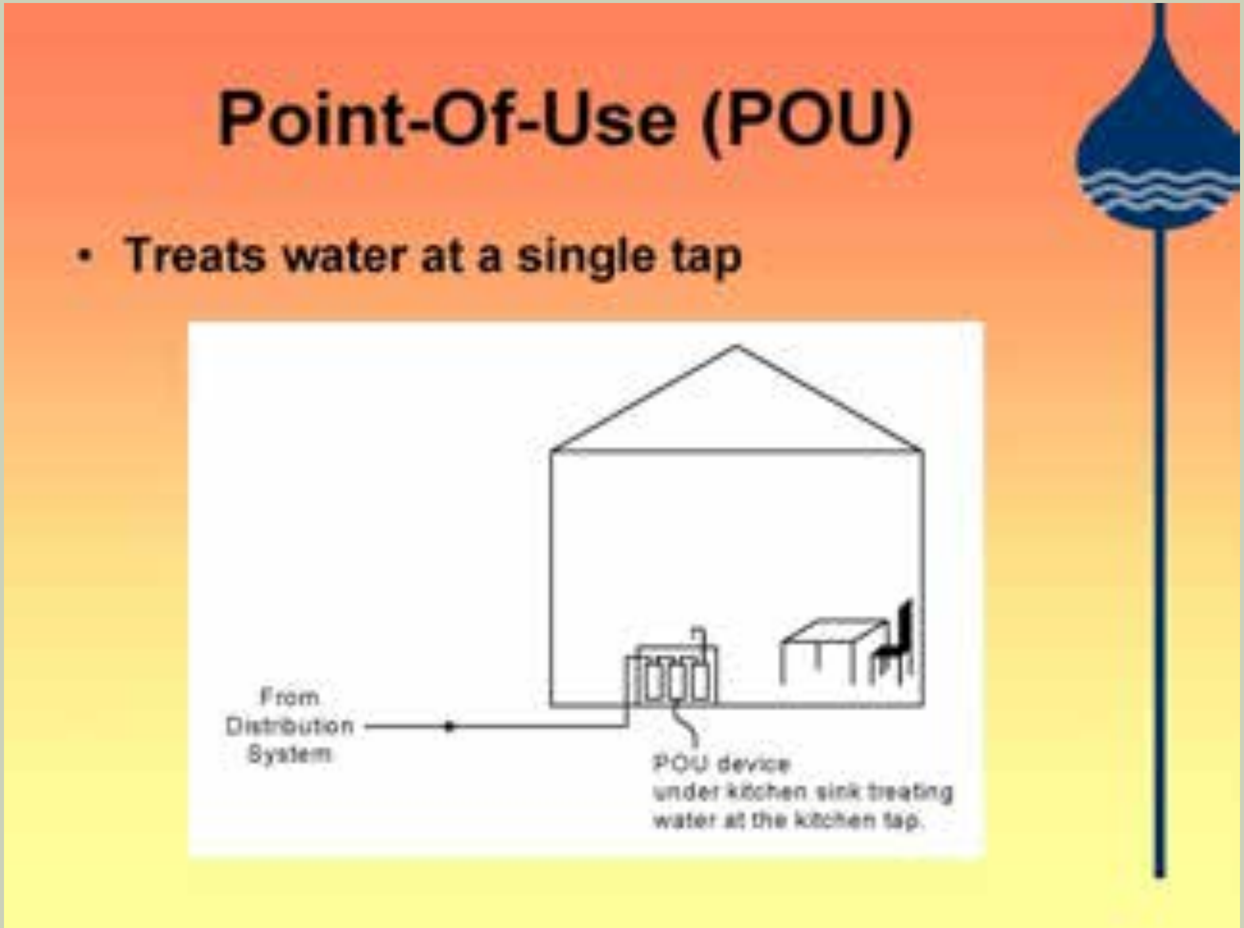
Treatment Unit Installation Training

Date

PURPOSE

- Assist local DAC communities in eliminating public health issues related to poor drinking water quality.
- Demonstrate appropriate installation of Point of Use (POU) Reverse Osmosis (RO) treatment systems.
- Provide training for appropriate field sampling and analysis and water quality sample collection.
- Demonstrate appropriate treatment system maintenance and troubleshooting.

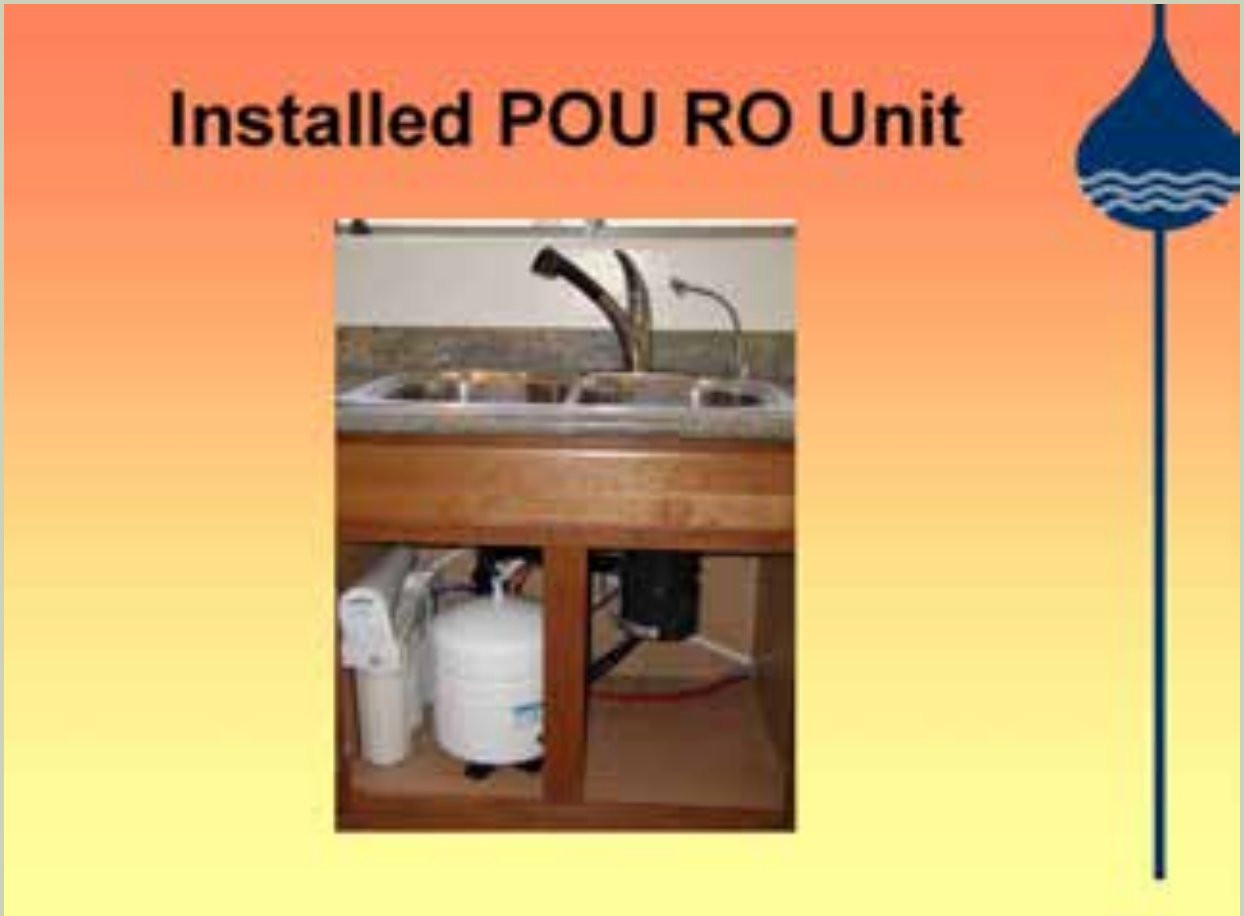
POU SYSTEM TREATS WATER FROM SINGLE TAP



SYSTEM IDENTIFICATION

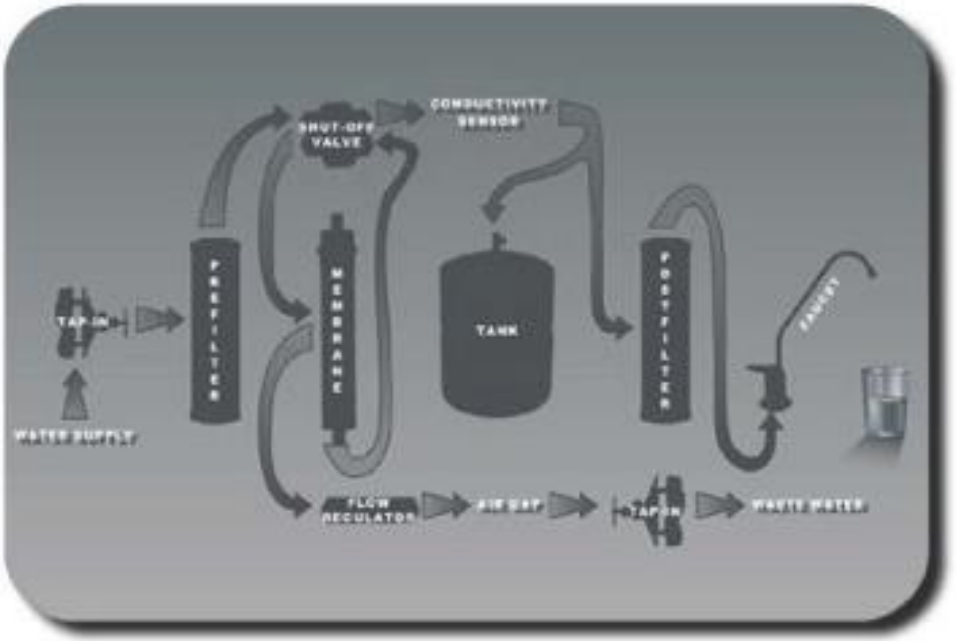
- Describe selected treatment system (provide pictures and photographs as available)
- Provide information on system components – including identification of all parts and connections

SYSTEM EXAMPLE



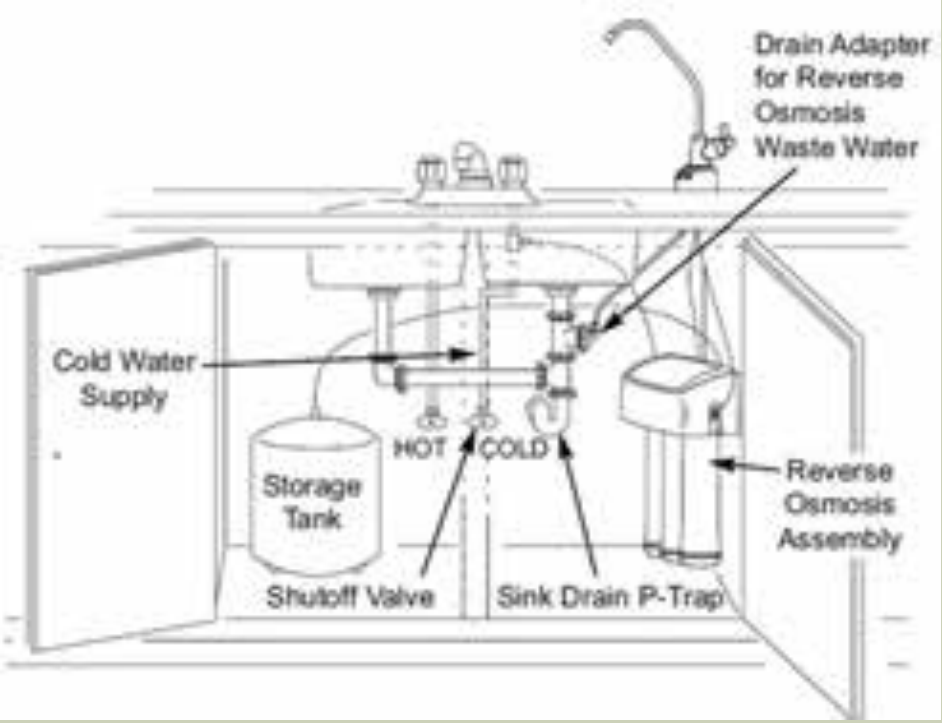
BASIC SYSTEM COMPONENTS

- Activated carbon block pre-filter
- Spiral-wound RO membrane module
- Activated carbon post-filter
- Storage tank
- Feed water saddle valve
- Faucet assembly



SYSTEM INSTALLATION

- Preparation
- Adaptors
- RO assembly
- Storage Tank
- Faucet
- Finish Connections



SITE PREPARATION

- Have all materials in hand at start of installation
- Have additional plumbing materials to address sub-standard plumbing if necessary
- Turn off water at shutoff valves
- Place unit in selected location – plan for space and accessibility (for installation, maintenance and monitoring)

INSTALLATION

1. Install Feed Water Connection
2. Install Drain Connection
3. Install RO Unit
4. Install Other Pre- or Post-treatment Units (as required)
5. Install Storage Tank
6. Install Faucet
7. Connect tubes

AFTER INSTALLATION

- Sanitize the system
  - Disinfect system with household bleach
- Purge the system
  - Remove air bubbles and carbon particles from the filter

WATER QUALITY TESTS

- Pre-installation – water samples and surrogate measurements
- Post-installation– water samples and surrogate measurements
- Routine Monitoring– water samples and surrogate measurements
- Record keeping

WATER QUALITY PARAMETERS

- Arsenic (EPA Method 200.8)
- Uranium (EPA Method 200.8)
- Fluoride (EPA Method 300.0)
- Nitrate (EPA Method 300.0)
- Hexavalent Chromium (EPA Method 218.7)

SURROGATE PARAMETERS

- Measured in field at site
- Correlated to constituent of concern <describe correlation here>
- Selected surrogate parameter is <insert surrogate parameter here>
- In-field measurement by <insert name of monitoring equipment here>

SAMPLE COLLECTION AND SHIPPING

- Calibrate all in-field equipment
- Grab samples from faucet after running water for at least one minute
- Collect two 500mL sterile plastic bottles and one 250mL sterile plastic bottle
- Collect sample for in-field surrogate analysis
- Inspect sample and record any visual observations (color, smell, clarity)
- Measure sample in field and record measurements
- Label samples in plastic bottles with sample number, sampling location, date, time and name of sampler
- Place samples in cooler with ice packs or loose ice in double ziplock bags
- Keep samples under 8^{o}C and get to lab within 24 hours

FIELD NOTES

- **Field notes should contain:**
  - Calibration of field equipment
  - Purpose of sampling
  - Location and description of the sampling point
  - Name and address of field contact
  - Documentation of procedures for preparation of reagent or supplies which become an integral part of the sample (e.g., field blanks)
  - Type of sample (e.g., tap water)
  - Number and volume of sample taken
  - Sample type taken (e.g., primary sample, replicate, field blank)
  - Sampling methodology
  - Sample preservation
  - Date and time of collection
  - Weather conditions
  - Sample distribution and how transported (e.g., name of the laboratory and shipping agent)
  - Reference such as maps of the sampling site
  - Field observations
  - Any field measurements made
  - Signature and date by the personnel responsible for observations
  - Decontamination procedures

CHAIN OF CUSTODY FORM

Analytical Sciences
P.O. Box 750336, Petaluma, CA 94975-0336
110 Liberty Street, Petaluma, CA 94952
(707) 769-3128
Fax (707) 769-8093

CHAIN OF CUSTODY

Lab Project Number: ______
Client's Project Name: ______
Client's Project Number: ______

CLIENT INFORMATION

Company Name: **RMC Water and Environment**
Address: **2001 North Main St, Suite 400**
Walnut Creek, CA 94596
Contact: **Leslie Dumas**
Phone #: **(925) 627-4100**
Fax #: **(925) 627-4101**
e-mail: ldumas@rmcwater.com

GeoTracker Required Yes No
GeoTracker Number:

TURNAROUND TIME (check one)

Same Day ______
48 Hours ______ 24 Hours ______
5 Days ______ Normal ______

Page ______ of ______

Item	Client Sample ID	Date Sampled	Time	Matrix	# Cont.	Preser. Y/N	Total Coliform & E. Coli	Enterococcus	TSS	TDS	Biological Oxygen Demand	Total Phosphorus	Dissolved Phosphorus	Fecal Coliform MPN	TKN as N	Nitrate as N	Nitrite as N	Ammonia as N	Total Nitrogen as N	Orthophosphate as P	Comments	Lab Sample #
1																						
2																						
3																						
4																						
5																						
6																					CC:	
7																					[illegible]	
8																						
9																						
10																						

SIGNATURES

Sampled By: ______

Relinquished By: ______ Received By: ______

Signature ______ Date ______ Time ______ Signature ______ Date ______ Time ______

WATER QUALITY TESTING FREQUENCY

- Once prior to treatment system installation
- Once immediately following treatment system installation
- Routinely – at least once per year

MAINTENANCE

- Replace filters and disinfect system per manufacturer's requirement at least once every year
- Inspect system for leaks or other defects
- Collect water quality samples regularly (annually at minimum) and test for system performance and drinking water safety
- Monitor system and replace RO membrane as needed
- Replace treatment unit at end of useful life [XX years]

TREATMENT SYSTEM DISINFECTION

1. Replace activated carbon filters and inspect membrane
2. Fill filter and membrane housing with a 3% hydrogen peroxide solution
3. Reconnect the filter and membrane housing
4. Turn on water to the system and allow storage tank to fill
5. Allow hydrogen peroxide solution to remain the system for several hours
6. Open the faucet and drain the storage tank

WASTE HANDLING

- Typical wastes include used filters and membranes
- Describe how wastes should be handled

RECORD KEEPING

- Record unit number, location and leasee
- Record maintenance conducted on unit
- Record post-maintenance water quality (both in-field measurements, visual observations, and samples collected and sent to laboratory)
- Describe any other maintenance conducted on unit
- Record name of person doing maintenance and date of maintenance

PROGRAM LOGISTICS

- Purchase, Storage, Installation Records
- System Maintenance Tracking
- Continuous Water Quality Data Monitoring

Appendix H - Sample Financing Plan Spreadsheet

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Point of Use Treatment System Maintenance Cost Calculator

Notes to user:

input cells: adjusted by user

See notes adjacent to each cell for more information regarding calculator inputs and outputs

Program Costs		
RO Unit Capital Cost	$ -	Enter the cost of a POU RO treatment unit
Replacement Filter Cost	$ -	Enter the cost of the replacement GAC filter
Replacement RO Membrane	$ -	Enter the cost of the replacement RO membrane
Monitoring Equipment	$ -	
Monthly Charge to Renter	$ -	Enter the estimated cost of treatment unit rental
Total # of units in use	-	Enter the total number of treatment units presently being rented

Maintenance Timing/Life			
Component	Months	Years	
RO Unit Replacement	0	0	Enter the estimated treatment unit life
RO Membrane Replacement	0	0	Enter the estimated RO membrane life (typically 3 to 5 years)
GAC Filter Replacement	0	0	Enter the estimated GAC filter life (typically 1 year)
Training Timing	0	0	How often will training occur (i.e. one a year [or every 12 months])
Monitoring Equipment	0	0	How often will monitoring of the treatment system occur?

Monthly Charge Allocation			
Component	%	$	For each category, what percentage of monthly rent goes to each cost category?
RO Unit Replacement	0%	$ -	
RO Membrane Replacement	0%	$ -	
GAC Filter Replacement	0%	$ -	
Training Timing	0%	$ -	
Monitoring Equipment	0%	$ -	
Total	**0%**	**$ -**	Note: this must total 100%

Funding Available for Program Components		
Component	Per Unit	Target Savings
RO Unit Replacement	$ -	$ -
RO Membrane Replacement	$ -	$ -
GAC Filter Replacement	$ -	$ -
Training Timing	$ -	$ -
Monitoring Equipment	$ -	$ -
Total	**$ -**	**$ -**

Funds available per category when replacement is needed; adjust percent by category above to ensure sufficient funds are available when needed.

Target savings = how much money you need to be saving to service all units.

Comparison of Savings to Anticipated Costs		
Component	Anticipated Annual Maintenance Cost	Target Annual Savings
RO Unit Replacement	$ -	$ -
GAC Filter Replacement	$ -	$ -
RO Membrane Replacement	$ -	$ -
Training Timing	-	$ -
Monitoring Equipment	$ -	$ -
Total	**$ -**	**$ -**

This table tells you if you are saving enough for replacing the various system components and/or covering costs for training, etc. Note, this is for all units currently being rented.

Point of Use Treatment System Maintenance Cost Calculator: EXAMPLE

Notes to user:

input cells: adjusted by user

See notes adjacent to each cell for more information regarding calculator inputs and outputs

Program Costs		
RO Unit Capital Cost	$ 125.00	Enter the cost of a POU RO treatment unit
Replacement Filter Cost	$ 25.00	Enter the cost of the replacement GAC filter
Replacement RO Membrane	$ 75.00	Enter the cost of the replacement RO membrane
Monitoring Equipment	$ 225.00	Enter the cost of the in-field monitoring equipment
Training Class	$ 500.00	Enter the estimated costs associated with each training class
Monthly Charge to Renter	$ 12.00	Enter the estimated cost of treatment unit rental. <u>If cell is **red,** the monthly rent needs to be increased to have adequate annual savings for the program.</u>
Total # of units in use	125	Enter the total number of treatment units presently being rented

Maintenance Timing/Life			
Component	Months	Years	
RO Unit Replacement	120	10	Enter the estimated treatment unit life
RO Membrane Replacement	60	5	Enter the estimated RO membrane life (typically 3 to 5 years)
GAC Filter Replacement	12	1	Enter the estimated GAC filter life (typically 1 year)
Training Timing	12	1	How often will training occur (i.e. once a year [or every 12 months])
Monitoring Equipment	36	3	How often will monitoring of the treatment system occur?

Monthly Charge Allocation		
Component	%	$
RO Unit Replacement	10%	$ 1.14
RO Membrane Replacement	11%	$ 1.37
GAC Filter Replacement	19%	$ 2.28
Training Timing	3%	$ 0.37
Monitoring Equipment	57%	$ 6.84
Total	**100%**	**$ 12.00**

For each category, what percentage of monthly rent goes to each cost category? Note that these percentages are calculated directly based on the information presented above.

Note: this must total 100%

Funding Available for Program Components		
Component	Per Unit	Target Savings
RO Unit Replacement	$ 136.88	$ 17,110
RO Membrane Replacement	$ 82.13	$ 10,266
GAC Filter Replacement	$ 27.38	$ 3,422
Training Timing	$ 4.38	$ 548
Monitoring Equipment	$ 246.39	$ 30,798
Total	**$ 497.16**	**$ 62,144**

Funds available per category when replacement is needed; adjust percent by category above to ensure sufficient funds are available when needed.

Target savings = how much money you need to be saving to service all units.

Comparison of Savings to Anticipated Costs		
Component	Anticipated Annual Maintenance Cost	Target Annual Savings
RO Unit Replacement	$ 1,563	$ 1,711
RO Membrane Replacement	$ 1,875	$ 2,053
GAC Filter Replacement	$ 3,125	$ 3,422
Training Timing	$ 500	$ 548
Monitoring Equipment	$ 9,375	$ 10,266
Total	**$ 16,438**	**$ 18,000**

This table tells you if you are saving enough for replacing the various system components and/or covering costs for training, etc. Note, this is for all units currently being rented.

The Total Target Annual Savings. If the Total Target Annual Saving is **red** , increase the monthly rental charge to users (above).

Appendix VII-D: Participation in Integrated Regional Water Management

This appendix includes a report describing the challenges to disadvantaged communities' participation in IRWM planning and efforts and potential ways to overcome those challenges.

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Coachella Valley Disadvantaged Community Outreach Program

Participation in Integrated Regional Water Management

Prepared by:

RMC
Water and Environment

In Association with:

Integrated Planning and Management Inc.
Generating Value Through Integration

October 2013

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List of Abbreviations

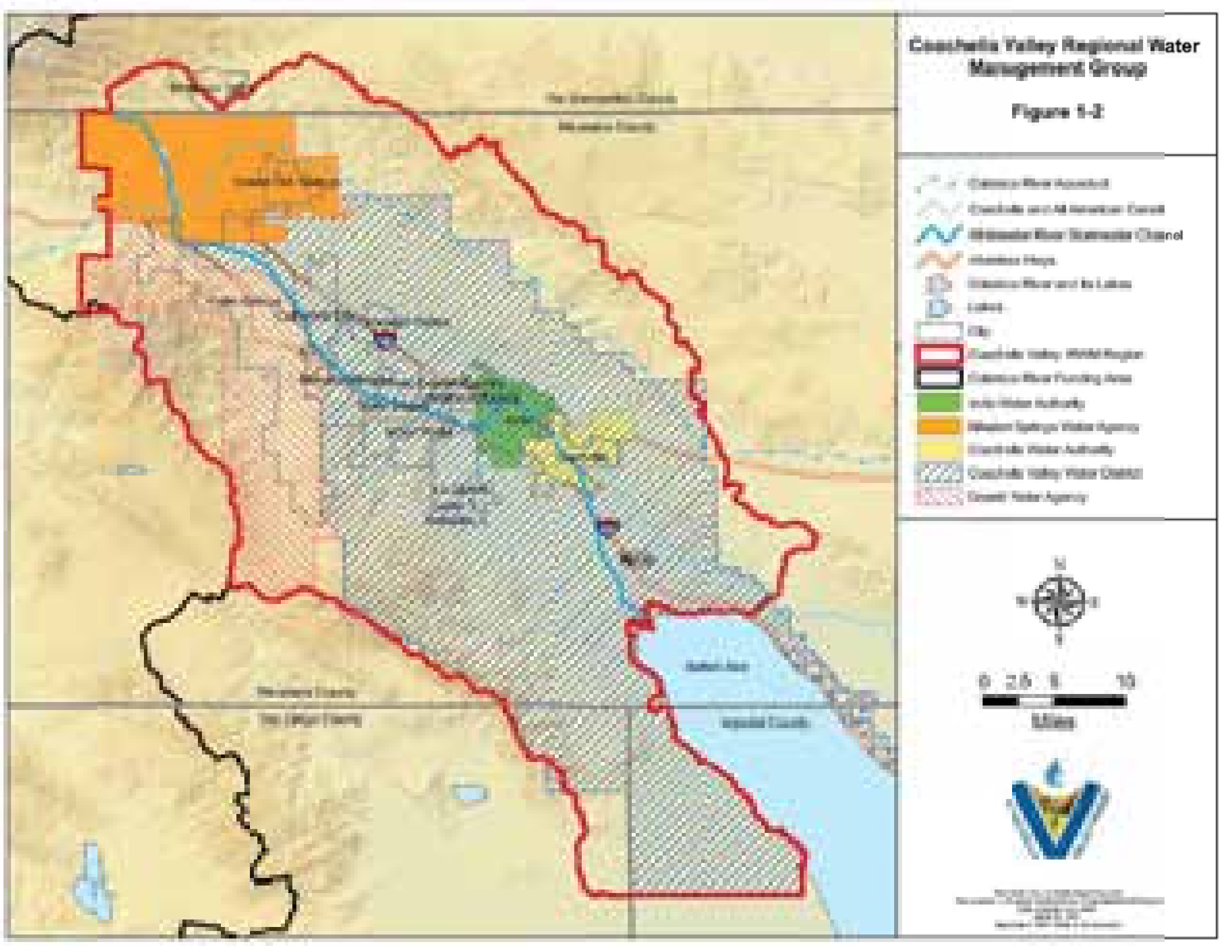
CVRWMG	Coachella Valley Regional Water Management Group
DAC	Disadvantaged Community
DAC Outreach Program	Coachella Valley DAC Outreach Program
DWR	California Department of Water Resources
IRWM	Integrated Regional Water Management
Region	Coachella Valley Integrated Regional Water Management Region

Executive Summary

The Coachella Valley Water District (CVWD), representing the Coachella Valley Regional Water Management Group (CVRWMG), has entered into a contract with the Department of Water Resources (DWR) to develop a Disadvantaged Community (DAC) Outreach Demonstration Program (DAC Outreach Program) for the Coachella Valley Integrated Regional Water Management Region (Region).

The DAC Outreach Program was implemented from 2012 to 2013 and had the overall purpose of developing and implementing methods to improve DAC participation in the Coachella Valley IRWM process. The DAC Outreach Program coordinated with and complemented the update of the Coachella Valley Integrated Regional Water Management (IRWM) Plan. The data and experience gained from the DAC Outreach Program will assist DWR in developing a model DAC Outreach Program for other similar areas in California. The Region, shown in **Figure 1-1** below, is managed by the CVRWMG, which is comprised of the five Coachella Valley water purveyors: Coachella Water Authority, Coachella Valley Water District, Desert Water Agency, Indio Water Authority, and Mission Springs Water District.

Figure 1 - 1: Coachella Valley IRWM Region



Section 1 Overview and Process

The overall purpose of this report is to describe the list of challenges that have historically prevented or discouraged DAC involvement in IRWM planning activities, and focuses on challenges that are specific to IRWM planning in the Coachella Valley. This report also includes information about outreach techniques and other methods that could be implemented to overcome those challenges and promote DAC involvement in IRWM planning activities. Information included in this report will be included in the 2014 Coachella Valley IRWM Plan Volume I (an update to the 2010 Coachella Valley IRWM Plan), which is currently being developed.

Many sources were used to gather the information included in this report. Notably, observations were made during DAC outreach efforts that were conducted during development of the 2010 IRWM Plan and directed DAC Outreach conducted in 2012 and 2013 for the DAC Outreach Program and 2014 IRWM Plan. Furthermore, information was provided by non-profit partners (El Sol Neighborhood Educational Center, Pueblo Unido Community Development Corporation, and Loma Linda University) as part of their individual contracts for the DAC Outreach Program. Lastly, the CVRWMG has provided input on challenges and opportunities regarding DAC participation in the IRWM Program based on extensive work that has been conducted with the agencies throughout the Coachella Valley IRWM planning process (2009 to present).

In accordance with the DAC Outreach Program contract with DWR, this report will be submitted to DWR, the CVRWMG, and the Planning Partners (IRWM Program stakeholders) for additional review and comment. A final draft approved by DWR will be released to the public for review and incorporation into the DAC Outreach Plan. Further information about the DAC Outreach Program can be found on the CVRWMG website: http://cvrwmg.org/dac.php

Section 2 Historical Challenges

The CVRWMG has long recognized that there are challenges to DAC involvement in the Coachella Valley IRWM Program. As there are many components of the IRWM Program, challenges are varied and extensive. These challenges provided the impetus for the CVRWMG to seek out additional grant funding from DWR to implement the DAC Outreach Program. The information presented below discusses the historical challenges to IRWM involvement for the various components of the IRWM Program, including: general participation and grant funding.

In addition to the challenges presented below, which are specific to the Coachella Valley IRWM Region, in April of 2013 a consortium of community leaders, residents, and social justice organizations that work with DACs in California submitted a letter to DWR stating that, "…the IRWM process has failed to reach its full potential to meaningfully and substantially address the needs of DACs…" This letter included comments on continued and ongoing challenges for DACs within IRWM Regions, and included some specific issues as they pertain to the Coachella Valley in relation to grant funding. The issues raised in the aforementioned letter pertaining to the Coachella Valley are provided under Section 2.2 Grant Funding, #1 Grant Funding Delays.

2.1 General Participation

General participation refers to stakeholder involvement in the IRWM Program. As discussed in detail in *Chapter 5, Stakeholder Involvement* of the 2010 Coachella Valley IRWM Plan and *Chapter 7, Stakeholder Involvement* of the 2014 Coachella Valley IRWM Plan Volume I, the IRWM Program has a governance structure that is heavily reliant upon input from stakeholders. Stakeholders are convened through a primary stakeholder group, the Planning Partners, which include several groups that represent DACs. In addition to the Planning Partners, a formal DAC Issues Group was formed in 2009 to provide specific feedback on the IRWM Program from a DAC perspective. Although DACs are very involved in the Coachella Valley IRWM Program, there are still substantial barriers to DACs with regards to ideal participation in the program.

Issues that may prevent DACs from participating in IRWM grant funding are discussed below.

1. <u>IRWM Program Complexity:</u> The IRWM Program is notoriously complex, involving extensive programmatic guidelines that dictate how an IRWM Plan is prepared, how IRWM regions conduct outreach, and how projects may receive IRWM funds. The IRWM Program also involves a complicated long-term process, requiring many stages and steps to yield a successful outcome. The IRWM Program also changes relatively frequently –IRWM grant application requirements change with every grant opportunity (through the various Proposal Solicitation Packages) and Program Guidelines change every few years. The complexity, complications, and fluctuating nature of the IRWM Program provide a barrier to participation by all stakeholders that may exhaust staff capacity and cause a loss of interest or trust when consistency is not maintained. This is a particular barrier to DACs who may not have a high level of trust in government programs already, or are represented by organizations that generally have limited staff capacity.

   IRWM Program complexity is not limited to the process, it is also technically complex. The IRWM Program is rife with jargon and technical requirements that provide a challenge to any layperson who is interested in becoming an IRWM stakeholder. Technical requirements for the IRWM Plan, such as climate change, make IRWM Plans bulky, complicated, and potentially meaningless if such issues are not pertinent to regional stakeholders. The technical complexity of IRWM planning may be a particular barrier to DACs who are not necessarily water resources managers and may not be aware of statewide issues and mandates that are required to be addressed by the local IRWM regions.

2. Role of the IRWM Program: Throughout the DAC Outreach Program two consistent and conflicting messages were repeatedly expressed by DAC stakeholders. Upon hearing about the IRWM Program, some stakeholders were immediately inspired to believe that help was available and would soon solve their problems, while other stakeholders failed to believe that this government-mandated program would result in change and continued to be disengaged. Stakeholders were generally confused about the role of the IRWM Program and asked questions such as what were its purpose, limitations, and breadth, and why was the outreach being conducted? Given the complexity of the IRWM Program (see point #1 above) and an existing amount of distrust among DAC stakeholders, it can difficult to implement the IRWM Program in a way that is understandable and meaningful to DAC stakeholders. An unclear understanding of the role of the IRWM Program can exacerbate these problems as distrust and disenchantment with the Program may lead to reduced participation.

3. Organizational Shifts and Spatial Coverage: The Coachella Valley IRWM Program has been actively involved in stakeholder outreach to DACs since the Program's official formation in 2009. Since the start of the Program's DAC outreach process, there has been a notable amount of turnover in the staff of some DAC organizations. Further, because the organizations are responsive to their stakeholders' needs and funding opportunities, their focus and available staff can shift over time. Such organizational shifts create discontinuity, requiring new staff members to quickly learn how the IRWM Program works, which is difficult given inherent complexities of the IRWM Program (see point #1 above). In addition to a discontinuity within DAC organizations, DAC participation can be affected by the spatial coverage of representative organizations. Many DAC organizations are local, sometimes highly localized, and may not represent the issues of a large DAC constituency. Additionally, statewide groups provide some broad-based representation but often lack the regional information to meaningfully represent specific local DAC needs, effectively created a gap in DAC representation for areas not within a local DAC organization's service area. This spatial discontinuity within which DAC areas are addressed can be a barrier to effective DAC communication, involvement, and participation in the IRWM Program.

4. Persistent Resistance to Engagement: Non-profit partners that participated in the DAC Outreach Program noted that some DAC stakeholders will experience a persistent resistance to engagement in large government-sponsored programs such as the IRWM Program. They noted that issues such as immigration status and language barriers may prevent some stakeholders from participating and limit others because they do not feel comfortable or welcome as participants. Non-profit partners also noted that past history and cultural beliefs may lead DAC stakeholders to feel as though there is no value to

investing time in large-scale government-sponsored planning efforts such as the IRWM Program. The reasons for this are many, including that the programs are not focused, take too long to produce results, undermine other interests of the community, or that there is a belief that the program will not solve real problems. While a general lack of staff, engagement, and sense of value in the IRWM Program may be a barrier to all stakeholders, information from the non-profit partners indicates that these are significantly more pervasive with DACs.

2.2 Grant Funding

Grant funding through Proposition 84 is a major component of the Coachella Valley IRWM Program; to date, the Region has been awarded $5 million and applied for an additional $5.24 million in IRWM grant funding.

To date, the Region has funded several projects that would directly benefit DACs, and has funded three projects to two entities that represent DACs (Pueblo Unido Community Development Corporation and Torres-Martinez Desert Cahuilla Indians). Although DACs have directly benefitted from IRWM-funded projects and DAC groups have directly received IRWM grant funding, substantial barriers to DACs remain with regards to IRWM grant funding.

Issues that may prevent DACs from participating in IRWM grant funding are discussed below.

1. Grant Funding Delays: The Proposition 84 Implementation Grant process requires grantees to expend funds, submit invoices for expended funds to DWR, then wait for DWR to reimburse them for expended funds. The Coachella Valley IRWM Region has experienced substantial funding delays in receiving grant reimbursements from DWR, and in some instances the time between invoice submittal and repayments has been six months. While funding delays impact all grantees, organizations that represent DACs are often small non-profit organizations that may be more severely impacted by funding delays due to limited access to capital funds and additional burdens due to the cost of funds if they cannot access project financing. Most non-profits work with small operating capital funds compared with government or for-profit businesses. Without adequate capital beyond their operating cash flow, non-profit organizations that receive IRWM grant funding have been forced to wait to receive reimbursements from DWR before they can continue implementing projects. Therefore, funding delays stall project implementation and may present a significant barrier to DACs in applying for IRWM grant funding.

   In the April 2013 DAC letter to DWR described above, it was noted that, "…in the Coachella Valley, the local sponsor organization is challenged to find a cash flow to purchase reverse osmosis filtration units and be reimbursed later. The real human cost is heartbreaking as hundreds of families facing high levels of arsenic in their groundwater are desperately waiting for this resource to have drinking water." This is a very specific and real example of how funding delays and DWR's reimbursement requirements impact DACs. Foreign aid programs have experienced similar impacts, and have found that without operating capital support it is possible to bankrupt the very organization that is being used to help deliver essential services to DACs.

2. Technical Complexity of IRWM Grants: Proposition 84 Implementation grant applications are highly complicated, requiring detailed cost benefit analyses and technical evaluations of projects. The complexity of IRWM Grants makes preparing applications costly and technically challenging. Both the cost and technical complexity of grant applications deter DAC organizations from participating in the grant program, because they may not have the funds or resources necessary to complete successful applications.

   IRWM grant applications also generally require projects to have significant planning and design work completed so that there is adequate information to complete a successful economic analysis for the grant application. Therefore, project applicants typically must expend their own operating funds and staff resources to prepare projects simply to be eligible for IRWM funding. These pre-project expenditures are a deterrent for small projects, DACs, and economically disadvantaged tribes, because they require allocation of scarce operating funds and technical resources before any commitment to the project is made. Project preparation is therefore a financial risk to the project sponsor, potentially to the point where the project is not submitted for IRWM grant opportunities.

3. Grant Funding Restrictions: The manner in which IRWM funds (specifically Proposition 84 Implementation Grant funding) can be expended is highly restricted. As mentioned above, grantees are required to expend funds that are later reimbursed by DWR. In addition, grantees are required to provide a minimum 25% funding match; while the funding match requirement may be waived for DACs, submitting a DAC funding match waiver adds an additional layer to the application complexity that may present a barrier to DACs in completing a successful application. The IRWM grants themselves have additional restrictions in that certain project components, such as sewer connection fees, may not be covered by the grant. The Proposition 84 Implementation Grant, for example, is not intended to pay for organizational delivery cost, general planning, or pilot testing work required to develop and deliver successful projects. While many IRWM regions, including the CVRWMG, have expressed these grant funding restriction problems to DWR, DWR has not been willing or able to amend the grant requirements. DWR however, continues to require that a certain amount of the IRWM grant funding be used to fund projects that directly benefit DACs.

   DWR restrictions that disproportionately impact DACs in conjunction with requirements that applications include DAC projects put IRWM regions in a very difficult situation similar to an un-funded mandate placed upon local agencies. To be compliant with IRWM grant requirements, IRWM regions must include DAC projects in applications, but because virtually no DAC organization can provide funding or technical work needed for the application and grant implementation process, IRWM regions are in effect mandated to provide this service to ensure that DAC projects are included in the application. In the Coachella Valley this predicament has an additional layer of complexity as many DACs are located outside the service areas of the CVRWMG agencies. Due to funding restrictions on general government in Proposition 13, county agencies and districts are reducing planning staff and funding unless directly paid by a grant, a development applicant, or in response to litigation, meaning that DAC organizations cannot readily receive support from the county agencies within which they lie. Additionally, Proposition 218 modified the State Constitution to require a direct nexus between the services provided and the cost charged by the agency providing the service. Since then, case law has even further restricted use of rate payer funding. Therefore, the CVRWMG agencies may not expend tax proceeds or rate payer funds outside of their service area for the benefit of those who are not rate payers, including DACs in the eastern Coachella Valley. In the Coachella Valley IRWM Region, DACs located outside of the agencies' service areas must rely on what was previously scarce, and is now non-existent, funding from County agencies or provide their own funding and technical resources to receive and successfully use IRWM grant funds.

Section 3 Overcoming Challenges – Recommended Techniques

One of the goals of the DAC Outreach Program was to determine techniques that could potentially be implemented to overcome historic challenges to DAC participation and promote DAC involvement in IRWM planning. Table 1 below provides a summary of the issues explained in Section 2, and a brief description of the techniques that are recommended to potentially overcome each issue. Each of the recommended techniques is described in further detail in Section 3.1 and Section 3.2 below. Items in italics are those activities that the Coachella IRWM Program has implemented to improve DAC participation in the IRWM Program during Proposition 84 Implementation Grant applications and the Plan Update process.

Table 1: Overall Issues and Recommended Techniques

Category	Issue	Sub-Issue	Recommended Technique
General Participation	IRWM Program Complexity	Changing Requirements	• Provide regional transparency to explain why requirements are changing. • DWR respond to comment letters. • DWR heavily support outreach and education to increase statewide knowledge of IRWM.
		Complicated Requirements	• Reduce burdensome requirements of the IRWM Guidelines and allow IRWM regions to complete planning that is of local relevance. • DWR ensure resources necessary to implement the program are available.
	Role of the IRWM Program	Want IRWM Program to "help"/don't believe in change	• Provide continuous long-term transparent information and education about the IRWM Program, what it is, what can be done, and highlight successes, especially in DAC communities. • Utilize organizations that already have strong relationships with DACs to participate in outreach efforts.
	Organizational Shifts and Spatial Coverage		• Use successful entities to develop and mentor organizations in other areas to expand spatial coverage and delivery of water-related projects to DAC areas.
	Persistent resistance to engagement	Cultural beliefs, immigration status, language barriers	• Empower communities with tools to make them successful and expand their capacity. • Recognize and support longer- term engagement with established organizations that have succeeded in navigating outreach difficulties or who are trying to do so. • Co-support/sponsor community forums and existing efforts outside water-related issues to inform and educate the community about water resources and related opportunities to support their needs. • Bring together diverse groups (regulators, land owners, county entities, and residents) to develop projects and improve working relationships.

Category	Issue	Sub-Issue	Recommended Technique
Grant Funding	Grant Funding Delays		• Revise grant funding approach for DAC and rural areas to provide operating and project capital or significantly streamline invoicing and payment to a normal industry payment duration (i.e., 30 days).
	Technical Complexity of IRWM Grants		• Reduce technical and economic analysis requirements, especially for DAC projects, in the application process, potentially requiring only a workplan as the first phase of a project.
	Grant Funding Restrictions		• Modify grant funding restrictions to meet identified DAC needs.

3.1 Recommended Techniques to increase General Participation

Issue: IRWM Program Complexity - Changing Requirements

Recommended Techniques: Provide regional transparency to explain why requirements are changing. DWR respond to comment letters and heavily support outreach and education to increase statewide knowledge of the IRWM Program.

Given the frequency of changes to the IRWM Program (through the IRWM Guidelines) and the IRWM Grant Requirements (through the Proposal Solicitation Packages), a potential technique to increase DAC involvement is for DWR to increase its communication with IRWM regions and conduct outreach to DACs to provide full disclosure and transparency regarding any changes that are anticipated to the IRWM Program or IRWM Grant Requirements. This information should be carried down from DWR to the IRWM regions which can use existing stakeholder communications (meetings, e-mail lists, webpage announcements) to communicate those changes to stakeholders. Increasing transparency will reduce some of the knowledge gaps seen with local stakeholders, who often do not understand why IRWM regions are conducting various planning activities, and will therefore help to reduce the perception that the IRWM Program is overly complex and difficult to understand.

Another technique that can be implemented to increase DAC involvement is responding to comment letters. When new IRWM Program Guidelines or Proposal Solicitation Packages are released, DWR holds public comment periods before finalizing each document. While IRWM regions and stakeholders appreciate the opportunity to provide comments, there is a perception that the comments are not considered by DWR. This perception occurs because DWR does not respond to comment letters and has historically not amended IRWM Program Guidelines or Proposal Solicitation Packages to address concerns. As indicated in this report, there are many concerns with the IRWM Program that are specific to DACs. Issues that are particular to DACs have been expressed to DWR via comment letters from a number of organizations throughout the state and across IRWM regions. Without a DWR response to these comment letters, DAC stakeholders continue to feel as though their concerns are not being considered and that highly necessary changes to the IRWM Program will not occur. Conversely, a DWR response to comment letters would help stakeholders and IRWM regions better understand limitations of the IRWM Program, legislature directives, or other items that may dictate IRWM Program requirements and prevent programmatic flexibility in responding to stakeholder concerns.

Due to the complexity of the IRWM Program and the steep learning curve for stakeholders, ongoing and continuous outreach is necessary to provide information about the IRWM Program, its purpose, limitations, and future activities. DWR should support outreach and education to increase knowledge of IRWM planning and the IRWM Program across the State of California. Further, more support should be provided to IRWM Regions to provide transparency on the IRWM Program to local stakeholders. This outreach and education will raise awareness of the IRWM Program and help to break down some knowledge gaps that may be preventing DAC participation in the IRWM Program.

Issue: IRWM Program Complexity – Complicated Requirements

Recommended Techniques: Reduce burdensome Guideline requirements and allow IRWM regions to complete planning that is of local relevance. DWR to ensure the resources necessary to implement the IRWM Program are available.

To reduce the impediments to DAC participation in the IRWM Program due to the complexity of program requirements, the IRWM Guidelines should be revised with less-complex or fewer requirements and a higher focus on local issues. Allowing IRWM regions to focus on planning efforts that are of local importance will help to increase involvement by all stakeholders, including DACs, who generally have locally-specific issues. In addition, by requiring less stringent requirements, IRWM regions will have the flexibility to choose how to prioritize their efforts and will be able to spend the time and resources necessary to address stakeholder concerns and implement the techniques recommended in this paper to increase DAC involvement in IRWM processes.

More financial support should be provided by DWR to ensure that IRWM regions have the resources necessary to implement the IRWM Program as required by DWR. Given the complexity of the IRWM Program Guidelines, IRWM regions must expend limited resources conducting planning studies while simultaneously implementing extensive outreach to retain stakeholder input and participation. The requirements stipulated by DWR can be expensive to implement, requiring substantial staffing and time commitments by IRWM regions. Therefore, to ensure that IRWM processes are implemented in accordance with the IRWM Guidelines and in a manner that ensures participation by DACs, it would be appropriate for DWR to provide the funding necessary for IRWM regions to meet these requirements.

In the Coachella Valley IRWM Region, the CVRWMG has historically provided DACs with substantial support to overcome complicated requirements associated with the state's IRWM Program. For example, the CVRWMG provided technical assistance to all stakeholders (including DACs) who requested technical support for entering projects into the online project database. These workshops were initiated by the CVRWMG to increase project submittal by all IRWM stakeholders, especially those who may not have otherwise submitted projects without technical support. Similarly, the CVRWMG provided extensive technical support to DACs whose projects were selected for inclusion in the regional Proposition-84 grant applications for work associated with completing economic analyses. Although the CVRWMG would like to carry on the practice of holding technical support workshops and providing technical assistance with completing grant applications in the future, there needs to be recognition of the time and expense required to conduct these items. As indicated in Section 2.2, DWR needs to acknowledge funding limitations of regional agencies and provide additional funding support to carry-out work that is necessary to maintain DAC involvement.

Issue: Role of the IRWM Program - Want IRWM Program to "help"/don't believe in change

Recommended Techniques: Provide continuous long-term transparent information and education about the IRWM Program, especially in economically disadvantaged communities. Utilize organizations that already have strong relationships with DACs to participate in outreach efforts.

The recommended techniques explained above for increasing transparency and participation by DACs regarding the IRWM Program also serves to clarify the role that the IRWM Program can play in addressing DAC issues and implementing DAC projects. Effective outreach will assist in developing realistic expectations of the IRWM Program, including the often lengthy timeframe for projects and funding limitations (see Section 3.2). Increasing communication and transparency will also help improve relationships between DACs and other stakeholders involved in IRWM processes. Improved trust, based on collaboration and open communication, in association with information about the goals and limitations of the IRWM Program will help overcome perception barriers about the IRWM Program's role in participating in DAC issues and needs.

In addition to increasing transparency regarding the IRWM Program through general outreach, another technique that could be implemented to clarify the role of the IRWM Program is to utilize the services of non-profits and other organizations that regularly work with DACs. Given that organizations that serve DACs tend to have trust and established relationships among DAC stakeholders, utilizing such organizations to provide information to DAC stakeholders will increase the likelihood that information about the IRWM Program will be communicated in an effective manner. This specific outreach technique was implemented in the Coachella Valley through the DAC Outreach Program. The technique did result in intended benefits as non-profit partners were able to conduct outreach and gain involvement from new members of DACs and helped the CVRWMG to implement new outreach methods through bilingual translation to increase the effectiveness of communication with DACs.

Issue: Organizational Shifts and Spatial Coverage

Recommended Technique: Use successful entities to develop and mentor organizations in other areas to expand spatial coverage and deliver water-related projects to DAC areas.

Organizational shifts are frequently a result of limited resources and a response to the immediate needs of DACs served by DAC organizations. Because organizational shifts are common for many DAC organizations, those that are successful can be used as a guide and a resource for other organizations to improve longevity and continuity. Leveraging the success of DAC organizations to increase the success of other DAC organizations can help to benefit DAC participation in IRWM planning as increased longevity and continual participation in the IRWM Program is critical to reducing knowledge gaps and understanding the technical complexity of the IRWM Program (see above).

Further, in the Coachella Valley and other areas of the state, DAC issues are often localized and successful DAC organizations may be limited in spatial coverage as they are focused on addressing issues in a single place. In order to expand coverage of DAC issues throughout an

IRWM Region, successful DAC organization models can be replicated to focus on DAC areas and issues that are not provided support by existing organizations. Additional support for those organizations that have proven successful could provide the resources necessary to expand their programs, and in this way serve a larger area and address the needs of more DACs in the IRWM Region.

<u>Issue: Persistent resistance to engagement - cultural beliefs, immigration status, language barriers</u>

Recommended Techniques: Empower communities with tools to make them successful and expand their capacity. Recognize and support longer term engagement with established organizations that have succeeded in navigating the difficulties. Co-support or sponsor community forums and existing efforts outside water-related issues to inform and educate the community about water resources, and related opportunities to support their needs. Bring together diverse groups (regulators, land owners, county entities and residents) to develop projects and improve working relationships.

Culture, immigration status, and language barriers can all contribute to a persistent resistance to engagement in IRWM processes. Building relationships with and empowering DACs, and fostering relationships between DAC organizations will help overcome the barriers to participation. An effort should be made to build knowledge and capacity in DACs, and develop relationships between DACs and other stakeholders in IRWM regions. This can be accomplished by empowering communities with tools to make them successful and expand their capacity, provide support for long-term engagement with organizations with a proven history of success, provide support for community forums, create opportunities to address DAC needs, and foster working relationships between diverse stakeholders. Education and outreach should seek to build knowledge and technical capacity, while financial support or incentives can be used to build to expand DAC capacity in other ways. By showing active interest and support, and connecting DACs with established organizations that have successfully navigated the IRWM processes, or have knowledge of how to navigate other programs that might be able to address DAC needs, will both help DACs participate in the IRWM program and build trust between DWR, the IRWM program, DACs, and other stakeholders. This specific outreach technique was implemented in the Coachella Valley through the DAC Outreach Program. Through the local non-profit partner organizations, outreach surveys were conducted with direct help from members of the community. This effort served to strengthen engagement with members of DACs as well as educate residents about issues and increase coordination among members of DACs.

Further, DWR and individual IRWM regions should take advantage of community forums and other established outreach mechanisms to build relationships with DACs and provide education and outreach on water resource issues and opportunities. DAC community members may not be able to attend multiple meetings per month, quarter, or year, so participation in community meetings will provide an opportunity for IRWM efforts to reach a wider audience compared to hosting individually-sponsored IRWM meetings. Regional IRWM programs can also build trust with DACs by bringing together diverse groups to develop projects and working relationships. As these interactions continue in a supportive environment, relationships and trust will grow between DACs and other groups or agencies, providing opportunities for effective or creative integrated solutions to address DAC-specific and regional issues.

3.2 Recommended Techniques for Grant Funding Issues

Issue: Grant Funding Delays

Recommended Technique: Revise grant funding approach for DAC and rural areas to provide operating and project capital or significantly streamline invoicing and payment to typical industry payment durations (i.e., 30 days).

One of the most significant barriers to addressing DAC needs is a lack of capital to fund project implementation. Lack of existing capital is generally why DACs and DAC organizations seek out grant funding from such programs as the IRWM program, and why DACs are not required to meet the minimum funding match required for other projects. As described above in Section 2, lack of capital funding also delays DAC projects from progressing during implementation and potentially discourages DACs from participating in the IRWM Program. A technique to overcoming this challenge would be for DWR to revise the requirement to reimburse only after work has been paid for or completed, and instead release funds to DACs at an earlier stage in the process. This would provide sufficient capital to keep DAC projects moving forward and encourage DACs to participate in the IRWM Program. If pre-payment prior to expenditures is not possible, reimbursement for DAC projects should be prioritized and invoicing and payments should be streamlined such that repayments from DWR are received in a manner consistent with industry standards (approximately 30 days). This technique, if successfully implemented by DWR on a long-term basis, would provide project sponsors with additional trust in the reliance of receiving timely reimbursements, and could potentially increase DAC involvement in the IRWM Program.

Issue: Technical Complexity of IRWM Grants

Recommended Technique: Reduce technical and economic analysis requirements in the application process, especially for DAC projects, potentially requiring only a workplan as the first phase of a project.

The technical and economic analyses necessary to prepare grant applications for IRWM funding have proven to be a significant obstacle to DAC participation in IRWM programs, and should be re-examined by DWR. Without a guarantee of grant funding, especially in the regions like the Coachella Valley where implementation grants are highly competitive, expending the time and money to prepare grant applications is potentially risky given that those expenditures may not result in the receipt of grant funding. Reducing these technical requirements for DAC projects during the application process would increase the number of DAC projects submitted for inclusion in IRWM funding applications and could potentially increase DAC participation in the IRWM Program. Recognizing that DWR may not be able to completely remove the economic and technical analyses requirements for DAC projects, these analyses could be required as part of the first phase of DAC projects along with the resulting workplan, rather than during the application process.

Issue: Grant Funding Restrictions

Recommended Technique: Modify grant funding restrictions to meet identified DAC needs.

As discussed in Section 2, restrictions on grant funding are found in multiple levels of the IRWM grant process, including project eligibility, the application process, grant administration, and implementation. Each of these restrictions presents impediments to participation in the IRWM Program, and has particular consequences to DAC participation as organizations that represent DACs may have a more difficult time complying with IRWM grant requirements than other organizations.

To increase DAC participation, the IRWM grant restrictions should be modified or eased for all grantees, but especially for DACs. Of particular concern in the Coachella Valley is the issue of providing the technical support necessary to include DAC projects in the IRWM grant application even though a large portion of DAC areas are located outside of the CVRWMG agencies' service areas. In order to overcome this challenge, DWR could provide funding necessary to prepare grant applications for DAC projects or, as discussed above, could substantially reduce requirements for DAC projects.

The other primary concern in the Coachella Valley is grant restrictions that do not allow IRWM funding to readily pay for those services that are most needed for DACs. Projects that connect DACs to municipal services (both water and sewer) are considered a priority for DACs, and also meet the DWR definition of addressing critical water supply or water quality issues for DACs. Despite the importance of these projects, DWR representatives have continually stated that the IRWM grant funding may not pay for portions of these projects such as connection fees. Considering the local funding restrictions associated with Proposition 13 and Proposition 218 (see Section 2), the CVRWMG agencies may not use their ratepayer funds to cover these costs, and therefore may be required to exclude DAC projects from grant applications. To increase the implementation of those projects that would meet critical DAC needs, it is imperative that DWR reduce restrictions associated with IRWM funding for DACs or that DWR provide local funding to DAC projects to cover additional fees that may not be covered by the IRWM grant itself.

Section 4 DAC Outreach Participation

The Coachella Valley has had success with DAC participation in its IRWM Program, but realized early in the IRWM process that additional measures were required to increase DAC participation. As such, the CVRWMG implemented one of the techniques explained in Section 3.1 and contracted with existing DAC organizations to conduct outreach for the IRWM Program. Through this collaboration with local DAC organizations, the CVRWMG was able to implement some of the solutions to DAC participation barriers described above, and found the end result to be, for the most part, highly successful. Section 4.1 explains the process undertaken to contract and work with local DAC organizations to implement IRWM Program outreach. Section 4.2 explains the relative success of the DAC partnership approach implemented by the CVRWMG, and Section 4.3 explains challenges to the approach.

4.1 Approach for Partnering with DAC Organizations

The scope of work for the DAC Outreach Program included contracting with DAC organizations (non-profit organizations) to support the implementation of DAC outreach efforts in the Coachella Valley IRWM Region for three tasks: conducting outreach activities, completing refined DAC mapping, and providing information about DAC participation in the IRWM Program. The process to contract with non-profit organizations that would implement the three aforementioned tasks began in the fall of 2012, and is described in detail below.

The first step for contracting with local non-profit organizations involved an evaluation of the eligible organizations (non-profit organizations) in the Coachella Valley IRWM Region that work with DACs. After completing this evaluation, the CVRWMG sent information to those identified non-profit organizations to let them know about the DAC Outreach Program and the three tasks that needed to be completed. In addition, the CVRWMG announced the non-profit partnering opportunity to all IRWM stakeholders through the existing website (www.cvrwmg.org), through the stakeholder email list, and through flyers that were distributed at IRWM-related meetings and workshops.

Following outreach to eligible and interested organizations throughout the Coachella Valley, six organizations expressed interest in participating in the DAC Outreach Program. Those organizations included: Loma Linda University, Pueblo Unido Community Development Corporation (PUCDC), California Rural Legal Assistance Foundation (CRLAF), Inland Congregations United for Change (ICUC), Desert Alliance for Community Empowerment (DACE), and Poder Popular. Prior to initiating interviews with the interested DAC organizations, the CVRWMG identified specific considerations and criteria that should be used to determine whether or not the organizations would be able to participate in the DAC Outreach Program. The considerations the CVRWMG used to assess DAC organizations include:

- Established history and relationship with DAC areas in the Coachella Valley
- Willingness or desire to participate in the IRWM Program
- Ability to provide technical services required to complete the required tasks
- Ability to complete required tasks on-time, on-budget, and in a professional manner

- Willingness to contract with the CVRWMG through a DWR contract and complete invoicing and deliverables in accordance with DWR requirements

Following the interview process four of these organizations (CRLAF, ICUC, DACE, and Poder Popular) notified the CVRWMG that they would not be able to participate in the DAC Outreach Program to complete the required outreach tasks. Some of the challenges described in Section 2 prevented these organizations from participating, including a lack of personnel or resources, concern with meeting DWR invoicing requirements, and organizational focus shifts.

The two remaining organizations, Loma Linda University and PUCDC were able to provide support on all three required DAC Program Outreach tasks. Despite these organizations' ability to provide the necessary support, the CVRWMG was concerned that the two organizations did not provide full geographic coverage throughout the IRWM Region and that there was a need to locate an additional non-profit partner with existing experience in the western Coachella Valley. Following additional outreach, El Sol Neighborhood Educational Center (El Sol) was identified as an existing organization that had the resources, experience, and interest necessary to participate in the DAC Outreach Program. Following an additional interview process with El Sol, the CVRWMG officially contracted with Loma Linda University, PUCDC, and El Sol.

Through the three DAC organizations, outreach efforts were conducted throughout the spring and summer of 2013, and final deliverables for each task were completed by September 2013. Work completed by the three DAC organizations included public outreach meetings, door-to-door surveys, soliciting feedback on the identified DAC issues, needs, and barriers to participation, providing information on potential projects and project types to address DAC needs, and updated mapping and issues reports based on the outreach meetings and door-to-door surveys. The three DAC organizations will attend and speak at the final DAC Outreach Workshop to present information and findings to DAC stakeholders on November 6, 2013.

4.2 Success of Approach

Part of the CVRWMG's goal in utilizing the DAC organizations for outreach efforts was to determine if working through established organizations with personal connections to DAC areas would increase DAC participation and involvement in the IRWM Program. Outreach efforts demonstrated that the DAC organizations did impart this benefit, because prior to the DAC Outreach Program, few DAC community members (members of the public in DACs) attended any IRWM Program meetings. In contrast, the DAC Outreach Program workshops, held in June, 2013 and co-hosted/sponsored by the DAC organizations, saw over 100 attendees, most of whom were local residents. This outcome demonstrates that the existing trust and relationships these organizations have with the DACs they serve contributed strongly to resident participation in the DAC workshops. Furthermore, services provided by the DAC organizations such as bilingual translation for meeting materials and meeting facilitation are believed to have encouraged additional involvement in the DAC workshops.

The use of Loma Linda University, El Sol, and PUCDC provided multiple benefits to the DAC Outreach Program beyond using their trusted relationships with DACs to increase meeting attendance. Many DAC members speak Spanish and have limited English, especially for some of the more technical components of IRWM planning. Loma Linda University, El Sol, and PUCDC provided translation services at the DAC workshops, for handouts provided at the workshops, and for a variety of outreach materials that were handed out prior to the workshops to advertise the workshops. In addition, the surveys that were conducted by the three organizations throughout the Coachella Valley were conducted bilingually through teams that were comprised of students from Loma Linda University and either promoters (promotores) from El Sol or staff/volunteers gathered by PUCDC. Using the translation services and conducting outreach in both Spanish and English is thought to have provided additional benefits in reaching out to DAC stakeholders as this has allowed the CVRWMG to demonstrate that they understand some of the barriers to DAC participation, and are willing to implement solutions necessary to overcome barriers. The bilingual outreach efforts have also helped start building positive relationships between the CVRWMG and DAC residents by providing a means to have a meaningful conversation about the water needs and issues of DACs in the Region, and allowing DAC residents with the opportunity to express their concerns first-hand rather than through DAC organizations.

Partnerships with the three DAC organizations also enabled the CVRWMG to draw on the existing knowledge of how to work successfully with DACs in the Region. Given that the three organizations have extensive past working relationships with DACs, they were able to identify strategies that have worked for them in the past, and provide input on proposed outreach efforts. For example, the three DAC organizations noted that outreach materials should advertise the availability of child care at meetings, and meetings should be held in the evenings in familiar locations to increase attendance by local residents. In addition, the DAC organizations recommended that bilingual door knob hangers be developed to advertise the workshops and that the hangers should be placed on the doors of those residents who were not home when surveyors came by to conduct surveys and alert residences to the upcoming workshops. This recommended outreach mechanism, which was successfully implemented with translation assistance from the DAC organizations, allowed for broad advertisement of the DAC workshops across the Coachella Valley.

In collaboration with the partner DAC organizations, the DAC Outreach Program has been able to implement some of the outreach techniques identified in Section 3 to improve DAC participation in the IRWM Program. These efforts have been quite successful in the Coachella Valley IRWM Region, as evidenced by the strong turnout at bilingual DAC outreach meetings, development of an expanded, detailed, and refined discussion of DACs and DAC issues and needs in the 2014 Coachella Valley IRWM Plan Volume I, and project development and design for four DAC projects that may be submitted for consideration during the next round of IRWM funding. As a result of these efforts, the Coachella Valley IRWM Program was able to build or strengthen trust and relationships between the CVRWMG and DAC residents.

4.3 Challenges to Approach

Though the approach taken by the DAC Outreach Program proved successful in many ways, it was not implemented without challenges. As mentioned in Section 4.1, four of the DAC organizations that were interviewed did not end up participating as partners in the DAC Outreach Program. The Coachella Valley DAC Outreach Program was not designed to address internal instability and staff changes in its potential partner organizations, which contributed to the choice to opt-out of the program by several of the organizations. The formal contracting process also presented a challenge to formalizing partnerships with the DAC organizations. Though this challenge was ultimately overcome for the three DAC organizations that became partners, the contracting process took longer than initially anticipated and delayed initial project work while contracting was formalized. Some of the DAC organizations were not be accustomed to the requirements of the IRWM Program as administered by DWR, and had difficulty in submitting DWR-compliant invoices for completed work. Similar to how DACs have expressed concerns with grant contracting required for Proposition 84 Implementation Grants, DWR contracting for the DAC Outreach Program demonstrated that even with substantial time and effort, contracting and invoicing compliant with DWR standards proves to be an issue for DAC organizations.

The DAC organizations that participated in the IRWM Program also experienced difficulties in completing and submitting final deliverables in a timely fashion. Due to time and staffing constraints, deliverables were submitted by some of the organizations months later than expected, even after substantial support from the DAC Outreach Program and the CVRWMG. Further, some of the submitted deliverables were not of a quality or format appropriate for public release, requiring additional time and effort to revise and fine-tune reports and other deliverables prior to submittal to DWR and the public.

In the Coachella Valley, the organizations involved in the DAC Outreach Program were able to work well together and supported each other. Their contributions complemented one another, which further contributed to the success of the Coachella Valley DAC outreach approach. However, this may not always be the case for other regions, or if other organizations had been involved. Therefore the existing relationships between potential organizations should be considered if using this approach to DAC outreach and participation in other IRWM regions or in other efforts in the Coachella Valley. This approach can provide a means of bringing DAC organizations together and helping to exchange knowledge about successfully working with DACs (addressing the spatial coverage challenge), but may exacerbate existing conflicts between DAC organizations in some regions. If a region has extreme conflict between DAC organizations, this approach may not be appropriate.

Section 5 Next Steps

The biggest challenge facing DAC participation is how to continue engaging DACs in the IRWM Program and how to build upon the success of the DAC Outreach Program in the future. General participation in the Coachella Valley IRWM Program has historically diminished between Program milestones (e.g., IRWM Plan preparation, grant applications). Diminished participation can make it necessary to re-educate stakeholders prior to the initiation of each new milestone, which is a more extensive task than continuing outreach and education on an ongoing basis. While ongoing outreach is time consuming and expensive, continued engagement with DACs can provide value by reducing the extent of outreach necessary to engage stakeholders. If DAC outreach is continued in the Coachella Valley, additional outreach will build on the relationships initiated through the DAC Outreach Program, and position DACs for increased participation in future IRWM Program milestones. However, there are no funding mechanisms currently in place to support continued efforts to engage DACs. In addition, for reasons explained above in Section 2.2 the CVRWMG agencies cannot readily fund these activities, especially in the East Valley, because the DACs in those areas are not located within the agencies' service areas. Additionally, even with ongoing outreach, past experience in the Coachella Valley suggests that without an immediate opportunity for a real change (such as providing input on regional priorities in the IRWM Plan or obtaining funding for a project that would address a DAC need), DACs are not likely to commit their scarce resources to IRWM Program participation. Therefore, as the 2014 Coachella Valley IRWM Plan Volume I is completed and associated outreach efforts are finalized, there will not be funding or an IRWM Program milestone to continue DAC engagement and involvement in the IRWM Program until the next round (Round 3) of Implementation Grant funding is initiated.

During the Proposition 84 Round 2 Implementation Grant project solicitation and selection process, the CVRWMG held trainings for DACs on how to input projects into the project database and provided information in multiple venues about what attributes and components would make projects potentially successful for IRWM (Proposition 84) funding. This outreach increased the number of DAC projects submitted to the Coachella Valley IRWM project database, and resulted in the inclusion of three projects that would directly address critical water quality or water supply needs of DACs in the Region's grant application. Given the success of DAC outreach efforts during past IRWM grant application processes, it would be ideal for the upcoming Round 3 funding opportunity to be accompanied by DAC outreach efforts. However, as explained previously, there is no current funding mechanism to provide future outreach to DACs, including during the project solicitation and selection process.

Given that the next round (Round 3) of IRWM Grant funding is the next major IRWM Program milestone after completion of the 2014 Coachella Valley IRWM Plan Volume I, the first priority for a next step to continuing DAC Outreach in the Coachella Valley IRWM Program is to identify mechanisms for funding grant-related outreach efforts to DACs.

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Appendix VII-E: Disadvantaged Community Workshop Materials

This appendix includes bilingual meeting handouts and agendas from the two Disadvantaged Communities Outreach Public Workshops held in June 2013.

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Coachella Valley Integrated Regional Water Management Program (IRWMP)

Programa de Alcance para Comunidades en Desventaja (DAC)
Taller de Agua Comunitaria – Este del Valle de Coachella

Martes, 18 de Junio del 2013
5:00 p.m. – 7:00 p.m.

San Jose Community and Learning Center
69455 Pierce Street
Thermal, CA 92274

AGENDA

Orden del Día:

1. Bienvenida e Introducciones

2. Antecedentes y Propósito del Programa de Alcance DAC

3. DAC Estrategias del Mapeo y Proceso de Encuestas

4. Ejercicio Mapeo Comunitario

6. Preguntas y Comentarios

7. Próximos pasos

Junta de planeación IRWM para el Valle de Coachella:
12 de Septiembre del 2013

El sitio web del Valle de Coachella IRWMP:
www.cvrwmg.org

Coachella Valley Integrated Regional Water Management Program (IRWMP)

Coachella Valley Disadvantaged Community (DAC) Outreach Program
Community Water Workshop – Eastern Coachella Valley

Tuesday June 18th, 2013
5:00 p.m. – 7:00 p.m.

San Jose Community and Learning Center
69455 Pierce Street
Thermal, CA 92274

AGENDA

Agenda:

1. Welcome and Introductions
2. Background and Purpose of DAC Outreach Project
3. DAC Mapping and Surveying Approach
4. Community Mapping Exercise
5. Questions and Comments
6. Next Steps

Coachella Valley IRWM Planning Partners Meeting:
September 12, 2013

Coachella Valley IRWM website:
www.cvrwmg.org

Coachella Valley Integrated Regional Water Management Program (IRWMP)

Programa de Alcance para Comunidades en Desventaja (DAC)
Taller de Agua Comunitaria –Oeste del Valle de Coachella

Jueves, 20 de Junio del 2013
5:00 p.m. – 7:00 p.m.

DHS Family Resource Center
14201 Palm Drive, Suite 108
Desert Hot Springs, CA 92240

AGENDA

Orden del Día:

1. Bienvenida e Introducciones

2. Antecedentes y Propósito del Programa de Alcance DAC

3. DAC Estrategias del Mapeo y Proceso de Encuestas

4. Ejercicio Mapeo Comunitario

6. Preguntas y Comentarios

7. Próximos pasos

Junta de planeación IRWM para el Valle de Coachella:
12 de Septiembre del 2013

El sitio web del Valle de Coachella IRWMP:
www.cvrwmg.org

Coachella Valley Integrated Regional Water Management Program (IRWMP)

Coachella Valley Disadvantaged Community (DAC) Outreach Program

Community Water Workshop – Western Coachella Valley

Thursday June 20th, 2013
5:00 p.m. – 7:00 p.m.

DHS Family Resource Center
14201 Palm Drive, Suite 108
Desert Hot Springs, CA 92240

AGENDA

Agenda:

1. Welcome and Introductions
2. Background and Purpose of DAC Outreach Project
3. DAC Mapping and Surveying Approach
4. Community Mapping Exercise
5. Project Development Exercise
6. Questions and Comments
7. Next Steps

Coachella Valley IRWM Planning Partners Meeting:
September 12, 2013

Coachella Valley IRWM website:
www.cvrwmg.org

Lista Preliminar de Proyectos a Implementar en el Valle de Coachella
Programa de IRWM para el Valle de Coachella
Taller informativo brindado por Comunidades en Desventaja (DAC)

1. **Proyecto de Tratamiento de Aguas Subterráneas:** Este proyecto ha sido propuesto para desarrollar un sistema listo-para-proceder el cual trata en el sitio los problemas de calidad de agua potable subterráneas.

Adonde: Porfavor *déjenos saber cualquier ubicación (sea lo más específico posible), donde puede llevarse a cabo dicho proyecto.*

- ______________________________
- ______________________________
- ______________________________

Quien: *Por favor déjenos saber si usted tiene conocimiento de alguien que esté interesado en implementar o participar en este proyecto.*

- ______________________________
- ______________________________
- ______________________________

2. **Rehabilitación del sistema séptico o Proyecto de Reemplazo:** Este proyecto ha sido propuesto para desarrollar un sistema listo-para-proceder, el cual tratara problemas relacionados con fallos o fugas en los sistemas sépticos.

Adonde: Por favor *déjenos saber cualquier ubicación (sea lo más específico posible), donde puede llevarse a cabo dicho proyecto.*

- ______________________________
- ______________________________
- ______________________________

Quien: *Por favor déjenos saber si usted tiene conocimiento de alguien que esté interesado en implementar o participar en este proyecto.*

- ______________________________
- ______________________________
- ______________________________

3. **Coordinación de Control de Inundaciones**: Un proyecto propuesto para reconocer lugares de inundación y desarrollar ingeniería para resolver los problemas de inundación.

Adonde: Por favo*r déjenos saber cualquier ubicación (sea lo más específico posible), donde puede llevarse a cabo dicho proyecto.*

- ______________________________
- ______________________________
- ______________________________

Quien: Por *favor déjenos saber si usted tiene conocimiento de alguien que esté interesado en implementar o participar en este proyecto.*

- ______________________________
- ______________________________
- ______________________________

Otros: Por favor proporcione cualquier otra información sobre ideas de proyectos potenciales que pueden ser implementadas para resolver los problemas relacionados con el agua en el Valle de Coachella.

Preliminary List of Disadvantaged Community (DAC) Implementation Projects Coachella Valley IRWM Program *DAC Workshop Information Form*	
1. **Onsite Groundwater Treatment Project:** A proposed project to develop ready-to-proceed onsite treatment systems to address localized groundwater quality issues for drinking water purposes. **Where:** *Please let us know any locations (be as specific as possible) where this project may be implemented.* • ______________________ • ______________________ • ______________________ **Who:** *Please let us know if you are aware of any parties that may be interested in implementing or participating in this project.* • ______________________ • ______________________ • ______________________	2. **Septic System Rehabilitation or Replacement Project:** A proposed project to develop a ready-to-proceed septic system rehabilitation or replacement program to address issues associated with failing or leaking septic systems. **Where:** *Please let us know any locations (be as specific as possible) where this project may be implemented.* • ______________________ • ______________________ • ______________________ **Who:** *Please let us know if you are aware of any parties that may be interested in implementing or participating in this project.* • ______________________ • ______________________ • ______________________
3. **Flood Control Coordination:** A proposed project to clarify flood locations and develop concept-level engineering to resolve flooding issues. **Where:** *Please let us know any locations (be as specific as possible) where this project may be implemented.* • ______________________ • ______________________ • ______________________ **Who:** *Please let us know if you are aware of any parties that may be interested in implementing or participating in this project.* • ______________________ • ______________________ • ______________________	**OTHER:** Please provide any other information regarding potential project concepts that may be implemented to resolve water-related issues in the Coachella Valley.

Appendix VII-F: Disadvantaged Communities Project 1 – Educational Materials

This appendix includes the educational materials developed through the DAC Outreach Program's Project 1.

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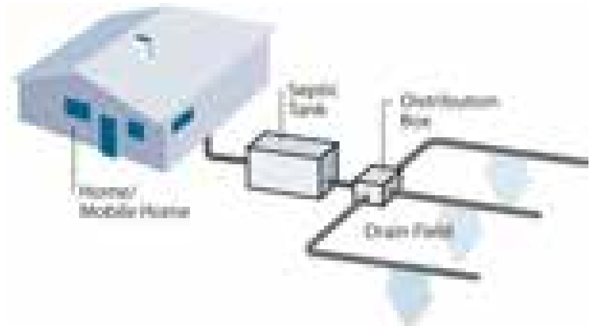
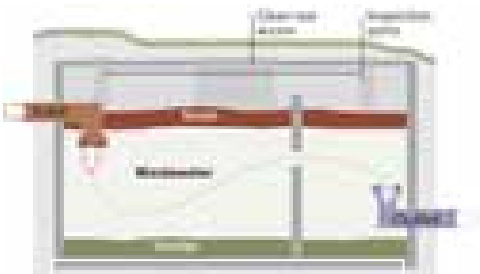
Basic Water and Wastewater Information for the Coachella Valley

How Septic Systems Work

There are two main parts to the basic septic system: the septic tank and the drainfield.



Water and waste from your house flows directly in to your septic tank. In the tank, heavy solids settle to the bottom forming a sludge layer and grease and light solids float to the top forming a scum layer. The sludge and scum remain in the tank where naturally occurring bacteria work to break them down.



Septic Tank

The separated wastewater in the middle layer of the tank is pushed out into the drainfield (leach field) as more wastewater enters the septic tank from the house.

Drainfields continue treatment of the wastewater by allowing it to trickle from a series of pipes with holes through a layer of gravel, and down through the soil. The soil acts as a natural filter and contains organisms that help treat the waste. If wastewater moves through a septic tank to quickly, solids can be carried with it to the drainfield and clog the small holes in the pipes and the surrounding gravel. This can lead to surfacing of water and waste or the risk of contaminating groundwater.

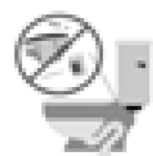
Ways to ensure your septic system runs properly include:

- Space out activities that use a lot of water, like laundry, over several days
- Do not use garbage disposals
- Do not use septic tank additives or commercial septic tank cleaners etc.
- Inspections by a professional every 3-5 years and pumped as recommended
- Keep roof drains and surface water away from the drainfield
- Maintain your plumbing to eliminate leaks
- Conserve water by using less water in the bathtub and take 3 minute showers
- Run full loads of clothes and dishwashers
- Install high-efficiency shower heads and low-flow toilets
- Turn off faucets while shaving or brushing teeth

How to Address Water Quality

Many water quality problems are caused by old or substandard piping or fixtures, low pressure or damage, often causing rust or water with an odor. These issues are not a problem with the water as much as the piping and fixtures and often a qualified plumber can assist with an initial assessment.

Items that cannot go down the drain or toilet:



- Food scraps
- Coffee Grounds
- Cigarette butts
- Oil/waste oil
- Cotton swabs
- Cat litter
- Diapers
- Dental Floss
- Condoms
- Tampons or pads
- Paper towels
- Flushable wipes
- Prescriptions
- Medications
- Pesticides
- Hazardous waste
- Paints, Varnishes
- Thinners

If you think you have water quality issues beyond plumbing, it is important to know where your water is coming from so you know who to contact for assistance.

- ***Municipal (Public) Water Service*** is provided by the city or water district in your area. These systems are highly regulated and required to perform testing in order to meet high water quality standards. They provide clean drinking water at economical prices, avoiding the need for expensive bottled water.

- ***Small Systems*** are those with 5 to 14 connections that are regulated by the County of Riverside. Small systems may have their drinking water come from wells in a given area but serve a small community such as a mobile home park. County Environmental Health can assist you if believe your system is not providing water that meets the standards.

- ***Individual Wells*** that have less than 5 connections and serve less than 25 people are for the most part unregulated and not required to perform frequent water quality testing. If you obtain water from your own well or from one of these systems, you can have a laboratory or Coachella Valley Water District test your water for a nominal fee.

Other Issues and Code Enforcement

Many other issues and problems are indirectly related to water and wastewater problems and impact the quality of life and health and safety of Coachella Valley residents. IVAN Coachella, (http://ivan-coachella.org/) is a web and smart phone App-based environmental reporting tool for the Coachella Valley that allows residents, groups and agencies to report environmental problems and related information. Government agencies monitor the network and assist in problem solving. Table 2 provides a reference to assist with related issues and problems.

Table 2: Need Help - Who to Call

Issue or Problem	Agency or District to Contact	Phone Number
Septic systems, water system permitting, well evaluation, water sampling/testing, hazardous materials/waste, vector control	Riverside County, Department of Environmental Health	(888) 722-4234
Dangerous electrical, substandard mobile homes/structures, illegal dumping	Riverside County, Code Enforcement	(951) 955-2004
Mobile home development standards	Riverside County, Economic Development Agency	(951) 955-8916
Flood control	Riverside County, Flood Control or Coachella Valley Water District	(951) 955-1200 (760) 391-9600
Water issues for Municipal Service Water and waste water issues	Coachella Valley Water District Desert Water Agency Mission Springs Water District City of Coachella/Coachella Water Authority City of Coachella/Coachella Sanitation District City of Indio/Indio Water Authority City of Indio/Valley Sanitary District Myoma Dunes Mutual Water Company Salton Community Services District Or call your city	(760) 391-9600 (760) 323-4971 (760) 329-6448 (760) 398-3502 (760) 391-5008 (760) 391-4038 (760) 347-2356 (760) 772-1967 (760) 394-4446
Stray cats and dogs	Riverside County Department of Animal Services	(951) 358-7387
Street paving and improvements in an incorporated city	Your city department	

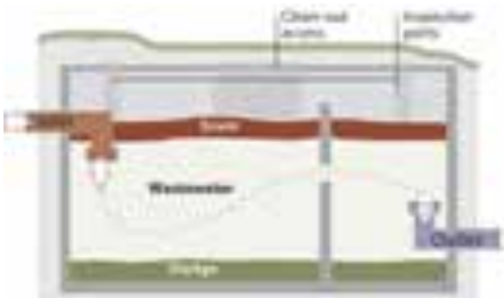
This document was developed for the Disadvantaged Communities in the Coachella Valley and was funded by California Department of Water Resources, Disadvantaged Community Outreach Demonstration Program for the Coachella Valley.

Información para el Valle de Coachella:
Servicios Básicos de Agua y Aguas Residuales

¿Cómo Funcionan los Sistemas Sépticos?

Hay dos partes principales para el sistema séptico: el tanque séptico y el campo de filtración.

El agua y los residuos de su casa fluyen directamente de su fosa séptica. En la fosa séptica, los sólidos pesados se hunden en la parte inferior formando una capa lodosa de grasa y en la parte superior los líquidos forman una capa pequeña de agua y espuma. Las bacterias naturales que están presentes en la fosa séptica trabajan para descomponer el lodo y la espuma.



Las aguas residuales que están entre la capa inferior y la capa superior fluyen de la fosa séptica al campo de filtración cuando las aguas residuales de la casa entran en la fosa séptica.

El campo de filtración continúa con el tratamiento de las aguas residuales a través de filtración en la tierra. El campo de filtración consiste en una serie de tuberías con agujeros pequeños, y el agua de la fosa séptica fluye a través de los tubos hacia la tierra. La tierra actúa como un filtro natural y contiene organismos que ayudan a tratar los residuos en el agua.

Si las aguas residuales se mueven a través de la fosa séptica rápidamente, en vez de quedarse en la fosa séptica los sólidos de las aguas residuales fluyen al campo de filtración. Los sólidos pueden obstruir los pequeños agujeros en las tuberías. Como consecuencia de la obstrucción, las aguas residuales pueden romper la superficie o causar el riesgo de contaminar las aguas subterráneas.

Formas de Garantizar que su Sistema Séptico Funcione Correctamente:

- No hacer actividades que consuman gran cantidad de agua (como lavar la ropa y duchase) al mismo tiempo
- Realizar inspecciones por un profesional cada 3-5 años, y bombear como es recomendado
- No utilizar aditivos para fosas sépticas o limpiadores comerciales para las fosas sépticas
- Dar mantenimiento a los drenajes de la casa y las aguas de superficie del campo de filtración
- No utilizar trituradores de basura
- Dar mantenimiento regular a las tuberías para eliminar fugas
- Efectuar cargas completas de ropa en su lavadora y vajilla en su lava platos
- Instalar una regadera eficiente en su baño y no llene tanto de tanque del inodoro
- Cerrar la llave del lavamanos mientras se afeita o se lava los dientes
- Conservar el agua usando menos agua en la bañera y tomar duchas de 3 minutos

Los elementos que no pueden ir por el desagüe o el inodoro:

- Restos de comida
- Granos de Café
- Colillas de Cigarro
- Aceite y Residuos
- Hisopos de Algodón
- Piedras Sanitarias para Gatos
- Pañales
- Hilo Dental
- Preservativos
- Tampones o Toallas Higiénicas
- Papel Desechable
- Medicamentos
- Pesticidas
- Residuos Peligrosos
- Pinturas o Diluyente de Pintura

Cómo Resolver la Calidad del Agua

Muchos problemas de la calidad del agua son causados porque hay tuberías dañadas, viejas, o de calidad inferior, que resultan en presión baja, óxido, o un mal olor en el agua. Estos problemas son resultado de las tuberías o instalaciones y generalmente no son un problema de la calidad del agua misma. Si usted piensa que tiene problemas con la calidad del agua más allá de la plomería, es importante conocer el origen de donde proviene el agua y pedir ayuda.

- ***Servicio de Agua Municipal (Público)*** es proporcionado por la ciudad o el distrito del agua en su área. Estos sistemas están regulados y están obligados a realizar pruebas con el fin de cumplir con los estándares más altos de calidad del agua. Estos sistemas proporcionan agua potable a precios económicos, evitando la necesidad de comprar botellas de agua que son caras.
- ***Sistemas Pequeños*** son los que tienen de 5 a 14 conexiones que están regulados por el Condado de Riverside. Los sistemas pequeños pueden tener el agua potable que provienen de pozos en un área determinada, pueden servir a una comunidad pequeña como un parque de casas móviles. El Departamento de Salud Ambiental del Condado puede ayudarle si cree que su sistema no está proporcionando agua que cumpla con los estándares de calidad.
- ***Pozos Individuales*** que tienen menos de 5 conexiones y dar servicio a menos de 25 personas. En general los pozos individuales no tienen regulaciones y no es necesario realizar las pruebas de calidad del agua con frecuencia. Si obtiene el agua de su propio pozo o de uno de estos sistemas individuales, puede tener una prueba de su agua de un laboratorio o del Distrito del Agua del Valle de Coachella por un precio significativo.

Otros Problemas y la Aplicación del Código Municipal o de Condados

Algunos otros asuntos o problemas están indirectamente relacionados con el agua, incluyendo los problemas de aguas residuales que afectan la calidad de la vida, la salud, y la seguridad de los residentes del Valle de Coachella. IVAN Coachella, (http://ivan-coachella.org/) es una aplicación del teléfono inteligente/smart y una herramienta de información ambiental para el Valle de Coachella que permite a los residentes, grupos, y agencias que informen problemas ambientales y ofrecer información relacionada al problema. Las agencias gubernamentales supervisan la red y ayudan a dar soluciones. La Tabla 1 proporciona referencias que ayudan con estas situaciones.

Tabla 1: A Quién Llamar si Necesita Ayuda

Asunto o Problema	**Agencia o Distrito de Contacto**	**Número de Teléfono**
Las fosas sépticas, permisos del sistema de agua, toma de pruebas de agua, materiales peligrosos, control de vectores	Condado de Riverside, Departamento de Salud Ambiental	(888) 722-4234
Peligros eléctricos, casas/estructuras móviles deficientes, vertidos ilegales	Condado de Riverside, aplicación del Código	(951) 955-2004
Estándares para el desarrollo de casas móviles	Condado de Riverside, Agencia de Desarrollo Económico	(951) 955-8916
Control de inundaciones	Condado de Riverside, Control de Inundaciones o el Distrito de Agua del Valle de Coachella	(951) 955-1200 (760) 391-9600
Problemas del agua para el Servicio Municipal de Agua y cuestiones de aguas residuales	Distrito de Agua del Valle de Coachella Agencia del Agua del Desierto Distrito de Agua en Mission Springs Ciudad de Coachella/Autoridad de Agua en Coachella Ciudad de Coachella/Distrito Sanitación de Coachella Ciudad de Indio/ Autoridad de Agua en Indio Ciudad de Indio/ Distrito Sanitario del Valle Myoma Dunes Compañía del Agua mutua Servicios Comunitarios del Distrito de Salton O llame a su ciudad	(760) 391-9600 (760) 323-4971 (760) 329-6448 (760) 398-3502 (760) 391-5008 (760) 391-4038 (760) 347-2356 (760) 772-1967 (760) 394-4446
Gatos y perros callejeros	Condado de Riverside, Departamento de Servicios de Animales	(951) 358-7387
Pavimentación de calles y mejoras (Ciudad)	Su departamento de la ciudad	

Este documento fue desarrollado por las Comunidades en desventaja en el Valle de Coachella y fue financiado por el Departamento de Recursos Hídricos, Programa de recursos económicos para la Demostración de Alcance Comunitario en el Valle de Coachella.

Appendix VII-G: Public Utility Connection Opportunities in Disadvantaged Communities

This appendix includes a technical memorandum about potential connection opportunities for DACs to connect to municipal water and wastewater systems. This technical memorandum was developed through the DAC Outreach Program's Project 2.

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Coachella Valley Integrated Regional Water Management Program

Disadvantaged Community Outreach Demonstration Project

Public Utility Connection Opportunities in Disadvantaged Communities

Final Report

Prepared by:

RMC Water and Environment

February 2014

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Appendices

This technical memorandum (TM) provides a summary of the analysis conducted to evaluate the feasibility of connecting disadvantaged communities (DACs) to existing public water and wastewater systems. This TM presents the results of that analysis and recommendations to the Coachella Valley Regional Water Management Group (CVRWMG) as part of its Disadvantaged Community (DAC) Outreach Demonstration Program. Specifically, this TM assesses the challenges of connecting each DAC to the nearest public water distribution system pipeline and/or wastewater collection system.

1 Project Background and Purpose

The Coachella Valley Water District, representing the CVRWMG, has entered into a contract with the Department of Water Resources (DWR) to develop the Disadvantaged Community Outreach Demonstration Program (DAC Outreach Program) for the Coachella Valley Integrated Regional Water Management (IRWM) Region (Region). The goal of the DAC Outreach Program is to develop and implement methods to improve DAC participation in the overall Coachella Valley IRWM planning process. The DAC Outreach Program identified potential project concepts that could be implemented to directly benefit DACs and resolve high-priority water-related issues in DACs. To move the project concepts forward, the DAC Outreach Program scope included additional work to develop in-depth mapping and assessment as needed to address identified needs. Through a series of public workshops in 2013, the Region's stakeholders identified a need to conduct more detailed evaluation of where mobile home park sites in DACs may be located within proximity of municipal water and sewer services, and could therefore be connected in a cost-effective way. This TM presents the results of that analysis, using the data made available by IRWM stakeholders.

The CVRWMG is composed of five Coachella Valley water purveyors: Coachella Water Authority (CWA), Mission Springs Water District (MSWD), Coachella Valley Water District (CVWD), Desert Water Agency (DWA), and Indio Water Authority (IWA). Each of these water agencies have DACs within their jurisdiction that may or may not be connected to the public water distribution system. Those DACs that are not connected typically rely on groundwater from private wells. Similarly, DACs not connected to the centralized wastewater collection system typically rely on the use of onsite wastewater treatment systems (OWTS or septic systems). Evaluated herein are the DACs located within or adjacent to the wastewater jurisdictional areas served by Coachella Sanitary District (CSD), CVWD, DWA, MSWD, and Valley Sanitary District (VSD). The wastewater jurisdictional areas served by the City of Palm Springs were also included within this analysis.

DACs are sometimes composed of mobile home park (MHP) dwelling units or some form of unpermitted housing. Many DACs are not within urban areas; the remote location of DACs can make connecting these communities to public systems even more difficult. The goal of the DAC Outreach Demonstration Program is to understand the water supply and wastewater management issues within the region's DACs and find as many opportunities as possible to provide DACs with a safer and more reliable water supply and wastewater disposal means. While this study aims to find the most feasible MHP sites for connecting to public water and wastewater systems, from a civil engineering standpoint, this does not necessarily mean that homeowners or landlords at those sites will agree to the connection. Additional factors, such as cost of connection, changes in water quality, and community impact, will play an important role in the homeowners' or landlords' final decision regarding whether or not to connect to the public system. An evaluation of these factors is beyond the scope of this project.

2 Methodology

The following summarizes the methodology used in assessing the feasibility of connecting a DAC to a public water system and/or wastewater collection system:

- Collect geocoded data of DACs within the Coachella Valley Groundwater Basin and within the Coachella Valley IRWM Region;

- Assemble a Geographic Information Systems (GIS) map containing water and wastewater infrastructure data from CVRWMG members;
- Map DAC locations and determine for each DAC:
  - The location of the nearest existing water and wastewater infrastructure for connection
  - Length of pipeline required for that connection
  - Any easily observable challenges to the connection (based on aerial imagery review)
  - The possibility of connecting additional, non-geocoded, mobile home parks to the proposed pipeline alignment
- Summarize results and make recommendations for next steps.

2.1 DAC Data

Data regarding the DACs were provided by Dr. Ryan Sinclair of the Loma Linda University School of Public Health. Dr. Sinclair's research team surveyed DACs within the IRWM Region and recorded self-reported information from residents such as address, number of household members, and the perceived source of tap water and perceived wastewater treatment service provided to each residence. The self-reported opinion data collected through the survey were then provided to RMC Water and Environment for use in this analysis.

It is important to note that data available are opinions reported by DACs, were not verified, and were not consistent across all DAC sites due to varying knowledge and information regarding the DACs utility connections and services as noted by each interview subject.

2.1.1 Data Processing

The DAC survey data contained opinion-based information for 320 different households. Some of these households are located within the same community (DAC), but all households within that DAC were not necessarily interviewed as part of the survey. For example, a mobile home park with 15 households may be represented by only two DAC data points—possibly with the same address information but also possibly with slightly different address information.

The DAC address information was reviewed and corrected for errors by Ryan Sinclair's team in order to get the address field formatted as best possible to enable geocoding[1]. ArcGIS, a geospatial information software program, was used to geocode each of the addresses within DAC database. The unmapped locations may have failed to geocode because of data entry errors in the address fields or the inability of the software to find some of the rural or unpermitted locations.

2.1.2 Water and Wastewater Utility Information

GIS data were requested from the water and wastewater agencies serving the Coachella Valley in order to accurately place utility infrastructure information within the GIS maps. GIS-formatted data were received from CVWD, IWA, VSD, and MSWD. These data covered the jurisdiction of all of the agencies involved in this study. The agencies noted that some aspects of the utility information may not have been as up-to-date as their existing network.

DWA, CWA, and CSD did not have utility information in GIS format, but were able to provide it in Computer-Aided Design (CAD) format. The CAD information from CWA and CSD was imported into the GIS software with no issues. However, there were some issues with the import of CAD information from DWA, including:

[1] Geocoding involves processing a text field containing address information through a database of mapping data which includes counties, states, streets, etc. The quality and accuracy of the geocoding is dependent on both the quality of address data and the quality of the georeferencing database used to map the address data.

- The CAD files did not have a spatial coordinates system attached.
- The utilities did not scale correctly when projected into the map's coordinate system.
- The map was not oriented to north.

For these reasons, the converted DWA GIS infrastructure data for water and wastewater utilities are not considered reliable for future *detailed* analysis in other studies; however, the data was modified to a degree sufficient enough to allow for an analysis that was appropriate for this level of effort.

Neither GIS data nor CAD data regarding utility infrastructure was received from the City of Palm Springs.

2.2 DAC Site Review

Each mapped DAC site was reviewed with an aerial image background to evaluate the potential pipeline alignments that would connect a DAC to an existing water or wastewater main. As described in Section 2.1 above, the information that was the basis of this analysis (whether or not specific DACs are connected to municipal water or wastewater services) was based on self-reported opinions from the survey conducted by Dr. Ryan Sinclair. As described in detail below, a process was undertaken to verify if the DACs included in this study are connected to municipal services.

Review of aerial imagery allowed for additional assessments of the DACs, some of which determined that the community may have a utility main immediately near the property but may lack a customer service connection to the site. Based on the site review, each DAC site was then assigned to a category characterizing its utility connection status; these categories were "Main Immediate", "High Feasibility Connection", "Medium Feasibility Connection" or "Low Feasibility Connection". In some cases, information about the DAC utility status was unclear. For example, the source of the potable water supply was not completely clear, or if the DAC was, in fact, connected to a public utility and who owned that public utility (i.e. CVWD or Salton Community Services District). For these sites, the site was assigned to a "Need Additional Data" category under the anticipated lead agency.

The following examples summarize some of the assessments attributed to DACs which contributed to the data evaluation process and the final results.

2.2.1 DACs Near the Public Utility System

Many of the sites evaluated showed DACs (represented by a green stars in the figure below) in an area immediately adjacent to existing water mains (represented by blue lines) or wastewater mains (not shown in the example figures below), or surrounding sites with water and/or wastewater main connections. For these DAC sites, it was often determined that the site is either not connected to the public water and/or wastewater system or is connected to a municipal system through a master meter. These sites were classified as "Main Immediate" and were deemed to either have no service connection despite the ability to easily connect to the public system or to already be connected via a master meter, in which case additional follow-up work with the applicable agency is required. As the IRWM outreach project does not provide for service connections, these sites, once their connection status is confirmed, will be removed from the connection feasibility list. **Figure 2-1** below illustrates an example of a site where the "Main Immediate" determination was made, resulting in the site being placed on a "Main Immediate" list for review and confirmation by the agency responsible for the main.

Figure 2-1: Example of DAC Classified as "Main Immediate"

Footnote: Main Immediate sites represented by green stars.

2.2.2 High Feasibility Connection Sites

DAC sites that could be relatively easily connected to a public water or sewer system and which have a public water or wastewater main within 0.25 miles of the entrance to the property were classified as a *High Feasibility* connection site. All feasibility classifications only considered the distance of pipeline involved for site connection and did not take into account other possible engineering, permitting or legal challenges such as highway crossings, creek crossings, easement issues, or on-site service piping. **Figure 2-2** below illustrates an example of a site with a commercial property across the street and a potable water line approximately 700 feet northeast of the property entrance.

Figure 2-2: Example of High Feasibility for Connection Site

Footnote: High Feasibility sites represented by green circles.

2.2.3 Medium and Low Feasibility Connection Sites

DAC sites that are further away from existing public water or wastewater mains were identified as medium feasibility and low feasibility sites. Typically, a site requiring between 0.25 miles and 0.5 miles of pipeline would be considered a *Medium Feasibility* site**,** and sites further than 0.5 miles would be considered *Low Feasibility* sites. **Figure 2-3** and

Figure 2-4, below, show examples of these two types of sites.

Figure 2-3: Example of Medium Feasibility Connection Site

Footnote: Medium feasibility sites represented by orange triangles.

Figure 2-4: Example of Low Feasibility Connection Site

Footnote: Low feasibility sites represented by red squares.

2.2.4 Grouping Multiple Sites under One Pipeline Project

In some cases, multiple mobile park sites were clustered close together such that multiple sites could be served by a single pipeline extension project. For these cases, a single pipeline project was assumed even if it required, for example, an additional 500 feet of pipe extension to reach an additional DAC.

In **Figure 2-5**, below, a single pipeline would be extended (represented as a red, dashed line) to the DACs to the far west. The pipe extension would allow for water service to two different DACs.

Figure 2-5: Example of Grouped DACs for Singular Pipeline Project

In general, for clusters of sites that were more than one mile from an existing utility line, a single project would be conceived to connect the multiple clusters if it could be done with minimal pipe branching. If significant pipe branching would be required, or if the downstream clusters were several miles away from a preceding cluster, then multiple projects would be utilized to address the various sites.

2.3 Pipeline Assumptions

2.3.1 Pipeline Alignment

After the DAC site review process, each site assigned to a high, medium, and low feasibility category for connection was reviewed at a cursory level for possible pipeline alignments and connection to the main. In general, the alignments remained in the public right-of-way, primarily along roads, and avoided crossing through any land that appeared to be private property.

Pipeline length only considered the length of pipeline required to extend the existing water or wastewater system main to the front of the DAC property. Almost all of the sites will require additional service lines within the site to provide water and wastewater service to each of the individual dwelling units. It is assumed that each DAC would be responsible for paying for service lines installed on-site.

Each pipeline measurement was evaluated as a standalone project such that the pipeline distance was measured all the way to an existing water and/or wastewater main and did not include any potential future pipelines of another DAC project that might share a part of the alignment (i.e. there can be some duplication of pipeline alignment among adjacent DACs).

2.3.2 Additional Parcels Served

Low feasibility projects typically involved a pipeline exceeding one mile in length. To evaluate the possibility of deriving more value from the project, all of the parcels along the alignment were reviewed through aerial imagery to determine if there were additional mobile home parks that could also be connected to the pipeline. All of these sites will require follow-up field verification and confirmation by relevant utility agencies regarding the connection status of the sites.

There were three different projects for water connections that could have added a total of 7 parcels to the various alignments. There were seven different projects for wastewater connections that could have added a total of 17 potential sites to the various alignments. A summary of these additional parcels is provided in Appendix B.

3 Results

The following tables summarize high feasibility, medium feasibility, and low feasibility projects by agency jurisdiction. Each of the locations in the tables below should be further reviewed by the relevant agencies to confirm that the DACs are not currently being served by that agency.

Table 3-1 lists potential water connection projects (number of potential projects) by each feasibility classification and by each water agency included in this evaluation. Table 3-2 lists potential water connection sites (number of potential sites) by each feasibility classification and by each water agency included in this evaluation. The difference between Table 3-1 and Table 3-2 is that a single project may include multiple DAC sites due to the ability to potentially connect multiple sites with one project as described above in Section 2.2.4.

The information presented in Table 3-1 and 3-2 is also presented in maps in Figures 3-1 through Figure 3-8. Please note that due to the size of CVWD's service area, the CVWD service area was broken up into several maps to show the potential sites at a finer scale. The overall map of CVWD's service area, presented in Figure 3-1, has three boxes that correspond to the specific quadrants shown in Figure 3-2, Figure 3-3, and Figure 3-4, which show the potential sites at a closer scale so that each potential site is more visible.

Each individual site shown in Figure 3-1 through Figure 3-8 is numerically coded with a Project ID number. The Project ID numbers included within the figures correspond to the Project ID numbers included within the tables in Appendix A, which show each of the potential site connections by agency with a corresponding address and community.

Table 3-1: Summary of Number of Water Connection Projects by Feasibility

Agency	High Feasibility	Medium Feasibility	Low Feasibility	Main Immediate
Coachella Valley Water District	2	4	13	14
Coachella Water Authority	0	0	1	1
Desert Water Agency	0	0	0	0
Indio Water Authority	0	0	0	1
Mission Springs Water District	0	1	0	5

Footnote: A single project may include multiple DAC sites. Project 303-G has sites within Coachella Valley Water District and Coachella Water Authority service areas and is listed as a project under both agencies.

Table 3-2: Summary of Number of Water Connection Sites by Feasibility

Agency	High Feasibility	Medium Feasibility	Low Feasibility	Main Immediate
Coachella Valley Water District	3	5	61	14
Coachella Water Authority	0	0	2	1
Desert Water Agency	0	0	0	0
Indio Water Authority	0	0	0	2
Mission Springs Water District	0	1	0	8

Footnote: Appendix A contains a detailed list of these sites.

Table 3-3 lists potential wastewater connection projects (number of potential projects) by each feasibility classification and by each water agency that was included in this evaluation. Table 3-4 lists potential wastewater connection sites (number of potential sites) by each feasibility classification and by each water agency that was included in this evaluation. The difference between Table 3-3 and Table 3-4 is that a single project may include multiple DAC sites due to the ability to potentially connect multiple sites with one project as described above in Section 2.2.4.

The information presented in Table 3-3 and 3-4 is also presented in maps in Figures 3-9 through Figure 3-17. Please note that due to the size of CVWD's service area, the CVWD service area was broken up into several maps to show the potential sites at a finer scale. The overall map of CVWD's service area, presented in Figure 3-9, has four boxes that correspond to the specific quadrants shown in Figure 3-10, Figure 3-11, Figure 3-12, and Figure 3-13, which show the potential sites at a closer scale so that each potential site is more visible.

Each individual site shown in Figure 3-9 through Figure 3-17 is numerically coded with a Project ID number. The Project ID numbers included within the figures correspond to the Project ID numbers included within the tables in Appendix A, which show each of the potential site connections per agency with a corresponding address and community.

Table 3-3: Summary of Number of Wastewater Connection Projects by Feasibility

Agency	High Feasibility	Medium Feasibility	Low Feasibility	Main Immediate	Needs Additional Data
Coachella Valley Water District	2	2	13	7	3
Coachella Sanitary District	0	0	1	1	0
Desert Water Agency	0	0	2	0	0
Valley Sanitary District	0	0	0	1	0
Mission Springs Water District	1	1	3	0	0

Footnote: A single project may include multiple DAC sites. Project 303-G has sites within Coachella Valley Water District and Coachella Sanitary District service areas and is listed as a project under both agencies.

Table 3-4: Summary of Number of Wastewater Connection Sites by Feasibility

Agency	High Feasibility	Medium Feasibility	Low Feasibility	Main Immediate	Needs Additional Data
Coachella Valley Water District	3	3	73	7	5
Coachella Sanitary District	0	0	3	1	0
Desert Water Agency	0	0	6	0	0
Valley Sanitary District	0	0	0	2	0
Mission Springs Water District	1	1	7	0	0

Footnote: Appendix A contains a detailed list of these sites. As indicated within Appendix A, the wastewater sites listed within DWA's service area are within the wastewater service area of the City of Palm Springs.

Figure 3-1: <u>Coachella Valley Water District</u> Water Connection Feasibility - Overall

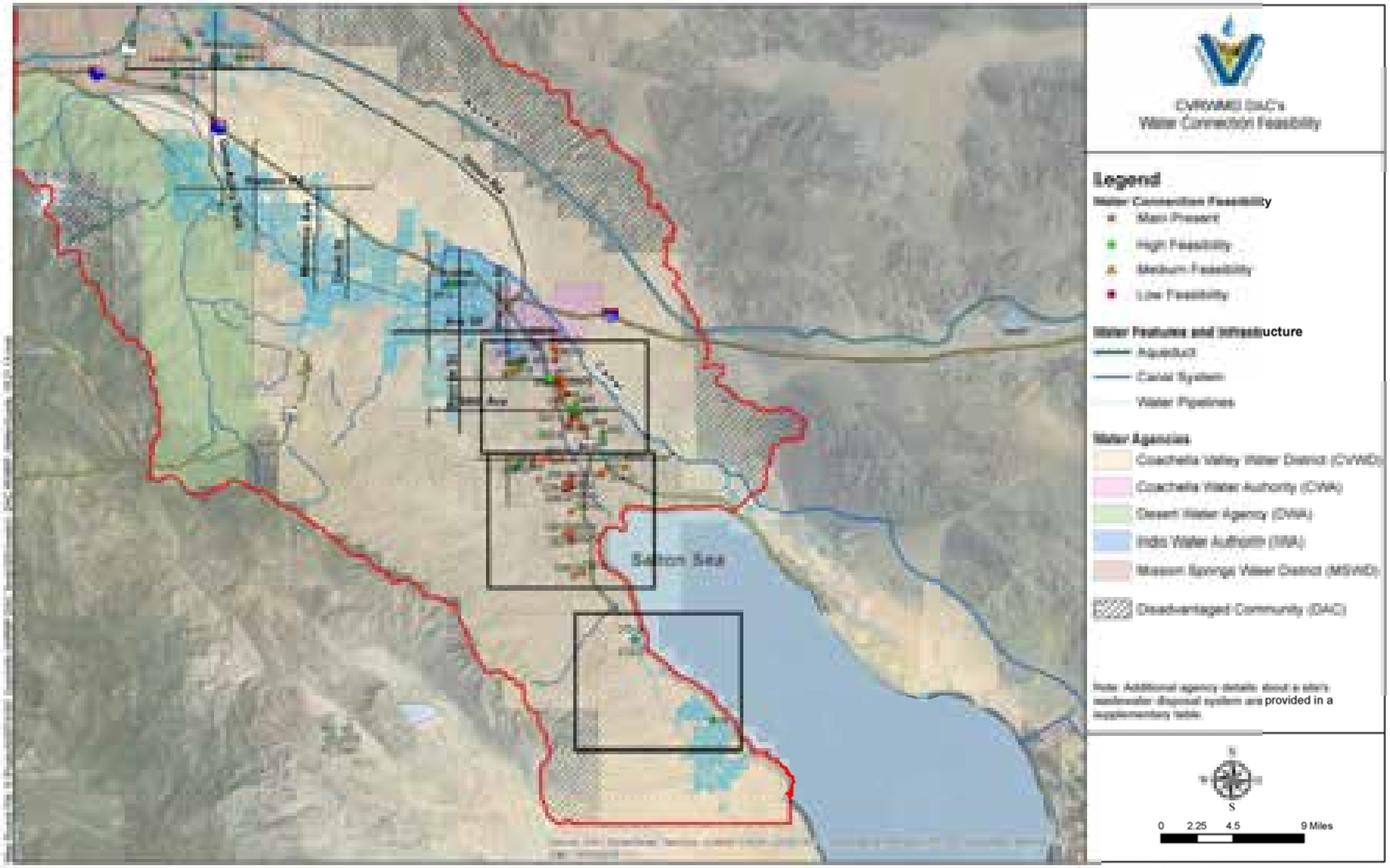


Figure 3-2: Coachella Valley Water District Water Connection Feasibility – East Valley Quadrant 1

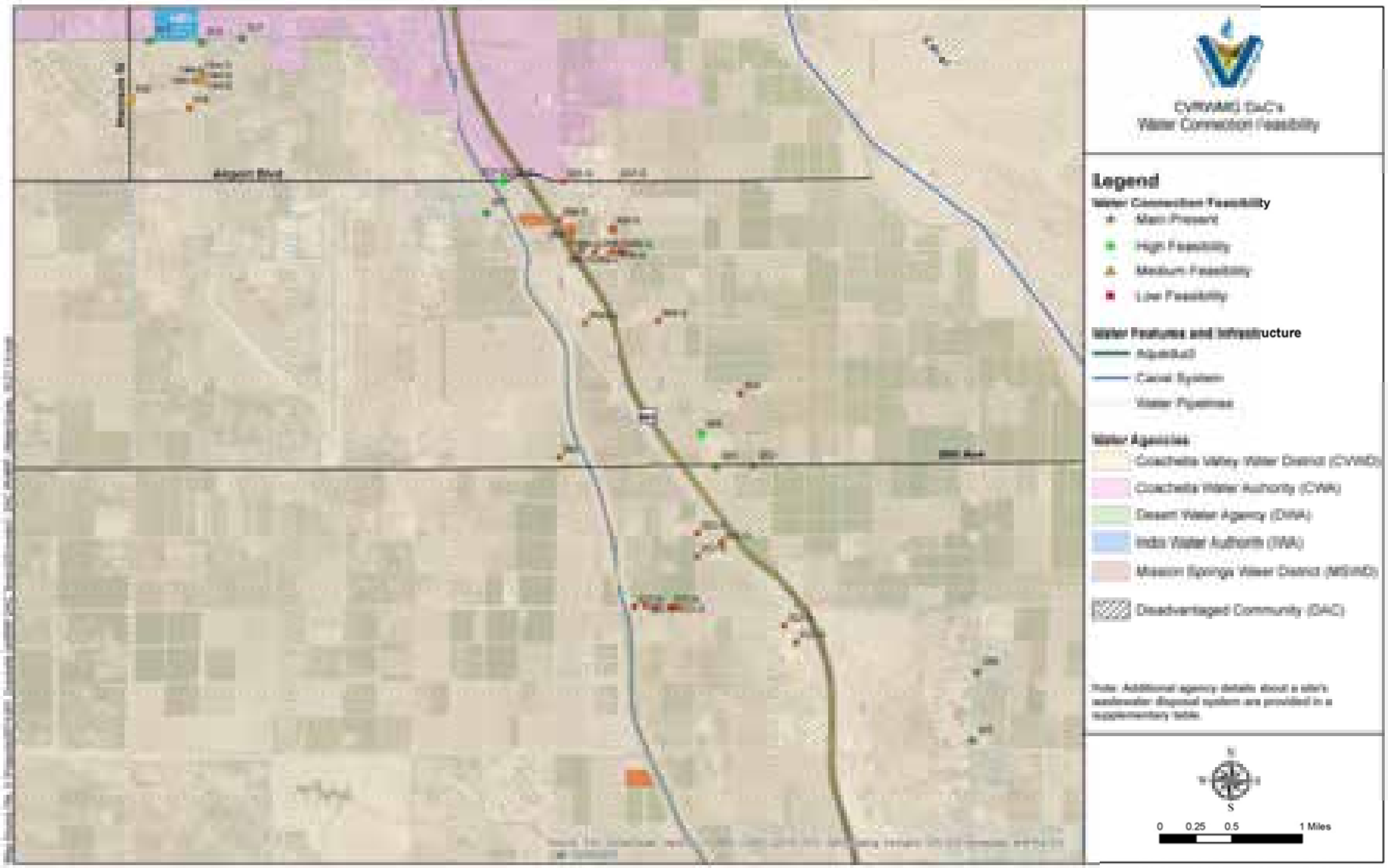


Figure 3-3: <u>Coachella Valley Water District</u> Water Connection Feasibility – East Valley Quadrant 2

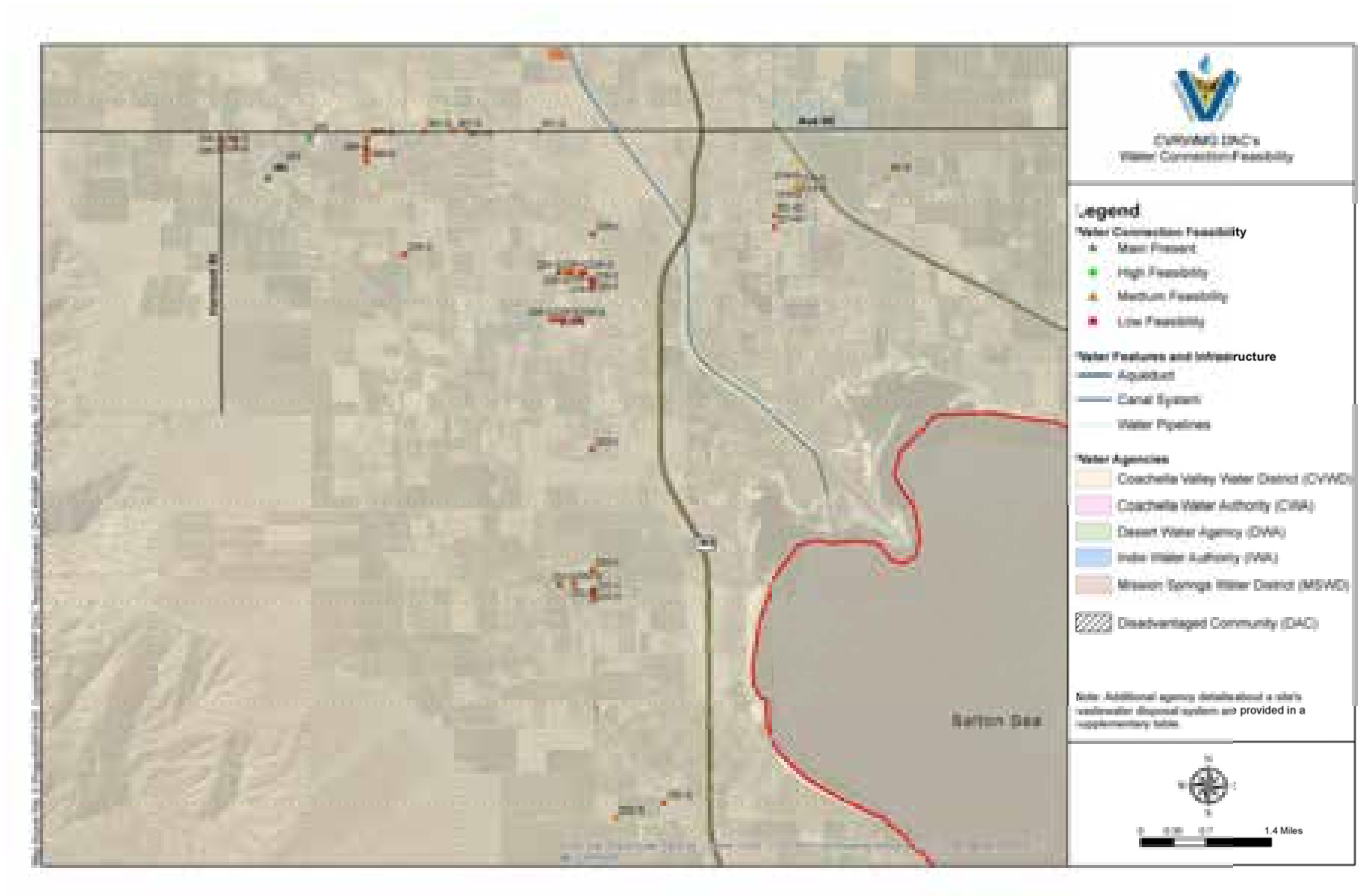


Figure 3-4: <u>Coachella Valley Water District</u> Water Connection Feasibility – East Valley Quadrant 3

Figure 3-5: <u>Coachella Water Authority</u> Water Connection Feasibility

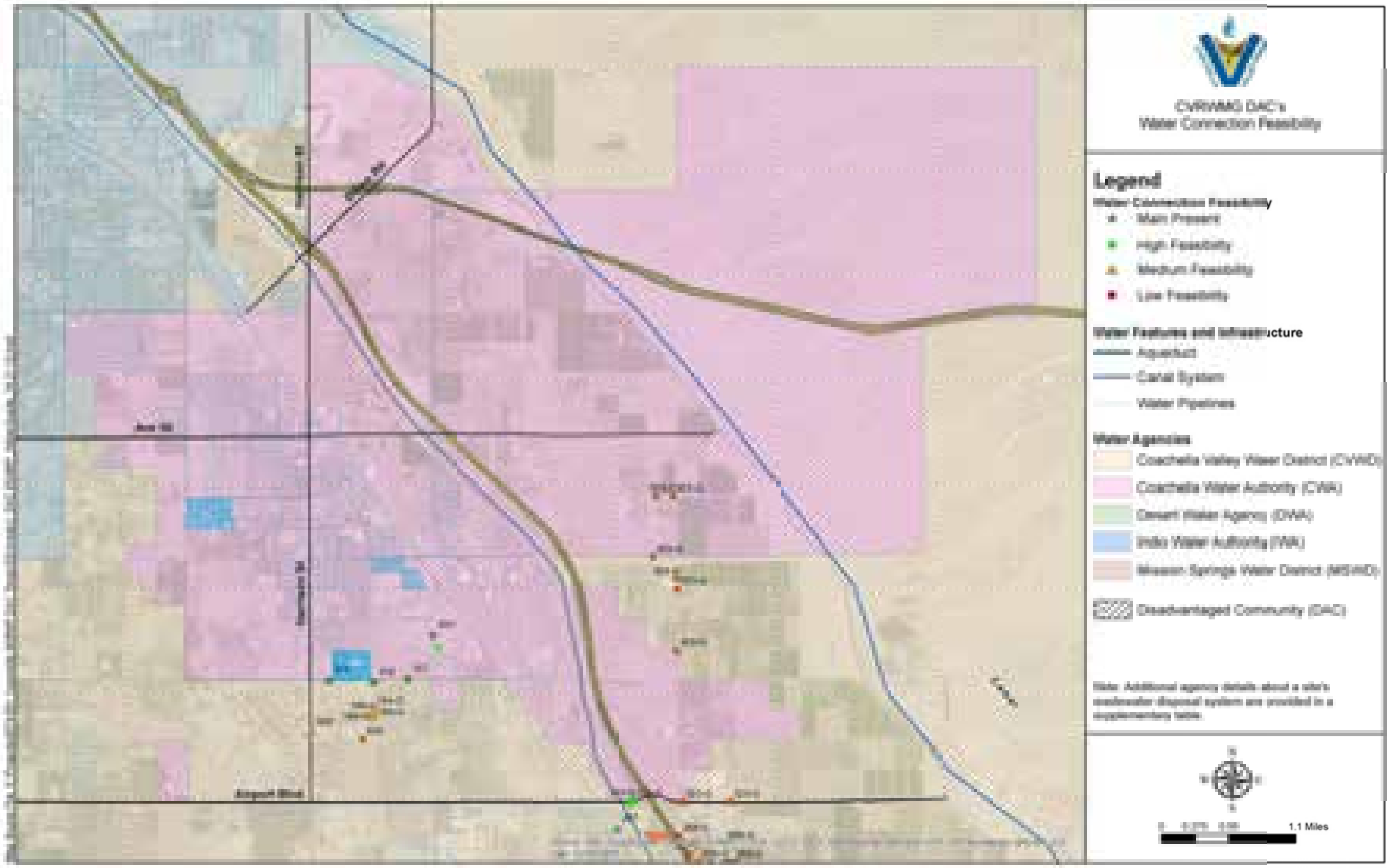


Figure 3-6: Desert Water Agency Water Connection Feasibility

There are no identified water connection sites located within the Desert Water Agency Service area

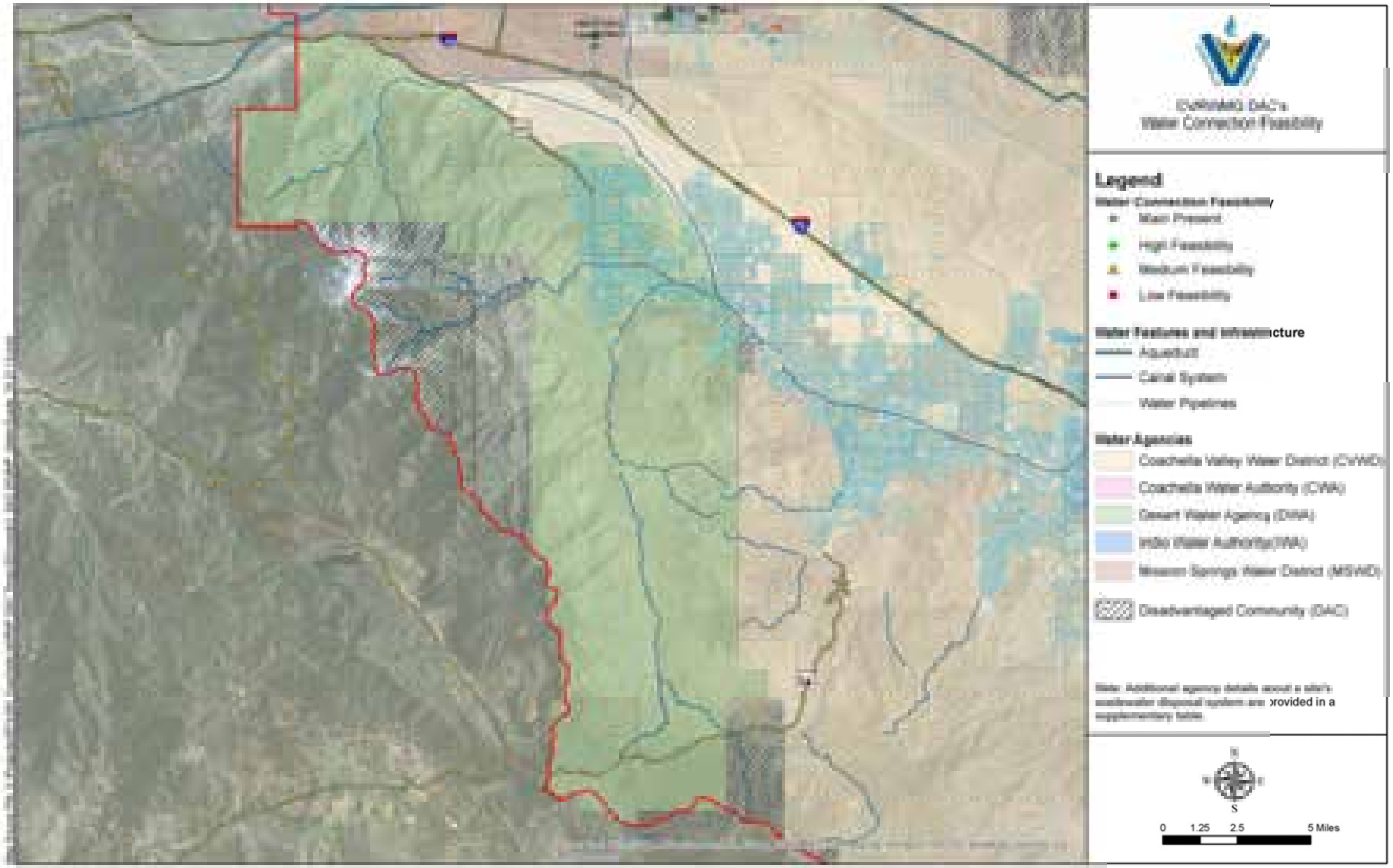


Figure 3-7: Indio Water Authority Water Connection Feasibility

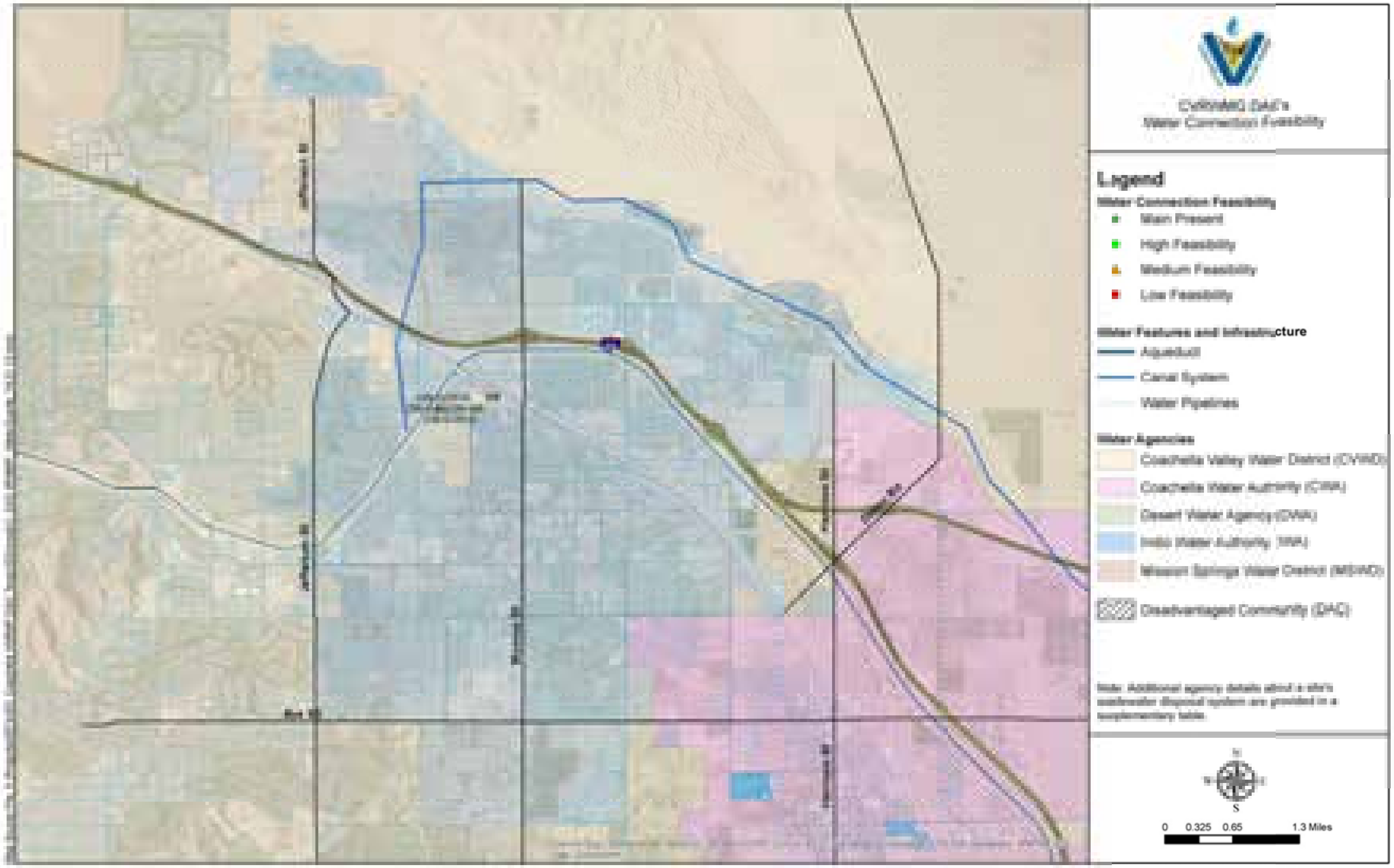


Figure 3-8: <u>Mission Springs Water District</u> Water Connection Feasibility

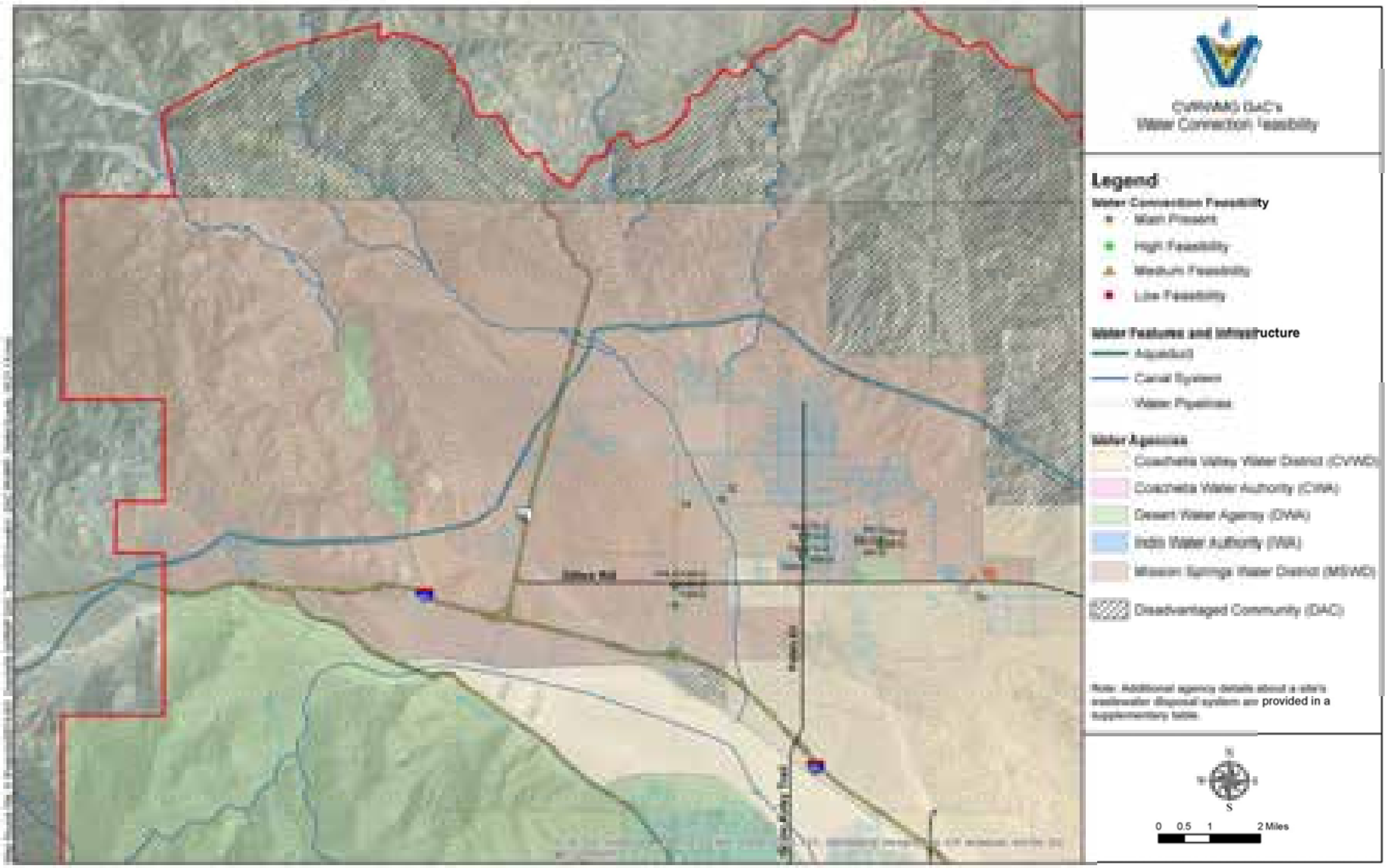


Figure 3-9: <u>Coachella Valley Water District</u> Wastewater Connection Feasibility - Overall

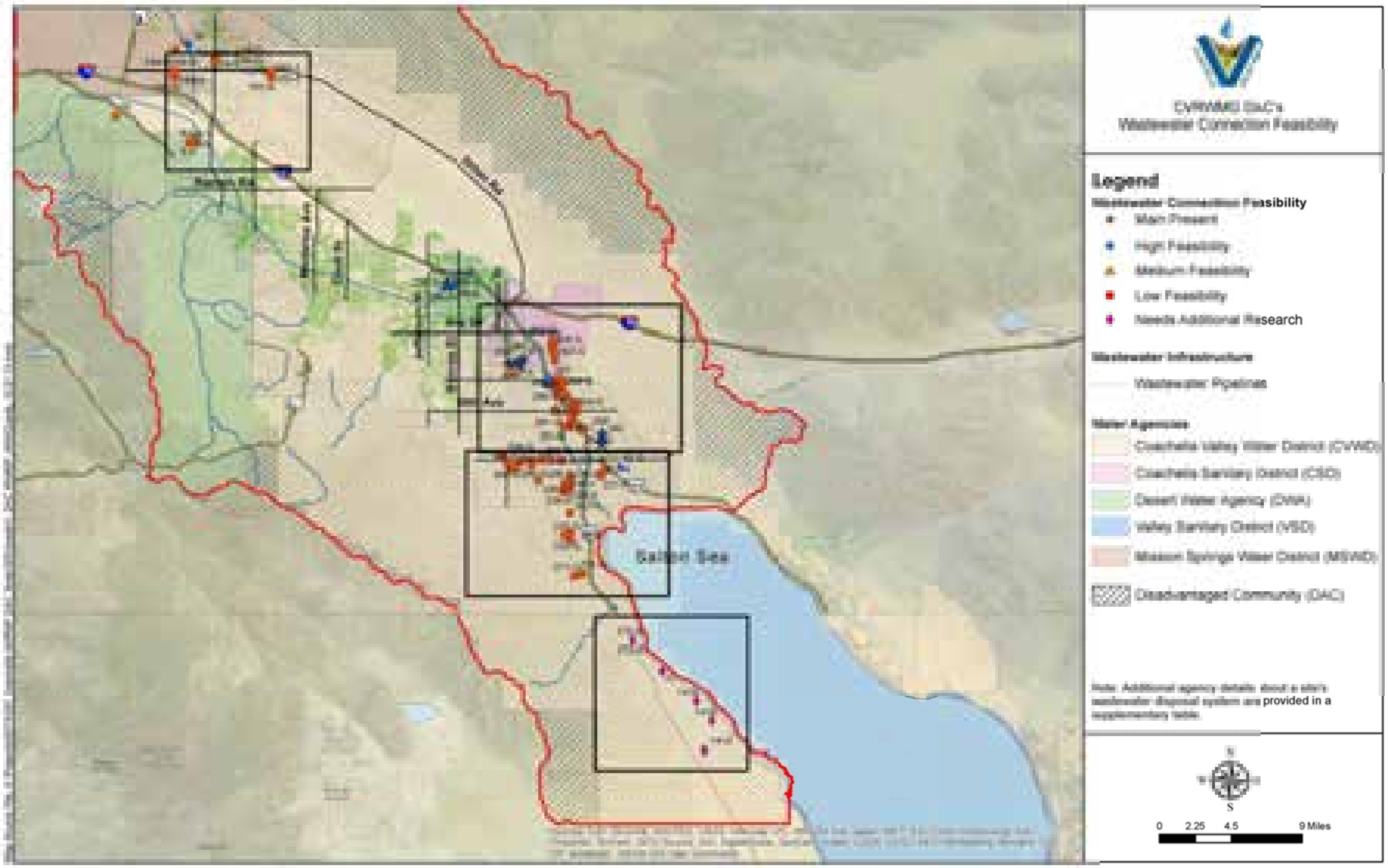


Figure 3-10: Coachella Valley Water District Wastewater Connection Feasibility – West Valley Quadrant

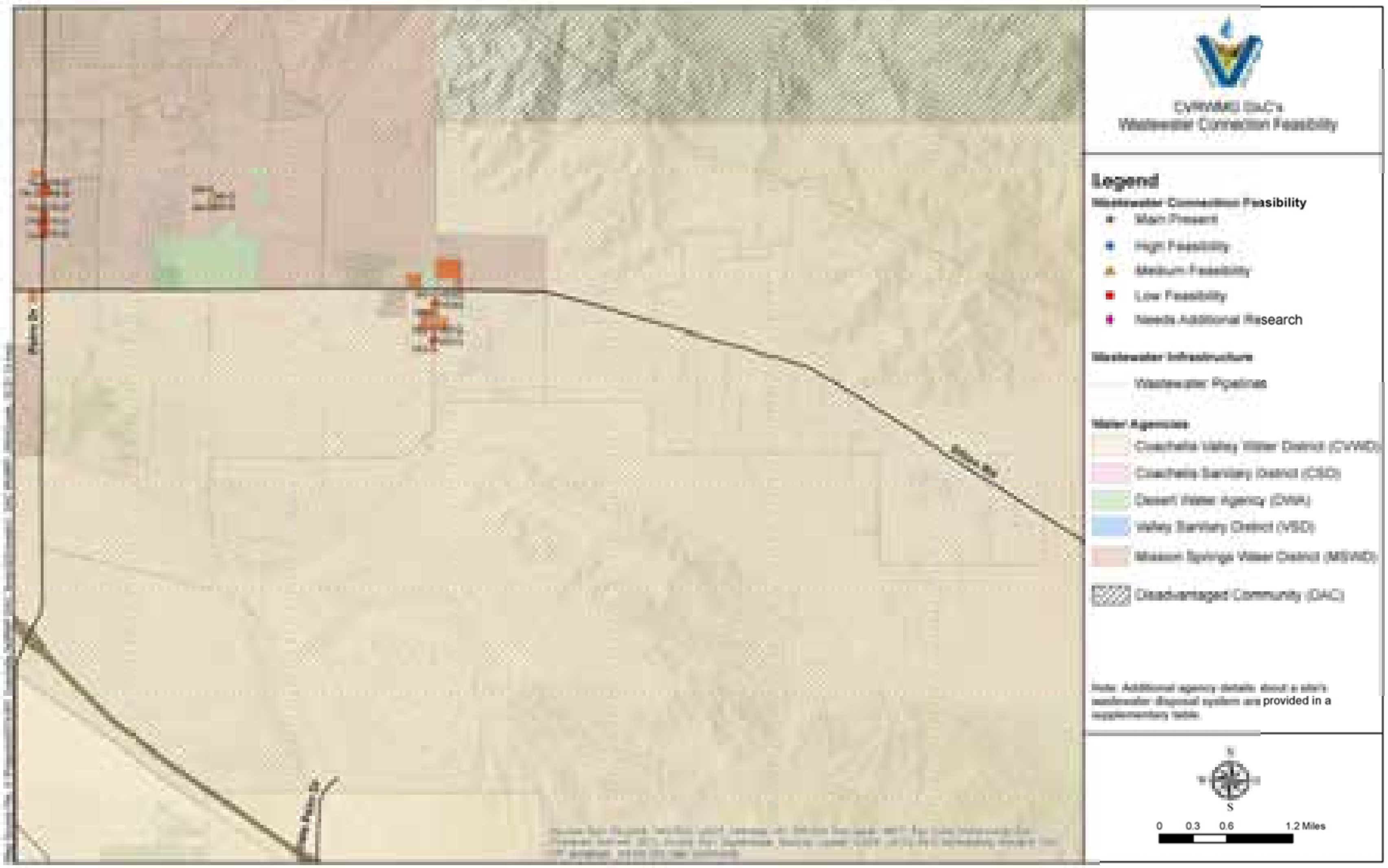


Figure 3-11: <u>Coachella Valley Water District</u> Wastewater Connection Feasibility – East Valley Quadrant 1

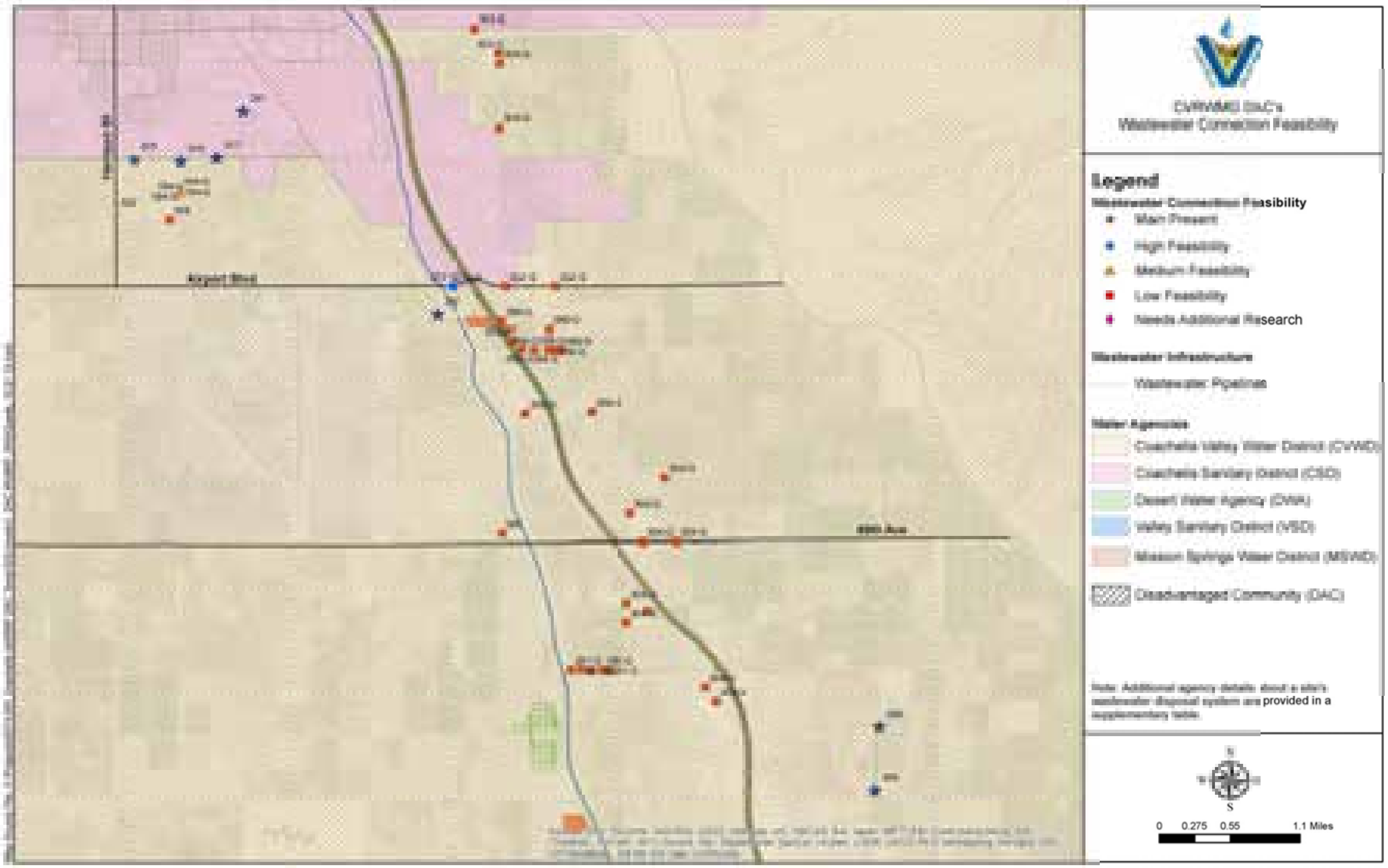


Figure 3-12: Coachella Valley Water District Wastewater Connection Feasibility – East Valley Quadrant 2

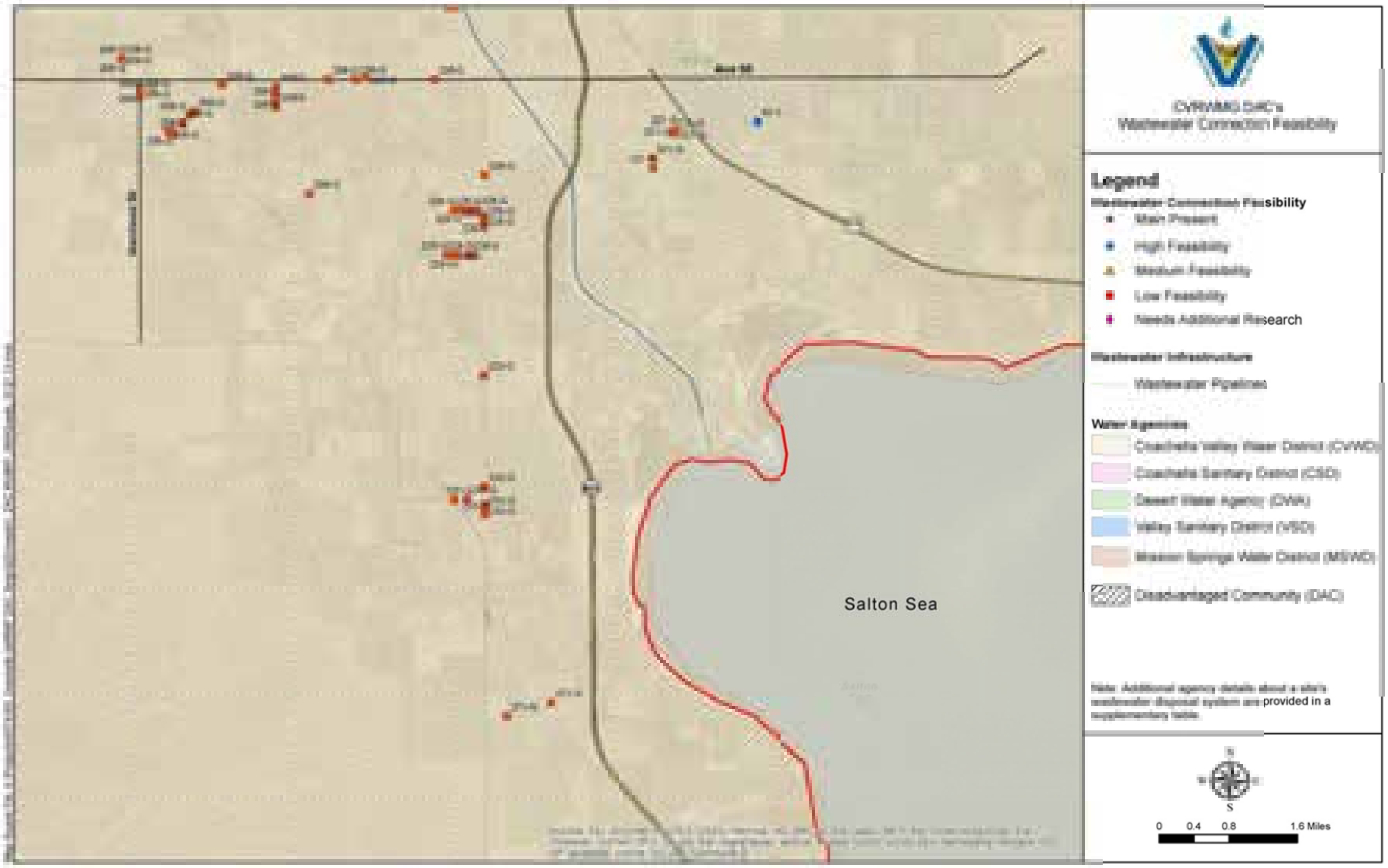


Figure 3-13: Coachella Valley Water District Wastewater Connection Feasibility – East Valley Quadrant 3

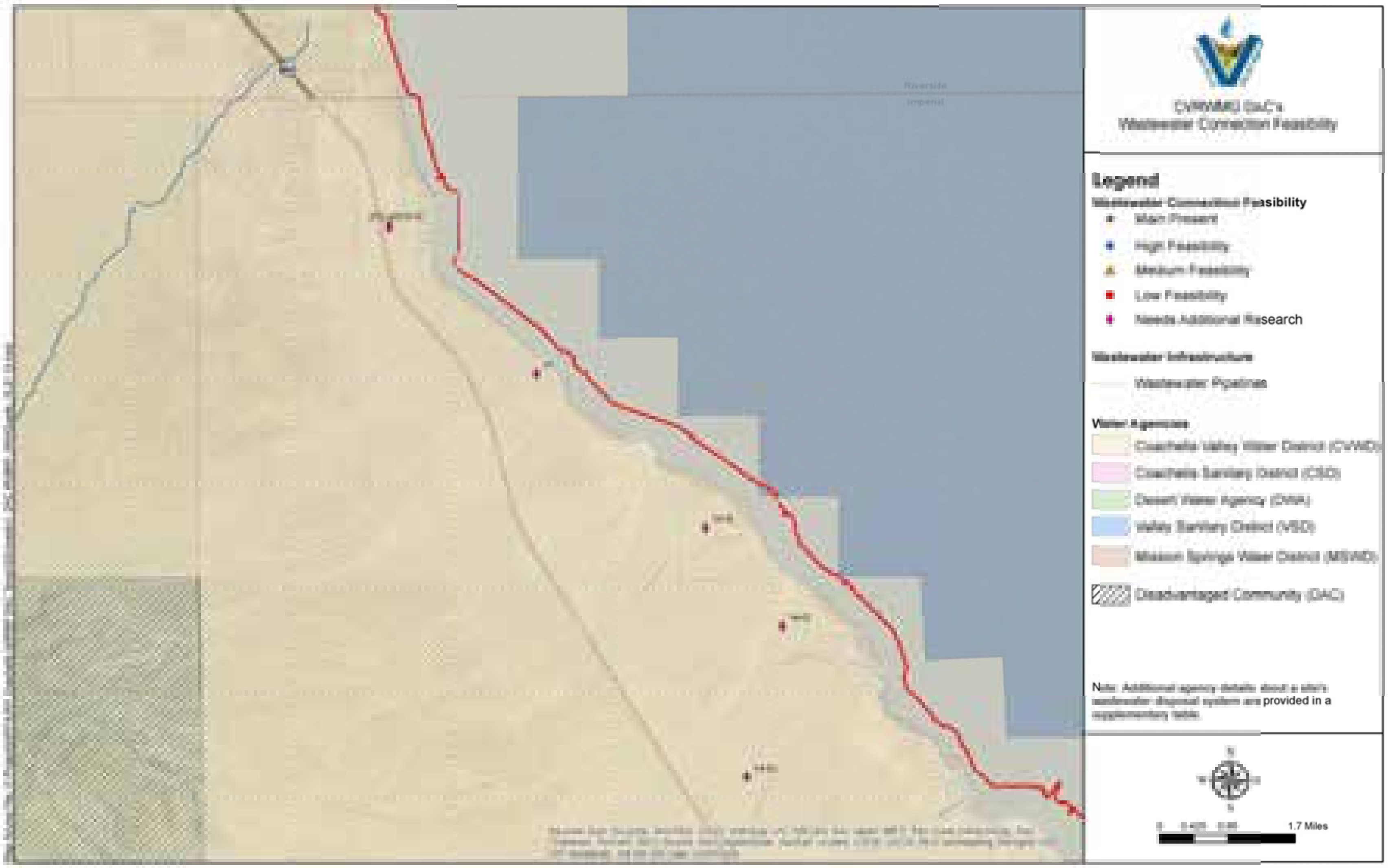


Figure 3-14: <u>Coachella Sanitary District</u> Wastewater Connection Feasibility

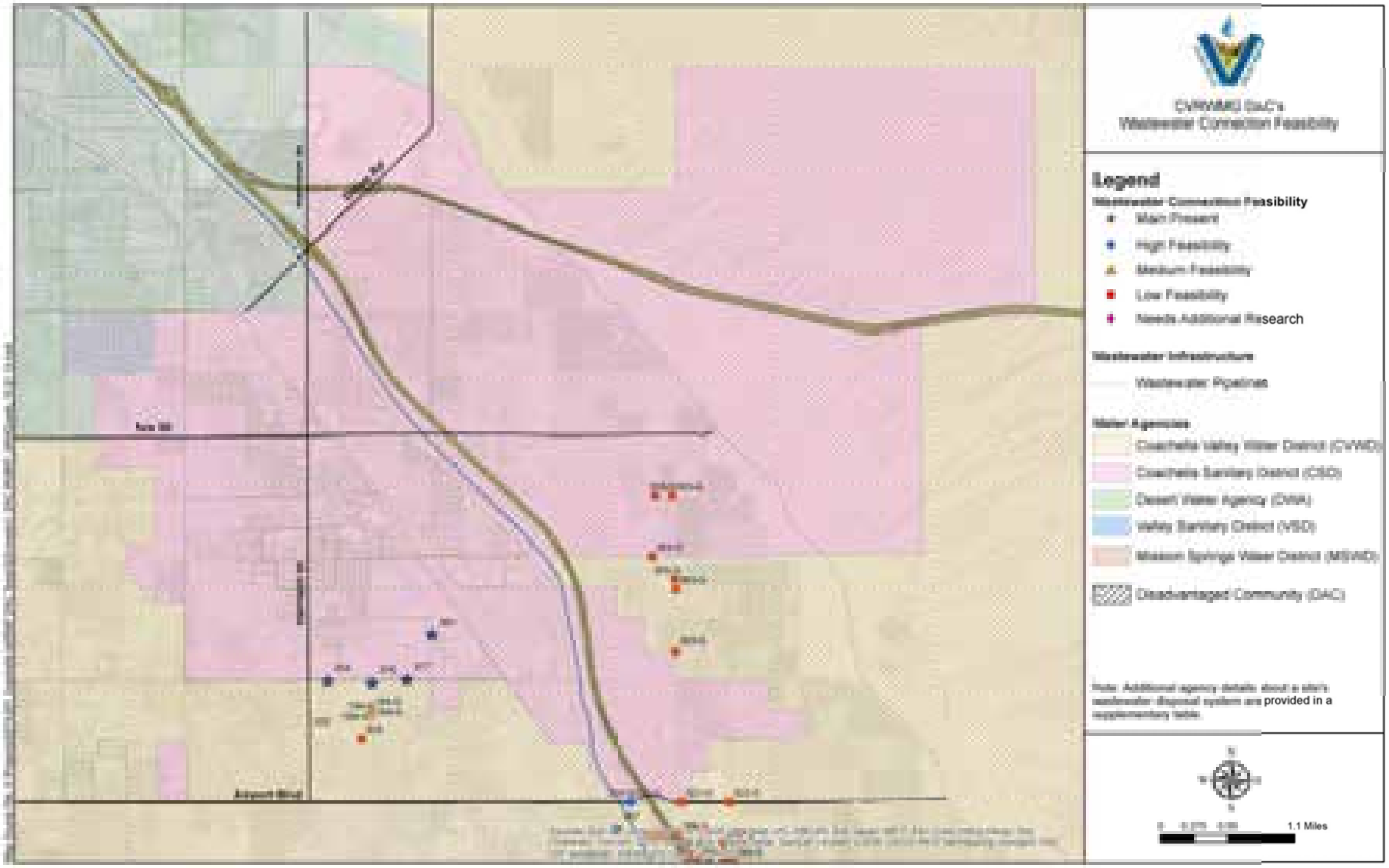


Figure 3-15: <u>Desert Water Agency</u> Wastewater Connection Feasibility

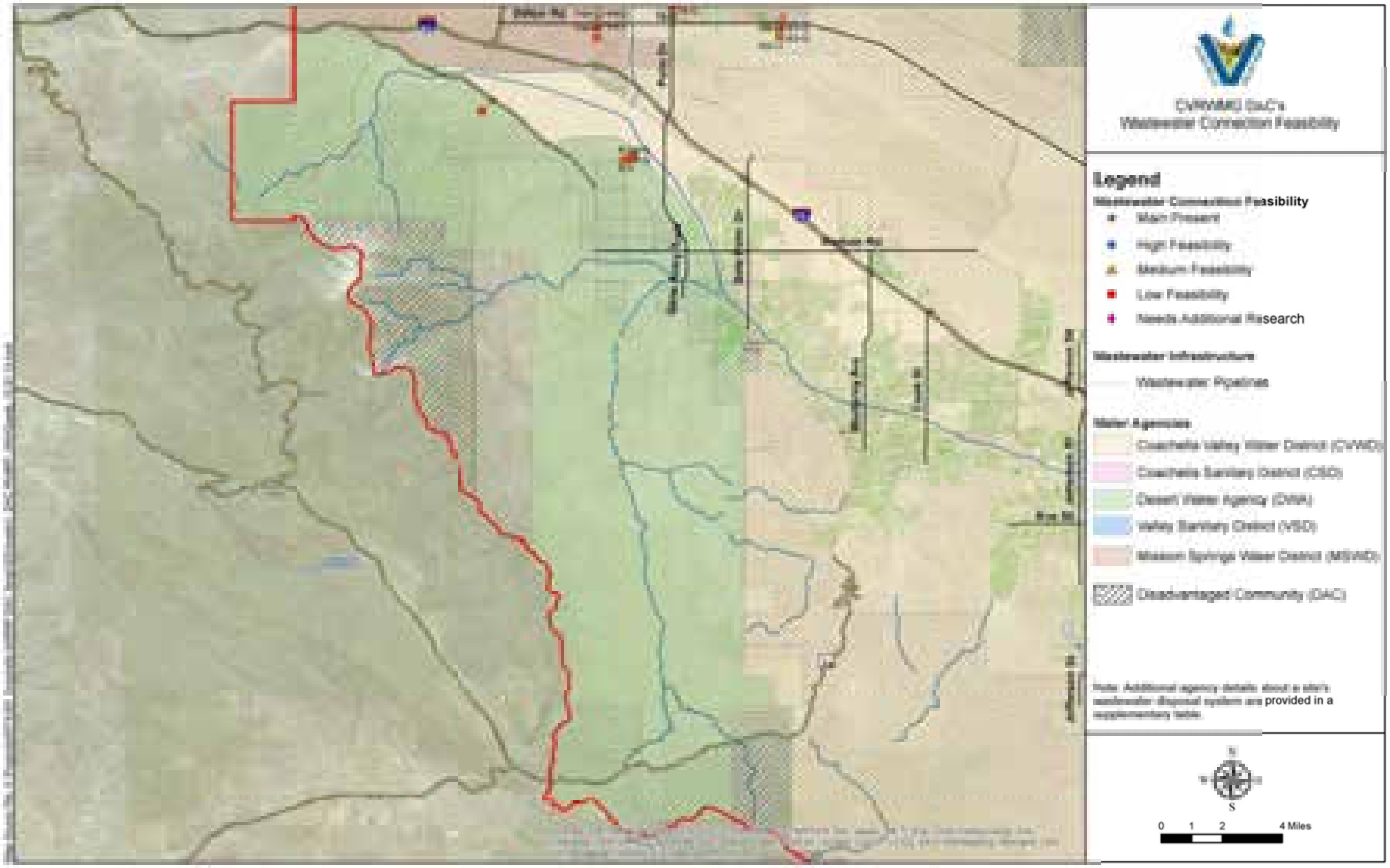


Figure 3-16: <u>Valley Sanitary District</u> Wastewater Connection Feasibility

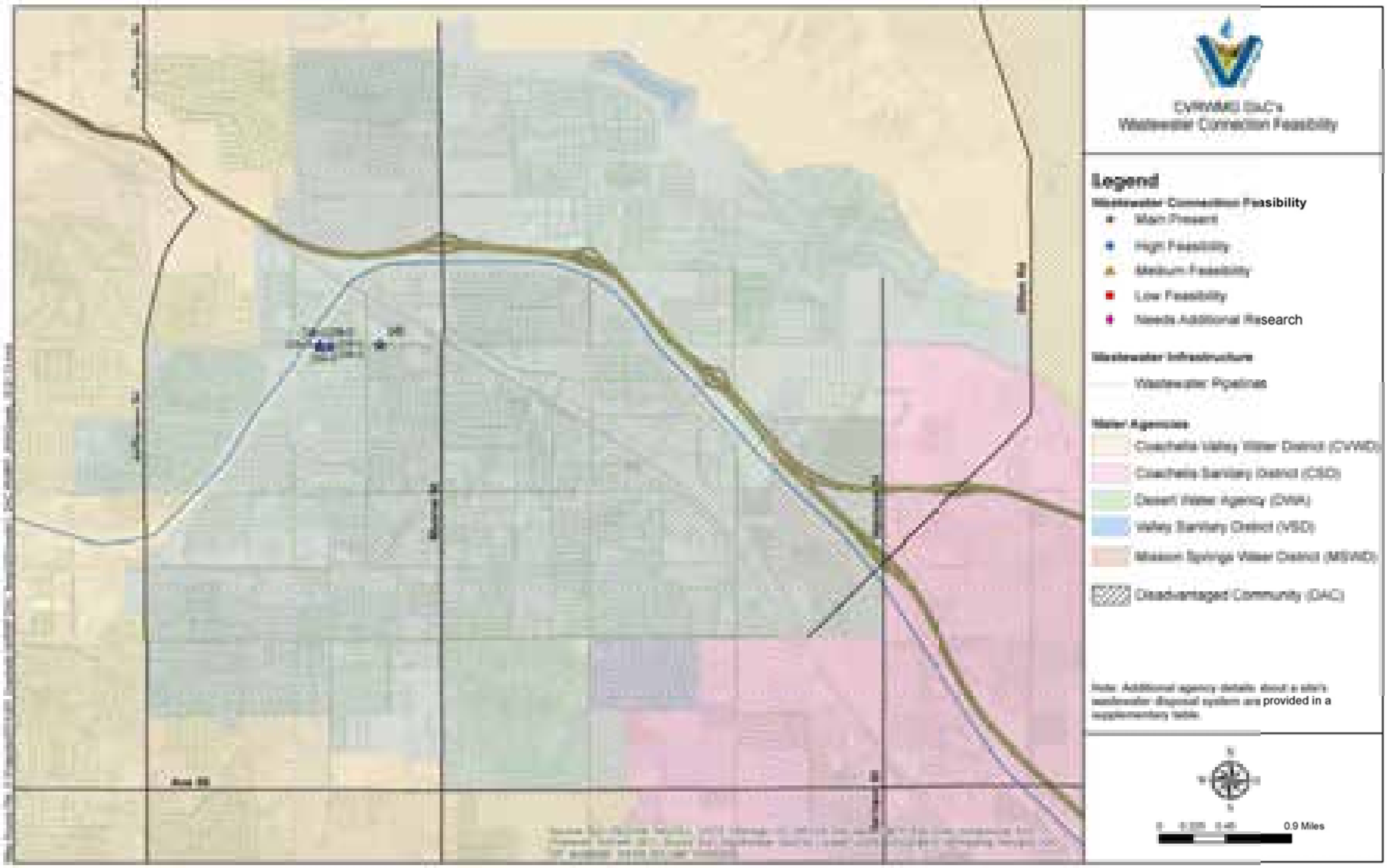
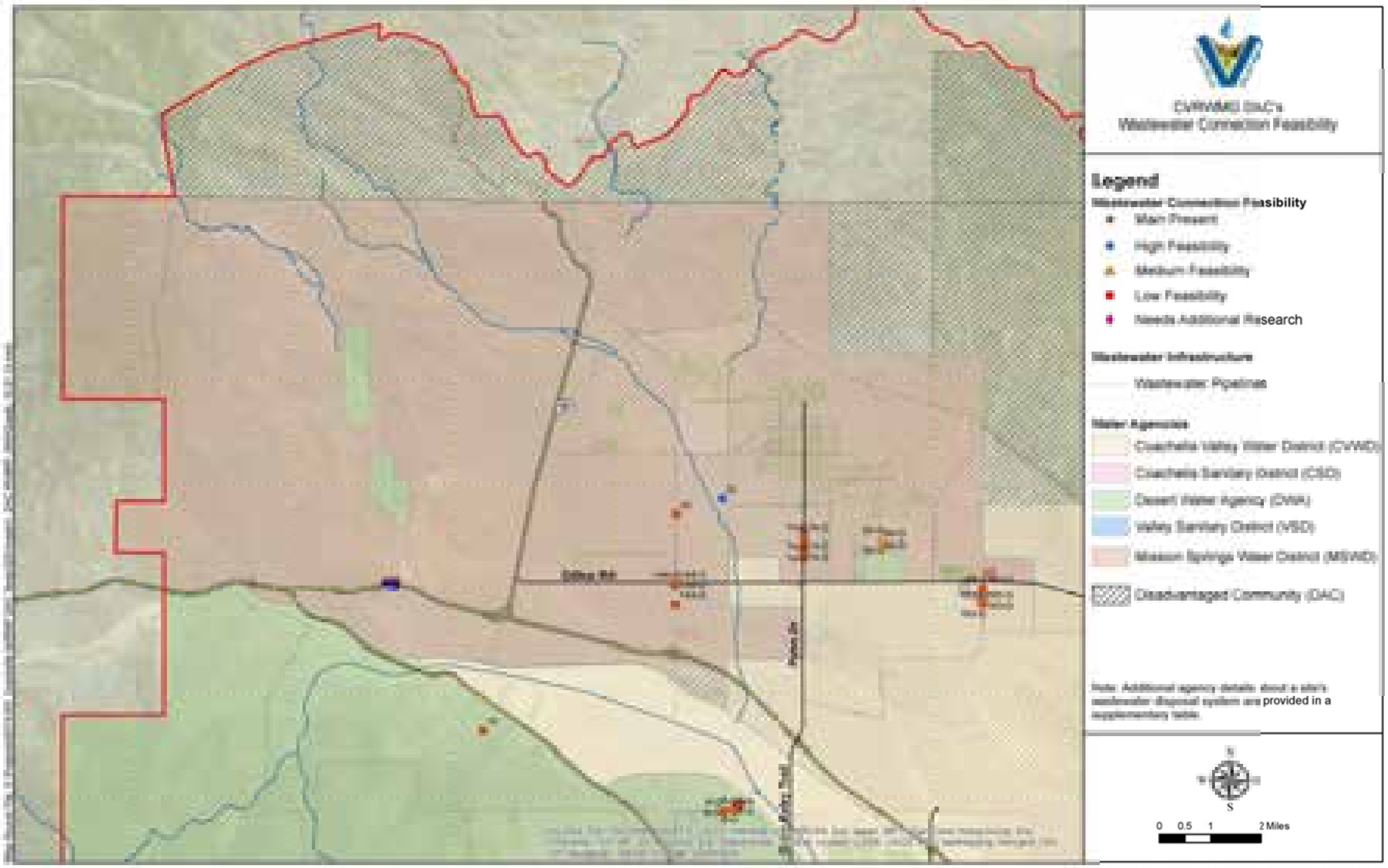


Figure 3-17: <u>Mission Springs Water District</u> Wastewater Connection Feasibility



4 Recommendations

Based on the preliminary findings, it is recommended that all high feasibility DACs be confirmed by the applicable agencies to verify that they are not, in fact, connected to the municipal system. Once the sites have been confirmed as not connected, it is recommended that all high feasibility sites be connected to nearby water and/or wastewater infrastructure. Sites categorized as “Main Immediate” should also be confirmed by the appropriate agency, but because the IRWM project will not fund homeowner service connections, no further action would likely be required after this confirmation. Each of the low feasibility sites will also need to be reviewed in more detail to assess the challenges involved for site connection and to determine if it is still reasonable to pursue that option. Further, each of the high feasibility and main immediate sites should be assessed to determine the extent to which infrastructure improvements in the public right-of-way are necessary to complete connections.

Along with confirmation by the applicable agencies, outreach and communication should be conducted with owners of small mobile home parks or other residences that could potentially connect to the municipal water and sewer system. The purpose of this outreach would be to discuss the landowner’s willingness to work with the IRWM Program and potentially connect to the municipal system.

While there were additional non-geocoded mobile home park sites that could be added to some of the low feasibility sites, the number of sites and dwelling units were typically not significant enough to substantially improve the cost-effectiveness of the project. In the case that outside funding becomes available to supplement these more rural and expensive DAC connections, the feasibility and priority of these sites for connection could be improved.

In addition to further DAC connection status research, additional evaluation should be conducted to determine potential health hazards that may exist within existing un-connected sites and how service piping and metering within the DAC sites would be implemented, including financing and maintenance. These additional considerations may re-prioritize the recommendations noted above. Finally, while sites have been categorized as High Feasibility or Main Immediate, this does not necessarily mean that homeowners at those sites will agree to connect to the public utility system. Additional factors, such as cost of connections, change in water quality, and community impact, will be important factors in the homeowner’s final decision in connecting to a public water and/or wastewater system.

After the aforementioned analyses and outreach items are completed, the CVRWMG should continue activities such as Planning Partners meetings and other outreach efforts that encourage landowners, residents, municipal service providers, regional and state funding agencies, and other stakeholders to work together to support collaborative projects. Collaborative projects may include development of a comprehensive, regional plan to extend services to communities that rely on private water and wastewater facilities and could feasibly connect to the municipal system. It is also recommended that the CVRWMG work with relevant stakeholders to determine potential connection projects that could be implemented through the IRWM Program. This work will entail analyzing projects for their potential viability to receive IRWM or other grant or loan funding that could increase the cost-effectiveness and viability of municipal sewer and water connection projects. Potential connection projects will be assessed for their technical and financial feasibility; any projects implemented by the CVRWMG agencies must be implemented in accordance with relevant local policies such as those that require new development and infrastructure projects to be implemented without financially impacting existing customers.

Appendices

Appendix A: Feasibility Status for Connection of Mobile Home Parks to the Public Water and Wastewater Systems

The following tables summarize water and wastewater connection opportunities by feasibility class for each agency. The information in the following tables is preliminary, and will be updated after further consultation with each agency. Please note that not all of the addresses listed below have Project ID numbers – those sites without Project ID numbers are individual sites that are considered part of a larger project (refer to Section 2.2.4) that has already been given a designated Project ID number.

Coachella Valley Water District Connection Feasibility for Water Service

Coachella Valley Water District: Water Feasibility	Project ID	Site Name	Address
CVWD: Main Immediate	16	Single Trailer	1148 Caspian Ave.
	246	Bermuda Palms Apartment Homes	81600 Fred Waring Dr.
	257	Thermal Trailer Park	56335 Hwy 111
	292	Unknown Name	85777 Middleton Street
	293	Unknown Name	85641 Middleton Street
	299	Chapultepec Apartments	62600 Lincoln Ave, Mecca
	300	Heroes 2	62552-62898 Lincoln Street
	302	Rancho Lemus	89000-89448 60th Ave
	305	Farm Castro	89000-89448 60th Ave
	309	Near Spates Manufacturing	85422-85424 Middleton St, Thermal
	315	Unknown Name	54th Ave, Thermal
	316	Unknown Name	54317 Shady Ln, Thermal
	317	Unknown Name	85755 54th Ave, Coachella
	272-G	Desert View Mobile Home Park	87629 DESERT VIEW
CVWD: High Feasibility	268	Unknown Name	59600 Pierce St
	273-G	Unknown Name	87620 Airport Blvd, Thermal
		Desert View Mobile Home Park	87629 Airport Blvd, Thermal
CVWD: Medium Feasibility	320	Mora	54878 Hwy 86, Thermal
	194-G	Am** camp	54540 Shady Ln
		Garcia Ranch	54596 Shady Ln
	214-G	Saint Anthony's park	67075 Hwy 111, Mecca, CA
	42-G	Unknown Name	National Ave, Mecca
CVWD: Low Feasibility	265	Se Vende Traila	Fillmore St
	304	home	88785-89399 59th Ave
	318	Unknown Name	85-400 55th Ave, Thermal
	206-G	Polanco1	64975 Harrison St
		Unknown Name	66190 Harrison St
	221-G	Polanco 2	67959 LINCOLN
		Unknown Name	Lincoln Street

Coachella Valley Water District: Water Feasibility	Project ID	Site Name	Address
	228-G	Duros Mobile Home Park	68507 Pierce St
		El Mesquit	88000-88998 69th Ave, Thermal
CVWD: Low Feasibility		Gamez Trailer Park	69353 Pierce St
		Los Gatos Mobile Home Park	88740 Ave 70
		Oasis Gardens LLC	68555 Polk St, Thermal
		Oasis Mobile Home Park	88700 Ave 70
		Unknown Name	88701 Ave 70
		Unknown Name	88740 Ave 70
		Polanco 6	88510 69th Ave
		Polanco7	88773 69th Ave
		Unknown Name	
		Unknown Name	69th Ave, Thermal
		Unknown Name	70th Ave
	232-G	Unknown Name	81st Ave
		Angel's Ranch	72753 Pierce St
		B.C. Ranch	75655 Pierce St
		D & D Oasis Mobile Home Park	76250 Pierce St
		D&D MHP	76086 Pierce St
		Polanco 3	76250 Pierce St
		Unknown Name	80627 Harrison St
		Unknown Name	88598-88634 76th Ave, Thermal
		Unknown Name	88715-88999 76th Ave, Thermal
	269-G	Unknown Name	56540 Fillmore St, Thermal
		Unknown Name	8441 58th Ave
		Unknown Name	88100 Fillmore St, Thermal
		Unknown Name	88210 Fillmore St, Thermal
		Unknown Name	88275 Fillmore St, Thermal
		Unknown Name	88330 Fillmore St, Thermal
		Unknown Name	88420 57th Ave, Thermal
		Unknown Name	88455 57th Ave, Thermal
		Unknown Name	8867 58th Ave
		Unknown Name	John Deere St
	298-G	Unknown Name	66242 Martinez Road
		Unknown Name	66355 Martinez Road
		Unknown Name	Martinez Road
	301-G	Unknown Name	66th Ave, Thermal
		Unknown Name	87125 66th Ave, Thermal
		Unknown Name	87742 66th Ave, Thermal
		Unknown Name	87850 66th Ave, Thermal

Coachella Valley Water District: Water Feasibility	Project ID	Site Name	Address
	303-G	Unknown Name	52219 Fillmore St
		Unknown Name	52742 Fillmore St, Thermal, CA
	322-G	Duarte	62775 Hwy 111
		Lopez mobile home park	62325 Hwy 111
CVWD: Low Feasibility		Los Gatos Mobile Home Park	88705 62nd Ave
		Unknown Name	88705 62nd Ave
		Polanco 8	88847 62nd Ave
		Ramirez	88811
		Unknown Name	50970 61st Ave
		Unknown Name	62nd Ave
		Unknown Name	Pierce St
		Unknown Name	Hwy 111
		Unknown Name	88835 62nd Ave
	323-G	Unknown Name	88375 Airport Blvd, Thermal
		Valley View Trailer Park	88-041 Airport Blvd, Thermal

Footnote: Project ID 303-G is duplicated in the CWA table below as that ID has sites that fall within both the CVWD and CWA agency boundaries.

Coachella Water Authority Connection Feasibility for Water Service

Coachella Water Authority: Water Feasibility	Project ID	Site Name	Address
CWA: Main Immediate	281	Unknown Name	Tyler Ave
CWA: Low Feasibility	303-G	mobiles	Along Fillmore
		Unknown Name	800 Ave 51

Footnote: Project ID 303-G is duplicated in the CVWD table as that ID has sites that fall within both the CVWD and CWA agency boundaries.

Desert Water Agency Connection Feasibility for Water Service

There are no feasible water connections to be considered in the Desert Water Agency service area.

Indio Water Authority Connection Feasibility for Water Service

Indio Water Authority: Water Feasibility	Project ID	Site Name	Address
IWA: Main Immediate	239-G	Bermuda Palms Apartment Homes	81225 Fred Waring Dr.
		Unknown Name	81235 Fred Waring Dr.

Mission Springs Water District Connection Feasibility for Water Service

Mission Springs Water District: Water Feasibility	Project ID	Site Name	Address

Mission Springs Water District: Water Feasibility	Project ID	Site Name	Address
MSWD: Main Immediate	32	SFH	13695 United Rd
	109-G	Palm Drive Mobile Estates	15685 Palm Drive
		Unknown Name	15686 Palm Drive
		Unknown Name	15687 Palm Drive
	144-G	Care Free Mobile Home Park	17069 N. Indian Ave
	74-G	Vista Montana	15300 Palm Drive
		Whispering Sands	15225 Palm Drive
MSWD: Main Immediate	94-G	Mountain View Park	15525 Mountain View Rd
MSWD: Medium Feasibility	33	Two Springs Resort	14200 N. Indian Canyon Drive

Coachella Valley Water District Connection Feasibility for Wastewater Service

Coachella Valley Water District: Wastewater Feasibility	Project ID	Site Name	Address
CVWD: Main Immediate	246	Bermuda Palms Apartment Homes	81600 Fred Waring Dr.
	257	Thermal Trailer Park	56335 Hwy 111
	299	Chapultepec Apartments	62600 Lincoln Ave, Mecca
	300	Heroes 2	62552-62898 Lincoln Street
	315	Unknown Name	54th Ave, Thermal
	316	Unknown Name	54317 Shady Ln, Thermal
	317	Unknown Name	85755 54th Ave, Coachella
CVWD: High Feasibility	273-G	Unknown Name	87620 Airport Blvd, Thermal
		Desert View Mobile Home Park	87629 Airport Blvd, Thermal
	42-G	Unknown Name	National Ave, Mecca
CVWD: Medium Feasibility	320	Mora	54878 Hwy 86, Thermal
	194-G	Am** camp	54540 Shady Ln, Thermal
		Garcia Ranch	54596 Shady Ln
CVWD: Low Feasibility	265	Se Vende Traila	Fillmore St
	318	Unknown Name	85-400 55th Ave, Thermal
	163-G	Casa Del Sol Mobile Home Park	17300 Corkhill Rd
		Corkhill Park	17989 Corkhill Rd
	206-G	MHP2	85390 Middleton St
		Unknown Name	85396 Middleton St
		Near Spates Manufacturing	85422-85424 Middleton St, Thermal
		Oasis Gardens LLC	68555 Polk St, Thermal
		Polanco 5	85691 Middleton St
		Polanco1	64975 Harrison St
		Unknown Name	66190 Harrison St

Coachella Valley Water District: Wastewater Feasibility	Project ID	Site Name	Address
		Sunbird Mobile Home Park	84950 Echols Rd
		Unknown Name	66242 Martinez Road
		Unknown Name	66355 Martinez Road
		Unknown Name	66th Ave, Thermal
		Unknown Name	85641 Middleton Street
		Unknown Name	85777 Middleton Street
		Unknown Name	87125 66th Ave, Thermal
		Unknown Name	87742 66th Ave, Thermal
CVWD: Low Feasibility		Unknown Name	87850 66th Ave, Thermal
		Unknown Name	Martinez Road
	221-G	Polanco 2	67959 Lincoln
		Saint Anthony's park	67075 Hwy 111
		Unknown Name	Lincoln Street
	228-G	Duros Mobile Home Park	68507 Pierce St
		el mesquite	88000-88998 69th Ave, Thermal
		Gamez Trailer Park	69353 Pierce St
		Los Gatos Mobile Home Park	88740 70th Ave
		Oasis Mobile Home Park	88700 70th Ave
		Unknown Name	88701 70th Ave
		Unknown Name	88740 70th Ave
		Polanco 6th	88510 69th Ave
		polanco7	88773 69th Ave
		Unknown Name	
		Unknown Name	69th Ave, Thermal
		Unknown Name	70th Ave
	232-G	Angel's Ranch	72753 Pierce St
		B.C. Ranch	75655 Pierce St
		D & D Oasis Mobile Home Park	76250 Pierce St
		D&D Mobile Home Park	76086 Pierce St
		Polanco 3	76250 Pierce St
		Unknown Name	88598-88634 76th Ave, Thermal
		Unknown Name	88715-88999 76th Ave, Thermal
	261-G	Los Gatos Mobile Home Park	88705 62nd Ave
		polanco8	88847 62nd Ave
		Ramirez	88811
		Unknown Name	62nd Ave
		Unknown Name	88835 62nd Ave
	269-G	Unknown Name	56540 Fillmore St, Thermal
		Unknown Name	8441 58th Ave

Coachella Valley Water District: Wastewater Feasibility	Project ID	Site Name	Address
		Unknown Name	88100 Fillmore St, Thermal
		Unknown Name	88210 Fillmore St, Thermal
		Unknown Name	88275 Fillmore St, Thermal
		Unknown Name	88330 Fillmore St, Thermal
		Unknown Name	88420 57th Ave, Thermal
		Unknown Name	88455 57th Ave, Thermal
		Unknown Name	8867 58th Ave
		Unknown Name	John Deere St
	271-G	Unknown Name	81st Ave
		Unknown Name	80627 Harrison St
CVWD: Low Feasibility	303-G	Unknown Name	52219 Fillmore St
		Unknown Name	52742 Fillmore St, Thermal, CA
	304-G	Duarte	62775 Hwy 111
		Farm Castro	89000-89448 60th Ave
		Home	88785-89399 59th Ave
		Lopez Mobile Home Park	62325 Hwy 111
		Rancho Lemus	89000-89448 60th Ave
		Unknown Name	50970 61st Ave
		Unknown Name	59600 Pierce St
		Unknown Name	Pierce St
		Unknown Name	Hwy 111
	322-G	Unknown Name	88375 Airport Blvd, Thermal
		Valley View Trailer Park	88-041 Airport Blvd, Thermal
CVWD: Needs Research	11	MHP1	246 Coachella Ave.
	14-G	SFH	1249 California Dr.
		Unknown Name	1330 Beacon Dr.
		Single Trailer	1148 Caspian Ave.
	272-G	Desert View Mobile Home Park	87629 Desert View

Footnote: Project ID 303-G is duplicated in the CSD table as that ID has sites that fall within both the CVWD and CSD agency boundaries.

Coachella Sanitary District Connection Feasibility for Wastewater Service

Coachella Sanitary District: Wastewater Feasibility	Project ID	Site Name	Address
CSD: Main Immediate	281	Unknown Name	Tyler Ave
CSD: Low Feasibility	303-G	mobiles	Along Fillmore
		Unknown Name	800 Ave 51
		Unknown Name	87510 52nd Ave

Footnote: Project ID 303-G is duplicated in the CVWD table as that ID has sites that fall within both the CVWD and CSD agency boundaries.

Desert Water Agency Connection Feasibility for Wastewater Service

Desert Water Agency: Wastewater Feasibility	Project ID	Site Name	Address
DWA: Low Feasibility	10	Western Village Mobile Home Park	125 Pioneer Trail
	6-G	Golden Sands Park	1900 E San Rafael
		Unknown Name	24 Douglas Drive
		Unknown Name	42 Karen Ln
		Unknown Name	44 Karen Ln
		Unknown Name	69 Lynette Ln

Footnote: All of the sites listed within the Desert Water Agency table are located within the wastewater service area of the City of Palm Springs. These sites have not yet been confirmed with the City of Palm Springs.

Valley Sanitary District Connection Feasibility for Wastewater Service

Valley Sanitary District: Wastewater Feasibility	Project ID	Site Name	Address
VSD: Main Immediate	239-G	Bermuda Palms Apartment Homes	81225 Fred Waring Dr.
		Unknown Name	81235 Fred Waring Dr.

Mission Springs Water District Connection Feasibility for Wastewater Service

Mission Springs Water District: Wastewater Feasibility	Project ID	Site Name	Address
MSWD: High Feasibility	32	SFH	13695 United Rd
MSWD: Medium Feasibility	94-G	Mountain View Park	15525 Mountain View Rd
MSWD: Low Feasibility	33	Two Springs Resort	14200 N. Indian Canyon Drive
	144-G	Care Free Mobile Home Park	17069 N. Indian Ave
	74-G	Palm Drive Mobile Estates	15685 Palm Drive
		Unknown Name	15686 Palm Drive
		Unknown Name	15687 Palm Drive
		Vista Montana	15300 Palm Drive
		Whispering Sands	15225 Palm Drive

Appendix B: Potential Additional Parcels Identified for Inclusion in Utility Connection Projects

The parcels listed by APN number in the table below were identified for potential inclusion with the project identified in the first column. For example, Project 232 had four potential sites that were not a part of the geocoded DAC sites that could possibly be added to Project 232. Each of these APN's would require additional field verification and review by the appropriate agency.

Table B-1: Additional Parcels Identified for Possible Inclusion for Water Utility Connection

Water Connection Project ID	APN
206	751120010
232	755231001
	755231014
	755231015
	755231016
269	757080018
	757110031

Table B-2: Additional Parcels Identified for Possible Inclusion for Wastewater Utility Connection

Wastewater Connection Project ID	APN
144	657220010
163	654160009
	654160010
	654170043
	654170057
	654170058
	654180014
	654200055
206	751120010
228	749320015
269	757080018
	757110031
271	755231001
	755231014
	755231015
	755231016
74	656030010

Appendix VII-H: Disadvantaged Communities Project 3 – Regional Program for Septic Rehabilitation

This appendix includes the project report for the Regional Program for Septic Rehabilitation, developed in support of the DAC Outreach Program to provide a framework for planning septic system rehabilitation for small mobile home parks.

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Coachella Valley Integrated Regional Water Management Program

Disadvantaged Community Outreach Demonstration Project

Regional Program for Septic System Rehabilitation

Final Report

Prepared by:

RMC
Water and Environment

In Association with:

Pueblo Unido CDC

February 2014

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List of Abbreviations

BOD	Biological Oxygen Demand
CDPH	California Department of Public Health
CUP	Conditional Use Permit
CVRWMG	Coachella Valley Regional Water Management Group
CVSC	Coachella Valley Stormwater Channel
CVWD	Coachella Valley Water District
DAC	Disadvantaged Community
DWR	California Department of Water Resources
gpd	gallons per day
IRWM	Integrated Regional Water Management
MSL	Mean Sea Level
NGO	Non-Governmental Organization
OWTS	Onsite Wastewater Treatment System
PUCDC	Pueblo Unido Community Development Corporation
RWQCB	Regional Water Quality Control Board
SWIS	Subsurface Wastewater Infiltration System
USDA	United States Department of Agriculture
MHP	Mobile Home Park

1 Introduction and Background

This chapter presents the project background and purpose, the scope of this study, and the grant funding made available to conduct this work.

1.1 Project Background and Purpose

The Coachella Valley Water District (CVWD), representing the Coachella Valley Regional Water Management Group (CVRWMG), has entered into a contract with the Department of Water Resources (DWR) to develop a Disadvantaged Community (DAC) Outreach Demonstration Program (DAC Outreach Program) for the Coachella Valley Integrated Regional Water Management (IRWM) Region (Region). The goal of the DAC Outreach Program is to develop and implement methods to improve DAC participation in the overall Coachella Valley IRWM planning process. The DAC Outreach Program identified potential project concepts that could be implemented to directly benefit DACs and resolve high-priority water-related issues in DACs. To move the project concepts forward, the DAC Outreach Program scope included additional work to develop in-depth engineering and project management plans for priority DAC projects. The data and experience gained from the DAC Outreach Program will help to address specific DAC issues in the Coachella Valley and will also assist DWR in developing a model DAC Program for other similar areas in California.

In June of 2013 the CVRWMG and non-profit partners hired to work on the Coachella Valley DAC Outreach Program developed general project concepts that would address major issues identified by DAC stakeholders in the Coachella Valley pertaining to water resources management. Onsite Wastewater Treatment System (OWTS) rehabilitation or replacement was identified as one of the concepts to address issues associated with aging or failing OWTSs. Aging or failing OWTSs have been cited as a serious public health concern and a potential source of water quality constituents such as bacteria and nitrates in local water resources.

Due to the importance of local groundwater quality throughout the Coachella Valley, there is a need to rehabilitate or replace aging or failing OWTSs to protect the Region's groundwater supplies and prevent constituents of concern from entering agricultural drains and the Salton Sea in areas where failing OWTSs are located in the shallow groundwater aquifer. Stakeholders in the Region, particularly in the eastern Coachella Valley, have noted that failing OWTSs may not be properly designed and therefore fail because they cannot handle the amount of wastewater produced by residents. Stakeholders have also noted that regular maintenance of septic systems may not occur due to a variety of monetary and technical capability reasons.

OWTSs can be a reliable and sanitary method for treating and disposing of wastewater, provided that systems are appropriately designed and maintained. Due to the large number of OWTSs throughout the Coachella Valley, it is possible that OWTS rehabilitation or replacement projects could provide a significant positive impact to the community by:

1. Assessing current issues with failing OWTS (determine why they are failing), and
2. Implementing actions necessary to resolve OWTS issues – replacing, rehabilitating, or performing maintenance on the systems, based on identified issues.

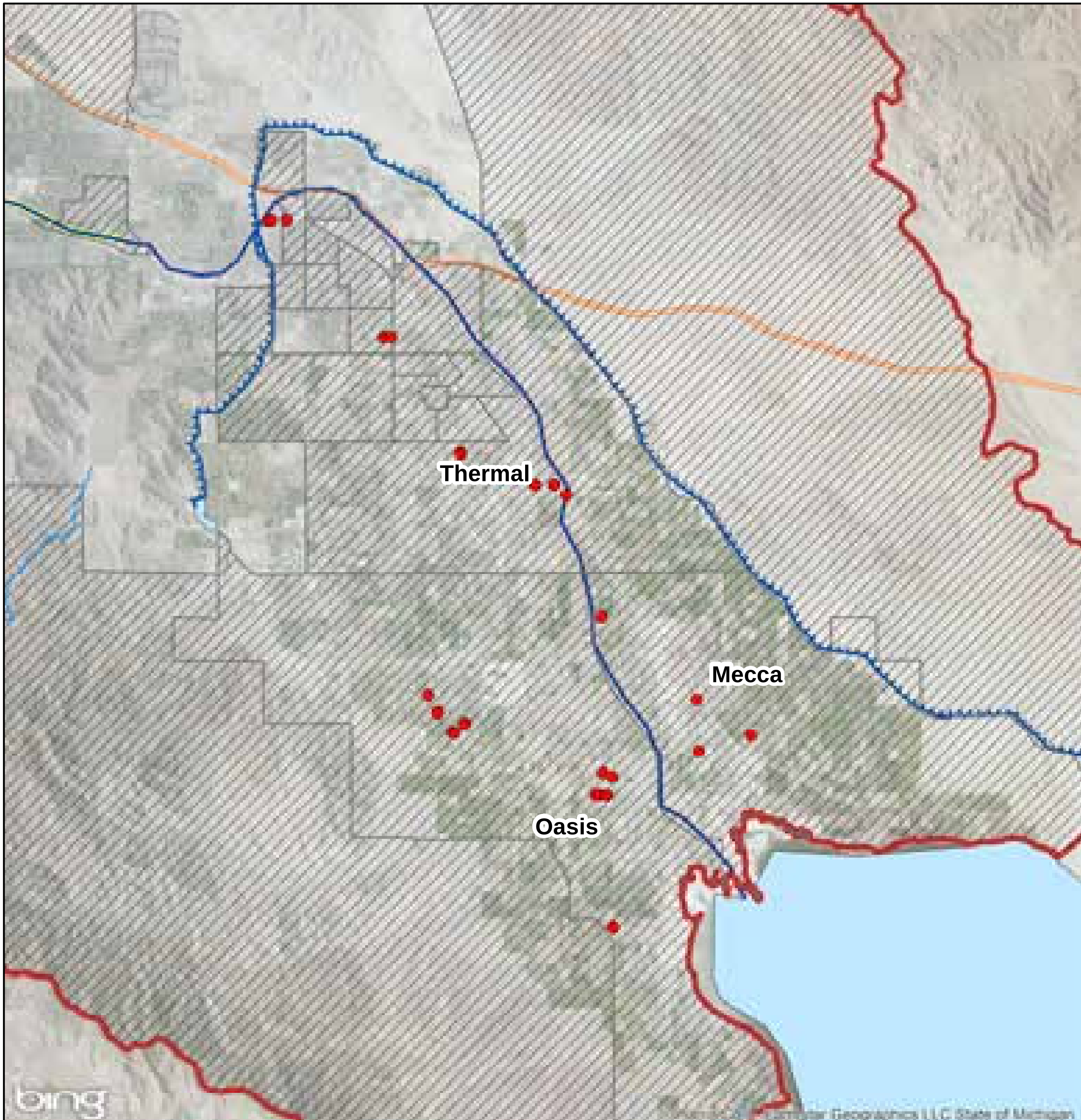
OWTS rehabilitation and replacement projects are optimal in areas that are located at far distances from municipal sewer systems, and in communities where connecting to the municipal sewer system may be too costly due to collection system expansion into remote areas. The purpose of this project was to develop an affordable onsite wastewater treatment option in instances where connecting to the municipal sewer system is not feasible due to location or costs. Affordability of septic rehabilitation may be improved with clustering of nearby communities, and should be considered for future implementation. As a result of feedback from the non-profit partners hired to work on the DAC Outreach Program, it was recommended that a rehabilitation program for OWTSs should target small mobile home parks in the eastern Coachella Valley. The locations of perceived OWTS failures as reported by local DACs in the eastern Coachella Valley are shown in Figure 1-1.

The purpose of this project is to address OWTS failure issues in eastern Coachella Valley through the following steps:

- Step 1: Work with the non-governmental organizations (NGOs) to determine representative sites with average conditions that could be considered representative of other DACs in the East Valley and that are ready and willing to participate in an OWTS rehabilitation project.
- Step 2: Conduct soils testing, prepare preliminary engineering reports, and prepare design plans for the representative sites. The work performed would determine: 1) how to design or rehabilitate existing onsite wastewater systems to achieve code compliance and 2) what onsite wastewater treatment systems could be installed to address public health concerns.
- Step 3: Identify operations and maintenance requirements and prepare a maintenance schedule that outlines and describes actions that need to occur on a regular basis to operate and maintain functioning onsite wastewater treatment systems.
- Step 4: Prepare the project report. Given the goal of replicating this process throughout other DACs, the work performed under this project would not only be site-specific, but would also indicate potential rehabilitation and treatment options for a range of onsite conditions. The report would also consider emerging technologies and advanced treatment for OWTSs in order to provide nutrient removal.

Perceived OWTS Issues from Opinion Survey

Figure 1-1



Perceived Septic Issues
Colorado River Aqueduct
Coachella and All American Canals
Whitewater River Storm Water Channel
Coachella Valley Storm Water Channel
Highways
Water Bodies
Disadvantaged Communities
Coachella Valley IRWM Region

Disadvantaged communities are considered those who earned less than $48,706 (80% Statewide MHI)

N S W E

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Miles

File Name: Fig 2-4_Wastewater and Recycled Water.mxd
File Location: L:\Projects GIS\0264-001_CoachellaIRWMP\mxds\
Date Updated: Nov 2010
Made By: DNF
Department: RMC Water & Environment

1.2 Scope of Study

RMC teamed with Pueblo Unido Community Development Corporation (PUCDC), a local non-profit organization that responds to the needs of rural communities in the eastern Coachella Valley. PUCDC has provided much-needed assistance during development of community projects, including design and permitting assistance for small mobile home parks that rely on OWTS for wastewater treatment and disposal.

The scope of this study includes:

- **Identify Representative DAC Sites** – PUCDC helped identify four DAC sites for assistance with evaluation and design of a new or rehabilitated OWTS. The sites were known by PUCDC to have unpermitted and/or failing OWTSs through their work with the Riverside County Department of Environmental Health (Riverside County DEH). The sites are all small mobile home parks that are very common throughout the eastern Coachella Valley, and are therefore considered representative of other sites.
- **Soils Testing –** Soils testing and reports were prepared by Earth Systems Southwest for three of the identified DAC sites. One of the DAC sites had a recent soils report on file with PUCDC and did not require additional soil-related work. Soils testing and reporting was performed in accordance with the requirements of Riverside County DEH.
- **Preparation of OWTS Design Plans** – PUCDC prepared the design drawings with review and assistance from RMC as the engineer and review by Earth Systems Southwest in accordance with Riverside County DEH requirements.
- **Identify Permitting Requirements** – RMC contacted Riverside County and worked with PUCDC to develop a flow chart and description of permitting requirements for DAC communities in the eastern Coachella Valley.
- **Evaluation of Treatment Alternatives** – RMC identified and evaluated various OWTS treatment and disposal alternatives and identified which conditions would merit the use of various technologies. As part of this task, RMC included a brief discussion of larger centralized and de-centralized wastewater collection and treatment facilities, although these types of systems are not considered a near-term solution for the project Study Area. This task also included identifying examples of emerging technologies for OWTSs to provide further treatment such as nutrient removal. RMC evaluated the applicability of these technologies to the Study Area based on the benefits these systems provide.
- **Prepare a Project Report** - This report is meant to provide a road map for an OWTS rehabilitation program that can be replicated by local non-governmental organizations and other interested parties. The study articulates appropriate environmental conditions, sizing procedures, preferred retrofit/rehabilitation techniques and recommendations, and maintenance protocols for OWTS. Appendix C of this report includes a work plan in a style consistent with the 2012 IRWM Grant Program – Proposal Solicitation Package for Round 2 Implementation Grants. This work plan is designed as a template for a regional septic rehabilitation program to be included in future IRWM grant applications, and provides information about the work that was completed for this report so that interested entities can potentially replicate this process to rehabilitate other OWTS in the Coachella Valley.

1.3 Grant Funding

This study is part of the Coachella Valley Disadvantaged Community Outreach Program (DAC Outreach Program), which was funded through a grant from the California Department of Water Resources. Due to limited participation by DACs in IRWM planning efforts throughout the State of California, DWR provided additional funding via grants to six IRWM regions in the state, including the Coachella Valley.

The purpose of the DAC Outreach Program in the Coachella Valley is to conduct outreach, mapping, project development, and other work to increase DAC involvement in the Coachella Valley IRWM Program and address identified DAC issues and needs. The information collected and the work products prepared for the Coachella Valley DAC Outreach Program will be sent to DWR for input on how to increase DAC participation in statewide IRWM planning efforts.

The Regional Program for Septic System Rehabilitation will also help DACs in the Coachella Valley position for additional funding sources for implementation of OWTS upgrades. One of the issues identified as part of the DAC Outreach Program is that IRWM grants provided by DWR (specifically, Proposition 84 Implementation Grants) are most suitable for construction/implementation projects. The Proposition 84 Implementation Grant applications are rigorous and require a substantial amount of technical information to successfully complete; therefore, projects that have already completed design and engineering work and are closer to implementation are generally more competitive than those that are in more conceptual phases. As such, the Regional Program for Septic System Rehabilitation provides an identified need for DAC projects as this program will get the four representative sites farther along towards implementation (by completing soils testing and design work), and will therefore increase their potential competitiveness for Proposition 84 Implementation Grant funding. In addition, there are other grants available to rural communities such as the USDA Rural Assistance Grants, which are only for construction work and will not cover costs associated with planning, design, and engineering work. Therefore, the Regional Program for Septic System Rehabilitation will also allow the four representative sites analyzed as part of the program to increase their competitiveness for other funding streams such as USDA funding.

2 Study Area and Setting

This chapter provides a description of the Study Area and conditions within the Study Area that have an impact on onsite wastewater treatment, primarily general groundwater and soil conditions. Study Area Description

2.1 Study Area Location

The Coachella Valley lies in the northwestern portion of a great valley, the Salton Trough, which extends from the Gulf of California in Mexico northwesterly to the Cabazon area. The eastern portion of the Coachella Valley IRWM Region is the focus of this study, and is shown in Figure 2-1: Project Study Area.

The Study Area is underlain by a series of groundwater basins, the largest of which is the Indio/Whitewater River Sub-Basin. The Coachella Valley is ringed with mountains on three sides. On the north and west sides are the San Bernardino Mountains, San Jacinto, and Santa Rosa, which rise more than 10,000 feet above mean sea level (MSL). To the northeast and east are the Little San Bernardino Mountains, which attain elevations of 5,500 feet above MSL.

The Coachella Valley is geographically divided into the West Valley and the East Valley. The boundary between the East Valley and West Valley extends from Washington Street and Point Happy northeast to the Indio Hills near Jefferson Street. The East Valley is considered the area southeast of the boundary line, and the West Valley is northwest of the boundary line (refer to Figure 2-1: Project Study Area). The geographic divide between East Valley and West Valley is widely used for water resources planning purposes, because the Region’s geology varies between the East Valley and West Valley. The West Valley is generally underlain by coarse-grain sediments that allow surface water to percolate to the Region’s groundwater basins. In contrast, the East Valley is underlain by several impervious clay layers (an aquitard) that impedes groundwater recharge. Section 2.3 includes further information about the Region’s soil and groundwater conditions.

Generally, the West Valley, which includes the cities of Palm Springs, Cathedral City, Rancho Mirage, Indian Wells and Palm Desert, is contained within the service areas of the Mission Springs Water District, the Desert Water Agency, or the Coachella Valley Water District, and residents within this area receive municipal water and wastewater services. In general the East Valley, which includes the cities of Coachella, Indio, and La Quinta and the communities of Mecca, Oasis and Thermal (located within Riverside County), is lower in population density. The unincorporated communities that are located within Riverside County are also rural in nature and include a high proportion of the Region’s agricultural industry. Portions of the East Valley are provided water and wastewater services by three of the five CVRWMG agencies, including the Coachella Valley Water District, the Indio Water Authority, the Coachella Water Authority, and an additional agency, the Valley Sanitary District. The East Valley communities that are not located within incorporated cities or within the service areas of the aforementioned agencies generally do not receive municipal water or wastewater services due to their geographic distance from existing water and wastewater infrastructure. Figure 2-1: Project Study Area, which shows the Study Area, also shows that there is a particular lack of existing wastewater infrastructure within the East Valley communities of Mecca, Oasis and Thermal.

Project Study Area

Figure 2-1

Division between West and East Valley
Wastewater Pipelines
Colorado River Aqueduct
Coachella and All American Canals
Whitewater River Storm Water Channel
Coachella Valley Storm Water Channel
Highways
Water Bodies
Coachella Valley IRWM Region

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Made By: DNF
Department: RMC Water & Environment

2.2 General Soil and Groundwater Conditions

The Coachella Valley Groundwater Basin encompasses much of the Coachella Valley floor. Geologic faults and structures divide the basin into five sub-basins. Two of the sub-basins, Whitewater River (also referred to as Indio) and Desert Hot Springs, fall within the project Study Area. The locations of these groundwater sub-basins are shown in Figure 2-2: Groundwater Basins in Coachella Valley Study Area.

The Indio/Whitewater River Sub-basin is the largest groundwater sub-basin in the Coachella Valley. The sub-basin has a storage capacity of approximately 30 million acre-feet (AF) (DWR, 1964). The geology of the basin varies with coarse-grained sediments located in the vicinity of Whitewater and Palm Springs (West Valley), gradually transitioning to fine-grained sediments near the Salton Sea (East Valley).

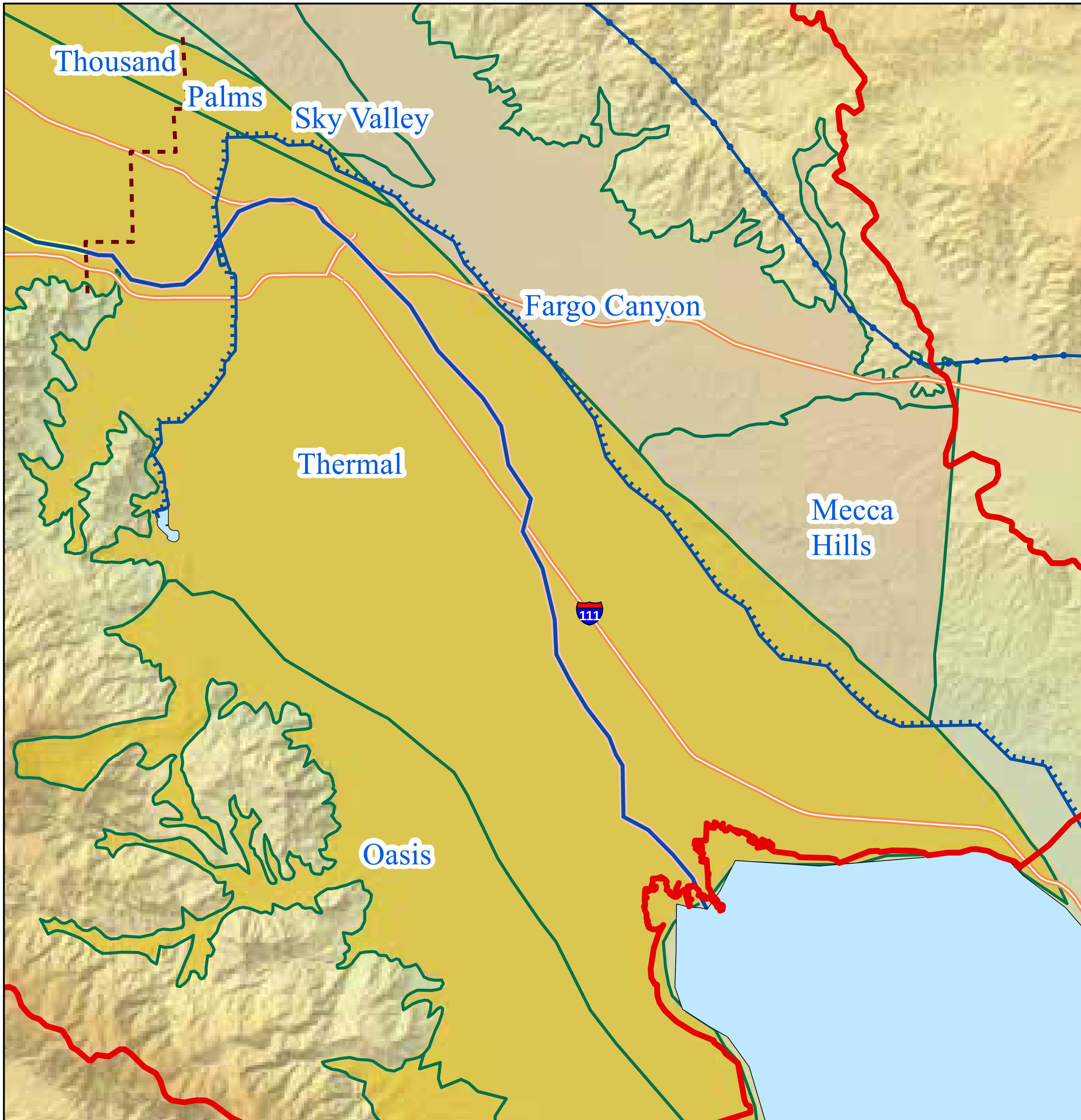
Due to high percolation potential in the West Valley, discharges from OWTSs in the West Valley area may reach the underlying groundwater basin and could potentially impact groundwater quality. Due to nitrate and bacteria content within OWTS discharges, septic discharge is highly regulated in several areas in the West Valley. According to the last *Water Quality Control Plan for the Colorado River Basin* (Basin Plan) adopted by Colorado River Basin Regional Water Quality Control Board (RWQCB), OWTS discharge restrictions have been placed in specific locations within the West Valley.

In the East Valley, several impervious silt and clay layers (collectively referred to as an aquitard) lie between the ground surface and the main groundwater aquifer. Formed by remnants of ancient lake beds, this aquitard layer generally impedes percolation into groundwater aquifers in the East Valley. As a result, for portions of the East Valley underlain by the aquitard, discharges from OWTS do not likely make contact with groundwater in the deep aquifers, and the Basin Plan does not include discharge restrictions within the East Valley. There are portions of the East Valley that have permeable soil; within these areas OWTS discharges may flow to the underlying groundwater basin. Even with the presence of the aquitard, surface water in the East Valley that percolates into the shallow groundwater aquifer ultimately flows to agricultural drains and potentially to the Salton Sea. Although there is no site-specific water quality data for the existing OWTSs, it is suspected that insufficiently treated wastewater from the OWTSs percolates to and potentially contaminates the underlying shallow groundwater aquifer. The presence of a high groundwater table and poor percolation rates in the East Valley can also negatively impact the operation of the OWTSs, and may result in the subsurface flow of water from the septic system to adjacent agricultural drains.

The general soil and groundwater conditions of the West Valley compared to the East Valley are another reason that the Study Area only focused on OWTS rehabilitation and retrofitting options in the East Valley. Given Basin Plan restrictions on OWTS in the West Valley, rehabilitating OWTS in this area was not considered as part of this study. However; this study did consider the potential to implement additional treatment methods, which would be most beneficial in areas of the West Valley as they can reduce nitrate levels and other constituents from the OWTS waste byproducts (refer to Section 3.2 of this report for more information).

Groundwater Basins in Study Area

Figure 2-2



- Division between West and East Valley
- Colorado River Aqueduct
- Coachella and All American Canals
- Whitewater River Storm Water Channel
- Coachella Valley Storm Water Channel
- Highways
- Water Bodies
- Coachella Valley IRWM Region

Groundwater Basins in Study Area

- Desert Hot Springs
- Indio/Whitewater River
- Groundwater Sub Areas

Source: DWR Bulletin 118 & 2010 Coachella Valley Water Management Plan

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Date Updated: November 4, 2013
Department: RMC Water & Environment

3 Wastewater Treatment Alternatives

This chapter presents wastewater treatment options for rural residential communities, such as those located within the eastern Coachella Valley. Countless variations of wastewater collection and treatment technologies are available on the marketplace today; therefore, every possible wastewater treatment option cannot be included in this report. This report focuses on options which are most applicable to the Study Area.

3.1 Conventional OWTS

Installation of conventional OWTS or upgrades to existing systems in remote rural communities is often the most cost-effective and preferred option for addressing existing wastewater treatment issues. This is because OWTSs are effective and simple if properly designed and maintained, and are therefore a good option in remote areas where connection to a larger municipal system is not feasible. Conventional OWTSs are described below.

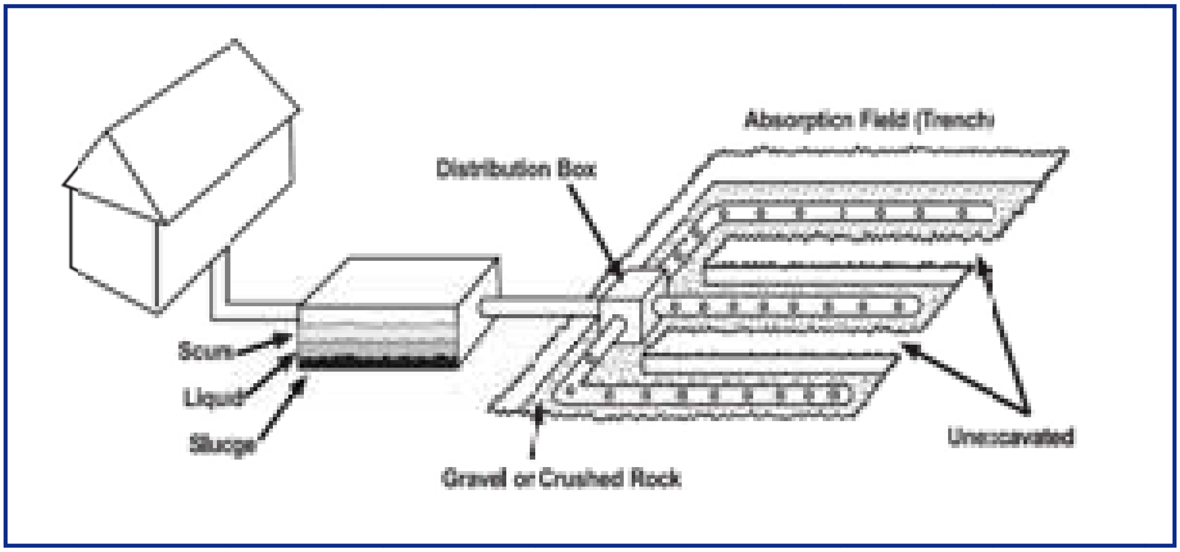
3.1.1 Description

Conventional OWTSs have the ability to remove suspended solids, floatable grease and scum, nutrients, and pathogens from wastewater discharges. The typical OWTS consists of two main components:

- Septic tank
- Disposal system (including the soil)

A typical OWTS is shown in Figure 3-1. The particular system shown in the figure below has a soil absorption field Surface Wastewater Infiltration System (SWIS) to dispose of septic tank effluent. Other septic tank SWIS options are available and are sometimes required based on site restrictions. Alternative disposal systems that do not discharge to the soil are also available.

Figure 3-1: Conventional Onsite Wastewater Treatment System



Source: EPA OWTS Manual 2002

Septic tanks remove most settleable and floatable material and function as an anaerobic bioreactor that promotes partial digestion of retained organic matter. Septic tank effluent, which can contain significant concentrations of pathogens and nutrients, is discharged to soil, sand, or other media absorption fields for further treatment through biological processes, adsorption, filtration, and infiltration by the underlying soils.

Conventional OWTSs are passive, effective, and inexpensive treatment systems due to the assimilative capacity of many soils, which can transform and recycle most pollutants found in domestic wastewater. Soil characteristics, lot size, and the proximity of sensitive water resources affect the use of conventional OWTS.

3.1.2 Regulations

Since 2005, septic system discharges have been gradually restricted in portions of the West Valley to protect deep groundwater aquifers from potential contamination. The aquitard protects the deep groundwater aquifers in the East Valley from potential contamination, and the Basin Plan does not restrict OWTS usage in the East Valley. According to current regulations, new septic systems that generate more than 5,000 gallons per day (gpd) from a single lot are required to apply for general discharge permit from the RWQCB. Smaller users with projected sewer flows lower than 5,000 gpd may apply for Conditional Use Permits (CUPs) according to guidelines established by Riverside County.

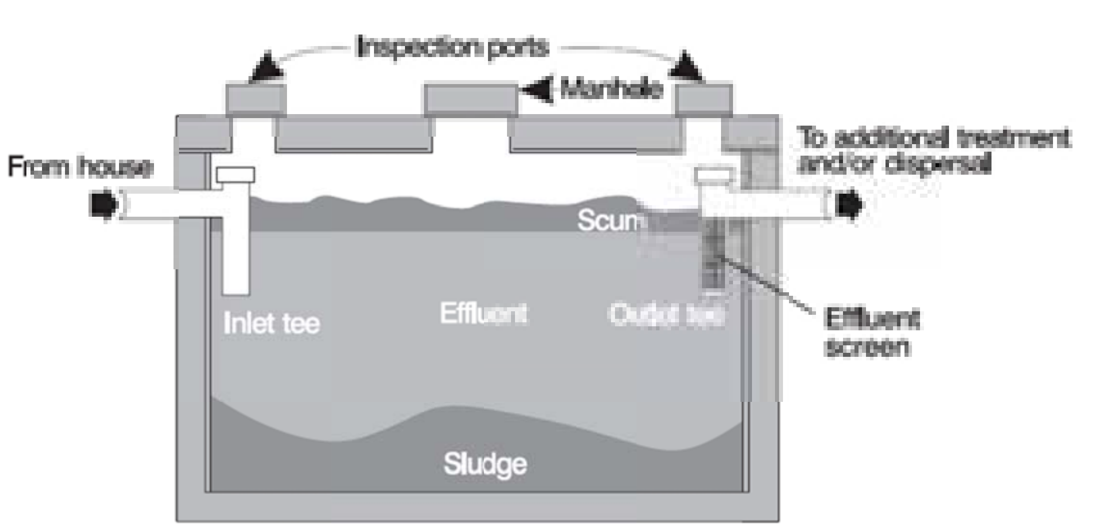
Riverside County continually updates their Technical Guidance Manual for Onsite Wastewater Treatment Systems according to the best available knowledge and technology. As a result, existing systems in the Study Area may not be designed according to the most current guidance manual available. Despite this fact, all existing OWTSs do not necessarily need to be rehabilitated, and rehabilitation of all of the existing systems may be cost-prohibitive and unnecessary. As a first step, OWTS owners should hire a C-42 State-licensed plumber to evaluate their existing systems for proper functionality. Systems that are determined to be operating under normal conditions can be certified as existing subsurface disposal systems. Riverside County may approve properly certified existing systems during the CUP application process based on performance, even though their configuration may be slightly different from the most current design requirements.

The most recent update to the Basin Plan will incorporate the 2012 OWTS Policy from the State Water Resources Control Board (State Board), which has a more stringent guideline on OWTS usage. The State Board will give an initial five-year waiver period to local jurisdictions to incorporate the OWTS Policy into local codes; this waiver period expires in May of 2018. Currently, Riverside County recommends following the existing design manual for implementing this proposed septic rehabilitation program, because the Region's local regulations regarding OWTS will not change for five years. As long as existing facilities are properly functional at the time the OWTS Policy is implemented, the existing OWTS will be in automatic compliance with the new OWTS Policy as properly functional existing systems. Specific guidelines regarding conventional septic system design is discussed in following sections.

3.1.3 Septic Tank

The septic tank is the most commonly used wastewater pretreatment unit for onsite wastewater systems. The septic tank is connected to the house sewer main and is the first treatment process in an OWTS. The septic tank provides primary treatment inside a covered, watertight vessel. In addition to primary treatment, the septic tank stores and partially digests settled and floating organic solids in sludge and scum layers. The process can reduce sludge and scum volumes by as much as 40 percent. At the same time, the septic tank conditions the wastewater by breaking down organic molecules for subsequent treatment in the soil or by other unit processes. Gasses generated from digestion of the organic matter are vented back through the building sewer and out of the house plumbing vent. Inlet structures are designed to limit short-circuiting of incoming wastewater across the tank to the outlet, while outlet structures retain the sludge and scum layers in the tank and draw effluent only from the zone between the sludge and scum layers. The outlet should be fitted with an effluent screen to retain larger solids that might be carried in the effluent to the SWIS, where it could contribute to clogging and eventual system failure. Risers are provided to allow access for inspection and maintenance. See Figure 3-2 for a cross section of a typical septic tank.

Figure 3-2: Typical Single Compartment Septic Tank



Source:
National Small Flows Clearinghouse (NSFC). 2000. Small Flows Quarterly. Vol.1, No.4, Summer 2000. National Environmental Service Center, West Virginia University. Morgantown,WV.

Riverside County has specific requirements for septic tanks, including:

1. Risers and effluent filters must be provided that meet the requirements defined in Riverside County Ordinance Number 650.
2. A minimum of two risers must be provided, one on the influent side and the other on the effluent side. The risers should extend to within 4 inches of the final grade, must be sealed off with an approved lid, and be accessible from the ground surface.
3. Liquid capacity shall conform to the Uniform Plumbing Code based on the number of bedrooms and the estimated waste/sewage design flow rate or the number of plumbing fixture units, whichever is greater. Sizes for typical septic tanks are presented below in Table 3-1.

Table 3-1: Typical Septic Tank Liquid Volume Requirements

Septic Tank Sizes	Uniform Plumbing Code (gallons)
Minimum	750
1-2 Bedrooms	750
3 Bedrooms	1,000
4 Bedrooms	1,200
5 Bedrooms	1,500
Additional Bedrooms (each)	Add 150

Water-tightness of the septic tank is critical to the performance of the entire OWTS. Infiltration of clear water to the tank from the building's storm sewer or groundwater adds to the hydraulic load of the system and can upset the treatment processes. Exfiltration of water from the septic tank can threaten groundwater quality with partially treated wastewater if the liquid level is lowered below the outlet baffle and the outlet baffle becomes fouled with scum.

3.1.4 Disposal Systems

Disposal systems can be divided into two main categories:

- Subsurface water infiltration systems (SWIS), which discharge water to the surrounding soil, and
- Systems that do not discharge to the surrounding soil

Riverside County DEH currently allows systems that dispose of effluent through evapotranspiration (plant uptake) where SWIS systems are not feasible due to site conditions. Evapotranspiration systems are discussed as alternatives to SWIS below. Many other types of disposal systems are available, but the systems below are the most applicable to the Study Area at this time and are currently allowed by Riverside County DEH.

Subsurface Wastewater Infiltration System (SWIS)

There are many different types of SWISs as disposal systems for septic tank effluent. Systems which have been permitted in Riverside County are discussed in this section and include soil absorption fields, seepage pits, and mound systems. The purpose of this part of the OWTS is to disperse primary treated effluent from the septic tank to the soil for further treatment.

SWIS applications differ in their geometry and location in the soil profile (vertical location with respect to the ground surface). Trenches have a large length-to-width ratio, while seepage pits are deep, circular excavations that rely almost completely on sidewall infiltration. Three types of SWISs that are permitted in Riverside County are presented below.

SWISs disperse septic tank effluent to the soil for further treatment. Effluent is transported from the infiltration system through three zones in the soil. These three soil zones are described below:

- Infiltration zone: The infiltration zone is a transition zone between the disposal system and the soil interface. The infiltration zone is only a few centimeters thick, is the most biologically active zone, and is often referred to as the "biomat." Carbon-rich material in the wastewater is quickly degraded in this zone, and nitrification occurs immediately below this zone if sufficient oxygen is present.
- Vadose zone: The vadose zone is an unsaturated zone beneath the infiltration zone. The vadose zone provides a significant pathway for oxygen diffusion to re-aerate the infiltration zone, and it is also the zone where most absorption reactions occur because the negative moisture potential in the unsaturated zone causes percolating water to flow into the finer pores of the soil, resulting in greater contact with the soil surfaces. Much of the phosphorus and pathogen removal occurs in this zone
- Saturated Zone: Below the vadose zone, the fluid passes through the saturated zone. In this zone treated wastewater can be carried from the site by fluid movement.

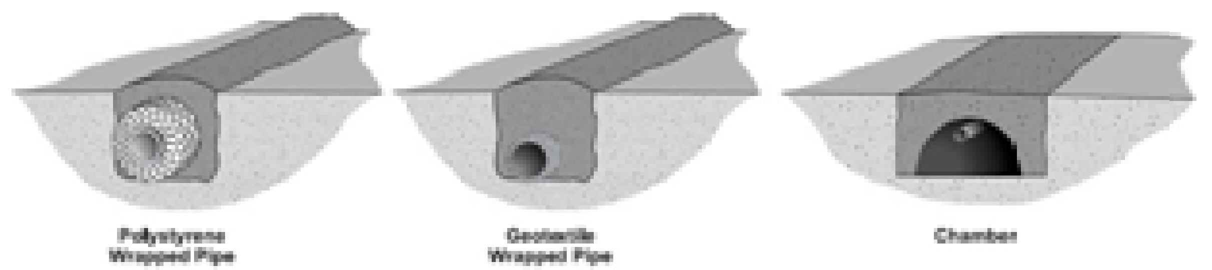
Soil Absorption Field or Leach Field

In soil absorption fields, infiltration surfaces may be created in natural soil or imported fill material. Most traditional systems are constructed below ground surface in natural soil. In some instances, a restrictive (impermeable) soil type above a more permeable soil type may be removed during the time of excavation.

The performance of conventional systems relies primarily on the treatment of the wastewater effluent in the soil horizon below the dispersal and infiltration components of the SWIS. SWIS are the most commonly used systems for the treatment and dispersal of onsite wastewater. As the wastewater infiltrates and percolates through the soil, it is treated through a variety of physical, chemical, and biochemical processes and reactions. The primary infiltrative surface is the bottom of the buried excavations. Perforated pipe is installed on top of the infiltrative surface to distribute the wastewater over the infiltration surface. A porous medium, typically gravel or crushed rock, is placed in the excavation below and around the distribution piping to support the pipe and spread the localized flow from the distribution pipes across the excavation cavity. However, other gravel-less or "aggregate-free" system components may be substituted (refer to Figure 3-3: Various Gravel-less Systems). Natural soil is typically used for backfilling, and the surface of the backfill is usually slightly mounded and seeded with grass.

A leaching chamber is one of the commonly used “gravel-less” systems for a leach field (Figure 3-3: Various Gravel-less Systems). These systems can be installed with small equipment and in hand-dug trenches where conventional gravel systems would not be possible. Leaching chambers have two key functions: to disperse the effluent from septic tanks and to distribute flow throughout the trenches. A typical leaching chamber consists of several high-density polyethylene injection-molded arch-shaped chamber segments. There are gravel-less systems that have drain field chambers with no bottoms and plastic chamber sidewalls, available in a variety of shapes and sizes.

Figure 3-3: Various Gravel-less Systems



Source:
National Small Flows Clearinghouse (NSFC). 2001. Pipeline. Vol.12, No.3, Summer 2001. National Environmental Service Center, West Virginia University. Morgantown,WV.

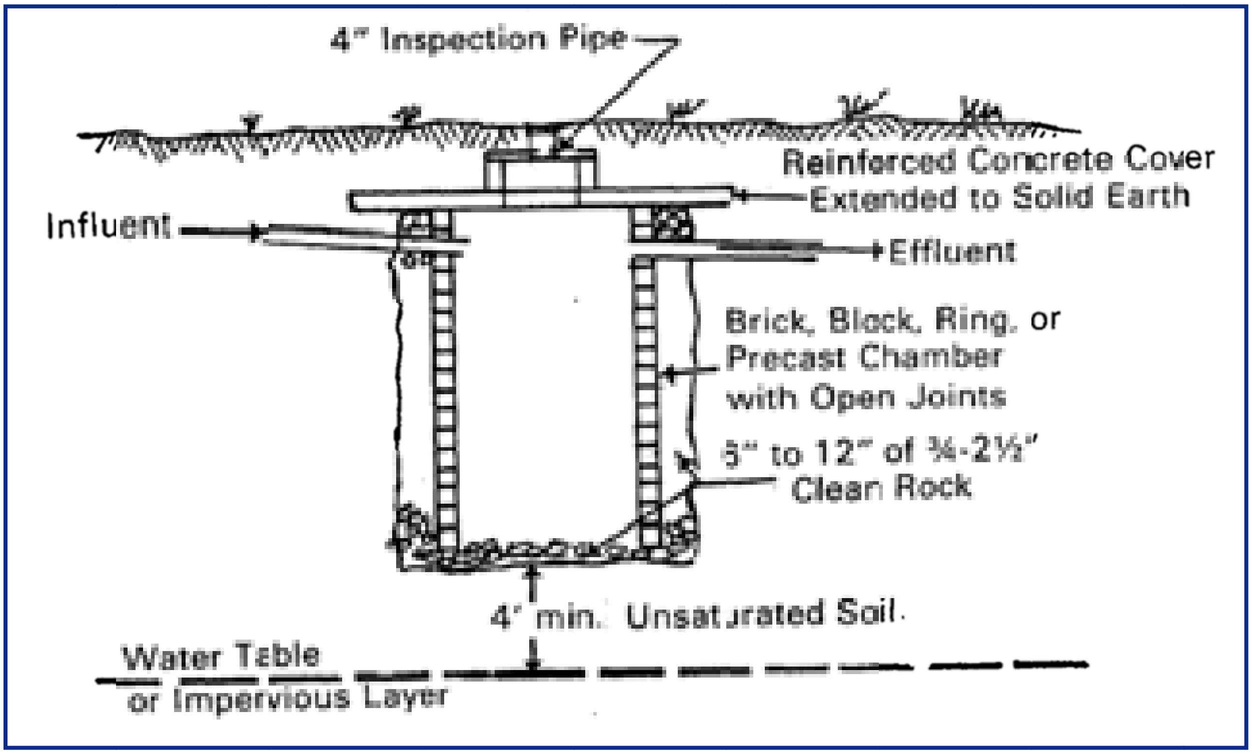
Riverside County has specific requirements for leach field systems. The guideline specifies the width of the leach fields, minimum separation between leach lines and minimum depth of soils between the bottom of the leach field and high groundwater level. Key requirements include:

- A minimum of 5 feet between the high groundwater level and the leach lines, except for some areas in the Coachella Valley where a minimum of 4 feet separation from groundwater is allowed.
- A minimum percolation rate for leach fields of 1 inch/hour (see Section 3.5 on soils, below).
- The width of the leach fields must be equal to 3 feet, with 4 feet minimum separation by sufficient natural and undisturbed soil between leach lines.
- Leach chamber must be laid level and the end of the line must be capped.

Seepage Pits

Seepage pits are deep excavations used for subsurface disposal of septic tank effluent. Covered porous-walled chambers are placed in the excavation chamber and surrounded by gravel or crushed rock. Wastewater enters the chamber where it is stored until it seeps out through the chamber wall and infiltrates the sidewall of the excavation. Seepage pits are used where land area is too limited for trench or the upper 3 to 4 feet of the soil profile is underlain by a more permeable unsaturated soil material of great depth. Site condition is similar to leach field except that soils with percolation rates slower than 30 minutes per inch are generally excluded. Seepage pits also require a minimum of 10 feet of soil between the groundwater and the bottom of a seepage pit and are therefore not often applicable in the project area. An example of a seepage pit is shown in Figure 3-4: Seepage Pit

Figure 3-4: Seepage Pit



Source: EPA OWTS Design Manual 1980

Riverside County has specific requirements for seepage pit systems. Those requirements include:

- A minimum of 10 feet between the high groundwater level and the leach lines.
- A minimum percolation rate for leach fields of 1.1 gallons per square foot of sidewall per day (see Section 3.5 on soils, below).
- The diameter of the seepage pit should be no less than 5 feet. The pit shall be lined with approved materials listed in Riverside County OWTS design manual.
- The sidewall should have a minimum of 10 feet below the inlet, and a maximum total depth of 40 feet.

Mound System

Placement of a SWIS infiltration surface may be below, at, or above the existing ground surface. Actual placement relative to the original soil profile at the site is determined by desired separation from a limiting condition. The mound system was originally developed to overcome problems with low-permeability soils (with slow permeation) and high water tables in rural areas. Mound systems are soil absorption systems that are elevated above the natural soil surface in a suitable fill material. The purpose of the design is to overcome site restrictions that prohibit the use of conventional SWISs. Such restrictions are:

1. Slowly permeable soils

2. Shallow permeable soils over porous bedrock
3. Permeable soils with high water tables

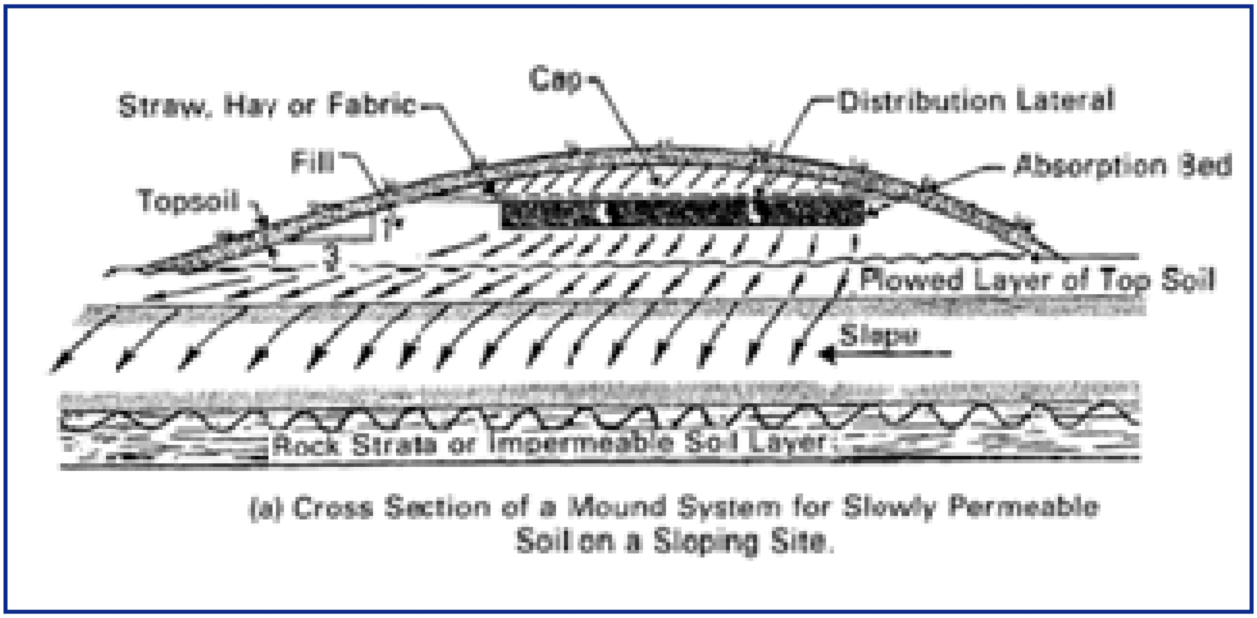
In slowly permeable soils, the mound serves to improve absorption of the effluent by utilizing the more permeable topsoil and eliminate construction in the wetter and more slowly permeable sub-soil. In permeable soils with high water tables (insufficient depth to groundwater) or over porous bedrock, the fill material in the mound provides the necessary treatment of the wastewater without relying on the natural soil below.

The mound system consists of:

1. A suitable fill material
2. An absorption area
3. A distribution network
4. A cap
5. Top soil

In a mound system, the effluent is pumped or siphoned into the absorption area through a distribution network located in the upper part of the coarse aggregate. Effluent passes through the aggregate and infiltrates the fill material. Treatment of the wastewater occurs as it passes through the fill material and the unsaturated zone of the natural soil. The cap sheds precipitation, and retains moisture for a good vegetative cover.

Figure 3-5: Typical Mound System



Source: EPA OWTS Design Manual 1980

The Riverside County Department of Environmental Health will allow mound systems on a limited basis. The only situation where a mound system will be approved is if the groundwater level is very close to the ground surface. Due to the relative small number of mound systems used in Riverside County, this type of system is evaluated case by case. Formal guidelines for design requirements are not provided in the OWTS manual developed by Riverside County.

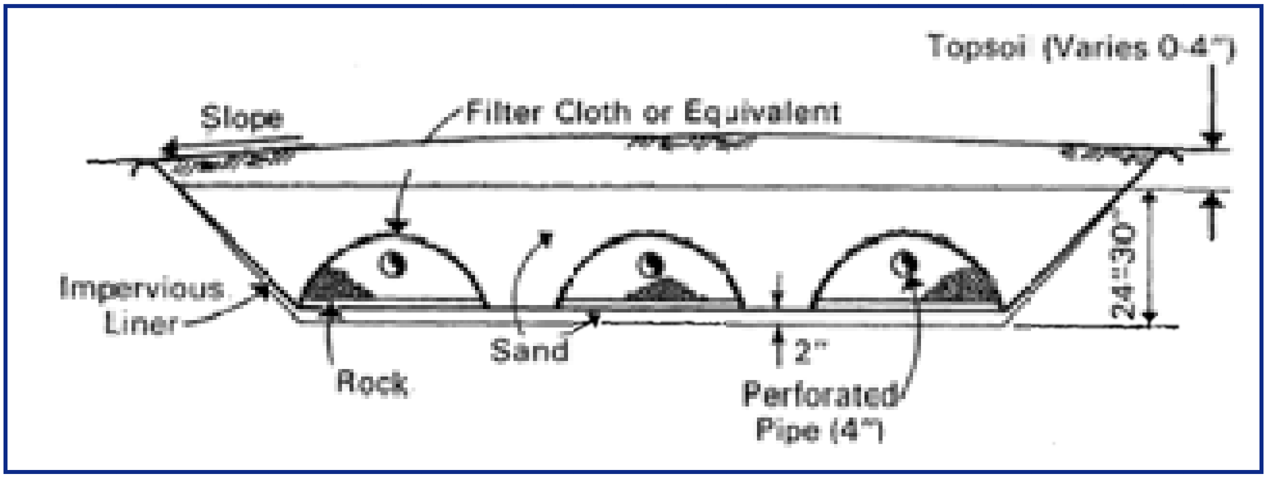
Alternative Disposal Methods (Evapotranspiration System)

A "last resort" solution is to dispose of wastewater to the atmosphere so that discharge to surface or groundwater is reduced or eliminated. An evapotranspiration (ET) system normally consists of a sand bed with an impermeable liner and effluent distribution piping. The surface of the sand bed may be planted with vegetation. An ET system functions by raising the effluent to the upper portion of the bed by capillary action in the sand, and then evaporating it to the atmosphere. In addition, vegetation transports water from the root zone to the leaves, where it is transpired. The design needs of ET systems are based on a correlation between available pan evaporation data and observed ET rates.

ET disposal systems are primarily used where geological limitations prevent the use of subsurface disposal, and where discharge to surface water is not permitted or feasible. The geological conditions that tend to favor the use of ET systems include very shallow soil mantle, high groundwater, relatively impermeable soils, or fractured bedrock. As with other disposal methods that require area-intensive construction, the use of ET systems can be constrained by limited land availability and site topography. Based on experience to date with ET disposal for year-around single-family homes, approximately 4,000 to 6000 square feet of available land is typically required.

By far the most significant constraint on the use of ET systems is climatic conditions. The evaporation rate is controlled primarily by climatic factors such as precipitation, wind speed, humidity, solar radiation, and temperature. Recent studies indicate that essentially all of the precipitation that falls on an ET bed infiltrates into the bed and becomes part of the hydraulic load that requires evaporation.

Figure 3-6: Typical Evapotranspiration System



Source: EPA OWTS Design Manual 1980

The Riverside County Department of Environmental Health will allow ET systems on a limited basis. The only situation where an ET system will be approved is if the groundwater level is very close to the ground surface. Due to the relative small number of ET systems used in Riverside County, this type of system is evaluated case by case. Formal guidelines for design requirements are not provided in the OWTS manual developed by Riverside County.

3.1.5 Site Conditions and Applicability of Disposal Systems

Soils testing conducted during the planning stage of OWTS design helps to select the appropriate disposal method. Riverside County requires a minimum of one percolation test and one 15-foot deep boring on each lot within the proposed site. Soil test results are generally valid for one year. If results were obtained longer than one year prior to design, a soil engineer needs to re-assess the site for significant changes in soil conditions, and submit a letter of update to Riverside County. Percolation tests and borings need to be conducted according to test procedures and details provide in Riverside County OWTS Design Manual.

Riverside County requires that soil in the area of the OWTS shall not have a percolation rate slower than 60 minutes per inch for absorption fields or 1.1 gallons per square foot of sidewall per day for seepage pits.

If the percolation rates are faster than 5 minutes per inch for leach lines or 10 gallons per square foot per day for seepage pits, the soil depths required must contain at least 10% fines smaller than 0.08 millimeters (fit through a #200 sieve).

If no groundwater is detected in the 15 foot boring, that high groundwater table would not impact OWTS performance according to Riverside County OWTS design manual. Otherwise, additional facts and findings need to be provided to demonstrate that groundwater table will not fluctuate to the point of encroachment. Table 3-2: Selection of OWTS Disposal Methods under Various Site Constraints includes a matrix of general site soil and groundwater conditions and the applicable disposal system that would be appropriate for each condition.

Table 3-2: Selection of OWTS Disposal Methods under Various Site Constraints

Systems	Site Constrains and Applicability								
	Soil Permeability			Depth to Bedrock			Water Table		Small Lot Size
	Rapid	Moderate	Slow	Shallow and Porous	Shallow and Nonporous	Deep	Shallow	Deep	
Leach field	-	Y	-	-	-	Y	-	Y	-
Seepage Pits	-	Y	-	-	-	Y	-	Y	Y
Evapotranspiration	-	Y	Y	Y	Y	-	Y	Y	-
Mound	Y	Y	Y	Y	Y	-	Y	Y	-

Footnotes: Y means system can function effectively with that constraint.

3.1.6 Operations and Maintenance Requirements

Operations and maintenance (O&M) of OWTS is relatively straightforward compared to more complex treatment alternatives. Because the systems are passive, there is no day-to-day operation required. The following are regular O&M requirements for a conventional OWTS:

- **Annual inspection and maintenance:** Including cleaning of the effluent filter or screen, checking sludge and scum accumulations, inspecting for structural soundness, water-tightness, and the condition of the inlet and outlet baffles and screens, and observing the condition of the leach field or disposal system for signs of overloading (such as water ponding). These inspections should not require entering the septic tank, as it is a confined space and entering can be extremely hazardous because of toxic gases and/or insufficient oxygen.
- **Septic tank pumping (every 3-5 years):** Periodic pumping of the septic tank is required to ensure proper system performance and reduce the risk of hydraulic failure. Septic tanks should be pumped when sludge and scum accumulations exceed 30 percent of the tank volume or are encroaching on the inlet and outlet baffle entrances, which, in general is every 3 to 5 years depending on the size of the tank, the number of building occupants, and household appliances and habits. Accumulated sludge and scum material (septage) stored in the tank should be pumped by a certified, licensed, and trained service provider and reused or disposed of in accordance with applicable codes. Most septage in California is treated at publicly owned sewage/wastewater treatment plants. The facilities accepting septage are generally larger municipal wastewater facilities.

3.1.7 Advantages/Disadvantages of Conventional OWTS

Conventional OWTSs are economical and can meet performance requirements in many applications, particularly when connection to a municipal wastewater collection system is infeasible. Conventional systems work well if they are installed in areas with appropriate soils and hydraulic capacities, designed to treat the incoming waste load to meet public health, groundwater, and surface water performance standards, installed properly, and maintained to ensure long-term performance. In most parts of the Study Area, soils are moderately permeable. Therefore the most appropriate SWIS is a leach field for the Study Area. Deep groundwater aquifers are protected from septic discharge impacts by the impermeable strata layer (aquitard). Even though nitrate and bacteria removal of conventional OWTS is lower than advanced systems (see Section 3.2), the combination of septic tank and leach field remains the method of choice for wastewater treatment by many rural communities in the Study Area. .

3.2 Advanced Treatment Options

Onsite nitrogen removal has been well-documented, and common treatment systems include conventional engineered systems as well as proprietary systems. In areas where there is no aquitard (West Valley) and nitrate is a concern, additional add-on components for nitrogen removal could be added to the conventional OWTS. The nitrogen removal treatment units could be connected between the septic tank and disposal system to provide enhanced nitrate removal. The process takes place in two steps: adding nitrifying bacteria to convert the ammonia to nitrate, then reducing the nitrate to nitrogen gas so it can be released to atmosphere.

There are many technologies available for advanced treatment for OWTS. Most systems fall under one of the following three categories: Aerobic treatment units (ATUs), sequencing batch reactor (SBR) or media filters.

All three of these categories of treatment are discussed below and two proprietary examples of the most common system (media filters) are presented. Many different technologies are available on the market, including systems that are combinations of the three main technologies discussed, or that do not fit into these categories altogether. Under the scope of this study, all options for advanced treatment cannot be presented or evaluated. A detailed study of OWTS treatment options is presented in the *Review of Technologies for Onsite Wastewater Treatment in California*, prepared for the California State Water Resources Control Board (UC Davis 2002).

3.2.1 Aerobic Treatment Units

Aerobic treatment units (ATUs) generally consist of two treatment processes, an aerobic reaction process and a clarification process. The aerobic reaction process uses air injection or blowers to aerate the wastewater and support bacterial growth to decompose organic material. This is followed by clarification (settling) to allow solids and bacteria to settle out of the wastewater before it is sent to the disposal system, which is any of the systems described above for conventional OWTS. Some of the solids and bacteria from the clarification process are returned to the aerobic reaction chamber for mixing and additional treatment. The process reduces total suspended solids (TSS) and biochemical oxygen demand (BOD) versus conventional OWTS.

3.2.2 Sequencing Batch Reactors

A sequencing batch reactor (SBR) utilizes the same treatment technology as ATUs but uses a single treatment tank to perform aeration and clarification through cycles. Wastewater enters the tank, then the full tank is aerated for biological treatment. After aeration, mixing halts, and the solids are settled. Effluent is decanted from a clear zone in the tank. The last phase of the cycle is an idle period to promote anaerobic conditions for nitrogen removal. SBRs reduce TSS, BOD and can also reduce nitrogen in effluent.

3.2.3 Media Filters

Likely the most common form of advanced treatment for OWTS, media filters consist of a watertight structure containing media that provides a surface for bacteria to grow. The wastewater is trickled through the media bed and the bacteria growing on the media provide treatment by decomposing organic matter and consuming nutrients in the effluent. The filter is maintained in an aerobic environment which promotes the establishment of beneficial aerobic microorganisms.

The process of identifying nitrogen reduction treatment systems began with reviewing the Environmental Protection Agency's Environmental Technology Verification (ETV) Program. The ETV Program tested residential nutrient reduction technologies and verified the nitrogen reduction performance of systems designed to treat residential wastewater. Two media filtration companies that were evaluated through the ETV Program are Aquapoint and SeptiTech. These companies provide packaged wastewater treatment systems for residential homes and larger commercial systems. The systems are described in more detail below.

Aquapoint Bioclere

The Aquapoint Bioclere system is a modified trickling filter over a clarifier. Wastewater from the home is treated through the septic tank and flows into the baffled chamber of the Bioclere system. A cross-section view of the Bioclere system is shown in Figure 3-7.

With a Bioclere system, wastewater is passed through a media filter periodically through the day. Oxygen is distributed throughout the filter by a fan that draws external air into the Bioclere systems. Microorganisms living on the media filter (also called biomass) reduce the organic content of the wastewater. Biomass will grow and subsequently slough off the media and fall to the bottom of the clarifier. A sludge pump will pump the settled biomass from the clarifier back to the septic tank. Treated water will flow from the top of the clarifier past a floating sludge separator to a subsurface dispersal field.

To reduce nitrate in the effluent, biological nitrification/denitrification must occur. Nitrification occurs in the Bioclere via the aerobic (oxygenated) environment of the media filter. Denitrification will also occur in the trickling filter because diffused oxygen will be used up by the aerobic outer portion of the biomass and anoxic (lack of oxygen) conditions are created within the biological film. Denitrification is also achieved by re-circulating nitrified wastewater from the Bioclere back to the septic tank.

The Bioclere system is visible from the ground. The top of the clarifier unit rises 1-2 feet above the ground surface and has a vent located a few feet away from the unit. Vegetation can be planted around the treatment units to help camouflage them, but should not interfere with access for maintenance.

SeptiTech

The SeptiTech system is a biological trickling filter. Wastewater from the home is treated through the septic tank and flows by gravity to the SeptiTech system. A pump at the bottom of the treatment tank moves wastewater over the media filter, as shown in Figure 3-8. Biomass growth on the media reduces the organic load of the wastewater as well as performs nitrification/denitrification to remove nitrogen. Solids that settle at the bottom of the tank are pumped back to the septic tank. Similar to the Bioclere system, nitrified wastewater is pumped back to the septic tank for denitrification.

The SeptiTech system is hardly visible from the surface. Both the septic tank and treatment tank are completely buried with only access hatches reaching the ground surface. The treatment system can be camouflaged with vegetation, similarly to the Bioclere system. An air vent will be required, which can be located next to the house or another structure.

Figure 3-7: Cross-Section View of a Bioclere System

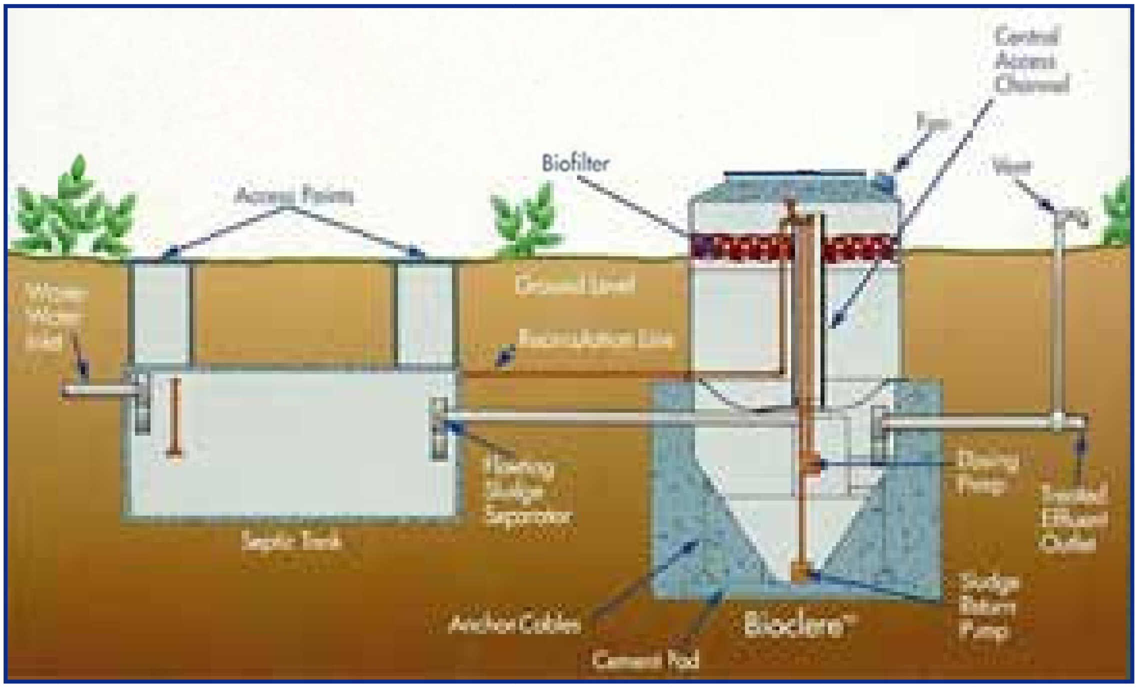
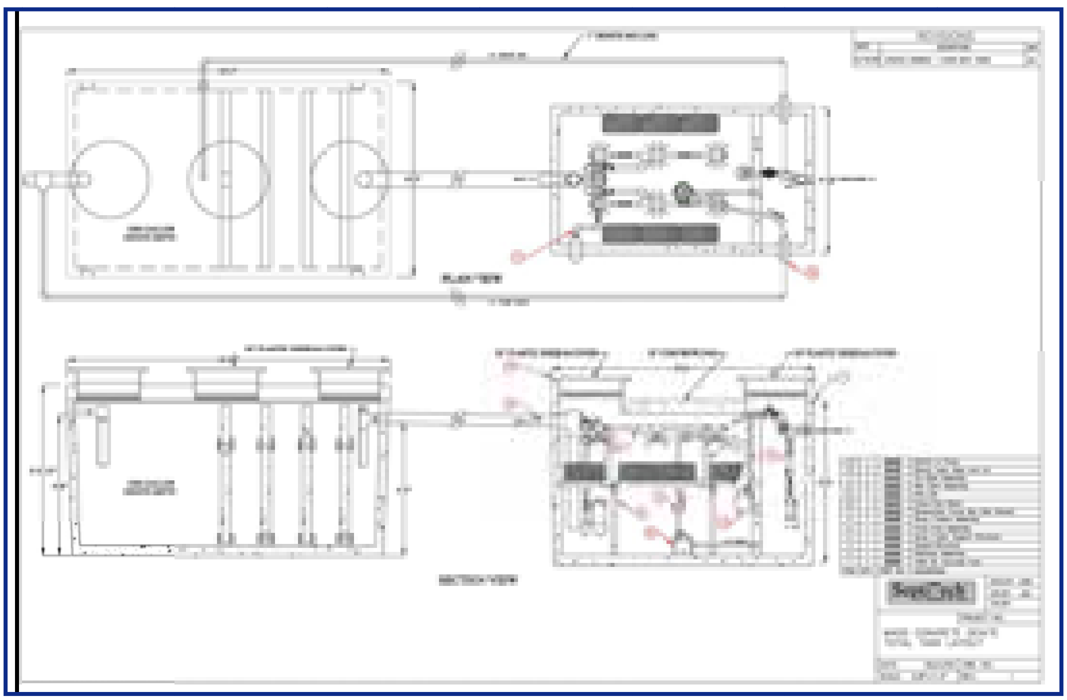


Figure 3-8: Schematic of a SeptiTech System



3.2.4 Applicability of Advanced Treatment

The nitrogen removal units are very effective in removing residual nitrogen content in wastewater. Commercial flows and residential flows from larger communities usually have high nitrogen concentrations and could potentially cause groundwater contamination in drinking water aquifers. The groundwater in the Study Area is isolated by the aquitard, and thus protected from potential nitrate contamination from OWTS discharges. Therefore, additional nitrogen removal processes are not required for the specific OWTS evaluated in this study. These technologies may be more applicable to areas of the West Valley, and could become applicable to areas within the East Valley in the future.

3.2.5 Operations and Maintenance

Annual service agreements can be made with manufacturers to provide maintenance to treatment systems. Manufacturer's representatives would also respond to alarms and address and other problems that arise. Most systems require electricity for pumps or aeration equipment, which is paid for by the homeowner. In addition, the standard operations and maintenance for conventional OWTS systems apply (inspection of the septic tank and regular pumping).

3.2.6 Advantages and Disadvantages

The alternative systems offer increased treatment capacity for higher biological oxygen demand (BOD) and nitrogen content. However, these added benefits also require more complicated maintenance programs for the OWTS. Incorporating additional treatment units will also increase the capital investment of people implementing the OWTS, which for purposes of this study are disadvantaged community members. Furthermore, the community members may not have the adequate training or budget to properly maintain these systems since the mechanical parts include various fans and pumps, which need additional inspection by an experienced professional. The costs from electricity required to run these systems year-round may increase the economic burden placed on those DACs implementing the OWTS. In conclusion, since Riverside County does not currently require additional nitrate removal treatment for the East Valley, no additional treatment needs to be added to the conventional OWTS analyzed for this project.

3.3 Decentralized Treatment

Decentralized systems are satellite collection and treatment systems that serve medium-sized communities with approximately 100 to 1,000 units. Because of the larger size, more constant flow conditions, and increased solid load of decentralized systems compared to singular OWTSs, more advanced technologies could be implemented for these systems. Some examples include sand filters, and small packaged mechanical treatment plants. These systems provide a higher level of treatment, which can be customized to provide a desired water quality and can have disinfection capabilities. These systems are often permitted to discharge to waterways through an NPDES permit, or could be designed to provide tertiary treated recycled water for irrigation or industrial use.

Decentralized treatment technology would be better-suited for clustered mobile home parks that could be grouped into a larger community. As communities grow, decentralized, clustered systems become more feasible and could be cost-effective compared to building and maintaining individual septic tanks.

Decentralized treatment is not considered a viable alternative for the Study Area at this time, because the disadvantaged communities included in this study usually have less than 20 units per community. Because of the limited number of units, the design flow generated will fall under the optimal design flow for packaged decentralized treatment facilities. That being said, if population and housing density increase in the area, several adjacent disadvantaged communities may be clustered into a small group and will then be able to generate the amount of flows that could best utilize the advantage of decentralized treatment systems.

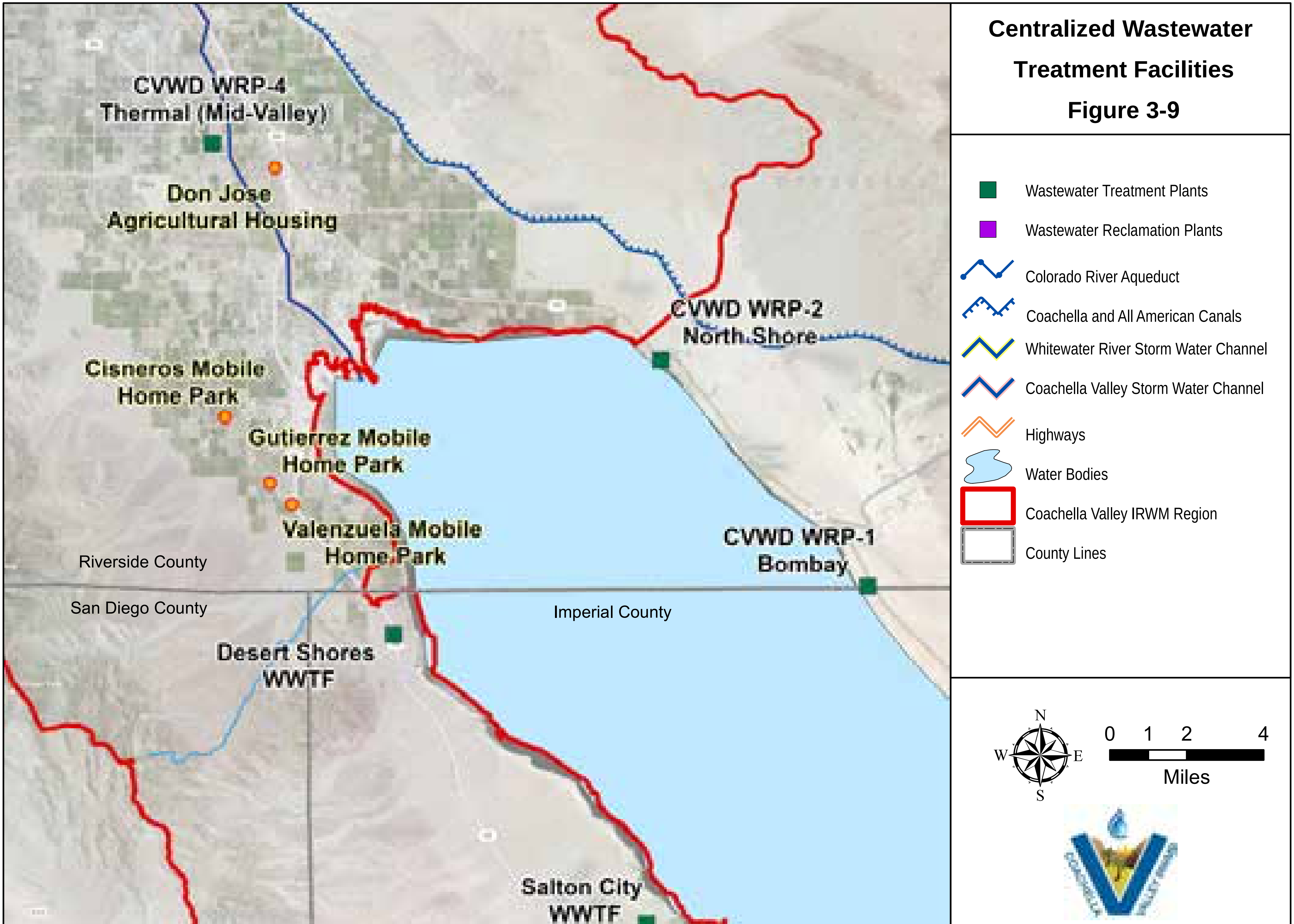
3.4 Centralized Treatment

Centralized systems are wastewater treatment plants (WWTPs) operated by local agencies. These treatment plants collect large sewer flows from the districts' service areas through wastewater collection systems. Disadvantaged communities need to be connected to these collection systems to use centralized treatment.

The closest wastewater treatment facilities to the Study Area are CVWD's Water Reclamation Plant (WRP)-4 Thermal (Mid Valley) and Salton Community Services District's Desert Shores WWTP south. Other wastewater treatment facilities in the Study Area include the Salton City Wastewater Treatment Facility (WWTF), CVWD's WRP-1, and CVWD's WRP-2. The locations of these treatment plants are shown in Figure 3-9. The distance between the treatment facilities and the specific sites included in the Study Area ranges from 2 miles to 10 miles. The study conducted for a separate DAC Project in the 2014 Coachella Valley IRWM Plan Volume II, the *Public Utility Connection Opportunities in Disadvantaged Communities* (refer to Appendix VII-G of the 2014 Coachella Valley IRWM Plan Volume II) defined projects as "low feasibility" if they were low in population density and further than 0.5 miles from existing infrastructure. The "low feasibility" sites were deemed as such due to the low cost-effectiveness of connecting few users to distant infrastructure. Furthermore, connecting to existing infrastructure in the East Valley tends to be less cost-effective due to elevation. Given the flat nature of the East Valley (in general), water and wastewater systems require the construction and implementation of additional lift or pumping facilities to move water and wastewater to and from treatment facilities and customers. In the future, the centralized treatment alternative may become more feasible as the agricultural population grows to develop larger, more developed community clusters in the Study Area.

Centralized Wastewater Treatment Facilities

Figure 3-9



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Made By: DNF
Department: RMC Water & Environment

4 Sites for OWTS Rehabilitation

This chapter focuses on the sites chosen for OWTS rehabilitation under this project.

4.1 Introduction

The DACs that are the focus of this study are Polanco Mobile Home Parks. Polanco Mobile Home Parks are mobile home parks developed under the Polanco Bill passed in 1992 (Farm Labor Housing Protection Act, AB3526). To meet requirements of the Polanco Bill, mobile home parks must be occupied by farm workers and are limited to a maximum of 14 units, including a main dwelling unit, a second unit, and 12 mobile home park spaces. The Polanco Parks included within this report are considered economically disadvantaged community (DACs) per requirements established by DWR.

Polanco Parks are typically owned by farm workers and their family members. There are about 200 small mobile home parks in the East Valley today, 50 of which have obtained Conditional Use Permits (CUPs) from the County of Riverside and are therefore considered permitted Polanco Parks. The rest of mobile home parks do not have CUPs and therefore do not have entitlement permits from the County's Planning Department. The Polanco parks must receive clearances from the Environmental Health, Fire and Building and Safety departments before the County can properly issue a CUP. Existing OWTSs in the Polanco Parks can be a barrier to obtaining proper permitting, because the existing systems are typically not constructed according to regulatory ordinances and most of the unpermitted Polanco Parks do not have the engineering and economic resources to bring their existing OTWSs into compliance.

Pueblo Unido Community Development Corporation (PUCDC) is a non-profit organization that assists communities in the East Valley. The organization helped local DAC members on affordable housing and infrastructure improvement. The organization has identified several OWTSs that need to be properly redesigned and permitted.

RMC worked with PUCDC and Riverside County Department of Environmental Health (DEH) to identify Polanco Parks that require septic system rehabilitation. PUCDC has provided local migrant farmers with support on CUP applications, and has worked with DEH on various septic system projects. PUCDC selected parks without properly designed onsite wastewater treatment systems as project candidates. After that, RMC worked with PUCDC to develop design plans of OWTS for those communities willing to participate in the septic system rehabilitation program. The final deliverable from this project is a work plan (refer to Appendix C). This work plan includes specific tasks and deliverables that will help guide other entities in implementing similar programs to rehabilitate OWTS in the Coachella Valley. The septic rehabilitation program as described here was created in partnership with PUCDC, who considers the program feasible for local DACs as a short-term solution to resolving existing wastewater issues.

Future funding opportunities will provide further support on obtaining approval of the design of the OWTS from Riverside County DEH. Since septic system evaluation is part of the CUP application process, this project will ultimately make CUP possible for Polanco Park owners. In order to fully prepare for the CUP application, park owners are also required to provide plans to be approved by the Department of Building and File Department.

Through collaborative effort with PUCDC and Riverside County DEH, RMC has identified four Polanco Parks that need immediate assistance on OWTS rehabilitation. Detailed information on these parks and their proposed septic system designs are included in the following sections.

4.2 Don Jose Agricultural Housing

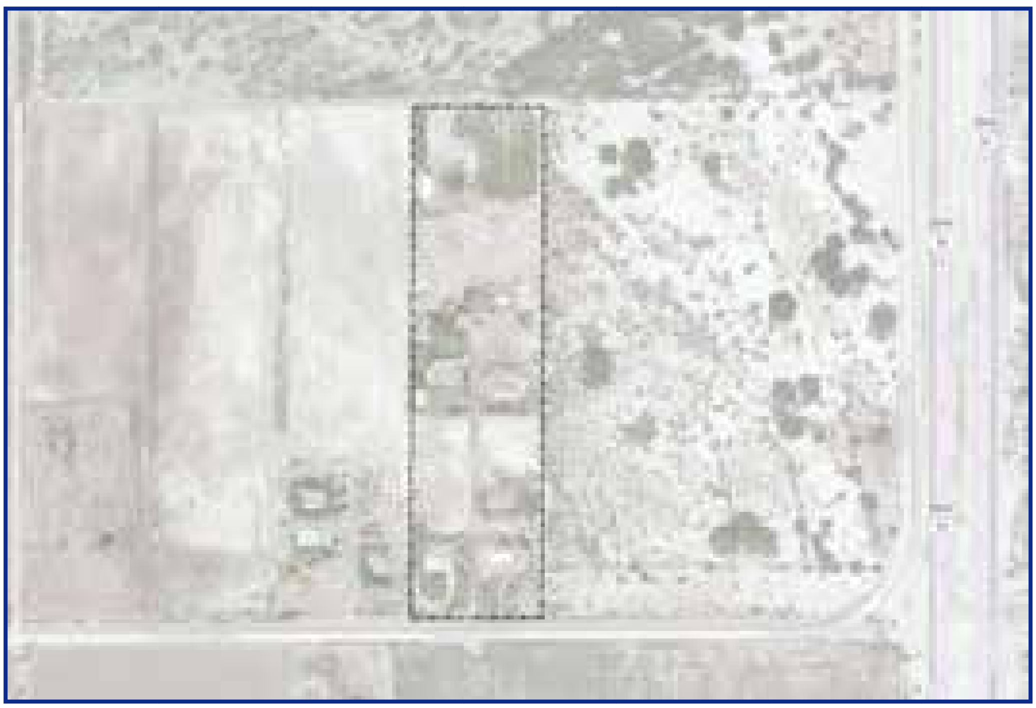
4.2.1 Description

The Done Jose Agricultural Housing mobile home park has six existing mobile homes with OWTSs installed. These systems were designed with 1,000 gallons of septic tank volume per mobile home park, and 40 square-feet of leach field per 100 gallons of septic tank volume. The existing OWTS have prepared a certification of existing subsurface disposal system conducted by C-42 state licensed plumbers. No CUP application has been submitted for this park. The certified existing septic systems have not been reviewed by the Riverside County DEH. In addition to the existing mobile homes, the park owner is planning to add five additional mobile homes to the park and connect them with an adequately sized OWTS. See Table 4-1 for information on this park and Figure 4-1 for a site layout.

Table 4-1: Don Jose Agricultural Housing Information

Items	Description
Status	Unpermitted
Address	89-860 64th Avenue, Thermal, CA 92274
APN	749-060-021
Owner	Sergio Mora, Sonia Mora and Jose Cervera
Existing Units	6
Planned Units	12

Figure 4-1: Aerial Site Layout of 89-960 64th Avenue, Thermal, CA 92274



4.2.2 Soil Tests

Southland Geotechnical conducted soil tests for the Don Jose Agricultural Housing mobile home park in 1997 and reached a conclusion that a portion of the site may be feasible for soil percolation. Twelve percolation tests and two deep borings were made according to standards set by Riverside County DEH. Groundwater was encountered 7.5 feet below the ground surface.

Under this project, Earth Systems Southwest provided a soil reports update on October 10, 2013. See Appendix A1 for the complete soil reports and update for Don Jose Agricultural Housing. The selected key findings and recommendations from the soil tests are as follows:

- The site has highly erratic soil percolation for septic tank systems. A portion of the site may be feasible for soil percolation while other portions are not. Each location chosen for percolation should be evaluated for the presence of silt soils, which may inhibit percolation.
- The soils encountered generally have more than 10% fines smaller than a #200 sieve.
- Results are consistent with previous report and recommendations from the previous report should be applied as amended and superseded.
- Based on a stabilized rate of 47 minutes per inch, conventional leach lines should be sized using 100 square feet of leaching area per 100 gallons of septic tank capacity.

4.2.3 OWTS Design Plans

The soil report update indicates that some areas in the park are suitable for leach line installation while others are not. Design plans show 40 square feet of leach field per 100 gallons of septic tank for existing systems, which should be adequate for existing systems to achieve C24 certification since the systems were inspected and are working properly. For the proposed new mobile homes the draft design plans must include 100 square feet of leach field per 100 gallons of septic tank based on the recent soil report update. Draft design plans are included in Appendix A1. Design criteria are listed in Table 4-2.

Table 4-2: OWTS Design Criteria for Don Jose Agricultural Housing

Item	Criteria	Unit 2,3,5,6,8	Unit 1,7,9	Unit 4,10,12	Unit 11
Septic Tank	Units per Tank (#)	1	1	1	1
	Minimum Tank Size (gal)	1,000	1,000	1,000	1,000
Leach fields	Minimum Area (sq.ft)	400	400	400	400
	Parallel Chambers (#)	2	2	2	2
	Minimum Length (ft)	67	67	67	67

4.2.4 Cost Estimates

Capital and operations and maintenance cost estimates are shown in Table 4-3.

Table 4-3: Don Jose Septic Rehabilitation Project Cost Estimate

Item	Unit Cost	Quantity	Unit	Total Cost
Capital Cost				
1-Unit System	$10,000	5	LS	$50,000
Contingency (20%)				$10,000
Total Capital Cost				**$60,000**
O&M Cost (Pumping)	$300	12	LS	**$3,600/5 yr**

4.3 Cisneros Mobile Home Park

4.3.1 Description

The Cisneros Mobile Home Park has 13 existing mobile homes. The current condition of the existing OWTS is unknown. No CUP application has been submitted for this park. The owner is planning to include 12 mobile homes in the septic rehabilitation improvement plan and connect them with an adequately sized OWTS. The park layout will change according to the proposed septic rehabilitation plan. Information on the park is listed in Table 4-4 and a site layout is shown in Figure 4-2.

Table 4-4: Cisneros Mobile Home Park Information

Items	Description
Status	Unpermitted
Address	88-410 Avenue 77, Thermal, CA 92274
APN	755-161-007
Owner	Carlos Cisneros
Existing Units	13
Planned Units	12

Figure 4-2: Aerial Site Layout of 88-410 Avenue 77, Thermal, CA 92274

4.3.2 Soil Tests

Sladden Engineering conducted soil tests in 1999 and reached a conclusion that the site is feasible for soil percolation. Eleven percolation tests and two explorative trenches were made according to standards set by Riverside County DEH. Groundwater was not encountered at 12 feet below ground surface, and was expected to be more than 15-feet deep in this area. Based on the design soil percolation rate of 7 minutes per inch, the leach field designed to this rate should be 20 square feet of leaching area per 100 gallons of septic tank capacity.

Sladden Engineering provided a letter update to the original soil reports on February 4, 2013. The soil engineering confirmed that the site condition is generally unchanged since the original soil tests. The original test report can be used as bases for OWTS design. See Appendix A2 for the complete soil reports and update for Cisneros Mobile Home Park.

4.3.3 OWTS Design Plans

The OWTS design plans uses a standard 40 square feet of leach field per 100 gallons of septic tank, more conservative than the soil engineer's recommendation. The draft design plan is included in Appendix A2. Design criteria are listed in Table 4-5.

Table 4-5: OWTS Design Criteria for Cisneros Mobile Home Park

Item	Criteria	All Units
Septic Tank	Units per Tank (#)	2
	Minimum Tank Size (gal)	2,000
Leach fields	Minimum Area (sq.ft)	800
	Parallel Chambers (#)	5
	Minimum Length (ft)	53

4.3.4 Cost Estimates

Capital and operations and maintenance costs are shown in Table 4-6.

Table 4-6: Cisneros Septic Rehabilitation Project Cost Estimate

Item	Unit Cost	Quantity	Unit	Total Cost
Capital Cost				
2-Unit System	$15,000	6	LS	$90,000
Contingency (20%)				$18,000
Total Capital Cost				**$108,000**
O&M Cost (pumping)	$300	6	LS	**$1,800/5 yr**

4.4 Valenzuela Mobile Home Park

4.4.1 Description

Valenzuela Mobile Home Park has 11 existing mobile homes. The current condition of the existing OWTS is unknown. The park layout will change according to the proposed septic rehabilitation plan. No CUP application has been submitted for this park. The owner is planning to include eight mobile homes in the septic rehabilitation improvement plan and connect them with adequately sized OWTS. Information for the Valenzuela Mobile Home Park is listed in Table 4-7 and a site layout is shown in Figure 4-3.

Table 4-7: Valenzuela Mobile Home Park Information

Items	Description
Status	Unpermitted
Address	81-550 Harrison Rd, Thermal, CA 92274
APN	737110002
Owner	Francisco Valenzuela and Maria Valenzuela
Existing Units	11
Planned Units	8

Figure 4-3: Aerial Site Layout 81-550 Harrison Rd, Thermal, CA 92274

4.4.2 Soil Tests

Southland Geotechnical conducted the original soil test in 1999 and reached a conclusion that the site is feasible for soil percolation. Ten percolation tests and one deep boring were made according to standards set by Riverside County DEH. Groundwater was not encountered at 15 feet below ground surface, and was expected to be between 15 feet to 30 feet deep in this area. Based on a design soil percolation rate of 5 minutes per inch, the leach field designed to this rate should be 20 square feet of leaching area per 100 gallons of septic tank capacity.

Earth Systems Southwest provided the soil reports updates on October 10, 2013. See Appendix A3 for the complete soil reports and update for Valenzuela Mobile Home Park. The selected key findings and recommendations are as follows:

- The site is feasible for soil percolation and will support leach field application.
- The soils encountered generally have more than 10% fines smaller than a #200 sieve.
- Results are consistent with previous report and recommendations from the previous report should be applied as amended and superseded within.

- Based on a stabilized rate of 5 minutes per inch, conventional leach lines should be sized using 20 square feet of leaching area per 100 gallons of septic tank capacity.

4.4.3 OWTS Design Plans

The OWTS design plans uses standard at 40 square feet of leach field per 100 gallons of septic tank, more conservative than the soil engineering's recommendation. The design plan is included in Appendix A3. Design criteria are listed in Table 4-8.

Table 4-8: OWTS Design Criteria for Valenzuela Mobile Home Park

Item	Criteria	Unit 1-3	Unit 4-5	Unit 6-8
Septic Tank	Units per Tank (#)	3	2	3
	Minimum Tank Size (gal)	3,000	2,000	3,000
Leach fields	Minimum Area (sq.ft)	1,200	800	1,200
	Parallel Chambers (#)	4	3	4
	Minimum Length (ft)	100	89	100

4.4.4 Cost Estimates

Capital and operations and maintenance costs are shown in Table 4-9.

Table 4-9: Valenzuela Mobile Home Park Septic Rehabilitation Project Cost Estimate

Item	Unit Cost	Quantity	Unit	Total Cost
Capital Cost				
2 and 3 Unit System	$15,000	3	LS	$45,000
Contingency (20%)				$9,000
Total Capital Cost				**$54,000**
Annual O&M Cost	$300	3	LS	**$900/5 yr**

4.5 Gutierrez Mobile Home Park

4.5.1 Description

Gutierrez Mobile Home Park has four existing mobile homes with OWTS installed. The current condition of the existing OWTS is unknown. The park layout will change according to the proposed septic rehabilitation plan. No CUP application has been submitted for this park. The owner is planning to include all four mobile homes in the septic rehabilitation improvement plan and connect them with an adequately sized OWTS. Park information is listed in Table 4-10 and a site layout is shown in Figure 4-4.

Table 4-10: Gutierrez Mobile Home Park Information

Items	Description
Status	Unpermitted
Address	80-200 Hwy 86, Thermal, CA 92274
APN	755251010
Owner	Martha Barragan
Phone Number	
Existing Units	4
Planned Units	4

Figure 4-4: Aerial Site Layout 80-200 Hwy 86, Thermal, CA 92274

4.5.2 Soil Tests

Earth Systems Southwest conducted soil testing in September 2013 and reached a conclusion that the site is feasible for soil percolation. Sixteen percolation tests and two deep borings were made according to standards set by Riverside County DEH. Groundwater was encountered between 22.5 to 30 feet below ground surface. Based on a tentative design soil percolation rate of 3.2 minutes per inch, the leach field designed to this rate should be 20 square feet of leaching area per 100 gallons of septic tank capacity. See Appendix A4 for the complete soil reports and update for Gutierrez Mobile Home Park.

4.5.3 OWTS Design Plans

The design plans uses standard at 40 square feet of leach field per 100 gallons of septic tank, more conservative than the soil engineering's recommendation. The draft design plan is included in Appendix A4. Design criteria are listed in Table 4-11.

Table 4-11: OWTS Design Criteria for Gutierrez Mobile Home Park

Item	Criteria	1-Unit System	2-Unit System
Septic Tank	Units per Tank (#)	1	2
	Minimum Tank Size (gal)	1,000	2,000
Leach fields	Minimum Area (sq.ft)	400	800
	Parallel Chambers (#)	2	3
	Minimum Length (ft)	67	89

4.5.4 Cost Estimates

Capital and operations and maintenance costs are shown in Table 4-12

Table 4-12: Gutierrez Mobile Home Park Septic Rehabilitation Project Cost Estimate

Item	Unit Cost	Quantity	Unit	Total Cost
Capital Cost				
1-Unit System	$10,000	2	LS	$20,000
2-Unit System	$15,000	1	LS	$15,000
Subtotal				$35,000
Contingency (20%)				$7,000
Total Capital Cost	$25,000			**$42,000**
Annual O&M Cost	$300	3	LS	$900/5 yr

5 Next Steps

This Regional Program for Septic System Rehabilitation has completed initial research, planning, and design work for four mobile home parks, which are described in Section 4. Following this initial design work, the next steps for these sites to complete OWTS upgrades would be to obtain proper permitting from the County of Riverside and move forward with project construction, as described in Section 5.1.1.

One of the purposes of the Regional Program for Septic System Rehabilitation is to provide information to other entities within the Coachella Valley who would be interested in planning and designing similar OWTS upgrades for applicable sites. The work plan included in Appendix C to this report explains the process undertaken for the Regional Program for Septic System Rehabilitation and also explains information about permitting and operations and maintenance considerations that are necessary to implement the OWTS upgrades described in this report. Funding for implementation of the Septic System Rehabilitation Program could take place through the IRWM Program (with Proposition 84 Funding); however, due to restrictions and potential expiration of this funding source, potential project proponents should consider other funding options that may be available to them. Potential sources of funding that could be used for such a project are listed in *Chapter 11, Framework for Implementation, Section 11.5 Finance* of the 2014 Coachella Valley IRWM Plan Volume I.

5.1.1 Permitting

The proposed OWTS rehabilitation for the four mobile home parks described in Section 4 of this report will provide adequate wastewater treatment capacity for existing and planned disadvantaged community members living within the parks. The septic system design plans must be submitted to the County of Riverside in order to obtain Conditional Use Permits (CUPs) prior to construction. OWTS improvements within mobile home parks in the County of Riverside are typically reviewed as part of a complete design plan along with other improvements required for the mobile home park to receive a CUP from the County of Riverside, which requires: water system improvements, street/access improvements, and fire suppression.

Given that OWTS design must be permitted as part of a larger package of other community improvements, rather than as an independent project, there are additional challenges to obtaining proper permitting for the mobile home parks described in this report. Packaging improvements together means that design and implementation of the other community improvements must be completed in order to implement the OWTS portion of the project. Furthermore, this process outlines a larger-picture issue that spans beyond the IRWM Program and water planning efforts in general, which is that the unpermitted mobile home parks often do not just have issues associated with water, but are unpermitted for a variety of factors and have a wide range of needs.

Once the mobile home parks have completed design plans for other onsite improvements (structural and electrical plans, a fire plan, and a water plan). The complete set of plans along with the design plans included within this report should be submitted together to the Department of Building and Safety, who will coordinate with the Fire and Environmental Health Departments for CUP application process and provide final issuance of CUP for project implementation. The overall application process is demonstrated in Figure 5-1 on the following page.

5.1.2 Continue Identifying Sites in Need of Assistance

The OWTS improvements identified for the mobile home parks included in this study can be used as an example for future sewer improvement projects in and outside of the Coachella Valley. As discussed earlier in this report, numerous Polanco Parks in the eastern Coachella Valley have not yet obtained CUPs and are therefore currently unpermitted. Information included within Appendix C is intended to provide a template or guidance document for other entities who are interested in implementing OWTS in mobile home parks similar to the ones described in this report.

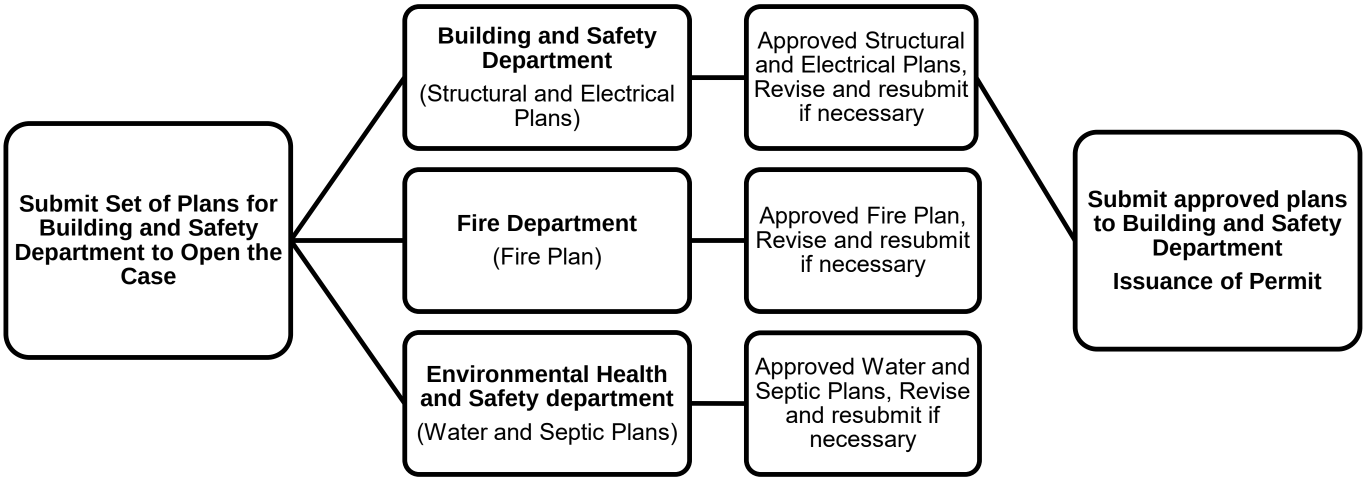


Figure 5-1: Conditional Use Permit Application Overview

Adapted based on information from: *Redevelopment Agency for the County of Riverside. 2010. Mobile Home Park Development Standards & Design Criteria. Available:* http://www.rivcoeda.org/LinkClick.aspx?fileticket=qcYkeHL%2BZTA%3D&tabid=57&mid=2389

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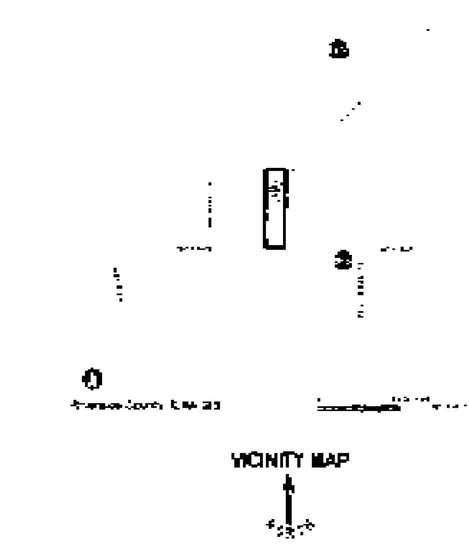
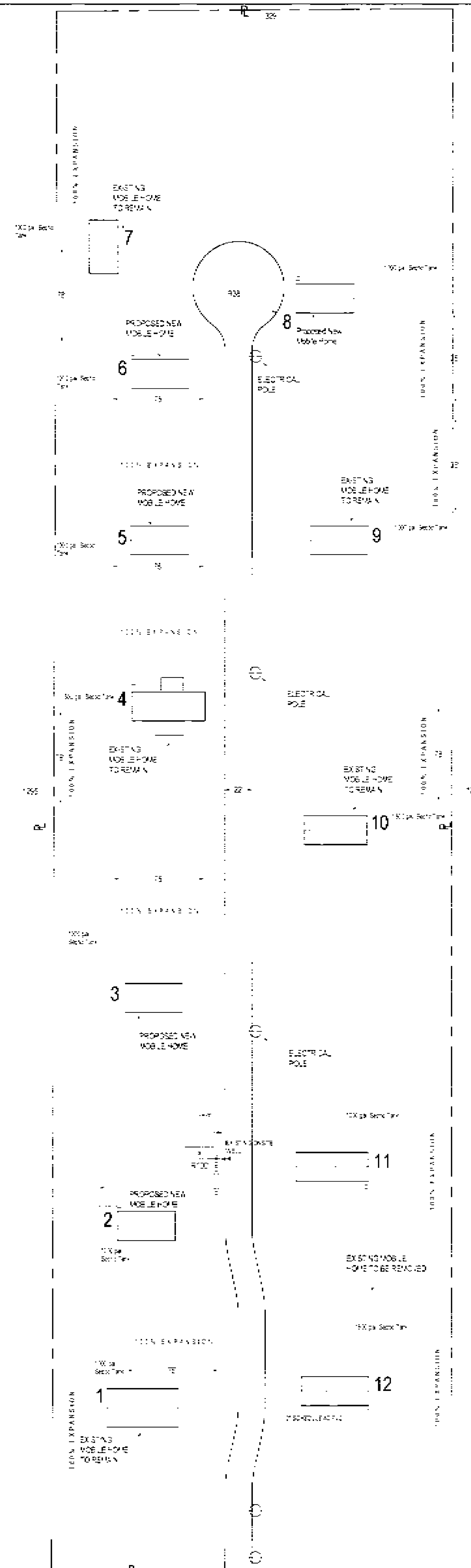
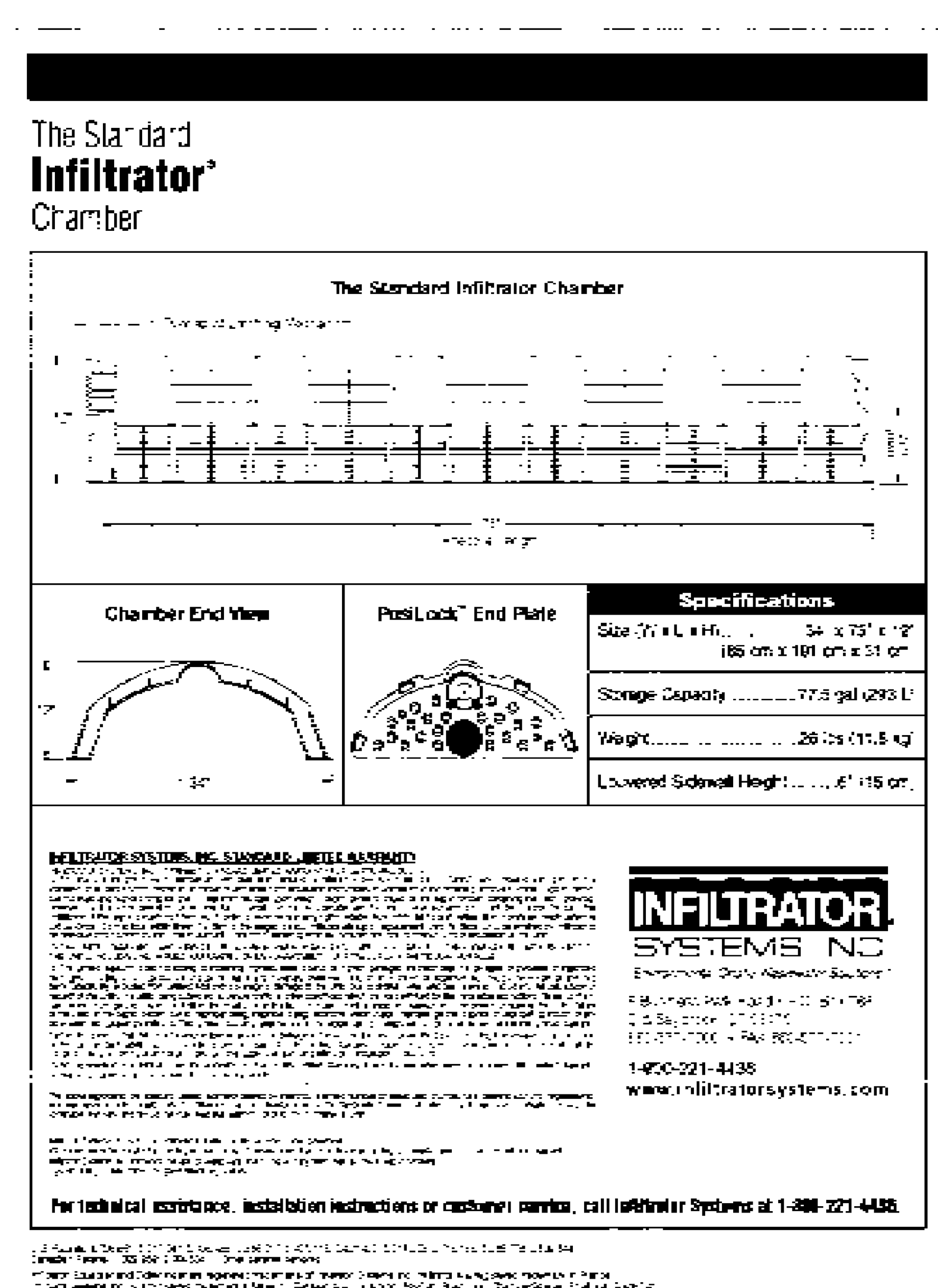
Appendix A – OWTS Design Plans

Appendix A1 – Don Jose Agricultural Housing

SITE







PUEBLO UNIDO CDC

POLANCO REHABILITATION ASSISTANCE PROGRAM

78-115 CALLE ESTADO, LA QUINTA, CA 92253
PHONE (760) 427-0985 FAX (760) 771-0271

Earth Systems Southwest

GEOTECHNICAL ENGINEERING
79-811B COUNTRY CLUB DRIVE
BERMUDA DUNES, CA 92201

PHONE (760) 345-1588 FAX (760) 345-7315

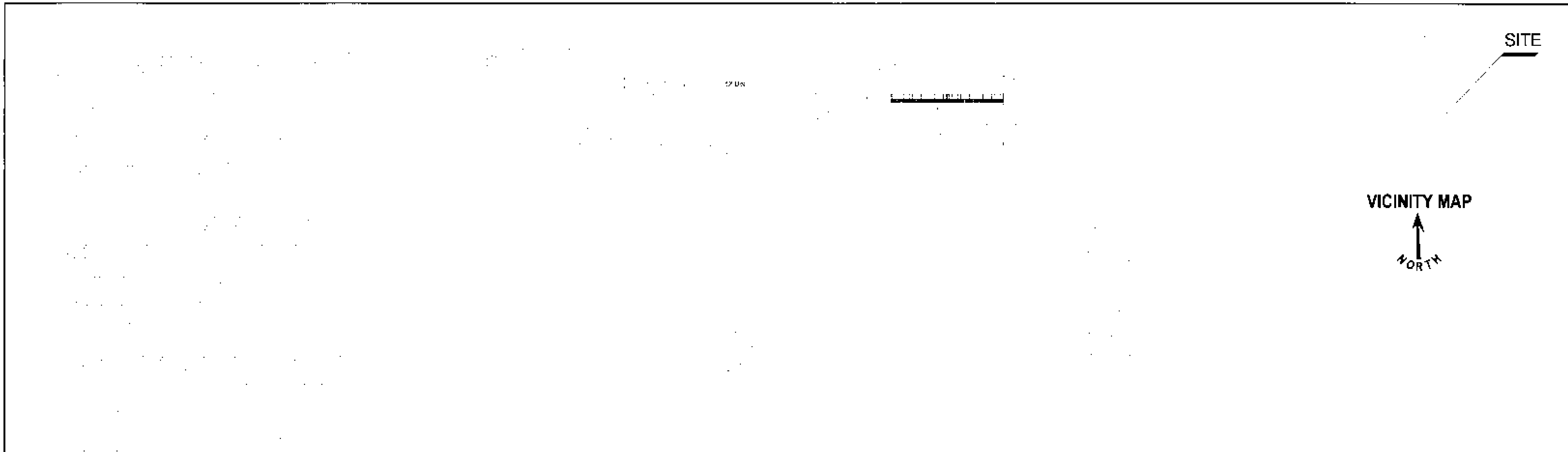
ASSESSOR PARCERL NUMBER : 749-060-021
PROJECT ADDRESS:
89-860 64TH AVE
THERMAL, CA 92274

SCALE
H: 1" = 40' V: N/A

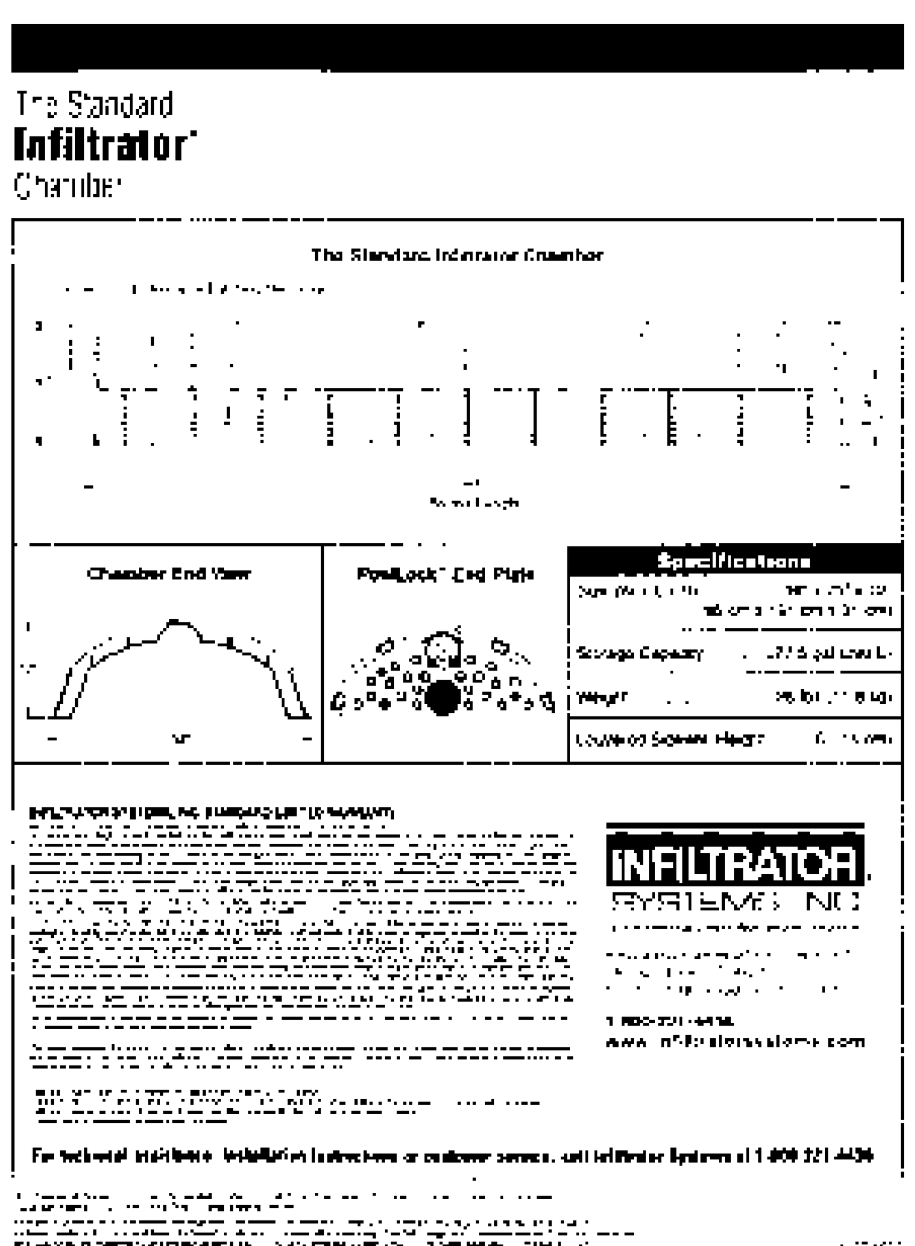
COUNTY OF RIVERSIDE
DON JOSE AGRICULTURAL HOUSING
SEPTIC SYSTEM PLAN

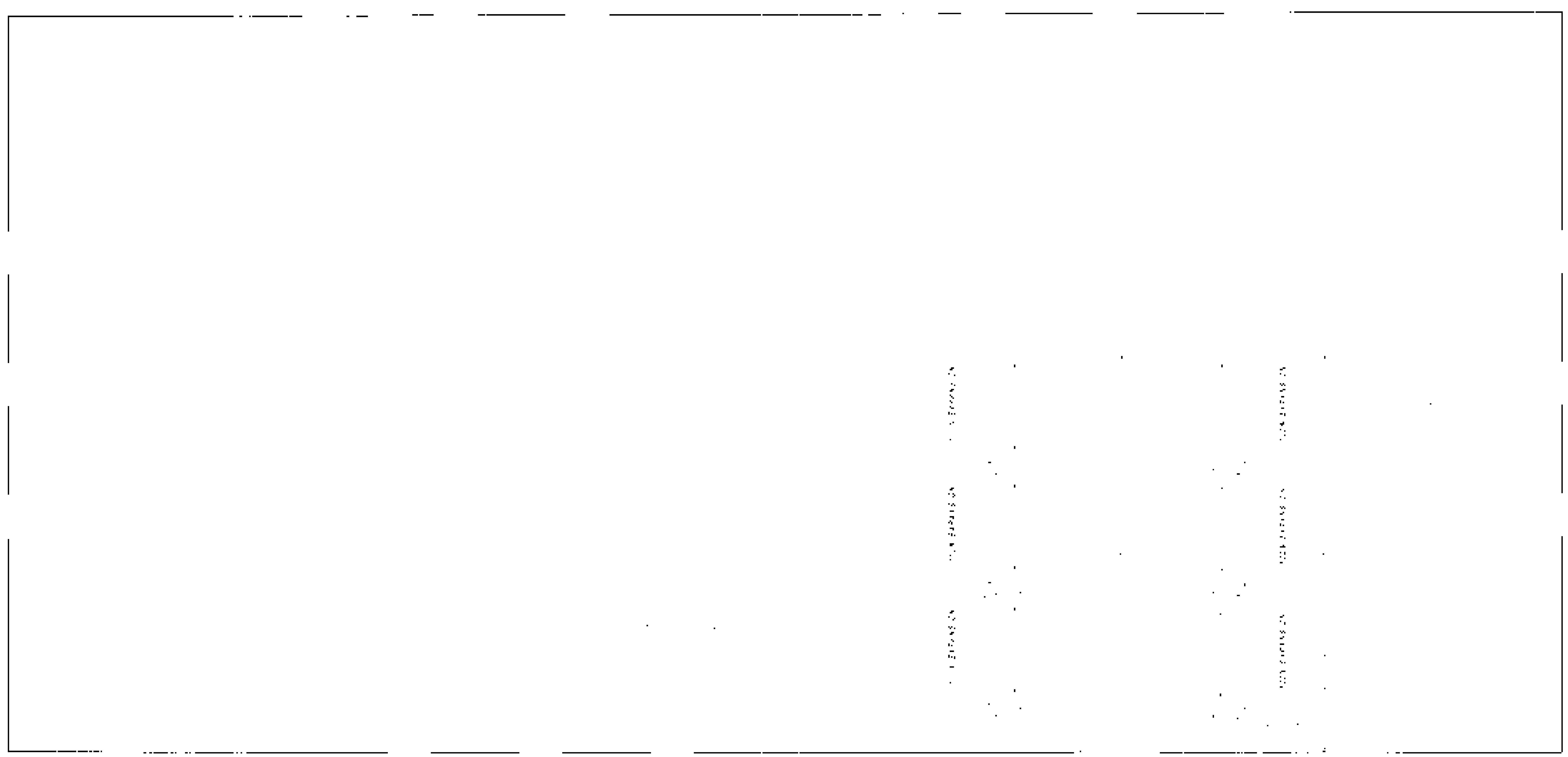
S-1

Appendix A2 – Cisneros Mobile Home Park



VICINITY MAP



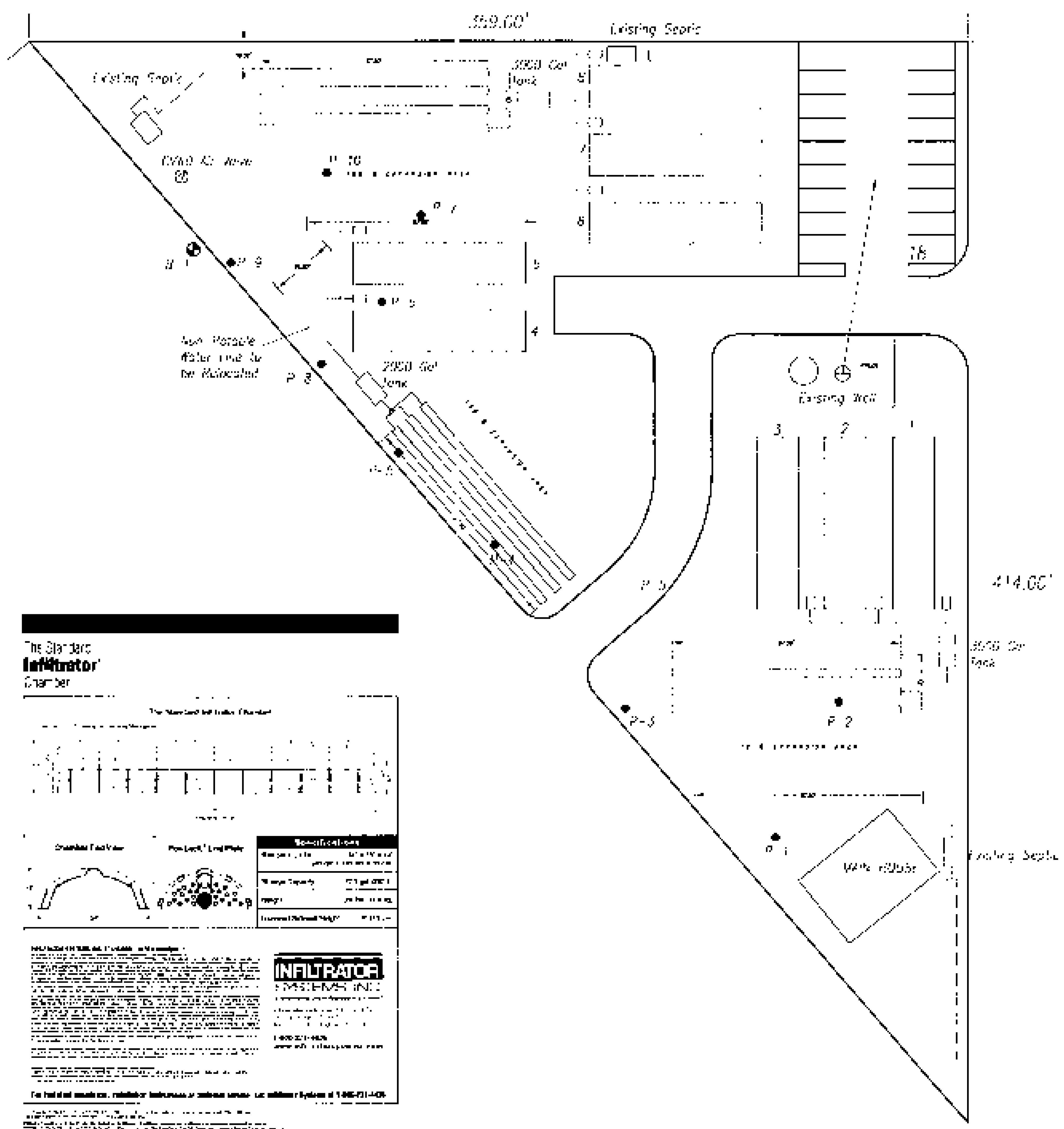


PUEBLO UNIDO CDC AGRICULTURAL WORKER HOUSING REHABILITATION PROGRAM 53010 AVENIDA MENDOZA LA QUINTA, CA 92253 PHONE (760) 427-0885 FAX (760) 777-7550	1/25/13	SLADDEN ENGINEERING 49090 GOLF CENTER PARKWAY INDIO, CA 92201 (760) 772-3893 FAX (772-3895)	ASSESOR PARCEL NUMBER: 755-161-007 PROJECT ADDRESS: 88410 AVENUE 77TH THERMAL, CA 92274 BMK# SCALE H 1" = 60' V N/A

COUNTY OF RIVERSIDE
CISNEROS AHC
SEPTIC SYSTEM

S

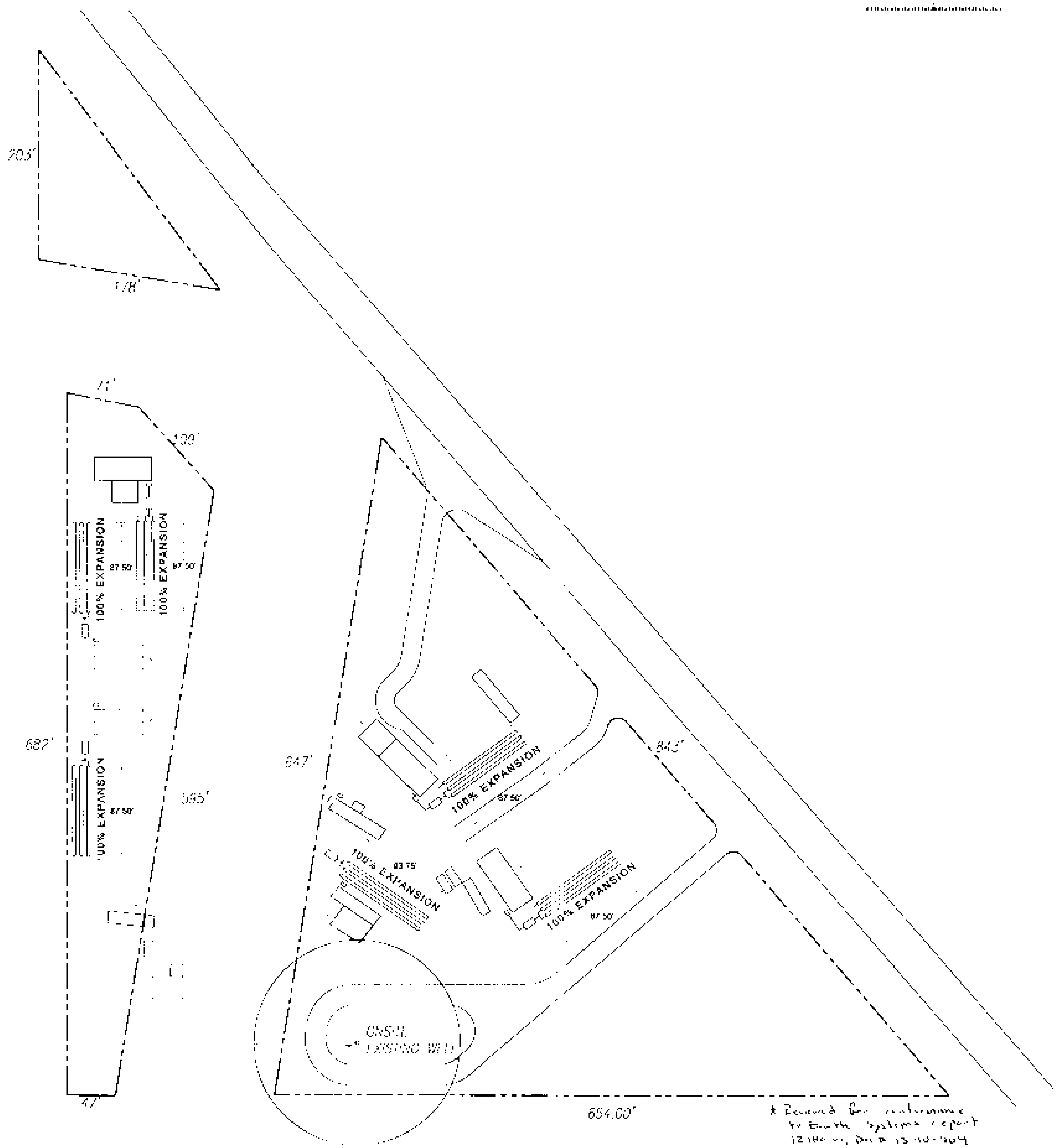
Appendix A3 – Emma Valenzuela Mobile Home Park



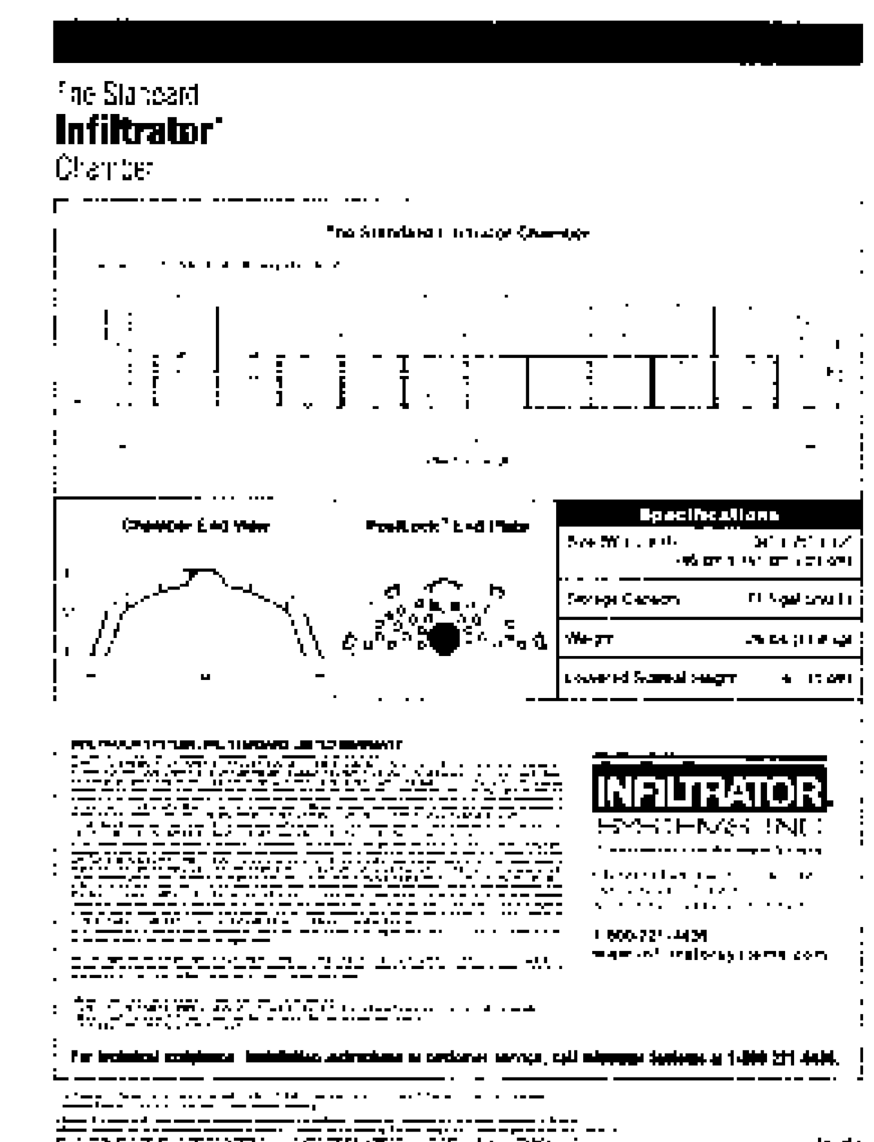
PUEBLO UNIDO COC *AGRICULTURAL HOUSING REHABILITATION PROGRAM* *53040 AVENIDA MENDOZA* *LA QUINTA, CA 92253* *PHONE (760) 427-0985 FAX (760) 777-7550*			**Earth Systems Southwest** GEOTECHNICAL ENGINEERING 79-811B COUNTRY CLUB DRIVE BERMUDA DUNES, CA 92201 PHONE (760) 345-1588 FAX (760) 345-7315	ASSESOR PARCEL NUMBER: PROJECT ADDRESS: 81-550 HARRISON RD. THERMAL, CA 92274 BMK# SCALE H 1" = 30' V N/A	COUNTY OF RIVERSIDE EMMA VALENZUELA MOBILE HOME PARK SEPTIC SYSTEM PLANS

S

Appendix A4 – Gutierrez Mobile Home Park



* Reviewed for conformance to Earth Systems report 12180-01, Dated 13-10-2004
Septic system sizing & design by others.



PUEBLO UNIDO CDC

AGRICULTURAL HOUSING REHABILITATION PROGRAM

53040 AVENIDA MENDOZA
LA QUINTA, CA 92253
PHONE (760) 427 0965 *FAX (760) 777-7550*

Earth Systems Southwest

GEOTECHNICAL ENGINEERING

79-811B COUNTRY CLUB DRIVE
BERMUDA DUNES, CA 92201

PHONE (760) 345-1588 FAX (760) 345-7315

ASSESOR PARCEL NUMBER:
PROJECT ADDRESS:
82-200 HARRISON RD.
THERMAL CA 92274

BMK#

SCALE
H 1" = 60' V N/A

COUNTY OF RIVERSIDE
GUTIERREZ RANCH
SEPTIC SYSTEM PLANS

S

Appendix B – Soil Test Reports

Appendix B1 – Don Jose Agricultural Housing

RMC WATER AND ENVIRONMENT
515 SOUTH FLOWER STREET, 36TH FLOOR
LOS ANGELES, CALIFORNIA 90071

**SEWAGE DISPOSAL FEASIBILITY AND
SOIL PERCOLATION REPORT UPDATE
PROPOSED DON JOSE
AGRICULTURAL HOUSING PROJECT
89-860 64TH AVENUE
THERMAL, RIVERSIDE COUNTY
CALIFORNIA**

October 10, 2013

File No.: 08786-02
Doc. No.: 13-10-706

TABLE OF CONTENTS

Section 1
INTRODUCTION

1.1 Project Description

This sewage disposal feasibility and soil percolation report has been prepared for the proposed Don Jose Agricultural Housing Project located at 89-860 64th Avenue in Thermal, California. The Assessor's Parcel Number (APN) is 749-060-021. Twelve mobile homes may ultimately be situated on a portion of the site. Septic tanks and leach field waste disposal systems are proposed for this unsewered area. Domestic water comes from a well on the site. The site location is shown on Plate 1 in Appendix A. This report is being prepared to substantiate previous percolation testing evaluated by Earth Systems on February 2, 2007.

1.2 Site Description

The proposed Don Jose Agricultural Housing Project is to be developed on a portion of the rectangular-shaped parcel that consists of approximately 9 acres. The project is located at 82-860 64th Avenue in Thermal, Riverside County, California. The site location is shown on Plate 1 in Appendix A. The Don Jose Agricultural Housing Project site is situated on nearly level ground that drains by surface infiltration and gentle sheet flow toward the southeast. Based upon information provided to us, we have assumed 12 mobile homes (3 bedrooms), laid out as shown on Plate 2. The locations of the tests are within an open and undeveloped area on the property. The proposed Don Jose Agricultural Housing Project area is currently an existing mobile home park.

1.3 Purpose and Scope of Services

The purpose for our services was to evaluate and verify the site soil conditions and to provide professional opinions and recommendations regarding the feasibility for sewer waste disposal on the site and to provide updated recommendations if necessary. The scope of services included:

- A general reconnaissance of the site.
- Shallow subsurface exploration by drilling one exploratory boring to a depth of 30 feet below existing grades and to evaluate current groundwater levels and soil stratigraphy.
- Two percolation tests in the area of the proposed leach fields to verify previous percolation tests.
- An engineering evaluation of the acquired data from the exploration and testing and previous reports.
- A summary of our findings and recommendations in this written report, including:
  - Discussions on subsurface soil and groundwater conditions.
  - Discussions on soil percolation rate.
  - Recommendations regarding need for septic systems and leach field design criteria.

<u>Not Contained In This Report</u>: Although available through Earth Systems Southwest, the current scope of our services does not include:

- An environmental assessment.
- An investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater, or air on, below, or adjacent to the subject property.

Section 2
METHODS OF EXPLORATION

2.1 Field Exploration

Previous field exploration was performed on October 3, 1997 to evaluate percolation characteristics of the subject site. For this current study, additional field exploration was performed to evaluate previous reports. Two percolation borings were drilled on September 23, 2013 with an 8-inch auger to a depth of approximately 3 feet. Additionally, one deep exploratory boring was drilled to a depth of approximately 30 feet below the existing ground surface to observe soil profiles. The deep exploratory boring was drilled on September 23, 2013 using an 8-inch outside diameter hollow stem auger powered by a Mobile B-61 drill rig. The boring locations are shown on the Boring and Test Location Map, Plate 2, in Appendix A. The locations shown are approximate, established using nearby landmarks. Soil samples were collected at various intervals and sealed for transport to Earth Systems laboratory. Samples were collected in a modified California sampler and contained in brass rings.

The final logs of the borings represent our interpretation of the contents of the field logs and review of the samples obtained during the subsurface exploration. The final logs of the percolation and deep borings are included in Table 1 and Appendix A of this report, respectively. The stratification lines represent the approximate boundaries between soil types, although transitions may be gradational.

2.2 Percolation Tests

Two percolation tests were performed on September 25, 2013 in the vicinity of the proposed leach fields as shown on Plate 2. The County was notified prior to conducting our onsite percolation testing (County notification number PR # 1718). The percolation tests were performed in substantial conformance to the County percolation test method for single lots, normal or sandy soil criteria (as applicable), as described in the *Onsite Waste Treatment Systems, Technical Guidance Manual, Version A.*

The tests were performed using 8-inch diameter boreholes made to a depth of about 3 feet below existing ground surface. Hole sidewalls were cleared of any smeared material. A 6 inch diameter perforated PVC pipe was installed in the excavated hole to reduce the potential for caving or disturbance from the addition of water. The boreholes had approximately 1 to 2 inches of gravel placed on the sides and bottom of the hole, respectively, to minimize sidewall disturbance and sedimentation. A gravel correction factor was applied to the volume of water percolated. Tests were performed in the typical silty sand and silt soils (Unified Soil Classification System, USCS, soil types SM and ML, respectively). The boreholes were filled with water on September 24, 2013 and presoaked overnight and for approximately ½ hour prior to testing. For testing, successive readings of the drop in water level were made over several 10- or 30-minute periods (depending on normal or sandy soil criteria) until a stabilized drop was recorded. Measurements were referenced from the top of the perforated pipe terminated at the ground surface. The field percolation test results are included in Appendix B and below.

Table 1

Onsite Seepage Pit Percolation Results

Test Hole	Test Description	Soil Condition	USCS Soil Description	Test Zone Below Existing Grades (feet)	Estimated Basic Percolation Rate (Minutes/Inch)
P-1	8" Drilled Hole	Native	0-2.5' Silt (ML)	2-3	Did Not Percolate
P-2	8" Drilled Hole	Native	0-2.5' Silty Sand (SM)	2-3	47

The test results indicate that the stabilized drop ranges from approximately no percolation to 47 minutes per inch (mpi). Previous results indicated infiltration rates of up to 24 minutes per inch (mpi) where percolation occurred. At various locations tested previously, various areas did not percolate. Please see attached previous report.

Section 3
DISCUSSION

3.1 Soil Conditions

The field exploration indicates that site soils consist primarily of interbedded silt and silty sand in the shallow leach area. The boring logs provided in Appendix A include detailed descriptions of the soils encountered.

3.2 Groundwater

Initial groundwater was determined to be at approximately 7½ feet below the ground surface based upon evaluation of the percent saturation of samples collected. Groundwater levels may fluctuate with precipitation, irrigation, drainage, and site grading. The shallow groundwater levels are generally a semi-perched layer and are strongly influenced by surrounding agricultural irrigation and drainage. This semi-perched zone is generally not used as a domestic water supply, nor is it suited for potable use because of its alkalinity, salinity, and dissolved solids content.

3.3 Geologic Setting

The site lies at an elevation of about 175 feet below mean sea level in the lower Coachella Valley, a part of the Colorado Desert geomorphic province. A significant feature within the Colorado Desert geomorphic province is the Salton Trough. The Salton Trough is a large northwest-trending structural depression that extends approximately 180 miles from San Gorgonio Pass to the Gulf of California. Much of this depression in the area of the Salton Sea is below sea level. In the prehistoric past, ancient Lake Cahuilla submerged the lower Coachella Valley.

The Coachella Valley forms the northerly portion of the Salton Trough. The lower Coachella Valley contains a thick sequence of Miocene to Holocene sedimentary deposits. The upper sediments within the lower valley consist of fine-grained sands with interbedded clays and silts that are of lacustrine (lakebed), aeolian (wind-blown), and alluvial (water-deposited) origin.

Geohydrologic Setting: The site lies within the Thermal subbasin of the Coachella Valley groundwater basin. The Thermal subbasin is subdivided into four generalized zones: a semi-perched zone with alternating clay layers to about 100 foot depth, underlain by an upper and lower aquifer, separated by an aquitard layer at least 100 feet thick. Domestic wells in the region derive their water form the lower portion of the upper aquifer and the lower aquifer, generally from about 400 to 1,200 feet deep. The upper semi-perched zone is generally not used as a domestic water supply, nor is it suited for potable use because of its alkalinity, salinity, and dissolved solids content.

Section 4
CONCLUSIONS AND RECOMMENDATIONS

The following is a summary of our conclusions and professional opinions based on the data obtained from the site evaluation.

- The site is highly erratic for soil percolation and septic tank systems with infiltrators for waste disposal. Percolation tests results as well as soil and groundwater conditions indicate that a portion of the site may be feasible for soil percolation while other portions are not. The recommendations of Earth Systems previous report apply for areas which do not sufficiently percolate for sewage disposal. Each location chosen for percolation should be evaluated for the presence of silt soils which may inhibit percolation. The evaluation should be performed by a representative of the geotechnical engineer at the time of excavation. Leach fields may require moving to more acceptable areas if silt soils are observed.

- The soils encountered generally have more than 10% fines smaller than a #200 sieve.

- Results are consistent with previous report findings and recommendations from the previous report should be applied as amended and superseded within.

- The percolation test results as described in Section 2.2, presented in Appendix B indicate that the percolation may be set at 47 minutes per inch (mpi) in areas that were shown to percolate. Based upon a stabilized rate of 47 mpi, conventional leach lines for sanitary waste disposal may be sized using 100 square feet of leaching area per 100 gallons of septic tank capacity (based on design soil percolation rate of 44-48 mpi).

- Groundwater was at 7½ feet previously and currently at 7½ feet. Signs of groundwater higher than 7½ feet were not observed.

- The final design should delineate the area to be set aside and used for 100% expansion.

- Leach lines should be constructed to provide the required leaching area. Leach lines should have a maximum length of 100 feet and be separated at least 4 feet (edge-to-edge) from each other. The leach lines should have at least 12 inches of soil cover and have a bottom no more than 24 inches below existing prevailing grade. Due to the very moist upper soils encountered, the leach fields should consist of standard size chamber systems, such as the Infiltrator® or Cultec System. This system replaces leach lines with perforated drainage pipe and gravel with a sturdy plastic chamber that is 34 inches wide, 12 inches high, and completely open on the bottom. Although allowed by Code, due to the high moisture content of the upper soils, we <u>do not</u> recommend a 20% reduction in leaching area for this type of system.

- Rapid injection or high volume discharge of effluent may tax the ability of the soils to readily absorb effluent over the short term. System design should consider the effects of increased user use (additional residents per home), incorporate low flow discharge (low flow toilets, shower heads, etc.) and incorporate low flow septic systems which dose the leach field slower.

- Leach fields should be located at least 5 feet from property lines, 8 feet from buildings or covered areas, and 100 feet away from on-site or off property wells. Other separations detailed in *Onsite Waste Treatment Systems, Technical Guidance Manual, Version A* for Riverside County apply and should be referred to in design.

- Maintenance of onsite waste disposal systems can be the most critical element in determining the success of a design. Due to general accessibility limitations which typically exist with drainage systems and infiltration structures, they must be protected clogging of any filter medium, and the near structure soils. The potential for clogging can be reduced by pre-treating structure inflow through the installation of a proper septic tank. In addition, sediment, paper, and debris must be removed from the tank on a regular basis.

- Based on the data presented in this report and using the recommendations set forth, it is the judgment of this professional that there is sufficient area to support a primary and expansion OWTS that will meet the current standards of the Department of Environmental Health and the Regional Water Quality Control Board (RWQCB). Based on the data presented in this report and the testing information accumulated, it is the judgment of this professional that the groundwater table will not encroach within the current allowable limit set forth by County and State requirements (5 feet below the base of the leach field set at no deeper than 2 feet below existing grade).

- This report should be submitted to the Riverside County Department of Environmental Health (RCDEH) for their review and comment. Earth Systems should have the opportunity to review the plan of the septic system and details.

Section 5
LIMITATIONS

Our findings and recommendations in this report are based on selected points of field exploration, percolation testing, and our understanding of the Don Jose Agricultural Housing Project. Furthermore, our findings and recommendations are based on the assumption that soil conditions do not vary significantly from those found at specific exploratory locations. Variations in soil or groundwater conditions could exist between and beyond the exploration points.

Findings of this report are valid as of the issued date of the report. However, changes in conditions of a property can occur with passage of time, whether they are from natural processes or works of man, on this or adjoining properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or broadening of knowledge. Accordingly, findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of one year.

This report is issued with the understanding that the owner or the owner's representative has the responsibility to bring the information and recommendations contained herein to the attention of the designer for the septic systems and are incorporated into the plans and specifications. The owner or the owner's representative also has the responsibility to take the necessary steps to see that the contractor carry out such recommendations in the field. It is further understood that the owner or the owner's representative is responsible for submittal of this report to the appropriate governing agencies.

Earth Systems has striven to provide our services in accordance with generally accepted geotechnical engineering practices in this locality at this time. No warranty or guarantee, express or implied, is made. This report was prepared for the exclusive use of the Client and the client's authorized agents.

Earth Systems should be provided the opportunity for a general review of the septic tank and leach field plan in order that our recommendations may be properly interpreted and implemented in the design. If Earth Systems is not accorded the privilege of making this recommended review, we can assume no responsibility for misinterpretation of our recommendations.

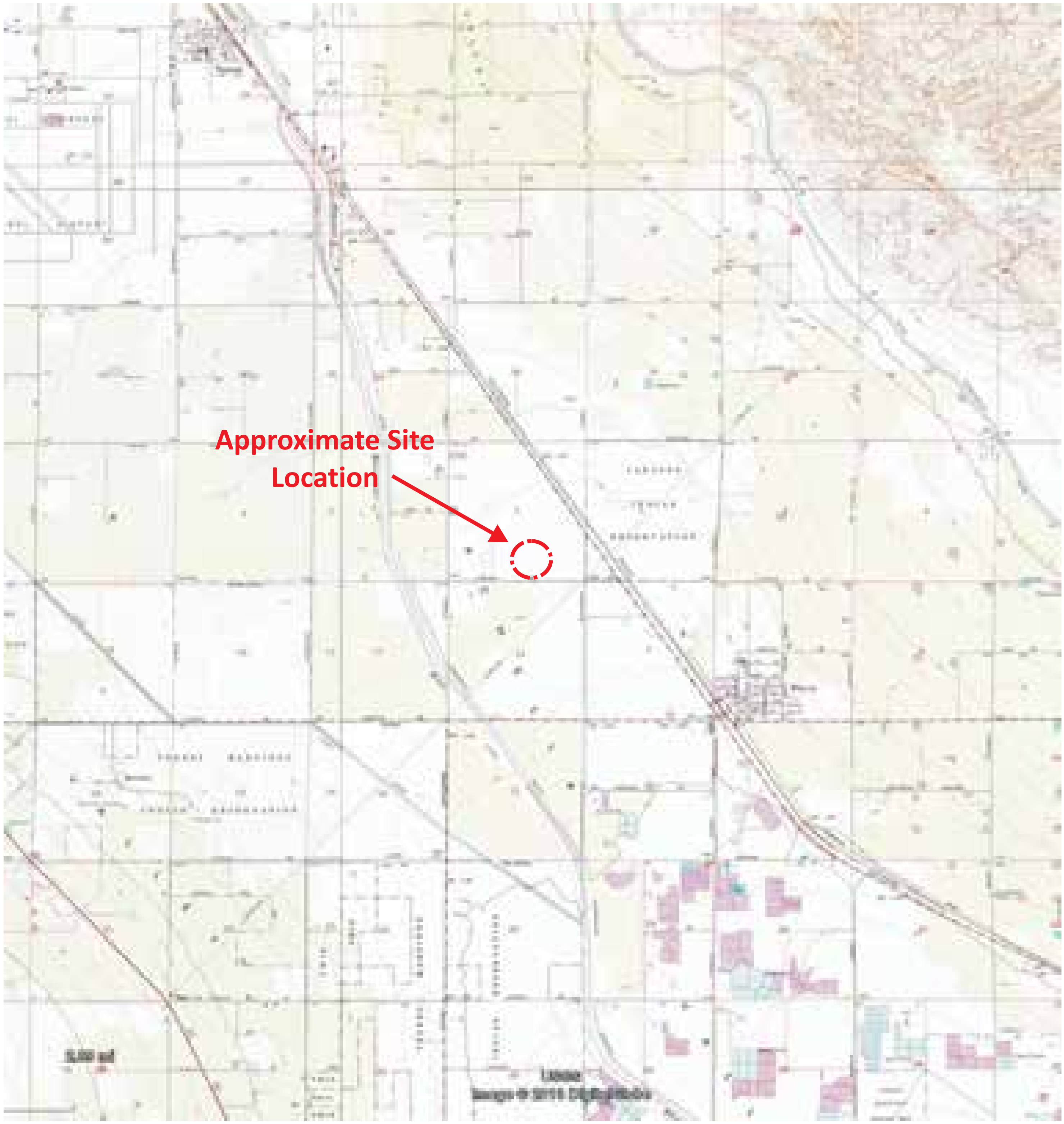
Although available through Earth Systems Southwest, the current scope of our services does not include an environmental assessment or an investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater, or air on, below, or adjacent to the subject property.

-o0o-

Appendices as cited are attached and complete this report.

APPENDIX A

Plate 1 – Site Location Map
Plate 2 – Boring & Percolation Test Location Map
Terms and Symbols Used on Boring Logs
Soil Classification System
Log of Boring
Laboratory Test Results



Reference: Good Earth Satellite Image with Historical Topographic Map Overlay, dated 2011.

LEGEND

Approximate Site Location

Approximate Scale: 1" = 1 Mile

0 1 Mile 2 Miles

N

Plate 1
Site Location Map

Proposed Don Jose Agricultural Housing Project
89-860 64th Avenue
Thermal, Riverside County, California

Earth Systems
Southwest

10/10/2013

File No.: 08786-02

Reference: Google Earth Satellite Image dated 3/22/2013.

LEGEND

B-2 Approximate Boring Locations

P-2 Approximate Percolation Test Location

Approximate Scale: 1" = 175'

0 175' 350'

N

Plate 2
Boring & Percolation Test Location Map

Proposed Don Jose Agricultural Housing Project
89-860 64th Avenue
Thermal, Riverside County, California

Earth Systems
Southwest

10/10/2013

File No.: 08786-02

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on ASTM Designations D 2487 and D 2488 (Unified Soil Classification System). Information on each boring log is a compilation of subsurface conditions obtained from the field as well as from laboratory testing of selected samples. The indicated boundaries between strata on the boring logs are approximate only and may be transitional.

SOIL GRAIN SIZE

U.S. STANDARD SIEVE

12"		3"		3/4"		4		10		40		200		
	BOULDERS		COBBLES	GRAVEL				SAND					SILT	CLAY
				COARSE		FINE		COARSE		MEDIUM		FINE		
305		76.2		19.1		4.76		2.00		0.42		0.074		0.002

SOIL GRAIN SIZE IN MILLIMETERS

RELATIVE DENSITY OF GRANULAR SOILS (GRAVELS, SANDS, AND NON-PLASTIC SILTS)

Very Loose	*N=0-4	RD=0-30	Easily push a 1/2-inch reinforcing rod by hand
Loose	N=5-10	RD=30-50	Push a 1/2-inch reinforcing rod by hand
Medium Dense	N=11-30	RD=50-70	Easily drive a 1/2-inch reinforcing rod with hammer
Dense	N=31-50	RD=70-90	Drive a 1/2-inch reinforcing rod 1 foot with difficulty by a hammer
Very Dense	N>50	RD=90-100	Drive a 1/2-inch reinforcing rod a few inches with hammer

*N=Blows per foot in the Standard Penetration Test at 60% theoretical energy. For the 3-inch diameter Modified California sampler,140-pound weight, multiply the blow count by 0.63 (about 2/3) to estimate N. If automatic hammer is used, multiply a factor of 1.3 to 1.5 to estimate N. RD=Relative Density (%). C=Undrained shear strength (cohesion).

CONSISTENCY OF COHESIVE SOILS (CLAY OR CLAYEY SOILS)

Very Soft	*N=0-1	*C=0-250 psf	Squeezes between fingers
Soft	N=2-4	C=250-500 psf	Easily molded by finger pressure
Medium Stiff	N=5-8	C=500-1000 psf	Molded by strong finger pressure
Stiff	N=9-15	C=1000-2000 psf	Dented by strong finger pressure
Very Stiff	N=16-30	C=2000-4000 psf	Dented slightly by finger pressure
Hard	N>30	C>4000	Dented slightly by a pencil point or thumbnail

MOISTURE DENSITY

Moisture Condition: An observational term; dry, damp, moist, wet, saturated.
Moisture Content: The weight of water in a sample divided by the weight of dry soil in the soil sample expressed as a percentage.
Dry Density: The pounds of dry soil in a cubic foot.

MOISTURE CONDITION

Dry.....................Absence of moisture, dusty, dry to the touch
Damp................Slight indication of moisture
Moist.................Color change with short period of air exposure (granular soil)
Below optimum moisture content (cohesive soil)
Wet....................High degree of saturation by visual and touch (granular soil)
Above optimum moisture content (cohesive soil)
Saturated..........Free surface water

RELATIVE PROPORTIONS

Trace............minor amount (<5%)
with/some......significant amount
modifier/and...sufficient amount to influence material behavior (Typically >30%)

PLASTICITY

DESCRIPTION	FIELD TEST
Nonplastic	A 1/8 in. (3-mm) thread cannot be rolled at any moisture content.
Low	The thread can barely be rolled.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit.
High	The thread can be rerolled several times after reaching the plastic limit.

LOG KEY SYMBOLS

Bulk, Bag or Grab Sample

Standard Penetration Split Spoon Sampler (2" outside diameter)

Modified California Sampler (3" outside diameter)

No Recovery

GROUNDWATER LEVEL

Water Level (measured or after drilling)

Water Level (during drilling)

Terms and Symbols Used on Boring Logs

Earth Systems Southwest

MAJOR DIVISIONS			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS *More than 50% of material is <u>larger</u> than No. 200 sieve size*	GRAVEL AND GRAVELLY SOILS *More than 50% of coarse fraction <u>retained</u> on No. 4 sieve*	CLEAN GRAVELS		GW	*Well-graded gravels, gravel-sand mixtures, little or no fines*
				GP	*Poorly-graded gravels, gravel-sand mixtures. Little or no fines*
		GRAVELS WITH FINES		GM	*Silty gravels, gravel-sand-silt mixtures*
				GC	*Clayey gravels, gravel-sand-clay mixtures*
	SAND AND SANDY SOILS *More than 50% of coarse fraction <u>passing</u> No. 4 sieve*	CLEAN SAND (Little or no fines)		SW	*Well-graded sands, gravelly sands little or no fines*
				SP	*Poorly-graded sands, gravelly sands, little or no fines*
		SAND WITH FINES (appreciable amount of fines)		SM	*Silty sands, sand-silt mixtures*
				SC	*Clayey sands, sand-clay mixtures*
FINE-GRAINED SOILS *More than 50% of material is <u>smaller</u> than No. 200 sieve size*	SILTS AND CLAYS	LIQUID LIMIT <u>LESS</u> THAN 50		ML	*Inorganic silts and very fine sands, rock flour, silty low clayey fine sands or clayey silts with slight plasticity*
				CL	*Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays*
				OL	*Organic silts and organic silty clays of low plasticity*
		LIQUID LIMIT <u>GREATER</u> THAN 50		MH	*Inorganic silty, micaceous, or diatomaceous fine sand or silty soils*
				CH	*Inorganic clays of high plasticity, fat clays*
				OH	*Organic clays of medium to high plasticity, organic silts*
HIGHLY ORGANIC SOILS				PT	*Peat, humus, swamp soils with high organic contents*
VARIOUS SOILS AND MAN MADE MATERIALS					*Fill Materials*
MAN MADE MATERIALS					*Asphalt and concrete*

Soil Classification System

Earth Systems
Southwest

Earth Systems
Southwest

79-811B Country Club Drive, Bermuda Dunes, CA 92201
Phone (760) 345-1588 Fax (760) 345-7315

Boring No. B-1

Project Name: Don Jose Agricultural Housing
Project Number: 08786-02
Boring Location: See Plate 2

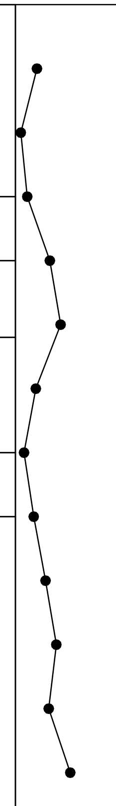
Drilling Date: September 23, 2013
Drilling Method: 8" Hollow Stem Auger
Drill Type: Mobile B61 HDX w/Autohammer
Logged By: Randy Reed

Description of Units

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Depth (Ft.)	Sample Type (Bulk / SPT / MOD Calif.)	Penetration Resistance (Blows/6")	USCS/Bedrock	Dry Density (pcf)	Moisture Content (%)	Description of Units
0			SM			SILTY SAND: yellowish brown, medium dense, damp, fine grained sand
	MOD Calif.	5, 9, 11				
5	MOD Calif.	2, 2, 3				loose, moist
	MOD Calif.	3, 4, 7	ML			CLAYEY SILT: brown, firm, wet, cohesive, plastic
10	MOD Calif.	13, 16, 16	SP-SM			POORLY GRADED SAND WITH SILT: brown, medium dense, wet, fine to medium grained sand
	MOD Calif.	11, 20, 22	SM			SILTY SAND: brown, medium dense, wet, fine to medium grained sand
15	MOD Calif.	8, 9, 10				
	MOD Calif.	3, 4, 4	ML			CLAYEY SILT: brown, firm, wet, cohesive, plastic
20	MOD Calif.	6, 7, 10	SM			SILTY SAND: brown, medium dense, wet, fine to medium grained sand
	MOD Calif.	7, 13, 15				
25	MOD Calif.	13, 19, 19				
	MOD Calif.	10, 14, 17				
30	MOD Calif.	12, 23, 28				dense

Graphic Trend
Blow Count | Dry Density



Total Depth 31 1/2 feet
Groundwater Encountered at 7 1/2 feet
No Refusal, Backfilled w/cuttings and bentonite

File No.: [illegible] October 10, 2013

Lab No.: 13-295

UNIT DENSITIES AND MOISTURE CONTENT ASTM D2937 & D2216-98

Job Name: Proposed [illegible] Agriculture [illegible] Project

Sample Location	Depth (feet)	Unit Dry Density (pcf)	Moisture Content (%)	USCS Group Symbol
B1	2.5	92	7	SM
B1	5	95	11	SM
B1	7.5	97	5	ML
B1	10	108	14	SP-SM
B1	12.5	120	14	SM
B1	15	86	27	SM
B1	17.5	68	29	ML
B1	20	68	29	SM
B1	22.5	97	17	SM
B1	25	96	18	SM
B1	27.5	91	19	SM
B1	30	102	21	SM

File No.: [illegible]	[illegible]

Lab No.: [illegible]

SIEVE ANALYSIS

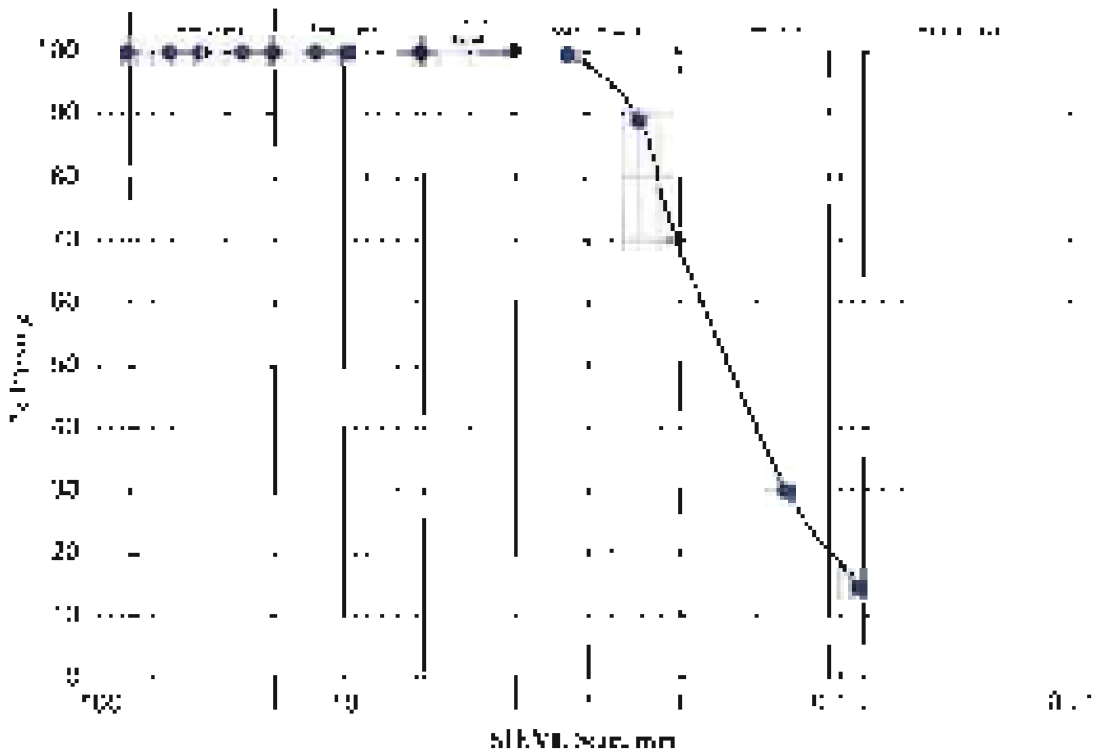
ASTM [illegible]

Job Name: Proposed [illegible] Housing Project

Sample ID: [illegible] feet

Description: Silty Sand (SM)

Sieve Size	% Passing
3"	100
2"	100
1-1/2"	100
1"	100
3/4"	100
1/2"	100
3/8"	100
#4	100
#10	100
#16	100
#30	90
#40	70
#100	30
#200	15.2



% Coarse Gravel	0	% Coarse Sand	0			
% Fine Gravel	0	% Medium Sand	30	Cu	NA	
		% Fine Sand	55	Cc	NA	Gradation
% Total Gravel	0	% Total Sand	85	% Fines	15	NA

[illegible]

APPENDIX B

Percolation Test Results

Leachline Percolation Data Sheet

Project:	Don Jose Ag Housing	Job No.:	08786-02
Test Hole No.:	P-1	Date Excavated:	9/23/2013
Depth of Test Hole:	2.5	Soil Classification:	Silt (ML)
Check for Sandy Soil Criteria Tested by:	R. Reed	Date:	9/24/2013
Presoak:	Yes		
Actual Percolation Tested by:	R. Reed	Date:	9/25/2013
[illegible]:	[illegible]	[illegible]:	2.5

SANDY SOIL CRITERIA TEST

Trial No.	Time of Reading	Time Elapsed (min)	Initial Water Level (in)	Final Water Level (in)	Change in Water Level (in)
A	15:45 / 16:10	30	4.6	1.2	3.4
B					

Reduction Factor: [illegible]

[illegible] Sandy Soil Criteria

Reading No.	Time Start of Reading	Time End of Reading	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min/inch)
1	10:10	10:40	30	30	7.0	7.0	0.0	No Perc
2	10:40	11:10	30	60	7.0	7.0	0.0	No Perc
3	11:10	11:40	30	90	7.0	6.5	0.5	[illegible]
4	11:40	12:10	30	120	6.5	6.5	0.0	No Perc
5	12:10	12:40	30	150	6.5	6.5	0.0	No Perc
6	12:40	13:10	30	180	6.5	6.5	0.0	No Perc
7	13:10	13:40	30	210	6.5	6.5	0.0	No Perc
8	13:40	14:10	30	240	6.5	6.5	0.0	No Perc
9	14:10	14:40	30	270	6.5	6.5	0.0	No Perc
10	14:40	15:10	30	300	6.5	6.5	0.0	No Perc
11	15:10	15:40	30	330	6.5	6.0	0.5	[illegible]
12	15:40	16:10	30	360	6.0	6.0	0.0	No Perc

Leachline Percolation Data Sheet

Project	Don Jose Ag Housing	Job No.	08786-02
Test Hole No.	P-2	Date Excavated	9/23/2013
Depth of Test Hole	2.5	Soil Classification	Silty Sand (SM)
Check for Sandy Soil Criteria Tested by	R. Reed	Date	9/24/2013
Presoak	Yes		
Actual Percolation Tested by	R. Reed	Date	9/25/2013
Pipe Size (inch)	[illegible]	Length of Pipe (ft)	[illegible]

SANDY SOIL CRITERIA TEST

Trial No.	Time of Reading	Time Interval (min)	Initial Water Level (in)	Final Water Level (in)	Change in Water Level (in)
A	15:50 16:20	30	[illegible]	1.5	[illegible]
B					

Sandy Factor [illegible]

[illegible] (Sandy Soil Criteria) [illegible]

Reading No.	Time Started Reading	Time Ended Reading	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Percolation Rate (min/inch)
1	10:00	10:30	30	30	6.0	3.0	3.0	[illegible]
2	10:30	11:00	30	60	6.0	4.0	2.0	[illegible]
3	11:00	11:30	30	90	7.3	6.0	1.3	[illegible]
4	11:30	12:00	30	120	6.0	4.5	1.5	[illegible]
5	12:00	12:30	30	150	7.0	5.3	1.8	[illegible]
6	12:30	13:00	30	180	6.3	4.5	1.8	[illegible]
7	13:00	13:30	30	210	7.0	6.3	0.8	[illegible]
[illegible]	13:30	14:00	30	240	6.3	[illegible]	[illegible]	[illegible]
[illegible]	14:00	15:00	[illegible]	[illegible]	5.5	2.0	[illegible]	[illegible]
10	15:00	16:00	[illegible]	[illegible]	7.8	6.0	[illegible]	[illegible]

APPENDIX C

Earth Systems Southwest Previous Percolation Report for the Site dated February 2, 2007.

Earth Systems
Southwest

[illegible]

February 2, 2010 File No.: 10-90631
[illegible]

Mr. Jose Cervera
89-800 Avenue 64
Thermal, California 92274

Project: **Cervera Mobile Home Park**
APN 749-060-021
89-800 Avenue 64
Thermal, California

Subject: **Update to Soil Percolation Feasibility Report**

Reference: Southland Geotechnical, Soil Percolation Feasibility Report, APN 749-060-021, Avenue 64 East of Pierce Street, Mecca, California, File No. 1997116, dated October 3, 1997

As requested, we have reviewed the referenced document for purposes of updating the report. The undersigned engineer had prepared this report in 1997. As stated in the report, additional testing is required for trailer spaces 4, 7, and 9, or alternatively routing to leach fields within proven areas of acceptable percolation. It is our opinion that the referenced document remains applicable to the Cervera mobile home park. The report is attached for reference and convenience.

Should you have any questions concerning this letter or attached report, please give us a call and we will be pleased to assist you.

Respectfully submitted,
EARTH SYSTEMS SOUTHWEST

Shelton L. Stringer
GE 2266

Letter/sdt

Distribution: 3/Mr. Jose Cervera
1/RC File
2/BD File

Attachments: Soil Percolation Feasibility Report

[illegible]

October 3, 1997

JHC & Associates
P.O. Box 3024
Indio, CA 92202

Attn: John Castillo

Soil Percolation Feasibility Report
Mobile Home Park
Avenue 64 East of Pierce Street
APN 749-060-021
Mecca, California
Report No. P97116

Dear John:

This report presents the findings of our soil percolation feasibility study for the proposed mobile home park near Mecca, California. The project site is located at the northeast corner of Avenue 64 and Pierce Street (See Vicinity Map, Plate 1). The proposed development will consist of a 10-lot mobile home park for migrant farm laborers. [illegible] 1500 gallon septic tanks and leachfield disposal fields are planned.

Field Exploration

We conducted a subsurface exploration on August 28, 1997 by observing two backhoe test pits previously dug and made to an approximate depth of 8 feet below the existing ground surface. The test pit locations are shown on the Site and Exploration Plan on Plate 2. The test pits were located by paced measurements and should be considered approximate. A staff geologist developed logs of the test pits from observation of the exposed soils within the pit. The test pit logs are presented on Plates 3 and 4 attached to this report.

Percolation Tests

Twelve percolation tests were made on September 3, 1997 in the vicinity of the proposed systems as shown on Plate 2. The percolation tests were made in conformance to Riverside County percolation report standards, as described in "Waste Disposal for Individual Homes, Commercial and Industrial", published by the Riverside County Division of Environmental Health.

The tests were performed using a basket inside a 10 inch diameter, hand auger boreholes made to depths of 3.0 feet below existing ground surface. The boreholes were filled with water and normal soil criteria was determined to be applicable, so the boreholes were presoaked with water overnight. Successive readings of drop in water level were made over several periods of about 30 minutes until a stabilized drop was recorded.

The field percolation test results are summarized below with calculations included in the Appendix of this report. The test results indicate that the stabilized percolation rate in the soil are highly erratic and range from 5 to over 120 minutes per inch (mpi). Areas having over 60 mpi percolation rate are unacceptable for leach field systems.

Site Conditions

The 9.8 acre project site consists of agricultural land. The site is relatively flat and drains through surface of runoff and sheet flow to the southwest. The area is bounded by vacant land to the east, west and north, and Avenue 64 to the south. The project site lies at an elevation of approximately 180 feet below mean sea level.

Subsurface Soils

The field exploration conducted on August 28, 1997 indicates that the soils consist generally of silt and sandy silt (ML). According to the USDA Soil Conservation Soils Survey Map, the surficial soils classified as Indio silt, wet. Groundwater was encountered in the exposed test pits made to a depth of 7.5 feet.

Soil Percolation Rate and Leachfield Design

The percolation test results as well as soil and groundwater conditions indicate that a portion of this site may be feasible for soil percolation. A tentative design soil percolation rate for use in areas of proven acceptable percolation may be set at 24 minutes per inch (mpi). Accordingly, the leachfields designed for this rate using 60 square feet of leaching area per 100 gallons of septic tank capacity. This will require 300 LF of 3-ft. wide leach lines for a 1500 gallon septic tank.

Based on the data presented in this report, it is the judgement of the engineer that prepared and signed this report that further testing may be required to evaluate whether there is sufficient area in the lot in question to support individual sewage disposal systems that will meet the current codes and standards of the Riverside County Health Department. Additional tests are required in particular at trailer spaces 4, 7 and 8 to evaluate whether the exceptionally low percolation is representative of those areas or whether additional tests will indicate acceptable percolation rate (<60mpi). Alternatively, the trailers for these spaces may be relocated such that the leachfields could be installed in areas of proven percolation on adjacent trailer spaces. This report should be submitted to the Riverside County Health Department for their review and comment. Based on the subsurface data presented in this report, it is the judgement of the same engineer that the groundwater table is marginally within the current allowable limits set forth by county and state requirements.

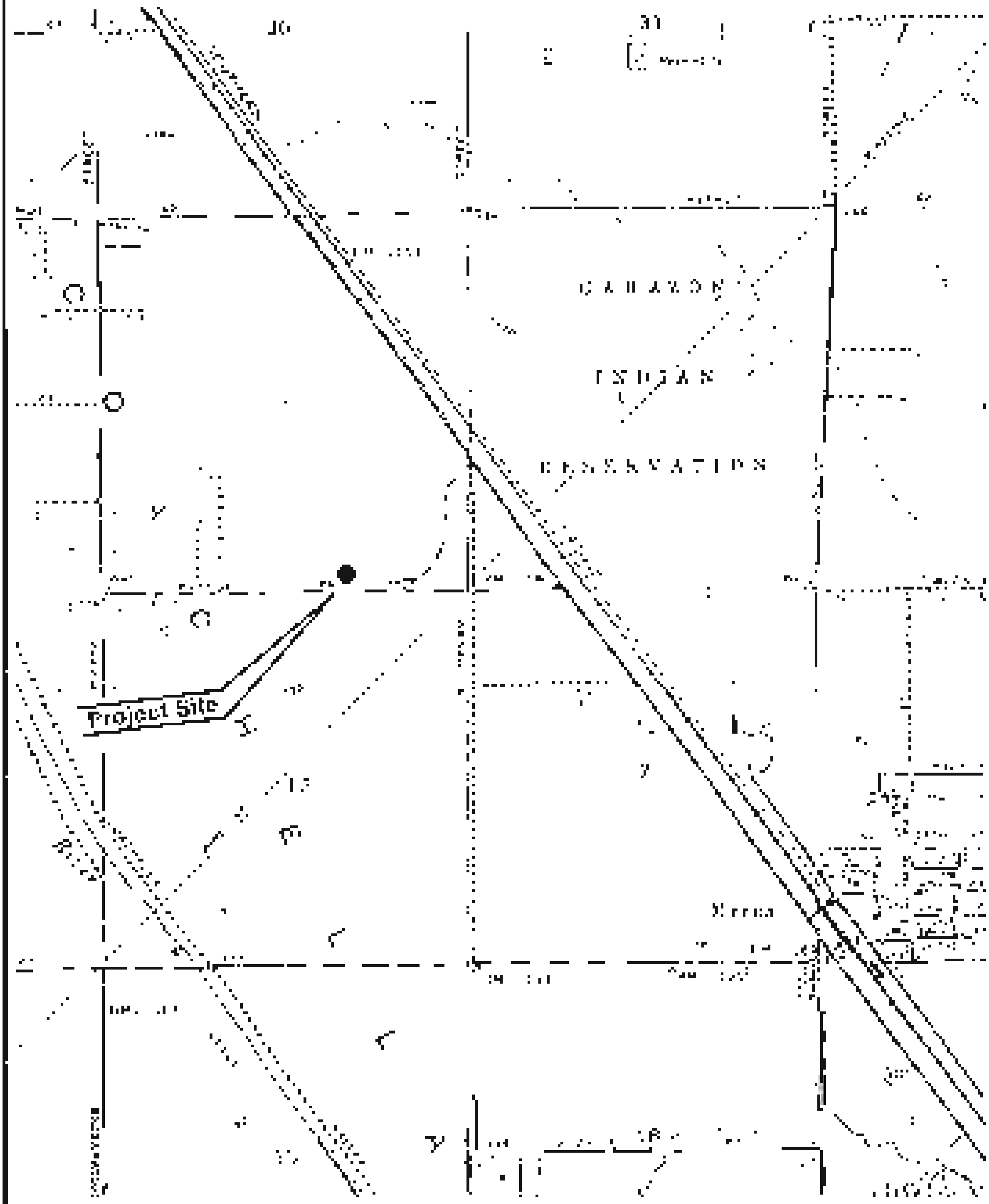
We appreciate the opportunity to provide our professional services. If you have any questions or comments regarding our findings, please call our office at 360-0606.

Respectfully,
SOUTHLAND GEOTECHNICAL, INC.

Shelton L. Stringer, PE, GE
Senior Geotechnical Engineer

REGISTERED PROFESSIONAL ENGINEER
SHELTON L. STRINGER
No. 2250
Exp. 6-30-06
GEOTECHNICAL
STATE OF CALIFORNIA

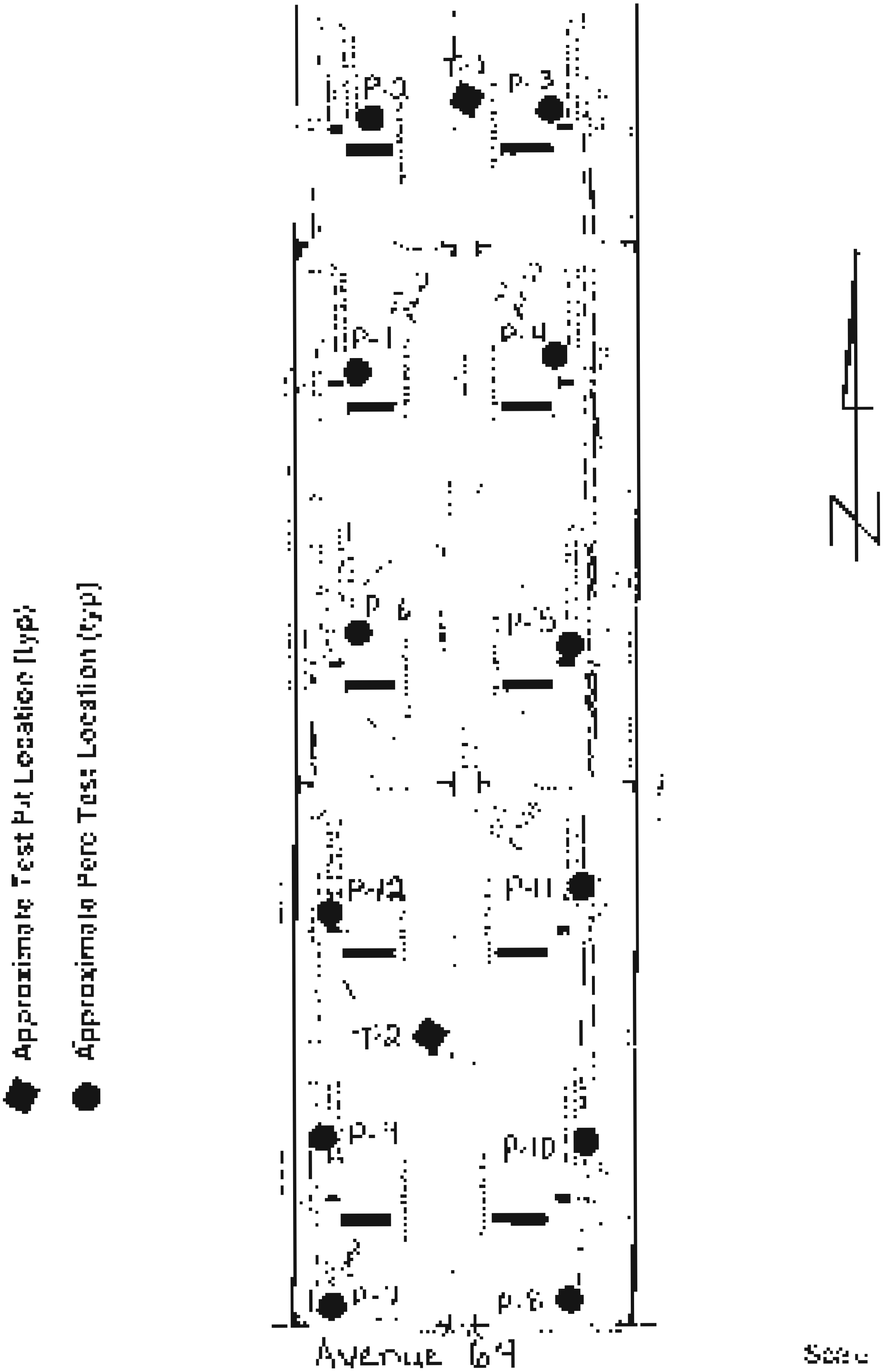
Attachments: Plate 1 - Vicinity Map
Plate 2 - Site and Exploration Map
Plate 3-4 - Log of Borings
Appendix - Soil Percolation Test Results



Project No: P97110

Vicinity Map

Plate 1



Scale 1" = 150'

Project No: P97116

Site and Exploration Plan

Plate
2

CLIENT: JRC & Associates | METHOD OF EXCAVATION: Backhoe
PROJECT: Perc Testing, [illegible] | DATE OBSERVED: [illegible]
LOCATION: See Site & Exploration Plan | LOGGED BY: [illegible]

LOG OF TEST PIT T-1

DESCRIPTION OF MATERIAL

SURFACE ELEV: [illegible]

SILT (ML): Gray, medium dense, [illegible] some very fine sand

SILTY SAND (SM): Gray, medium dense, [illegible] fine grained

SANDY SILT (ML): Gray, [illegible] saturated

GWT @ 7.5 ft

Bottom of Excavation @ [illegible]

Project No. P97116		Plate 3

CLIENT: JRC & Associates | METHOD OF EXCAVATION: Backhoe
PROJECT: [illegible] | DATE OBSERVED: [illegible]
LOCATION: See Site & Exploration Map | LOGGED BY: K. [illegible]

LOG OF TEST PIT T-2

SHEET 1 OF 1

DESCRIPTION OF MATERIAL

SURFACE ELEV.: [illegible]

DEPTH (FEET)	DESCRIPTION OF MATERIAL
1	SANDY SILT (ML) Gray, medium dense, dry to moist
2	
3	
4	Moist
5	
6	
7	Wet/Saturated
	GWT @ [illegible]
8	
9	Bottom of Excavation @ 8 ft
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	

LEACH LINE PERC DATA SHEET [illegible]

Project: [illegible] Job No.: [illegible]
Test Hole No. P1 Date Excavated: 8-28-[illegible]
Depth of Test Hole: [illegible] Soil Classification: ML
Check for Sandy Soil Criteria Tested By: [illegible] Date: 8-28-[illegible] Presoak: [illegible]
Actual Percolation Tested by: [illegible] Date: 9-3-[illegible]

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)
1	6:00 6:25	25	9 1/4	4	[illegible]
2	6:26 [illegible]	25	9 1/2	6 1/2	[illegible]

Use Normal Sandy (Circle One) Soil Criteria

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Percolation Rate (min/inch)
7:00 7:30	30	30	10	9 1/8	0.88	[illegible]
7:30 8:00	30	60	9 1/4	8 5/8	0.63	[illegible]
8:02 [illegible]	30	90	8 7/8	8 1/4	[illegible]	[illegible]
8:38 9:08	30	120	9 1/2	8 7/8	[illegible]	789
[illegible]	30	150	9 7/8	9 3/8	0.50	60.0
9:46 10:16	30	180	9 7/8	9 3/8	0.50	60.0
10:17 [illegible]	30	210	10 1/8	9 3/4	0.38	[illegible]
10:48 [illegible]	30	240	10 1/8	9 3/4	0.38	[illegible]
[illegible]	30	270	10	9 5/8	0.38	[illegible]
[illegible]	30	300	[illegible]	9 1/2	0.38	[illegible]
[illegible]	30	330	9 3/4	9 3/8	[illegible]	[illegible]
[illegible]	30	[illegible]	[illegible]	9 1/2	0.25	120.0

[illegible] 80

PERCOLATION TEST DATA SHEET

Project: [illegible] Job No.: [illegible]

Test Hole No.: P-2 Date Excavated: 9-28-97

Depth of Test Hole: 26" Soil Classification: ML

Check for Sandy Soil Criteria Tested By: LH Date: 9-28-97 Presoak: [illegible]

Actual Percolation Tested By: [illegible] Date: 9-29-97

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)
1	6:25 6:50	25	9 1/4	1/2	8 3/4
2	6:51 6:56	25	9 3/8	5 7/8	4 1/2

Use (Normal) Sandy (Circle One) Soil Criteria

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Percolation Rate (min/inch)
7:05 7:35	30	30	9 7/8	5	4.88*	[illegible]
7:40 8:10	30	60	9	6 3/4	2.25	13.3
8:11 8:41	30	90	9 1/4	7 1/8	2.13	14.1
8:42 9:12	30	120	9 1/8	7 1/8	2.0	15.0
9:13 9:43	30	150	9 1/2	7 5/8	1.88	16.0
9:44 10:14	30	180	9 1/4	7 1/2	1.75	17.1
10:15 10:45	30	210	9 1/4	7 1/2	1.75	17.1
10:46 11:16	30	240	9 3/8	5 7/8	1.50	20.0
11:17 11:47	30	270	9 5/8	8 1/8	1.50	20.0
11:48 12:18	30	300	9 1/4	7 3/4	1.50	20.0
12:19 12:49	30	330	9 1/4	7 7/8	1.38	21.7
12:50 1:20	30	360	9 1/2	8 1/8	1.38	21.7

[illegible]

[illegible] DATA SHEET

Project: [illegible] Job No: [illegible]

Test Hole No. [illegible] Date Excavated: [illegible]

Depth of Test Hole: [illegible] Soil Classification: [illegible]

Check for Sandy Soil Criteria Tested By: [illegible] Date: [illegible] Presoak: [illegible]

Actual Percolation Tested By: [illegible] Date: [illegible]

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)
1	[illegible]	25	[illegible]	[illegible]	7 ⅛
2	[illegible]	25	9 ⅛	[illegible]	[illegible]

Use (Normal) Sandy (Circle One) Soil Criteria

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Percolation Rate (min/inch)
[illegible]	30	30	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	30	60	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	30	[illegible]	9 ¼	[illegible]	[illegible]	18.4
[illegible]	30	[illegible]	9 ¼	[illegible]	[illegible]	18.4
[illegible]	30	[illegible]	9 ⅞	[illegible]	1.60	20.0
[illegible]	30	[illegible]	9 ⅛	[illegible]	1.38	21.7
[illegible]	30	[illegible]	9 ⅛	[illegible]	1.38	21.7
[illegible]	30	[illegible]	9 ⅜	[illegible]	1.38	21.7
[illegible]	30	[illegible]	9 ⅜	[illegible]	1.38	21.7
[illegible]	30	330	9 ⅜	8	1.38	21.7
[illegible]	30	[illegible]	9 ⅜	⅜	1.38	21.7

[illegible]

[illegible] PERC DATA SHEET

Project: [illegible] Job No: [illegible]
Test Hole No. [illegible] Date Excavated: [illegible]
Depth of Test Hole: [illegible] Soil Classification: [illegible]
Check for Sandy Soil Criteria Tested By: [illegible] Date: [illegible] Presoak: [illegible]
Actual Percolation Tested by: [illegible] Date: [illegible]

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)
1	6:[illegible] [illegible] 6:[illegible]	25	9¼	0	9¼
2	6:[illegible] [illegible]	25	10⅜	6½	3⅞

Use (Normal) Sandy (Circle One) Soil Criteria

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Percolation Rate (min/inch)
7:0[illegible] 7:37	30	30	10¼	9¾	0.[illegible]	40.0
7:3[illegible] 8:0[illegible]	30	60	9¼	9[illegible]	0.38	[illegible]
8:0[illegible] 8:3[illegible]	30	90	9⅜	9	0.38	78.[illegible]
8:3[illegible] 9:0[illegible]	30	120	9	8⅝	0.38	[illegible]
[illegible]	30	150	9⅜	9[illegible]	0.38	[illegible]
[illegible]	30	180	9[illegible]	9⅜	0.38	[illegible]0.3
10:07 10:37	30	210	9⅜	9	0.38	[illegible]
10:3[illegible] 11:06	30	240	9	[illegible]	0.25	120.0
[illegible]	30	270	9⅞	[illegible]	0.25	120.0
[illegible] 12:[illegible]	30	300	9½	9⅛	0.38	[illegible]
[illegible]	30	330	9⅜	[illegible]	0.25	120.0
[illegible]	30	360	9¾	9½	0.25	120.0 say 120

PERCOLATION TEST DATA SHEET

Project: [illegible] Job No.: [illegible]
Test Hole No.: [illegible] Date Excavated: [illegible]
Depth of Test Hole: [illegible] Soil Classification: [illegible]
Check for Sandy Soil Criteria Tested By: [illegible] Date: [illegible] Remarks: [illegible]
Actual Percolation Tested By: [illegible] Date: [illegible]

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)
1					
2					

Use (Normal) Sandy (Circle One) Soil Criteria

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Percolation Rate (min/inch)
[illegible]	[illegible]	30	9 1/8	2 3/4	6.38	4.7
[illegible]	30	61	8 7/8	1 3/4	7.0	4.3
[illegible]	30	92	8 5/8	[illegible]	6.19	4.4
[illegible]	30	122	8 5/8	2 5/8	6.00	5.0
[illegible]	30	154	8 3/4	2 1/4	6.15	4.2
[illegible]	30	184	8 5/8	2 1/8	6.06	[illegible]
[illegible]	30	216	8 1/4	3	5.25	5.7
10:56 11:26	30	245	8 5/8	3	5.58	[illegible]
11:26 11:56	32	278	7 7/8	3	4.88	6.1
[illegible]	30	309	9 3/4	3	6.75	4.4
12:26 12:58	30	340	9 1/2	3	6.50	4.6
12:59 1:29	30	371	9 1/8	3	6.13	4.9

[illegible]

TRENCH LINE PERC DATA SHEET

Project: [illegible] Job No: 1971-6
Test Hole No. P6 Date Excavated: 8-26-97
Depth of Test Hole: 5 ft. Soil Classification: [illegible]
Check for Sandy Soil Criteria Tested By: [illegible] Date: [illegible] Presoak: 24 hr
Actual Percolation Tested by: [illegible] Date: 9-3-97

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)
1					
2					

Use (Normal) Sandy (Circle One) Soil Criteria

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Percolation Rate (min/inch)
6:51 7:21	30	30	11/8	1 3/4	1.5	4.0
7:22 7:52	30	61	9 3/8	3 3/4	5.6	5.5
7:53 8:24	30	92	9 1/4	4 7/8	4.25	7.1
8:30 9:00	30	122	9 1/2	6 1/4	3.25	9.2
9:01 9:31	30	153	9 3/4	6 7/8	2.88	10.4
9:34 10:05	33	186	9 1/4	6 7/8	2.63	11.4
10:05 10:35	30	216	9 3/4	7 3/8	2.38	12.6
10:36 11:06	30	248	9 7/8	7 7/8	2.0	15.0
11:06 11:36	30	279	9 3/8	7 1/2	1.88	16.0
11:37 12:07	30	310	9 1/4	7 3/8	1.88	16.0
12:08 12:38	30	341	9 5/8	7 3/4	1.88	16.0
12:39 1:09	30	372	9 3/8	7 1/2	1.88	16.0

[illegible]

[illegible] PERC DATA SHEET

Project: [illegible] Job No: [illegible]6
Test Hole No. [illegible]7 Date Excavated: 9-2-97
Depth of Test Hole: [illegible] Soil Classification: [illegible]
Check for Sandy Soil Criteria Tested By: [illegible] Date: [illegible] Rate: [illegible]
Actual Percolation Tested By: [illegible] Date: [illegible]

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)
1					
2					

Use (Normal) Sandy (Circle One) Soil Criteria

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Percolation Rate (min/inch)
5:48 / 6:18	30	30	[illegible] 7/8	[illegible] 3/8	0.5	60
7:17 / 7:47	30	60	11	10 7/8	0.13	230.8
7:50 / 8:20	30	90	10 7/8	10 [illegible]	0.44	68.2
[illegible]	30	120	[illegible]	[illegible]	0.13	230.8
[illegible]	30	150	[illegible]	[illegible]	0.19	157.9
[illegible]	30	180	[illegible]	9 7/8	0.25	120.0
9:24 / [illegible]	30	210	[illegible]	[illegible]	0.25	120.0
[illegible]	30	240	11 [illegible]	11 [illegible]	0.25	120.0
[illegible]	30	270	11 [illegible]	[illegible]	0.38	78.9
[illegible] / 11:[illegible]	30	300	10 [illegible]	[illegible]	0.13	230.8
11:56 / 12:26	30	330	10 [illegible]	10 [illegible]	0.13	230.8
12:29 / 12:59	30	360	10 [illegible]	10 [illegible]	0.13	230.8 Say [illegible]

[illegible] PERC DATA SHEET

Project: Perc Testing [illegible] Job No: [illegible]6
Test Hole No. 18 Date Excavated: 9-2-97
Depth of Test Hole: 2.5' Soil Classification: ML
Check for Sandy Soil Criteria Tested By: Date: Presoak: 24 hr
Actual Percolation Tested by: [illegible] Date: 9-3-97

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)
1					
2					

Use (Normal) Sandy (Circle One) Soil Criteria

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Percolation Rate (min/inch)
6:52 7:22	30	30	8 7/8	1 7/8	7.13	4.2
7:25 7:55	30	61	9 5/8	1 1/8	8.5	[illegible]
[illegible] 8:28	30	92	10 3/4	2.1	8.63	[illegible]
[illegible] 8:57	30	123	11 1/8	[illegible]	8.0	[illegible]
[illegible] 9:28	30	154	10 1/4	4 [illegible]	6.38	4.7
[illegible] [illegible]	30	185	8 5/8	3 7/8	4.75	6.3
[illegible] [illegible]	30	216	11 5/8	4 1/8	[illegible]	4.2
[illegible] [illegible]	30	247	11 5/8	4 7/8	6.75	4.4
[illegible] [illegible]	30	278	[illegible]	5 7/8	6.88	4.4
[illegible] [illegible]	30	309	10 7/8	4 1/8	6.75	4.6
[illegible] [illegible]	30	340	9 1/2	4 5/8	4.88	6.1
[illegible] [illegible]	30	371	11 7/8	5 1/8	6.5	4.6

[illegible]

TRENCH LINE PERC DATA SHEET

Project: [illegible] Job No: [illegible]

Test Hole No. [illegible] Date Excavated: [illegible]

Depth of Test Hole: 34 Soil Classification: ML

Check for Sandy Soil Criteria Tested By: — Date: — Presoak: 24 Hr

Actual Percolation Tested By: C. [illegible] Date: 9-3-97

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)
1					
2					

Use (Normal) Sandy (Circle One) Soil Criteria

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Percolation Rate (min/inch)
6:56 7:26	30	30	8 1/2	0	8.5	3.5
7:27 7:57	30	61	[illegible]	[illegible]	2.94	3.8
[illegible]	30	92	[illegible]	0	5.38	5.6
[illegible]	30	123	[illegible]	[illegible]	4.13	7.3
[illegible]	30	154	[illegible]	[illegible]	3.75	8.0
[illegible]	30	185	[illegible]	[illegible]	3.06	9.8
[illegible]	30	216	[illegible]	[illegible]	3.00	10
[illegible]	30	247	[illegible]	[illegible]	2.50	12
[illegible]	30	278	[illegible]	[illegible]	2.38	13
[illegible]	30	309	[illegible]	[illegible]	2.38	13
12:06 12:36	30	340	[illegible]	[illegible]	2.13	14
12:37 [illegible]	30	371	[illegible]	[illegible]	2.0	15

24 Hr

PERCOLATION TEST DATA SHEET

Project: Aquamarine(?), East of [illegible] Job No.: 80116

Test Hole No.: P-12 Date Excavated: 6-28-97

Depth of Test Hole: 36 Soil Classification: MC

Check for Sandy Soil Criteria Tested by: -- Date: -- Presoak: 24 hrs

Actual Percolation Tested by: C. Barnes Date: 9-3-97

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)
1					
2					

Use (Normal) Sandy (Circle One) Soil Criteria

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Percolation Rate (min/inch)
[illegible]	30	30	[illegible]	0	8.75	3.4
[illegible]	30	60	9	[illegible]	8.69	3.5
[illegible]	30	92	[illegible]	[illegible]	7.19	4.2
[illegible]	30	123	[illegible]	[illegible]	6.38	4.7
[illegible]	30	154	[illegible]	[illegible]	4.75	6.3
[illegible]	30	186	[illegible]	[illegible]	5.00	5.5
[illegible]	30	216	8 [illegible]	3	5.75	5.2
[illegible]	30	246	9 [illegible]	1 [illegible]	7.75	3.9
[illegible]	30	278	[illegible]	[illegible]	4.88	6.2
[illegible]	30	308	[illegible]	[illegible]	4.50	6.7
[illegible]	30	340	[illegible]	[illegible]	4.00	7.5
[illegible]	30	371	[illegible]	[illegible]	4.00	7.5

[illegible]

[illegible] DATA SHEET

Project: Avenue [illegible], East of [illegible] St. Job No. [illegible]

Test Hole No. P4 Date Excavated: [illegible]

Depth of Test Hole: 36" Soil Classification: ML

Check for Sandy Soil Criteria Tested By: Date: Presoak: [illegible]

Actual Percolation Tested By: C. Barnes Date: 9-3-97

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)
1					
2					

Use (Normal) Sandy (Circle One) Soil Criteria

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Percolation Rate (min/inch)
7:01 / 7:31	30	30	9 1/2	9 1/8	0.38	80
7:55 / 8:25	30	61	9 1/8	8 3/4	0.38	80
[illegible]	30	92	9 [illegible]	9 [illegible]	0.19	160
[illegible]	30	123	[illegible]	9 [illegible]	0.25	120
[illegible]	30	154	[illegible]	9 [illegible]	0.38	80
[illegible]	30	185	9 [illegible]	9 [illegible]	0.25	120
10:06 / 10:36	30	216	9 [illegible]	9 [illegible]	0.13	240
10:48 / 11:18	30	247	9 [illegible]	9 [illegible]	0.25	120
11:1? / 11:4?	30	278	9 [illegible]	9	0.25	120
11:43 / 12:13	30	309	9	8 3/4	0.25	120
12:1? / 12:4?	30	340	8 [illegible]	8 5/8	0.13	240
12:45 / 1:15	30	371	8 5/8	8 1/2	0.13	240

LEACH LINE PERC DATA SHEET

Project: Auburn Golf, Garden Ranch Rd   Job No: [illegible]
Test Hole No. P-7   Date Excavated: 8-28-97
Depth of Test Hole: 25'   Soil Classification: ML
Check for Sandy Soil Criteria Tested By: Date: Presoak: 24hr
Actual Percolation Tested by: C. Rogers   Date: 9-2-97

SANDY SOIL CRITERIA TEST

Trial No.	Time	Time Interval (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)
1					
2					

Use (Normal) Sandy (Circle One) Soil Criteria

Time	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Δ in Water Level (inches)	Percolation Rate (min/inch)
7:48 - 8:18	30	30	4	3 3/4	[illegible]	[illegible]
[illegible]	30	61	7 1/2	4	2.625	11.4
[illegible]	30	92	10 1/4	7 1/2	2.75	11
[illegible]	30	124	[illegible]	7 1/8	2.40	12
[illegible]	30	154	5	8 1/4	1.88	16
[illegible]	30	186	[illegible] 1/2	[illegible]	1.75	17
[illegible]	30	216	10 3/8	8 7/8	1.50	20
10:45 - 11:15	30	247	[illegible]	7 [illegible]	1.36	22
11:16 - 11:46	30	278	10	8 3/4	1.25	24
11:47 - 12:17	30	300	6 3/8	7 3/8	1.50	20
12:18 - 12:48	30	340	10 3/8	8 7/8	1.50	20
[illegible]	30	371	9 7/8	8 7/8	1.00	30

Use 24 mpi

Appendix B2 – Cisneros Mobile Home Park

Sladden Engineering

45090 Golf Center Parkway, Suite F, Indio, CA. 92201 (760) 863-0713 Fax (760) 863-0847
450 Egan Avenue, Beaumont, CA 92223 (951) 845-7743 Fax (951) 845-8863
800 E. Florida Avenue, Hemet, CA 92543 (951) 766-8777 Fax (951) 766-8778

February 4, 2013

Project No. 544-8107
13-02-045

Mr. Carlos Cisneros
88410 Avenue 77
Thermal, California 92274

Project: Cisneros Mobile Home Park
88410 Avenue77
Oasis Area
Riverside County, California

Subject: Sewage Disposal Feasibility Report Update

Ref: Percolation Testing for Sewage Disposal Feasibility prepared by Sladden Engineering dated March 8, 1999; Project No. 544-8107

As requested, we have reviewed the above referenced Sewage Disposal Feasibility report as it relates to the design and installation of the new on-site sewage disposal systems proposed for the subject site. The project site is located at 88410 Avenue 77 in the Oasis area of Riverside County, California.

The referenced report includes information and recommendations pertaining to the design of the on-site sewage disposal systems. It is our opinion that the information provided within the referenced report remains applicable for the design and installation of the new on-site sewage disposal systems proposed for the existing mobile home park. The application rates and related leach line design information indicated in the referenced report remains applicable.

If you have questions regarding this letter or the above referenced report, please contact the undersigned.

Respectfully submitted,
SLADDEN ENGINEERING

Brett L. Anderson
Principal Engineer

BRETT L. ANDERSON
No. C45389
Exp. 9/30/14
CIVIL
ENGINEERING
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

Letter/gvm

Copies: 4/ Mr. Carlos Cisneros

Sladden Engineering

6782 Stanton Ave., Suite E, Buena Park, CA 90621 (562) 864-4121 (714) 523-0952 Fax (714) 523-1369
39-725 Garand Ln., Suite G, Palm Desert, CA 92211 (760) 772-3893 Fax (760) 772-3896

March 8, 1999

544-8107

Carlos S. Cisneros & Ana D. Cisneros
88-410 Avenue 77
Thermal, California 92274

Project : Proposed Mobile Home Park
A.P.N. 755-161-007
88-410 Avenue 77
Oasis Area
Riverside County, California

Subject: Percolation Testing for Sewage Disposal Feasibility

As requested, we have performed field exploration and percolation testing for sewage disposal feasibility on the above referenced project site. It is our understanding that a 10 to 12 unit mobile home park is proposed for the site. The site is located on the north side of Avenue 77, approximately one quarter mile west of Highway 86, in the Oasis area of Riverside County, California. There is an existing well located on the west side of the site. The majority of the proposed mobile homes are to be located within the eastern portion of the site so that a minimum of 100 feet of separation is maintained between the well and the leachlines.

Due to the relatively shallow depth to groundwater, septic tank and leachline disposal systems are recommended. Six new sewage disposal systems are currently proposed with each system serving two mobile homes. One existing system including a 1500 gallon septic tank and an 80 foot long by 3 foot wide leachline is located approximately 120 feet northeast of the existing well. The approximate system locations are indicated on a site plan provided by JRC & Associates.

Two exploratory trenches and ten test holes were excavated on the property on November 21, 1998. The exploratory trench and test holes were excavated by the owner with a rubber-tired backhole. The exploratory trenches were excavated to a depth of approximately twelve feet below existing grade. The test holes were excavated to depths of approximately two to three feet below existing grade. The approximate exploratory trench and percolation test hole locations are indicated on the attached plan. The locations of the test holes were determined by pacing and sighting from existing prominent features and should only be considered accurate to the degree implied.

The soils encountered within the exploratory trenches consisted primarily of silty fine grained sands and sandy silts. The site soils appeared fairly consistent in composition and stratigraphy throughout the site. The surface soils were dry on the surface but typically moist at a depth below five feet. No groundwater was encountered in the exploratory trenches and capillary moisture was not observed at the 12 foot depth. Based upon our observations we expect that groundwater will be in excess of 15 feet in this area.

Percolation tests were performed on November 21, 1998. Two inches of ½ inch gravel was placed on the bottom of the holes to prevent scouring when water was added. Tests were performed by filling the test holes with approximately eight to ten inches of water and recording the drop in the water surface at regular intervals. The water percolated out at rates such that the "sandy" soil criteria was used on each of the test holes. Tests results are summarized below:

Test Hole No.	Rate (min/inch)	Minimum Square Feet Per 100 Gallons of Septic Tank Capacity
A	7	20
B	4	20
C	4	20
D	5	20
E	4	20
F	2	20
G	3	20
H	2	20
I	5	20
J	5	20

Leachlines may be designed using a minimum of 20 square feet per 100 gallons of septic tank capacity which is the maximum allowable application rate as determined by Riverside County guidelines. The leachlines should be located in the area of the tests except that the minimum setbacks as contained in the County Ordinance should be maintained. All systems should operate by gravity flow. No grading should be necessary in the area of the leach lines which should be bottomed no more than 6 feet below the existing ground surface. It appears that there will be sufficient area for the sewage disposal systems and the required expansion area.

Based on the data presented in the report and using the recommendations set forth, it is the judgment of the engineer that there is sufficient area of the property in question to support individual sewage disposal systems that will meet the current codes and standards of the health department.

Based on the data presented in the report and the test information accumulated, it is the judgment of the engineer that the groundwater table should not encroach within the current allowable limit set forth by County and State requirements when the recommendations of this report are followed.

The analysis and recommendations submitted in this report are based in part upon the data obtained from the exploratory trenches and ten percolation test holes excavated on the property. The nature and extent of variations within the field may not become evident until construction. If variations then appear evident, it may be necessary to reevaluate the recommendations of this report.

Findings of this report are valid as of this date. However, changes in conditions of a property can occur with passage of time whether they be due to natural processes or works of man. In addition, changes in applicable or appropriate standards can occur whether they result from legislation or the broadening of knowledge. Accordingly, findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of one (l) year.

In the event that any changes in the nature, design or location of the development are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

This report is issued with the understanding that it is the responsibility of the owner, or of his representative, to insure that the information and recommendations contained herein are called to the attention of the architect and engineers for the project and are incorporated into the plans and specifications.

It is also the owners responsibility, or his representative, to insure that the necessary steps are taken to see that the general contractor and all subcontractors carry out such recommendations in the field. It is further understood that the owner or his representative is responsible for submittal of this report to the appropriate governing agencies.

This report has been prepared for the exclusive use of the client and authorized agents. This report has been prepared in accordance with generally accepted soil and foundation engineering practices. No other warranties, either expressed or implied, are made as the professional advice provided under the terms of this agreement, and included in the report.

It is recommended that Sladden Engineering be provided the opportunity for a general review of final design and specifications in order that percolation rates and designated areas for the sewage disposal system will be properly interpreted and implemented in the design and specifications. If Sladden Engineering is not accorded the privilege of making this recommended review, we can assume no responsibility for misinterpretation of our recommendations.

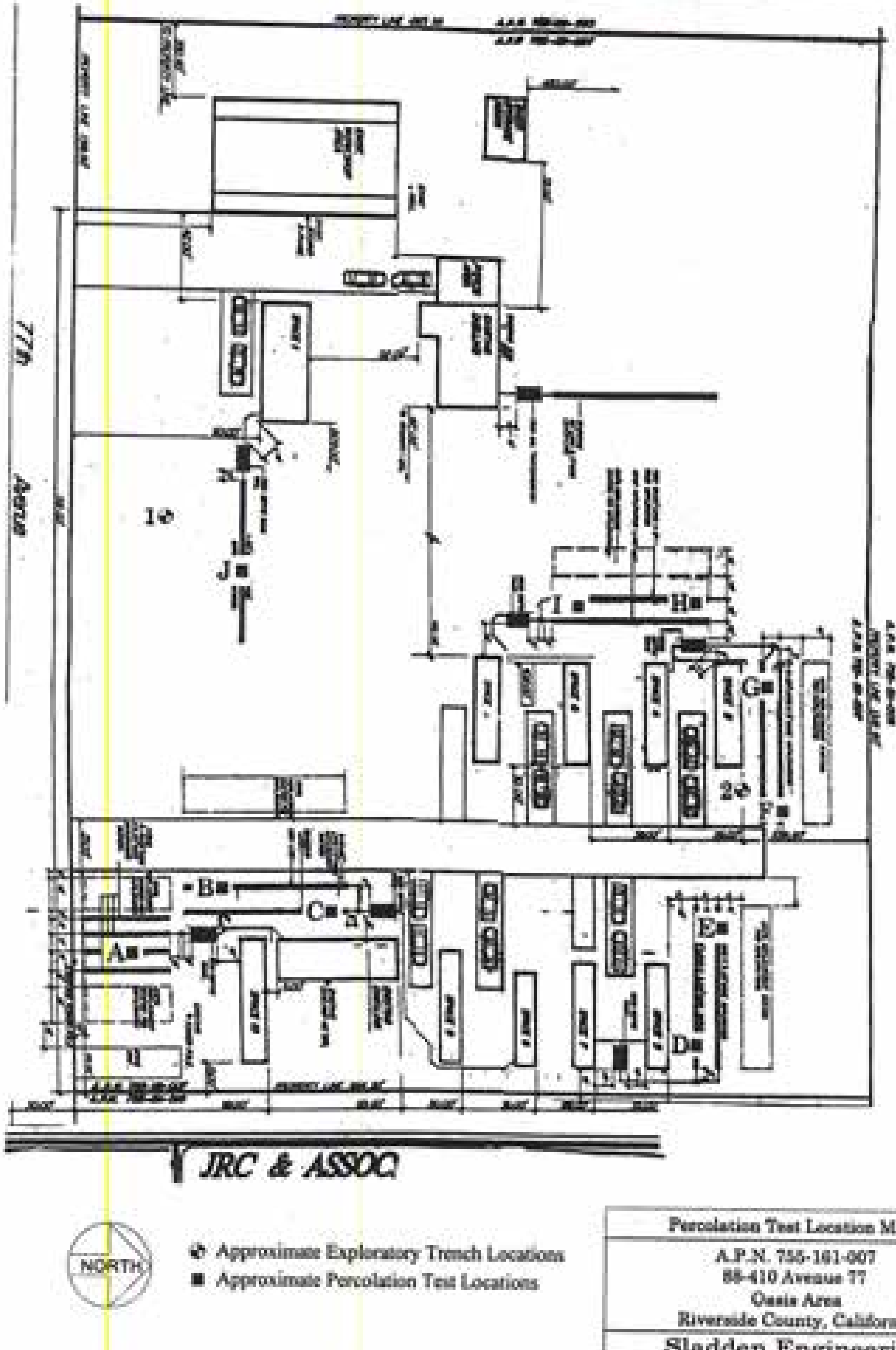
If there are any questions regarding this report, please contact the undersigned.

Respectfully submitted,
SLADDEN ENGINEERING

Hogan R. Wright
Project Engineer

Brett L. Anderson
Principal Engineer

Copies - 4 - Carlos S. Cisneros & Ana D. Cisneros



Approximate Exploratory Trench Locations

■ Approximate Percolation Test Locations

Percolation Test Location Map	
A.P.N. 755-161-007 88-410 Avenue 77 Oasis Area Riverside County, California	
Sladden Engineering	
DATE: 3-4-99	JOB NO.: 544-8107

A.P.N. 755-161-007 / 88-410 Avenue 77

Date: 9-23-98 | Trench No.: 1 | Job No.: 544-8107

Depth (in feet)	Symbol	Core	Blows/ft.	DESCRIPTION	Soil Type	Unit Dry Wt. (pcf)	% Moisture	% Relative Compaction	REMARKS
0–4				Silty Sand: Brown, fine grained	SM		Dry Dry		
4–8				Sandy Silt: Brown, slightly clayey	ML		Moist Moist		Interbedded silty sand layers, moist
8–12				Silty Sand: Brown, fine grained	SM		Moist		Thin interbedded clay layers, moist
12–28									Total Depth = 12' No Groundwater No Bedrock

Note: The statification lines represent the approximate boundaries between the soil types; the transitions may be gradual.

A.P.N. 755-161-007 / 88-410 Avenue 77

Date: 9-23-98 | Trench No.: 2 | Job No.: 544-8107

Depth (in feet)	Symbol	Core	Blows/ft.	DESCRIPTION	Soil Type	Unit Dry Wt. (pcf)	% Moisture	% Relative Compaction	REMARKS
0				Silty Sand: Brown, fine grained	SM		Dry		
1									
2							Dry		
3				" "	"				
4							Damp		
5				" "	"				
6									
7				Sandy Silt: Brown, slightly clayey	ML		Moist		Interbedded silty sand layers, moist
8				Silty Sand: Brown, fine grained	SM				
9									
10									
11				" "	"		Moist		
12									Total Depth = 12' No Groundwater No Bedrock
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									Note: The statification lines represent the approximate boundaries between the soil types; the transitions may be gradual.

Stormwater Percolation Data Sheet

Project: A.P.N. 755-161-007 / 68-410 Avenue 77
Project No.: 544-8107
Test Hole: A
Date Excavated: 11-21-98
Depth of Test Hole: 24"
Soil Classification: SM
Check for Sandy Soil Criteria Tested by: Ryan
Date: 11-21-98 Presoak: ---
Actual Percolation Tested by: Ryan
Date: 11-21-98

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	9:30 9:55	25	11.2	0.0	11.2
B	10:00 10:25	25	10.4	0.0	10.4

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:30 - 10:41	10	10	11.0	9.5	1.5	6.7
2	10:49 - 10:59	10	20	9.9	6.3	3.6	2.8
3	11:00 - 11:10	10	30	9.6	5.8	3.8	2.6
4	11:12 - 11:22	10	40	9.8	5.5	4.3	2.3
5	11:22 - 11:32	10	50	10.2	7.4	2.8	3.6
6	11:32 - 11:42	10	60	9.2	6.2	3.0	3.3

Stormwater Percolation Data Sheet

Project: A.P.N. 755-161-007 / 88-410 Avenue 77
Project No.: 544-8107
Test Hole: B
Date Excavated: 11-21-98
Depth of Test Hole: 24"
Soil Classification: SM
Check for Sandy Soil Criteria Tested by: Ryan
Date: 11-21-98 Presoak: —
Actual Percolation Tested by: Ryan
Date: 11-21-98

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	9:31 9:56	25	11.0	0.0	11.0
B	10:01 10:26	25	10.0	0.0	10.0

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:33 - 10:43	10	10	8.3	4.7	3.6	2.8
2	10:46 - 10:56	10	20	11.1	7.0	4.1	2.4
3	10:58 - 11:08	10	30	9.9	6.1	3.8	2.6
4	11:11 - 11:21	10	40	9.0	5.9	3.1	3.2
5	11:21 - 11:31	10	50	10.8	8.1	2.7	3.7
6	11:33 - 11:43	10	60	9.8	6.6	3.2	3.1

Stormwater Percolation Data Sheet

Project: A.P.N. 755-161-007 / 88-410 Avenue 77

Project No.: 544-8107

Test Hole: C

Date Excavated: 11-21-98

Depth of Test Hole: 24"

Soil Classification: SM

Check for Sandy Soil Criteria Tested by: Ryan

Date: 11-21-98 Presoak: ---

Actual Percolation Tested by: Ryan

Date: 11-21-98

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	9:47 10:12	25	11.0	0.0	11.0
B	10:17 10:42	25	10.0	0.0	10.0

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:42 - 10:52	10	10	9.3	4.7	4.6	2.2
2	10:54 - 11:04	10	20	8.0	4.3	3.7	2.7
3	11:05 - 11:15	10	30	8.6	4.9	3.7	2.7
4	11:16 - 11:26	10	40	8.8	5.5	3.3	3.0
5	11:26 - 11:36	10	50	9.4	6.8	2.6	3.8
6	11:36 - 11:46	10	60	9.5	6.6	2.9	3.4

Stormwater Percolation Data Sheet

Project: A.P.N. 755-161-007 / 88-410 Avenue 77

Project No.: 544-8107

Test Hole: D

Date Excavated: 11-21-98

Depth of Test Hole: 24"

Soil Classification: SM

Check for Sandy Soil Criteria Tested by: Scott

Date: 11-21-98 Presoak: ---

Actual Percolation Tested by: Scott

Date: 11-21-98

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	11:27 11:52	25	11.2	0.0	11.2
B	11:52 12:17	25	10.1	0.0	10.1

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	12:27 - 12:37	10	10	10.6	4.7	5.9	1.7
2	12:44 - 12:54	10	20	8.2	4.3	3.9	2.6
3	12:59 - 1:09	10	30	9.1	4.9	4.2	2.4
4	1:10 - 1:20	10	40	9.1	5.5	3.6	2.8
5	1:21 - 1:31	10	50	9.3	6.8	2.5	4.0
6	1:32 - 1:42	10	60	9.0	6.6	2.4	4.2

Stormwater Percolation Data Sheet

Project: A.P.N. 755-161-007 / 66-410 Avenue 77

Project No.: 544-8107

Test Hole: E

Date Excavated: 11-21-98

Depth of Test Hole: 30"

Soil Classification: SM

Check for Sandy Soil Criteria Tested by: Scott

Date: 11-21-98 Presoak: --

Actual Percolation Tested by: Scott

Date: 11-21-98

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	11:35 12:00	25	11.5	0.0	11.5
B	12:00 12:25	25	12.1	0.0	12.1

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	12:25 - 12:35	10	10	10.6	4.0	6.6	1.5
2	12:37 - 12:47	10	20	10.3	6.1	4.2	2.4
3	12:51 - 1:01	10	30	10.8	5.9	4.9	2.0
4	1:04 - 1:14	10	40	8.8	5.0	3.8	2.6
5	1:15 - 1:25	10	50	8.7	5.8	2.9	3.4
6	1:26 - 1:36	10	60	9.0	5.6	3.4	2.9

Stormwater Percolation Data Sheet

Project: A.P.N. 755-161-007 / 88-410 Avenue 77
Project No.: 544-8107
Test Hole: F
Date Excavated: 11-21-98
Depth of Test Hole: 24"
Soil Classification: SM
Check for Sandy Soil Criteria Tested by: Scott
Date: 11-21-98 Presoak: --
Actual Percolation Tested by: Scott
Date: 11-21-98

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	11:40 12:05	25	11.2	0.0	11.2
B	12:05 12:30	25	11.5	0.0	11.5

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	12:33 - 12:43	10	10	10.7	3.0	7.7	1.3
2	12:47 - 12:57	10	20	10.8	2.9	7.9	1.3
3	12:58 - 1:08	10	30	10.8	2.9	7.9	1.3
4	1:08 - 1:18	10	40	10.0	3.5	6.5	1.5
5	1:20 - 1:30	10	50	10.0	3.8	6.2	1.6
6	1:30 - 1:40	10	60	9.6	3.2	6.4	1.6

Stormwater Percolation Data Sheet

Project: A.P.N. 755-161-007 / 88-410 Avenue 77
Project No.: 544-8107
Test Hole: G
Date Excavated: 11-21-98
Depth of Test Hole: 30"
Soil Classification: SM
Check for Sandy Soil Criteria Tested by: Ryan Reid
Date: 11-21-98 Presoak: --
Actual Percolation Tested by: Ryan Reid
Date: 11-21-98

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	11:23 11:48	25	11.0	0.0	11.0
B	11:48 12:13	25	10.3	0.0	10.3

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	12:14 - 12:24	10	10	8.3	2.0	6.3	1.6
2	12:26 - 12:36	10	20	9.1	3.8	5.3	1.9
3	12:38 - 12:48	10	30	9.0	3.8	5.2	1.9
4	12:49 - 12:59	10	40	8.0	3.9	4.1	2.4
5	1:00 - 1:10	10	50	9.0	5.0	4.0	2.5
6	1:11 - 1:21	10	60	9.2	5.2	4.0	2.5

Stormwater Percolation Data Sheet

Project: A.P.N. 755-161-007 / 88-410 Avenue 77
Project No.: 544-8107
Test Hole: H
Date Excavated: 11-21-98
Depth of Test Hole: 30"
Soil Classification: SM
Check for Sandy Soil Criteria Tested by: Ryan Reid
Date: 11-21-98 Presoak: --
Actual Percolation Tested by: Ryan Reid
Date: 11-21-98

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	11:23 11:48	25	10.8	0.0	10.8
B	10:23 10:48	25	10.0	0.0	10.0

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:48 - 10:58	10	10	8.0	0.0	8.0	1.3
2	10:58 - 11:08	10	20	8.0	0.0	8.0	1.3
3	11:08 - 11:18	10	30	8.1	0.0	8.1	1.2
4	11:19 - 11:29	10	40	8.0	0.0	8.0	1.3
5	11:29 - 11:39	10	50	8.3	0.0	8.3	1.2
6	11:39 - 11:49	10	60	8.2	0.0	8.2	1.2

Stormwater Percolation Data Sheet

Project: A.P.N. 755-161-007 / 88-410 Avenue 77
Project No.: 544-8107

Test Hole: I
Date Excavated: 11-21-98

Depth of Test Hole: 24"
Soil Classification: SM

Check for Sandy Soil Criteria Tested by: Ryan Reid
Date: 11-21-98 Presoak: ---

Actual Percolation Tested by: Ryan Reid
Date: 11-21-98

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	11:51 12:16	25	10.6	0.0	10.6
B	12:18 12:43	25	10.0	0.0	10.0

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	12:45 - 12:55	10	10	8.3	5.5	2.8	3.6
2	12:56 - 1:06	10	20	10.5	7.0	3.5	2.9
3	1:08 - 1:18	10	30	10.0	7.2	2.8	3.6
4	1:20 - 1:30	10	40	9.3	7.1	2.2	4.5
5	1:33 - 1:43	10	50	10.3	7.5	2.8	3.6
6	1:44 - 1:54	10	60	9.8	7.2	2.6	3.8

Stormwater Percolation Data Sheet

Project: A.P.N. 755-161-007 / 68-410 Avenue 77
Project No.: 544-8107
Test Hole: J
Date Excavated: 11-21-98
Depth of Test Hole: 30"
Soil Classification: SM
Check for Sandy Soil Criteria Tested by: Ryan Reid
Date: 11-21-98 Presoak: ---
Actual Percolation Tested by: Ryan Reid
Date: 11-21-98

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	11:56 12:21	25	10.2	0.0	10.2
B	12:23 12:48	25	10.9	3.2	7.7

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	12:50 - 1:00	10	10	8.3	5.5	2.8	3.6
2	1:01 - 1:11	10	21	10.5	7.0	3.5	2.9
3	1:13 - 1:23	10	33	10.0	7.2	2.8	3.6
4	1:25 - 1:35	10	45	9.3	7.1	2.2	4.5
5	1:36 - 1:46	10	56	10.3	7.5	2.8	3.6
6	1:48 - 1:58	10	68	9.8	7.2	2.6	3.8

Appendix B3 – Emma Valenzuela Mobile Home Park

RMC WATER AND ENVIRONMENT
515 SOUTH FLOWER STREET, 36TH FLOOR
LOS ANGELES, CALIFORNIA 90071

SEWAGE DISPOSAL FEASIBILITY AND SOIL PERCOLATION REPORT UPDATE EMMA VALENZUELA MOBILE HOME PARK 81-550 HARRISON STREET THERMAL, RIVERSIDE COUNTY CALIFORNIA

October 10, 2013

File No.: 07427-04
Doc. No.: 13-10-705

Earth Systems
Southwest

[illegible]

October 10, 2013

File No.: 07427-04
Doc. No.: 13-10-705

RMC Water and Environment
515 South Flower Street, 30th Floor
Los Angeles, California 90071

Subject: **Sewage Disposal Feasibility and Soil Percolation Report Update**

Project: **Emma Valenzuela Mobile Home Park**
81-550 Harrison Street
Thermal, California

Reference: Earth Systems Consultants, Sewage Disposal Feasibility and Soil Percolation Report, Francisco Valenzuela Polanco Mobile Home Park, 81-550 Highway 86, Oasis, California, File No.: 07427-01, Doc. No.: 99-11-728, dated November 9, 1999

Dear Mr. [illegible]:

Earth Systems Southwest (Earth Systems) presents this sewage disposal feasibility and soil percolation report for the Emma Valenzuela Mobile Home Park to be located at 81-550 Harrison Street in Thermal, Riverside County, California. This report presents our findings and recommendations for leach field waste disposal. This report should stand as a whole and no part of the report should be excerpted or used to exclusion of any other part.

This report completes our scope of services in accordance with our agreement (SWP-13-154), dated September 9, 2013. Other services that may be required, such as plan review, are additional services and will be billed according to the Fee Schedule in effect at the time services are provided. Unless requested in writing, the client is responsible for distributing this report to the appropriate governing agency.

We appreciate the opportunity to provide our professional services. Please contact our office if there are any questions or comments concerning this report or its recommendations.

Respectfully submitted,
EARTH SYSTEMS SOUTHWEST

Kevin L. Paul, PE, GE
Senior Engineer

Perc/[illegible]

Distribution: 4/RMC Water and Environment
1/BD File

TABLE OF CONTENTS

Section 1
INTRODUCTION

1.1 Project Description

This sewage disposal feasibility and soil percolation report has been prepared for the Emma Valenzuela Mobile Home Park located at 81-550 Harrison Street in Thermal, California. The Assessor's Parcel Number (APN) is 737-110-002. The property currently has one permanent residence and 9 mobile homes for employee housing on it. Eight mobile homes may ultimately be re-situated on the site. Septic tanks and leach field waste disposal systems are proposed for this unsewered area. Domestic water comes from a well on the site. The site location is shown on Plate 1 in Appendix A. This report is being prepared to substantiate previous percolation testing performed onsite by Earth Systems on November 9, 1999.

1.2 Site Description

The Emma Valenzuela Mobile Home Park is to be developed on a portion of the triangular-shaped parcel that consists of approximately 3 acres. The project is located at 81-550 Harrison Street in Thermal, Riverside County, California. The site location is shown on Plate 1 in Appendix A. The mobile home park site is situated on nearly level ground that drains by gentle sheet flow towards the northeast. An open drainage channel lies to the north of the property. Based upon information provided to us, we have assumed 9 mobile homes (3 bedrooms), laid out as shown on Plate 2. The location of the test is within the existing mobile home property.

1.3 Purpose and Scope of Services

The purpose for our services was to evaluate and verify the site soil conditions and to provide professional opinions and recommendations regarding the feasibility for sewer waste disposal on the site and to provide updated recommendations if necessary. The scope of services included:

- A general reconnaissance of the site.
- Shallow subsurface exploration by drilling one exploratory boring to a depth of 30 feet below existing grades to evaluate current groundwater levels and soil stratigraphy.
- One percolation test in the area of the proposed leach fields.
- An engineering evaluation of the acquired data from the exploration and testing and previous reports.
- A summary of our findings and recommendations in this written report, including:
    - Discussions on subsurface soil and groundwater conditions.
    - Discussions on soil percolation rate.
    - Recommendations regarding need for septic systems and leach field design criteria.

<u>Not Contained In This Report</u>: Although available through Earth Systems Southwest, the current scope of our services does not include:

- An environmental assessment.
- An investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater, or air on, below, or adjacent to the subject property.

Section 2
METHODS OF EXPLORATION

2.1 Field Exploration

Previous field exploration was performed on October 22, 1999, to evaluate percolation characteristics of the subject site. Additional field exploration was performed that include one percolation boring drilled on September 23, 2013 with an 8-inch auger to a depth of approximately 2.5 feet. Additionally, one deep exploratory boring was drilled to a depth of approximately 30 feet below the existing ground surface to observe current ground water levels and soil profiles. The deep exploratory boring was drilled on September 23, 2013 using an 8-inch outside diameter hollow stem auger powered by a Mobile B-61 drill rig. The boring locations are shown on the Boring Location Map, Plate 2, in Appendix A. The locations shown are approximate, established using nearby landmarks. Soil samples were collected at various intervals and sealed for transport to Earth Systems laboratory. Samples were collected in a Modified California Sampler and contained in brass rings.

The final logs of the borings represent our interpretation of the contents of the field logs and review of the samples obtained during the subsurface exploration. The final logs of the percolation and deep borings are included in Table 1 and Appendix A of this report, respectively. The stratification lines represent the approximate boundaries between soil types, although transitions may be gradational.

2.2 Percolation Tests

One percolation test was performed on September 24 and 25, 2013 in the vicinity of the proposed leach fields as shown on Plate 2. This test was performed to substantiate previous testing. The County was notified prior to conducting our onsite percolation testing (County notification number PR # 1717). The percolation tests were performed in substantial conformance to the County percolation test method for single lots, normal or sandy soil criteria (as applicable), as described in the *Onsite Waste Treatment Systems, Technical Guidance Manual, Version A.*

The test was performed using 8-inch diameter boreholes made to a depth of about 2.5 feet below existing ground surface. Hole sidewalls were cleared of any smeared material. A 6 inch diameter perforated PVC pipe was installed in the excavated hole to reduce the potential for caving or disturbance from the addition of water. The boreholes had approximately 1 to 2 inches of gravel placed on the sides and bottom of the hole, respectively, to minimize sidewall disturbance and sedimentation. A gravel correction factor was applied to the volume of water percolated. Tests were performed in the typical sand with silt soils (Unified Soil Classification System, USCS, soil type SP-SM). The boreholes were filled with water on September 23, 2013 and presoaked overnight and for approximately ½ hour prior to testing. For testing, successive readings of the drop in water level were made over several 10-minute periods (for sandy soil criteria). Measurements were referenced from the top of the perforated pipe. The field percolation test results are included in Appendix B and below.

Table 1

Onsite Seepage Pit Percolation Results

Test Hole	Test Description	Soil Condition	USCS Soil Description	Test Zone Below Existing Grades (feet)	Estimated Basic Percolation Rate (Minutes/Inch)
P-1	8" Drilled Hole	Native	0-2.5' Sand with Silt (SP-SM)	2-2.5	2.5

The test results indicate that the stabilized drop ranges from approximately 2.5 minutes per inch (mpi). Previous results indicated infiltration rates of 0.4 to 4.6 minutes per inch (mpi). Please see attached previous report dated November 9, 1999.

Section 3
DISCUSSION

3.1 Soil Conditions

The field exploration indicates that site soils consist primarily of interbedded sands in the shallow leach area. The boring logs provided in Appendix A include detailed descriptions of the soils encountered.

3.2 Groundwater

Initial groundwater was determined to be at approximately 18 feet below the ground surface based upon evaluation of the percent saturation of samples collected. Previous groundwater levels in 1999 were greater than 15 feet. Historic high groundwater level is likely to exist at a depth of about 12 feet. As such, we estimate that high groundwater levels at the site may be on the order of 12 feet below existing grades. Groundwater levels may fluctuate with precipitation, irrigation, drainage, and site grading. The absence of groundwater may not represent an accurate or permanent condition. The shallow groundwater levels are generally a semi-perched layer and are strongly influenced by surrounding agricultural irrigation and drainage. This zone is generally not used as a domestic water supply, nor is it suited for potable use because of its alkalinity, salinity, and dissolved solids content.

3.3 Geologic Setting

The site lies at an elevation of about 152 feet below mean sea level in the lower Coachella Valley, a part of the Colorado Desert geomorphic province. A significant feature within the Colorado Desert geomorphic province is the Salton Trough. The Salton Trough is a large northwest-trending structural depression that extends approximately 180 miles from San Gorgonio Pass to the Gulf of California. Much of this depression in the area of the Salton Sea is below sea level. In the prehistoric past, ancient Lake Cahuilla submerged the lower Coachella Valley.

The Coachella Valley forms the northerly portion of the Salton Trough. The lower Coachella Valley contains a thick sequence of Miocene to Holocene sedimentary deposits. The upper sediments within the lower valley consist of fine-grained sands with interbedded clays and silts that are of lacustrine (lakebed), aeolian (wind-blown), and alluvial (water-deposited) origin.

<u>Geohydrologic Setting</u>: The site lies within the Thermal subbasin of the Coachella Valley groundwater basin. The Thermal subbasin is subdivided into four generalized zones: a semi-perched zone with alternating clay layers to about 100 foot depth, underlain by an upper and lower aquifer, separated by an aquitard layer at least 100 feet thick. Domestic wells in the region derive their water form the lower portion of the upper aquifer and the lower aquifer, generally from about 400 to 1,200 feet deep. The upper semi-perched zone is generally not used as a domestic water supply, nor is it suited for potable use because of its alkalinity, salinity, and dissolved solids content.

Section 4
CONCLUSIONS AND RECOMMENDATIONS

The following is a summary of our conclusions and professional opinions based on the data obtained from the site evaluation.

- The site is feasible for soil percolation and will support leach field and septic tank systems with infiltrators for waste disposal.
- Historic high groundwater is anticipated to be on the order of 12 feet below the ground surface based upon soil mottling observed and iron staining.
- Based upon the low moisture content in the upper 15 feet, there does not appear to be impermeable strata precluding the downward migration of water.
- The soils encountered generally have greater than 10% fines smaller than a #200 sieve in a zone at least 5 feet in thickness above the historic water table.
- Results are consistent with previous report findings and recommendations from previous report should be applied except as modified and superseded below.
- The designed system shall be located in natural undisturbed soil at the depth the tests were performed. Proposed system depths (see attached) correspond to the tested elevations. Leach beds should not be founded deeper than approximately 3 feet below existing grades.
- Based on testing, and the similarity of soil types, the natural occurring body of minerals and organic matter at the proposed wastewater disposal area contains earthen materials having more than 50% of its volume composed of particles smaller than 0.08 inches (2mm) in size.
- There is at least 5 feet of undisturbed soil between the bottom of the tested leach field bottom and anticipated historic high groundwater.
- The percolation test results as described in Section 2.2 and presented in Appendix B indicate that the stabilized drop range is from 0.4 to 4.6 minutes per inch (mpi). Based upon a stabilized rate of 5 mpi, conventional leach lines for sanitary waste disposal may be sized using 20 square feet of leaching area per 100 gallons of septic tank capacity (based on design soil percolation rate of 0 to 9 mpi).
- The final design should delineate the area to be set aside and used for 100% expansion.
- Leach lines should be constructed to provide the required leaching area. Leach lines should have a maximum length of 100 feet and be separated at least 4 feet (edge-to-edge) from each other. The leach lines should have at least 12 inches of soil cover and have a bottom no more than 24 to 36 inches below existing prevailing grade. The leach fields should consist of standard size chamber systems, such as the Infiltrator® or Cultec System. This

system replaces leach lines with perforated drainage pipe and gravel with a sturdy plastic chamber that is 34 inches wide, 12 inches high, and completely open on the bottom.

- Leach lines should be bottomed in natural undisturbed soil. If during leach live excavations soils previously used for leach fields are encountered, they should be removed and replaced with sandy soils similar to the sieve gradation presented within and approved by the geotechnical engineer.

- Leach line bottom soils should be observed prior to backfilling by the geotechnical engineer or his representative to confirm the soils are sandy as anticipated, or to modify the recommendations if siltier or clay soils are encountered.

- Rapid injection or high volume discharge of effluent may tax the ability of the soils to readily absorb effluent over the short term. System design should consider the effects of increased user use (additional residents per home), incorporate low flow discharge (low flow toilets, shower heads, etc.) and incorporate low flow septic systems which dose the leach field slower.

- Leach fields should be located at least 5 feet from property lines, 8 feet from buildings or covered areas, and 100 feet away from on-site or off property wells. Other separations detailed in *Onsite Waste Treatment Systems, Technical Guidance Manual, Version A* for Riverside County apply and should be referred to in design.

- Maintenance of onsite waste disposal systems can be the most critical element in determining the success of a design. Due to general accessibility limitations which typically exist with drainage systems and infiltration structures, they must be protected clogging of any filter medium, and the near structure soils. The potential for clogging can be reduced by pre-treating structure inflow through the installation of a proper septic tank. In addition, sediment, paper, and debris must be removed from the tank on a regular basis.

- Based on the data presented in this report and using the recommendations set forth, it is the judgment of this professional that there is sufficient area to support a primary and expansion OWTS that will meet the current standards of the Department of Environmental Health and the Regional Water Quality Control Board (RWQCB). Based on the data presented in this report and the testing information accumulated, it is the judgment of this professional that the groundwater table will not encroach within the current allowable limit set forth by County and State requirements (5 feet below the base of the leach field set at no deeper than 3 feet below existing grade).

- This report should be submitted to the Riverside County Department of Environmental Health (RCDEH) for their review and comment. Earth Systems should have the opportunity to review the plan of the septic system and details.

Section 5
LIMITATIONS

Our findings and recommendations in this report are based on selected points of field exploration, percolation testing, and our understanding of the mobile home park. Furthermore, our findings and recommendations are based on the assumption that soil conditions do not vary significantly from those found at specific exploratory locations. Variations in soil or groundwater conditions could exist between and beyond the exploration points.

Findings of this report are valid as of the issued date of the report. However, changes in conditions of a property can occur with passage of time, whether they are from natural processes or works of man, on this or adjoining properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or broadening of knowledge. Accordingly, findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of one year.

This report is issued with the understanding that the owner or the owner's representative has the responsibility to bring the information and recommendations contained herein to the attention of the designer for the septic systems and are incorporated into the plans and specifications. The owner or the owner's representative also has the responsibility to take the necessary steps to see that the contractor carry out such recommendations in the field. It is further understood that the owner or the owner's representative is responsible for submittal of this report to the appropriate governing agencies.

Earth Systems has striven to provide our services in accordance with generally accepted geotechnical engineering practices in this locality at this time. No warranty or guarantee, express or implied, is made. This report was prepared for the exclusive use of the Client and the client's authorized agents.

Earth Systems should be provided the opportunity for a general review of the septic tank and leach field plan in order that our recommendations may be properly interpreted and implemented in the design. If Earth Systems is not accorded the privilege of making this recommended review, we can assume no responsibility for misinterpretation of our recommendations.

Although available through Earth Systems Southwest, the current scope of our services does not include an environmental assessment or an investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater, or air on, below, or adjacent to the subject property.

-o0o-

Appendices as cited are attached and complete this report.

APPENDIX A

Plate 1 – Site Location Map
Plate 2 – Boring Location Map
Terms and Symbols Used on Boring Logs
Soil Classification System
Logs of Borings
Laboratory Test Results

Reference: Good Earth Satellite Image with Historical Topographic Map Overlay, dated 2011.

LEGEND

Approximate Site Location

Approximate Scale: 1" = 4,000'

0 4,000' 8,000'

N

Plate 1
Site Location Map

Emma Valenzuela Mobile Home Park
81-550 Harrison Road
Thermal, Riverside County, California

Earth Systems
Southwest

10/10/2013 File No.: 07427-04

Reference: Google Earth Satellite Image dated 5/27/2012 &Pueblo Unido CDC Septic System Plans Sheet S, dated 2/11/13.

LEGEND

B-1 Approximate Boring Location

P-1 Approximate Infiltration Test Location

Approximate Scale: 1" = 100’

0 100’ 200’

N

Plate 2
Boring Location Map

Emma Valenzuela Mobile Home Park
81-550 Harrison Road
Thermal, Riverside County, California

Earth Systems
Southwest

10/10/2013	File No.: 07427-04

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on ASTM Designations D 2487 and D 2488 (Unified Soil Classification System). Information on each boring log is a compilation of subsurface conditions obtained from the field as well as from laboratory testing of selected samples. The indicated boundaries between strata on the boring logs are approximate only and may be transitional.

SOIL GRAIN SIZE

U.S. STANDARD SIEVE

12” | 3” | 3/4” | 4 | 10 | 40 | 200

BOULDERS	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

305 | 76.2 | 19.1 | 4.76 | 2.00 | 0.42 | 0.074 | 0.002

SOIL GRAIN SIZE IN MILLIMETERS

RELATIVE DENSITY OF GRANULAR SOILS (GRAVELS, SANDS, AND NON-PLASTIC SILTS)

Very Loose	**N=0-4*	*RD=0-30*	*Easily push a 1/2-inch reinforcing rod by hand*
Loose	*N=5-10*	*RD=30-50*	*Push a 1/2-inch reinforcing rod by hand*
Medium Dense	*N=11-30*	*RD=50-70*	*Easily drive a 1/2-inch reinforcing rod with hammer*
Dense	*N=31-50*	*RD=70-90*	*Drive a 1/2-inch reinforcing rod 1 foot with difficulty by a hammer*
Very Dense	*N>50*	*RD=90-100*	*Drive a 1/2-inch reinforcing rod a few inches with hammer*

**N=Blows per foot in the Standard Penetration Test at 60% theoretical energy. For the 3-inch diameter Modified California sampler,140-pound weight, multiply the blow count by 0.63 (about 2/3) to estimate N. If automatic hammer is used, multiply a factor of 1.3 to 1.5 to estimate N. RD=Relative Density (%). C=Undrained shear strength (cohesion).*

CONSISTENCY OF COHESIVE SOILS (CLAY OR CLAYEY SOILS)

Very Soft	**N=0-1*	**C=0-250 psf*	*Squeezes between fingers*
Soft	*N=2-4*	*C=250-500 psf*	*Easily molded by finger pressure*
Medium Stiff	*N=5-8*	*C=500-1000 psf*	*Molded by strong finger pressure*
Stiff	*N=9-15*	*C=1000-2000 psf*	*Dented by strong finger pressure*
Very Stiff	*N=16-30*	*C=2000-4000 psf*	*Dented slightly by finger pressure*
Hard	*N>30*	*C>4000*	*Dented slightly by a pencil point or thumbnail*

MOISTURE DENSITY

Moisture Condition: *An observational term; dry, damp, moist, wet, saturated.*
Moisture Content: *The weight of water in a sample divided by the weight of dry soil in the soil sample expressed as a percentage.*
Dry Density: *The pounds of dry soil in a cubic foot.*

MOISTURE CONDITION

Dry.....................Absence of moisture, dusty, dry to the touch
Damp................Slight indication of moisture
Moist.................Color change with short period of air exposure (granular soil)
Below optimum moisture content (cohesive soil)
Wet....................High degree of saturation by visual and touch (granular soil)
Above optimum moisture content (cohesive soil)
Saturated..........Free surface water

RELATIVE PROPORTIONS

Trace............minor amount (<5%)
with/some......significant amount
modifier/and...sufficient amount to influence material behavior (Typically >30%)

PLASTICITY

DESCRIPTION	FIELD TEST
Nonplastic	A 1/8 in. (3-mm) thread cannot be rolled at any moisture content.
Low	The thread can barely be rolled.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit.
High	The thread can be rerolled several times after reaching the plastic limit.

LOG KEY SYMBOLS

Bulk, Bag or Grab Sample

Standard Penetration Split Spoon Sampler (2” outside diameter)

Modified California Sampler (3” outside diameter)

No Recovery

GROUNDWATER LEVEL

Water Level (measured or after drilling)

Water Level (during drilling)

Terms and Symbols Used on Boring Logs

Earth Systems Southwest

MAJOR DIVISIONS			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS *More than 50% of material is larger than No. 200 sieve size*	GRAVEL AND GRAVELLY SOILS *More than 50% of coarse fraction retained on No. 4 sieve*	CLEAN GRAVELS		GW	*Well-graded gravels, gravel-sand mixtures, little or no fines*
				GP	*Poorly-graded gravels, gravel-sand mixtures. Little or no fines*
		GRAVELS WITH FINES		GM	*Silty gravels, gravel-sand-silt mixtures*
				GC	*Clayey gravels, gravel-sand-clay mixtures*
	SAND AND SANDY SOILS *More than 50% of coarse fraction passing No. 4 sieve*	CLEAN SAND (Little or no fines)		SW	*Well-graded sands, gravelly sands little or no fines*
				SP	*Poorly-graded sands, gravelly sands, little or no fines*
		SAND WITH FINES (appreciable amount of fines)		SM	*Silty sands, sand-silt mixtures*
				SC	*Clayey sands, sand-clay mixtures*
FINE-GRAINED SOILS *More than 50% of material is smaller than No. 200 sieve size*	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	*Inorganic silts and very fine sands, rock flour, silty low clayey fine sands or clayey silts with slight plasticity*
				CL	*Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays*
				OL	*Organic silts and organic silty clays of low plasticity*
		LIQUID LIMIT GREATER THAN 50		MH	*Inorganic silty, micaceous, or diatomaceous fine sand or silty soils*
				CH	*Inorganic clays of high plasticity, fat clays*
				OH	*Organic clays of medium to high plasticity, organic silts*
HIGHLY ORGANIC SOILS				PT	*Peat, humus, swamp soils with high organic contents*
VARIOUS SOILS AND MAN MADE MATERIALS					*Fill Materials*
MAN MADE MATERIALS					*Asphalt and concrete*

Soil Classification System

Earth Systems
Southwest

Earth Systems
Southwest
79-811B Country Club Drive, Bermuda Dunes, CA 92201
Phone (760) 345-1588 Fax (760) 345-7315

Boring No. B-1
Project Name: Emma Valenzuela Mobile Home Park
Project Number: 07427-04
Boring Location: See Plate 2

Drilling Date: September 23, 2013
Drilling Method: 8" Hollow Stem Auger
Drill Type: Mobile B61 HDX w/Autohammer
Logged By: Randy Reed

Depth (Ft.)	Sample Type (Bulk / SPT / MOD Calif.)	Penetration Resistance (Blows/6")	USCS/Bedrock	Dry Density (pcf)	Moisture Content (%)	Description of Units
0			SP-SM			POORLY GRADED SAND WITH SILT: gray brown, medium dense, damp, fine to coarse grained sand, no mottling
2.5	MOD Calif.	6, 11, 13				
5	MOD Calif.	8, 13, 15				no mottling
6.5			SM			SILTY SAND: brown, medium dense, moist, fine to coarse grained sand
7.5	MOD Calif.	13, 17, 22				cobble in upper part of sampler, no mottling
10	MOD Calif.	8, 13, 11				cobble in sampler tip, no mottling
12.5	MOD Calif.	7, 11, 11	SM			SILTY SAND: brown, medium dense, moist, fine to coarse grained sand, some mottling
15	MOD Calif.	7, 11, 14	ML			SILT WITH CLAY: brown, very stiff, moist, cohesive, some plasticity, some iron staining
17.5	MOD Calif.	6, 8, 11	SM/ML			SILTY SAND/SANDY SILT: brown, medium dense/very stiff, wet, fine grained sand
20	MOD Calif.	8, 9, 13	SM			SILTY SAND: brown, medium dense, wet, fine to medium grained sand
22.5	MOD Calif.	11, 13, 15				
25	MOD Calif.	6, 11, 8	ML			SILT WITH CLAY: brown, very stiff, wet, cohesive, slight plasticity
27.5	MOD Calif.	4, 7, 8				saturated
30	MOD Calif.	8, 10, 13	SM			SILTY SAND: brown, medium dense, wet, fine grained sand

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Graphic Trend: Blow Count, Dry Density

Total Depth 31 1/2 feet
Groundwater Encountered at 18 feet
No Refusal, Backfilled w/cuttings

File No.: [illegible]   [illegible]

Lab No.: [illegible]

UNIT DENSITIES AND MOISTURE CONTENT ASTM D2937-[illegible] & D2216-[illegible]

Site Name: [illegible]

Sample Location	Depth (feet)	Unit Dry Density (pcf)	Moisture Content (%)	USCS Group Symbol
B1	2.5	111	2	SP-SM
B1	5	115	2	SP-SM
B2	7.5	112	4	SM
B2	10	113	5	SM
B1	12.5	108	5	SM
B1	15	106	15	ML
B2	17.5	104	16	SM-ML
B2	20	112	17	SM
B2	22.5	98	25	SM
B1	25	108	24	MT
B2	27.5	94	24	ML
B2	30	106	23	SM

File No.: 10427-15 12/10/2015

Lab No.: 15-2941

SIEVE ANALYSIS

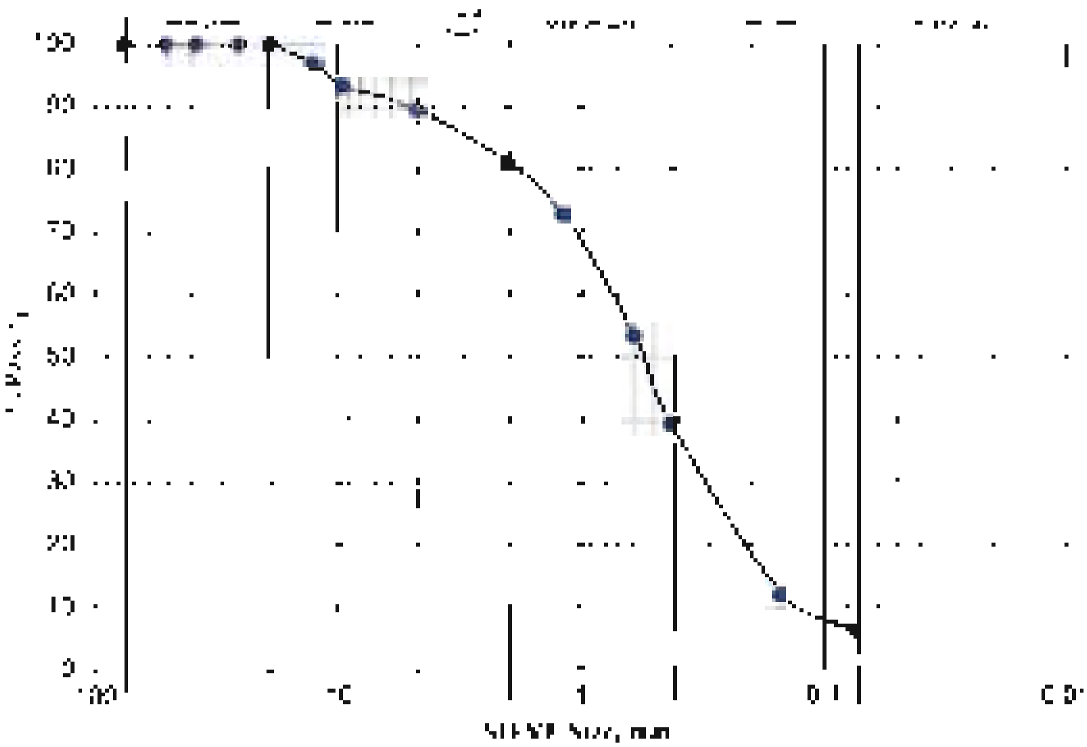
ASTM D6913

Job Name: Emma McTravis's Mobile Home Park

Sample ID: HC @ Street

Description: Poorly Graded Sand with Silt and Gravel (SP)

Sieve Size	% Passing
3"	100
2"	100
1-1/2"	100
1"	100
3/4"	100
1/2"	97
3/8"	93
#4	89
#10	81
#16	73
#30	54
#40	40
#100	12
#200	6.5



% Coarse Gravel	0	% Coarse Sand	8				
% Fine Gravel	11	% Medium Sand	41		Cu: 4.58		
		% Fine Sand	33		Cc: 1.09		Gradation
% Total Gravel	11	% Total Sand	83	% Fines	6		Poorly Graded

APPENDIX B

Percolation Test Results

Leachline Percolation Data Sheet

Project: Emma Valenzuela Mobile Home Park Job No.: 07427-04

Test Hole No.: P-1 Date Excavated: 9/23/2013

Depth of Test Hole: 2.5 [illegible] Soil Classification: Sand with Silt (SP-SM)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/24/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/25/2013

Pipe Stick Up (ft): [illegible] Length of Pipe (ft): 2.50

SANDY SOIL CRITERIA TEST

Trial No.	Time of Reading	Time Interval (min)	Initial Water Level (in)	Final Water Level (in)	Change in Water Level (in)
A	08:15 08:40	[illegible]	6.0	0.0	[illegible]
B	08:45 09:10	[illegible]	10.0	0.0	[illegible]

[illegible]: [illegible]

Use Normal or Sandy, Circle One Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Computed Percolation Rate (min/inch)
1	08:20	08:30	10	[illegible]	17.0	12.0	5.0	[illegible]
2	08:30	08:40	10	20	12.0	7.0	[illegible]	[illegible]
3	08:40	08:50	10	[illegible]	7.0	2.0	[illegible]	[illegible]
4	08:50	09:00	10	40	9.0	4.0	5.0	[illegible]
5	09:00	09:10	10	[illegible]	7.0	2.0	[illegible]	[illegible]
6	09:10	09:20	10	[illegible]	6.0	0.5	[illegible]	[illegible]

APPENDIX C

Earth Systems Southwest Previous Geotechnical Report for the Site dated November 9, 1999.

COACHELLA VALLEY HOUSING COALITION
47-501 MONROE STREET
SUITE C, PLAZA I
INDIO, CALIFORNIA 92201

SEWAGE DISPOSAL FEASIBILITY

AND SOIL PERCOLATION REPORT

FRANSISCO VALENZEULA

POLANCO MOBILE HOME PARK

81-550 HIGHWAY 86

OASIS, CALIFORNIA

File No. [illegible]-01
99-12-713

Earth Systems Consultants
Southwest

[illegible]

November 9, 1999

File No.: 07177-01
99-11-178

Coachella Valley Housing Coalition
45-701 Monroe Street, Suite G, Plaza I
Indio, California 92201

Attention: Ms. Debra Arauz

Subject: **Sewage Disposal Feasibility and Soil Percolation Report**

Project: **Francisco Valenzuela**
Polanco Mobile Home Park
81-550 Highway 86
Oasis, California

We take pleasure to present this Sewage Disposal and Soil Percolation Report prepared for the existing Polanco Mobile Home Park located at 81-550 Highway 86 near Oasis, Riverside County, California. This report presents our findings and recommendations for leachfield waste disposal. This report should stand as a whole, and no part of the report should be excerpted or used to exclusion of any other part.

This report completes our scope of services in accordance with our agreement dated October 1, 1999. Other services that may be required, such as plan review and additional services and will be billed according to the Fee Schedule in effect at the time services are provided. Unless requested in writing, the client is responsible to distribute this report to the appropriate governing agency.

We appreciate the opportunity to provide our professional services. Please contact our office if there are any questions or comments concerning this report or its recommendations.

Respectfully submitted,
EARTH SYSTEMS CONSULTANTS
Southwest

Shelton L. Stringer
GE 2266

No 2266
Exp. 6-30-00

SLS/cs

Distribution: 4/Coachella Valley Housing Coalition
1/VTA File, 1/BD File

TABLE OF CONTENTS

Section 1
INTRODUCTION

1.1 Project Description

This Sewage Disposal Feasibility and Soil Percolation Report has been prepared for the existing [illegible] Mobile Home Park owned by Francisco Valenzuela and located at 81-550 Highway 86 near Oasis, Riverside County, California. The property currently has one permanent residence and 12 mobile homes for employee housing on it. Twelve mobile homes are contemplated to use existing septic tanks and leachfield waste disposal systems, since this is unsewered area. Domestic water comes from a well on the site.

1.2 Site Description

The mobile home park is located on the east side of Highway 86. The site location is shown on Figure 1 in Appendix A. The property is located within the SW 1/4 of the SW 1/4 Section [illegible], T8S, R9E of the San Bernardino Baseline Meridian.

The mobile home park site is situated on gently sloping ground by sheet flow to the southeast. Agricultural lands surround most of the property. Additional mobile homes lie on the property to the north. There are no known agricultural tile drain lines on or near the property. An open drainage channel lies to the north of the property. Construction of new Highway 86 is to the east of the site.

1.3 Purpose and Scope of Work

The purpose for our services was to evaluate the site soil conditions and to provide professional opinions and recommendations regarding the feasibility for sewer waste disposal on the site. The scope of work included the following:

- A general reconnaissance of the site
- Shallow subsurface exploration by drilling one exploratory boring to a depth of about 15 feet
- 10 percolation tests in the area of the leach fields
- Evaluation of existing septic tanks and leach lines
- Engineering evaluation of the acquired data from the exploration and testing
- A summary of our findings and recommendations in this written report, including:
  - Discussions on subsurface soil and groundwater conditions
  - Discussions on soil percolation rate
  - Discussions on the adequacy of existing septic tanks and leach lines
  - Recommendations regarding need for additional septic systems and leach field design criteria.

Not Contained In This Report: Although available through Earth Systems Consultants Southwest, the current scope of our services does not include:

- An environmental assessment
- Investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater, or air on, below, or adjacent to the subject property
- Geotechnical and geologic studies, such as soil liquefaction hazard

Section 2
METHODS OF INVESTIGATION

2.1 Field Exploration

One exploratory boring was drilled to a depth of about 15 feet below the existing ground surface to observe the soil profile. The boring was drilled on October 22, 1999 using 8-inch outside diameter hollow-stem augers and powered by a CME-45 truck-mounted drilling rig. The location of the boring is approximate, established by sighting from existing topographic features. The approximate boring location is shown on the site and percolation test location plan, Figure 2, in Appendix A.

The final log of the boring represents our interpretation of the contents of the field log and review of bulk samples obtained during the subsurface investigation. The final log is included in Appendix A of this report.

2.2 Percolation Tests

Ten (10) percolation tests were made on October 27, 1999, in the vicinity of the proposed leachfields as shown on Figure 2. The percolation tests were made in conformance to Riverside County percolation test method, as described in "Waste Disposal for Individual Homes, Commercial and Industrial", published by the Riverside County Division of Environmental Health (RCDEH).

The tests were performed using 8-inch diameter boreholes drilled to depths of 3 feet below existing ground surface. The boreholes were filled with water and the sandy soil presoaking test conducted. Successive readings of drop in water level were made over several 10-minute periods until a stabilized drop was recorded. Measurements were referenced from the top of a 3-inch diameter [illegible] pipe set in the borehole to reduce caving and perforated at the bottom. The field percolation test results are included in Appendix B. The test results indicate that the stabilized drop range from 0.4 to 5 minutes per inch (mpi).

2.3 Evaluation of Existing Septic Systems

As part of our sewage disposal evaluation, we subcontracted with Terra Geosciences of Loma Linda, California to conduct geophysical surveys of the existing septic tanks/pits and any connecting leach lines. This survey was conducted by ground penetrating radar. The investigation consisted of the following:

- Locating and uncovering the existing septic tanks/pits to determine their type, condition, and estimate their capacities by indirect measurement.
- Locating some of the existing leachlines and uncovering them at a few locations to evaluate their construction.

Section 3
DISCUSSION

3.1 Soil Conditions

The field exploration indicates that site soils consist primarily of Silty Sand (SM). The boring logs provided in Appendix A include detailed descriptions of the soils encountered. The USDA Soil Conservation Service maps the upper 60 inches of soil as Myoma fine sand with expected slight conditions for soil percolation.

3.2 Groundwater

Free groundwater was not encountered in the 15 foot boring during exploration. The depth to groundwater in the area may be 15 to 30 feet. The first groundwater zone is a semi-perched zone above deeper clay layers. This semi-perched zone is generally not used as a domestic water supply but is unsuited for potable use because of its alkalinity, salinity, and dissolved solids content.

3.3 Geologic Setting

The site lies at an elevation of about 150 feet below mean sea level in the lower Coachella Valley, a part of the Colorado Desert geomorphic province. A significant feature of the Colorado Desert geomorphic province is the Salton Trough. The Salton Trough is a large northwest trending structural depression that extends from San Gorgonio Pass, approximately 180 miles to the Gulf of California. Much of this depression in the area of the Salton Sea is below sea level. In the prehistoric past, ancient Lake Cahuilla submerged the lower Coachella Valley.

The Coachella Valley forms the northerly portion of the Salton Trough. The lower Coachella Valley contains a thick sequence of sedimentary deposits that are Miocene to recent in age. The upper sediments within the lower valley consist of fine grained sands with interbedded clays and silts that are of lacustrine (lakebed), aeolian (wind blown), and alluvial (water deposited) origin.

Geohydrologic Setting: The site lies within the Thermal subbasin of the Coachella Valley groundwater basin. The Thermal subbasin is subdivided into four generalized areas: a semi-perched zone with alternating clay layers to about 100 feet depth, underlain by an upper and lower aquifer separated by an aquitard layer at least 100 feet thick. Domestic wells in the region derive their water form the lower portion of the upper aquifer and the lower aquifer generally from about 400 to 1200 feet deep.

3.4 Existing Septic Systems

The following table is a summary of information regarding existing septic tanks discovered on site. The locations of the septic tanks are shown on Figure 2 in Appendix A.

Septic Tank Number	Number of Units Served	Dimensions (LxWxD) (feet)	Estimated Capacity (gallons)	Sanitary Tee Inlets	Construction Type
S-1	1 - residence	4x8x5	1500	baffles	Concrete
S-2*	N/A	N/A*	N/A*	N/A*	N/A*
S-3*	N/A	N/A*	N/A*	N/A*	N/A*
S-4	N/A	7.5x4x4 cylindrical	750	Baffles, septic level flowing over	Steel, moderately rusted, completely [illegible], thick scum layer
S-5	N/A	N/A	N/A	no	Homemade, rotted wood (with metal siding?)
Total	12				

* These tanks were not evaluated in that they lie in close proximity to the well and should be abandoned.

The following table provides a summary of information regarding existing leach lines discovered on site. The locations of the leach lines are shown on Figure 2 in Appendix A.

Connected Septic Tank Number	Number of Units Served	Number & Length x Width (feet)	Leaching Area (sf)	Remarks
S-1	1 - residence	1 @ 50x3	150	Detected by GPR
S-4	N/A	1 @ 50x3	150	Detected by GPR
S-5	N/A	1 @ 12x3, 1 @ 16x3	84	Detected by GPR

Section 4
CONCLUSIONS AND RECOMMENDATIONS

The following is a summary of our conclusions and professional opinions based on the data obtained from the site evaluation.

- The site is feasible for soil percolation and will support leachfield and septic tank systems for waste disposal.

- Most of the existing septic tanks for the mobile homes are unacceptable in their present condition except Septic Tank S-[illegible]. These tanks should be abandoned. Septic Tank S-4 could be pumped out and used for only one mobile home. The septic systems may present a potential health hazard by contaminating the onsite domestic well. *We recommend testing these wells for possible septic contamination.*

- There should be the following septic tank capacities, depending on the number of units:

Units Served by Septic Tanks	Septic Tank Capacity (gallons)
2	1500
3	2250
4	[illegible]
5	[illegible]
6	[illegible]

- The percolation test results as described in Section 2.2 and presented in Appendix B indicate that the stabilized drop range from 0.4 to 5 minutes per inch drop. Therefore, leach lines for sanitary waste disposal may be sized using 70 square feet of leaching area per 100 gallons of septic tank capacity. As an example, based on the design soil percolation rate given above, 1050 lineal feet of 1 foot wide leach lines should be provided for a 1500 gallon septic tank.

- Additional leach lines should be constructed to supplement existing leach lines to provide the required leaching area. The site is limited for possible leach fields. Possible areas include the southeast corner of site (dependent on location of any off site wells to the north), southwest corner of the site, and along the frontage road.

- Leach lines should have a maximum length of 100 feet and be separated at least 4 feet, edge to edge, from each other. The leach lines should have at least 12 (preferably 18) inches of soil cover and have a bottom at least 30 inches but no more than 48 inches deep. The widths of the leach lines should range from 18 to 36 inches wide. Drain rock consisting of 3/4 to 2 1/2 inch size gravel should be used. The perforated drainage pipe should be laid level and have a minimum of 2 inches of gravel cover. Untreated building paper should be laid over the gravel cover to reduce soil infiltration, yet allow evapotranspiration. They should be located at least 5 feet from property lines, 8 feet from buildings or covered areas, and 100 feet away from onsite or off property wells. A typical leach line construction detail is provided on Figure 5 in Appendix A.

- Based on the data presented in this report, it is the judgement of the engineer who prepared and signed this report that there may be sufficient area within the park to support an individual sewage disposal system that can meet the current codes and standards of the Riverside County Department of Environmental Health. Based on the subsurface data presented in the report, it is the judgement of the same engineer that neither the groundwater table or bedrock will encroach within the current allowable limit set forth by county and state requirements. This report should be submitted to the Riverside County Department of Environmental Health for their review and comment. ESCSW should have the opportunity to review the plan of the leachfield layout and details.

Section 5
LIMITATIONS

Our findings and recommendations in this report are based on selected points of field exploration, percolation testing, and our understanding of the onsite waste plan. Furthermore, our findings and recommendations are based on the assumption that soil conditions do not vary significantly from those found at specific exploratory locations. Variations in soil or groundwater conditions could exist between and beyond the exploration points.

Findings of this report are valid as of the issued date of the report. However, changes in conditions of a property can occur with passage of time whether they are from natural processes or works of man on this or adjoining properties. In addition, changes in applicable or appropriate standards occur whether they result from legislation or broadening of knowledge. Accordingly, findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of one year.

This report is issued with the understanding that the owner, or the owner's representative, has the responsibility that the information and recommendations contained herein are brought to the attention of the designer for the septic systems and are incorporated into the plans and specifications. The owner, or his representative, also has the responsibility to take the necessary steps to see that the contractor carry out such recommendations in the field. It is further understood that the owner or the owner's representative is responsible for submittal of this report to the appropriate governing agencies.

ESCSW has striven to provide our services in accordance with generally accepted geotechnical engineering practices in this locality at this time. No warranty or guarantee is express or implied. This report was prepared for the exclusive use of the Client and their authorized agents.

ESCSW should be provided the opportunity for a general review of the septic tank and leachfield plan in order that our recommendations may be properly interpreted and implemented in the design. If ESCSW is not accorded the privilege of making this recommended review, we can assume no responsibility for misinterpretation of our recommendations.

Although available through Earth Systems Consultants Southwest, the current scope of our services does not include an environmental assessment, or investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater or air on, below, or adjacent to the subject property.

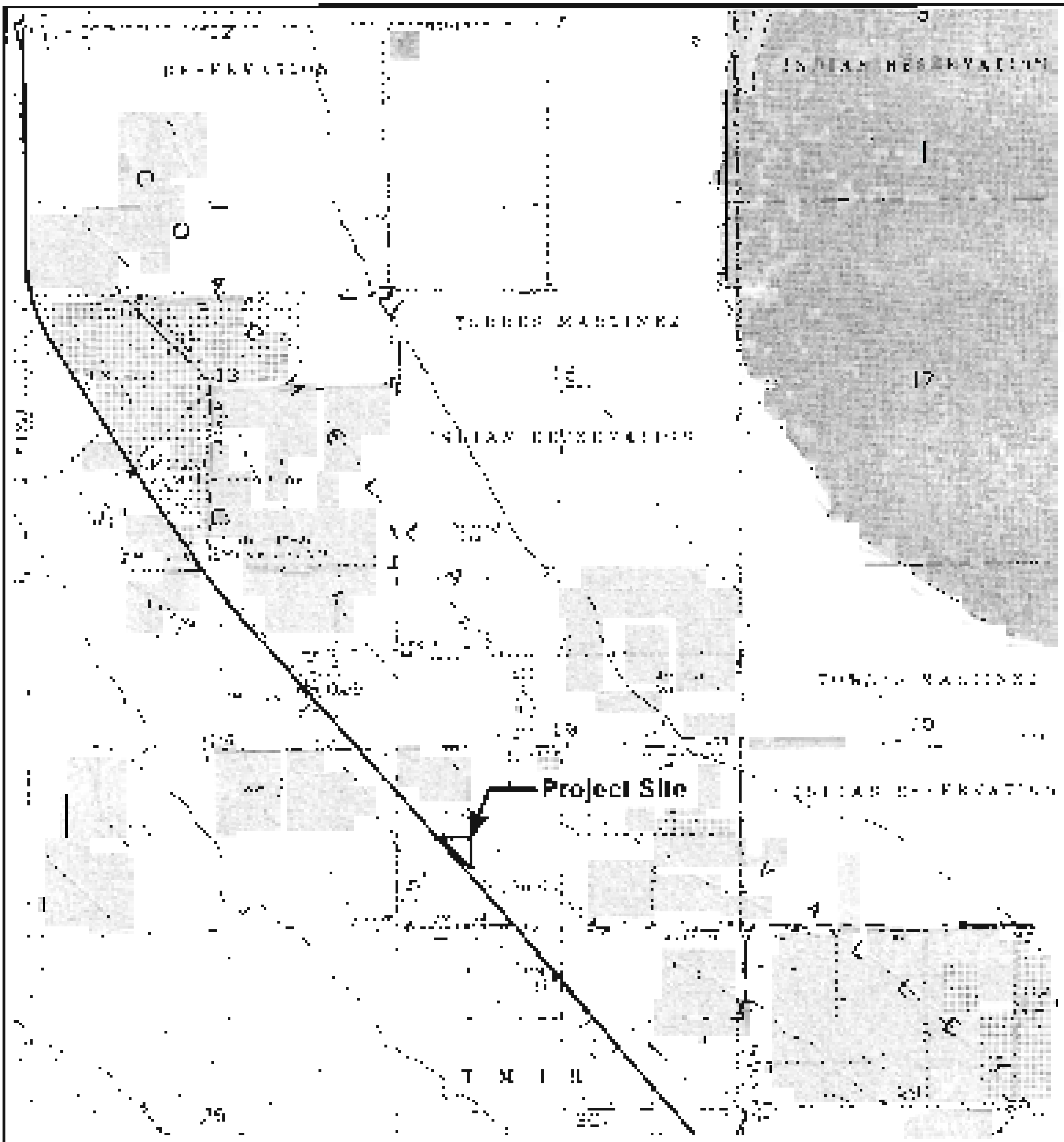
-oOo-

Appendices as cited are attached and complete this report.

APPENDIX A

Figure 1 – Site Location
Figure 2 - Site and Test Location Plan

Logs of Borings



Reference: Oasis 7.5 min. USGS Quadrangle (photorevised 1974)

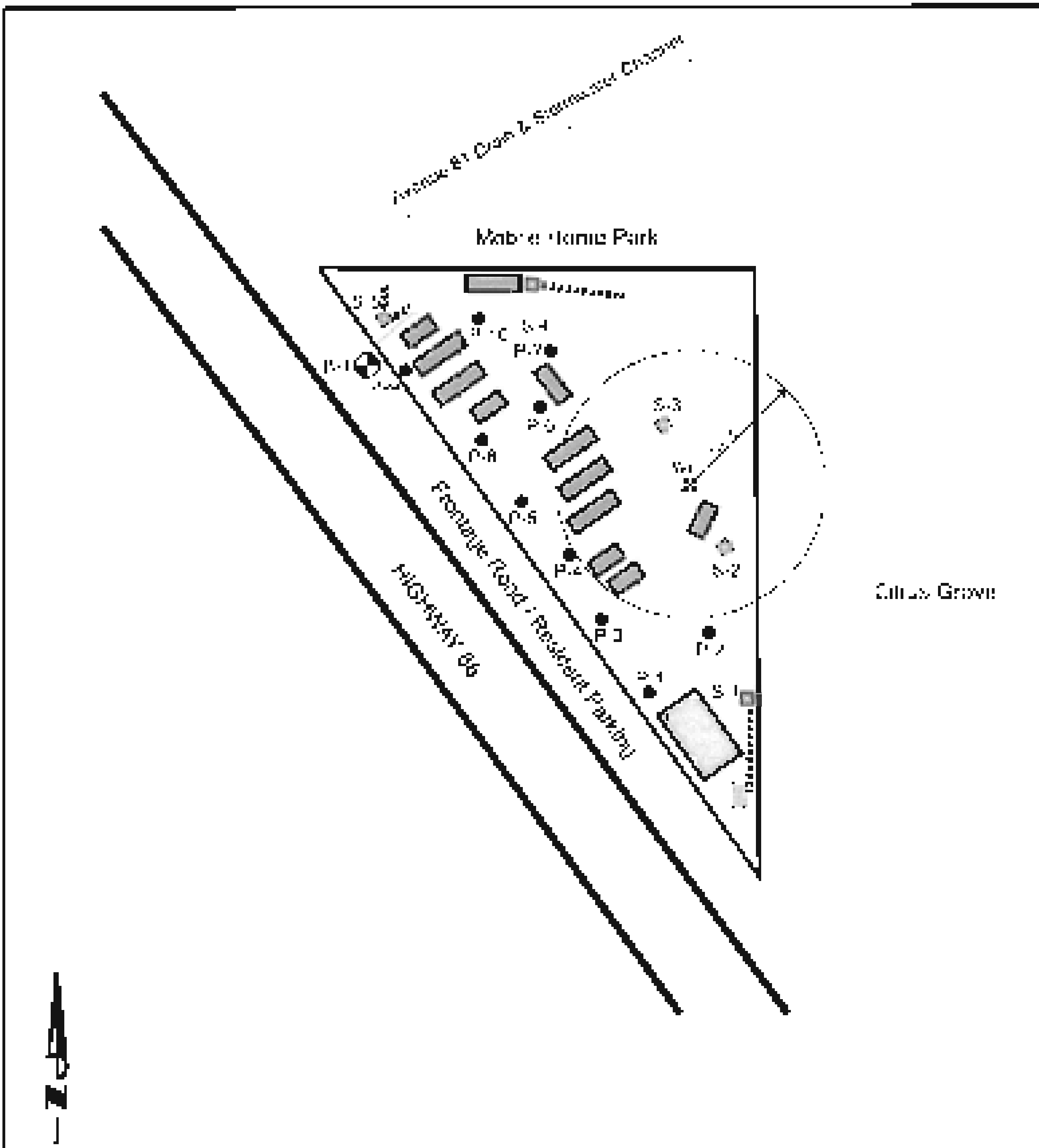
Scale: 1" = 2,000'

0 2,000 4,000

Figure 1 - Site Location

Project Name: Valenzuela Mobile Home Park
Project No: 07427-01

Earth Systems Consultants
Southwest



LEGEND

Approximate Boring Location
Approximate Perc Test Location
Existing Septic Tank Location
Existing Leach Line
Existing Mobile Home

Scale 1" = 100'

0 100 200

Figure 2 - Site and Test Location Plan

Valenzuela Mobile Home Park
81-550 Highway 86
Job Number 07427-01

Earth Systems Consultants
Southwest

Earth Systems Consultants
Southwest

Boring No: B-1

[illegible]

Description of Units

[illegible]

SM		SILTY SAND: Brown, damp, [illegible] fine grained with some clay

Total Depth [illegible]
[illegible]

APPENDIX B

Percolation Test Results

Leaching Percolation Data Sheet

Project: Valenzuela MUP - 8?-550 Hwy 86 Job No.: [illegible]

Test Hole No.: P-1 Date Excavated: [illegible]

Depth of Test Hole: 3.5 feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: D. Howe Date: [illegible] Presoak: Yes

Actual Percolation Test by: D. Howe Date: [illegible]

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 3.63

SANDY SOIL CRITERIA TEST

Trial No.	Time of Reading	Time Interval (min)	Initial Water Level (in)	Final Water Level (in)	Change in Water Level (in)
A	09:37 / 10:02	25	10.0	5.0	5.0
B	10:32 / 10:57	25	10.0	6.6	6.7

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Percolation Rate (min/inch)
1	14:44	14:54	10	10	12.5	8.5	4.0	2.5
2	14:55	15:05	10	21	12.1	9.6	2.5	4.0
3	15:06	15:16	10	32	12.2	10.0	2.3	4.4
4	15:17	15:27	10	43	13.1	12.1	1.6	6.0
5	15:20	15:30	10	54	12.2	[illegible]	2.4	3.0
6	15:29	15:39	10	65	13.9	11.5	2.5	4.5

Earth Systems Consultants Southwest

Leachline Percolation Data Sheet

Project: **Valenzuela MHP - 81-550 Hwy 86** Job No.: 07407-01

Test Hole No.: **P-2** Date Excavated: 10-26-[illegible]

Depth of Test Hole: [illegible] feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: [illegible] Date: 10-27-[illegible] Presoak: [illegible]

Actual Percolation Tested by: [illegible] Date: 10-27-[illegible]

Pipe Stick Up (ft): [illegible] Length of Pipe (ft): [illegible]

SANDY SOIL CRITERIA TEST

Trial No.	Time of Reading	Time Interval (min)	Initial Water Level (in)	Final Water Level (in)	Change in Water Level (in)
A	09:39 10:04	25	9.0	0.0	9.0
B	10:34 10:59	25	11.[illegible]	0.0	11.[illegible]

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Percolation Rate (min/inch)
1	14:47	14:57	10	10	11.2	0.0	11.2	0.9
2	14:58	15:08	10	21	10.1	0.8	[illegible]	0.9
3	15:09	15:19	10	32	18.7	1.4	17.3	0.6
4	15:20	15:30	10	43	20.2	1.4	18.7	0.5
5	15:31	15:41	10	54	24.0	1.9	22.2	0.5
6	15:42	15:52	10	65	27.4	3.0	24.4	0.4

Earth Systems Consultants Southwest

Leaching Percolation Data Sheet

Project: **Valenzuela MHP - 81-550 Hwy 86** Job No: 07427-01
Test Hole No.: P-3 Date Excavated: 10/26/99
Depth of Test Hole: 5.0 feet below grade Soil Classification: Silty Sand (SM)
Check for Sandy Soil Criteria Tested by: D. Howe Date: 10/27/99 Presoak: Yes
Actual Percolation Tested by: D. Howe Date: 10/27/99
Pipe Size (Length): [illegible] Length of Presoak: [illegible]

SANDY SOIL CRITERIA TEST

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	09:41 10:06	25	10.4	0.0	10.4
B	10:38 11:01	23	10.2	0.0	10.2

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: Ended Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Percolation Rate (min/inch)
1	14:50	15:00	10	10	12.5	0.0	12.5	0.8
2	15:01	15:11	10	21	14.5	2.0	12.6	0.9
3	15:12	15:22	10	32	18.2	4.0	14.1	0.7
4	15:23	15:33	10	43	19.4	4.7	14.9	0.7
5	15:34	15:44	10	54	19.3	5.5	13.8	0.7
6	15:45	15:55	10	65	18.5	5.5	12.4	0.8

Leachline Percolation Data Sheet

Project: Valenzuela MHP - 81-550 Hwy 86 Job No: [illegible]

Test Hole No: P-4 Date Excavated: [illegible]

Depth of Test Hole: [illegible] feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: [illegible] Date: [illegible] Presoak: Yes

Actual Percolation Test by: [illegible] Date: [illegible]

Pipe Stick up (ft): [illegible] Length of Pipe (ft): [illegible]

SANDY SOIL CRITERIA TEST

Trial No.	Time of Reading	Time Interval (min)	Initial Water Level (in)	Final Water Level (in)	Change in Water Level (in)
A	09:43 10:08	25	[illegible]	0.0	[illegible]
B	[illegible] [illegible]	25	[illegible]	0.0	[illegible]

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Percolation Rate (min/inch)
1	16:07	[illegible]	10	10	[illegible]	[illegible]	[illegible]	[illegible]
2	16:18	16:28	10	21	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	16:39	10	32	15.1	[illegible]	9.7	[illegible]
4	16:40	16:50	10	43	15.2	[illegible]	[illegible]	[illegible]
5	[illegible]	17:01	10	54	14.9	[illegible]	[illegible]	[illegible]
6	17:02	[illegible]	[illegible]	65	[illegible]	[illegible]	[illegible]	[illegible]

Earth Systems Consultants Southwest

Leachline Percolation Data Sheet

Project: **Valenzuela MHP - 81-550 Hwy 86** | Job No.: 07437-01
Test Hole No.: P-5 | Date Excavated: [illegible]
Depth of Test Hole: 3.2 feet below grade | Soil Classification: Silty Sand (SM)
Check for Sandy Soil Criteria Tested by: H. Howe | Date: [illegible] | Presoak: Yes
Actual Percolation Tested by: H. Howe | Date: [illegible]
Pipe Stick Up (ft): [illegible] | Length of Pipe (ft): 3.66

Sandy Soil Criteria Test

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	09:45 10:10	25	10.6	0.0	10.6
B	10:40 11:05	25	[illegible]	0.0	[illegible]

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Percolation Rate (min./inch)
1	13:15	13:25	10	10	[illegible]	[illegible]	[illegible]	[illegible]
2	13:26	13:36	10	21	11.5	[illegible]	[illegible]	[illegible]
3	13:37	13:47	10	32	11.2	[illegible]	4.8	[illegible]
4	13:49	13:58	10	43	[illegible]	7.7	4.4	[illegible]
5	13:59	14:09	10	54	8.4	4.2	[illegible]	[illegible]
6	14:10	14:20	10	65	13.0	[illegible]	3.6	[illegible]

Earth Systems Consultants Southwest

Leaching Percolation Data Sheet

Project: [illegible] MHP - 81-550 Hwy 86 Job No. [illegible]

Test Hole No. P-6 Date Excavated [illegible]

Depth of Test Hole [illegible] ft below grade Soil Classification Silty Sand (SM)

Check for Sandy Soil Criteria Tested by R. Brown Date [illegible] Presoak Yes

Actual Percolation Tested by R. Brown Date 10/27/99

Pipe Stick Up (ft) 0.55 Length of Riser (ft) 0.85

SANDY SOIL CRITERIA TEST

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	09:47 / 10:12	25	12.6	0.0	12.6
B	10:47 / 11:07	25	13.5	0.0	13.5

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time Start (hh:mm)	Time Finish (hh:mm)	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Percolation Rate (min./inch)
1	11:35	11:45	10	10	9.6	0.0	9.6	1.0
2	11:46	11:56	10	20	11.0	[illegible]	[illegible]	[illegible]
3	11:57	12:07	10	[illegible]	12.4	2.4	10.0	1.0
4	[illegible]	12:10	10	[illegible]	[illegible]	[illegible]	[illegible]	1.2
5	12:14	[illegible]	10	[illegible]	[illegible]	[illegible]	[illegible]	1.0
6	[illegible]	[illegible]	10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Leachline Percolation Data Sheet

Project:	Valenzuela MHP - 81-550 Hwy 86	Job No.:	07402-01
Test Hole No.:	P-7	Date Excavated:	10/26/01
Depth of Test Hole:	3.2 ft below grade	Soil Classification:	Silty Sand (SM)
Check for Sandy Soil Criteria Tested by:	D. Howe	Date:	10/27/01
		Presoak:	Yes
Actual Percolation Tested by:	D. Howe	Date:	10/27/01
Pipe Stick-up (ft):	0.5	Length of Pipe (ft):	3.4

SANDY SOIL CRITERIA TEST

Trial No.	Time of Reading	Time Elapsed (min)	Initial Water Level (in)	Final Water Level (in)	Change in Water Level (in)
A	09:49 / 10:14	25	11.4	1.2	10.2
B	10:44 / 11:09	25	15.6	5.2	10.4

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Percolation Rate (min/inch)
1	11:08	11:18	10	10	11.9	8.9	3.0	3.3
2	11:20	11:30	10	21	12.7	10.0	2.8	3.6
3	12:00	12:10	10	32	12.5	10.2	2.4	4.2
4	12:11	12:21	10	43	12.1	9.8	2.3	4.4
5	12:22	12:32	10	54	11.9	9.0	2.0	4.9
6	12:33	12:43	10	65	11.9	9.7	2.2	4.5

Leachline Percolation Data Sheet

Project: Valenzuela MHP - 81-550 Hwy 86 Job No.: 07437-01

Test Hole No.: P-8 Date Excavated: 10/26/99

Depth of Test Hole: 3.0 feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: H. Howe Date: 10/27/99 Presoak: Yes

Actual Percolation Tested by: H. Howe Date: 10/27/99

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 3.25

Sandy Soil Criteria Test

Trial No.	Time of Reading	Time Interval (min)	Initial Water Level (in)	Final Water Level (in)	Change in Water Level (in)
A	09:51 / 10:16	25	13.[illegible]	3.0	10.4
B	10:46 / 11:11	25	13.7	3.[illegible]	10.[illegible]

Use Normal or (Sandy) (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Percolation Rate (min/inch)
1	13:12	13:22	10	10	11.8	4.8	7.0	1.4
2	13:23	13:33	10	21	14.[illegible]	7.[illegible]	7.2	1.4
3	13:34	13:44	10	32	12.2	7.[illegible]	5.[illegible]	1.9
4	13:45	13:55	10	43	12.4	7.[illegible]	5.0	2.0
5	13:56	14:06	10	54	11.5	6.8	4.7	2.1
6	14:07	14:17	10	65	11.4	6.8	4.6	2.2

Leachline Percolation Data Sheet

Project: Valenzuela MHP - 81-550 Hwy 86 Job No: [illegible]

Test Hole No: P-8 Pipe Length: 4.0 Date Excavated: 10/2/99

Depth of Test Hole: 3.4 feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: [illegible] Date: 10/27/99 Presoak: Yes

Actual Percolation Tested by: [illegible] Date: 10/27/99

Pipe Stick Up (ft): 0.55 Length of Pipe (ft): [illegible]

Sandy Soil Criteria Test

Trial No	Time of Reading	Time Interval (min)	Initial Water Level (in)	Final Water Level (in)	Change in Water Level (in)
A	09:51 10:16	25	10.4	0.0	10.4
B	10:48 11:13	25	17.6	0.0	13.8

Use Normal or (Sandy) (Circle One) Soil Criteria

Reading No	Time Start of Reading	Time End of Reading	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Percolation Rate (min/inch)
1	13:09	13:19	10	10	14.4	3.6	10.8	0.9
2	13:20	13:30	10	21	15.5	[illegible]	10.8	0.9
3	13:31	13:41	10	32	16.2	6.0	10.2	1.0
4	13:42	13:52	10	43	15.1	[illegible]	9.0	1.1
5	13:53	14:03	10	54	16.0	7.2	9.1	1.1
6	14:04	14:14	10	65	15.4	6.0	9.5	1.2

Leachline Percolation Data Sheet

Project: **Valenzuela MHP - 81-550 Hwy 86** Job No. [illegible]

Test Hole No. P-10 Date Excavated: 10/26/99

Depth of Test Hole 3.5 feet below grade Soil Classification Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: R. Howe Date 10/27/99 Presoak Yes

Actual Percolation Tested by: R. Howe Date 10/27/99

Pipe Stick Length (ft): 0.5[illegible] Length of Pipe (ft): 3.92

SANDY SOIL CRITERIA TEST

Test No.	Time of Reading	Time Interval (min)	Initial Water Level (in)	Final Water Level (in)	Change in Water Level (in)
A	09:55 10:20	25	13.1	0.0	13.1
B	10:50 11:15	25	9.6	0.0	9.6

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min)	Total Elapsed Time (min)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Percolation Rate (min/inch)
1	11:41	11:51	10	10	11.4	0.0	11.4	0.9
2	11:52	12:02	10	21	11.0	1.6	9.4	1.1
3	12:03	12:13	10	32	14.0	2.4	11.6	0.9
4	12:14	12:24	10	43	14.3	3.6	10.4	1.0
5	12:25	12:35	10	54	13.7	4.0	9.7	1.0
6	12:36	12:46	10	65	13.6	3.8	9.7	1.0

Appendix B4 – Gutierrez Mobile Home Park

RMC WATER AND ENVIRONMENT
515 SOUTH FLOWER STREET, 36TH FLOOR
LOS ANGELES, CALIFORNIA 90071

SEWAGE DISPOSAL FEASIBILITY AND SOIL PERCOLATION REPORT PROPOSED MOBILE HOME PARK 80-200 HARRISON STREET THERMAL, CALIFORNIA

October 14, 2013

File No.: 12180-01
Doc. No.: 13-10-704

Earth Systems
Southwest

79-811B Country Club Drive
Bermuda Dunes, CA 92203
(760) 345-1588
(800) 924-7015
FAX (760) 345-7315

October 14, 2013

File No.: 12180-01
Doc. No. 13-10-704

RMC Water and Environment
515 South Flower Street, 36th Floor
Los Angeles, California 90071

Subject: **Sewage Disposal Feasibility and Soil Percolation Report**

Project: **Proposed Mobile Home Park**
80-200 Harrison Street
Thermal, California

Dear Mr. Bichette:

Earth Systems Southwest (Earth Systems) presents this sewage disposal feasibility and soil percolation report for the proposed Mobile Home Park to be located at 80-200 Harrison Street in Thermal, Riverside County, California. This report presents our findings and recommendations for leach field waste disposal. This report should stand as a whole and no part of the report should be excerpted or used to exclusion of any other part.

This report completes our scope of services in accordance with our agreement (SWP-13-161), dated September 11, 2013. Other services that may be required, such as plan review, are additional services and will be billed according to the Fee Schedule in effect at the time services are provided. Unless requested in writing, the client is responsible for distributing this report to the appropriate governing agency.

We appreciate the opportunity to provide our professional services. Please contact our office if there are any questions or comments concerning this report or its recommendations.

Respectfully submitted,
EARTH SYSTEMS SOUTHWEST

Kevin L. Paul, PE, GE
Senior Engineer

Perc/rcr/klp/cgj

Distribution: 4/RMC Water and Environment
1/BD File

TABLE OF CONTENTS

Section 1
INTRODUCTION

1.1 Project Description

This sewage disposal feasibility and soil percolation report has been prepared for the proposed Mobile Home Park located at 80-200 Harrison Street in Thermal, California. The Assessor's Parcel Number (APN) is 755-251-010. Nine mobile homes may ultimately be situated on a portion of the site. Septic tanks and leach field waste disposal systems are proposed for this unsewered area. Domestic water comes from a well on the site. The site location is shown on Plate 1 in Appendix A.

1.2 Site Description

The proposed mobile home park is to be developed on a portion of the triangular-shaped parcel that consists of approximately 11 acres. The project is located at 82-200 Harrison Street in Thermal, Riverside County, California. The site location is shown on Plate 1 in Appendix A. The mobile home park site is situated on nearly level ground that drains by onsite infiltration and gentle sheet flow towards a natural drainage course that runs from north to south through the center of the mobile home park. Based upon information provided to us, we have assumed 9 mobile homes (3 bedrooms), laid out as shown on Plate 2. The location of the tests is within the existing mobile home property. The proposed mobile home park area is currently an existing mobile home park.

1.3 Purpose and Scope of Services

The purpose for our services was to evaluate the site soil conditions and to provide professional opinions and recommendations regarding the feasibility for sewer waste disposal on the site. The scope of services included:

- A general reconnaissance of the site.
- Shallow subsurface exploration by drilling two exploratory borings to a depth of 30 feet below existing grades.
- Sixteen percolation tests in the general area of the proposed leach fields.
- An engineering evaluation of the acquired data from the exploration and testing.
- A summary of our findings and recommendations in this written report, including:
  - Discussions on subsurface soil and groundwater conditions.
  - Discussions on soil percolation rate.
  - Recommendations regarding need for septic systems and leach field design criteria.

Not Contained In This Report: Although available through Earth Systems Southwest, the current scope of our services does not include:

- An environmental assessment.
- An investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater, or air on, below, or adjacent to the subject property.

Section 2
METHODS OF EXPLORATION

2.1 Field Exploration

Sixteen percolation borings were drilled on September 24, 2013 with an 8-inch hand auger to a depth of approximately 2.5 to 3 feet. Additionally, two deep exploratory borings were drilled to a depth of approximately 30 feet below the existing ground surface to observe soil profiles. The deep exploratory borings were drilled on September 23, 2013 using an 8-inch outside diameter hollow stem auger powered by a Mobile B-61 drill rig. The boring locations are shown on the Boring and Test Location Map, Plate 2, in Appendix A. The locations shown are approximate, established using nearby landmarks. Samples from the borings were collected in a modified California sampler, sealed, and transported to our laboratory.

The final logs of the borings represent our interpretation of the contents of the field logs and review of the samples obtained during the subsurface exploration. The final logs of the percolation and deep borings are included in Table 1 and Appendix A of this report, respectively. The stratification lines represent the approximate boundaries between soil types, although transitions may be gradational.

2.2 Percolation Tests

Sixteen percolation tests were performed on September 26, 2013 in the vicinity of the proposed leach fields as shown on Plate 2. The County was notified prior to conducting our onsite percolation testing (County notification number PR # 1719). The percolation tests were performed in substantial conformance to the County percolation test method for single lots, normal or sandy soil criteria (as applicable), as described in the *Onsite Waste Treatment Systems, Technical Guidance Manual, Version A.* Tests were made across the site in order to evaluate the general percolation rate across the site.

The tests were performed using 8-inch diameter boreholes made to a depth of about 2.5 to 3 feet below existing ground surface. Hole sidewalls were cleared of any smeared material. A 6 inch diameter perforated PVC pipe was installed in the excavated hole to reduce the potential for caving or disturbance from the addition of water. The boreholes had approximately 1 to 2 inches of gravel placed on the sides and bottom of the hole, respectively, to minimize sidewall disturbance and sedimentation. A gravel correction factor was applied to the volume of water percolated. Tests were performed in the typical silty sand and sand soils (Unified Soil Classification System, USCS, soil types SM and SP, respectively). The boreholes were filled with water on September 25, 2013 and presoaked overnight and for approximately ½ hour prior to testing. For testing, successive readings of the drop in water level were made over several 10-minute periods (sandy soil criteria) until a stabilized drop was recorded. Measurements were referenced from demarcations in perforated pipe. The field percolation test results are included in Appendix B and below. Laboratory test results are included in Appendix A.

Table 1

Onsite Seepage Pit Percolation Results

Test Hole	Test Description	Soil Condition	USCS Soil Description	Test Zone Below Existing Grades (feet)	Estimated Basic Percolation Rate (Minutes/Inch)
P-1	8” Drilled Hole	Native	0-2.5’ Silty Sand (SM)	2.5	2.8
P-2	8” Drilled Hole	Native	0-2.5’ Silty Sand (SM)	2.5	3.2
P-3	8” Drilled Hole	Native	0-3’ Poorly Graded Sand (SP)	2-3	0.7
P-4	8” Drilled Hole	Native	0-3’ Poorly Graded Sand (SP)	2-3	0.9
P-5	8” Drilled Hole	Native	0-3’ Poorly Graded Sand (SP)	2-3	0.9
P-6	8” Drilled Hole	Native	0-3’ Poorly Graded Sand (SP)	2-3	0.8
P-7	8” Drilled Hole	Native	0-3’ Silty Sand (SM)	2-3	2.0
P-8	8” Drilled Hole	Native	0-3’ Poorly Graded Sand (SP)	2-3	0.7
P-9	8” Drilled Hole	Native	0-3’ Silty Sand (SM)	2-3	2.0
P-10	8” Drilled Hole	Native	0-3’ Silty Sand (SM)	2-3	2.0
P-11	8” Drilled Hole	Native	0-3’ Silty Sand (SM)	2-3	2.0
P-12	8” Drilled Hole	Native	0-3’ Silty Sand (SM)	2-3	3.2
P-13	8” Drilled Hole	Native	0-3’ Silty Sand (SM)	2-3	2.0
P-14	8” Drilled Hole	Native	0-3’ Silty Sand (SM)	2-3	2.0
P-15	8” Drilled Hole	Native	0-3’ Silty Sand (SM)	2-3	2.0
P-16	8” Drilled Hole	Native	0-3’ Silty Sand (SM)	2-3	2.0

The test results indicate that the stabilized drop ranges from approximately 0.7 to 3.2 minutes per inch (mpi).

Section 3
DISCUSSION

3.1 Soil Conditions

The field exploration indicates that site soils consist primarily of interbedded sand and silty sand in the shallow leach area. The boring logs provided in Appendix A include detailed descriptions of the soils encountered.

3.2 Groundwater

Groundwater was encountered as perched layers at approximately 22½ to 30 feet. Historic high groundwater level is likely to exist at a depth of about 35 feet below existing grades based upon groundwater level contours (DWR Bulletin 108, 1961). Further historic review estimates groundwater at approximately 20 feet (DWR Bulletin 108, 1949 contours). As such, we estimate that high groundwater levels at the site may be on the order of 20 feet below existing grades based upon the encountered perched conditions. Groundwater levels may fluctuate with precipitation, irrigation, drainage, and site grading. The absence of groundwater may not represent an accurate or permanent condition. The shallow groundwater levels are strongly influenced by surrounding agricultural irrigation and drainage. This semi-perched zone is generally not used as a domestic water supply, nor is it suited for potable use because of its alkalinity, salinity, and dissolved solids content.

3.3 Geologic Setting

The site lies at an elevation of about 130 feet below mean sea level in the lower Coachella Valley, a part of the Colorado Desert geomorphic province. A significant feature within the Colorado Desert geomorphic province is the Salton Trough. The Salton Trough is a large northwest-trending structural depression that extends approximately 180 miles from San Gorgonio Pass to the Gulf of California. Much of this depression in the area of the Salton Sea is below sea level. In the prehistoric past, ancient Lake Cahuilla submerged the lower Coachella Valley.

The Coachella Valley forms the northerly portion of the Salton Trough. The lower Coachella Valley contains a thick sequence of Miocene to Holocene sedimentary deposits. The upper sediments within the lower valley consist of fine-grained sands with interbedded clays and silts that are of lacustrine (lakebed), aeolian (wind-blown), and alluvial (water-deposited) origin.

<u>Geohydrologic Setting</u>: The site lies within the Thermal subbasin of the Coachella Valley groundwater basin. The Thermal subbasin is subdivided into four generalized zones: a semi-perched zone with alternating clay layers to about 100 foot depth, underlain by an upper and lower aquifer, separated by an aquitard layer at least 100 feet thick. Domestic wells in the region derive their water form the lower portion of the upper aquifer and the lower aquifer, generally from about 400 to 1,200 feet deep. The upper semi-perched zone is generally not used as a domestic water supply, nor is it suited for potable use because of its alkalinity, salinity, and dissolved solids content.

Section 4
CONCLUSIONS AND RECOMMENDATIONS

The following is a summary of our conclusions and professional opinions based on the data obtained from the site evaluation.

- The site is feasible for soil percolation and will support leach field and septic tank systems for waste disposal.
- Perched groundwater level was encountered at a depth of 22½ feet.
- Historic high groundwater is anticipated to be on the order of 20 feet below the ground surface.
- The soils encountered have greater than 10% fines smaller than a #200 sieve in a zone at least 5 feet thick above the groundwater table.
- The designed system shall be located in natural undisturbed soil at the depth the tests were performed. Proposed system depths (see attached) correspond to the tested elevations. Leach beds should not be founded deeper than approximately 4 feet below existing grades.
- Based on testing, and the similarity of soil types, the natural occurring body of minerals and organic matter at the proposed wastewater disposal area contains earthen materials having more than 50% of its volume composed of particles smaller than 0.08 inches (2mm) in size.
- There is at least 5 feet of undisturbed soil between the bottom of the tested leach field bottom and anticipated historic high groundwater.
- The percolation test results as described in Section 2.2 and presented in Appendix B indicate that the stabilized drop range is from 0.7 to 3.2 minutes per inch (mpi). Based upon a stabilized rate of 3.2 mpi, conventional leach lines for sanitary waste disposal may be sized using 20 square feet of leaching area per 100 gallons of septic tank capacity (based on design soil percolation rate of 0 to 9 mpi).
- The final design should delineate the area to be set aside and used for 100% expansion.
- Leach lines should be constructed to provide the required leaching trench area. Leach lines should have a maximum length of 100 feet and be separated at least 4 feet (edge-to-edge) from each other. The leach lines should have at least 18 inches of soil cover and have a bottom no more than 36 to 48 inches below existing prevailing grade. All leach field design should follow the Riverside County Onsite Waste Water Treatment Systems Technical Guidance Manual (current version).
- Rapid injection or high volume discharge of effluent may tax the ability of the soils to readily absorb effluent over the short term. System design should consider the effects of increased user use (additional residents per home), incorporate low flow discharge (low flow toilets,

shower heads, etc.) and incorporate low flow septic systems which dose the leach field slower.

- Leach fields should be located at least 5 feet from property lines, 8 feet from buildings or covered areas, and 100 feet away from on-site or off property wells. Other separations detailed in *Onsite Waste Treatment Systems, Technical Guidance Manual, Version A* for Riverside County apply and should be referred to in design.

- Maintenance of onsite waste disposal systems can be the most critical element in determining the success of a design. Due to general accessibility limitations which typically exist with drainage systems and infiltration structures, they must be protected clogging of any filter medium, and the near structure soils. The potential for clogging can be reduced by pre-treating structure inflow through the installation of a proper septic tank. In addition, sediment, paper, and debris must be removed from the tank on a regular basis.

- A minimum 15-foot setback should be provided from the stormwater drainage course for septic tanks, leach lines, and leach beds.

- Based on the data presented in this report and using the recommendations set forth, it is the judgment of this professional that there is sufficient area to support a primary and expansion OWTS that will meet the current standards of the Department of Environmental Health and the Regional Water Quality Control Board (RWQCB). Based on the data presented in this report and the testing information accumulated, it is the judgment of this professional that the groundwater table will not encroach within the current allowable limit set forth by County and State requirements (5 feet below the base of the leach field set at no deeper than 3 feet below existing grade).

- This report should be submitted to the Riverside County Department of Environmental Health (RCDEH) for their review and comment. Earth Systems should have the opportunity to review the plan of the septic system and details.

Section 5
LIMITATIONS

Our findings and recommendations in this report are based on selected points of field exploration, percolation testing, and our understanding of the mobile home park. Furthermore, our findings and recommendations are based on the assumption that soil conditions do not vary significantly from those found at specific exploratory locations. Variations in soil or groundwater conditions could exist between and beyond the exploration points.

Findings of this report are valid as of the issued date of the report. However, changes in conditions of a property can occur with passage of time, whether they are from natural processes or works of man, on this or adjoining properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or broadening of knowledge. Accordingly, findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of one year.

This report is issued with the understanding that the owner or the owner's representative has the responsibility to bring the information and recommendations contained herein to the attention of the designer for the septic systems and are incorporated into the plans and specifications. The owner or the owner's representative also has the responsibility to take the necessary steps to see that the contractor carry out such recommendations in the field. It is further understood that the owner or the owner's representative is responsible for submittal of this report to the appropriate governing agencies.

Earth Systems has striven to provide our services in accordance with generally accepted geotechnical engineering practices in this locality at this time. No warranty or guarantee, express or implied, is made. This report was prepared for the exclusive use of the Client and the client's authorized agents.

Earth Systems should be provided the opportunity for a general review of the septic tank and leach field plan in order that our recommendations may be properly interpreted and implemented in the design. If Earth Systems is not accorded the privilege of making this recommended review, we can assume no responsibility for misinterpretation of our recommendations.

Although available through Earth Systems Southwest, the current scope of our services does not include an environmental assessment or an investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater, or air on, below, or adjacent to the subject property.

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Appendices as cited are attached and complete this report.

APPENDIX A

Plate 1 – Site Location Map
Plate 2 – Boring & Percolation Test Location Map
Terms and Symbols Used on Boring Logs
Soil Classification System
Logs of Borings
Laboratory Test Results

Reference: Good Earth Satellite image with Historical Topographic Map Overlay, dated 2011.

LEGEND

Approximate Site Location

Approximate Scale: 1" = 4,000'

0 4,000' 8,000'

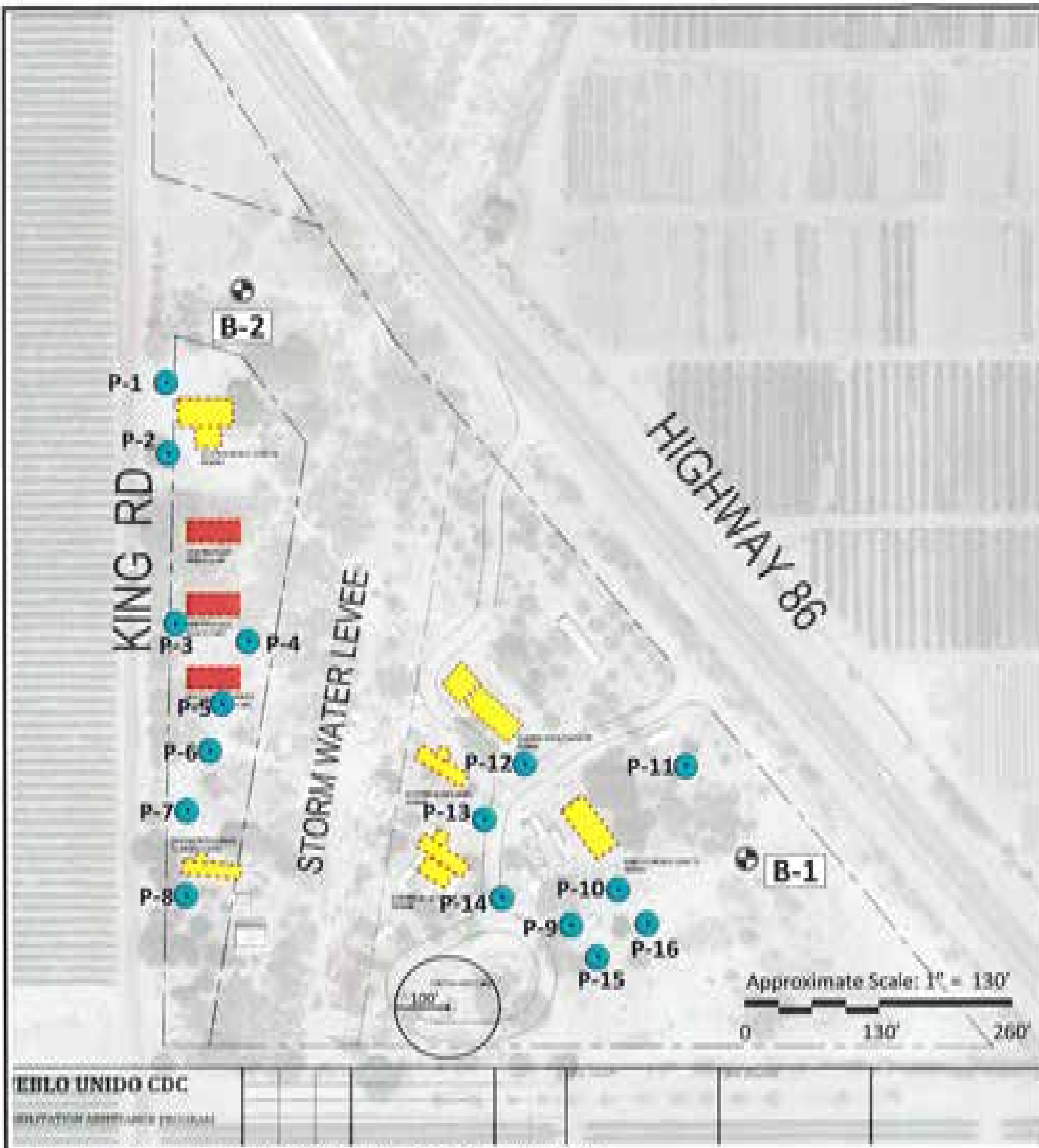
N

Plate 1
Site Location Map

Proposed Gutierrez Mobile Home Park
80-200 Highway 86
Thermal, Riverside County, California

Earth Systems
Southwest

10/14/2013	File No.: 12180-01



Reference: Google Earth Satellite Image dated 1/27/2012 & Pueblo Unido CDC Index Sheet, dated 9/18/2013.

LEGEND

B-2 Approximate Boring Locations
P-16 Approximate Percolation Test Locations
Existing Mobile Home
Proposed New Mobile Home

N

Plate 2
Boring Location Map

Proposed Gutierrez Mobile Home Park
80-200 Highway 86
Thermal, Riverside County, California

Earth Systems Southwest

10/14/2013 | File No.: 12180-01

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on ASTM Designations D 2487 and D 2488 (Unified Soil Classification System). Information on each boring log is a compilation of subsurface conditions obtained from the field as well as from laboratory testing of selected samples. The indicated boundaries between strata on the boring logs are approximate only and may be transitional.

SOIL GRAIN SIZE

U.S. STANDARD SIEVE

	12"		3"		3/4"		4		10		40		200		
BOULDERS		COBBLES		GRAVEL: COARSE		GRAVEL: FINE		SAND: COARSE		SAND: MEDIUM		SAND: FINE		SILT	CLAY
	305		76.2		19.1		4.76		2.00		0.42		0.074		0.002

SOIL GRAIN SIZE IN MILLIMETERS

RELATIVE DENSITY OF GRANULAR SOILS (GRAVELS, SANDS, AND NON-PLASTIC SILTS)

Very Loose	*N=0-4	RD=0-30	Easily push a 1/2-inch reinforcing rod by hand
Loose	N=5-10	RD=30-50	Push a 1/2-inch reinforcing rod by hand
Medium Dense	N=11-30	RD=50-70	Easily drive a 1/2-inch reinforcing rod with hammer
Dense	N=31-50	RD=70-90	Drive a 1/2-inch reinforcing rod 1 foot with difficulty by a hammer
Very Dense	N>50	RD=90-100	Drive a 1/2-inch reinforcing rod a few inches with hammer

*N=Blows per foot in the Standard Penetration Test at 60% theoretical energy. For the 3-inch diameter Modified California sampler, 140-pound weight, multiply the blow count by 0.63 (about 2/3) to estimate N. If automatic hammer is used, multiply a factor of 1.3 to 1.5 to estimate N. RD=Relative Density (%). C=Undrained shear strength (cohesion).

CONSISTENCY OF COHESIVE SOILS (CLAY OR CLAYEY SOILS)

Very Soft	*N=0-1	*C=0-250 psf	Squeezes between fingers
Soft	N=2-4	C=250-500 psf	Easily molded by finger pressure
Medium Stiff	N=5-8	C=500-1000 psf	Molded by strong finger pressure
Stiff	N=9-15	C=1000-2000 psf	Dented by strong finger pressure
Very Stiff	N=16-30	C=2000-4000 psf	Dented slightly by finger pressure
Hard	N>30	C>4000	Dented slightly by a pencil point or thumbnail

MOISTURE DENSITY

Moisture Condition: An observational term; dry, damp, moist, wet, saturated.
Moisture Content: The weight of water in a sample divided by the weight of dry soil in the soil sample expressed as a percentage.
Dry Density: The pounds of dry soil in a cubic foot of soil.

MOISTURE CONDITION

Dry....................Absence of moisture, dusty, dry to the touch
Damp................Slight indication of moisture
Moist.................Color change with short period of air exposure (granular soil)
Below optimum moisture content (cohesive soil)
Wet....................High degree of saturation by visual and touch (granular soil)
Above optimum moisture content (cohesive soil)
Saturated.........Free surface water

PLASTICITY

DESCRIPTION	FIELD TEST
Nonplastic	A 1/8 in. (3-mm) thread cannot be rolled at any moisture content.
Low	The thread can barely be rolled.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit.
High	The thread can be rerolled several times after reaching the plastic limit.

GROUNDWATER LEVEL

Water Level (measured or after drilling)

Water Level (during drilling)

RELATIVE PROPORTIONS

Trace.............minor amount (<5%)
with/some......significant amount
modifier/and...sufficient amount to influence material behavior (Typically >30%)

LOG KEY SYMBOLS

Bulk, Bag or Grab Sample

Standard Penetration Split Spoon Sampler (2" outside diameter)

Modified California Sample (3" outside diameter)

No Recovery

Terms and Symbols used on Boring Logs

Earth Systems Southwest

MAJOR DIVISIONS			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS More than 50% of material is <u>larger</u> than No. 200 sieve size	GRAVEL AND GRAVELLY SOILS More than 50% of coarse fraction <u>retained</u> on No. 4 sieve	CLEAN GRAVELS		GW	Well-graded gravels, grand-sand mixtures, little or no fine
				GP	Poorly-graded gravels, gravel-sand mixtures. Little or no fines
		GRAVELS WITH FINES		GM	Silty gravels, gravel-sand-silt mixtures
				GC	Clayey gravels, gravel-sand-clay mixtures
	SAND AND SANDY SOILS More than 50% of coarse fraction <u>passing</u> No. 4 sieve	CLEAN SAND (Little or no fines)		SW	Well-graded sands, gravelly sands, little or no fines
				SP	Poorly-graded sands, gravelly sands, little or no fines
		SAND WITH FINES (appreciable amount of fines)		SM	Silty sands, sand-silt mixtures
				SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS More than 50% of material is <u>smaller</u> than No. 200 sieve size	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	Inorganic silts and very fine sands, rock flour, silty low clayey fine sands or clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
				OL	Organic silts and organic silty clays of low plasticity
		LIQUID LIMIT <u>GREATER</u> THAN 50		MH	Inorganic silty, micaceous, or diatomaceous fine sand or silty soils
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS				PT	Peat, humus, swamp soils with high organic contents
VARIOUS SOILS AND MAN MADE MATERIALS					Fill Materials
MAN MADE MATERIALS					Asphalt and concrete

Soil Classification System

Earth Systems Southwest

Earth Systems
Southwest
79-811B Country Club Drive, Bermuda Dunes, CA 92203
Phone (760) 345-1588 Fax (760) 345-7315

Boring No. B-1

Project Name: Gutierrez Mobile Home Park
Project Number: 12180-01
Boring Location: See Plate 2

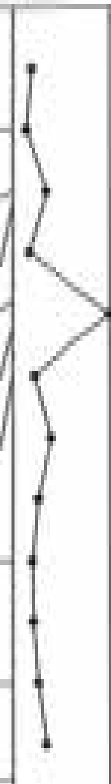
Drilling Date: September 23, 2013
Drilling Method: 8" Hollow Stem Auger
Drill Type: Mobile B61 HDX w/Autohammer
Logged By: Randy Reed

Description of Units

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Depth (Ft.)	Sample Type (Bulk / SPT / MOD-Cal)	Penetration Resistance (Blows/6")	USCS Symbol	Dry Density (pcf)	Moisture Content (%)	Description of Units
0			SP			POORLY GRADED SAND: gray, medium dense, dry, fine to coarse grained sand
	MOD-Cal	6, 8, 11		114	1	
5	MOD-Cal	5, 6, 8	SP-SM	110	2	POORLY GRADED SAND WITH SILT: gray, medium dense, damp, fine to medium grained sand
	MOD-Cal	6, 17, 17	SP	111	3	POORLY GRADED SAND: gray, medium dense, damp, fine to coarse grained sand, cobbles
10	MOD-Cal	6, 8, 9	ML	108	3	SANDY SILT: brown, stiff, damp, fine to medium grained sand
	MOD-Cal	50/6"	SP	98	2	POORLY GRADED SAND: gray, very dense, damp, fine to coarse grained sand, gravel, cobbles
15	MOD-Cal	8, 11, 11	SP-SM	98	1	POORLY GRADED SAND WITH SILT: brown, very dense, damp, fine to medium grained sand
	MOD-Cal	13, 19, 20	SP	113	2	POORLY GRADED SAND: gray, medium dense, moist, fine to coarse grained sand
20	MOD-Cal	10, 13, 13		114	5	
	MOD-Cal	6, 7, 13	ML	107	18	SANDY SILT WITH CLAY: brown, stiff, wet, fine grained sand, cohesive
25	MOD-Cal	6, 10, 11		107	19	gravel
	MOD-Cal	9, 12, 14	SM	86	22	SILTY SAND: brown, medium dense, wet, fine to medium grained sand
30	MOD-Cal	12, 17, 17		110	19	

Graphic Trend
Blow Count Dry Density



Total Depth 31 1/2 feet
Groundwater Encountered at 22 1/2 feet
No Refusal, Backfilled w/cuttings

Earth Systems
Southwest
79-811B Country Club Drive, Bermuda Dunes, CA 92203
Phone (760) 345-1588 Fax (760) 345-7315

Boring No. B-2

Project Name: Gutierrez Mobile Home Park
Project Number: 12180-01
Boring Location: See Plate 2

Drilling Date: September 23, 2013
Drilling Method: 8" Hollow Stem Auger
Drill Type: Mobile B61 HDX w/Autohammer
Logged By: Randy Reed

Description of Units

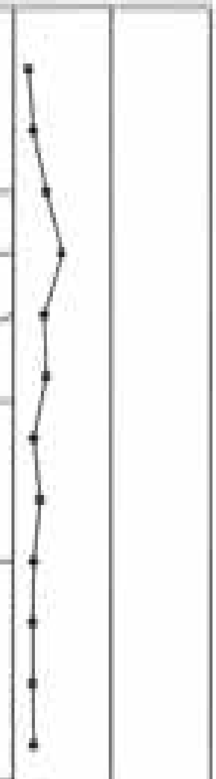
Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Penetration Resistance (Blows/6")	USCS Symbol	Dry Density (pcf)	Moisture Content (%)	Description of Units
	SM			SILTY SAND: gray, medium dense, damp, fine grained sand
4, 6, 9		89	2	
7, 9, 11				No Recovery
6, 15, 18	ML	102	4	SANDY SILT: gray, medium dense, damp, fine grained sand
13, 30/6"	SP	126	1	POORLY GRADED SAND: gray, medium dense, damp, fine to coarse grained sand
9, 12, 19	ML	103	6	SANDY SILT: gray, stiff, damp, fine grained sand
9, 13, 20		101	2	
	SP			POORLY GRADED SAND: gray, medium dense, damp, fine to medium grained sand
8, 7, 14		104	3	
8, 11, 16		110	3	
6, 10, 11	SM	107	18	SILTY SAND: brown, medium dense, wet, fine grained sand
7, 10, 10		112	14	
8, 10, 10		107	20	
9, 10, 11		108	16	

Depth (Ft.): 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60

Sample Type: Bulk, SPT, MOD.CALI.

Graphic Trend: Blow Count, Dry Density



Total Depth 31 1/2 feet
Groundwater Encountered at 22 1/2 feet
No Refusal, Backfilled w/cuttings

UNIT DENSITIES AND MOISTURE CONTENT ASTM D2937-04 & D2216-05

Job Name: Proposed Gutierrez Mobile Home Park

Sample Location	Depth (feet)	Unit Dry Density (pcf)	Moisture Content (%)	USCS Group Symbol
B1	2.5	114	1	SP
B1	5	110	2	SP-SM
B1	7.5	111	5	SP/ML
B1	10	108	3	ML
B1	12.5	98	3	SP-SM
B1	15	98	1	SP
B1	17.5	113	2	SP
B1	20	114	5	SP
B1	22.5	107	18	ML
B1	25	107	19	ML
B1	27.5	86	22	SM
B1	30	110	19	SM
B2	2.5	89	2	SM
B2	7.5	102	4	ML
B2	10	126	1	SP
B2	12.5	103	6	ML
B2	15	101	2	SP
B2	17.5	104	2	SP
B2	20	110	3	SP
B2	22.5	107	18	SM
B2	25	112	14	SM
B2	27.5	107	20	SM
B2	30	108	16	SM

File No.: 12180-01 10/14/2013

Lab No.: 13-296

SIEVE ANALYSIS

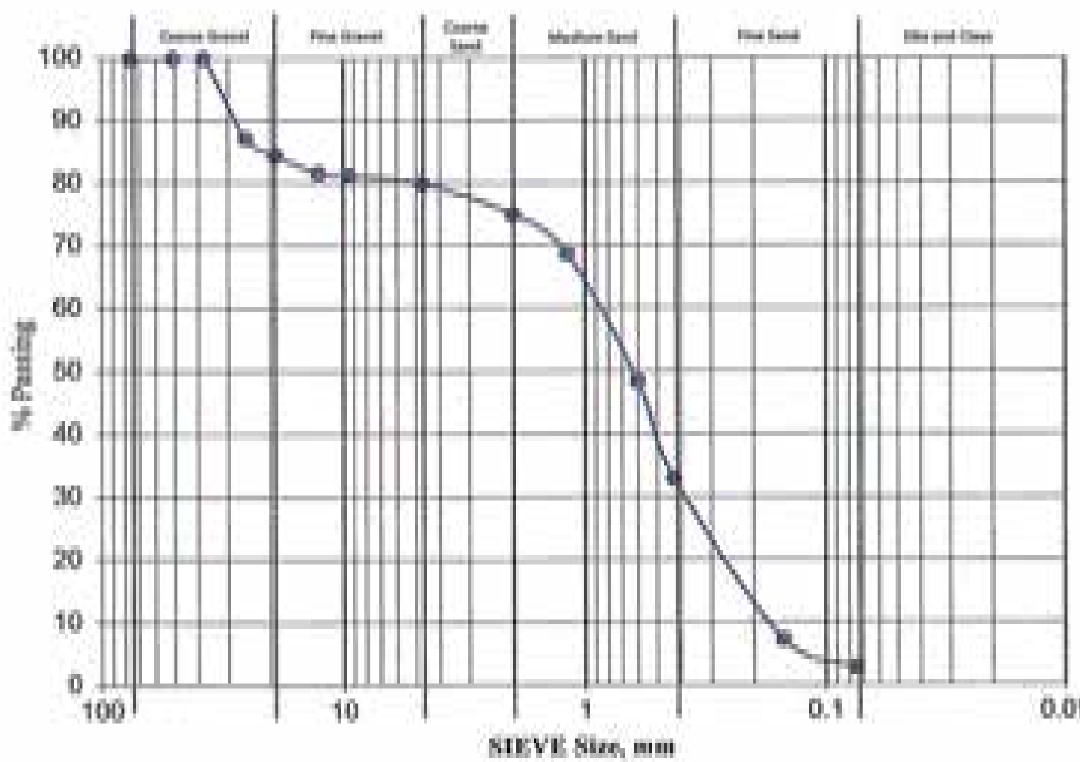
ASTM D6913-09

Job Name: Proposed Gutierrez Mobile Home Park

Sample ID: B1 @ 15 feet

Description: Poorly Graded Sand w/Gravel (SP)

Sieve Size	% Passing
3"	100
2"	100
1-1/2"	100
1"	87
3/4"	84
1/2"	82
3/8"	81
#4	80
#10	75
#16	69
#30	48
#40	33
#100	7
#200	2.9



% Coarse Gravel:	16	% Coarse Sand:	5			
% Fine Gravel:	5	% Medium Sand:	42	Cu:	0.6	
		% Fine Sand:	30	Cc:	0.11	Gradation
% Total Gravel	20	% Total Sand	77	% Fines:	3	Poorly Graded

File No.: 12180-01 10/14/2013

Lab No.: 13-296

SIEVE ANALYSIS

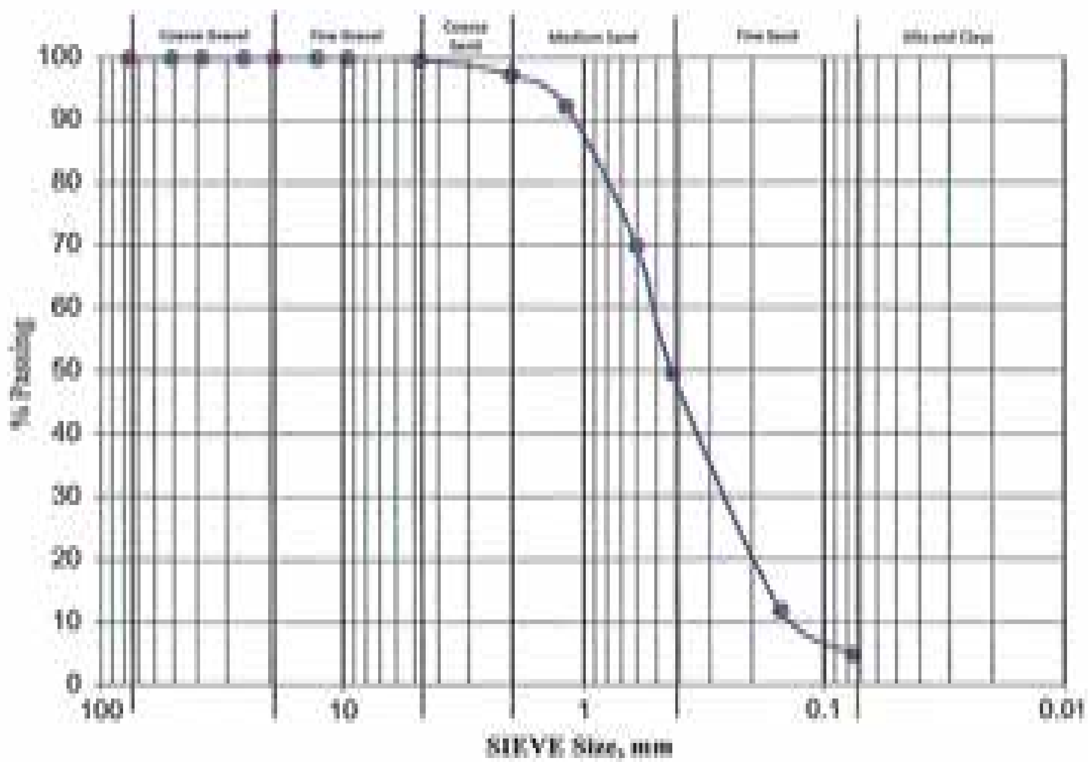
ASTM D6913-09

Job Name: Proposed Gutierrez Mobile Home Park

Sample ID: B2 @ 17 1/2 feet

Description: Poorly Graded Sand (SP)

Sieve Size	% Passing
3"	100
2"	100
1-1/2"	100
1"	100
3/4"	100
1/2"	100
3/8"	100
#4	100
#10	97
#16	92
#30	70
#40	50
#100	12
#200	4.9



% Coarse Gravel:	0	% Coarse Sand:	2			
% Fine Gravel:	0	% Medium Sand:	48	Cu:	0.38	
		% Fine Sand:	45	Cc:	0.09	Gradation
% Total Gravel	0	% Total Sand	95	% Fines:	5	Poorly Graded

APPENDIX B

Percolation Test Results

Leachline Percolation Data Sheet

Project: Gutierrez — Job No.: 12180-01

Test Hole No.: P-1 — Date Excavated: 9/24/2013

Depth of Test Hole: 2.5 feet below grade — Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: R. Reed — Date: 9/25/2013 — Presoak: Yes

Actual Percolation Tested by: R. Reed — Date: 9/26/2013

Pipe Stick Up (ft): 0.00 — Length of Pipe (ft): 2.50

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	07:00 07:25	25	7.0	0.0	7.0
B	07:25 07:50	25	7.0	0.0	7.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	08:20	08:30	10	10	21.0	12.5	8.5	1.6
2	08:30	08:40	10	20	12.5	6.8	5.8	2.4
3	08:40	08:50	10	30	12.8	8.3	4.5	3.0
4	08:50	09:00	10	40	21.0	13.0	8.0	1.7
5	09:00	09:10	10	50	13.0	9.0	4.0	3.4
6	09:10	09:20	10	60	9.0	6.3	2.8	5.0

Leachline Percolation Data Sheet

Project: Guitierrez Job No.: 12180-01

Test Hole No.: P-2 Date Excavated: 9/24/2013

Depth of Test Hole: 2.5 feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/25/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/26/2013

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.50

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	07:01 07:26	25	7.0	0.0	7.0
B	07:27 07:52	25	7.0	0.0	7.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time		Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
	Start of Reading	End of Reading						
1	08:25	08:35	10	10	22.5	12.3	10.3	1.3
2	08:35	08:45	10	20	12.3	7.0	5.3	2.6
3	08:45	08:55	10	30	24.5	14.0	10.5	1.3
4	08:55	09:05	10	40	14.0	10.0	4.0	3.4
5	09:05	09:15	10	50	16.0	11.5	4.5	3.0
6	09:15	09:25	10	60	11.5	7.3	4.3	3.2

Leachline Percolation Data Sheet

Project: Gutierrez Job No.: 12180-01

Test Hole No.: P-3 Date Excavated: 9/24/2013

Depth of Test Hole: 3.0 feet below grade Soil Classification: Sand (SP)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/25/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/26/2013

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	07:20 07:45	25	6.0	0.0	6.0
B	07:45 08:10	25	7.5	0.0	7.5

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	09:40	09:50	10	10	18.5	0.0	18.5	0.7
2	09:50	10:00	10	20	20.0	0.0	20.0	0.7
3	10:00	10:10	10	30	20.0	0.0	20.0	0.7
4	10:10	10:20	10	40	21.0	0.0	21.0	0.7
5	10:20	10:30	10	50	21.0	0.0	21.0	0.7
6	10:30	10:40	10	60	21.0	0.0	21.0	0.7

Leachline Percolation Data Sheet

Project: Gutierrez Job No.: 12180-01

Test Hole No.: P-4 Date Excavated: 9/24/2013

Depth of Test Hole: 3.0 feet below grade Soil Classification: Sand (SP)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/25/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/26/2013

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	07:23 07:48	25	7.0	0.0	7.0
B	07:48 08:13	25	7.0	0.0	7.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	11:01	11:11	10	10	16.0	0.0	16.0	0.9
2	11:11	11:21	10	20	16.0	0.0	16.0	0.9
3	11:21	11:31	10	30	16.0	0.0	16.0	0.9
4	11:31	11:41	10	40	16.0	0.0	16.0	0.9
5	11:41	11:51	10	50	16.0	0.0	16.0	0.9
6	11:51	12:01	10	60	16.0	0.0	16.0	0.9

Leachline Percolation Data Sheet

Project: Gutierrez Job No.: 12180-01

Test Hole No.: P-5 Date Excavated: 9/24/2013

Depth of Test Hole: 3.0 feet below grade Soil Classification: Sand (SP)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/25/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/26/2013

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	07:31 07:56	25	6.3	0.0	6.3
B	07:56 08:21	25	7.0	0.0	7.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	11:02	11:12	10	10	15.0	0.0	15.0	0.9
2	11:12	11:22	10	20	17.0	0.0	17.0	0.8
3	11:22	11:32	10	30	16.0	0.0	16.0	0.9
4	11:32	11:42	10	40	16.0	0.0	16.0	0.9
5	11:42	11:52	10	50	16.0	0.0	16.0	0.9
6	11:52	12:02	10	60	16.0	0.0	16.0	0.9

Leachline Percolation Data Sheet

Project: Gutierrez Job No.: 12180-01

Test Hole No.: P-6 Date Excavated: 9/24/2013

Depth of Test Hole: 3.0 feet below grade Soil Classification: Sand (SP)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/25/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/26/2013

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	07:34 07:59	25	7.0	0.0	7.0
B	07:59 08:24	25	7.0	0.0	7.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	11:04	11:14	10	10	18.0	0.0	18.0	0.9
2	11:14	11:24	10	20	18.0	0.0	18.0	0.8
3	11:24	11:34	10	30	18.0	0.0	18.0	0.8
4	11:34	11:44	10	40	18.0	0.0	18.0	0.8
5	11:44	11:54	10	50	18.0	0.0	18.0	0.8
6	11:54	12:04	10	60	18.0	0.0	18.0	0.8

Leachline Percolation Data Sheet

Project: Gutierrez Job No.: 12180-01

Test Hole No.: P-7 Date Excavated: 9/24/2013

Depth of Test Hole: 3.0 feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/25/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/26/2013

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	07:36 08:01	25	6.5	0.0	6.5
B	08:01 08:26	25	7.0	0.0	7.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	11:55	12:05	10	10	18.0	4.3	13.8	1.0
2	12:05	12:15	10	20	20.0	8.0	12.0	1.1
3	12:15	12:25	10	30	19.0	8.5	10.5	1.3
4	12:25	12:35	10	40	13.0	6.0	7.0	2.0
5	12:35	12:45	10	50	17.0	7.5	9.5	1.4
6	12:45	12:55	10	60	19.0	12.0	7.0	2.0

Leachline Percolation Data Sheet

Project: Gutierrez — Job No.: 12180-01

Test Hole No.: P-8 — Date Excavated: 9/24/2013

Depth of Test Hole: 3.0 feet below grade — Soil Classification: Sand (SP)

Check for Sandy Soil Criteria Tested by: R. Reed — Date: 9/25/2013 — Presoak: Yes

Actual Percolation Tested by: R. Reed — Date: 9/26/2013

Pipe Stick Up (ft): 0.00 — Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	07:40 08:05	25	6.5	0.0	6.5
B	08:05 08:30	25	7.0	0.0	7.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	12:00	12:10	10	10	14.0	0.0	14.0	1.0
2	12:10	12:20	10	20	19.0	0.0	19.0	0.7
3	12:20	12:30	10	30	19.0	0.0	19.0	0.7
4	12:30	12:40	10	40	19.0	0.0	19.0	0.7
5	12:40	12:50	10	50	19.0	0.0	19.0	0.7
6	12:50	13:00	10	60	19.0	0.0	19.0	0.7

Leachline Percolation Data Sheet

Project: Guitierrez Job No.: 12180-01

Test Hole No.: P-9 Date Excavated: 9/24/2013

Depth of Test Hole: 3.0 feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/25/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/26/2013

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	12:57 13:22	25	10.0	0.0	10.0
B	13:23 13:48	25	10.0	0.0	10.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	14:05	14:15	10	10	7.0	0.0	7.0	2.0
2	14:15	14:25	10	20	7.0	0.0	7.0	2.0
3	14:25	14:35	10	30	7.0	0.0	7.0	2.0
4	14:35	14:45	10	40	7.0	0.0	7.0	2.0
5	14:45	14:55	10	50	7.0	0.0	7.0	2.0
6	14:55	15:05	10	60	7.0	0.0	7.0	2.0

Leachline Percolation Data Sheet

Project: Gutierrez Job No.: 12180-01

Test Hole No.: P-10 Date Excavated: 9/24/2013

Depth of Test Hole: 3.0 feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/25/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/26/2013

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	13:00 13:25	25	21.0	0.0	21.0
B	13:25 13:50	25	21.0	0.0	21.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	14:05	14:15	10	10	14.0	0.0	14.0	1.0
2	14:15	14:25	10	20	7.0	0.0	7.0	2.0
3	14:25	14:35	10	30	7.0	0.0	7.0	2.0
4	14:35	14:45	10	40	7.0	0.0	7.0	2.0
5	14:45	14:55	10	50	7.0	0.0	7.0	2.0
6	14:55	15:05	10	60	7.0	0.0	7.0	2.0

Leachline Percolation Data Sheet

Project: Gutierrez   Job No.: 12180-01
Test Hole No.: P-11   Date Excavated: 9/24/2013
Depth of Test Hole: 3.0 feet below grade   Soil Classification: Silty Sand (SM)
Check for Sandy Soil Criteria Tested by: R. Reed   Date: 9/25/2013   Presoak: Yes
Actual Percolation Tested by: R. Reed   Date: 9/26/2013
Pipe Stick Up (ft): 0.00   Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No.	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	13:01 13:26	25	21.0	0.0	21.0
B	13:27 13:52	25	21.0	0.0	21.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	15:13	15:23	10	10	7.0	0.0	7.0	2.0
2	15:23	15:33	10	20	7.0	0.0	7.0	2.0
3	15:33	15:43	10	30	7.0	0.0	7.0	2.0
4	15:43	15:53	10	40	7.0	0.0	7.0	2.0
5	15:53	16:03	10	50	7.0	0.0	7.0	2.0
6	16:03	16:13	10	60	7.0	0.0	7.0	2.0

Leachline Percolation Data Sheet

Project: Guitierrez Job No.: 12180-01

Test Hole No.: P-12 Date Excavated: 9/24/2013

Depth of Test Hole: 3.0 feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/25/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/26/2013

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	13:03 13:28	25	21.0	0.0	21.0
B	13:29 13:54	25	21.0	0.0	21.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	15:20	15:30	10	10	7.0	0.0	7.0	2.0
2	15:30	15:40	10	20	7.0	0.0	7.0	2.0
3	15:40	15:50	10	30	7.0	0.0	7.0	2.0
4	15:50	16:00	10	40	7.0	0.0	7.0	2.0
5	16:00	16:10	10	50	7.0	0.0	7.0	2.0
6	16:10	16:20	10	60	7.0	2.8	4.3	3.2

Leachline Percolation Data Sheet

Project: Gutierrez Job No.: 12180-01

Test Hole No.: P-13 Date Excavated: 9/24/2013

Depth of Test Hole: 3.0 feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/25/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/26/2013

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	13:05 13:23	18	21.0	0.0	21.0
B	13:31 13:56	25	21.0	0.0	21.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time		Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
	Start of Reading	End of Reading						
1	15:22	15:32	10	10	7.0	0.0	7.0	2.0
2	15:32	15:42	10	20	7.0	0.0	7.0	2.0
3	15:42	15:52	10	30	7.0	0.0	7.0	2.0
4	15:52	16:02	10	40	7.0	0.0	7.0	2.0
5	16:02	16:12	10	50	7.0	0.0	7.0	2.0
6	16:12	16:22	10	60	7.0	0.0	7.0	2.0

Leachline Percolation Data Sheet

Project: Gutierrez Job No.: 12180-01
Test Hole No.: P-14 Date Excavated: 9/24/2013
Depth of Test Hole: 3.0 feet below grade Soil Classification: Silty Sand (SM)
Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/26/2013 Presoak: Yes
Actual Percolation Tested by: R. Reed Date: 9/26/2013
Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	13:07 13:32	25	21.0	0.0	21.0
B	13:33 13:58	25	21.0	0.0	21.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time		Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
	Start of Reading	End of Reading						
1	15:24	15:34	10	10	7.0	0.0	7.0	2.0
2	15:34	15:44	10	20	7.0	0.0	7.0	2.0
3	15:44	15:54	10	30	7.0	0.0	7.0	2.0
4	15:54	16:04	10	40	7.0	0.0	7.0	2.0
5	16:04	16:14	10	50	7.0	0.0	7.0	2.0
6	16:14	16:24	10	60	7.0	0.0	7.0	2.0

Leachline Percolation Data Sheet

Project: Gutierrez Job No.: 12180-01

Test Hole No.: P-18 Date Excavated: 9/24/2013

Depth of Test Hole: 3.0 feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/25/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/26/2013

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	13:11 13:33	22	9.0	0.0	9.0
B	13:34 13:59	25	9.0	0.0	9.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	14:09	14:19	10	10	7.0	0.0	7.0	2.0
2	14:19	14:29	10	20	7.0	0.0	7.0	2.0
3	14:29	14:39	10	30	7.0	0.0	7.0	2.0
4	14:39	14:49	10	40	7.0	0.0	7.0	2.0
5	14:49	14:59	10	50	7.0	0.0	7.0	2.0
6	14:59	15:09	10	60	7.0	0.0	7.0	2.0

Leachline Percolation Data Sheet

Project: Gutierrez Job No.: 12180-01

Test Hole No.: P-16 Date Excavated: 9/24/2013

Depth of Test Hole: 3.0 feet below grade Soil Classification: Silty Sand (SM)

Check for Sandy Soil Criteria Tested by: R. Reed Date: 9/25/2013 Presoak: Yes

Actual Percolation Tested by: R. Reed Date: 9/26/2013

Pipe Stick Up (ft): 0.00 Length of Pipe (ft): 2.00

SANDY SOIL CRITERIA TEST

Trial No	Time of Reading	Time Interval (min.)	Initial Water Level (in.)	Final Water Level (in.)	Change in Water Level (in.)
A	13:22 13:47	25	17.0	0.0	17.0
B	13:48 14:00	12	17.0	0.0	17.0

Gravel Factor 0.73

Use Normal or Sandy (Circle One) Soil Criteria

Reading No.	Time: Start of Reading	Time: End of Reading	Time Interval (min.)	Total Elapsed Time (min.)	Initial Water Level (inches)	Final Water Level (inches)	Change in Water Level (inches)	Corrected Percolation Rate (min./inch)
1	14:11	14:21	10	10	10.0	0.0	10.0	1.4
2	14:21	14:31	10	20	7.0	0.0	7.0	2.0
3	14:31	14:41	10	30	7.0	0.0	7.0	2.0
4	14:41	14:51	10	40	7.0	0.0	7.0	2.0
5	14:51	15:01	10	50	7.0	0.0	7.0	2.0
6	15:01	15:11	10	60	7.0	0.0	7.0	2.0

Appendix C – Work Plan for the Coachella Valley Septic Rehabilitation Program

Coachella Valley Integrated Regional Water Management Program

Disadvantaged Community Outreach Demonstration Project

Regional Program for Septic Rehabilitation Work Plan

Prepared by:

RMC

February 2014

1 Introduction

The Coachella Valley Regional Water Management Group (CVRWMG) – comprising Coachella Valley Water District (CVWD), Coachella Water Authority (CWA), Desert Water Agency (DWA), Indio Water Authority (IWA), and Mission Springs Water District (MSWD) – are updating the 2010 Coachella Valley Integrated Regional Water Management (IRWM) Plan. As part of this update, a concerted effort was made to improve the region's understanding of the issues and needs of disadvantaged communities (DACs) in the Coachella Valley IRWM Region. Through a grant from the California Department of Water Resources (DWR), the CVRWMG developed a Disadvantaged Community Outreach Demonstration Program (DAC Outreach Program), the goal of which is to develop and implement methods to improve DAC participation in the Coachella Valley IRWM planning process. Through this process, and with the input of local non-profit organizations with existing relationships with local DACs, the DAC Outreach Program identified potential projects that could be implemented to directly benefit DACs and address high priority water-related issues in DACs. Some of these projects were selected as example projects to be further developed, and to serve as an example for how similar projects might work. Templates and sample documents were created for many of the deliverables, and the DAC Outreach Program report contains a summary of the lessons learned and analysis of which strategies were effective and which strategies may not be as effective in moving DAC projects forward.

One of these projects that was identified and expanded was onsite wastewater treatment system (OWTS) rehabilitation or replacement. Aging or failing OWTSs in the shallow aquifer (particularly in the eastern Coachella Valley) have been cited as a serious public health concern and a potential source of local water contamination from bacteria and nitrates. This Work Plan is included in the *Regional Program for Septic System Rehabilitation Report* as Appendix C.

1.1 Project Purpose

The purpose of the Regional Program for Septic System Rehabilitation is to address a critical water quality issue facing Coachella Valley DACs. Stakeholders in the Region have noted that failing OWTSs may not be properly designed and therefore fail because they are not able to handle the volume of wastewater produced by residents. Stakeholders also noted that regular and proper maintenance may not occur due to various financial and technical capacity reasons. Many areas with suspected or identified failing OWTSs are located in remote areas, far from existing sewer service connections. These communities may also be outside the service area of local wastewater agencies. To address these issues, a local non-profit organization with extensive experience with DACs in the Coachella Valley, Pueblo Unido Community Development Corporation (PUCDC), supported development of this program. All decisions related to this program were vetted through PUCDC for technical and financial feasibility within the constraints of a typical Coachella Valley DAC.

1.2 Background

OWTSs can be a reliable and sanitary method for treating and disposing of wastewater, provided that systems are appropriately designed and maintained. Due to the large number of OWTSs throughout the Coachella Valley, it is possible that OWTS rehabilitation or replacement projects could provide a significant positive impact to the community by:

1. Assessing current issues with failing OWTS (determine why they are failing), and
2. Implementing actions necessary to resolve OWTS issues – replacing, rehabilitating, or performing maintenance on the systems, based on identified issues.

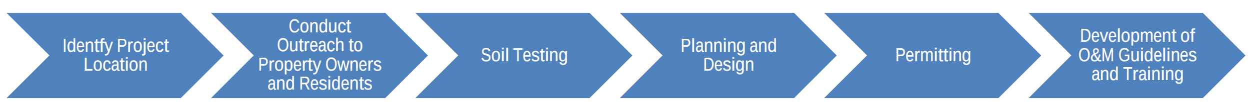
OWTS rehabilitation and replacement projects are optimal in areas that are located at far distances from municipal sewer systems, and in communities where connecting to the municipal sewer system may be too costly due to collection system expansion into remote areas. As a result of feedback from the non-profit partners hired to work on the DAC Outreach Program, it was recommended that a rehabilitation program for OWTSs should target small mobile home parks in the eastern Coachella Valley.

1.3 Work Plan for the Coachella Valley Septic Rehabilitation Program

This work plan is intended to provide a framework for local agencies and non-governmental organizations (NGOs) who are interested in implementing onsite wastewater treatment system (OWTS) improvement projects similar to the Septic Rehabilitation Program (these implementing groups are collectively referred to as project proponents). This work plan is a supporting document to the Septic Rehabilitation Program; background information about OWTS and issues associated with OWTS should be obtained from the larger Septic Rehabilitation Program document.

OWTS improvement projects will help protect disadvantaged communities from potential public health concerns by improving OWTS performance and potentially protecting surface and groundwater quality. The following sections (tasks) of the work plan provide a step-by-step outline for projects that are similar to the Septic System Rehabilitation Project. A flow chart of the activities required for OWTS rehabilitation project implementation is shown in **Figure 1** and explained in the following sections.

Figure 1: Flow Chart for OWTS Rehabilitation Implementation



1.4 Using the Work Plan

This work plan was developed in support of the *Regional Program for Septic System Rehabilitation*. It provides a template that can be used to apply for IRWM funding opportunities by laying out the different tasks necessary to identify potential project areas, gain stakeholder support, determine the most appropriate type of OWTS for each site, develop training materials designed to enable residents to properly operate and maintain their system, as well as provides information on how to design projects, what permitting requirements may need to be considered. This work plan has been included as Appendix C of the *Regional Program for Septic System Rehabilitation* report. While the work plan is written specific to the Coachella Valley's septic system rehabilitation project, it is also designed to act as guidance and a template for other regions considering similar projects, and written for a program that is regional in nature. Text in **[bold brackets]** indicates text that should be changed to fit the individual project or that provides guidance on what sort of information may be required. It is anticipated that this template can be used for future IRWM funding opportunities, and with this is mind, was written to meet the requirements of DWR's 2012 Proposition 84 Implementation Grant – Round 2 Guidelines, with the expectation that requirements will either remain similar in future rounds or that the information contained herein will be easily translated into new funding opportunity applications. The content of this work plan should be modified to fit the criteria of the targeted grant opportunity.

2 Work Plan for the *Regional Program for Septic System Rehabilitation* project

2.1 Introduction

2.1.1 Project Sponsor

The Regional Program for Septic System Rehabilitation is sponsored by **[Project Sponsor]**.

2.1.2 Project Need

The Coachella Valley IRWM Region **[Region or Project Area]** is located within the Region 7 (Colorado River Basin) of the California Regional Water Quality Control Board (RWQCB). The RWQCB's *Water Quality Control Plan for the Colorado River Basin* (Basin Plan) set water quality objectives for the region and laid out strategies for achieving those objectives. The Basin Plan notes Septic System Impacts to Groundwater Basins as a critical issue in the region, and that improperly designed, maintaining, or otherwise damaged or failing septic systems have the potential to negatively impact groundwater.

Groundwater is the primary source of water in the Coachella Valley IRWM Region, and provides potable water, agricultural irrigation water, and in parts of the valley hot water that fuels the spa and tourism industry. Most of the development in the Valley is concentrated along the Whitewater River (and associated stormwater channel), along the floor of the Valley. For communities outside the established cities, it can be challenging to connect to existing municipal systems. These communities often rely on groundwater they pump themselves, and septic systems for wastewater disposal. They are often relatively remote communities that lack the monetary and technical capacity to ensure that these septic systems are adequate for their needs and remain protective of the groundwater on which they and the rest of the Region are dependent.

Adequate wastewater disposal was identified as a critical issue in disadvantaged communities (DACs) in the Region. Disadvantaged communities are those earning 80% or less of the statewide Median Household Income (MHI). In **[year]**, DACs were those communities with an MHI of **[DAC MHI]** or less. The DACs targeted by this project are considered Polanco Mobile Home Parks. These are small mobile home parks of up to 14 units, and approximately 200 such communities exist in the eastern Coachella Valley. Of these 200 communities, only about 50 are considered permitted Polanco Parks, having received a Conditional Use Permit (CUP) from the County of Riverside. Clearances from Environmental Health, Fire, and Building and Safety departments are required prior to the issue of a CUP, which can be hindered by existing OWTSs, which are often not constructed in accordance with regulatory ordinances. Most unpermitted Polanco Parks do not have the engineering and economic resources to bring their existing OWTSs into compliance, and are therefore unable to become permitted.

2.1.3 Project Purpose

The purpose of the *Regional Program for Septic System Rehabilitation* **[Project title]** project is to address the critical wastewater and public health issues of DACs unable to connect to municipal sewer systems by replacing faulty or inadequate on-site wastewater treatment systems (OWTSs). It will also serve to protect groundwater and local surface water from contamination from poorly designed, sited, or maintained OWTSs.

2.1.4 Project Objectives

The *Regional Program for Septic System Rehabilitation* **[Project title]** includes the following project objectives:

- Identify areas with OWTS failure

- Assess current issues with failing OWTSs and determine why they are failing
- Replace, rehabilitate, or perform maintenance on failing OWTSs to address the identified issues
- Reduce public health threat from inadequate or failing OWTSs
- Create a sustainable use of OWTSs by empowering residents and property owners through training to maintain and operate their OWTSs to ensure proper continued use of their systems

The project is consistent with the 2014 Coachella Valley IRWM Plan Volume I**[appropriate plan]**, and will contribute towards achieving six **[number]** objectives of the 2014 Coachella Valley IRWM Plan Volume I **[appropriate plan]**. **[Table X]** provides an overview of the 2014 Coachella Valley IRWM Plan Volume I objectives that are expected to be indirectly (○) or directly (●) achieved through implementation of the *Regional Program for Septic System Rehabilitation* **[project title]**.

Table X: Contribution to 2014 Coachella Valley IRWM Plan Volume I Objectives

Proposal Projects	Contribution to 2014 Coachella Valley IRWM Plan Volume I Objectives												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Regional Program for Septic System Rehabilitation **[Project title]**	○				●	○				●	○	●	

● = directly related; ○ = indirectly related

This project contributes to the 2014 Coachella Valley IRWM Plan Volume I objectives in the following ways:

Objective A – Provide reliable water supply. The program will help to provide a reliable water supply by reducing contamination risks to groundwater, the primary water supply source throughout the Region.

Objective E – Protect groundwater quality and improve where feasible. The project targets failing or damaged OWTSs that have the potential to negatively impact groundwater quality. By replacing these with properly designed, sited, and providing training on proper maintenance and operation, the risks to groundwater from septic systems are minimized to become negligible.

Objective F – Preserve and improve surface water quality. Some damaged or failing OWTSs that will be replaced as part of the project may be at risk of failure during storm events, or otherwise have wastewater conveyed by runoff to surface waters. Properly sited and designed septic systems do not allow wastewater to contaminate surface water, and conversion to these systems will protect surface water from contamination from OWTSs.

Objective J – Maximize stakeholder involvement. This project will involve training residents receiving new or rehabilitated septic systems on proper operation and maintenance of the system. This empowers residents to understand and address their wastewater needs, and engages them in the project, helping to ensure long-term success.

Objective K – Address water-related needs of local Native American culture. The project has the potential to address water-related needs of local Native American peoples if a tribal DAC chooses to participate in the program. It also will serve to protect groundwater quality, a documented concern of local tribes.

Objective L – Address water and sanitation needs of DACs. This project directly addresses water and sanitation needs of DACs by removing failing OWTSs that pose risks of potential unsanitary conditions. Potential nitrate and pathogen contaminations of the shallow aquifer will be eliminated via replacement and rehabilitation of septic systems in DACs.

2.1.5 Project Partners

The **[Project sponsor]** is the primary project sponsor for the *Regional Program for Septic System Rehabilitation* **[Project title]** project. **[Project sponsor]** has partnered with **[list project proponents]** to implement the project. **[add information on why project proponents are appropriate for the project – their interest in its success, etc.]**.

2.1.6 Project Abstract

[use project abstract from throughout grant application] The *Regional Program for Septic System Rehabilitation* **[Project title]** project will replace **[rehabilitate, or perform maintenance on]** failing on-site wastewater treatment systems (OWTSs) in disadvantaged communities (DACs) in the Coachella Valley **[Project area/Region]**. The DACs identified as having failing systems fall outside the current service areas of the Region's wastewater agencies, or are located too far from existing sewer systems to make connection to sewers feasible. Known issues with OWTSs in the Region include **[list known issues – could include systems too close together, inadequately sized, not maintained or cleaned out, faulty pipelines, too shallow of leach field, open ponding or other unsafe wastewater treatment systems]**. Failing systems pose a public health risk to those communities, and have the potential to contaminate groundwater. The Coachella Valley is dependent on groundwater, with many communities and industries using untreated water from the aquifer. The targeted DACs of this project use untreated well water as their source of tap water, as they are too far from existing municipal potable water supply systems to be connected. This puts these communities at greater risk of coming in contact with water contaminated by failing OWTSs **[delete this information if DACs are not on wells]**. Failing systems may also pose a risk to surface waters, as surface contamination may be conveyed into local surface waters via runoff or storm events, or if shallow underground flow reaches surface waters rather than percolating down.

This project will replace failing OWTSs in four **[target number]** DACs in the Coachella Valley **[Region]**, and is expected to serve **[number]** people. The four DACs directly benefitting from the *Regional Program for Septic System Rehabilitation* project are Don Jose Agricultural Housing, Cisneros Mobile Home Park, Valenzuela Mobile Home Park, and Gutierrez Mobile Home Park. These communities have or plan to have between 4 and 13 units, and none are permitted.

2.1.7 Linkages and Synergies between Projects

[Describe any other projects in the area that complement, support, or are otherwise related and linked to the project] This program will replace failing and damaged septic systems with properly designed and sited septic systems in DACs that are unable to connect to existing sewer systems due to feasibility issues. This project serves to address a critical water and public health issue in DACs in the Region, and protect groundwater supplies from contamination. These efforts complement and continue similar efforts of previously funded IRWM Projects, such as the *Groundwater Quality Protection Program – Subarea D2*, and the *San Antonio del Desierto DAC Sewer Extension Project*, both funded through Proposition 84 Implementation Grant – Round 2, and the *Groundwater Quality Protection Program – Desert Hot Springs*, funded through Proposition 84 Implementation Grant – Round 1, which convert DACs from failing septic and other on-site wastewater treatment systems to sewer. For those previously funded projects, communities with failing OWTSs have been able to connect to existing municipal sewer systems, primarily due to their location within a wastewater agency service area or near existing sewer systems and planned expansions. The purpose of those projects is consistent with those of the *Regional Program for Septic System Rehabilitation Program*, that is, to address wastewater disposal and groundwater quality issues and protect public health in DACs. For DACs outside of a wastewater agency service area or located far from existing sewer systems and planned expansions, it is unfeasible to connect to sewer systems, leaving OWTS as the only option. When designed and sited properly, OWTSs can be a reliable and sanitary method for treating and disposing of wastewater, and in conjunction with other septic rehabilitation and sewer connection projects, serves to protect public health and groundwater quality.

2.1.8 Completed Work

[add information on completed] The following work has been completed prior to the grant award date:

- Coachella Valley IRWM DAC Project – Regional Program for Septic System Rehabilitation was completed in 2013, and provided background on failing OWTSs in the Region, as well as identification of target areas, soils testing, and preliminary OWTS design
- **[if any of the Work Plan tasks have been completed already, or will be completed prior to grant start, move that to here]**
- **[add any other completed work]**

2.1.9 Existing Studies and Data

The following includes a list of studies that have been conducted and data that has been collected in support of the *Regional Program for Septic System Rehabilitation* project, and provide justification for the activities and decisions inherent in the project. These documents are also included as **[Appendix X]**. Where noted, only the relevant pages have been included in the appendix.

- **[List existing studies and data used for project site choice, feasibility, technical methods. Provide page numbers that support claims made]**

2.1.10 Project map

[Figure X] provides a map showing project area for the *Regional Program for Septic System Rehabilitation*, including which areas in the Region are DACs, areas with suspected failing septic systems, proximity to nearest sewer systems, and wastewater agency service areas. **[Describe map elements as appropriate.]**

2.1.11 Project Timing and Phasing

The *Regional Program for Septic System Rehabilitation* **[Project tile]** is intended to be the start of a region-wide program to address issues with OWTSs in DACs and rural communities. **[If permitting does not require septic improvements to be part of a larger design plan:]** However, because it will identify failing OWTSs, implement solutions to these failing systems, and provide training to residents to properly maintain and operate their systems, it is also able to function as an independent project and will be able to achieve the project objectives without implementation of any other projects or phases. **[If permitting requires septic improvements to be included as part of a larger design plan, describe that larger plan:]** However, within the County of Riverside, OWTS improvements within mobile home parts are typically reviewed as part of a complete design plan along with other improvements in order to obtain a Conditional Use Permit. As such, this project is part of a larger design package, but is the only element of the design package eligible and applying for funding under the IRWM Grant Program **[grant opportunity]**. This larger permitting package includes **[describe other elements in the greater design package]**.

2.1.12 Project Work

<u>**Direct Project Administration Costs**</u>

Task 1: Project Administration – Ongoing project administration for this project will involve coordinating with **[grant administrator]** on DWR-related **[funding agency]** contracting efforts and coordinating with **[project consultant, other parties, other project sponsors]**.

Task 1 deliverables:

- **[Add appropriate deliverables here as necessary]**

Task 2: Labor Compliance Program – [Project sponsor] will contract with a consultant to develop a Labor Compliance Program to verify that construction will be completed in accordance with current applicable wage laws. This program will be completed and submitted to the California Department of Industrial Relations **[appropriate agency]**. Implementation of the Labor Compliance Program will begin prior to and throughout project construction, and will end with construction.

Task 2 deliverables:

- Final Labor Compliance Program report and submittal to the California Department of Industrial Relations **[appropriate agency]**

Task 3: Reporting – Reporting will be completed by **[project sponsor]** for the *Regional Program for Septic System Rehabilitation* **[Project title]** and submitted to **[grant administrator]** for inclusion in regional reporting to DWR **[Funding agency]**. Reporting activities include those required for quarterly progress reports and invoices, a project assessment, and a project completion report. It will also include any data collection and analysis reporting to appropriate databases, as required.

Task 3 deliverables:

- Quarterly invoices and progress reports, including required deliverables
- Project Assessment and Evaluation Plan (PAEP)
- Project Completion Report

Table X: Direct Project Administration

Activity or Deliverable	Schedule	Status	Completion of Task	
			Before Sept 2013	After Sept 2013
Task 1: Project Administration				
Project Coordination	**[Start of grant – end of grant]**	Not yet begun		X
Task 2: Labor Compliance Program				
Labor Compliance Program, including field interviews, reviewing contractor payroll, preparing deficiency notifications, and preparing final report	**[Start of grant – end of Task 9 + 1 month]**	Not yet begun		X
Task 3: Reporting				
Compile PAEP, Invoices, and Progress Reports	**[Start of grant – end of grant]**	Not yet begun		X
Prepare Quarterly Reports	**[End of first quarter after start of grant – end of grant]**	Not yet begun		X
Prepare Final Report	**[6 months prior to end of grant – end of grant]**	End of work		X

Land Purchase/Easement

A land purchase easement is not required for implementation of this project. As such, there are no deliverables related to land purchase easement. **[Describe any land purchases or easements required for projects, if applicable. Describe any deliverables or tasks, include summary table]**

Planning/Design/Engineering/Environmental Documentation

Task 4: Assessment and Evaluation – There are three subtasks for Task 4, described here:

Subtask 4.1: Identify Project Location **[This task may be conducted during project development, prior to grant application. If so, incorporate results into project background, purpose, need, completed work, and existing data and studies, as appropriate]**

[Project sponsor] must identify locations where existing OWTSs are failing or where new OWTSs need to be installed. Some target communities may not have OWTS yet installed, while some communities may have existing OWTSs that may be unpermitted, poorly designed, or not properly maintained. Communities with unpermitted systems may be difficult for agencies or **[project sponsor]** to identify. **[Project sponsor]** will consult with **[local environmental health departments]** and **[appropriate NGOs]**, who work on septic rehabilitation projects. These local groups are able to identify a number of disadvantaged communities without proper OWTSs through their work in the communities, observations, and testing. The **[local environmental health department]** should be able to provide records of identified failing OWTS, and **[local NGOs]** may be able to help verify the issues or identify communities with OWTS issues that the health department has not yet discovered.

After the project site is selected it will be mapped in an interactive mapping program such as ArcGIS. The map of the project site will be compared against the *Water Quality Control Plan for the Colorado River Basin* (Basin Plan) adopted by Colorado River Basin Regional Water Quality Control Board (RWQCB) **[appropriate reference plan and agency]**. This step is necessary to ensure that the project site is not located in an area within which the Basin Plan limits the use of OWTS; direct coordination with the RWQCB will ensure that the site is eligible for potential OWTS rehabilitation. The project site will also be mapped to determine the applicable land use agency (City or County) for the project, and allow for direct coordination with the applicable land use agency to ensure that the project site does not conflict with applicable municipal codes.

After the project site has been deemed feasible in terms of the Basin Plan and the applicable land use agency, backup documentation to describe the existing conditions and the need for OWTS upgrades will be gathered. While not all sites will have such materials, backup documentation includes photographs of OWTS overflows or spills, water quality records, citations from the RWQCB, the County Department of Environmental Health, or other relevant agencies. **[These materials help to define the need for the project with respect to other similar projects and are important if the project proponents are seeking competitive grant funds to help pay for project implementation. If documentation collected prior to application, include in Project Need, Purpose, Objective, etc.]**

Subtask 4.1 deliverables:

- Formal map of the selected project site,**[preferably in ArcGIS format]**. The map will show, at a minimum the: potential project site, applicable land use agency, and major roadways.
- A brief write-up that explains consistency with the Basin Plan and applicable municipal codes, including the applicable land use agency.
- Information about the selected project site, including but not limited to: number of residents, condition of the existing OWTS, documentation of OWTS issues or failures, water quality tests (if applicable).

Subtask 4.2: Conduct Outreach to Property Owners and Residents

After identifying potential sites for OWTS improvements, **[project sponsors]** will initiate meetings and conversations with the property owners and residents living in those communities that require OWTS rehabilitation. During this subtask, the assistance of **[a local NGO]**, which is active and trusted in the community can provide significant benefits. Experience from the *Coachella Valley DAC Outreach Program* found that working with local NGOs can reduce language and cultural barriers, and an active local community organizer can help to convey the importance of the project and create a positive atmosphere from the onset of the project. At some sites, the assistance of NGOs in this step may be essential to project success **[if known, name project sites that require NGO assistance to be most successful]**.

This subtask provides **[project sponsors]** the opportunity to explain the importance of properly designed and constructed OWTSs to owners and residents and helps to gain owner and resident support of the project, which is critical to project implementation. **[Project sponsors]**will use this subtask to confirm that owners and members of the candidate communities are willing to participate in an OWTS improvement project before moving forward. Formal willingness to participate in the OWTS improvement project (via a letter or other signed document) on behalf of the property owner is required prior to initiating Task 2.

Subtask 4.2 deliverables:

- Documentation of outreach to local community (property owner and residents) through meeting summaries.
- Formal willingness to participate in the OWTS improvement project on behalf of the property owner.

Subtask 4.3: Soil Testing

Because each individual site's sub-surface (soil) conditions are the key parameters of OWTS performance, soil testing provides crucial information for OWTS planning and design. A preliminary layout of the existing OWTS will be prepared prior to soils testing in order to identify the location and number of soils tests to be performed. System layout will be finalized under Task 5 (see below), after soils testing is complete. Soil engineers will follow **[local agency's]** guidelines for soil tests. The soil evaluation consists of two different tests: a deep boring and a shallow percolation test **[these are generally what is involved in soil evaluation, adjust as appropriate]**. The deep boring will identify groundwater levels and the presence, if any, of impermeable soil layers and bedrock; the percolation test will evaluate the percolation rate of the site on a parcel or subdivision level, depending on the site. Soil testing will ensure that subsurface conditions are suitable for OWTS installation. Soil testing will also help the engineer determine the types and sizes of OWTS that are most appropriate for a particular site during Task 5 Final Design.

Subtask 4.3 deliverables:

- Copy of **[applicable local agency's**] guidelines for soil tests.
- Preliminary layout of the existing OWTS.
- Deep boring test results (documentation of groundwater level and presence of any impermeable soil layers and bedrock).
- Shallow percolation test results (documentation of onsite percolation rates).

Task 5: Final Design - After review of the soils testing results, the [**project engineer]**will identify a viable OWTS alternative based on the soil test report, size and layout the system **[refer to Section 3 of the *Coachella Valley Septic Rehabilitation Program Report* for more information on system types]**.

A number of site parameters are considered in the course of selecting the type of OWTS for a specific site, including the number of existing and near-term planned units, the onsite percolation rate, groundwater level, the community layout, and the locations and depth of existing utilities. In addition, other site conditions such as the formal location and permitting status will be evaluated as part of this task. **[Table X]** shows the types of onsite parameters that will be considered in this task. **[modify table as appropriate to individual project. Table below can be used as an example]**

Table X: Onsite Parameters

Items	Description
Status	Permitted or Unpermitted
Address	Formal address for permitting documents
APN	xxx-xxx-xxx
Owner	Name(s)
Existing Units	Number
Planned Units	Number (within next five years)

The design process will be implemented in compliance with local and state regulations. In Riverside County **[appropriate location]**, the soil engineer who performed the soils testing must sign off on the design before the final design of the OWTS is submitted to **[applicable regulating agency]** for permit application. **[Table 2]** shows the type of information that will be synthesized from the soils tests and considered in the design criteria. **[Modify table as appropriate to individual project. Table below is an example]**

Table X: OWTS Design Criteria

Item	Criteria	Unit X	Unit Y	Unit Z
Septic Tank	Units per Tank (#)	1	1	1
	Minimum Tank Size (gal)	1,000	1,000	1,000
Leach fields	Minimum Area (sq.ft)	400	400	400
	Parallel Chambers (#)	2	2	2
	Minimum Length (ft)	67	67	67

**Unit X, Y, Z indicates that an individual site or mobile home park likely has multiple units that would need to connect to a septic system, and that these units may have different capacities and leach field requirements.*

Task 5 deliverables:

- Final layout of the existing OWTS.
- Summary of onsite parameters
- Summary of OWTS design criteria
- Preliminary design plans.
- Final design plans.
- Soil engineer's sign-off on final design plans **[if applicable]**.

Task 6: Environmental Documentation – The project does not trigger CEQA, NEPA, or other environmental regulations and therefore does not require environmental documentation. **[If project will trigger CEQA/NEPA/etc., describe here]**

Task 6 deliverables:

As no environmental documentation is required, there are no deliverables associated with Task 6. **[If project triggers CEQA/NEPA or other environmental documentation, add appropriate deliverables here (EIR/EIS, MND, NegDec, FONSI, etc.)]**

Task 7: Permitting – There are two subtasks for permitting: determining the required permits, and obtaining the permits. These are described as Subtask 7.1 and Subtask 7.2, respectively.

Subtask 7.1: Determining Required Permit Type

[This subtask is unlikely to be included in a grant application – the amount of on-site subsurface discharge will likely be determined during the final design phase (Task 5), which will determine what type of permit is required. The work described in this subtask explains how to determine the permit type]

[Project sponsor] will coordinate with regulatory agencies to obtain information regarding permitting requirements for OWTS projects; please note that while permitting is formally discussed in Task 7, coordination with the applicable agencies is recommended during initiation of the project (see Task 4). According to the RWQCB's Order 97-500 for on-site subsurface discharge, projects generating flows greater than 5,000 gallons per day (gpd) per parcel are required to apply for a general discharge permit from the RWQCB. In contrast, parcels generating less than 5,000 gpd of sewer flow are usually issued a conditional use permit (CUP) by the Riverside County Planning Department. Therefore, the first step in permitting is to determine the amount of on-site subsurface discharge. **[The information presented herein is related to those projects that require a CUP and is not applicable if a general discharge permit is required.]** Unless otherwise determined during Subtask 7.1, **[Project sponsor]** will apply for a Conditional Use Permit. **[modify as appropriate]**.

Subtask 7.1 deliverables:

- Record of on-site subsurface discharge.

Subtask 7.2: Obtaining a Conditional Use Permit

[This subtask described how to obtain a CUP in Riverside County. The process likely varies depending on project location/region. Text included here provides guidance on the steps required to obtain permit, and notes that OWTS design must be permitted as part of a larger package, not as an individual project. This means that the project should already have a permit (as part of a larger project) or should acknowledge this, and state when/how project is expected to receive permit (as part of what other improvements?). Should be modified to reflect actual steps that will be taken to obtain permits.]

OWTS improvements within Polanco Parks, such as those evaluated in the *Coachella Valley Septic Rehabilitation Program*, are typically reviewed as part of a complete design plan along with other necessary improvements for the Polanco Park, which receives a CUP from the County of Riverside **[appropriate agency]**. Although this project focuses on improvements to OWTSs, a CUP requires multiple onsite improvements, including: water system improvements, street/access improvements, and fire suppression. A CUP from the County of Riverside requires review and approval of the proposed design plan for onsite improvements from the following departments:

- Environmental Health Department
- Fire Department
- Building and Safety Department

Comments from the above departments will be addressed in a revised design plan that will be resubmitted for approval by each department. Once all the comments are properly addressed and the plan has been approved, a permit to implement the proposed project will be issued. The project must be implemented in accordance with stipulations in the approved design plan, which will include conditions for the OWTS. **[Most counties have similar permitting requirements to those described above, which are specific to the Coachella Valley (portions of Riverside County located within the Colorado River Basin).]** Prior to approval, and during development of the OWTS design plan, **[local health department]** will be asked to provide informal review or input on the design.

[**That OWTS design must be permitted as part of a larger package of other community improvements, rather than as an independent project, presents additional challenges to obtaining**

proper permitting for small communities with failing OWTSs. Packaging improvements together means that in addition to the specific design work explained in Task 5 for the OWTS, project proponents must also complete planning and design work for other community improvements in order to obtain a CUP and implement the OWTS portion of the project. Figure 2 below provides an overview of the CUP process as it applies specifically to Riverside County.]

Figure 2: Conditional Use Permit Application Overview [modify as appropriate]

Adapted based on information from: *Redevelopment Agency for the County of Riverside. 2010. Mobile Home Park Development Standards & Design Criteria. Available:* http://www.rivcoeda.org/LinkClick.aspx?fileticket=qcYkeHL%2BZTA%3D&tabid=57&mid=2389

Subtask 7.2 deliverables:

- Compilation of other design plans (structural and engineering plans, fire plan, and water plan).
- Submittal of final design plans for all aspects of the project to the applicable agencies and departments.
- Comments on final design plans from the applicable agencies and departments **[if applicable]**.
- Revised design plans with approval from the applicable agencies and departments **[if applicable]**.
- Formal CUP issued by the applicable agency **[if applicable]**.
- **[Other permits as required]**

Table X: Planning/Design/Engineering/Environmental Documentation

Activity or Deliverable	Schedule	Status	Completion of Task	
			Before Sept 2013	After Sept 2013
Task 4: Assessment and Evaluation				
Subtask 4.1: Identify Project Location				
Identify organizations to assist in locating DACs with failing OWTS	**[Start of grant - +2 months]**	Not yet begun		X
Identify location of failing OWTS	**[End of ID organizations to assist in locating DACs - +4 months]**	Not yet begun		X
Develop map of project site	**[End of ID location of failing OWTS - + 2 months]**	Not yet begun		X
Write site report	**[End of develop map - +3 months]**	Not yet begun		X
Subtask 4.2: Conduct Outreach to Property Owners and Residents				
Meet with Property Owners **[specific # of meetings or property owners if known]**	**[End of Subtask 4.1 - +2 months]**	Not yet begun		X
Subtask 4.3: Soil Testing				
Develop preliminary OWTS layout	**[End of Subtask 4.2 - +1 month per site]**	Not yet begun		X
Deep boring soil testing **[appropriate soil test name]**	**[End of preliminary OWTS layout – +1 month per site]**	Not yet begun		X
Shallow percolation soil testing **[appropriate soil test name]**	**[End of preliminary OWTS layout – +1 month per site]**	Not yet begun		X
Task 5: Final Design				
Final layout of OWTS	**[End of Task 4 - +2 months]**	Not yet begun		X
Determine onsite parameters	**[End of Task 4 - +2 months]**	Not yet begun		X
Determine OWTS design criteria	**[End of Task 4 - +2 months]**	Not yet begun		X
Preliminary design plans **[% design phase]**	**[End of Task 4 - +4 months]**	Not yet begun		X
Final design plans **[100% design]**	**[End of preliminary design - +4 months]**	Not yet begun		X
Final design approval from soil engineer **[if applicable]**	**[End of final design - +1 month]**	Not yet begun		X
Task 7: Permitting				
Subtask 7.1: Determining Required Permit Type				
Coordinate with regulatory agencies to	**[End of Task 4 – End of Task 5 + 1**	Not yet begun		X

determine permitting requirements	**month]**			
Determine on-site subsurface discharge for proposed system	**[End of Task 4 – End of Task 5]**	Not yet begun		X
Subtask 7.2: Obtain Conditional Use Permit **[appropriate permit name, if multiple permit types required, change to Obtain Permits, and list individual permits as deliverables]**				
Compile other design plans	**[End of Subtask 7.1 - +4 months]**	Not yet begun		X
Submit final compiled design plans for all aspects of project for agency review	**[End of compile other design plans]**	Not yet begun		X
Incorporate agency comments into revised design plan	**[Submit final compiled design plans + 1 month - +4 months]**	Not yet begun		X
Submit revised design plan to agencies for approval	**[End of incorporate agency comments]**	Not yet begun		X
Obtain Conditional Use Permit	**[End of submit revised plan - +3 months]**	Not yet begun		X
[other permits, as required]	**[timeframe appropriate for permit]**			

Construction/Implementation

Task 8: Construction Contracting – [If applicable (adjust as needed):]Solicitation for a construction contractor will involve advertisement for bids, holding a preconstruction meetings, bid opening, bid evaluation, **[Project sponsor]** staff recommendations, **[Project sponsor]** board approval, and awarding the construction contract. The contracting process will also include confirming the contractor's insurance requirements and bonds. For each contract **[Project sponsor]** staff must issue a Request for Proposals, evaluate submitted proposals, and issue recommendations.

Task 8 deliverables:

- Final executed construction contract

Task 9: Construction – Construction tasks will include mobilization and site preparation, construction and installation of new OWTS, removal or abandonment of existing failing OWTS, and clean-up **[adjust as appropriate]**.

Subtask 9.1: Mobilization and Site Preparation – Mobilization and site preparation will entail **[number]** of steps, including development of O&M guidelines, training, and OWTS site preparation (equipment delivery, clearing, **[other site preparations]**).

Subtask 9.1.1: Development of O&M Guidelines and Training

Proper maintenance of OWTS after the initial installation or rehabilitation is essential to ensure its proper performance. **[Project sponsor]** will set forth operation and maintenance (O&M) guidelines and provide adequate training to community members to ensure that the capital improvements made to the OWTS are not wasted due to improper O&M. While system layout for various OWTSs may differ, the general guidelines for maintaining these systems are essentially the same, and will be developed in a manner that is usable to residents and property owners. O&M guidelines will include regular (annual) inspection of onsite septic tanks and leach lines as well as regular (every 3-5 years) pumping and disposal of waste byproducts from the OWTS to nearby wastewater treatment facilities or landfills **[adjust as necessary]**. **[Project sponsor]** will confer with the engineering team that completed design work as well as the applicable regulatory agencies to ensure that the O&M guidelines are appropriate for the designed system and are in compliance with any applicable regulations. **[Project sponsor]** will conduct **[number]** workshops to train residents and property owners in appropriate operation and maintenance of the new systems **[if installing systems at multiple sites, include number of workshops per site]**.

<u>Subtask 9.1.2: Site preparation</u>

Prior to construction of new OWTS, sites will be prepared as appropriate. This task will involve equipment delivery, site clearing, **[other]**.

Subtask 9.2: Project Construction – Project construction includes the activities necessary to install the new OWTS. These activities include installation of **[number]** OWTS **[specify type]**, **[linear feet]** of **[size]** pipe to connect residences to the new OWTS, **[steps to OWTS construction – could include digging activities, filling activities, any paving activities, and more]**.

Subtask 9.3: Performance Testing and Demobilization – This subtask will involve system inspection and testing **[add specific testing activities as appropriate]**. It will also include **[removal/abandonment]** of the **[number]** existing failing OWTS. **[Add activities that will either remove existing systems (excavation of system, capping pipes, etc.) or safely abandon systems (sealing pipes, pumping tanks, etc.)].**

Task 9 deliverables:

- O&M guidelines usable to residents and property owners.
- Documentation of initial and regular O&M trainings to local community (property owner and residents) through meeting summaries.
- Performance testing on **[number]** new OWTS.
- Certification of appropriate existing system **[removal/abandonment]**

Table X: Construction/Implementation

Activity or Deliverable	Schedule	Status	Completion of Task	
			Before Sept 2013	After Sept 2013
Task 8: Construction Contracting				
Bidding	**[End of Task 5 – +1 month]**	Not yet begun		X
Bid Evaluation	**[End of bidding - +3 months]**	Not yet begun		X
Contract Award	**[End of bid evaluation - +1 month]**	Not yet begun		X
Contract Execution	**[End of contract award – end of construction]**	Not yet begun		X
Task 9: Construction				
Subtask 9.1 Mobilization and Site Preparation				
Development of O&M Guidelines	**[End of Task 5 - +6 months]**	Not yet begun		X
[number] O&M training workshops	**[End of Development of O&M Guidelines - +1 month]**	Not yet begun		X
[site preparation activities (Subtask 9.1.2)]				
Subtask 9.2 Project Construction				
Installation of **[number]** OWTS	**[Completion of Task 7, Task 8, and subtask 9.1 - +2 months per site]**	Not yet begun		X
Installation of **[lineal feet]** pipelines	**[Completion of Task 7, Task 8, and subtask 9.1 - +2 months per site]**	Not yet begun		X
[other construction activities]				
Subtask 9.3 Performance Testing and Demobilization				
[Removal/Abandonment] of **[number]** failing OWTSs **[breakdown activities if known into separate rows in table]**	**[End of Subtask 9.2 - +1 month per site]**	Not yet begun		X

Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement – As noted in Task 6, this project will not trigger CEQA, NEPA, or other environmental regulations. Therefore no environmental compliance/mitigation/enhancement is required. **[If CEQA/NEPA/etc. is triggered (as noted in Task 6), describe any compliance/mitigation/enhancement that will be required. Could include compliance with mitigation monitoring and reporting plan (MMRP), existing monitoring efforts, any plans for mitigation, or if any enhancement activities will be part of the project]**

Construction Administration

Task 11: Construction Administration – Construction administration includes all activities necessary to oversee and manage the construction contract. These activities will include **[construction management activities – may include general construction management, materials testing, inspection, and construction staking]**.

Task 11 deliverables:

- Construction management contract

Table X: Construction Administration

Activity or Deliverable	Schedule	Status	Completion of Task	
			Before Sept 2013	After Sept 2013
Task 11 Construction Administration				
Management of construction contract	**[Start of Task 8 – End of Task 9]**	Not yet begun		X
[other activities as described above (e.g., materials testing, etc.)]				

2.1.13 Budget

The **[Project title]** will involve tasks that will allow **[Project sponsor]** to select, design, and construct OWTSs appropriate to meet the needs and conditions of each **[the]** project site. These new OWTSs will replace existing failing or inadequate OWTSs in DACs in the region **[project area]**. Failing OWTSs pose a risk to groundwater in the Coachella Valley **[region]**, which forms the sole **[primary]** source of water in the region. The communities served by the project are unable to connect to existing sewer services due to distance, cost, and restrictions on spending outside agency service areas. This project will address a critical wastewater need of a DAC, as well as address serious public health concerns in these communities. Funding for this project involves **[list categories for funding]**.

The total cost of the *Regional Program for Septic System Rehabilitation* **[Project title]** is **[total project cost]**. Of these total costs, **[grant request]** is being requested for grant funding through the IRWM Grant Program **[name of grant program/opportunity]**. The remaining **[remaining costs]** will be met by **[Project sponsor]**, **[partner agencies]**, and **[other grants]**. In total, the non-State share of the total project (funding match) is **[funding match %]** for this project. The funding match will be provided by the **[source of funding match]** of the operating funds of the **[project sponsor and partner agencies]**.

[Table X], below, provides a more detailed break-down of the total project budget.

Table X: Project Budget

Proposal Title: [Proposal Title]					
Project Title: Regional Program for Septic System Rehabilitation [Project title]					
Project serves a need of a DAC?: ☒ Yes ☐ No					
Funding Match Waiver request?: ☐ Yes ☒ No					
		(a)	**(b)**	**(c)**	**(d)**
Category		**Requested Grant Amount**	**Cost Share: Non-State Fund Source* (Funding Match)**	**Cost Share: Other State Fund Sources***	**Total**
(a)	Direct Project Administration				
(b)	Land Purchase/ Easement				
(c)	Planning/ Design/ Engineering/ Environmental Documentation				
(d)	Construction/ Implementation				
(e)	Environmental Compliance/ Mitigation/ Enhancement				
(f)	Construction Administration				
(g)	Other Costs				
(h)	Construction/ Implementation Contingency				
(i)	**Grand Total**				
** Sources of funding: The non-state funding match will be provided by the* ***[funding source]****.*					

This proposal is requesting funding for **[number]** project tasks identified within the *Regional Program for Septic System Rehabilitation* **[Project title]** work plan (refer to **[add reference]**). The sections below provide detailed description of each row and task budget (where applicable), as well as a description of how these costs were calculated.

Table X: Cost Breakdown by Work Plan Task and Subtask

Row/Task	Category	Total
GA	Grant Administration	
Row (a)	Direct Project Administration Costs	
Task 1	*Project Administration*	
Task 2	*Labor Compliance*	
Task 3	*Reporting*	
Row (c)	Planning/Design/Engineering/Environmental Documentation	
Task 4	*Assessment and Evaluation*	
Task 5	*Final Design*	
	[If applicable: Task 6 Environmental Documentation]	
Task 7	*Permitting*	
Row (d)	Construction/Implementation	
Task 8	*Construction Contracting*	
Task 9	*Construction*	
	[If applicable: Row (e) Environmental Compliance/Mitigation/Enhancement]	
	[If applicable: Task 10 Environmental Compliance/Mitigation/Enhancement]	
Row (f)	Construction Administration	
Task 11	*Construction Contracting*	
Row (g)	Other Costs	
Row (h)	Construction/Implementation Contingency	
Row (i)	**Grand Total**	

Grant Administration

[Describe how grant administration will be handled] Local project sponsors shall dedicate a portion of their grant funds to CVWD **[agency responsible for grant administration]** for administration and processing of the Implementation Grant **[grant name]**. The *Regional Program for Septic System Rehabilitation* **[Project title]** will contribute **[amount for grant administration]** to this administration cost. **[Describe who will be doing what for this task:]** Costs for grant administration include labor costs for a planning manager to coordinate receipt of quarterly progress reports and an analyst who will receive and reconcile invoices for grant reimbursables and funding match from project sponsors to create a grant invoice for DWR. The costs are based on hourly rates for these positions, and effort based on **[justification]**. **[Note: in the past, Coachella Projects have allocated between 2% and 3% of project cost for Grant Administration]**

Table X: Grant Administration

Activity	Discipline	Hourly Wage ($/hr)	Number of Hours	Total	Funding Match	Grant Request
Grant Administration						
Grant administration	Planning Manager	$85				
	Analyst	$60				
Grant Administration Total						

Direct Project Administration Costs

The total direct project administration costs for the project are **[total direct project administration costs]** and will be spent by **[responsible party]** for administration and processing of the IRWM Implementation Grant **[grant name]**.

Task 1: Project Administration – **[Project sponsor]** will assume all direct project administration costs for this project. This task involved administration of the *Regional Program for Septic System Rehabilitation* **[Project title]**, and included costs for a Project Manager and supplies to conduct project administration activities, including coordination with **[grant administrator]** on DWR-related **[funding agency]** contracting efforts and coordination with **[project consultant, other parties, other project sponsors]**. Project administration costs are estimated to be **[costs]**. Costs estimates are based on hourly wage of a Project Manager, effort is estimated based on **[justification]**, and costs adjusted for efficiencies based on experience from **[justification]**. Equipment and supply costs have been estimated based on experience with **[justification – typically a similar project]**. **[Provide appropriate justification for cost estimates]**

Task 2: Labor Compliance Program – **[Project sponsor]** will hire a consultant to implement a Labor Compliance Program to verify that construction will be completed in accordance with current applicable wage laws. The consultant will conduct all Labor Compliance Program activities. Costs for this task are estimated to be **[costs]**. These costs are based on hourly rates for the consultant, as well as hourly rates for a Project Manager to oversee consultant work. Effort required to complete this task has been estimated using experience from **[justification]**.

Task 3: Reporting – **[If not already included under Task 1:]** Costs for Task 3 will be incurred by all activities required to produce the PAEP, quarterly progress reports and invoices, and the project completion report. These costs are estimated as **[costs]**, calculated using the hourly rate for the **[job title]** responsible for producing Task 3 deliverables, and the estimated amount of time required to produce deliverables, based on **[justification]**

Table X: Direct Project Administration Budget

Activity	Discipline	Hourly Wage ($/hr)	Number of Hours	Total	Funding Match	Grant Request
Task 1: Project Administration						
Project Coordination	Project Manager	$100	240			
			Task 1 Total			
Task 2: Labor Compliance Program						
Field Interview Project Labor Force	Consultant	$120	72			
Review Contractor Certified Payroll	Consultant	$120	48			
Prepare Deficiency Notification	Consultant	$120	48			
Prepare Final Report Summarizing Labor Compliance	Consultant	$120	24			
			Task 2 Total			
Task 3: Reporting						
PAEP	**[job title]**					
Compile invoices and progress report	Consultant	$120	40			
Prepare Quarterly Reports	Consultant	$120	120			
Prepare Final Report	Consultant	$120	80			
			Task 3 Total			
			Row (a) Total [Sum of this table]			

Land Purchase/Easement

A land purchase or easement is not required for implementation of this project. As such, there are no costs related to land purchase easement. **[If applicable, describe estimated costs, who will do what, and provide justification for costs. Add cost table.]**

Planning/Design/Engineering/Environmental Documentation

The total Planning/Design/Engineer/Environmental Documentation costs for the project are **[costs]**. **[Table X]** provides a detailed listing of all applicable costs. The cost totals are based on the following for the three **[number]** applicable Planning/Design/Engineering/Environmental Documentation tasks:

Task 4: Assessment and Evaluation – Costs for Task 4 are those incurred by the three subtasks described in the project Work Plan (see **[add reference]**). Task 4 costs are estimated to be **[costs]**.

Subtask 4.1: Identify Project Location

Costs for this task include costs for identifying project sites, coordinating with local agencies and non-profits to identify highest risk areas, mapping these areas, and determining regulatory compliance requirements. It is anticipated that completion of Subtask 4.1 will require a Project Manager to coordinate with different organizations and manage the site identification process. Workshops will be held with **[appropriate NGOs and agencies]**, incurring staff costs and meeting costs (location, equipment, and materials). A GIS Analyst **[staff member]** will create maps of potential project sites. Costs for this task are based on hourly wages of each required staff member, standard rates for meeting spaces, **[number]** workshops, and a level of effort estimated based on **[justification for hours spent]**. Subtask 4.1 costs are estimated to total **[costs]**.

Subtask 4.2: Conduct Outreach to Property Owners and Residents

Costs for Subtask 4.2 are estimated as **[costs]**, and will cover expenses incurred by outreach activities to property owners and residents. **[Project sponsor]** will hold **[number]** outreach meetings. Each outreach meeting will require **[number]** hours for a Project Manager, **[number]** hours for a **[staff job title or consultant]**. Each meeting will also involve **[number]** hours from **[local partner NGO]** to assist in reaching target property owners and residents. **[Number]** hours are anticipated to be required to complete translation of outreach materials from English to Spanish to accommodate anticipated language and cultural barriers. The Project Manager will spend an additional **[number]** hours coordinating with staff and **[partner NGOs and agencies]**, and processing formal documentation of willingness to participate from property owners and residents. These estimates of the level of effort required are based on experience with past projects, namely **[provide example project]**. Costs are based on the level of effort, hourly wages of staff members involved, and the typical costs for materials and meeting spaces. **[Adjust cost justification as necessary]**

Subtask 4.3: Soil Testing

To complete Subtask 4.3, a Project Manager will coordinate between design engineers and soil engineers. This effort is estimated to require **[number]** hours per testing site. A Soil Engineer **[appropriate job title for soil testing engineer]** will conduct two soil tests: deep boring and shallow percolation **[adjust as appropriate]**. The deep boring test is estimated to require **[number]** hours, and **[list equipment]**. Shallow percolation testing requires **[number]** hours and **[list equipment]**. A **[Design Engineer]** will produce a preliminary layout of existing OWTS, which is anticipated to require an average of **[number]** hours per site. Costs for soil testing is based on hourly wage for a Project Manager, Soil Engineer, and **[Design Engineer]**, and standard equipment costs. Estimates of level of effort are based on **[justification]**.

Task 5: Final Design - This task includes the costs for final layout of the existing OWTSs, determination of onsite parameters and OWTS design criteria, and preliminary and final design. A Project Manager will oversee all project activities, a Project Engineer will complete layout and design activities, while the Soil Engineer who completed Subtask 4.3 will sign off on the final design. The level of effort for each of these activities has been estimated using past experience from **[add justification]**. Costs were calculated using hourly wage of each staff member. Total Task 5 costs are estimated to be **[costs]**, and broken down in detail in **[Table X]**, below.

Task 6: Environmental Documentation – As the project will not require environmental documentation beyond those already included in other tasks, no environmental documentation costs will be incurred.

Task 7: Permitting – [Adjust this budget as appropriate. As written, this budget will address the costs for the subtasks described in the example Work Plan] Costs for this task include the cost to determine which permits are required, and the costs to obtain these permits. Total costs for Task 7 is estimated at **[costs]**. These costs are estimated on hourly wages for staff, level of effort (based on past experience **[add justification]**), and permit fees.

Subtask 7.1: Determining Required Permit Type

A Project Manager will coordinate with regulatory agencies to determine appropriate permitting for the *Regional Program for Septic System Rehabilitation* **[Project title]**. This is anticipated to require **[number]** hours. Costs for this subtask is based on level of effort and hourly wage of the Project Manager.

Subtask 7.2: Obtaining a Conditional Use Permit

Costs to obtain a CUP include the cost for **[staff]** to compile a design plan package, estimated to require **[number]** hours of staff effort. Revision of design plans is anticipated to require **[number]** hours of **[project sponsor]** staff time. Costs for this subtask are estimated from hourly wages of staff and the required effort to compile and complete the permit application process. Effort is estimated based on past experience in obtaining CUPs.

Table X: Planning/Design/Engineering/Environmental Documentation

Activity	Discipline/Materials	Hourly Wage ($/hr)/Unit Cost ($)	Number of Hours/Units	Total	Funding Match	Grant Request
Task 4: Assessment and Evaluation						
Subtask 4.1: Identify Project Location						
[number] project site identification workshop(s)	Project manager					
	[Project sponsor staff]					
	[NGO staff]					
	[If appropriate]Translator					
	Meeting space, materials and equipment					
Project site mapping	GIS Analyst					
Subtask 4.2: Conduct Outreach to Property Owners and Residents						
[number] outreach meetings	Project Manager					
	[Project sponsor staff]					
	[NGO staff]					
	Translator					
Formal willingness to participate	Project Manager					
Subtask 4.3: Soil Testing						
Coordination	Project Manager					
Deep boring testing	Soil Engineer					
Shallow percolation testing	Soil Engineer					
Preliminary layout of existing OWTS	**[Design Engineer]**					
			Task 4 Total			
Task 5: Final Design						
Final existing OWTS layout	**[Design Engineer]**					
Determination of onsite parameters	**[Design Engineer]**					
Determination of OWTS design criteria	**[Design Engineer]**					
Preliminary design **[% design]**	**[Design Engineer]**					
Final design **[100%**	**[Design Engineer]**					

design]						
Design coordination	Project Manager					
			Task 5 Total			
[If applicable:] Task 6: Environmental Documentation						
[NEPA/CEQA/etc.]						
			Task 6 Total			
Task 7: Permitting						
Subtask 7.1: Determine Required Permit Type						
Coordination with regulatory agencies	Project Manager					
Subtask 7.2: Obtaining a Conditional Use Permit **[adjust as appropriate, see work plan]**						
Compile and submit design plan package	**[Project sponsor staff]**					
Revise and resubmit design plan package	**[Project sponsor staff]**					
			Task 7 Total			
			Row (c) Total [Sum of this table]			

Construction/Implementation

Task 8: Construction Contracting – Costs for construction contracting include the costs for **[Project sponsor staff]** to request bids, assess proposals, and award construction contracts. Based on **[Project sponsor]**'s typical construction contracting process, this is estimated to require **[number]** hours. Costs for Task 8 are estimated at **[costs]**, based on hourly wage for **[Project sponsor]** staff.

Task 9: Construction – Costs for construction and implementation are estimated to be **[Task 9 costs]**. These costs are incurred by all activities necessary to complete subtasks 9.1 thought 9.3, as described in the Work Plan (see **[reference Work Plan]**). The costs for Task 9 were estimated based on **[cost justification]**, and divided into three categories: Materials, Equipment, and Labor **[appropriate categories]**.

- Materials: Materials that will be required for construction/implementation of this project include training materials (handouts, manuals, **[other training materials]**), materials for the O&M Guidelines, and **[construction materials]**. Estimated cost for materials is **[cost]**.
- Equipment: Anticipated equipment costs for the project include costs for the new OWTSs, **[other equipment]**, and space and equipment for trainings. Total equipment cost is anticipated to be **[cost]**.
- Labor: Labor costs for this project include costs for a trainer, general contractor, masonry, an electrician, and a plumber **[use appropriate labor based on Work Plan]**. Total labor costs are estimated at **[cost]**.

Table X: Construction/Implementation

Activity	Discipline	Hourly Wage ($/hr)	Number of Hours	Total	Funding Match	Grant Request
Task 8: Construction Contracting						
Bidding and pre-construction meeting	**[Project sponsor staff]**					
Bid evaluations	**[Project sponsor staff]**					
Contract award	**[Project sponsor staff]**					
Contract execution	**[Project sponsor staff]**					
			Task 8 Total			
Task 9: Construction/Implementation						
Materials						
Activity	**Materials**	**Unit Costs ($)**	**Number of Units**	**Total ($)**	**Funding Match**	**Grant Request**
[number] trainings	Training materials					
	Handouts					
	[other training materials]					
Development of O&M guidelines	O&M Guidelines					
OWTS installation	**[Construction materials]**					
			Subtotal			
Equipment						
[number] trainings	Training Space		**[# of meetings]**			
	[other equipment for training – projectors, etc. if not included in space]					
OWTS installation	1-Unit System (LS)	$10,000	7	$70,000		
	2-Unit System (LS)	$15,000	8	$120,000		
	3-Unit System	$15,000	2	$30,000		
	[other construction equipment]					
			Subtotal			
Labor						
Activity	**Discipline**	**Hourly Wage ($/hr)**	**Number of Hours**	**Total**	**Funding Match**	**Grant Request**
[number] trainings	**[Job title for trainer]**					

	[NGO partner staff]					
	Translator					
	[other persons necessary to conduct training]					
Development of O&M guidelines	**[Project sponsor staff]**					
OWTS installation	General Contractor					
	Masonry					
	Electrician					
	Plumber					
	General Labor					
	[Other labor]					
			Subtotal			
			Row (d) Total [Sum of this table]			

Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement – As described in the Work Plan (see **[reference Work Plan]**), no environmental compliance/mitigation/enhancement will be required by the *Regional Program for Septic System Rehabilitation* **[Project title]**. Therefore, no costs are anticipated for Task 10.

Construction Administration

Construction administration costs for the project are estimated to be **[costs]**.

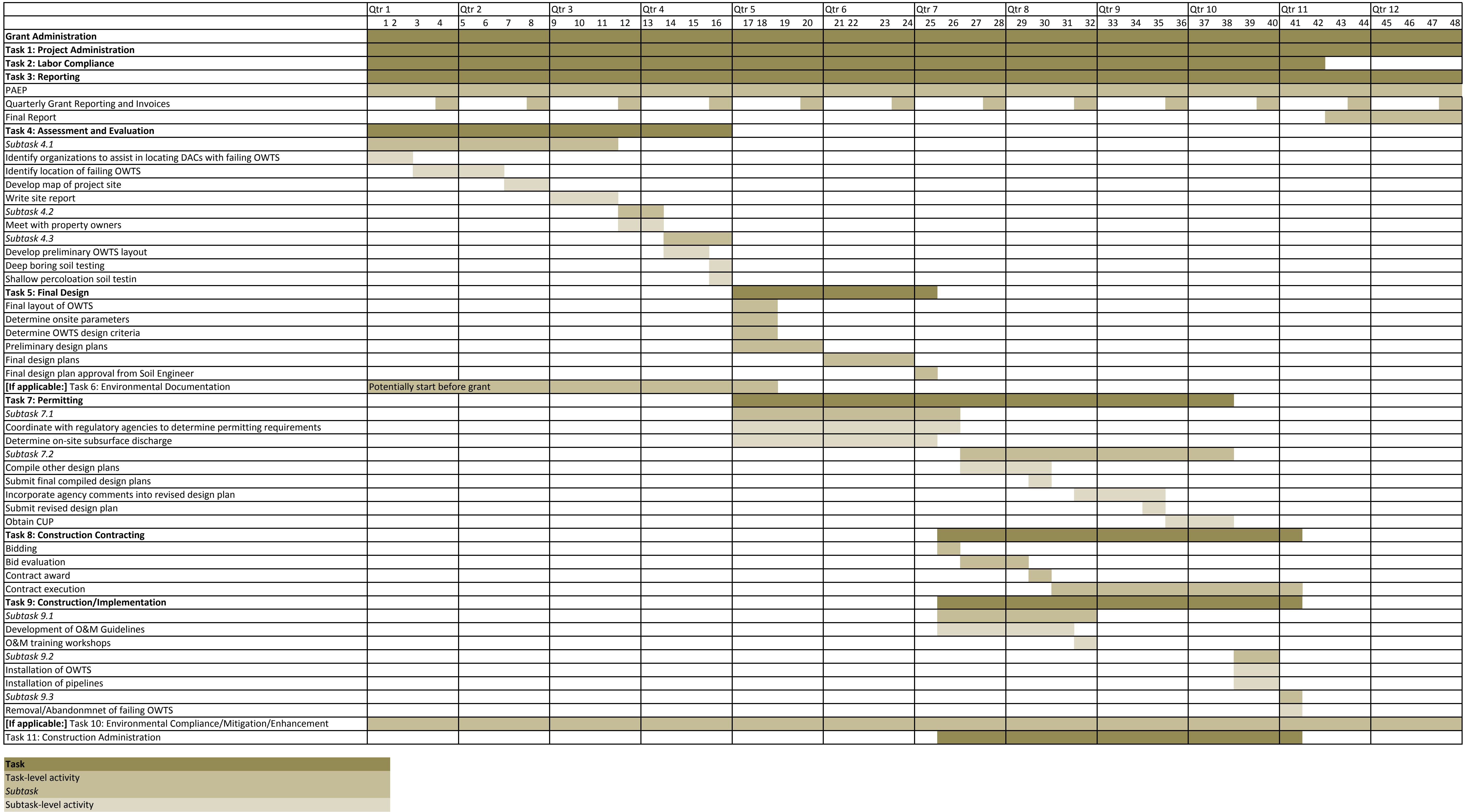
Task 11: Construction Administration – Costs for this task include work anticipated for construction management, materials testing, inspection, and construction staking **[use appropriate construction administration activities/costs]**. It is estimated the construction will take **[number]** months (from mobilization through performance testing). Labor hours were calculated with an estimate of **[number]** hours per month for the construction management team, including inspection. Staking labor is based on **[justification]**. A Project Manager will oversee all Construction Administration activities, and a Consultant will conduct all testing, inspection, and staking activities.

Table X: Construction Administration

Activity	Discipline	Hourly Wage ($/hr)	Number of Hours	Total	Funding Match	Grant Request
Task 11: Construction Administration						
Training administration	Project Manager					
Construction/installation administration	Project Manager					
Materials testing	Consultant					
Inspection	Consultant					
Construction staking	Consultant					
			Row (f) Total			

Other Costs

No other costs are expected for this project.


Qtr 1
Qtr 2
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Qtr 10
Qtr 11
Qtr 12
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
Grant Administration
Task 1: Project Administration
Task 2: Labor Compliance
Task 3: Reporting
PAEP
Quarterly Grant Reporting and Invoices
Final Report
Task 4: Assessment and Evaluation
Subtask 4.1
Identify organizations to assist in locating DACs with failing OWTS
Identify location of failing OWTS
Develop map of project site
Write site report
Subtask 4.2
Meet with property owners
Subtask 4.3
Develop preliminary OWTS layout
Deep boring soil testing
Shallow percoloation soil testin
Task 5: Final Design
Final layout of OWTS
Determine onsite parameters
Determine OWTS design criteria
Preliminary design plans
Final design plans
Final design plan approval from Soil Engineer
[If applicable:] Task 6: Environmental Documentation
Potentially start before grant
Task 7: Permitting
Subtask 7.1
Coordinate with regulatory agencies to determine permitting requirements
Determine on-site subsurface discharge
Subtask 7.2
Compile other design plans
Submit final compiled design plans
Incorporate agency comments into revised design plan
Submit revised design plan
Obtain CUP
Task 8: Construction Contracting
Bidding
Bid evaluation
Contract award
Contract execution
Task 9: Construction/Implementation
Subtask 9.1
Development of O&M Guidelines
O&M training workshops
Subtask 9.2
Installation of OWTS
Installation of pipelines
Subtask 9.3
Removal/Abandonmnet of failing OWTS
[If applicable:] Task 10: Environmental Compliance/Mitigation/Enhancement
Task 11: Construction Administration
Task
Task-level activity
Subtask
Subtask-level activity

<u>Construction/Implementation Contingency</u>

The Construction/Implementation Contingency costs for the *Regional Program for Septic System Rehabilitation* **[Project title]** are estimated to be **[costs]**. This was estimated to be approximately 10% of the total project budget. This value was based on **[Project sponsor]** experience and standard industry practice.

Table X: Construction/Implementation Contingency

Category	Contingency Percentage	Total ($)	Funding Match	Grant Request
Construction/Implementation Contingency	10%			
Row (h) Total				

<u>Grand Total</u>

The Grand Total for the *Regional Program for Septic System Rehabilitation* **[Project title]** project is **[total project costs]**, calculated as the sum of rows (a) through (h).

Table X: Grand Total Costs

Row	Budget Category	Total Costs
GA	Grant Administration	
(a)	Direct Project Administration Costs	
(b)	Land Purchase/Easement	
(c)	Planning/Design/Engineering/ Environmental Documentation	
(d)	Construction/Implementation	
(e)	Environmental Compliance/ Mitigation/Enhancement	
(f)	Construction Administration	
(g)	Other Costs (Including Legal Costs, Permitting and Licenses)	
(h)	Construction/Implementation Contingency	
(i)	**Grand Total**	

2.1.14 Schedule

The project schedule for the *Regional Program for Septic System Rehabilitation* **[Project title]** was developed from the Work Plan (**[reference Work Plan location]**), and includes anticipated start and end dates, as well as milestones for each work plan task. **[Note: grant application may require actual dates, not just lengths of time from grant start date, schedule included here is to provide the minimum time required to complete each task. Timing will vary depending on specific tasks, site characteristics, number of sites, and project sponsor's ability to front the funding to complete each task. Project sponsor may choose to add time to tasks to provide for unexpected delays]**