Appendices

1-a: Memorandum of Understanding (2008)

1-b: Draft MOU for the 2013 Update

1-c: Resolutions of Adoption [*pending approval by RWMGs*]

1-d: Current Stakeholders List

1-e: Notice of Intent (April 16, 2012)

2-a: California American Water Company Service Area Map

2-b: Land Use Designations

2-c: Seaside Basin Salt and Nutrient Management Plan

2-d: San Jose Creek Watershed Assessment

2-e: Canyon Del Rey Master Drainage Plan Update

2-f: Special Status Species

2-g: Potential Distribution of Special Status Species Based on Habitat Type

3-a: Objectives Feedback Results

5-a: Integrated Regional Water Management Inter-Regional Coordination Summary Report

6-a: Concept Proposals Submitted to Plan

6-b: Announcement of Project Ranking of Preliminary Results

6-c: List of Projects Submitted for Ranking

14-a: Stakeholder Involvement and Outreach Plan for the 2013 IRWMP Update

14-b: July 25, 2012 Stakeholder Meeting

14-c: Oct 24, 2012 Stakeholder Meeting

14-d: February 6, 2013 Stakeholder Meeting

14-e: February 7, 2013 Interregional Stakeholder Meeting (see Attachment 4 of Appendix 5-a)

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Appendix 1-a

Memorandum of Understanding (2008)

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Memorandum of Understanding for Integrated Regional Water Management in the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region

1. PURPOSE

The purpose of this Memorandum of Understanding (MOU) is to recognize a mutual understanding among entities in the southern Monterey Bay area regarding their joint efforts toward Integrated Regional Water Management (IRWM) planning. That understanding will continue to increase coordination, collaboration and communication for comprehensive management of water resources in the cities and unincorporated portions of the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region (Region).

2. RECITALS

A. The State of California desires to foster Integrated Regional Water Management (IRWM) planning and encourages local public, non-profit, and private (for profit) entities to define planning regions appropriate for managing water resources and to integrate strategies within these planning regions.

B. Water resources management authority in the Region is currently distributed among various public agencies with a range of legal powers and regulatory responsibilities. These public agencies have definite jurisdictional boundaries, whereas sensible water resources planning and management frequently requires actions in multiple jurisdictions. Non-public entities within the Region have considerable interests in cooperating with public entities to protect, manage, and enhance water resources within the Region.

C. Four public entities and one non-profit entity in the Region with responsibility and interests in the management of water resources have agreed to form a Water Management Group for the purposes of developing and implementing projects consistent with the guidelines set by the State of California for IRWM. These entities are: 1.) the Big Sur Land Trust (BSLT), a 501 (c) 3 organization; 2.) the City of Monterey; 3.) the Monterey Regional Water Pollution Control Agency (MRWPCA); 4.) the Monterey County Water Resources Agency (MCWRA); and 5.) the Monterey Peninsula Water Management District (MPWMD).

D. The Water Management Group has defined an appropriate planning Region that takes into consideration jurisdictional limits, powers and responsibilities, and watershed and groundwater basin boundaries. The Water Management Group is taking the lead in overseeing and implementing a detailed IRWM Plan within the planning Region. The Region is generally described as encompassing approximately 347 square miles and consists of groundwater basins and coastal watershed areas contributing to the Carmel Bay and south Monterey Bay. The Region includes coastal watersheds from the southernmost portion of the San Jose Creek watershed north to the northern limit of the Seaside Groundwater Basin. The inland area is bounded by the Seaside Groundwater

Basin to the north and by the Carmel River watershed to the south and east. The western limit of the planning Region generally coincides with the land and Pacific Ocean interface, but includes the Pt. Lobos, Carmel Bay, and Pacific Grove Areas of Special Biological Significance (ASBS) adjacent to the coastal portion of the Region.

The principal groundwater basins in the planning Region are the Seaside Groundwater Basin and the Carmel Valley Aquifer. The Region includes about 38 miles of the coast within the Monterey Bay National Marine Sanctuary, three ASBS, the Cities of Carmel-by-the Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, Seaside, and unincorporated portions of Monterey County including the Carmel Valley watershed (255 square miles), Pebble Beach, the Carmel Highlands and portions of the Seaside Groundwater Basin adjacent to Highway 68 (also known as Canyon Del Rey). This description of the planning Region is not intended to be a limitation on projects and resource planning that may be shared between adjacent IRWM planning Regions (e.g., the Salinas Valley IRWM planning Region to the north and east).

E. The entities signatory to this MOU desire to link and integrate efforts to jointly oversee the development and implementation of a comprehensive Integrated Regional Water Management Plan for the Region.

3. GOALS

The goals of the collaborative effort undertaken pursuant to this Memorandum of Understanding are:

3.1 To develop and adopt a comprehensive IRWMP for the Region that will consider the strategies that are required by the State under CWC 79562.5 and 79564 including at a minimum: ecosystem restoration, environmental and habitat protection and improvement, water supply reliability, flood management, groundwater management, recreation and public access, storm water capture and management, water conservation, water quality protection and improvement, water recycling, and wetlands enhancement and creation. Optional additional elements that may be considered include: conjunctive use, desalination, imported water, land use planning, non-point source pollution control, promotion of the steelhead run, surface storage, watershed planning, water and wastewater treatment, and water transfers.

3.2 To develop a comprehensive IRWMP for the Region that incorporates water supply, water quality, flood and erosion protection, and environmental protection and enhancement objectives.

3.3 To improve and maximize coordination of individual public, private, and non-profit agency plans, programs and projects for mutual benefit and optimal gain within the Region.

3.4 To help identify, develop, and implement collaborative plans, programs, and projects that may be beyond the scope or capability of individual entities, but which would be of mutual benefit if implemented in a cooperative manner.

3.5 To facilitate regional water management efforts that include multiple water supply, water quality, flood control, and environmental protection and enhancement objectives.

3.6 To foster coordination, collaboration and communication between stakeholders and other interested parties, to achieve greater efficiencies, enhance public services, and build public support for vital projects.

3.7. To realize regional water management objectives at the least cost possible through mutual cooperation, elimination of redundancy, and enhanced regional competitiveness for State and Federal grant funding.

4. DEFINITIONS

4.1 **Integrated Regional Water Management Plan (IRWMP or IRWM Plan).** The plan envisioned by state legislators and state resource agencies that integrates the strategies, objectives, and priorities for projects to manage water resources proposed by public entities, non-profit entities, and stakeholders within a defined Planning Region. The minimum plan standards are as shown in Appendix A of "Integrated Regional Water Management Grant Program Guidelines, November 2004, Department of Water Resources and State Water Resources Control Board, Proposition 50, Chapter 8," as revised.

4.2 **Integration**. The combining of water management strategies and projects to be included in an IRWMP.

4.3.a **Lead Agency for IRWM Plan Development.** The Monterey Peninsula Water Management District is designated by the Water Management Group to lead the development or implementation of an Integrated Regional Water Management Plan for the Region.

4.3.b **Lead Agency for IRWM Grant Applications.** The Water Management Group may designate any entity in the Water Management Group to be the Lead Agency in making application to the State for grant funds.

4.4. **Non-profit Agency.** A 501 (c) (3) corporation, conservancy, group or other organization involved in water resources management in the Region.

4.5 **Private Agency.** A private or publicly held for-profit corporation or property owner involved in water resources management in the Region

4.6. **Project**. A specific project that addresses a service function.

4.7. **Public Agency**. A state-authorized water district, water agency, water management agency or other public entity, be it a special district, city or other governmental entity, responsible for providing one or more services in the areas of water supply, water quality, wastewater, recycled water, water conservation, stormwater/flood control, watershed planning and aquatic habitat protection and restoration.

4.8. **Region.** The area defined by the Water Management Group (WMG) consisting of watersheds, sub-watersheds and groundwater basins under the jurisdiction of one or more entities within the WMG.

4.9. **Service Function.** A water-related individual service function provided by a private, public, or non-profit entity, i.e. water supply, water quality, wastewater, recycled water, water conservation, stormwater/flood protection, watershed planning, recreational facilities, and habitat protection and restoration.

4.10 **Signatory Entity.** A public, private, or non-profit entity within the Region that is signatory to this MOU.

4.11 **Stakeholder.** A non-signatory public, private, or non-profit agency identified in the IRWM Plan with an interest in water resources management within the Region.

4.12 **Technical Advisory Committee.** The committee organized to advise the Water Management Group and Stakeholders concerning the IRWM Plan. The group is comprised of individuals with technical backgrounds in the fields of marine and freshwater biology, ecology, geology, engineering, hydrogeology, planning, resource conservation, riparian systems, water conservation, and water quality.

4.13 **Water Management Group.** The group of entities that takes the lead in overseeing the development and implementation of the Integrated Regional Water Management Plan within the Planning Region (the Monterey Regional Water Pollution Control Agency, the Monterey County Water Resources Agency, the Monterey Peninsula Water Management District, the City of Monterey, and the Big Sur Land Trust).

4.14. **Water Management Strategies**. Plans for and activities to be considered in an IRWMP include, but are not limited to, ecosystem restoration, environmental and habitat protection and improvement, water-supply reliability, flood management, groundwater management, recreation and public access, storm water capture and management, water conservation, water quality improvement, water recycling, and wetlands enhancement and creation.

5. IRWMP PARTICIPANTS

5.1 **Adopting Entities.** The entities in the Region that participate in the development, adoption, and implementation of the Integrated Regional Water Management Plan for the Region. Each entity intending to carry out a project proposed in the IRWMP must formally adopt the IRWMP or provide written substantiation of acceptance by the governing authority of the entity. For a public agency, adoption of the IRWMP is by formal resolution of the governing body. For a non-profit or for-profit entity, proof of acceptance of the IRWMP by the equivalent of a public agency governing body is required (e.g., by a board of directors or other management entity).

5.2. **Stakeholders**. Entities, such as other public, private, and non-profit entities, business and environmental groups, that are considered valuable contributors to the understanding and management of the Region's water resources.

5.3. **Regulatory Agencies**. These agencies, including, but not limited to, the Central Coast Regional Water Quality Control Board, California Coastal Commission, U.S. Army Corps of Engineers, California Public Utilities Commission, National Marine Fisheries Service (NOAA Fisheries), U.S. Fish and Wildlife Service, and the California Department of Fish and Game, will be invited to participate in the development and implementation of the IRWMP.

5.4 **Water Management Group.** The group of entities that takes the lead in developing and implementing an Integrated Regional Water Management Plan within the Planning Region (the Monterey Regional Water Pollution Control Agency, the Monterey County Water Resources Agency, the Monterey Peninsula Water Management District, the City of Monterey, and the Big Sur Land Trust).

6. MUTUAL UNDERSTANDING

6.1. **Subject matter scope of the IRWMP**. The IRWMP for the Region will include, but is not limited to, water supply, water quality, wastewater, recycled water, water conservation, stormwater/flood control, watershed planning, erosion prevention, and habitat protection and restoration. It is acknowledged that the proposals contained in the IRWMP may be based, in part, on the land-use plans of the member entities local governments such as Cities, Monterey County, and special districts located within the Region. Therefore, the resultant IRWMP will by design have incorporated the land-use plans and assumptions intrinsic to the respective water-related service function.

6.2. **Geographical scope of the IRWMP.** The area for this Memorandum is generally defined as the watersheds and associated groundwater basins contributing to the south Monterey Bay and Carmel Bay as shown in Figure 3-1: Map of Monterey Peninsula Integrated Regional Water Management Planning Region in the IRWM Plan.

The Region includes coastal watersheds from the southernmost portion of the San Jose Creek watershed north to the northern limit of the Seaside Groundwater Basin. The inland area is bounded by the Seaside Groundwater Basin to the north and by the Carmel River watershed to the south and east. The western limit of the planning Region generally coincides with the land and Pacific Ocean interface, but includes the Pt. Lobos, Carmel Bay, and Pacific Grove Areas of Special Biological Significance (ASBS) adjacent to the coastal portion of the Region.

However, it is recognized that the geographic scope represented in the IRWM Plan may be amended to include projects that are implemented cooperatively between IRWM planning regions (e.g., with the Salinas Valley IRWM planning region) and is not intended to be a rigid boundary.

6.3. **Approach to developing the IRWMP**. The Lead Agency will provide a draft IRWMP to the Water Management Group and other public, private, and non-profit entities for review and comment. It will be the responsibility of each entity signatory to this Memorandum to provide the Lead Agency with information described in the draft IRWMP concerning project proposals or to identify the need for a water management strategy for each service function provided by a signatory entity.

In order to be part of a final IRWMP, all proposals for development of water management plans and water development project proposals related to the IRWMP must meet the standards identified in the draft IRWM Plan for the Region.

A technical advisory committee consisting of staff representatives from the Water Management Group, other Stakeholders and such other organizations as may become contributing entities, will review proposed management plans and project proposals for consistency with the draft IRWMP and recommend a prioritized list

of projects to be carried out within the Region. The Water Management Group and Stakeholders will meet to review the recommendation made by the TAC.

6.4. **Approval of prioritized project list.** Approval of the prioritized project list should occur by consensus of the Water Management Group and Stakeholders and should be based on the prioritization process described in the IRWMP and the recommendations of the Technical Advisory Committee. However, if a consensus cannot be reached among the Stakeholders and Water Management Group, the Water Management Group may make a final determination of the prioritized project list.

6.5. **Adoption of the IRWMP**. Plan adoption will occur by approval of the governing board of each entity. It should be noted at that the adopted Plan and project list may be amended from time to time as described below.

6.6 **Amendment of IRWMP or Prioritized Project list.** The IRWM Plan and prioritized project list may be amended from time to time. Any member of the Water Management Group or Stakeholders may request that the Lead Agency convene a meeting of the Water Management Group and Stakeholders for the purposes of amending the IRWM Plan or the prioritized project list. However, it is anticipated that the IRWMP or prioritized project list will be amended no more frequently than annually, unless more frequent amendments are required to meet State IRWM standards or grant application cycles. An amended IRWM Plan must be consistent with State IRWM standards as described in Definition 4.1 "Integrated Regional Water Management Plan" and any subsequent revisions by the State to IRWM guidelines.

6.7. **Project Implementation.** Project proponents will be responsible for completing proposed projects and providing project reports to the Lead Agency.

6.8 **Project Monitoring.** The Water Management Group will be responsible for monitoring the implementation of the IRWMP. The technical advisory committee will regularly report to the General Managers and Governing Boards of the Water Management Group regarding progress on the development and implementation of the IRWMP. The Lead Agency will be responsible for coordinating data collection and dissemination.

6.9 **Grant Applications.** The Water Management Group will designate a Lead Agency to apply for grant funds. The Lead Agency for each grant application should have a mission and expertise that is consistent with the purpose of the grant being applied for.

6.10 **Grant Awards and Agreement**. The Lead Agency will be the grantee and administer the grant on behalf of the Water Management Group and Stakeholders.

6.11 **Termination**. An entity signatory to this MOU may withdraw from participation upon 30 days advance notice to the other signatory entities, provided it agrees to be financially responsible for any previously committed, but unmet resource commitment.

6.12. **Personnel resources**. It is expected that the General Managers and/or other officials of each entity signatory to this MOU will periodically meet to insure that adequate staff resources are available to implement the IRWM Plan.

6.13. **Other on-going regional efforts**. Development of the IRWMP is separate from efforts of other organizations to develop water-related plans on a regional basis

around Monterey Bay and the Central Coast. As the IRWMP is developed and implemented, work products may be shared to provide other entities and groups with current information.

7. INDEMNIFICATION

7.1 Each Party shall indemnify, defend and hold harmless the other parties, to the extent allowed by law and in proportion to fault, against any and all third-party liability for claims, demands, costs or judgments (direct, indirect, incidental or consequential) involving bodily injury, personal injury, death, property damage or other costs and expenses (including reasonable attorneys' fees, costs and expenses) arising or resulting from the acts or omissions of its own officers, agents, employees or representatives carried out pursuant to the obligations of this Agreement.

7.2 These indemnity provisions shall survive the termination or expiration of this Agreement. Further, each Party will be liable to the other Party for attorneys' fees, costs and expenses, and all other costs and expenses whatsoever, which are incurred by the other Party in enforcing these indemnity provisions.

8. SIGNATORIES TO THE MEMORANDUM OF UNDERSTANDING

We, the duly authorized undersigned representatives of our respective entities, acknowledge the above as our understanding of the intent and expected outcome in overseeing the development and implementation of an Integrated Regional Water Management Plan for the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region.

WATER MANAGEMENT GROUP

Signature

Curtis V. Weeks
Printed Name
Monterey County Water Resources Agency

8/14/08
Date

****

Signature

William H. Leahy II
Printed Name
Big Sur Land Trust

6/16/08
Date

****

Signature

Keith Israel
Printed Name
Monterey Regional Water Pollution Control Agency

July 7, 2008
Date

****

Signature

Printed Name
City of Monterey

Date

****

Signature

Darby W. Fuerst
Printed Name
Monterey Peninsula Water Management District

June 9, 2008
Date

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8. SIGNATORIES TO THE MEMORANDUM OF UNDERSTANDING

We, the duly authorized undersigned representatives of our respective entities, acknowledge the above as our understanding of the intent and expected outcome in overseeing the development and implementation of an Integrated Regional Water Management Plan for the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region.

WATER MANAGEMENT GROUP

Signature

Printed Name
Monterey County Water Resources Agency

Date

****

Signature

Printed Name
Big Sur Land Trust

Date

****

Signature

Printed Name
Monterey Regional Water Pollution Control Agency

Date

****

Signature

Fred Meurer
Printed Name
City of Monterey

22 July 08
Date

****

APPROVED BY:

City Attorney's Office

Signature

Approved:

Printed Name
Monterey Peninsula Water Management District

Risk Manager

Date

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Appendix 1-b

Draft MOU for the 2013 Update

DRAFT

AMENDED

Memorandum of Understanding for Integrated Regional Water Management in the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region

1. PURPOSE

The purpose of this Memorandum of Understanding (MOU) is to recognize a mutual understanding among entities in the southern Monterey Bay area regarding their joint efforts toward Integrated Regional Water Management (IRWM) planning. That understanding will continue to increase coordination, collaboration and communication for comprehensive management of water resources in the cities and unincorporated portions of the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region (Region).

A. **Background and Description of Amendments**. The initial MOU to form a Regional Water Management Group (RWMG) was fully executed on July 22, 2008 by the Big Sur Land Trust (BSLT), a 501 (c) 3 organization, the City of Monterey, the Monterey Regional Water Pollution Control Agency (MRWPCA), the Monterey County Water Resources Agency (MCWRA), and the Monterey Peninsula Water Management District (MPWMD). The MOU formed a Regional Water Management Group (RWMG) for the purposes of developing and implementing projects consistent with the guidelines set by the State of California for IRWM.

   Subsequently, the Marina Coast Water District (MCWD) requested approval to become part of the RWMG and signed an amended MOU in June 2011 that includes MCWD as a member of the RWMG. In 2012, the Resource Conservation District of Monterey County (RCD) agreed to become a member of the RWMG.

   This amended MOU reflects the addition of MCWD and the RCD as members of the RWMG, describes processes and guidelines for changing the membership of the RWMG, and amends the MOU to meet Proposition 84 standards.

2. RECITALS

A. The State of California desires to foster Integrated Regional Water Management (IRWM) planning and encourages local public, non-profit, and private (for profit) entities to define planning regions appropriate for managing water resources and to integrate strategies within these planning regions.

B. Water resources management authority in the Region is currently distributed among various public agencies with a range of legal powers and regulatory responsibilities. These public agencies have definite jurisdictional boundaries, whereas sensible water resources planning and management frequently requires actions in multiple jurisdictions. Non-public entities within the Region have considerable interests in cooperating with public entities to protect, manage, and enhance water resources within the Region.

C. Six public entities and one non-profit entity in the Region with responsibility and interests in the management of water resources have agreed to form a Regional Water Management Group for the purposes of developing and implementing projects consistent with the guidelines set by the State of California for IRWM. These entities are: 1.) the Big Sur Land Trust (BSLT), a 501 (c) 3 organization; 2.) the City of Monterey; 3.) the Monterey Regional Water Pollution Control Agency (MRWPCA); 4.) the Monterey County Water Resources Agency (MCWRA); 5) the Marina Coast Water District (MCWD); 6) the Resource Conservation District of Monterey County; and 7.) the Monterey Peninsula Water Management District (MPWMD).

D. The Regional Water Management Group has defined an appropriate planning Region that takes into consideration jurisdictional limits, powers and responsibilities, and watershed and groundwater basin boundaries. The Regional Water Management Group is taking the lead in overseeing and implementing a detailed IRWM Plan within the planning Region. The Region is generally described as encompassing approximately 347 square miles and consists of groundwater basins and coastal watershed areas contributing to the Carmel Bay and south Monterey Bay. The Region includes coastal watersheds from the southernmost portion of the San Jose Creek watershed north to the northern limit of the Seaside Groundwater Basin. The inland area is bounded by the Seaside Groundwater Basin to the north and by the Carmel River watershed to the south and east. The western limit of the planning Region generally coincides with the land and Pacific Ocean interface, but includes the Pt. Lobos, Carmel Bay, and Pacific Grove Areas of Special Biological Significance (ASBS) adjacent to the coastal portion of the Region.

   The principal groundwater basins in the planning Region are the Seaside Groundwater Basin and the Carmel Valley Aquifer. The Region includes about 38 miles of the coast within the Monterey Bay National Marine Sanctuary, three ASBS, the Cities of Carmel-by-the Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, Seaside, and unincorporated portions of Monterey County including the Carmel Valley watershed (255 square miles), Pebble Beach, the Carmel Highlands and portions of the Seaside Groundwater Basin adjacent to Highway 68 (also known as Canyon Del Rey). This description of the planning Region is not intended to be a limitation on projects and resource planning that may be shared between adjacent IRWM planning Regions (e.g., the Greater Monterey County IRWM planning Region to the north and east).

E. The entities signatory to this MOU desire to link and integrate efforts to jointly oversee the development and implementation of a comprehensive Integrated Regional Water Management Plan for the Region.

3. GOALS

The goals of the collaborative effort undertaken pursuant to this MOU are:

3.1 To implement a comprehensive IRWMP for the Region that will consider the strategies that are required by the State under CWC 79562.5 and 79564 and

subsequent modifications required under Proposition 84. Eligible projects must yield multiple benefits and include one or more of the following elements (PRC § 75026.(a)):

- **Water supply reliability, water conservation and water use efficiency**
- **Stormwater capture, storage, clean-up, treatment, and management**
- **Removal of invasive non-native species, the creation and enhancement of wetlands, and the acquisition, protection, and restoration of open space and watershed lands**
- **Non-point source pollution reduction, management and monitoring**
- **Groundwater recharge and management projects**
- **Contaminant and salt removal through reclamation, desalting, and other treatment technologies and conveyance of reclaimed water for distribution to users**
- **Water banking, exchange, reclamation and improvement of water quality**
- **Planning and implementation of multipurpose flood management programs**
- **Watershed protection and management**
- **Drinking water treatment and distribution**
- **Ecosystem and fisheries restoration and protection**

3.2 To implement a comprehensive IRWMP for the Region that incorporates water supply, water quality, flood and erosion protection, and environmental protection and enhancement objectives.

3.3 To improve and maximize coordination of individual public, private, and non-profit agency plans, programs and projects for mutual benefit and optimal gain within the Region.

3.4 To help identify, develop, and implement collaborative plans, programs, and projects that may be beyond the scope or capability of individual entities, but which would be of mutual benefit if implemented in a cooperative manner.

3.5 To facilitate regional water management efforts that include multiple water supply, water quality, flood control, and environmental protection and enhancement objectives.

3.6 To foster coordination, collaboration and communication between stakeholders and other interested parties, to achieve greater efficiencies, enhance public services, and build public support for vital projects.

3.7. To realize regional water management objectives at the least cost possible through mutual cooperation, elimination of redundancy, and enhanced regional competitiveness for State and Federal grant funding.

4. DEFINITIONS

4.1 **Integrated Regional Water Management Plan (IRWMP or IRWM Plan).** The plan envisioned by state legislators and state resource agencies that integrates the strategies, objectives, and priorities for projects to manage water resources proposed by public entities, non-profit entities, and stakeholders within a defined Planning Region. The minimum plan standards are as shown in Appendix A of "Integrated Regional Water Management Grant Program Guidelines, November 2004, Department of Water Resources and State Water Resources Control Board, Proposition 50, Chapter 8," as revised. Minimum IRWM Plan standards may be revised from time to time by the State of California.

4.2 **Integration**. The combining of water management strategies and projects to be included in an IRWMP.

4.3.a **Lead Agency for IRWM Plan Development.** The Monterey Peninsula Water Management District is designated by the Regional Water Management Group to lead the development or implementation of an Integrated Regional Water Management Plan for the Region.

4.3.b **Lead Agency for IRWM Grant Applications.** The Regional Water Management Group may designate any entity in the Regional Water Management Group to be the Lead Agency in making application to the State for grant funds.

4.4. **Non-profit Agency.** A 501 (c) (3) corporation, conservancy, group or other organization involved in water resources management in the Region.

4.5 **Private Agency.** A private or publicly held for-profit corporation or property owner involved in water resources management in the Region

4.6. **Project**. A specific project that addresses a service function.

4.7. **Public Agency**. A state-authorized water district, water agency, water management agency or other public entity, be it a special district, city or other governmental entity, responsible for providing one or more services in the areas of water supply, water quality, wastewater, recycled water, water conservation, stormwater/flood control, watershed planning and aquatic habitat protection and restoration.

4.8. **Region.** The area defined by the Regional Water Management Group (RWMG) consisting of watersheds, sub-watersheds and groundwater basins under the jurisdiction of one or more entities within the RWMG.

4.9. **Service Function.** A water-related individual service function provided by a private, public, or non-profit entity, i.e. water supply, water quality, wastewater, recycled water, water conservation, stormwater/flood protection, watershed planning, recreational facilities, and habitat protection and restoration.

4.10 **Signatory Entity.** A public, private, or non-profit entity within the Region that is signatory to this MOU.

4.11 **Stakeholder.** A non-signatory public, private, or non-profit agency identified in the IRWM Plan with an interest in water resources management within the Region.

4.12 **Technical Advisory Committee.** The committee organized to advise the Regional Water Management Group and Stakeholders concerning the IRWM Plan. Normally, the group will be comprised of individuals with technical backgrounds in the fields of marine and freshwater biology, ecology, geology, engineering, hydrogeology, planning, resource conservation, riparian systems, water conservation, and water quality. However, stakeholders with interests in a

particular aspect of resource or project management, but not necessarily a technical background, may also be considered for inclusion in the TAC.

4.13 **Regional Water Management Group.** The group of entities that takes the lead in overseeing the development and implementation of the Integrated Regional Water Management Plan within the Planning Region. The RWMG consists of the Monterey Regional Water Pollution Control Agency, the Monterey County Water Resources Agency, the Monterey Peninsula Water Management District, the City of Monterey, the Marina Coast Water District, the Resource Conservation District of Monterey County, and the Big Sur Land Trust.

4.14. **Water Management Strategies**. Plans for and activities to be considered in an IRWMP include, but are not limited to, ecosystem restoration, environmental and habitat protection and improvement, water-supply reliability, flood management, groundwater management, recreation and public access, storm water capture and management, water conservation, water quality improvement, water recycling, and wetlands enhancement and creation.

5. IRWMP PARTICIPANTS

5.1 **Adopting Entities.** The entities in the Region that participate in the development, adoption, and implementation of the Integrated Regional Water Management Plan for the Region. Each entity intending to carry out a project proposed in the IRWMP must formally adopt the IRWMP or provide written substantiation of acceptance by the governing authority of the entity. For a public agency, adoption of the IRWMP is by formal resolution of the governing body. For a non-profit or for-profit entity, proof of acceptance of the IRWMP by the equivalent of a public agency governing body is required (e.g., by a board of directors or other management entity).

5.2. **Stakeholders**. Entities, such as other public, private, and non-profit entities, business and environmental groups, that are considered valuable contributors to the understanding and management of the Region's water resources.

5.3. **Regulatory Agencies**. These agencies, including, but not limited to, the Central Coast Regional Water Quality Control Board, California Coastal Commission, U.S. Army Corps of Engineers, California Public Utilities Commission, National Marine Fisheries Service (NOAA Fisheries), U.S. Fish and Wildlife Service, and the California Department of Fish and Game, will be invited to participate in the development and implementation of the IRWMP.

5.4 Regional **Water Management Group.** The group of entities that takes the lead in developing and implementing an Integrated Regional Water Management Plan within the Planning Region.

6. MUTUAL UNDERSTANDING

6.1. **Subject matter scope of the IRWMP**. The IRWMP for the Region will include, but is not limited to, water supply, water quality, wastewater, recycled water, water conservation, stormwater/flood control, watershed planning, erosion prevention, and habitat protection and restoration. It is acknowledged that the proposals contained in the IRWMP may be based, in part, on the land-use plans of the

member entities local governments such as Cities, Monterey County, and special districts located within the Region. Therefore, the resultant IRWMP will by design have incorporated the land-use plans and assumptions intrinsic to the respective water-related service function.

6.2. **Geographical scope of the IRWMP.** The area for this Memorandum is generally defined as the watersheds and associated groundwater basins contributing to the south Monterey Bay and Carmel Bay as shown in Figure 3-1: Map of Monterey Peninsula Integrated Regional Water Management Planning Region in the IRWM Plan.

The Region includes coastal watersheds from the southernmost portion of the San Jose Creek watershed north to the northern limit of the Seaside Groundwater Basin. The inland area is bounded by the Seaside Groundwater Basin to the north and by the Carmel River watershed to the south and east. The western limit of the planning Region generally coincides with the land and Pacific Ocean interface, but includes the Pt. Lobos, Carmel Bay, and Pacific Grove Areas of Special Biological Significance (ASBS) adjacent to the coastal portion of the Region.

However, it is recognized that the geographic scope represented in the IRWM Plan may be amended to include projects that are implemented cooperatively between IRWM planning regions (e.g., with the Greater Monterey County IRWM planning region) and is not intended to be a rigid boundary.

6.3. **Approach to developing the IRWMP**. It will be the responsibility of each entity signatory to this Memorandum to provide the Lead Agency with information for the IRWMP concerning project proposals or to identify the need for a water management strategy for each service function provided by a signatory entity.

In order to be included in the IRWMP, all proposals for development of water management plans and water development project proposals related to the IRWMP must meet the standards identified in the IRWM Plan for the Region.

A technical advisory committee consisting of staff representatives from the Regional Water Management Group, other Stakeholders and such other organizations as may become contributing entities, will review proposed management plans and project proposals for consistency with the IRWMP and recommend a prioritized list of projects to be carried out within the Region. The Regional Water Management Group and Stakeholders will meet to review the recommendation made by the TAC.

6.4. **Approval of prioritized project list.** Approval of the prioritized project list should occur by consensus of the Regional Water Management Group and Stakeholders and should be based on the prioritization process described in the IRWMP and the recommendations of the Technical Advisory Committee. However, if a consensus cannot be reached among the Stakeholders and Regional Water Management Group, the Regional Water Management Group may make a final determination of the prioritized project list.

6.5. **Adoption of the IRWMP**. Plan adoption will occur by approval of the governing board of each entity. Each member of the RWMG shall adopt the IRWM Plan or an

amended IRWM Plan, when the Plan becomes available. Project proponents named in an IRWM grant application shall adopt the IRWM Plan or amended IRWM Plan prior to submittal of the grant application. It should be noted that the adopted Plan and project list may be amended from time to time as described below.

6.6 **Amendment of IRWMP or Prioritized Project list.** The IRWM Plan and prioritized project list may be amended from time to time. Any member of the Regional Water Management Group or Stakeholders may request that the Lead Agency convene a meeting of the Regional Water Management Group and Stakeholders for the purposes of amending the IRWM Plan or the prioritized project list. However, it is anticipated that the IRWMP or prioritized project list will be amended no more frequently than annually, unless more frequent amendments are required to meet State IRWM standards or grant application cycles. An amended IRWM Plan must be consistent with State IRWM standards as described in Definition 4.1 "Integrated Regional Water Management Plan" and any subsequent revisions by the State to IRWM guidelines.

6.7. **Project Implementation.** Project proponents will be responsible for completing proposed projects and providing project reports to the Lead Agency.

6.8 **Project Monitoring.** The Regional Water Management Group will be responsible for monitoring the implementation of the IRWMP. The technical advisory committee will regularly report to the General Managers and Governing Boards of the Regional Water Management Group regarding progress on the development and implementation of the IRWMP. The Lead Agency will be responsible for coordinating data collection and dissemination.

6.9 **Grant Applications.** The Regional Water Management Group will designate a Lead Agency to apply for grant funds. The Lead Agency for each grant application should have a mission and expertise that is consistent with the purpose of the grant being applied for.

6.10 **Grant Awards and Agreement**. The Lead Agency will be the grantee and administer the grant on behalf of the Regional Water Management Group and Stakeholders.

6.11 **Participation in Regional Water Management Group (RWMG)**. Any qualified stakeholder may petition to become a member of the RWMG. A qualified stakeholder must demonstrate the following: a) an interest, responsibility or authority over multiple resources within the region; or b) a unique interest, responsibility, authority, or asset not shared by any other entity within the RWMG. The RWMG shall consider such a request for a change to the RWMG and shall vote by majority to accept or reject the request.

6.12 **Length of Term in Regional Water Management Group**. Members of the RWMG may change from time to time, depending on the level of resources available to each entity. However, there is no required minimum or maximum length of time required as a member of the RWMG. If an entity withdraws from the RWMG, the remaining entities should attempt to replace the interest, responsibility or authority lost by the withdrawal.

6.13 **Rights of the Parties and Constituencies**: This MOU does not provide any added legal rights or regulatory powers to any of the signatory parties, or to the RWMG as a whole. This MOU does not of itself give any party the power to adjudicate water rights, or to regulate or otherwise control the private property of other parties. This

MOU does not contemplate the parties taking any action that would adversely affect the rights of any of the parties, or that would adversely affect the customers or constituencies of any of the parties.

6.14 **Termination**. An entity signatory to this MOU may withdraw from participation upon 30 days advance notice to the other signatory entities, provided it agrees to be financially responsible for any previously committed, but unmet resource commitment.

6.15. **Personnel resources**. It is expected that the General Managers and/or other officials of each entity signatory to this MOU will periodically meet to insure that adequate staff resources are available to implement the IRWM Plan.

6.16. **Other on-going regional efforts**. Development of the IRWMP is separate from efforts of other organizations to develop water-related plans on a regional basis around Monterey Bay and the Central Coast. As the IRWMP is developed and implemented, work products may be shared to provide other entities and groups with current information.

7. INDEMNIFICATION

7.1 Each Party shall indemnify, defend and hold harmless the other parties, to the extent allowed by law and in proportion to fault, against any and all third-party liability for claims, demands, costs or judgments (direct, indirect, incidental or consequential) involving bodily injury, personal injury, death, property damage or other costs and expenses (including reasonable attorneys' fees, costs and expenses) arising or resulting from the acts or omissions of its own officers, agents, employees or representatives carried out pursuant to the obligations of this Agreement.

7.2 These indemnity provisions shall survive the termination or expiration of this Agreement. Further, each Party will be liable to the other Party for attorneys' fees, costs and expenses, and all other costs and expenses whatsoever, which are incurred by the other Party in enforcing these indemnity provisions.

8. RECORD OF AMENDMENTS

8.1 June 2010 – add Marina Coast Water District to RWMG. Revise Goals, Definitions and MOU terms to reflect Proposition 84 requirements.

8.2 March 2012 – add process to change RWMG, define when plan is to be adopted, revise to Proposition 84 standards

8.3 August 2012 – add Resource Conservation District of Monterey County to RWMG

9. SIGNATORIES TO THE MEMORANDUM OF UNDERSTANDING

We, the duly authorized undersigned representatives of our respective entities, acknowledge the above as our understanding of the intent and expected outcome in overseeing the development and implementation of an Integrated Regional Water Management Plan for the Monterey Peninsula, Carmel Bay, and South Monterey Bay Region.

_____
Signature

_____
Printed Name
Monterey County Water Resources Agency

_____
Date

****

_____
Signature

_____
Printed Name
Big Sur Land Trust

_____
Date

****


_____
Signature

_David J. Stoldt_____
Printed Name

Monterey Peninsula Water Management District

__7/8/2013_____
Date

_____
Signature

_____
Printed Name
Monterey Regional Water Pollution Control Agency

_____
Date

****

_____
Signature

_____
Printed Name
City of Monterey

_____
Date

****

_____
Signature

_____
Printed Name
Marina Coast Water District

_____
Date

Signature

_____

Printed Name
Board President, Resource Conservation District of Monterey County

_____

Date

****

U:\mpwmd\IRWM\Regional Water Management Group\2013 Amended MOU\RWMG-MOU-April2013_DS_Signed.docx

Appendix 1-c

Resolutions of Adoption

DRAFT

Appendix 1-d

Current Stakeholders List

DRAFT

Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan Update
WORKING DRAFT STAKEHOLDERS LIST (version: Aug 2, 2013)

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FEDERAL AGENCIES													
	X				Bridget Hoover	Monterey Bay National Marine Sanctuary	http://montereybay.noaa.gov/	X		X	Remain on List	X	
					Joyce Ambrosius	National Oceanic and Atmospheric Administration Fisheries	http://www.noaa.gov/fisheries.html	X				X	
					Frank Schwing	National Oceanic and Atmospheric Administration Fisheries	http://www.noaa.gov/fisheries.html	X				X	
			x	x	Jacqueline Pearson-Meyer	National Oceanic and Atmospheric Administration Fisheries	http://www.noaa.gov/fisheries.html						
					Dan Martel	U.S. Army Corps of Engineers	http://www.mvd.usace.army.mil/		X			X	
					Jacob Martin	U.S. Fish and Wildlife Service	http://www.fws.gov/	X		X		X	
					Larry Freeman	US Geological Survey	http://www.usgs.gov/	X		X		X	
					Robert LaFleur	USDA Natural Resources Conservation Service	http://www.ca.nrcs.usda.gov/	X				X	
					Shawn Milar	USFWS Coastal Program	http://www.fws.gov/GOMCP/funding.html	X			Remain on List	X	
			X		Jeff Kwasny	US Forest Service	http://www.fs.fed.us/	X			Remain on List	X	
					Gail Youngblood	U.S. Army Corps of Engineers							
					David Eisen	U.S. Army Corps of Engineers							
					Chad Mitcham	U.S. Fish and Wildlife Service	1100 Fiesta Way, Watsonville 95076.						
STATE AGENCIES													
					Jeff Frey	California State Parks	http://www.parks.ca.gov/	X				X	
			X		Mike Watson	California Coastal Commission	http://www.coastal.ca.gov/	X				X	
					Tamara Doan	California Coastal Commission	http://www.coastal.ca.gov/	X				X	
					Trish Chapman	California Coastal Conservancy	http://www.coastal.ca.gov/	X				X	
					Margaret Paul	California Department of Fish & Game: Fisheries	http://www.dfg.ca.gov/	X				X	
					John Shelton	California Department of Fish and Game	http://www.dfg.ca.gov/	X		X	Remain on List	X	
					Jan Sweigert	California Department of Public Health: Drinking Water	http://www.cdph.ca.gov/programs/Pages/DWP.aspx	X				X	
					Michelle Dooley	California Department of Water Resources	http://www.water.ca.gov/	X				X	
					Dane Mathis	California Department of Water Resources	http://www.water.ca.gov/	X		X	Remain on List	X	
					Ernie Taylor	California Department of Water Resources	http://www.water.ca.gov/	X				X	
					Monica Reis	California Department of Water Resources	http://www.water.ca.gov/	X				X	
					Steve Bachman	California State Parks	http://www.parks.ca.gov/	X		X	Remain on List	X	
					Matt Fuzie	California State Parks	http://www.parks.ca.gov/	X				X	
					Anya Spear	California State University Monterey Bay	http://csumb.edu/	X				X	
					Katherine Mrowka, Chief	California State Water Resources Control Board	http://www.swrcb.ca.gov/	X				X	
					Vicky Whitney, Deputy Director, Division of Water Rights	California State Water Resources Control Board	http://www.swrcb.ca.gov/	X				X	
					Connie Anderson	California State Water Resources Control Board	http://www.swrcb.ca.gov/		X	X	Remain on List	X	
					Laleh Rastegarzadeh	California State Water Resources Control Board	http://www.swrcb.ca.gov/						
					Jodi Pontureri (she's on WQPP Committee)	California State Water Resources Control Board	http://www.swrcb.ca.gov/	X				X	
					Pete Riegelhuth	Caltrans	http://www.dot.ca.gov/	X				X	
					Lyn Wickham, Caltrans District 5 Hydraulics	Caltrans	http://www.dot.ca.gov/	X				X	
					Lisa McCann	Central Coast Regional Water Quality Control Board	http://www.swrcb.ca.gov/rwqcb3/	X				X	
					Angela Schroeter	Central Coast Regional Water Quality Control Board	http://www.swrcb.ca.gov/rwqcb3/	X				X	
					Jennifer Epp	Central Coast Regional Water Quality Control Board	http://www.swrcb.ca.gov/rwqcb3/	X				X	
					Matt Keeling	Central Coast Regional Water Quality Control Board	http://www.swrcb.ca.gov/rwqcb3/	X				X	
					Katie McNeill (grant coordinator)	Central Coast Regional Water Quality Control Board	http://www.swrcb.ca.gov/rwqcb3/	X				X	
					Hector Hernandez	Central Coast Regional Water Quality Control Board	http://www.swrcb.ca.gov/rwqcb3/	X		X	Remain on List	X	
REGIONAL AND COUNTY GOVERNMENT/LOCAL AGENCIES, COUNCILS, DISTRICTS, & ADVISORY COMMITTEES (BESIDES WATER)													
					Lisa Lurie	Agriculture Water Quality Alliance	http://awqa.org/	X				X	
					Elizabeth Russell	Association of Monterey Bay Area Governments	http://ambag.org/	X				X	
					Steve Endsley	Fort Ord Reuse Authority	http://fora.org/		X			X	
					Crissy Maras	Fort Ord Reuse Authority	http://fora.org/		X			X	
					Michael A. Houlemard, Jr.	Fort Ord Reuse Authority	http://fora.org/		X			X	
	X				Jonathan Garcia	Fort Ord Reuse Authority	http://fora.org/	X			Remain on List	X	
	X				Jim Arnold	Fort Ord Reuse Authority	http://fora.org/	X				X	
					Janna Faulk	Monterey County Environmental Health	http://www.co.monterey.ca.us/	X				X	
					Roger VanHorn	Monterey County Health Dept., Division of Environmental Health	http://www.co.monterey.ca.us/	X				X	

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					Cheryl Sandoval	Monterey County Health Dept., Division of Environmental Health	http://www.co.monterey.ca.us/	X				X	
					Kate McKenna	Monterey County Local Agency Formation Commission	http://www.co.monterey.ca.us/lafco/	X				X	
					Phil Yenovkian	Monterey County Office of Emergency Services	http://www.co.monterey.ca.us/oes/	X				X	
					Paul Greenway	Monterey County Public Works	http://www.co.monterey.ca.us/publicworks/	X				X	
					Tom Harty	Monterey County Public Works	http://www.co.monterey.ca.us/publicworks/	X		X	Remain on List	X	
					Edward Muniz	Monterey County Public Works	http://www.co.monterey.ca.us/publicworks/	X				X	
					Ogarita Carranza	Monterey County Public Works	http://www.co.monterey.ca.us/publicworks/	X				X	
					Dirk Medema	Monterey County Public Works/Monterey County Service Area 50	http://www.co.monterey.ca.us/publicworks/	X		X	Remain on List	X	
X			X		Paul Robins	Monterey County Resource Conservation District	http://rcdmonterey.org/	X		X	Remain on List	X	X
X			X		Rami Shihadeh	Monterey County Resource Conservation District	http://rcdmonterey.org/	X				X	X
					Carl P. Holm	Monterey County Resource Management Agency	http://www.co.monterey.ca.us/rma/	X		X	Remain on List	X	
					Mike Novo	Monterey County Resource Management Agency	http://www.co.monterey.ca.us/rma/						
					Dawn Mathes	Monterey County Resource Management Agency	http://www.co.monterey.ca.us/rma/						
					Bob Roach (Assistant Ag Commissioner)	Monterey County Weed Management Area	http://www.eventbrite.com/org/42812605	X				X	
					Tim Jensen	Monterey Peninsula Regional Park District	http://www.mprpd.org/	X				X	
					Don Prescott	Monterey Regional Waste Management District	http://www.mrwmd.org/	X		X	Remain on List	X	
					Des Johnston	MPAD							X
					Richard LeWarne	Monterey County Environmental Health	http://www.co.monterey.ca.us/						
WATER / WASTEWATER DISTRICTS, JPAs & PRIVATE WATER SUPPLIERS													
					Jan Shriner	Marina Coast Water District	http://www.mcwd.org/						
					Eric Sabolsice	California American Water	http://www.amwater.com/caaw/	X				X	
			X		Richard Svindland	California American Water Company	http://www.amwater.com/caaw/	X				X	
					Catherine Bowie	California American Water	http://www.amwater.com/caaw/	X				X	
					Barbara Buikema	Carmel Area Wastewater District	http://cawd.org/	X		X	Remain on List	X	
	X				Brian Lee	Marina Coast Water District	http://www.mcwd.org/	X				X	
X	X				Brian True	Marina Coast Water District	http://www.mcwd.org/	X		X	Remain on List	X	X
X	X		X		Robert Johnson	Monterey County Water Resources Agency	http://www.co.monterey.ca.us/rma/	X		X	Remain on List	X	X
					Manuel Quezada	Monterey County Water Resources Agency	http://www.co.monterey.ca.us/rma/	X		X	Remain on List	X	
					Tom Moss	Monterey County Water Resources Agency	http://www.co.monterey.ca.us/rma/						
X	X		X		Henrietta Stern	Monterey Peninsula Water Management District	http://www.mpwmd.dst.ca.us/	X				X	X
				X	Lance Monosoff	Monterey Peninsula Water Management District	http://www.mpwmd.dst.ca.us/					X	
X			X		Joe Oliver	Monterey Peninsula Water Management District	http://www.mpwmd.dst.ca.us/	X				X	
				X	David Laredo	Monterey Peninsula Water Management District	http://www.mpwmd.dst.ca.us/						
					Sara Reyes	Monterey Peninsula Water Management District	http://www.mpwmd.dst.ca.us/						
					Jonathan Lear	Monterey Peninsula Water Management District	http://www.mpwmd.dst.ca.us/	X				X	X
				X	Kevan Urquhart	Monterey Peninsula Water Management District	http://www.mpwmd.dst.ca.us/	X		X	Remain on List	X	
					Mark Dudley	Monterey Peninsula Water Management District	http://www.mpwmd.dst.ca.us/	X				X	X
				X	Thomas Christensen	Monterey Peninsula Water Management District	http://www.mpwmd.dst.ca.us/	X				X	X
					Eric Sandoval	Monterey Peninsula Water Management District	http://www.mpwmd.dst.ca.us/	X				X	
X	X		X	X	Larry Hampson	Monterey Peninsula Water Management District	http://www.mpwmd.dst.ca.us/	X					X
					Bob Holden	Monterey Regional Water Pollution Control Agency	http://www.mrwpca.org/	X				X	
X	X				Brad Hagemann	Monterey Regional Water Pollution Control Agency	http://www.mrwpca.org/	X				X	
					Mike McCullough	Monterey Regional Water Pollution Control Agency	http://www.mrwpca.org/						X
					Christina Baca	Pebble Beach Community Service District	http://pbcsd.org/	X				X	
					J.T. Rethke	Pebble Beach Community- Service District							X
					Mike Niccum	Pebble Beach Community Service District (also, PGUSD)	http://pbcsd.org/		X	X	Remain on List	X	
					Chris Hauser	Santa Lucia Preserve	http://www.santaluciapreserve.com/	X				X	
					Dewey Evans	Seaside Basin Watermaster	http://seasidebasinwatermaster.org/	X		X	Remain on List	X	
MUNICIPALITIES													
					Sharon Friedrichsen	City of Carmel-by-the-Sea	http://ci.carmel.ca.us/carmel/index.cfm	X				X	
					Bob Jacques	Consultant for City of Carmel-by-the-Sea	http://ci.carmel.ca.us/carmel/index.cfm						
					Marc Wiener	City of Carmel-by-the-Sea	http://ci.carmel.ca.us/carmel/index.cfm						
					Dan Dawson	City of Del Rey Oaks	http://www.delreyoaks.org/	X				X	
	X				Edrie de los Santos	City of Marina	http://www.ci.marina.ca.us/	X				X	
X					Jeff Krebs	City of Monterey	http://monterey.org/	X				X	X
					Tom Reeves	City of Monterey	http://monterey.org/	X		X	Remain on List	X	

Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan Update
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					Linda English	City of Monterey	http://monterey.org/	X				X	
					Sarah Hardgrave	City of Pacific Grove	http://www.ci.pg.ca.us/	X		X	Remain on List	X	
					Steve Matarazzo	City of Sand City	http://sandcity.org/	X				X	
					Rick Riedl	City of Seaside	http://www.ci.seaside.ca.us/	X		X	Remain on List	X	
					Tim O'Halloran	City of Seaside and Seaside County Sanitation District	http://www.ci.seaside.ca.us/index.aspx?page=217	X				X	
	X				Leslie Llantero	City of Seaside	http://www.ci.seaside.ca.us/index.aspx?page=217						X
NONPROFIT ORGANIZATIONS & CITIZEN GROUPS													
					Rachel Saunders	Big Sur Land Trust	http://www.bigsurlandtrust.org/	X				X	
X					Bill Leahy	Big Sur Land Trust	http://www.bigsurlandtrust.org/	X				X	
					Joanna Devers	Big Sur Land Trust	http://www.bigsurlandtrust.org/						
					Keith Defiebre	Bike Racing—CCCX Cycling		X				X	
					Philomena Smith	California Native Plant Society, Monterey Chapter	http://montereybay.cnps.org/	X				X	
					David Styer	California Native Plant Society, Monterey Chapter	http://montereybay.cnps.org/	X				X	
					Mary Ann Matthews, Conservation Chair	California Native Plant Society, Monterey County Chapter	http://montereybay.cnps.org/	X		X	Remain on List	X	
					Roger Williams	Carmel River Steelhead Association	http://www.carmelriversteelheadassociation.org/	X		X	Remain on List	X	
					Brian LeNeve	Carmel River Steelhead Association	http://www.carmelriversteelheadassociation.org/	X				X	
					Roy Thomas, President	Carmel River Steelhead Association	http://www.carmelriversteelheadassociation.org/	X		X	Remain on List	X	
					Frank Emerson	Carmel River Steelhead Association	http://www.carmelriversteelheadassociation.org/	X				X	
			X		Lorin Letendre	Carmel River Watershed Conservancy	http://www.carmelriversteelheadassociation.org/	X		X	Remain on List	X	X
					Clive Sanders	Carmel River Watershed Conservancy	http://carmelriverwatershed.org/					X	
					Jack Hammerland	Carmel River Watershed Conservancy	http://carmelriverwatershed.org/	X				X	
					Todd Norgaard	Carmel Valley Association	http://www.carmelvalleyassociation.org/		X		Remain on List	X	
					Sierra Ryan	Central Coast Wetlands Group	http://ccwg.mlml.calstate.edu/	X				X	
					Ken Ekelund	Citizen Watershed Monitoring Network	http://montereybay.noaa.gov/monitoringnetwork/welc	X				X	
					George T. Riley	Citizens for Public Water	http://citizenswater.com/	X				X	X
					Greg Pepping	Coastal Watershed Council	http://coastal-watershed.org/	X		X	Remain on List	X	X
					Donna Meyers	Conserve Collaborate		X				X	
					Laura Dadiw	Del Monte Forest Foundation	http://delmonteforestfoundation.org/		X			X	
					Don Eastman	Del Monte Forest Property Owners	dmfpo.org/about.html		X			X	
					Sherry Bryan	Ecology Action	http://www.ecoact.org/	X				X	
					Bob Sevene	FORT Friends (Fort Ord Recreation Trails Friends, a consolidation of several groups)	http://fortfriends.net/	X				X	
					Gail Morton	Fort Ord Recreation Users	http://www.foru.us/MontereyDowns.html	X				X	
					Margaret Davis	Friends of Fort Ord Warhorse	http://fortordwarhorse.com/?page_id=8	X				X	
					Hannah Schoenthal-Muse	Friends of the River	http://www.friendsoftheriver.org/site/PageServer	X				X	
					Brian Center	Friends of the River	http://www.friendsoftheriver.org/site/PageServer					X	
					Chris Mack	Keep Fort Ord Wild	http://keepfortordwild.org/	X				X	
					Gordon Smith	Keep Fort Ord Wild	http://keepfortordwild.org/	X				X	
					Amy White, Interim ED	LandWatch Monterey County	http://www.landwatch.org/index.html	X				X	
					Renate Robe	Marina Equestrian Center	http://marinaequestrian.org/	X				X	
					Lisa Emanuelson	Monterey Bay Citizen Watershed Monitoring Network	http://montereybay.noaa.gov/monitoringnetwork/welcome.html		X		Remain on List	X	
					Doug Deitch	Monterey Bay Conservancy	http://montereybayconservancy.org/	X				X	
					Artthur McLoughlin	Monterey Bay Youth Camp	http://www.monterey.org/en-us/departments/montere	X				X	X
					Steve Shimek	Monterey Coastkeeper/The Otter Project	monterey-county-water-resources-agency-over-polluted-runoff	X		X	Remain on List	X	
					Sharon Lacalamita	Monterey Search and Rescue Dogs, Inc.	http://mcsard.org/	X				X	
					Darius Rike	MORCA (Monterey Off-Road Cycling Association, a Chapter of IMBA)	http://www.morcamtb.org/	X				X	
					Gary Courtright	MORCA (Monterey Off-Road Cycling Association, a Chapter of IMBA)	http://www.morcamtb.org/	X				X	
			X		Dr. Monica Hunter	Planning and Conservation League	http://www.pcl.org/	X				X	

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					Nancy Isakson	Salinas Valley Water Coalition							
					Christina Fischer, Executive Director	Santa Lucia Conservancy	http://www.slconservancy.org/	X				X	
					Laura Kasa, Executive Director	Save Our Shores	http://saveourshores.org/	X				X	
					Maris Sidenstecker	Save The Whales	http://www.savethewhales.org/	X				X	
					Joel Weinstein	Sierra Club	http://www.sierraclub.org/	X				X	
					Tom Moore, Fort Ord specialist	Sierra Club	http://www.sierraclub.org/	X				X	
					Tony Tersol	Surfrider Foundation	http://surfrider.org/	X				X	
					Sarah Corbin, Central CA Regional Manager	Surfrider Foundation	http://surfrider.org/	X				X	
					Luana Conley	Sustainable Marina (residents group)	http://c4smarina.weebly.com/index.html	X				X	
					Kay Cline	Sustainable Seaside (residents group)		X				X	
			X		Michael Waxer	Step Up 2 Green / Sustainability Academy		X				X	
					Liz Spence	The Nature Conservancy	http://www.nature.org/	X				X	
					Sarah Newkirk	The Nature Conservancy	http://www.nature.org/		X			X	
					Sam Davidson	Trout Unlimited	http://www.tu.org/	X					
					Oona Gaberšek	U.S. Green Building Council	www.og-la.com				Remain on List	X	
					Tom Hopkins, President	Ventana Wilderness Alliance	http://www.ventanawild.org/	X				X	
					Dennis Palm	Ventana Wilderness Alliance	http://www.ventanawild.org/	X				X	
					Mike Splain	Ventana Wilderness Alliance	http://www.ventanawild.org/	X				X	
					Kelly Sorenson, Executive Director	Ventana Wildlife Society	http://ventanaws.org/	X				X	
					Bruce Gordon	Cal Am Water Bill Payer							X
					Bob Steinberg	Citizen							X
					Arleen Hardenstein	MCAR: Member of the Public							X
					Doug Rogers	Interested Citizen							X
					Tom MacDonald	Interested Citizen							
					Bill Carrothers	Interested Citizen							
					Bill Phillips	Interested Citizen							
					Jason Campbell	Interested Citizen							
ACADEMIC INSTITUTIONS / RESEARCH													
					Marc LosHuertos	California State University Monterey Bay: Division of Science & Envir	http://sep.csumb.edu/sep/	X				X	
			X		Pam Krone-Davis	CSUMB	http://csumb.edu/	X				X	
					Marvin Biasotti	Carmel Unified School District	http://www.carmelunified.org/carmelunified/site/default.asp		X		Remain on List	X	
					Dr. Meg Caldwell	Center for Ocean Solutions	http://www.centerforoceansolutions.org/		X			X	
					Brian Anderson	Marine Pollution Studies Lab - UC Davis	http://mpsl.mlml.calstate.edu/	X				X	
					Josh Plant	Monterey Bay Aquarium Research Institute	http://www.mbari.org/	X				X	
					Ken Johnson	Monterey Bay Aquarium Research Institute	http://www.mbari.org/	X				X	
			X		Carol Reeb	Stanford University- Hopkins Marine Station	http://www-marine.stanford.edu/	X				X	
					Dr Fred Watson	The Watershed Institute at CSUMB	http://watershed.csumb.edu/wi/	X				X	
					Vince Voegeli	UC Berkeley Hastings Reserve	http://hastings.berkeley.edu/	X				X	
					Laura Lee Lienk	Watershed Institute at CSUMB	http://watershed.csumb.edu/wi/	X				X	
					Doug Smith	Watershed Institute at CSUMB	http://watershed.csumb.edu/wi/	X				X	
					Jody Hansen	Monterey Peninsula College							
PRIVATE COMPANIES/BUSINESS ORGANIZATIONS													
			X	X	Frank Pierce	Lee & Pierce, Inc.							X
					Thomas Quattlebaum	Pebble Beach Company							
POLITICAL CONTACTS													
					Jane Parker	Supervisor Jane Parker, Mo Co District 4	http://www.janeparker.org/	X				X	
					Dave Potter	Supervisor Dave Potter, Mo Co District 5	http://www.co.monterey.ca.us/d5_supervisor.htm	X				X	
					Larry Parrish	Green Party of Monterey County							
ALL IRWM Key Contacts													
	X				Alison Imamura	Denise Duffy & Associates, Inc./MP IRWMP consultant	http://ddaplanning.com/	X				X	X
	X				Susan Robinson	Greater Monterey County IRWMP	http://ccwg.mlml.calstate.edu/irwmp	X				X	
					John Ricker, Santa Cruz County Environment	Santa Cruz County	http://www.rcdsantacruz.org/	X				X	
					Chris Coburn	Santa Cruz County	http://www.rcdsantacruz.org/	X				X	

Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan Update
WORKING DRAFT STAKEHOLDERS LIST (version: Aug 2, 2013)

WMG / TAC	Ord Inter-regional	DAC con-tact	CR Task Force	CRAC	Contact	Organization	Website	Sent 4/30	Sent 5/8	Receipt	Reply Message	Rec'd 7/25/12 mtg Notice	Attended 7/25/12 mtg
					Tracy Hemmeter	Pajaro River Watershed	http://www.pajarowatershed.org/	X		X	Remain on List	X	
					Courtney Howard	San Luis Obispo County: Division of Public Works	http://www.slocity.org/publicworks/index.asp	X				X	
					Matt Naftaly	Santa Barbara County: Santa Barbara County Public Works Department	http://www.countyofsb.org/pwd/	X				X	
					Ross Clark	Central Coast Wetland Group	http://santacruzirwmp.org/	X				X	
					Denise Duffy	Denise Duffy & Associates, Inc./MP IRWMP consultant	http://ddaplanning.com/	X	X			X	X
					Michael Gonzales	Denise Duffy & Associates, Inc./MP IRWMP consultant	http://ddaplanning.com/	X				X	X
					Bryce Ternet	Denise Duffy & Associates, Inc./MP IRWMP consultant	http://ddaplanning.com/	X				X	
CARMEL RIVER TASK FORCE / ADVISORY COMMITTEES, ONLY (others, above, are marked in Column E)													
			X		Marjorie Ingram-Viales	Carmel River Task Force Membership		X					
			X		Shawn Atkins	Carmel River Task Force		X				X	
			X		Jennifer Bodensteiner	Carmel River Task Force		X				X	
			X		John Dalessio	Carmel River Task Force		X				X	
			X		Regina Doyle	Carmel River Task Force		X				X	
			X		Elizabeth Geisler	Carmel River Task Force		X				X	
			X		Seth Gentzler	Carmel River Task Force		X				X	
			X		Paula Gill	Carmel River Task Force		X				X	
			X		Thomas D. House	Carmel River Task Force		X					
			X		Mark Johnsson	Carmel River Task Force		X				X	
			X		Dana Jones	Carmel River Task Force		X				X	
			X		Kathleen Lee	Carmel River Task Force		X					
			X		Lawrence V. Levine	Carmel River Task Force		X					
			X		Chad Mitcham	Carmel River Task Force		X				X	
			X		Nikki Nedeff	Carmel River Task Force		X					
			X		Jacqueline R. Onciano	Carmel River Task Force		X				X	
			X		Peter Perrine	Carmel River Task Force		X				X	
			X	X	Margaret Robbins	Carmel River Task Force		X				X	X
			X		Tanja Gardens	Carmel River Task Force		X				X	
			X		Richard Rosenthal	Carmel River Task Force		X					
			X		Denis Ruttenberg	Carmel River Task Force		X				X	
			X		Enrique Saavedra	Carmel River Task Force		X					
			X		Clive Sanders	Carmel River Task Force		X					
				X	Vincent Frumkin	Carmel River Advisory Committee							
			X		James Sulentich	Carmel River Task Force		X				X	
DISADVANTAGE COMMUNITY ORGANIZATIONS													
		X				Monterey County Housing Authority							
		X				CHISPA							
		X				Foundation for Housing Assistance of Monterey County							
		X				Shelter Outreach Plus/ I Help Program							
		X				Oldemeyer Senior Center							
		X				Monterey Senior Center							
		X				Monterey County Department of Health Services							
		X				Seaside Family Health Center							
		X				Military and Veterans Affairs							
		X				Monterey County Social Services Department							
		X				Monterey County Welfare Department							
		X				Seaside Library							
		X				Monterey Library							
		X				City of Sand City							
		X				City of Seaside							
		X				City of Monterey							
		X			Mel Mason	NAACP						X	
		X			Carlos Ramos	LEAGUE OF UNITED LATIN AMERICAN CITIZENS						X	
		X			Paola Ramos	Environmental Justice Coalition for Water	http://www.ejcw.org/About/overview.htm	X				X	

Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan Update
WORKING DRAFT STAKEHOLDERS LIST (version: Aug 2, 2013)

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		X			LeVonne Stone	Ford Ord Environmental Justice Network	http://foejn.org/	X				X	
		X			Karen McBride	Rural Communities Assistance Corporation	http://www.rcac.org/		X			X	

Appendix 1-e

Notice of Intent (April 16, 2012)

DRAFT

PUBLIC NOTICE

Notice of Intent to Update to the Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management (IRWM) Plan

NOTICE IS HERBY GIVEN that the Monterey Peninsula Water Management District (MPWMD), on behalf of the Regional Water Management Group (RWMG), has initiated an update to the existing Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM Plan (IRWM Plan or IRWMP), dated November 2007, and projects supporting the IRWM Plan update are in progress, in accordance with the requirements in the Department of Water Resources Proposition 84 and 1E Final IRWM Guidelines.

The RWMG, which oversees the development of the IRWM Plan, is comprised of the following five agencies; Big Sur Land Trust, City of Monterey, , Monterey County Water Resources Agency, MPWMD, and Monterey Regional Water Pollution Control Agency. The RWMG is considering the addition of the Marina Coast Water District as a member to the RWMG. MPWMD is leading the effort in the region.

The IRWMP is a document that identifies and plans for the water resource-related needs of the Monterey Peninsula, Carmel Bay, and South Monterey Bay region. The IRWM Plan examines current and future water-related needs, identifies regional objectives for water-related resource management, develops strategies to address identified needs and then presents and evaluates stakeholder proposed projects to meet the regional objectives. The intent of the IRWM Plan is to integrate water management, watershed planning, implementation efforts, and to facilitate regional cooperation with the goal of improving water supply reliability, water recycling, water conservation, recreation and environmental habitat protection. One of the primary objectives of the IRWM Plan is to provide ongoing guidance and prioritization regarding implementation projects and programs for funding consideration under grant programs, including those funded by Proposition 84.

The existing IRWM Plan for the region complies with Proposition 50 IRWM standards. However, these standards have been revised and re-written and the existing IRWM Plan, which was adopted in 2007, must be amended to be in conformance with the new standards specifically, the IRWM Grant Program Guidelines for projects funded by Proposition 84, The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coast Protection Bond Act of 2006 and Proposition 1E, The Disaster Preparedness and Flood Prevention Bond Act of 2006.

To join the IRWM Plan Update notification list or to comment on the project, please submit requests in writing to:

Monterey Peninsula Water Management District
Larry Hampson, District Engineer
5 Harris Court, Building G, P.O. Box 85
Monterey, California 93942-0085
Tel: (831) 654-5620 FAX: (831) 659-2598
E-mail address: larry@mpwmd.net
Web address: www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm

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PUBLIC NOTICE Notice of Intent to Update to the Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management (IRWM) Plan NOTICE IS HERBY GIVEN that the Monterey Peninsula Water Management District (MPWMD), on behalf of the Regional Water Management Group (RWMG), has initiated an update to the existing Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM Plan (IRWM Plan or IRWMP), dated November 2007, and projects supporting the IRWM Plan update are in progress, in accordance with the requirements in the Department of Water Resources Proposition 84 and 1E Final IRWM Guidelines. The RWMG, which oversees the development of the IRWM Plan, is comprised of the following five agencies; Big Sur Land Trust, City of Monterey, , Monterey County Water Resources Agency, MPWMD, and Monterey Regional Water Pollution Control Agency. The RWMG is considering the addition of the Marina Coast Water District as a member to the RWMG. MPWMD is leading the effort in the region. The IRWMP is a document that identifies and plans for the water resource-related needs of the Monterey Peninsula, Carmel Bay, and South Monterey Bay region. The IRWM Plan examines current and future water-related needs, identifies regional objectives for water-related resource management, develops strategies to address identified needs and then presents and evaluates stakeholder proposed projects to meet the regional objectives. The intent of the IRWM Plan is to integrate water management, watershed planning, implementation efforts, and to facilitate regional cooperation with the goal of improving water supply reliability, water recycling, water conservation, recreation and environmental habitat protection. One of the primary objectives of the IRWM Plan is to provide ongoing guidance and prioritization regarding implementation projects and programs for funding consideration under grant programs, including those funded by Proposition 84. The existing IRWM Plan for the region complies with Proposition 50 IRWM standards. However, these standards have been revised and re-written and the existing IRWM Plan, which was adopted in 2007, must be amended to be in conformance with the new standards specifically, the IRWM Grant Program Guidelines for projects funded by Proposition 84, The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coast Protection Bond Act of 2006 and Proposition 1E, The Disaster Preparedness and Flood Prevention Bond Act of 2006. To join the IRWM Plan Update notification list or to comment on the project, please submit requests in writing to: Monterey Peninsula Water Management District Larry Hampson, District Engineer 5 Harris Court, Building P.O. Box 85 Monterey, California 93942-0085 Tel: (831) 654-5620 FAX: (831) 659-2598 E-mail address: larry@mpwmd.net Web address: www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm Published April 26 & May 1, 2012

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MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

PUBLIC NOTICE

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

Notice of Intent to Update to the Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management (IRWM) Plan

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E-mail address: larry@mpwmd.net
Web address:
www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm
Published April 26 & May 1, 2012

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Appendix 2-a

California American Service Area Map

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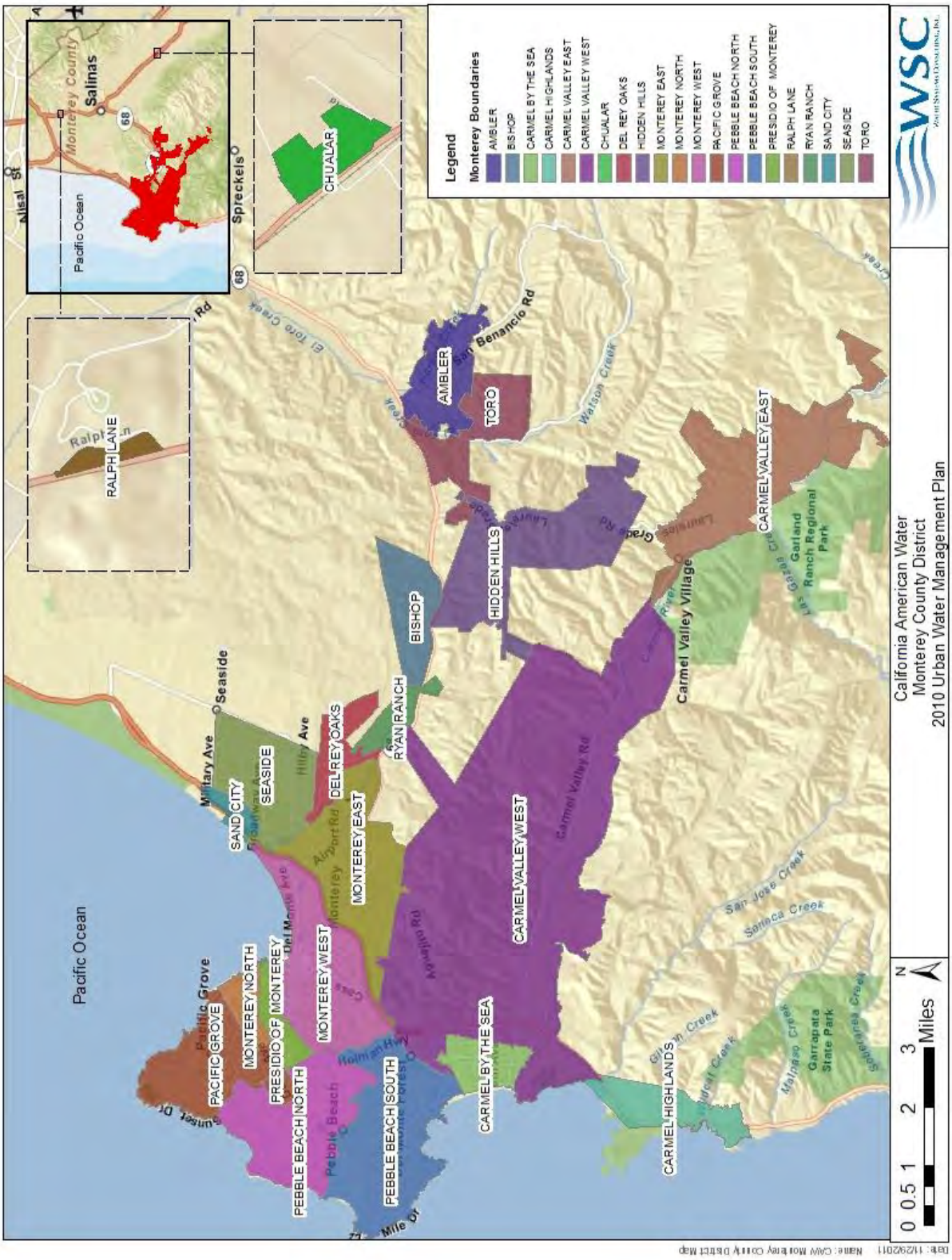


Figure 2-1: Map of California American Water's Central Division - Monterey County District

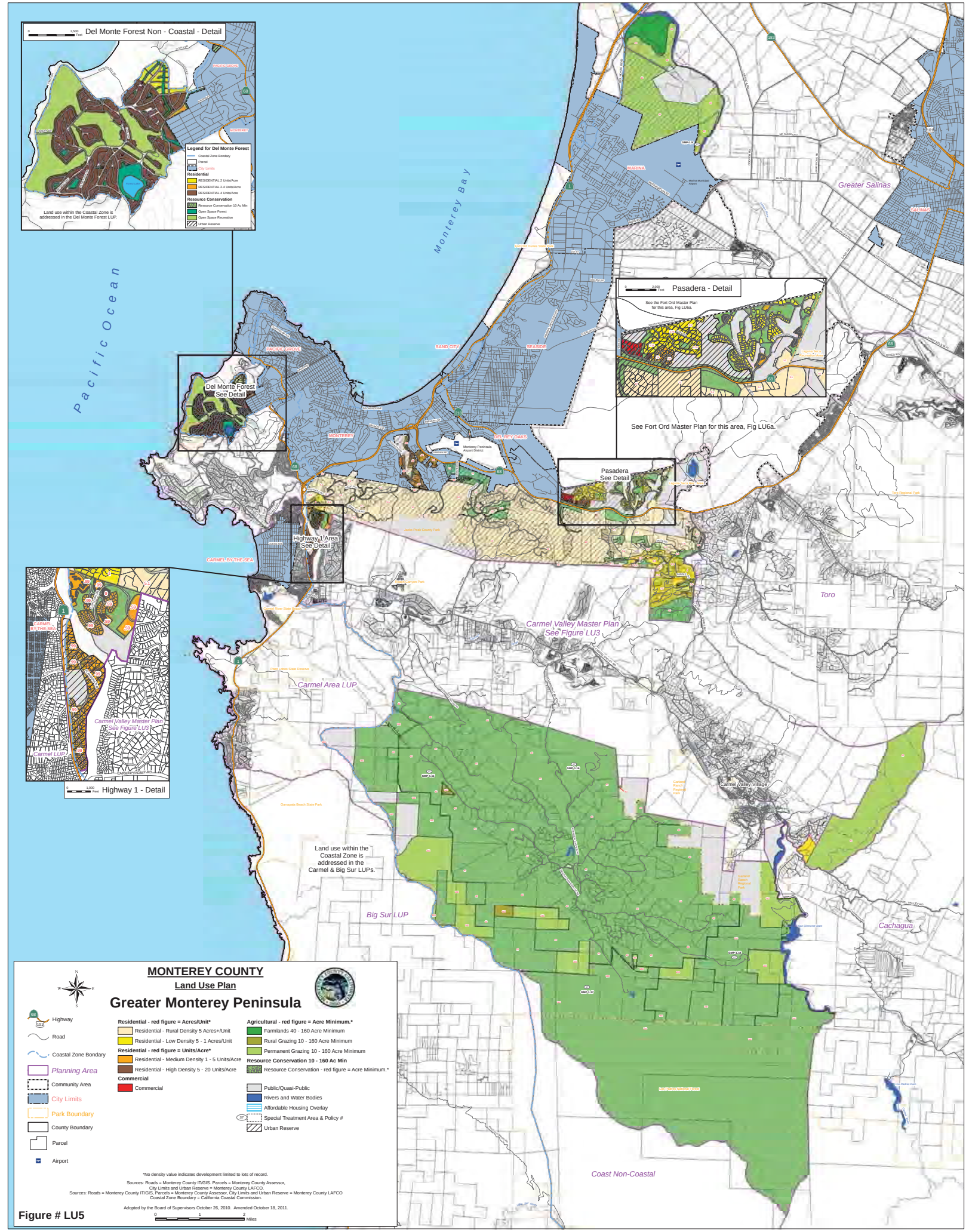
Appendix 2-b

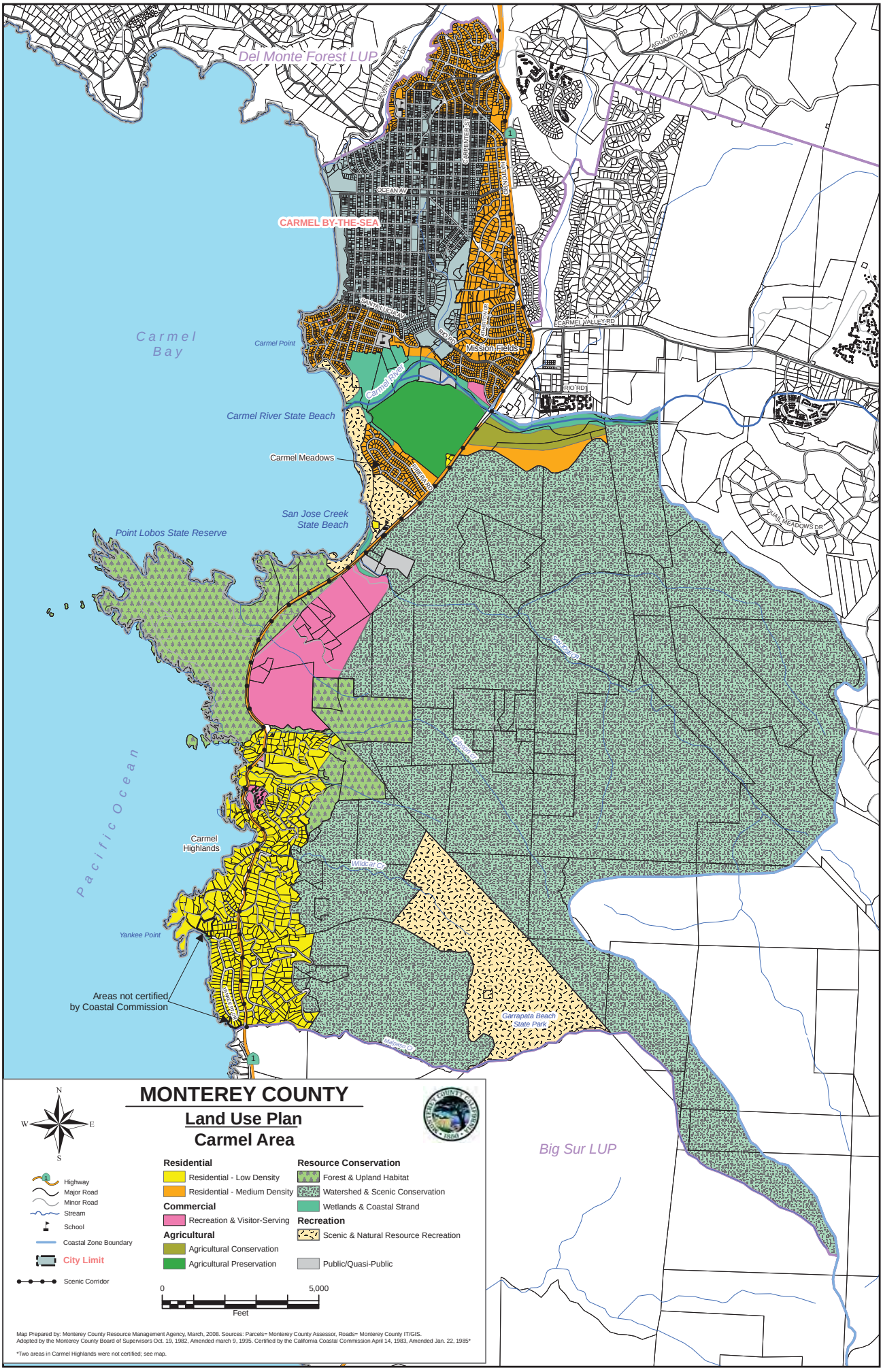
Land Use Designations

DRAFT

Land Use Designation Maps

I. Monterey County General Plan
    a. Greater Monterey Peninsula Area Plan
    b. Carmel Area Land Use Plan
    c. Del Monte Forest Land Use Plan
    d. Fort Ord Master Plan
    e. Carmel Valley Master Plan
II. Fort Ord Base Reuse Plan
III. City of Seaside General Plan
IV. Sand City General Plan
V. City of Del Rey Oaks General Plan
VI. City of Monterey General Plan
VII. City of Pacific Grove General Plan
VIII. City of Carmel-by-the-Sea General Plan


Del Monte Forest Non - Coastal - Detail
Legend for Del Monte Forest
Coastal Zone Boundary
Parcel
City Limits
Residential
RESIDENTIAL 2 Units/Acre
RESIDENTIAL 2.4 Units/Acre
RESIDENTIAL 4 Units/Acre
Resource Conservation
Resource Conservation 10 Ac Min
Open Space Forest
Open Space Recreation
Urban Reserve
Land use within the Coastal Zone is addressed in the Del Monte Forest LUP.
Pacific Ocean
Monterey Bay
Del Monte Forest See Detail
Pasadera - Detail
See the Fort Ord Master Plan for this area, Fig LU6a.
See Fort Ord Master Plan for this area, Fig LU6a.
Pasadera See Detail
Highway 1 Area See Detail
Highway 1 - Detail
Carmel Valley Master Plan See Figure LU3
Carmel LUP
Carmel Area LUP
Big Sur LUP
Coast Non-Coastal
Land use within the Coastal Zone is addressed in the Carmel & Big Sur LUPs.
Greater Salinas
Toro
Cachagua
Carmel Valley Village
MONTEREY COUNTY
Land Use Plan
Greater Monterey Peninsula
Highway
Road
Coastal Zone Bondary
Planning Area
Community Area
City Limits
Park Boundary
County Boundary
Parcel
Airport
Residential - red figure = Acres/Unit*
Residential - Rural Density 5 Acres+/Unit
Residential - Low Density 5 - 1 Acres/Unit
Residential - red figure = Units/Acre*
Residential - Medium Density 1 - 5 Units/Acre
Residential - High Density 5 - 20 Units/Acre
Commercial
Commercial
Agricultural - red figure = Acre Minimum.*
Farmlands 40 - 160 Acre Minimum
Rural Grazing 10 - 160 Acre Minimum
Permanent Grazing 10 - 160 Acre Minimum
Resource Conservation 10 - 160 Ac Min
Resource Conservation - red figure = Acre Minimum.*
Public/Quasi-Public
Rivers and Water Bodies
Affordable Housing Overlay
Special Treatment Area & Policy #
Urban Reserve
*No density value indicates development limited to lots of record.
Sources: Roads = Monterey County IT/GIS. Parcels = Monterey County Assessor, City Limits and Urban Reserve = Monterey County LAFCO.
Sources: Roads = Monterey County IT/GIS, Parcels = Monterey County Assessor, City Limits and Urban Reserve = Monterey County LAFCO
Coastal Zone Boundary = California Coastal Commission.
Adopted by the Board of Supervisors October 26, 2010. Amended October 18, 2011.
Miles
Figure # LU5


Del Monte Forest LUP
CARMEL BY-THE-SEA
Carmel Bay
Carmel Point
Carmel River
Carmel River State Beach
Carmel Meadows
San Jose Creek State Beach
Point Lobos State Reserve
Pacific Ocean
Carmel Highlands
Yankee Point
Areas not certified by Coastal Commission
Mission Fields
Garrapata Beach State Park
Big Sur LUP
MONTEREY COUNTY
Land Use Plan
Carmel Area
Residential
Residential - Low Density
Residential - Medium Density
Commercial
Recreation & Visitor-Serving
Agricultural
Agricultural Conservation
Agricultural Preservation
Resource Conservation
Forest & Upland Habitat
Watershed & Scenic Conservation
Wetlands & Coastal Strand
Recreation
Scenic & Natural Resource Recreation
Public/Quasi-Public
Highway
Major Road
Minor Road
Stream
School
Coastal Zone Boundary
City Limit
Scenic Corridor
0
5,000
Feet
Map Prepared by: Monterey County Resource Management Agency, March, 2008. Sources: Parcels= Monterey County Assessor, Roads= Monterey County IT/GIS.
Adopted by the Monterey County Board of Supervisors Oct. 19, 1982, Amended march 9, 1995. Certified by the California Coastal Commission April 14, 1983, Amended Jan. 22, 1985*
*Two areas in Carmel Highlands were not certified; see map.

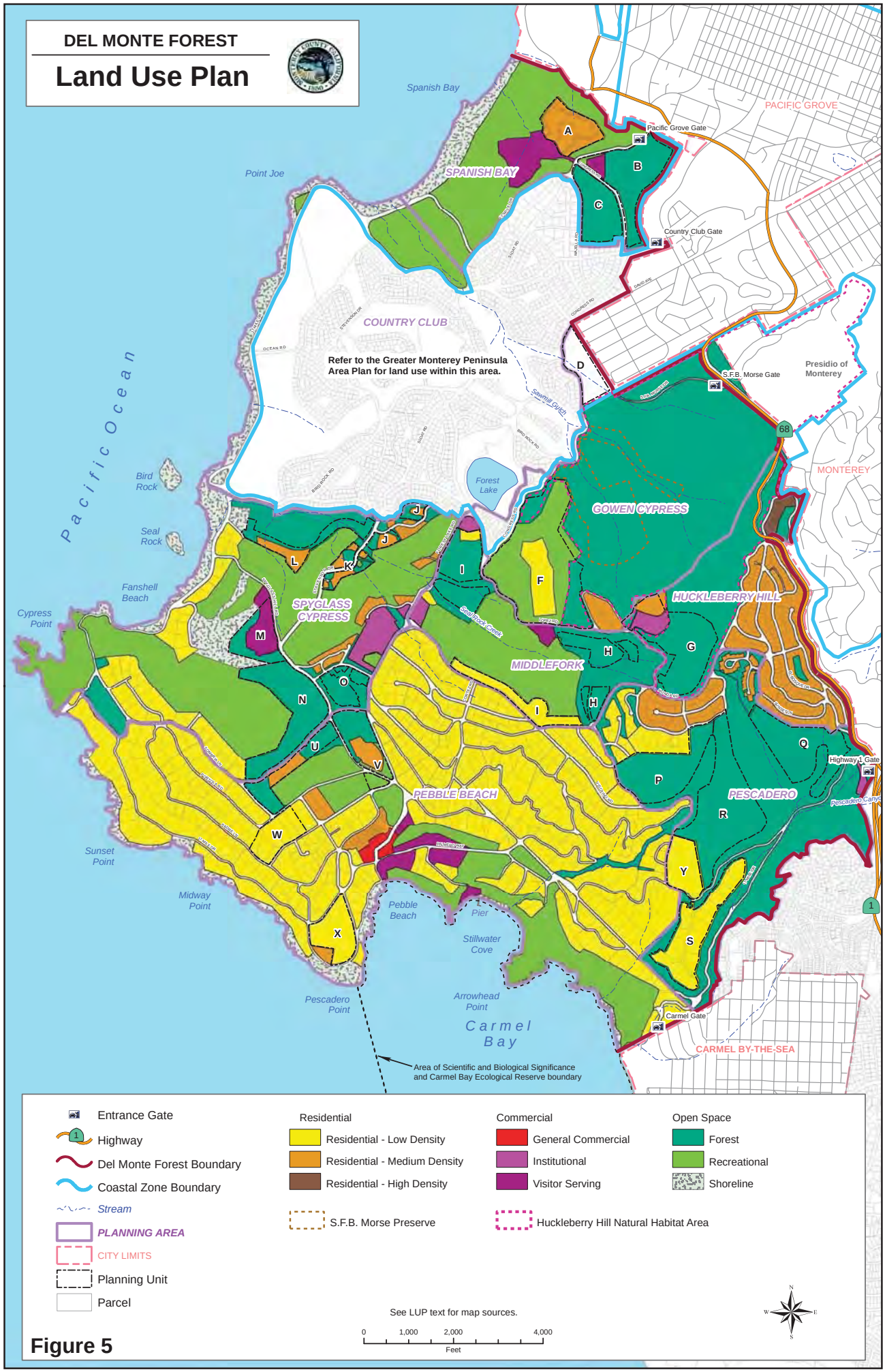

DEL MONTE FOREST
Land Use Plan
Spanish Bay
PACIFIC GROVE
Pacific Grove Gate
SPANISH BAY
Point Joe
Country Club Gate
COUNTRY CLUB
Refer to the Greater Monterey Peninsula Area Plan for land use within this area.
S.F.B. Morse Gate
Presidio of Monterey
Pacific Ocean
Bird Rock
Seal Rock
Forest Lake
MONTEREY
GOWEN CYPRESS
Fanshell Beach
Cypress Point
SPYGLASS CYPRESS
HUCKLEBERRY HILL
MIDDLEFORK
Highway 1 Gate
PEBBLE BEACH
PESCADERO
Sunset Point
Midway Point
Pebble Beach
Pier
Stillwater Cove
Arrowhead Point
Pescadero Point
Carmel Gate
Carmel Bay
CARMEL BY-THE-SEA
Area of Scientific and Biological Significance and Carmel Bay Ecological Reserve boundary
Entrance Gate
Highway
Del Monte Forest Boundary
Coastal Zone Boundary
Stream
PLANNING AREA
CITY LIMITS
Planning Unit
Parcel
Residential
Residential - Low Density
Residential - Medium Density
Residential - High Density
Commercial
General Commercial
Institutional
Visitor Serving
Open Space
Forest
Recreational
Shoreline
S.F.B. Morse Preserve
Huckleberry Hill Natural Habitat Area
See LUP text for map sources.
0
1,000
2,000
4,000
Feet
N
W
E
S

Figure 5

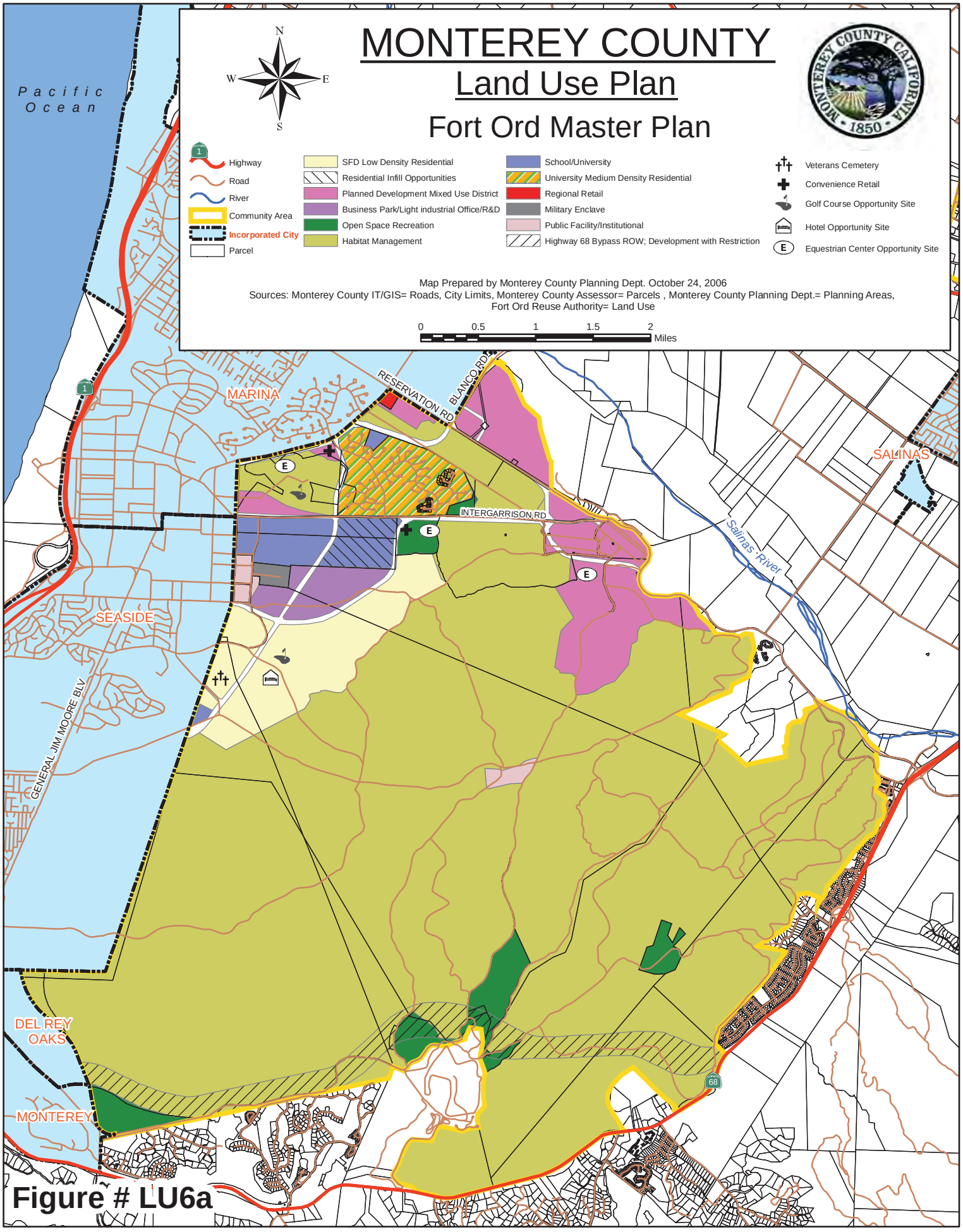
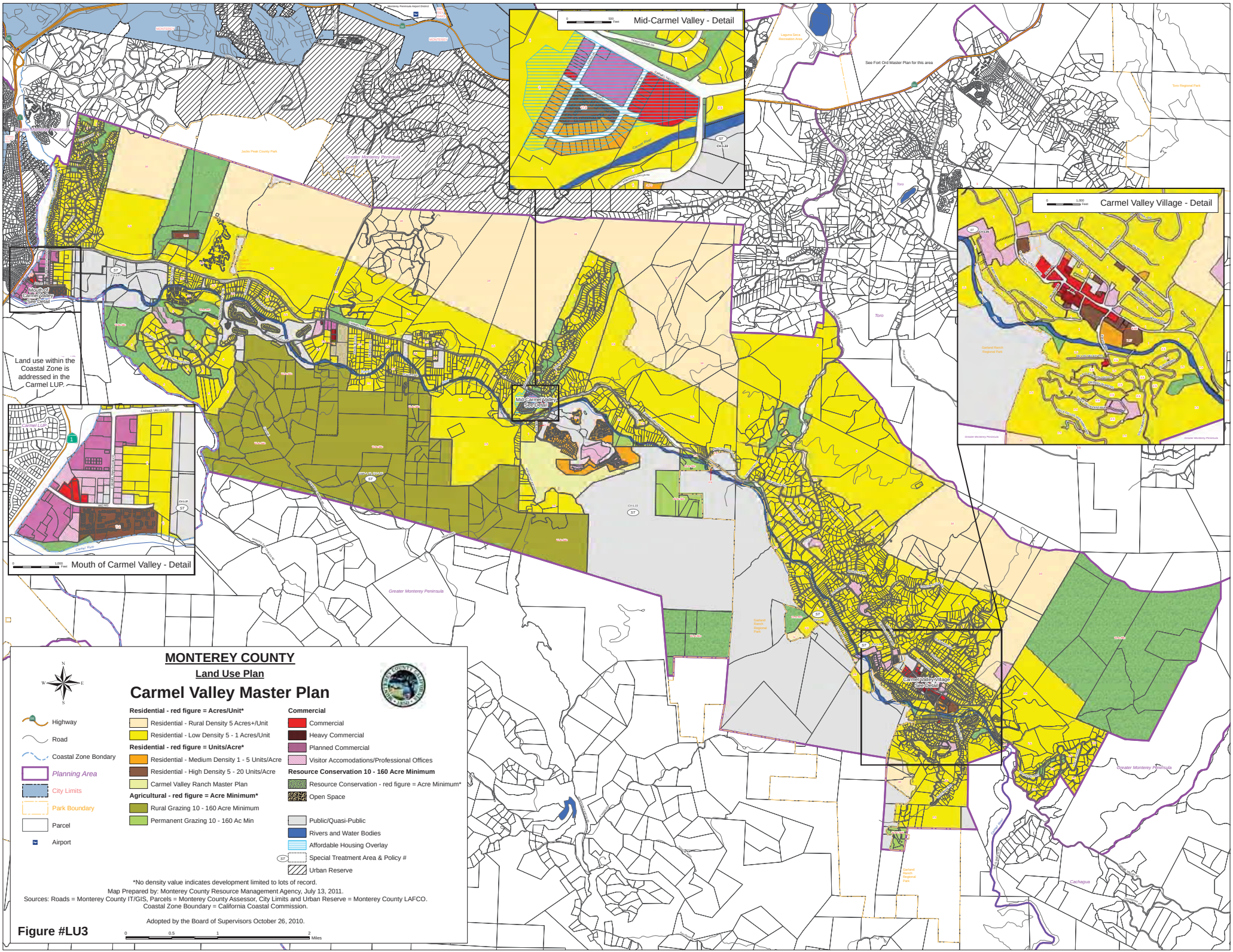
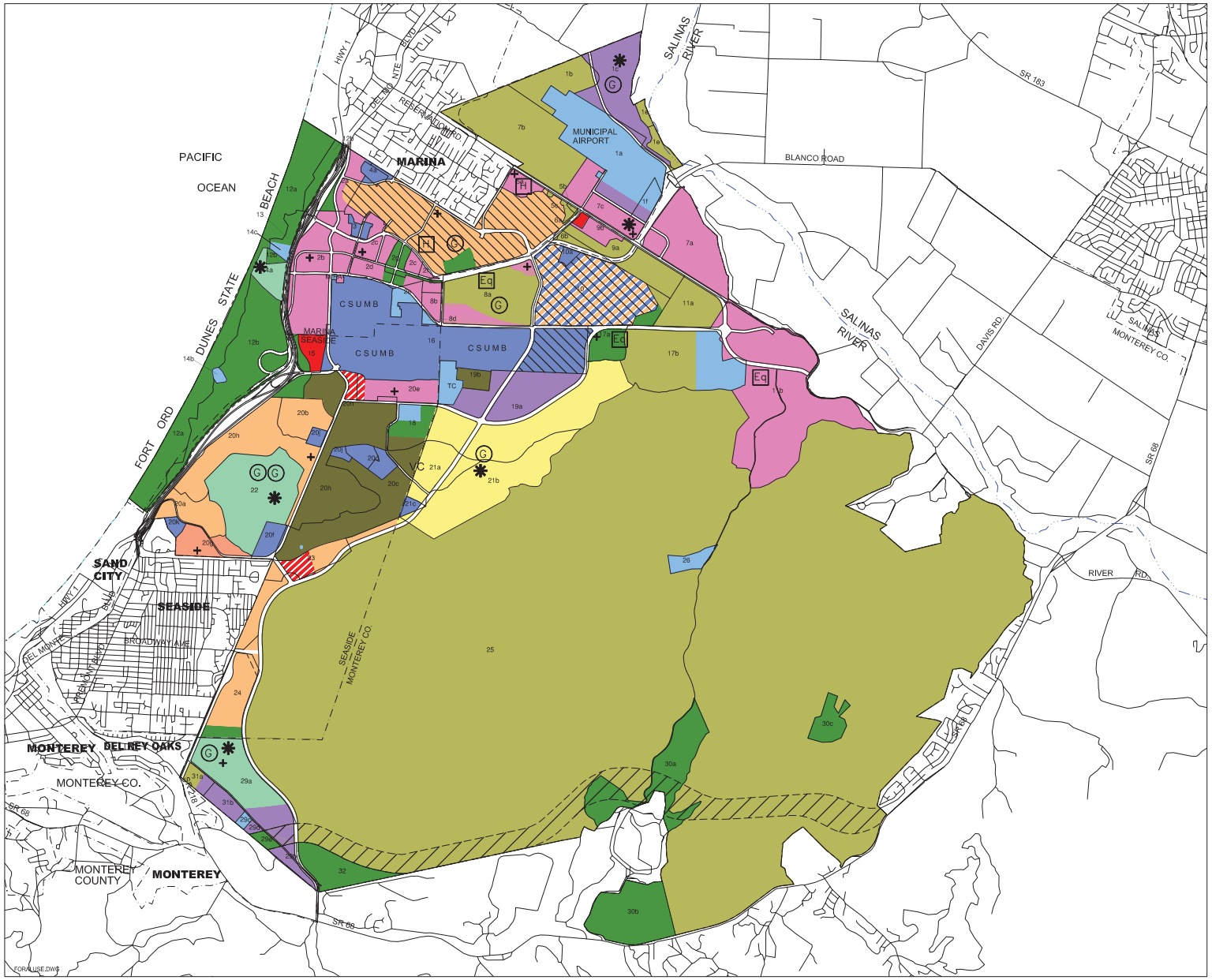

MONTEREY COUNTY
Land Use Plan
Fort Ord Master Plan
N
S
E
W
Pacific Ocean
Highway
Road
River
Community Area
Incorporated City
Parcel
SFD Low Density Residential
Residential Infill Opportunities
Planned Development Mixed Use District
Business Park/Light industrial Office/R&D
Open Space Recreation
Habitat Management
School/University
University Medium Density Residential
Regional Retail
Military Enclave
Public Facility/Institutional
Highway 68 Bypass ROW; Development with Restriction
Veterans Cemetery
Convenience Retail
Golf Course Opportunity Site
Hotel Opportunity Site
Equestrian Center Opportunity Site
Map Prepared by Monterey County Planning Dept. October 24, 2006
Sources: Monterey County IT/GIS= Roads, City Limits, Monterey County Assessor= Parcels , Monterey County Planning Dept.= Planning Areas,
Fort Ord Reuse Authority= Land Use
0 0.5 1 1.5 2 Miles
MARINA
RESERVATION RD
BLANCO RD
INTERGARRISON RD
SALINAS
Salinas River
SEASIDE
GENERAL JIM MOORE BLV
DEL REY OAKS
MONTEREY
1
68
E

Figure # LU6a


Mid-Carmel Valley - Detail
Carmel Valley Village - Detail
Mouth of Carmel Valley - Detail
Land use within the Coastal Zone is addressed in the Carmel LUP.
Mouth of Carmel Valley See Detail
Mid-Carmel Valley See Detail
Carmel Valley Village See Detail
See Fort Ord Master Plan for this area
Greater Monterey Peninsula
Cachagua
MONTEREY COUNTY
Land Use Plan
Carmel Valley Master Plan
Highway
Road
Coastal Zone Bondary
Planning Area
City Limits
Park Boundary
Parcel
Airport
Residential - red figure = Acres/Unit*
Residential - Rural Density 5 Acres+/Unit
Residential - Low Density 5 - 1 Acres/Unit
Residential - red figure = Units/Acre*
Residential - Medium Density 1 - 5 Units/Acre
Residential - High Density 5 - 20 Units/Acre
Carmel Valley Ranch Master Plan
Agricultural - red figure = Acre Minimum*
Rural Grazing 10 - 160 Acre Minimum
Permanent Grazing 10 - 160 Ac Min
Commercial
Commercial
Heavy Commercial
Planned Commercial
Visitor Accomodations/Professional Offices
Resource Conservation 10 - 160 Acre Minimum
Resource Conservation - red figure = Acre Minimum*
Open Space
Public/Quasi-Public
Rivers and Water Bodies
Affordable Housing Overlay
Special Treatment Area & Policy #
Urban Reserve
*No density value indicates development limited to lots of record.
Map Prepared by: Monterey County Resource Management Agency, July 13, 2011.
Sources: Roads = Monterey County IT/GIS, Parcels = Monterey County Assessor, City Limits and Urban Reserve = Monterey County LAFCO.
Coastal Zone Boundary = California Coastal Commission.
Adopted by the Board of Supervisors October 26, 2010.
Figure #LU3
Miles



EMC Planning Group Inc. Rev.: 7/30 /01 5:45PM

FORT ORD REUSE PLAN

Fort Ord Reuse Authority (FORA)

Land Planning	EDAW, Inc. EMC Planning Group, Inc.
Market Analysis	Sedway Kotin Mouchly Group
Transportation Engineering	JHK and Associates
CMII Engineering	Reimer Associates
Fiscal Analysis	Angus McDonald Associates
Habitat Planning	Zander Associates
Public Communications	The Ingram Group
Community Development	Resource Corps International

LEGEND:

- SFD Low Density Residential
- SFD Medium Density Residential
- MFD High Density Residential
- Residential Infill Opportunities
- Hwy 68 Bypass ROW; Development with Restrictions
- Planned Development Mixed Use District
- Business Park/Light Industrial Office/R & D
- Convenience Retail
- Neighborhood Retail
- Regional Retail
- Visitor Serving
- G — Golf Course Opportunity Site
- Hotel Opportunity Site
- Eq — Equestrian Center Opportunity Site
- Open Space/Recreation
- Habitat Management
- School/University
- University Medium Density Residential
- H — Alternative High School Sites
- Public Facility/Institutional
- Military Enclave
- VC — Veterans Cemetary

SHEET TITLE:

LAND USE CONCEPT ULTIMATE DEVELOPMENT

0 750 1500 3000 4500

NORTH

SOURCE:
Jones & Stokes, 1995
Reimer Associates, (Re-Projected), 1995
Monterey County, 1995
EDAW, Inc., 1996

FIGURE:

3.3-1

FORAUSE.DWG

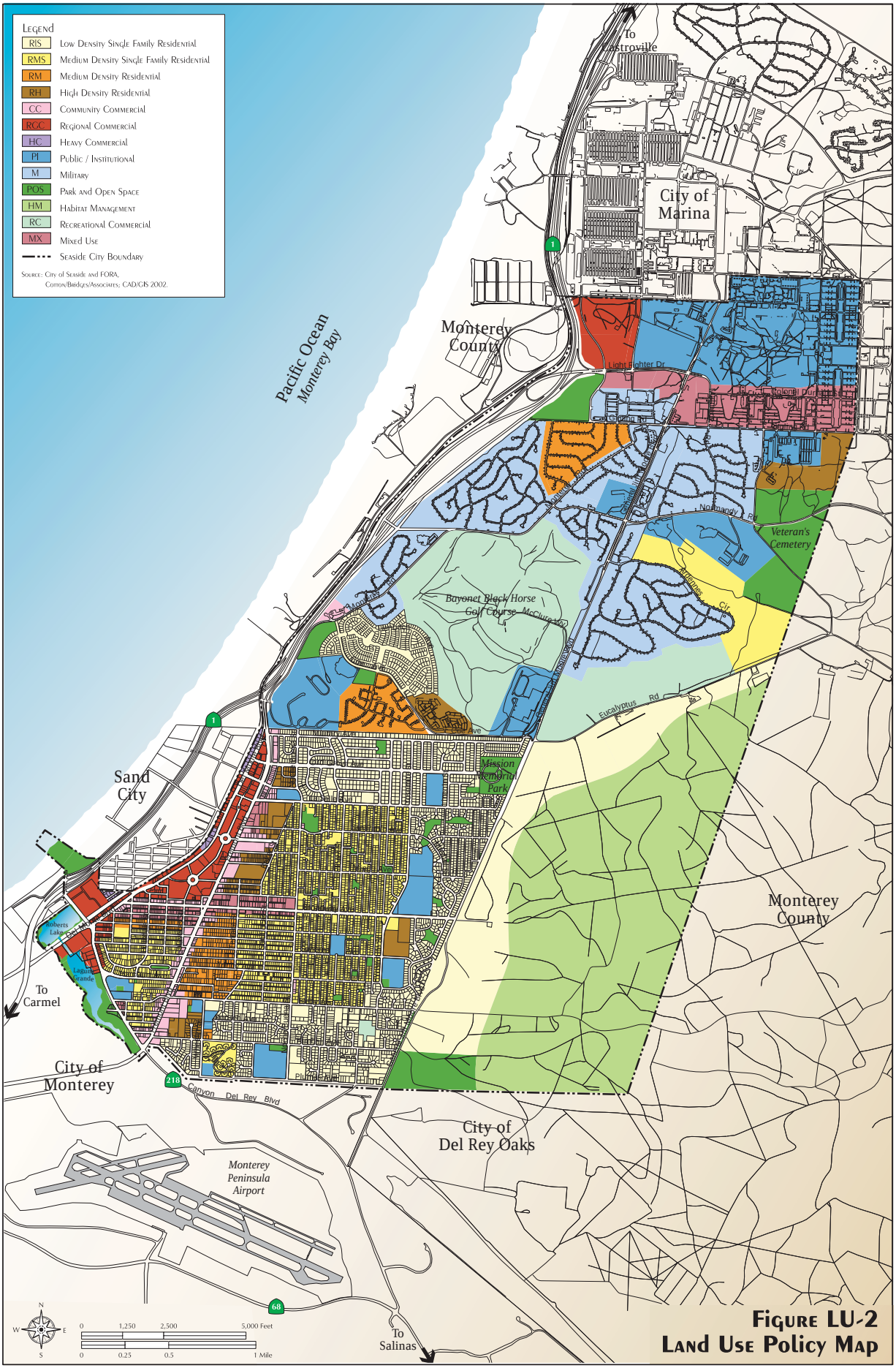
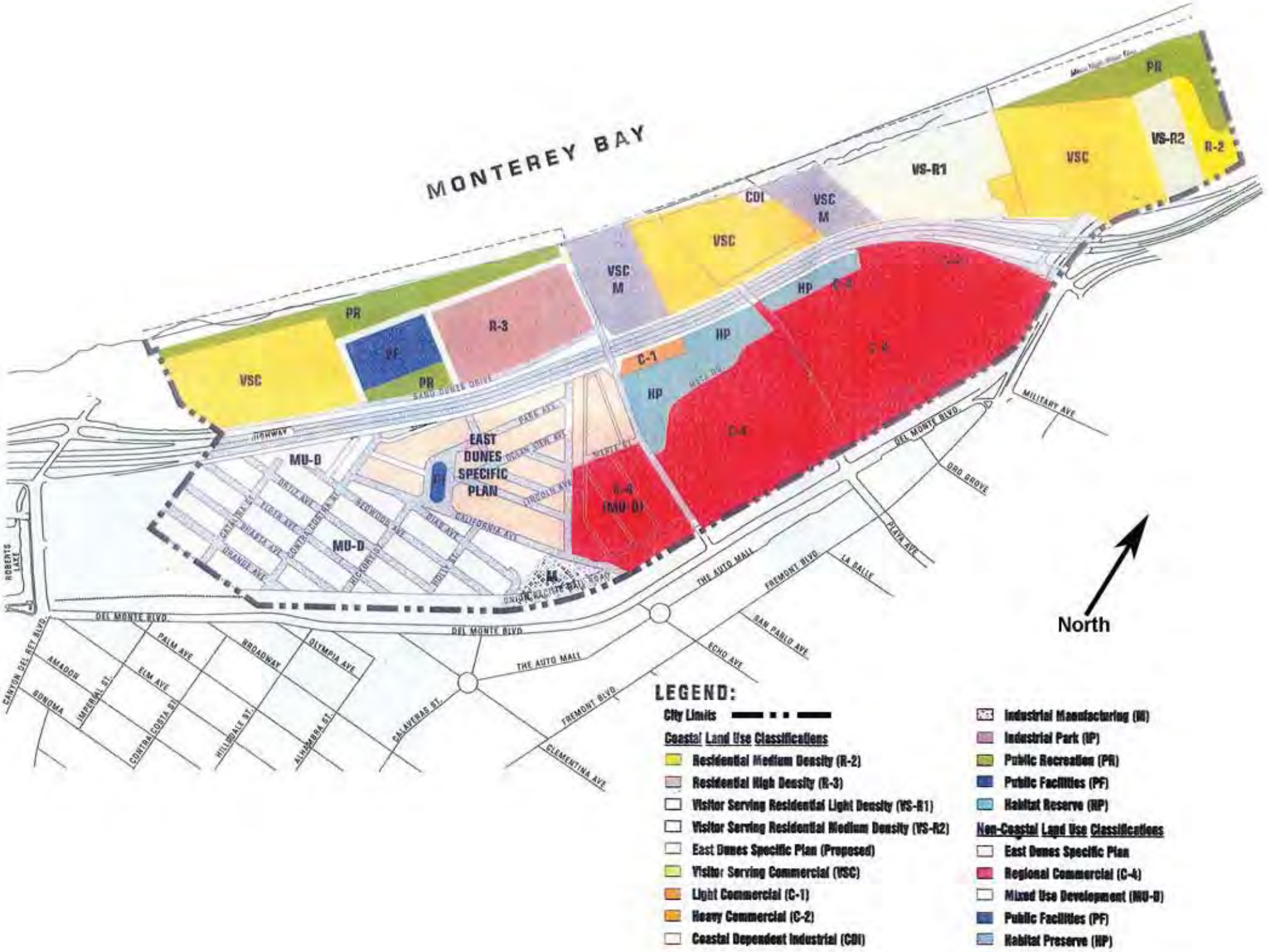
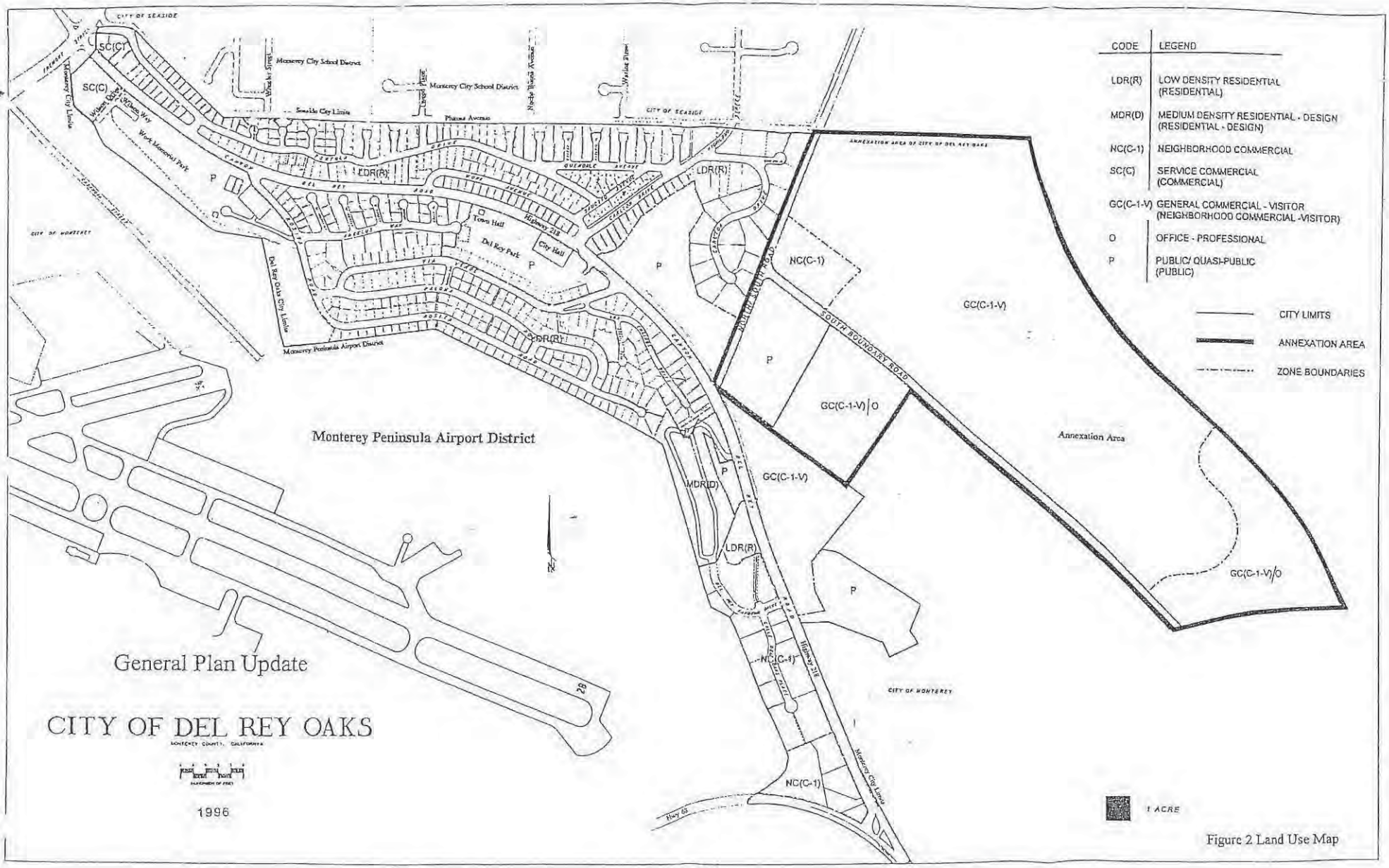


Figure LU-2
Land Use Policy Map


MONTEREY BAY
PR
VS-R1
VSC
VS-R2
R-2
CDI
VSC
M
VSC
VSC
PR
R-3
PF
PR
VSC
HP
C-4
HP
C-1
HP
C-4
C-4
(MU-D)
EAST
DUNES
SPECIFIC
PLAN
MU-D
MU-D
SAND DUNES DRIVE
HIGHWAY
PAGE AVE.
OCEAN VIEW AVE.
VIRGINIA AVE.
CALIFORNIA AVE.
MILITARY AVE
DEL MONTE BLVD.
ORO GROVE
PLAYA AVE
LA SALLE
THE AUTO MALL
FREMONT BLVD.
SAN PABLO AVE
ECHO AVE
ROBERTS LAKE
CANYON DEL REY BLVD.
DEL MONTE BLVD
DEL MONTE BLVD
PALM AVE
BROADWAY
OLYMPIA AVE
AMADOR
IMPERIAL ST.
ELM AVE
SONOMA
CONTRA COSTA ST.
HILLSDALE ST.
ALHAMBRA ST.
CALAVERAS ST.
THE AUTO MALL
FREMONT BLVD.
CLEMENTINA AVE
North
LEGEND:
City Limits
Coastal Land Use Classifications
Residential Medium Density (R-2)
Residential High Density (R-3)
Visitor Serving Residential Light Density (VS-R1)
Visitor Serving Residential Medium Density (VS-R2)
East Dunes Specific Plan (Proposed)
Visitor Serving Commercial (VSC)
Light Commercial (C-1)
Heavy Commercial (C-2)
Coastal Dependent Industrial (CDI)
Industrial Manufacturing (IM)
Industrial Park (IP)
Public Recreation (PR)
Public Facilities (PF)
Habitat Reserve (HP)
Non-Coastal Land Use Classifications
East Dunes Specific Plan
Regional Commercial (C-4)
Mixed Use Development (MU-D)
Public Facilities (PF)
Habitat Preserve (HP)



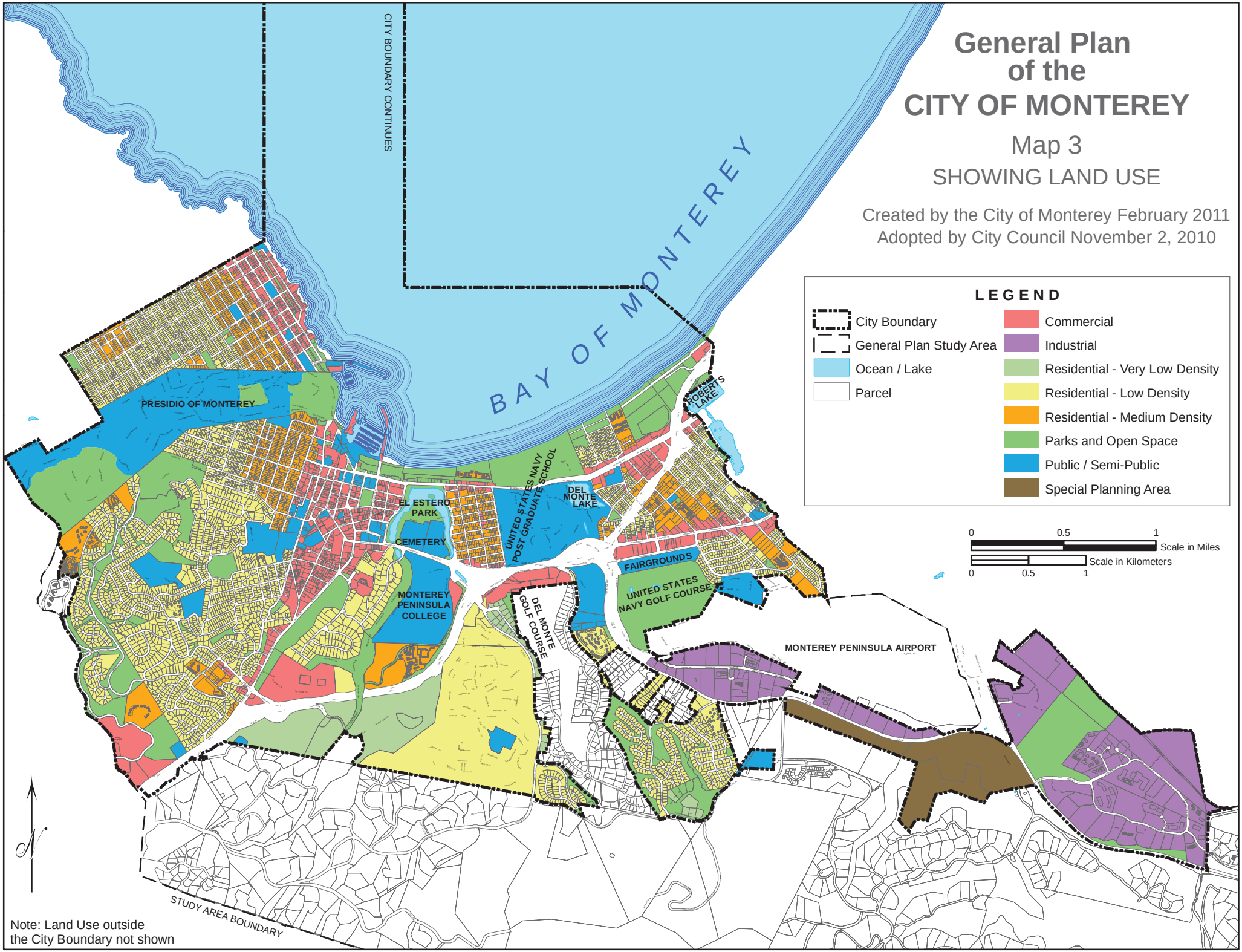
General Plan Update

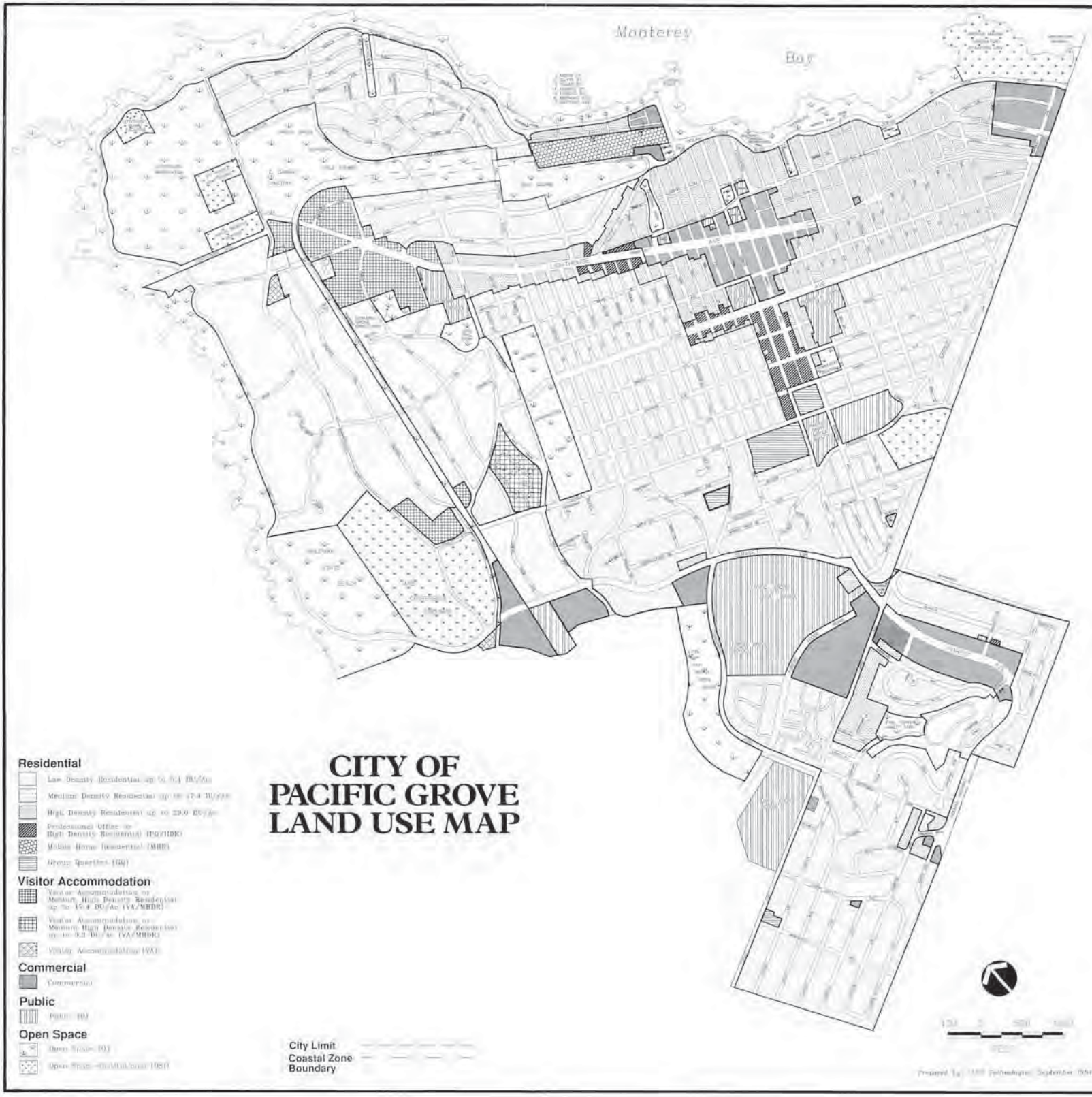
CITY OF DEL REY OAKS

MONTEREY COUNTY, CALIFORNIA

1996

Figure 2 Land Use Map


General Plan
of the
CITY OF MONTEREY
Map 3
SHOWING LAND USE
Created by the City of Monterey February 2011
Adopted by City Council November 2, 2010
LEGEND
City Boundary
General Plan Study Area
Ocean / Lake
Parcel
Commercial
Industrial
Residential - Very Low Density
Residential - Low Density
Residential - Medium Density
Parks and Open Space
Public / Semi-Public
Special Planning Area
0 0.5 1
Scale in Miles
0 0.5 1
Scale in Kilometers
CITY BOUNDARY CONTINUES
BAY OF MONTEREY
PRESIDIO OF MONTEREY
ROBERTS LAKE
UNITED STATES NAVY POST GRADUATE SCHOOL
DEL MONTE LAKE
EL ESTERO PARK
CEMETERY
FAIRGROUNDS
UNITED STATES NAVY GOLF COURSE
MONTEREY PENINSULA COLLEGE
DEL MONTE GOLF COURSE
MONTEREY PENINSULA AIRPORT
STUDY AREA BOUNDARY
N
Note: Land Use outside
the City Boundary not shown



CITY OF PACIFIC GROVE LAND USE MAP

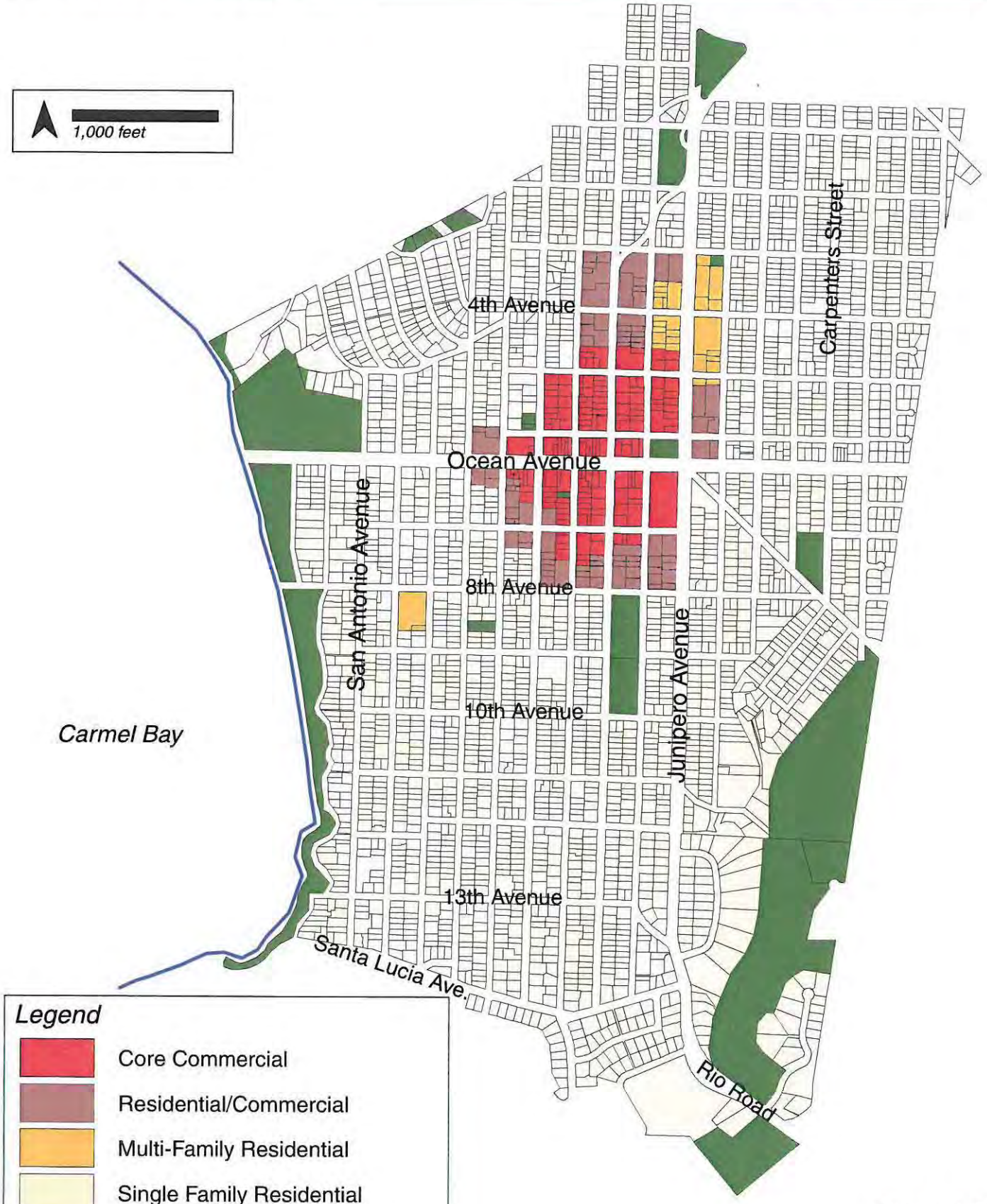


Figure 1.3
General Plan Land Use Map

Appendix 2-c

Seaside Basin Salt and Nutrient Management Plan

DRAFT

DRAFT

Seaside Groundwater Basin
Salt & Nutrient Management Plan

Prepared for:
Monterey Peninsula Water Management District





Prepared by:

March 2014

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TABLE OF CONTENTS

Abbreviations ..... **vi**

Section 1 Introduction **1**
1.1 Background 1
1.2 Goals 1
1.3 Objectives 1
1.4 Regulatory Requirements 3
1.4.1 Basin Plan and Beneficial Uses 3
1.4.2 Storm Water Regulations 3
1.4.3 Recycled Water Policy 5
1.4.4 Groundwater Basin Adjudication 5

Section 2 Stakeholder Process **7**
2.1 Stakeholder Identification 7
2.2 Stakeholder Involvement 7

Section 3 Basin Characteristics **9**
3.1 Basin Boundary 9
3.2 Basin Physiography 10
3.3 Watersheds And Hydrology 10
3.4 Climate 13
3.5 Geologic/Hydrogeologic Framework 15
3.5.1 Stratigraphy and Hydrostratigraphy 15
3.5.2 Structural Geology 17
3.6 Groundwater Occurrence 19
3.6.1 Groundwater in the Aromas Sands 19
3.6.2 Groundwater in Paso Robles Aquifer 19
3.6.3 Groundwater in Santa Margarita/ Purisima Aquifers 19
3.7 Groundwater Flow 20
3.7.1 Horizontal Flow Directions 20
3.7.2 Vertical Flow Gradients 20
3.8 Land Uses and Land Cover 23
3.9 Beneficial Water Uses 25
3.10 Surface / Storm Water Quality 25
3.11 Groundwater Quality 29
3.11.1 Groundwater Quality Description 29
3.11.2 Existing Groundwater Quality 37
3.11.3 Historical Groundwater Quality 41

3.11.4 Groundwater Water Quality Objectives 43
3.12 Imported Water Quality 43
3.12.1 Salinas Valley Groundwater 43
3.12.2 Carmel River System Water 44
3.13 Recycled Water Quality 45
3.14 Sand City Desalination Brine Quality 45
3.15 Rainfall Water Quality 46

Section 4 Salt and Nutrient Sources 47
4.1 Existing Sources 47
4.1.1 Deep Percolation of Rainfall 48
4.1.2 Mineral Dissolution 48
4.1.3 Storm Water 49
4.1.4 Landscape and Golf Course Fertilization 49
4.1.5 Carmel River System Water 50
4.1.6 Salinas Valley Groundwater Water 51
4.1.7 City of Sand City Desalination Plant 52
4.1.8 Irrigation with Recycled Water 52
4.1.9 Seaside Basin Groundwater Return Flow 54
4.1.10 Septic Systems 54
4.1.11 System Losses 55
4.2 Proposed Sources 55
4.2.1 Regional Urban Water Augmentation 55
4.2.2 Groundwater Replenishment Project 56
4.2.3 MPWMD/Cal-Am Aquifer Storage Project Phase II 56

Section 5 Existing Groundwater Monitoring Programs 57

Section 6 Existing Databases 64
6.1 Existing Database Identification and Description 64
6.2 Recommended Database 64

Section 7 Salt and Nutrient Evaluation 66
7.1 Water Balance 66
7.1.1 Conceptual Model 66
7.1.2 Inflows 68
7.1.3 Outflows 72
7.2 Salt and Nutrient Balances 74
7.2.1 Loading 74
7.2.2 Removal 83

7.2.3 Discussion of Overall Salt and Nutrient Loading 84
7.3 Assimilative Capacity 85
7.4 Anti-degradation Analysis 86

Section 8 Salt and Nutrient Management Strategies 88
8.1 Actions To Manage Salt and Nutrient Loading 88
8.2 Management Triggers 89

Section 9 Salt and Nutrient Monitoring Program 92
9.1 Goals and Objectives 92
9.2 Location of Monitoring Features 92
9.3 Constituents to be Monitored 92
9.4 Sampling Frequency 93
9.5 Stakeholder Roles and Responsibilities 93
9.6 Reporting 93

Section 10 Implementation Measures 94
10.1 Total Dissolved Solids 94
10.2 Chloride 94
10.3 Nitrate 95

Section 11 References 96

Appendix A: Monterey Peninsula Aquifer Storage and Recovery Project – Sampling and Analysis Plan

Appendix B: Water Balance Spreadsheet

Appendix C: Salt and Nutrient Loading Spreadsheet

LIST OF FIGURES

Figure 1: Seaside Groundwater Basin Boundary 11
Figure 2: Seaside Groundwater Basin Watersheds and Hydrology 12
Figure 3: Distribution of Rainfall 14
Figure 4: Geology and Faults 16
Figure 5: Top of the Monterey Formation (Base of Basin) 18
Figure 6: Shallow Groundwater Elevation Map – July/August 2012 21
Figure 7: Deep Groundwater Elevation Map – July/August 2012 22
Figure 8: Land Use 24
Figure 9: Storm Water Monitoring Site Catchments with Land Use 28
Figure 10: Stiff Diagrams of Monitoring Wells in the Northern Coastal, Southern Coastal, and Laguna Seca subareas 30
Figure 11: Wells with TDS Data and Selected Graphs of TDS Concentrations over Time 31
Figure 12: ASR MW-1 Historical TDS Concentrations 32
Figure 13: Wells with Nitrate Data and Graphs of Nitrate-N Concentrations over Time 34
Figure 14: Water Quality Zones for Total Dissolved Solids 38
Figure 15: Water Quality Zones for Chloride 39
Figure 16: Water Quality Zones for Nitrate-N 40
Figure 17: Location of Wells Monitored (Production and Dedicated Monitoring Wells) 62
Figure 18: Conceptual Water Balance 67
Figure 19: Conceptual Salt and Nutrient Balance 75

LIST OF TABLES

Table 1: Seaside Basin Beneficial Uses 25
Table 2: 2009 - 2012 Range in Storm Water Quality Collected by Monterey Bay Sanctuary Citizen Watershed Monitoring Network 27
Table 3: Hardness Classification 32
Table 4: Seaside Basin Groundwater Quality Ranges 35
Table 5: Seaside Basin Existing Groundwater Quality 37
Table 6: Comparison of 1979/1980 Water Quality with Current Water Quality 42
Table 7: Seaside Basin Groundwater Quality Objectives 43
Table 8: Imported Salinas Valley Water Quality for Bayonet and Black Horse Golf Course Irrigation and Municipal Supply by Marina Coast Water District 44
Table 9: Imported Water Quality from the Carmel River System by Cal-Am 44
Table 10: Nicklaus Club-Monterey Recycled Water Quality for Golf Course Irrigation 45
Table 11: Water Quality of Rain Water 46
Table 12: Summary of Existing Salt and Nutrient Sources 47
Table 13: Summary of Estimated Seaside Basin Golf Course Fertilizer Application 50
Table 14: Comparison of Groundwater Supply, Influent, and Effluent from 2006 - 2010 53
Table 15: Pasadera Wastewater Treatment and Recycling Facility Effluent Volumes for 2012 54
Table 16: Summary of Foreseeable Salt and Nutrient Sources 55
Table 17: Wells in the Laguna Seca Subarea Included in Existing Monitored Programs 59
Table 18: Wells in the Northern Coastal Subarea Included in Existing Monitored Programs 60
Table 19: Wells in the Northern Inland and Southern Coastal Subareas Included in Existing Monitored Programs 61
Table 20: Seaside Basin Water Balance 69
Table 21: Seaside Basin TDS Balance 76
Table 22: Seaside Basin Chloride Balance 77
Table 23: Seaside Basin Nitrate-N Balance 78
Table 24: Source Concentrations used for Salt and Nutrient Loading Calculations 79
Table 25: Summary of Estimated Seaside Basin Golf Course Fertilizer Application 82
Table 5: Seaside Basin Assimilative Capacity 85
Table 26: Proposed Salt and Nutrient Management Measures 90

ABBREVIATIONS

AFY	acre-feet per year
ASR	aquifer, storage and recovery
BMP	best management practices
CCR	California Code of Regulations
CDPH	California Department of Public Health
CEC	chemical of emerging concern
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CIMIS	California Irrigation Management Information System
DWR	California Department of Water Resources
ET	evapotranspiration
GWRP	Groundwater Replenishment Project
IRWMP	Integrated Regional Water Management Plan
MCL	maximum contaminant levels
MCWD	Marina Coast Water District
mg/L	milligrams per liter
MMP	monitoring and management program
MPWMD	Monterey Peninsula Water Management District
MRSWMP	Monterey Regional Storm Water Management Program
MRWPCA	Monterey Regional Water Pollution Control Agency
NPDES	National Pollutant Discharge Elimination System
POTW	publically owned treatment works
RUWAP	Regional Urban Water Augmentation Project
RWQCB	Regional Water Quality Control Board
SNMP	Salt and Nutrient Management Plan
SVRP	Salinas Valley Reclamation Plant
SWRCB	State Water Resources Control Board
TAC	Watermaster's Technical Advisory Committee
TDS	total dissolved solids
USGS	United States Geological Survey
WDR	waste discharge requirements
WQO	water quality objectives

SECTION 1
INTRODUCTION

1.1 BACKGROUND

As part of State Water Resources Control Board (SWRCB) adopted Resolution No. 2009-0011, which established a statewide Recycled Water Policy, salt and nutrient management plans (SNMP) for each groundwater basin in California are required by 2014. The SNMP are called for to facilitate management of salts and nutrients in a manner that optimizes recycled water use while ensuring protection of groundwater supply and beneficial uses, agricultural beneficial uses, and human health. The SNMP identifies sources, transport and fate of salts and nutrients in surface water and groundwater within the Seaside Basin.

The Seaside Basin SNMP has been prepared in response to the Recycled Water Policy requirement to complete a SNMP by the end of 2014. Its development dovetails with an update to the Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan (IRWMP). Funding for the SNMP and IRWMP update is provided by the California State Department of Water Resources (DWR) as part of a Proposition 84 IRWM Planning Grant.

1.2 GOALS

The goals of the SNMP are the same as those identified in the IRWMP in 2007:

> *Protect and improve water quality for beneficial uses consistent with regional community interests and the RWQCB basin plan through planning and implementation in cooperation with local and state agencies and regional stakeholders*.

1.3 OBJECTIVES

Meet or exceed all applicable water quality regulatory standards.
The primary objective of the SNMP is to protect groundwater in the Seaside Basin. To achieve this, programs need to be in place to ensure that water quality regulations are either met or exceeded. This includes activities that can mitigate current problems and evade possible future water quality degradation, e.g., seawater intrusion.

Meet or exceed urban water quality targets established by stakeholders.
Targets set by municipal and industrial stakeholders that are beyond regulatory requirements should be met or exceeded.

Meet or exceed recycled water quality targets established by stakeholders.
In order to promote public and private recycled water demand, it is important that water quality targets set by stakeholders not only meet regulatory requirements but also meet the requirements or expectations of the eventual end-users.

Protect surface waters from contamination
All surface waters in the planning region should be protected from contamination and the threat of contamination. Protecting surface waters that drain to Monterey Bay will protect the Monterey Bay National Marine Sanctuary. The Monterey Regional Storm Water Management Program is currently being implemented to assist in meeting this objective.

Protect the Seaside Basin from contamination and threat of contamination.
The Seaside Basin should be protected from contamination and the threat of contamination. This includes protecting from point-source and non-point-source pollutants and preventing sea-water intrusion.

Minimize impacts from storm water (or urban) runoff through implementation of Best Management Practices or other alternatives.
The discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The planning Region is subject to Phase II NPDES requirements which are intended to address potentially adverse impacts to water quality and aquatic habitat by instituting the use of controls on the unregulated sources of storm water discharges that have the greatest likelihood of causing continued environmental degradation.

1.4 REGULATORY REQUIREMENTS

1.4.1 BASIN PLAN AND BENEFICIAL USES

The Central Coast Regional Water Quality Control Board (RWQCB) relies on its adopted "Water Quality Control Plan for the Central Coast Basin Plan" (Basin Plan) to manage surface and groundwater in order to provide the highest water quality reasonably possible. The Basin Plan lists beneficial uses and describes water quality objectives to maintain water quality, describes programs, projects, and other actions to achieve the plan's standards, summarizes plans and policies to protect water quality, and describes statewide and regional monitoring programs.

The RWQCB implements the Basin Plan by issuing and enforcing waste discharge requirements (WDR, non-water body discharges) and National Pollutant Discharge Elimination System (NPDES) permits (surface water body discharges) for point discharges, establishment of water-quality based effluent limitations, prohibitions of discharge, and the review and establishment of Total Maximum Daily Loads.

Each water body under the Basin Plan is designated one or more beneficial uses such as domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources. Section 3.9 identifies all beneficial uses in the Seaside Basin.

Monitoring activities to determine compliance with water quality objectives include discharger self-monitoring required under WDRs and NPDES permits, and monitoring undertaken by the RWQCB through its Central Coast Ambient Monitoring Program.

1.4.2 STORM WATER REGULATIONS

The 1987 amendments to the Clean Water Act added Section 402(p) provides a framework for regulating certain storm water discharges under the NPDES program. Separate permits are required for municipal, industrial, and construction activities.

Since March 10, 2003, municipal storm water permits for urbanized areas in the Seaside Basin have been covered under EPA's Storm Water Phase II Final Rule (December 1999), which established application requirements for storm water permits for additional operators of MS4s in urbanized areas. In 2000, the cities in the Southern Monterey Bay area (including all those in the Seaside Basin), Monterey County, and the Pebble Beach Company formed a Working Group to develop a storm water management program and secure a Phase II NPDES permit from the RWQCB. The Working Group developed the Monterey Regional Storm Water Management Program (MRSWMP) and permit coverage was issued by the RWQCB in September 2006. The MRSWMP is currently being implemented by the participating entities. Under the permit, there are six types of pollution control activity: public education, pollution source identification and abatement, water quality monitoring, land use regulations, construction site regulation and control of municipal operations.

The MRSWMP contains a series of management practices, referred to as "Best Management Practices" (BMPs). These BMPs are designed to reduce the discharge of pollutants from the municipal separate storm sewer systems to the "maximum extent practicable," to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act.

Storm water associated with industrial activities that discharge either directly to surface waters or indirectly through separate municipal storm sewers must be regulated by an NPDES permit (Water Quality Order No. 97-03-DWQ, General Permit No. CAS000001).

Currently, the SWRCB has adopted a separate statewide general permit for construction activities disturbing an area greater than one acre (Order No. 2012-0006-DWQ, NPDES No. CAS000002). The intentions of this permit are to eliminate or reduce non-storm water discharges to storm sewer systems and other waters, and to implement and perform inspections of Best Management Practices (BMPs). State agencies such as Caltrans, municipal agencies and private construction activities are subject to this permit.

1.4.3 RECYCLED WATER POLICY

In an effort to increase availability and reliability of existing supplies, the use of recycled water has been increasing in California. In 2009, the SWRCB adopted the Recycled Water Policy (February 2009) to address long-term water quality issues raised by water reuse. As part of the policy, salt and nutrient management plans (SNMP) for each groundwater basin in California are required by 2014 to facilitate management of salts and nutrients in a manner that optimizes recycled water use while ensuring protection of groundwater supply and beneficial uses, agricultural beneficial uses, and human health. The policy was revised in January 2013 to include Chemicals of Emerging Concern (CECs) monitoring requirements for planned and future intentional recycled water recharge projects.

The Recycled Water Policy states that Salt and Nutrient Management Plans need to be completed by 2014 to facilitate basin-wide management of salt and nutrient from all sources in a manner that optimizes recycled water use while ensuring protection of groundwater supply and beneficial uses, agricultural beneficial uses, and human health.

The RWQCB through its regulation of waste discharges, requires operators of publically owned treatment works (POTW) to develop implementation plans to meet the objectives of the Recycled Water Policy.

1.4.4 GROUNDWATER BASIN ADJUDICATION

In 2006, the Monterey County Superior Court (*California American Water v. City of Seaside et al., Case No. M66343*) concluded that groundwater production within the Seaside Basin exceeds the Natural Safe Yield and therefore a physical solution that reduces production to the Natural Safe Yield was established to prevent seawater intrusion and its deleterious effects on the Basin. The adjudication process led to the issuance of the Court Decision (amended in 2007) that created the Seaside Groundwater Basin Watermaster (Watermaster). The Watermaster's role is to administer and enforce the provisions of the Amended Decision (California American Water v. City of Seaside et al., 2007). The Watermaster consists of nine representatives (number of representative in parentheses) from Cal-Am (1), City of Seaside (1), City of Sand City (1), City of Monterey (1), City of Del Rey Oaks (1), Landowner Group (2), Monterey Peninsula Water Management District (1), and Monterey County/Monterey County Water Resources Agency (1).

The threat of seawater intrusion is managed by the Court Decision in part by triennial pumping reductions which end in 2021 at the Natural Safe Yield of 3,000 acre-feet per year (AFY). The Decision required that a monitoring and management plan (MMP) be implemented that was consistent with criteria outlined in the Decision. This MMP was completed in September 2006 and approved by the Court in February 2007 to ensure that the Seaside Groundwater Basin is protected and managed as a perpetual source for beneficial users. The MMP includes groundwater production, groundwater level, and groundwater quality monitoring. Details of the MMP monitoring plan are provided in Section 5.

It should be noted that the adjudicated basin boundary is slightly different than the basin boundary that is used for this SNMP. A discussion of the different boundaries is presented in Section 3.1.

SECTION 2
STAKEHOLDER PROCESS

Stakeholder involvement is key to the success of developing and implementing a SNMP. The stakeholders are those responsible for ensuring the plan is carried out and updated as needed to reflect changing land use and activities within the basin.

2.1 STAKEHOLDER IDENTIFICATION

The Watermaster has a Board that comprises the City of Seaside, Laguna Seca subarea landowners, Monterey Peninsula Water Management District, City of Sand City, California American Water, City of Del Rey Oaks, Monterey County/Monterey County Water Resources Agency, Coastal subarea landowners, and the City of Monterey. These Board members account for most of the stakeholders in the basin. Others that are not as directly represented on the Board include the following golf courses: Nicklaus Club-Monterey (formerly Pasadera Country Club), Laguna Seca Golf Ranch, and Black Horse and Bayonet, which are owned by the City of Seaside.

2.2 STAKEHOLDER INVOLVEMENT

During the course of the SNMP development, the Watermaster's Technical Advisory Committee (TAC) was kept updated on development and asked to provide direction on key issues.

- May 9, 2012 – presentation to TAC on content of SNMP, and information request that will be issued to golf courses and other stakeholders with potential salt and nutrient loading activities.

- February 13, 2013 – TAC input on which basin boundary to use for the SNMP. The topic was referred to the Board who deferred it to the RWQCB's decision.

- January 8, 2014 – presentation to the TAC on SNMP findings and way forward.

- April 2014 – presentation to the Seaside Basin Watermaster TAC and Board to present findings of the SNMP.

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SECTION 3
BASIN CHARACTERISTICS

3.1 BASIN BOUNDARY

The Seaside basin as a subbasin of the Salinas Valley Basin is delineated by the DWR in Bulletin 118 as shown on Figure 1. This delineation of the basin has not been used historically or currently for management purposes. There are more relevant basin boundaries which are discussed below that are used in place of the DWR boundary. The Seaside Basin boundary that is included as Exhibit B of the original adjudication decision (Decision) filed March 27, 2006, is from Figure 2-1 of the CH2MHill 2004 report titled *Hydrogeologic Assessment of the Seaside Groundwater Basin*. Although not stated in that report, the overall basin boundaries, subbasin and subarea boundaries are taken from Plate 1 of the Fugro West, Inc. 1997 (Fugro 1997) report titled *Hydrogeologic Assessment, Seaside Coastal Groundwater subareas, Phase III Update*. The overall basin boundary used in the Fugro 1997 report was in turn based on Figure 3 of the U.S. Geological Survey 1982 report titled *Ground Water in the Seaside Area, Monterey County, California* (Muir, 1982). The northern and eastern boundaries delineated in this report were based on very limited geologic control and groundwater levels. Figure 1 shows the basin boundary used for the adjudication decision.

The overall basin boundaries of the adjudication decision are therefore based on reconnaissance-level analyses published by the USGS in 1982. The basin boundary was revised as part of an updated investigation of the Seaside Basin as described by Yates et al. (2005). Due to this more recent and detailed analysis of boundary conditions by Yates et al. (2005), this boundary is considered as the most current and accurate documented depiction of the basin boundaries and has been used in the Monterey Peninsula IRWMP. Figure 1 shows the difference between the adjudicated and updated boundaries.

Per the Decision, the basin is divided into four subareas. The coastal area west of the former Fort Ord boundary is divided into a Northern Coastal subarea and a Southern Coastal subarea by the extension of the Laguna Seca anticline (Figure 1). Similarly the area east of the former Fort Ord boundary is divided by the Laguna Seca anticline into the Northern Inland subarea and the Laguna Seca subarea.

3.2 BASIN PHYSIOGRAPHY

The Seaside basin is located adjacent to Monterey Bay in Monterey County. It underlies the Cities of Seaside, Sand City, Del Rey Oaks, Monterey, and portions of unincorporated county areas, including portions of former Fort Ord, and the Laguna Seca area. The basin is bounded by the Pacific Ocean to the west, the Salinas Valley to the north, the Toro Park area to the east, and Highways 68 and 218 to the south (Figure 1). An active dune system along the coast dominates the coastal topography, with older less active dunes found inland, mostly within the former Ford Ord open space. This hilly coastal plain, slopes both northwards to the Salinas River Valley and westwards towards the Monterey Bay. Elevations in the basin range from sea level at the coast to 950 feet above mean sea level inland.

3.3 WATERSHEDS AND HYDROLOGY

The groundwater basin contains a number of watersheds defined by the DWR that are part of the Salinas Hydrologic Unit (Figure 2). Pilarcitos Canyon and Corral de Tierra Valley watersheds drain northeast to the Salinas Valley, while the Laguna Seca and Monterey watersheds drain northwest to the Pacific Ocean.

There are few flowing creeks in the basin because of the permeable nature of the soils. The only creek with a defined channel is the Arroyo del Rey which flows intermittently in Canyon del Rey to the south of the basin, roughly alongside Highway 68 and 218 (Canyon del Rey Blvd), and into Laguna Grande Lake, through Roberts Lake and eventually into Monterey Bay through a series of flow control structures. Flow in the creek responds rapidly to rainfall, and is usually dry in the summer months. Creeks in the area have a "flashy" nature and readily lose water to streambed seepage. There are no natural surface water bodies within the basin boundary. Just south of the basin boundary, the coastal man-made lakes: Laguna Grande / Roberts Lake are found (Figure 2). Although these lakes do not fall directly within the basin boundaries, their catchments do include part of the Seaside basin.

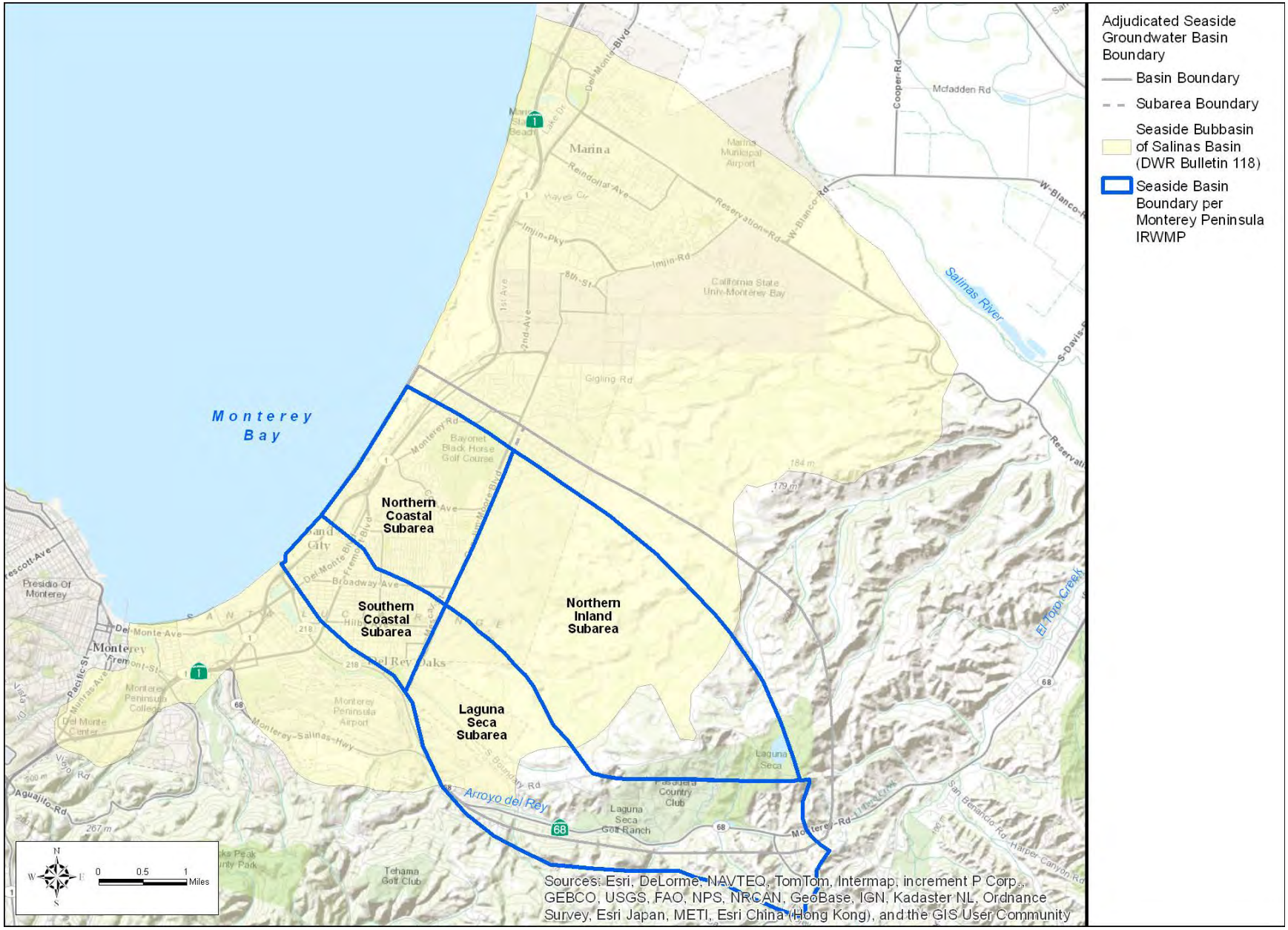


Figure 1: Seaside Groundwater Basin Boundary

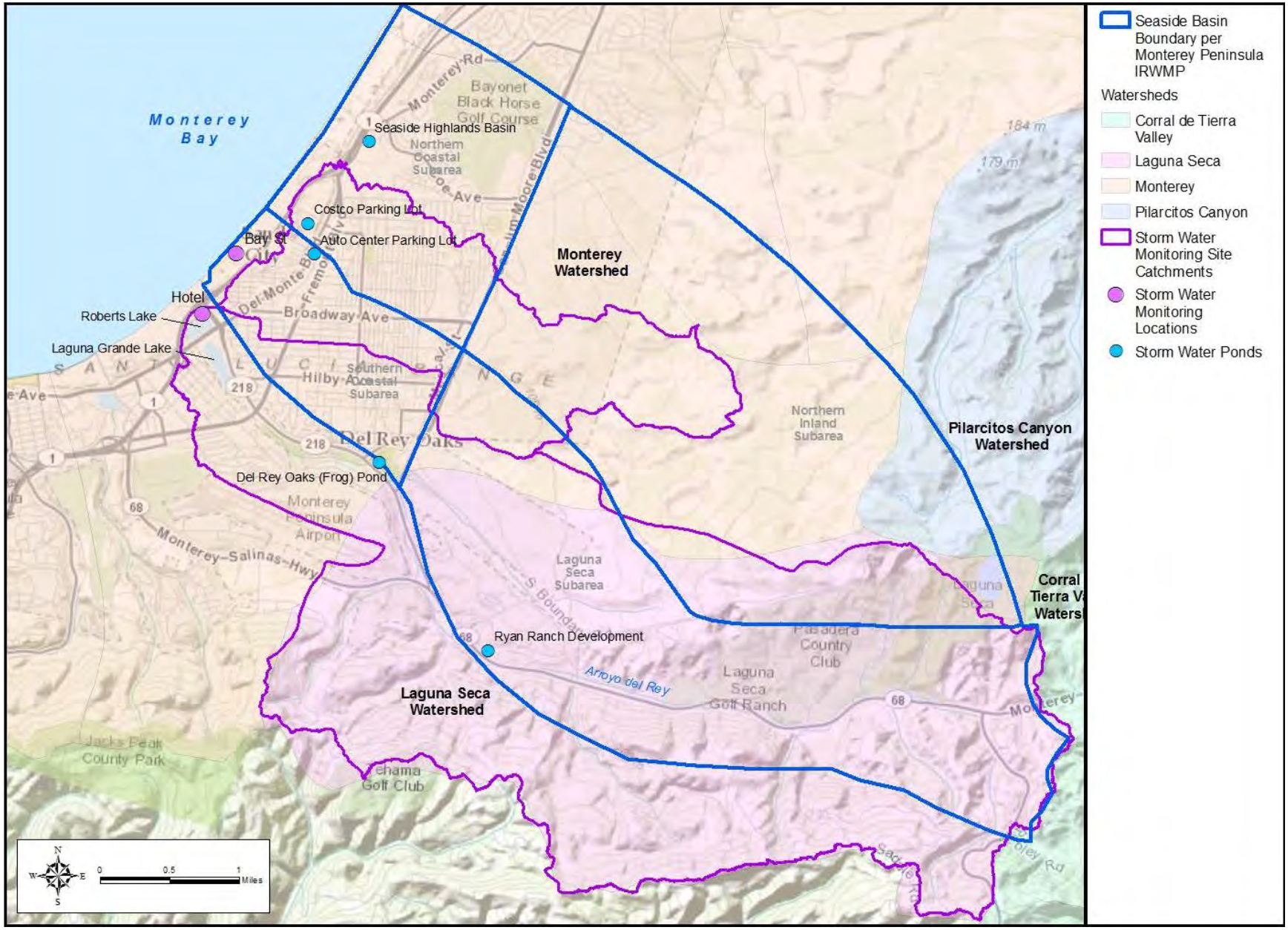


Figure 2: Seaside Groundwater Basin Watersheds and Hydrology

3.4 CLIMATE

The area experiences a Mediterranean-type, semi-arid climate, with warm dry summers and mild winters. Ninety percent of its annual rainfall falls in the months between November and April. There is no long-term weather station in the Seaside basin. The closest long-term climate stations are Monterey Station (045795) and Salinas#2 (047668). The Monterey Station is approximately 3.5 miles to the west of the Seaside Basin, and the Salinas Station approximately seven miles to the northeast (Figure 3). As shown by the isohyetal map on Figure 3, the rainfall across the Seaside basin varies from 14 inches near the Salinas Valley to 20 inches at the southern boundary. An average of the two stations is therefore a good measure of the average rainfall experienced by the basin. Averaging the rainfall from both stations for Water Year 1959 through 2011 gives an average of 16.5 inches per year. The rainfall over this period has ranged from 8 to 41 inches per year. Most years have below average rainfall but the years that are over the average are often at least 10 inches over the average. Figure 3 includes a plot of the annual rainfall from Water Year 1959 to 2011 for each station, and includes a cumulative departure from mean annual rainfall plot for the Monterey Station to show rainfall trends over time. The plot shows there were dry periods between 1959 and 1966, 1984 and 1992, and 1999 and 2004.

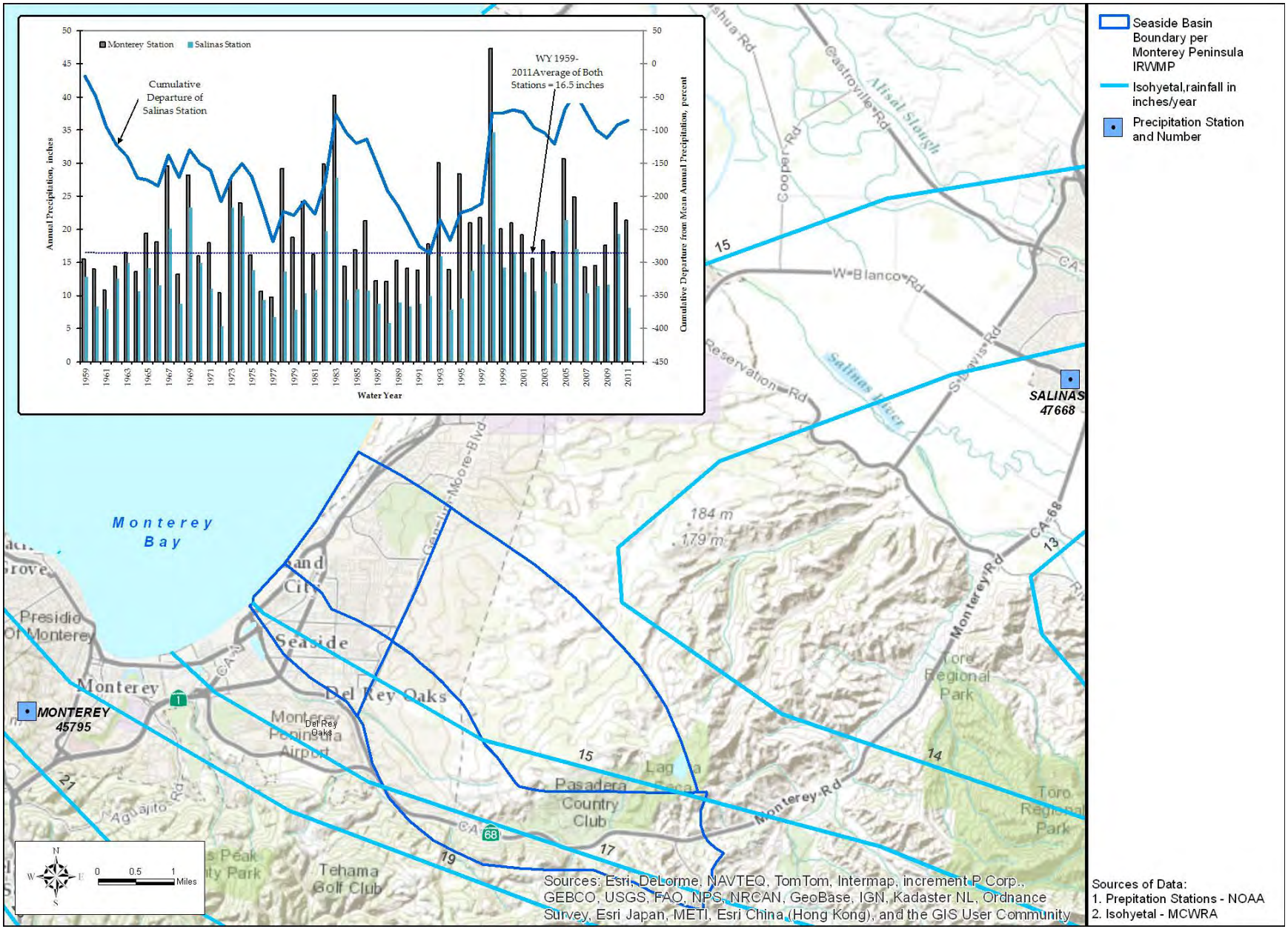


Figure 3: Distribution of Rainfall

3.5 GEOLOGIC/HYDROGEOLOGIC FRAMEWORK

3.5.1 STRATIGRAPHY AND HYDROSTRATIGRAPHY

The Seaside basin consists of a sequence of unconsolidated marine, fluvial and aeolian sediments that overlie relatively impermeable Monterey Formation of Miocene age and older crystalline rocks. The geologic map on Figure 4 shows the surface geology as mapped by Rosenberg (2001).

Conformably overlying the Monterey Formation is Santa Margarita Sandstone, which is also referred to as the Santa Margarita aquifer or deep aquifer. The Santa Margarita Sandstone consists primarily of marine-derived, sedimentary sandstone. Exploratory drilling associated with the Watermaster's sentinel wells suggests that parts of the deep aquifer previously assigned to the Santa Margarita Sandstone in and near the Northern Coastal and Northern Inland subareas consist of generally finer-grained sediments that should be assigned to the Purisima Formation. The only outcrops of Santa Margarita Sandstone (Tsm) within the basin occur along the eastern portion of the Laguna Seca Anticline and at the intersection of the Chupines and Ord Terrace Faults.

The Purisima Formation interfingers with the Santa Margarita Sandstone in the northern portion of the basin. The location of the transition is poorly understood due to a paucity of wells in the area where this transition occurs. The Purisima Formation is similar to the Santa Margarita Sandstone in that it is a marine deposit consisting of poorly indurated, gravels, sands, silts, and silty clay. Where the Purisima Formation is known to occur in the Marina area, it is deeper than 1,500 feet below MSL. There is no Purisima Formation outcrop in the basin.

The geologic unit unconformably overlying the Santa Margarita Sandstone and Purisima Formation is a Tertiary and Quaternary continental deposit locally called the Paso Robles or shallow aquifer. This unit consists of a mixture of continentally-derived gravel, sand, silt and clay sedimentary deposits. The unit is exposed in the foothills of the Laguna Seca subarea. It is an unconfined aquifer that is overlain by the surficial Aromas Sand. The Aromas Red Sands and Older Dune deposits are Quaternary surficial deposits representing the uppermost geologic units in the basin. These deposits are a variety of continental deposits, including: fluvial and coastal terrace, flood-plain, stream alluvium, colluviums and basin deposits (Yates, et al., 2002).

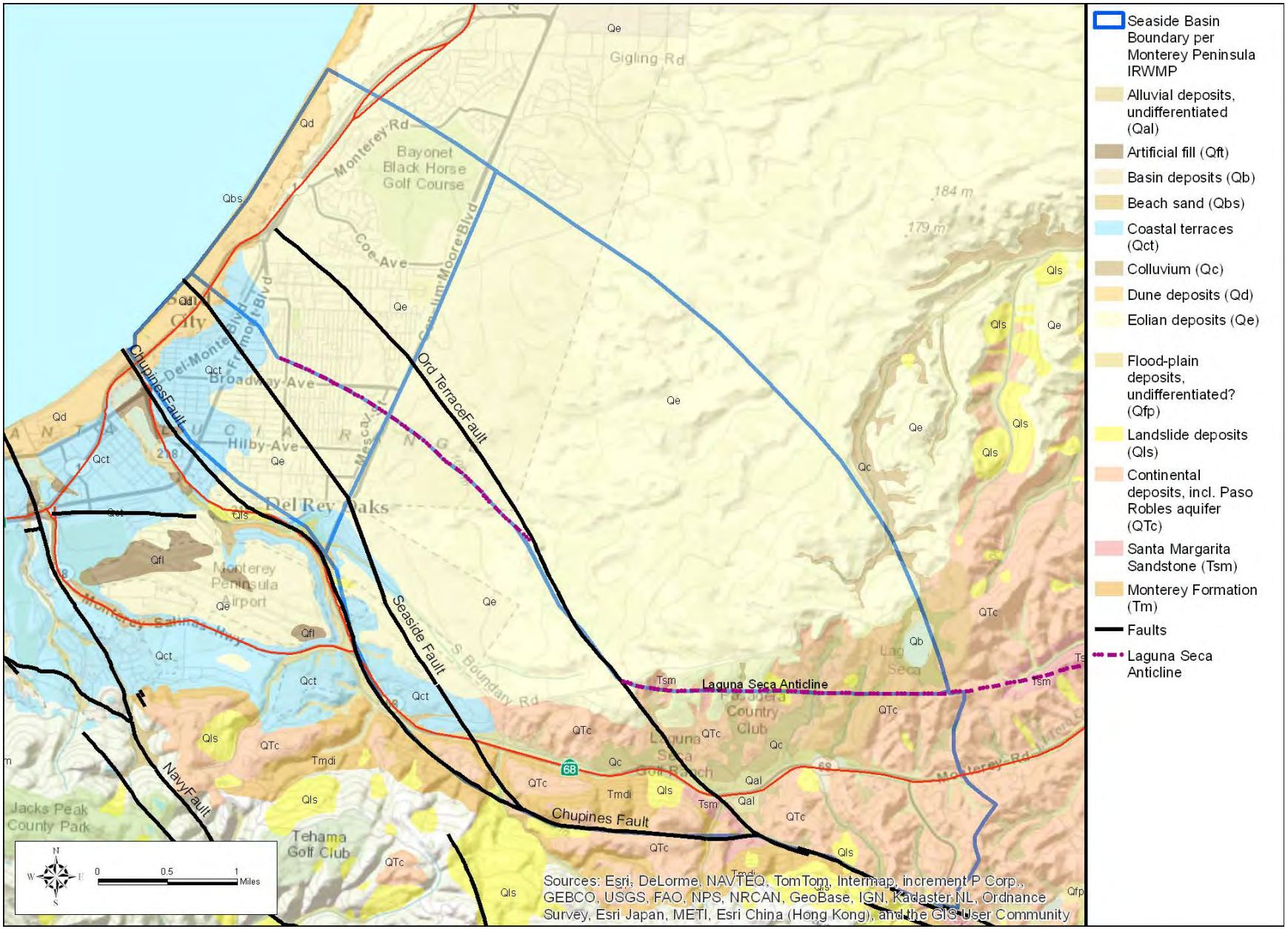


Figure 4: Geology and Faults

3.5.2 STRUCTURAL GEOLOGY

The Chupines Fault zone roughly bounds the southern edge of the basin (Figure 4). The Seaside and Ord Terrace Faults are found running through the basin, north of the Chupines Fault. The northeast side of the each of the faults is typically downthrown. This has resulted in a loss of Santa Margarita Sandstone south of the Seaside Fault, and as a result there is also very little Paso Robles aquifer or alluvial sediments in the area between the Chupines and Seaside Faults. For the conceptual model the faults are considered partial groundwater flow barriers although the offset in geology likely causes more of an impedance to groundwater flow than any fault gouge.

The Laguna Seca Anticline separates the northern and southern subareas of the Seaside Groundwater Basin (Figure 4). This feature—including the segment of the Ord Terrace Fault that offsets the anticline—forms a subsurface hydraulic partial barrier to groundwater flow.

The top of the Monterey Formation is considered non-water bearing due to low yields and poor water quality, and is therefore regarded as the base of the groundwater basin. There is no outcrop of Monterey Formation within the basin. A contour map showing its elevation and topography in basin found in Figure 5. Major features to note are the undulations in the Laguna Seca area due to the Laguna Seca anticline; and the depth of the basin in the north, where it reaches an elevation of 1,200 feet below MSL. Its highest elevation is approximately 500 feet above MSL, which is found at the Laguna Seca Anticline's intersection with the Ord Terrace Fault.

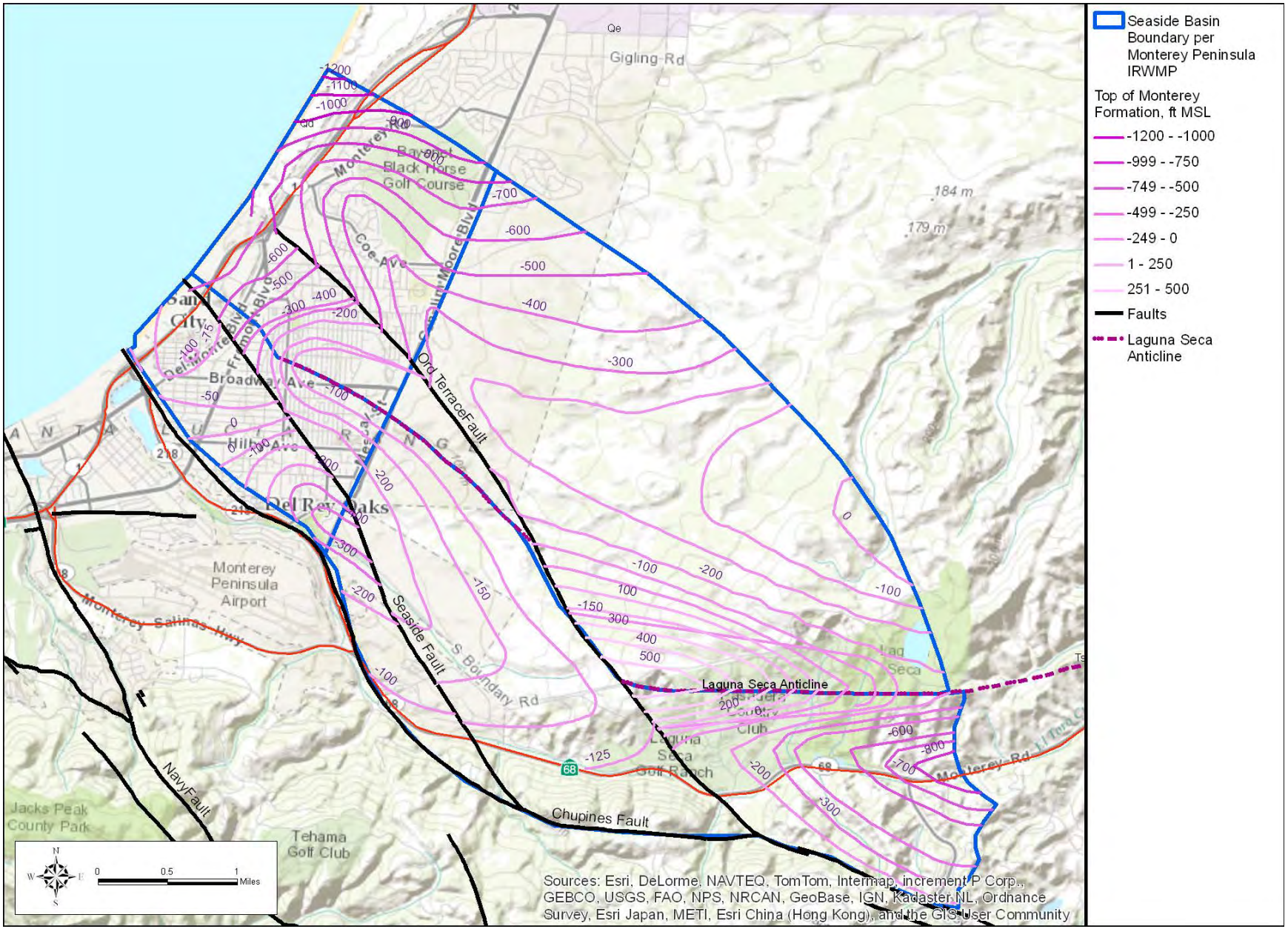


Figure 5: Top of the Monterey Formation (Base of Basin)

3.6 GROUNDWATER OCCURRENCE

3.6.1 GROUNDWATER IN THE AROMAS SANDS

The Aromas Sands and other surficial deposits are unsaturated in many parts of the Seaside basin, and are not extensively pumped for municipal use. Only near the coast are they partly saturated. These sediments are not significant sources of groundwater supply (Yates, et al., 2002).

3.6.2 GROUNDWATER IN PASO ROBLES AQUIFER

The Paso Robles aquifer is an unconfined aquifer that is tapped by production wells. Many of the wells that are screened in the Paso Robles aquifer are also screened in the underlying Santa Margarita aquifer.

The water-bearing characteristics of the Paso Robles aquifer are variable due to the flood plain depositional environment, which formed coarse-grained channel deposits cutting into fine-grained overbank deposits (Yates, et al., 2002). The Paso Robles aquifer is hydraulically linked to the ocean, which increases its susceptibility to seawater intrusion.

3.6.3 GROUNDWATER IN SANTA MARGARITA/ PURISIMA AQUIFERS

The majority of production wells in the basin produce groundwater from the deep or Santa Margarita/Purisima aquifer. Groundwater levels in this aquifer have shown a decline since production started in earnest in the 1990s. This in part has been attributable to pumping restrictions imposed on CAW's Carmel River pumping by the State Water Resources Control Board's Order 95-10.

Due to overlying low conductivity sediments, the Santa Margarita/Purisima aquifer is confined. Based on observed groundwater level behavior in the Santa Margarita aquifer, there appears to be limited leakage from the overlying shallow aquifer and limited connection to the ocean.

The Purisima Formation is less permeable than the Santa Margarita aquifer. However, it is much thicker than the Santa Margarita aquifer, which translates to similar transmissivity values (Feeney, 2007).

3.7 GROUNDWATER FLOW

3.7.1 HORIZONTAL FLOW DIRECTIONS

Figure 6 and Figure 7 show groundwater elevation contours for the shallow (Paso Robles) and deep (Santa Margarita/Purisima) aquifers, respectively. These contours were produced as part of the Water Year 2012 Seawater Intrusion Analysis report for the Watermaster (HydroMetrics WRI, 2012). Both aquifers have pumping depressions: in the Northern Coastal subarea and in the Laguna Seca subarea. In general, groundwater flows from the higher inland areas to the lower coastal areas.

3.7.2 VERTICAL FLOW GRADIENTS

Head differences between shallow and deep monitoring wells can be used to determine vertical hydraulic gradients. The data from paired wells showed that in the 1980's and early 1990's vertical gradients were upwards, or from the deep aquifer to the shallow aquifer; but as groundwater pumping in the Seaside basin increased, the gradients reversed to downwards, or from the shallow aquifer to the deep aquifer.

In the area of Roberts Lake and Laguna Grande in the Southern Coastal subarea, there is a probability that an upwards vertical gradient persists due to the area being a groundwater discharge point. This assumption, however, cannot be confirmed with groundwater elevation data as there are no paired monitoring wells in this area.

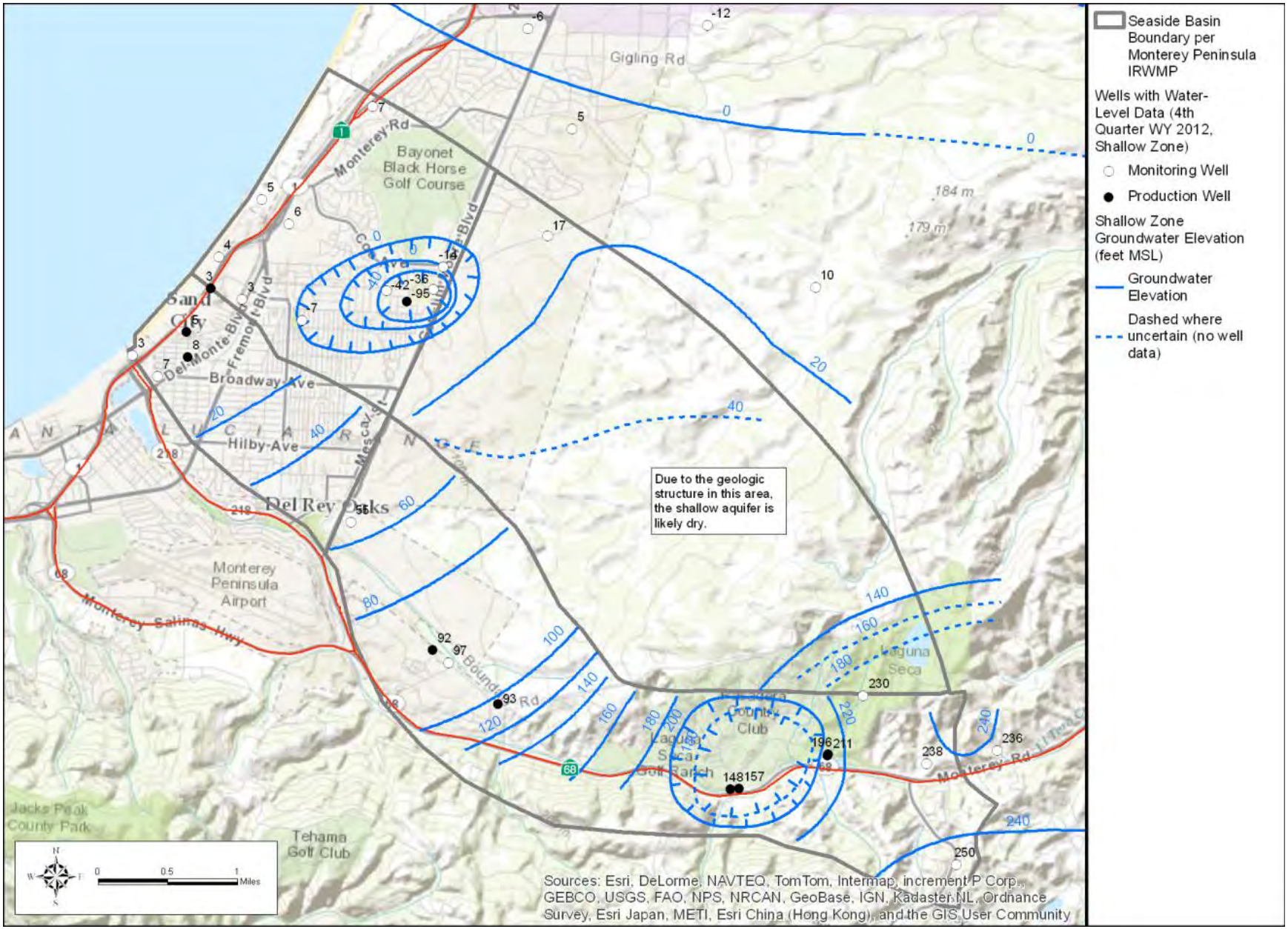


Figure 6: Shallow Groundwater Elevation Map – July/August 2012

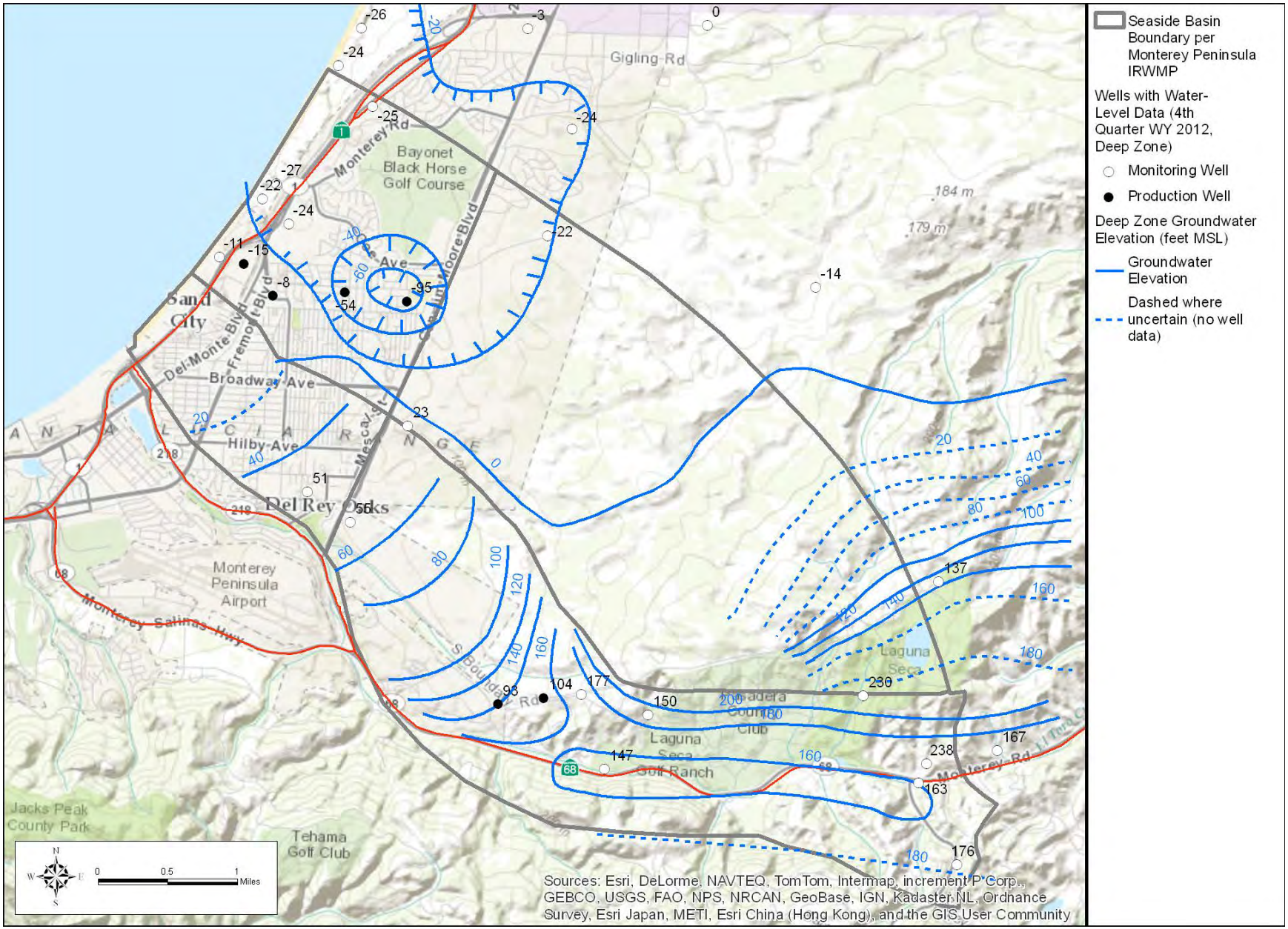


Figure 7: Deep Groundwater Elevation Map – July/August 2012

3.8 LAND USES AND LAND COVER

Land use along the coastal area east of Highway 1 comprises an approximately 1.5 mile wide strip of residential, light industrial, commercial and institutional facilities (Figure 8). The Bayonet and Black Horse Golf Courses are also found within this developed strip.

The other main developed artery is alongside Highway 68 (Monterey Salinas Highway) in the Laguna Sea area. Residential land use predominates, but there is also some industrial and commercial land use. Two golf courses, the Laguna Seca Golf Ranch and the Nicklaus Club-Monterey are found in this area. The Laguna Seca Recreation Area and Raceway is located north of Highway 68.

The Toro area is an additional developed hub in the southeast corner of the basin which extends beyond the basin's eastern boundary and along Highway 68. The main developed land use is residential housing.

The central part of the basin comprises open space that was formerly part of the Fort Ord military facility. Although there are plans to develop a small amount of former Fort Ord land near the already developed area east of Seaside, the remainder of the open space will stay undeveloped.

Figure 8 shows land use and land cover compiled from the 2010 adopted General Plan for Monterey County and City of Seaside's General Plan. Longer-term plans indicate some development along Fort Ord's western boundary. These areas are indicated with a cross-hatch pattern.

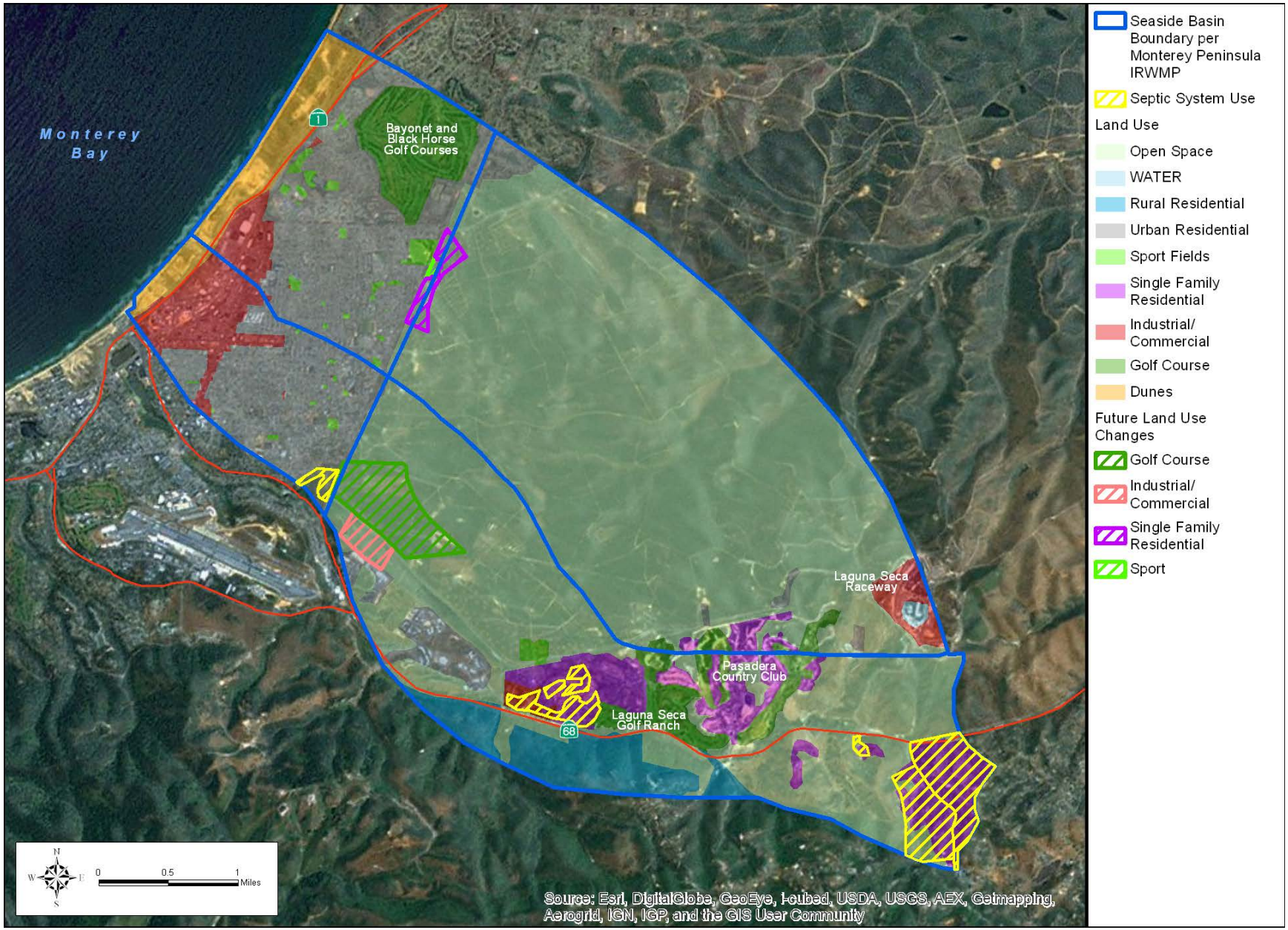


Figure 8: Land Use

3.9 BENEFICIAL WATER USES

Per the Central Coast RWQCB's Basin Plan (2011a), beneficial uses for surface water in the Seaside basin are identified in Table 1. Note that Laguna Grande and Roberts Lakes do not fall directly within the basin boundary, however their watersheds do include part of the Seaside basin.

Table 1: Seaside Basin Beneficial Uses

	Municipal and domestic	Agricultural	Industrial	Contact water recreation	Non-contact water recreation	Wildlife habitat	Cold fresh water habitat	Warm fresh water habitat	Commercial and sport fishing
Laguna Grande/Roberts Lake	X			X	X	X	X	X	X
Any Other Surface Water	X			X	X	X			
Groundwater	X	X	X						

The Basin Plan does not specifically identify beneficial uses for groundwater in the Seaside Basin. It does however state that groundwater throughout the Central Coast Basin, with one exception in another groundwater basin, is suitable for agricultural, municipal and domestic, and industrial uses.

3.10 SURFACE / STORM WATER QUALITY

As described previously, there is little surface water in the Seaside basin. This section describes the quality of water contained in Roberts Lake and storm water. Although there are several storm water percolation locations in the basin, there are no water quality data available for them. These ponds collect storm water from: the Seaside Highlands development, Monterey Peninsula Regional Park (Frog Pond Wetland Preserve), and the Ryan Ranch development off Highway 68 (Figure 2). Within the City of Seaside there are two percolation systems beneath parking lots: at Edgewater shopping center (Costco) and the other at Auto Center (Figure 2).

The only storm water quality data are collected by the Monterey Bay Sanctuary Citizen Watershed Monitoring Network. The network includes two sites in the Seaside basin (Figure 2). One site is near the Best Western hotel at Roberts Lake

(Hotel) and the second is from a storm water outfall near Bay Street (Bay St). Samples are collected at different times of the year. Dry run samples are storm water samples collected after a dry weather rainfall event, and first flush is collected from water flowing into the ocean during the first major storm of the season. Samples are also collected during dry weather in spring and summer.

The catchment for the Hotel monitoring site is much larger than the Bay St catchment; it encompasses almost the entire Laguna Seca subarea, and extends beyond the basin boundary (Figure 9). The land use within the catchment of the Hotel monitoring site includes former Fort Ord open space, urban and rural residential, the Nicklaus Club-Monterey and Laguna Seca golf courses, and a minor amount of industrial and commercial. It also contains the southern portion of the groundwater basin which has the basin's highest native groundwater TDS. Outside of the basin, the Hotel site catchment includes a portion of the Monterey Peninsula Airport, the Tehama Golf Course, urban and rural residential, open space, and industrial and commercial land uses.

The catchment for the Bay St. monitoring site includes almost all the basin's industrial and commercial land, and over half the basin's urban residential area.

Typical ranges in water quality from the two monitored sites are summarized in Table 2. Generally, the spring and summer water quality falls within the ranges for dry run and first flush data, and therefore were not included in Table 2.

The water quality observed at each of the sites is typical of quality expected from each of their respective land uses. The Bay St. site collects more storm water from developed areas than the Hotel site. Because of the permeable nature of the sediments in the basin, areas that are not developed with impervious surfaces have less storm water runoff and more percolation into the basin. As a result, urea, nitrate-nitrogen, metals, TSS, and bacteriological concentrations at Bay St. are greater than those measured at the Hotel site. The Hotel monitoring site has higher conductivity than Bay St., which is probably due to its catchment containing the Laguna Seca subarea where the occurrence of shallow Monterey Shale produces groundwater with higher conductivity and TDS, as described in Section 3.11.

Although the storm water monitored at the two sites is discharged to the ocean and does not have an opportunity to percolate into the basin, the water quality is representative of other storm water generated in similar environments throughout the basin.

Table 2: 2009 - 2012 Range in Storm Water Quality Collected by Monterey Bay Sanctuary Citizen Watershed Monitoring Network

Constituent	Water Quality Criterion	Dry Run 2009-2012 Range		First Flush 2009-2012 Range	
		Bay St	Hotel	Bay St	Hotel
Conductivity, µS/cm	-	NF	NA	70 - 240	36 – 1,480
Urea, µg/L	-	NF	26	62 - 284	37
Nitrate-Nitrogen (NO_3-N), mg/L	≤ 2.25[2]	NF	0.025	0.22 – 0.74	0.025
o-Phosphate as P, mg/L	≤ 0.12[2]	NF	0.14 – 0.51	0.17 – 0.34	0.22 – 0.53
Total Copper, µg/L	≤ 30[1]	NF	6 - 12	52 - 126	7 – 21
Total Zinc, µg/L	≤ 200[1]	NF	2.5	28.0 – 32.5	ND
Total Lead, µg/L	≤ 30[1]	NF	6 - 11	219 - 345	10 – 21
Total Suspended Solids, mg/L	≤ 500[2]	NF	9 - 23	59 - 173	12 – 25
***E. Coli*, MPN/100 ml**	≤ 235[3]	NF	20 - 100	34,162 – 64,900	273 – 2,393
Enterococcus, MPN/100 ml	≤ 104[3]	NF	20 - 100	47,396 – 90,327	344 – 1,465

[1] Basin Plan Objective, [2] Central Coast RWQCB, [3] EPA Ambient Water Quality Criteria
ND = non-detect, NF = not flowing, NA = not available
Source of data: Monterey Bay Sanctuary Citizen Watershed Monitoring Network (2012).

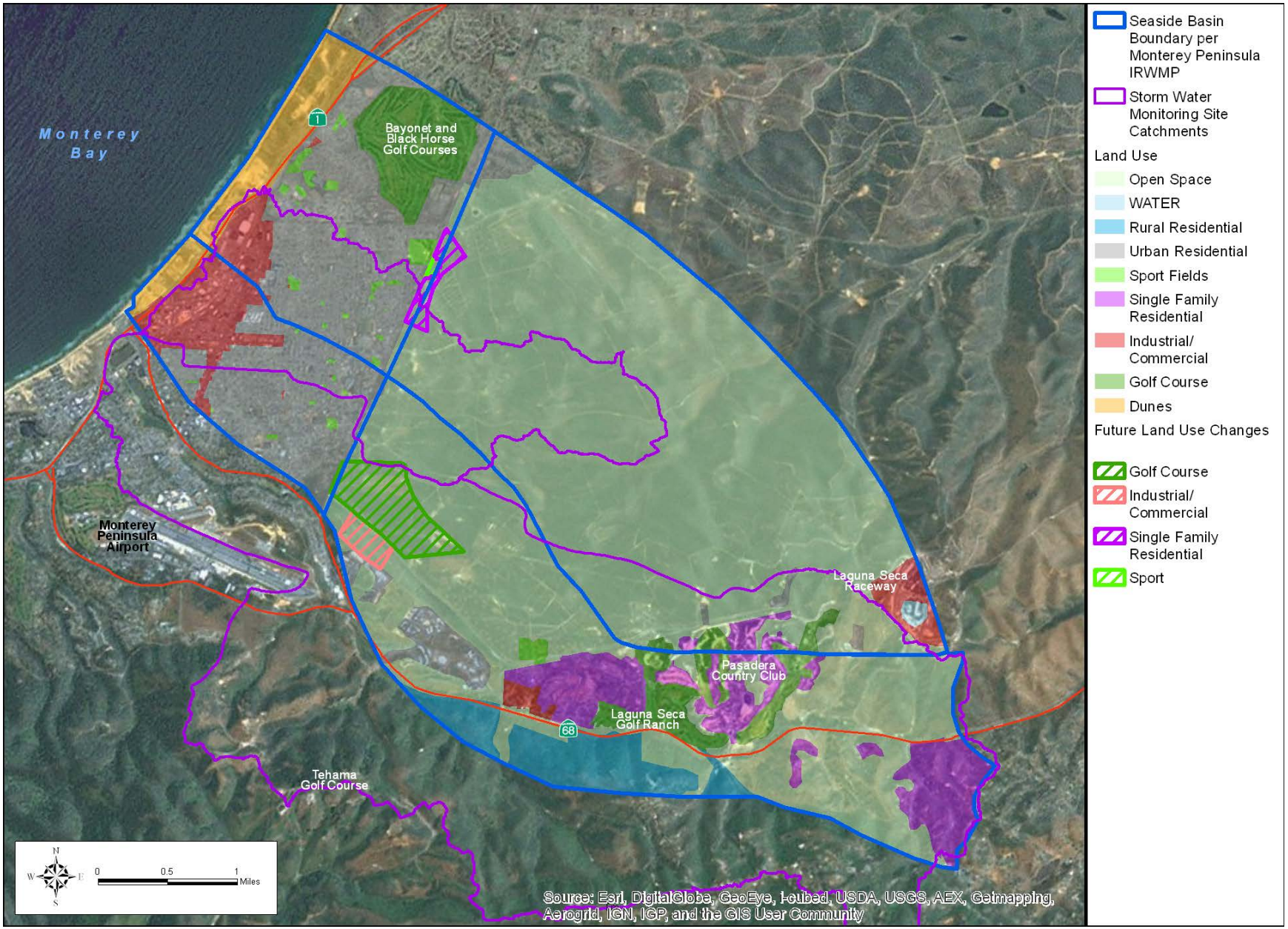


Figure 9: Storm Water Monitoring Site Catchments with Land Use

3.11 GROUNDWATER QUALITY

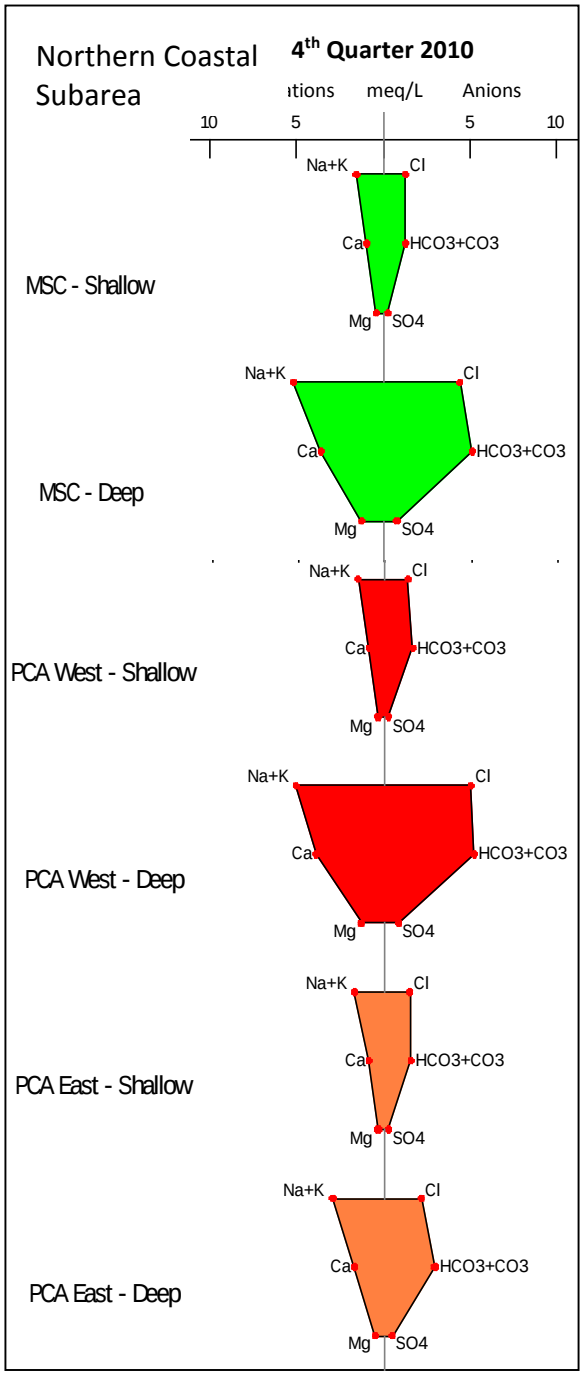
3.11.1 GROUNDWATER QUALITY DESCRIPTION

Groundwater in the basin is divided into two distinct types. The Northern Coastal subarea has sodium-bicarbonate type water, and the Southern Coastal and Laguna Seca subareas have sodium-chloride type waters (Muir, 1982). The shallow and deep aquifers also have differing groundwater qualities. Data used to describe the current groundwater quality in this section is from the Watermaster's database that is described in Section 6.

Data used to show concentration ranges starts in 1990. To characterize groundwater quality for each subarea, median well concentrations for TDS, chloride, and nitrate-N over the past five years (2008 through 2012) were contoured and area-weighted to arrive at an average groundwater quality for each subarea that is representative of current land use practices (Figure 14 through Figure 16). The maps include the wells and their median concentrations used in the analyses. Table 5 summarizes the existing water quality estimated for both the shallow and deep aquifers within each subarea, and also includes an average volume weighted concentration of the shallow and deep aquifers combined.

NORTHERN COASTAL SUBAREA

Stiff diagrams for monitoring wells in the Northern Coastal subarea show that, the shallow or Paso Robles aquifer has a lower anion/cation concentration than the deep or Purisima/Santa Margarita aquifer (Figure 10). As a result, total dissolved solids (TDS) for the Paso Robles aquifer (shallow) in the Northern Coastal subarea typically ranges from 200 to 600 mg/L, while in the Purisima/Santa Margarita (deep) aquifer in the Northern Coastal subarea has a TDS that typically ranges from 250 to 650 mg/L (Figure 11). The TDS of the deep aquifer at the aquifer storage and recovery (ASR) wells located on the eastern boundary of the Northern Coastal subarea has decreased substantially since the start of injection into the deep aquifer by MPWMD in 2010. Figure 12 shows the decrease from 600 to 320 mg/L in monitoring well ASR-MW1 which is located in close proximity to the two existing ASR wells. This conditioning trend is expected to continue and expand in area as Phase II of the program consisting of an additional two wells will be commissioned in 2014. More information on this project can be found in Section 3.12.2.



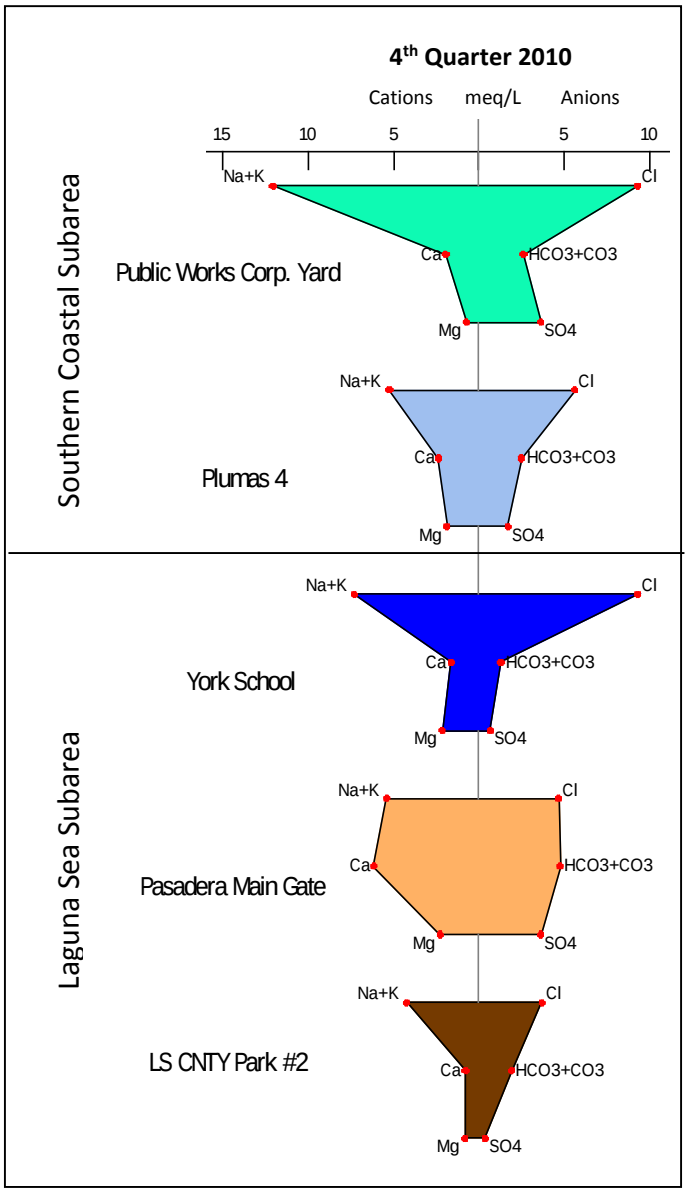


Figure 10: Stiff Diagrams of Monitoring Wells in the Northern Coastal, Southern Coastal, and Laguna Seca subareas

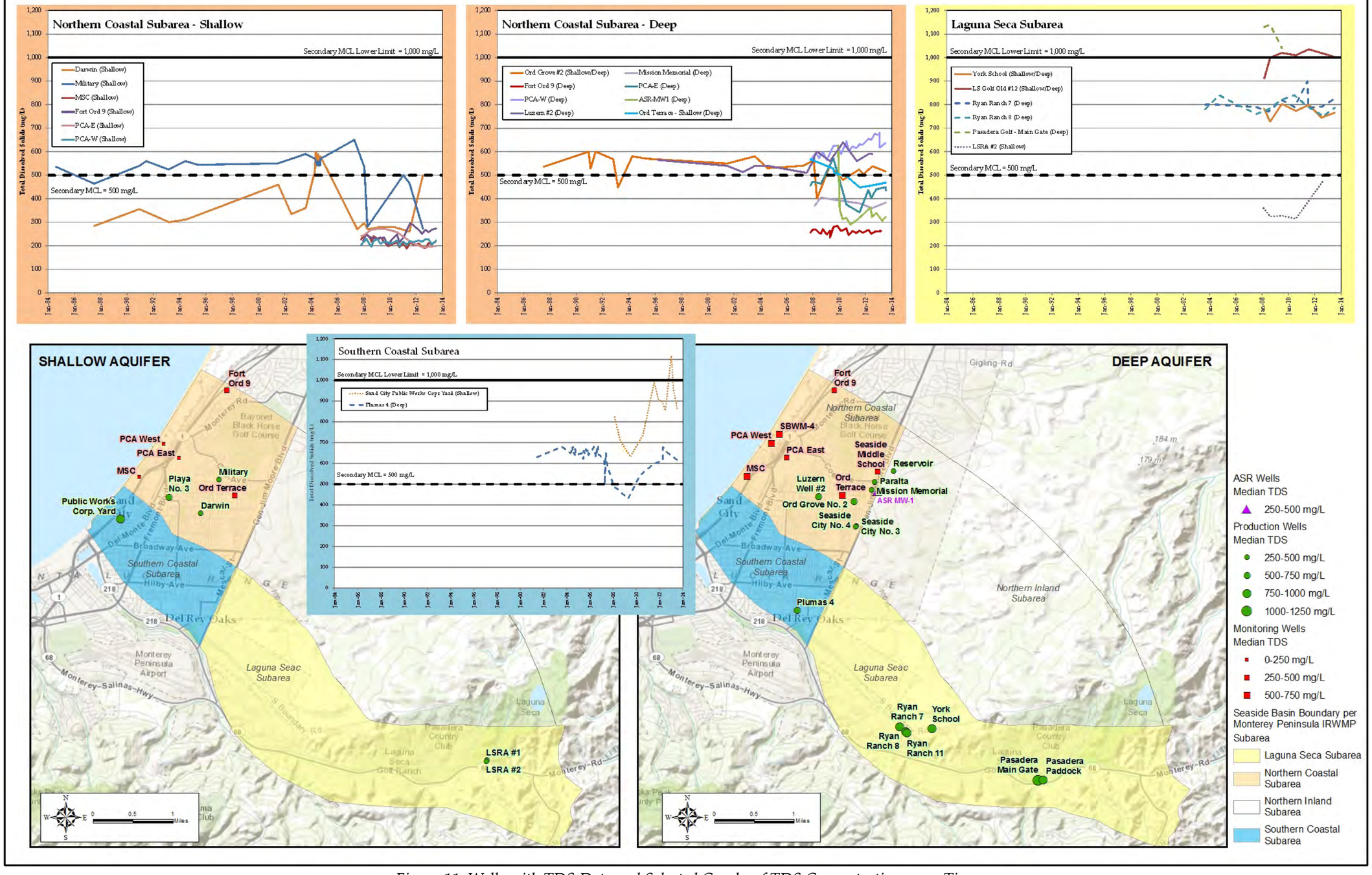


Figure 11: Wells with TDS Data and Selected Graphs of TDS Concentrations over Time

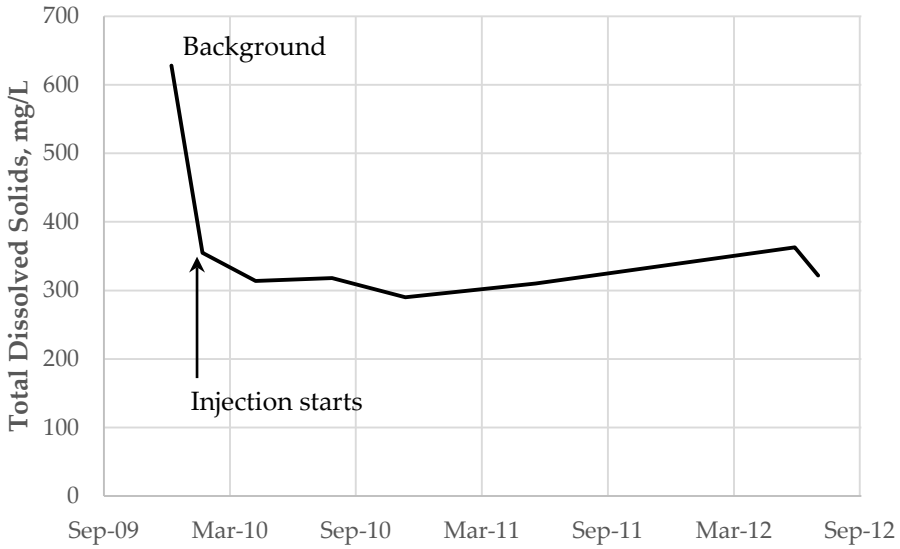


Figure 12: ASR MW-1 Historical TDS Concentrations

Deep aquifer chloride concentrations are slightly higher than the shallow aquifer, and can reach 420 mg/L. Nitrates in a portion the shallow aquifer in the Northern Coastal subarea are relatively high compared to other subareas in the basin (Figure 16), although concentrations have always remained below 10 mg/L nitrate –N (Figure 13). The deep aquifer nitrate-N concentrations are usually non-detect to very low (Figure 13). Wells with the highest nitrates in the subarea are located in an area that was historically used for truck farming before it became urbanized. Furthermore, the dune nature of the soils readily allows nutrients to infiltrate and percolate into the shallow groundwater system.

Hardness is high in the Northern Coastal subarea, although not as high as in the Laguna Seca subarea. Table 3 provides a hardness classification for reference.

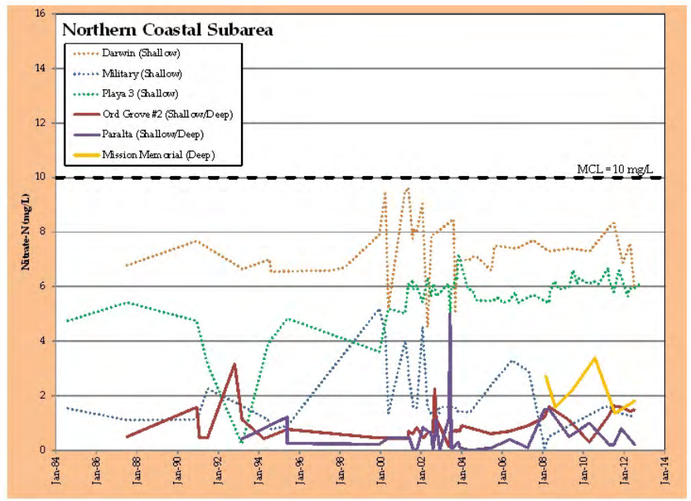
Table 4 summarizes the ranges in water quality for each subarea.

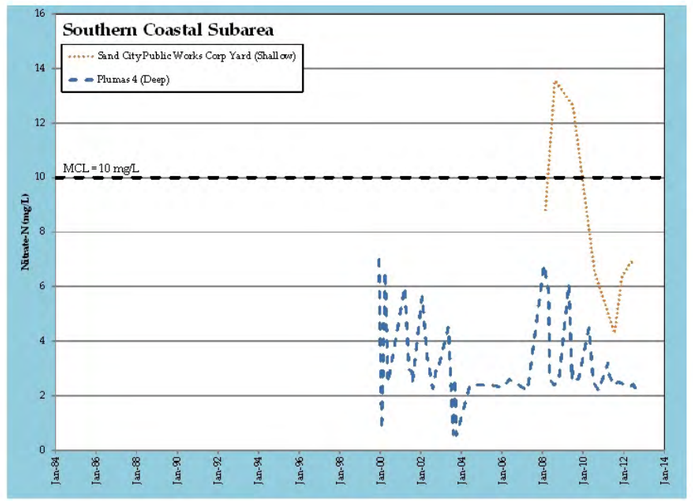
Table 3: Hardness Classification

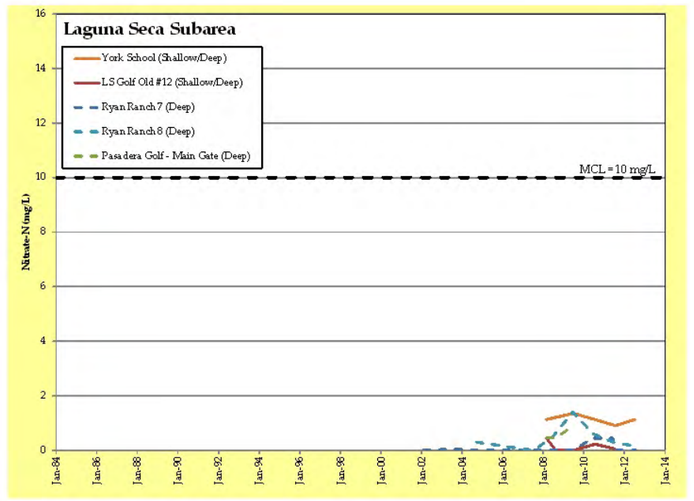
Hardness	mg/L as $CaCO_3$
Soft	0 – 60
Moderate	61 – 120
Hard	121 – 180
Very Hard	> 180

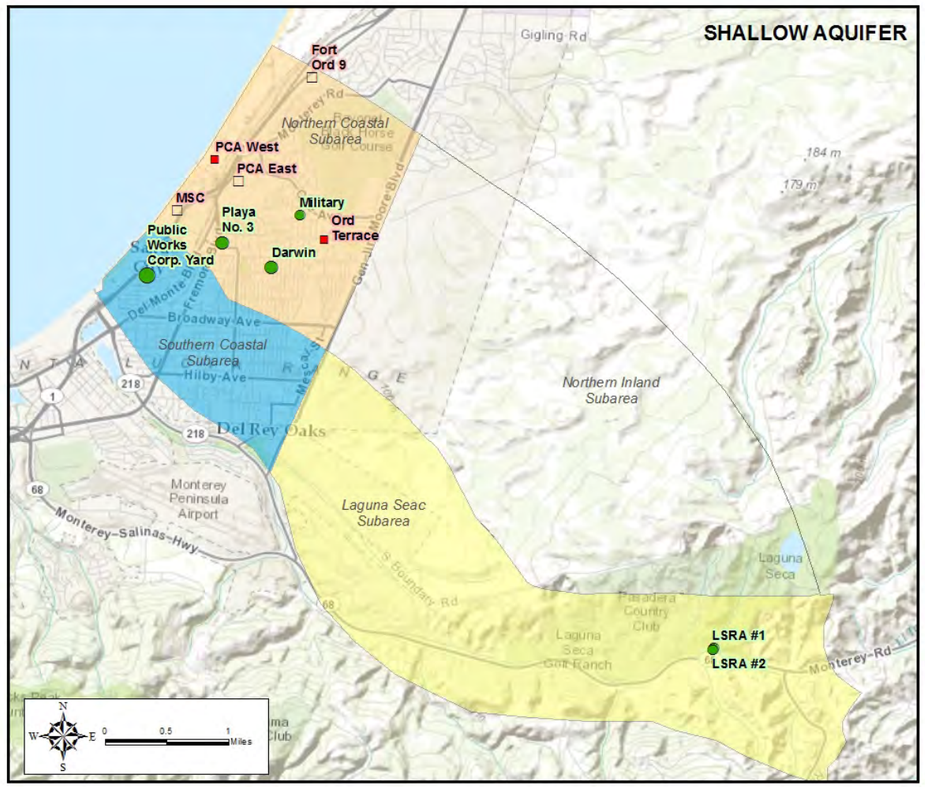
Source: http://water.usgs.gov/owq/hardness-alkalinity.html

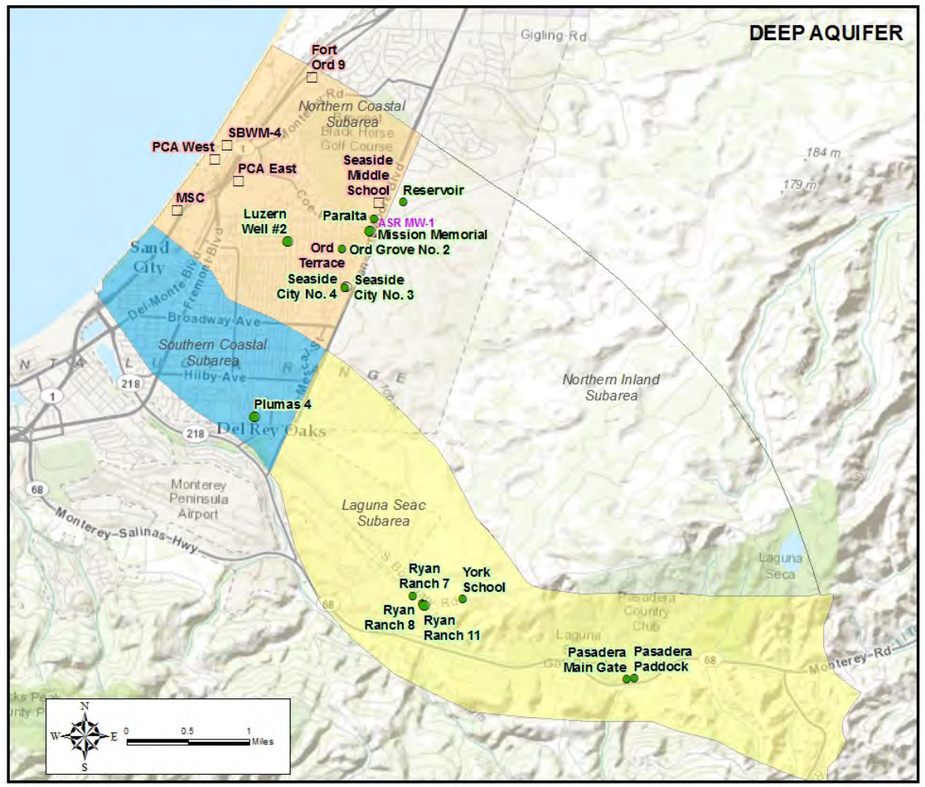
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Plots are provided for production wells because they have the greatest fluctuations in concentrations.

ASR Well
Median Nitrate-N
- Non-detect

Production Wells
Median Nitrate-N
- Non-detect
- < 2 mg/L
- < 5 mg/L
- 5 - 10 mg/L
- 5 - 15 mg/L

Monitoring Wells
Median Nitrate-N
- Non-detect
- < 2 mg/L
- 5 - 10 mg/L

Seaside Basin Boundary per Monterey Peninsula IRWMP

Subarea
- Laguna Seca Subarea
- Northern Coastal Subarea
- Northern Inland Subarea
- Southern Coastal Subarea

Figure 13: Wells with Nitrate Data and Graphs of Nitrate-N Concentrations over Time

Table 4: Seaside Basin Groundwater Quality Ranges

Constituent	Maximum Contaminant Level (MCL)	Northern Coastal Subarea		Northern Inland Subarea	Southern Coastal Subarea	Laguna Seca Subarea	
		Shallow	Deep			Shallow	Deep
TDS, mg/L	500-1,000*	200-600	250-650	150-630	450-990	300-800	750-1,100
Sulfate, mg/L	250-500*	10-270	10-370	10-100	40-180	10-110	30-250
Chloride, mg/L	250-500*	30-230	30-420	50-180	70-330	80-290	190-350
Sodium, mg/L	-	30-140	30-260	35-105	60-310	80-160	120-170
Magnesium, mg/L	-	2-60	1-80	5-25	5-25	10-30	25-40
Calcium, mg/L	-	10-90	10-180	15-80	30-50	10-65	30-160
Potassium, mg/L	-	ND - 10	ND - 50	2.2-5.5	ND - 5	ND - 20	ND - 6
Hardness as $CaCO_3$, mg/L	-	40-250	25-350	50-280	110-210	60-200	190-530
Nitrate as NO_3, mg/L	45	ND - 40	ND - 20	ND - 3	5 - 60	ND - 4	ND - 6
Nitrate-N (NO_3-N), mg/L	10	ND - 6	ND - 6	ND – 0.2	ND – 13	ND – 1.2	ND – 1.2
Ammonia-N, mg/L	-	ND - 1.9	ND - 1.6	ND	ND – 1.3	ND – 0.4	ND – 0.18
o-Phosphate as PO_4, mg/L	-	ND	ND	NS	ND	NS	ND – 1.69
o-Phosphate as P, mg/L	-	ND – 1.63	ND – 1.63	ND – 0.1	ND – 0.4	ND – 1.16	ND – 1.35
Arsenic, mg/L	0.010	NS	0.006-0.079	ND	NS	NS	NS
Iron, µg/L	0.3	ND - 5	ND - 25	ND – 2.3	ND – 0.1	0.1-4.0	ND – 4.0
Manganese, µg/L	0.05	ND – 1.0	ND – 2.0	ND – 0.1	ND – 0.03	ND – 0.2	ND – 0.6

* lower end of range is recommended
ND = non-detect, NS = no samples

SOUTHERN COASTAL AND LAGUNA SECA SUBAREAS

The southern subareas, i.e., Southern Coastal and Laguna Seca, have higher TDS than the rest of the basin. The Sand City's Public Works Corporation well, in the Southern Coastal subarea, has anomalous TDS, chloride and nitrate concentrations which are not consistent with nearby wells. In 2013, the Watermaster attempted to study the likely source of these anomalous concentrations but were unsuccessful sourcing historical groundwater quality data for the well or nearby wells. The well's sodium/chloride ratio suggests seawater is not the source of chloride. Historically, this area was used for truck farming which could account for the elevated nitrates. It should be noted, however, that this well is not screened in either the deep or shallow aquifers but in a water-bearing zone above these aquifers that is treated separately in the adjudicated Decision. Limited data for the only other well in the Southern Coastal subarea (Plumas 4) shows TDS is higher than the Northern Coastal subarea with chlorides just above 300 mg/L and nitrates being non-detect to very low (Figure 11 and Figure 13, respectively).

The inland Laguna Seca subarea has naturally occurring poorer groundwater quality than the rest of the basin. TDS typically ranges between 750 and 1,100 mg/L and chloride ranges between 190 – 350 mg/L in deeper wells, i.e., Cal-Am's Ryan Ranch wells (Figure 11). The cause of the higher TDS is likely connate water from the underlying Monterey shale formation mixing with the groundwater (Muir, 1982). Shallow wells in the Laguna Seca subarea have slightly lower TDS (300 – 800 mg/L) and chloride (80 – 290 mg/L) than deep wells (Table 4). Nitrate-N is non-detect to very low in both shallow and deep wells (Figure 13). Hardness is very high throughout the subarea, but particularly in deeper wells.

Hard to very hard water occurs throughout the basin and has compounding impacts on the basin. To improve hardness, residential water softeners use an ion exchange process which requires the addition of salts. These salts are disposed of to the sanitary sewer thereby increasing the salt load to wastewater treatment plants. This is the case with the Pasadera Wastewater Facility, which is located within the Laguna Seca subarea, as described in Section 4.1.8.

NORTHERN INLAND SUBAREA

Limited groundwater quality data exist for the Northern Inland subarea, which contains the former Fort Ord. From the few wells for which there are data, it appears that the groundwater quality is similar to the aquifers of the Northern Coastal subarea (Table 4).

3.11.2 EXISTING GROUNDWATER QUALITY

To characterize existing groundwater quality for each subarea of the Seaside basin, median well concentrations for TDS, chloride, and nitrate-N over the past five years (2008 through 2012) were delineated into zones and area-weighted to arrive at an average groundwater quality for each subarea that is representative of current land use practices (Figure 14 through Figure 16). The maps include the wells and their median concentrations used in the analyses. Table 5 summarizes the existing water quality estimated for both the shallow and deep aquifers within each subarea, and also includes an average of both aquifers based on the relative saturated thickness of each aquifer. The saturated thicknesses were collected from average groundwater levels over the last five years (2005-2009) of the calibrated Seaside Basin groundwater model (HydroMetrics LLC, 2009b).

Table 5: Seaside Basin Existing Groundwater Quality

Constituent		TDS mg/L	Chloride mg/L	Nitrate –N mg/L
Northern Coastal Subarea	**Shallow**	302	72	0.83
	Deep	437	102	0.30
	All	362	85	0.59
Southern Coastal Subarea	**Shallow**	839	260	6.9
	Deep	628	199	0.05
	All	702	221	2.4
Northern Inland Subarea	**Shallow**	344	63	0.43
	Deep	327	61	0.53
	All	336	62	0.48
Laguna Seca Subarea	**Shallow**	781	237	0.85
	Deep	855	241	0.48
	All	824	239	0.63

Concentration for "All" category is a volumetric-weighted average of shallow and deep aquifer concentrations.

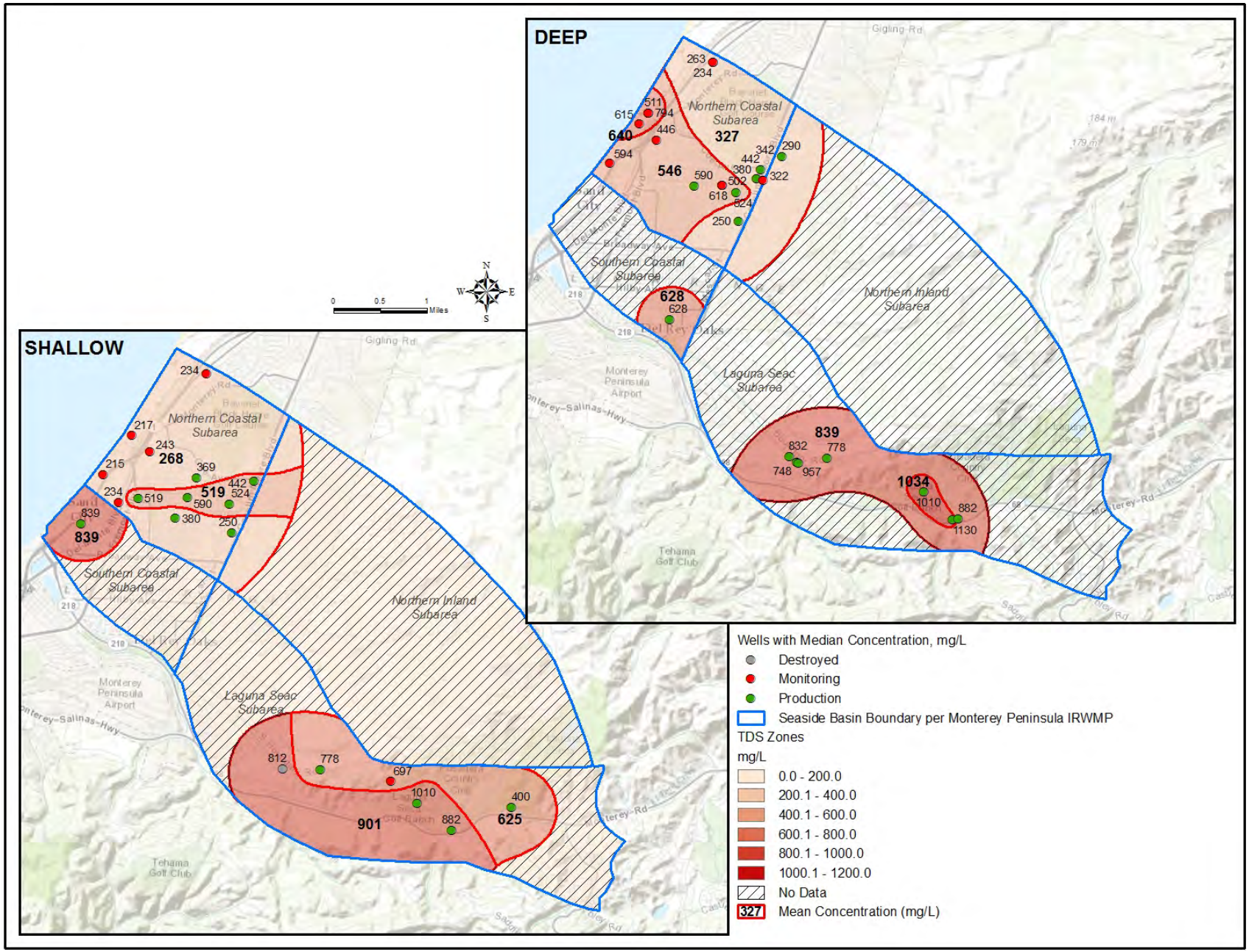


Figure 14: Water Quality Zones for Total Dissolved Solids

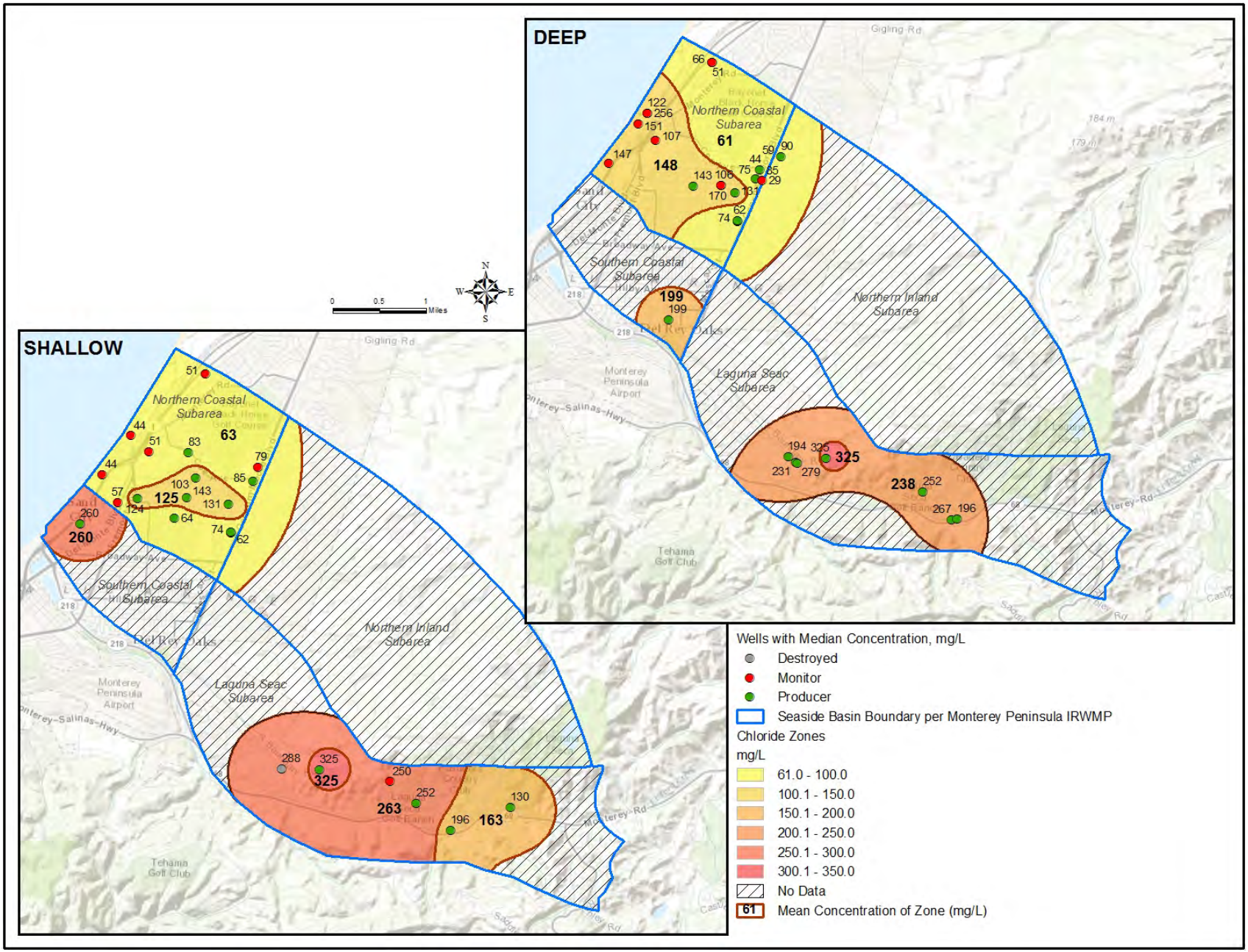


Figure 15: Water Quality Zones for Chloride

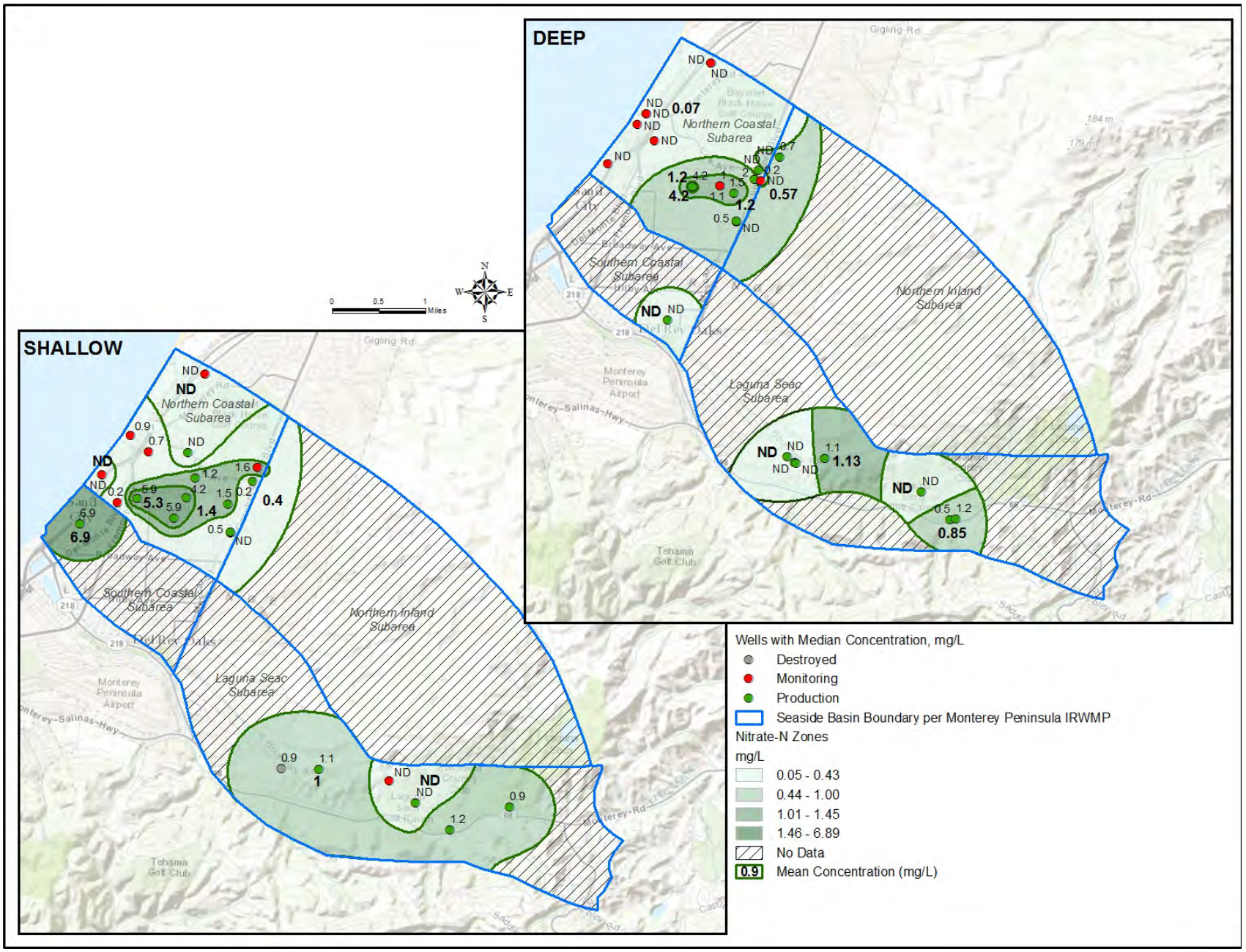


Figure 16: Water Quality Zones for Nitrate-N

3.11.3 HISTORICAL GROUNDWATER QUALITY

The earliest published groundwater quality data for the Seaside basin only dates back to 1982. This is the United States Geological Survey (USGS) report by Muir (1982), which includes groundwater quality for a number of wells in the Northern Coastal subarea. Based on state well numbers, most of these wells have since been destroyed. However, it was possible to substitute active wells completed within corresponding aquifers and within the same section to compare water quality. This comparison indicates that historical groundwater quality is similar to the existing groundwater quality in the Northern Coastal subarea (Table 6), with the exception of nitrate-N which appears to have increased, although it is still below the MCL. Figure 13 shows the concentrations of nitrate-N over time for each subarea. The data shown for the Northern Coastal subarea indicate the only well to exhibit a slight increase in nitrate-N from 1984 to 2012 is Cal-Am's Playa 3 well.

Historical data were not available for the other three subareas.

Table 6: Comparison of 1979/1980 Water Quality with Current Water Quality

Constituent	Playa 3		PCA Production		Luzern		Target		Ord Grove	
	22B3 Feb 1979	Playa 3 Jul 2012	PCA 15K1 Sep 1980	PCA-W Shallow Sep 2012	23D1 Feb 1979	Luzern New Jul 2011	22C2 Sep 1980	MSC Shallow/ Deep Sep 2012	Ord Grove 23B1 Feb 1979	Ord Grove 2 Jul 2012
TDS, mg/L	584	540	-	-	588	532	-	-	640	538
Specific Conductivity, µS/cm	920	878	380	325	920	905	651	300/1,018	1,000	904
Sulfate, mg/L	93	94.6	-	-	61	81.2	-	-	84	61.4
Chloride, mg/L	134	124.4	56	42	139	133.3	130	41/143	133	129.4
Sodium, mg/L	98	90.1	-	-	97	94.6	-	-	97	85.9
Magnesium, mg/L	22	17	-	-	19	18	-	-	21	19
Calcium, mg/L	63	56	-	-	75	66	-	-	87	68
Hardness as $CaCO_3$, mg/L	248	212	-	-	265	239	-	-	304	223
Nitrate as NO_3, mg/L	12.4	26.2	-	-	5.6	20.2	-	-	1.6	6.6
Nitrate-N (NO_3-N), mg/L converted from nitrate as NO_3	2.8	5.9	-	-	1.3	4.5	-	-	0.4	1.5
Iron, mg/L	0.03	< 0.1	-	-	0.09	< 0.1	-	-	0.06	< 0.1

S/D = shallow/deep

3.11.4 GROUNDWATER WATER QUALITY OBJECTIVES

The Seaside basin is not specifically included in the table of median groundwater quality objectives in the Central Coast RWQCB's Basin Plan (Chapter 3). For basins not specifically listed, quality objectives must meet the water's beneficial use. For the Seaside basin, beneficial uses are municipal, industrial, and agricultural. For the constituents of concern in this SNMP (TDS, chloride, and nitrate as N), the standards for municipal water contained in the California Code of Regulation (CCR) Title 22, Chapter 15 are the most stringent of the beneficial uses. Table 7 lists the water quality objectives (WQOs) used in this report.

Table 7: Seaside Basin Groundwater Quality Objectives

Constituent	Source	Seaside Basin Groundwater Quality Objective mg/L
TDS	Recommended Limit of Secondary MCL	500
Chloride	Recommended Limit of Secondary MCL	250
Nitrate-N	Primary MCL	10

3.12 IMPORTED WATER QUALITY

There are two sources of imported water to the Seaside basin: Salinas Valley groundwater and Carmel River system water.

3.12.1 SALINAS VALLEY GROUNDWATER

Water imported by the City of Seaside for irrigation of the Bayonet and Black Horse golf courses is supplied by Marina Coast Water District (MCWD) from groundwater pumped from the deep aquifer in the Salinas Valley groundwater basin. This use is per an in-lieu replenishment agreement that will expire tentatively in May 2018 (personal communications, Rick Riedl). Additionally, MCWD's service area includes a portion of the Seaside basin around the Bayonet and Black Horse golf courses.

MCWD's 2012 water quality is summarized in Table 8. None of the constituents exceed the basin's WQO.

Table 8: Imported Salinas Valley Water Quality for Bayonet and Black Horse Golf Course Irrigation and Municipal Supply by Marina Coast Water District

Constituent	Seaside Basin WQO mg/L	MCWD Water Quality Range for 2012 mg/L	MCWD Water Quality Averages for 2012 mg/L
TDS, mg/L	500	300 – 600	419
Chloride, mg/L	250	46 – 200	101
Nitrate-N (NO_3-N), mg/L converted from nitrate as NO_3	10	ND – 4.4	1.3

ND = non-detect

Source of data: Marina Coast Water District Consumer Confidence Report (2012)

3.12.2 CARMEL RIVER SYSTEM WATER

During winter months, Cal-Am imports water from the Carmel Alluvial River Aquifer to: 1) inject into Santa Margarita aquifer ASR wells, and 2) supply to customers in the Seaside basin once flows at the Robles del Rio gage on the Carmel River are greater than 40 cubic feet per second (cfs). Table 9 summarizes the range in selected concentrations from 2009 through 2012 together with the basin's WQOs.

Table 9: Imported Water Quality from the Carmel River System by Cal-Am

Constituent	Seaside Basin WQO mg/L	Carmel River System Water Quality Range mg/L	Carmel River System Water Quality Average mg/L
TDS, mg/L	500	280 – 385	317
Chloride, mg/L	250	23 – 28	26
Nitrate-N (NO_3-N), mg/L	10	ND – 0.3	0.1

ND = non-detect,

Source of data: MPWMD water quality database

Water from the Carmel River system is of higher quality than the native groundwater into which it is injected in the deep Santa Margarita aquifer. In particular, TDS and associated anions and cations, and hardness are substantially lower.

3.13 Recycled Water Quality

The only source of recycled water currently used in the Seaside basin is from the Pasadera Wastewater and Recycling Facility that supplies irrigation water to the Nicklaus Club-Monterey (formerly Pasadera Country Club). Recycled water is blended with groundwater produced from two golf course wells (Main Gate and Paddock) at a ratio of approximately ten parts groundwater to one part recycled water before being irrigated. Average effluent water quality delivered in 2012 for irrigation is summarized in Table 10.

Table 10: Nicklaus Club-Monterey Recycled Water Quality for Golf Course Irrigation

Constituent	Seaside Basin WQO mg/L	Pasadera Well Quality* for 2012 mg/L	Recycled Water Quality** Averages for 2012 mg/L	Calculated 10:1 Blended Quality mg/L
TDS, mg/L	500	868	1,241	902
Chloride, mg/L	250	191	375	208
Nitrate-N (NO_3-N), mg/L converted from nitrate as NO_3	10	non-detect	2.3	non-detect

Source of Data: Watermaster* and Cal-Am**

3.14 Sand City Desalination Brine Quality

The City of Sand City has a 300 acre-foot per year capacity desalination plant located in the dunes off Bay Street. The source water for the desalination plant is shallow brackish groundwater from the Southern Coastal subarea extracted by shallow beach wells. Sand City was granted rights to pumping this brackish water in the Amended Decision. Byproduct or reject water from the plant is disposed through a horizontal well beneath the beach in Sand City. The plant has been operating since April 2010 for municipal supply.

The reject water has a TDS similar to seawater and non-detect nitrate. The injected reject water is designed to flow into the ocean beneath the beach, and therefore is designed to have little impact on the basin's groundwater.

3.15 RAINFALL WATER QUALITY

The water quality of rainfall is generally low in salts and nutrients (Table 11). During infiltration into the ground, infiltrating rainwater picks up salts and nutrients that have been deposited on the ground. Atmospheric deposition of nitrogen is one source that has the potential to mobilize nutrients by infiltrating rain. As rainwater percolates through the vadose zone, it can further mobilize salts and nutrients, which increases concentrations.

Table 11: Water Quality of Rain Water

Constituent	Seaside Basin WQO mg/L	Rain Water Average mg/L
TDS, mg/L **converted from conductivity (x0.59)**	500	2.8
Chloride, mg/L	250	0.5
Nitrate-N (NO_3-N), mg/L **converted from nitrate as NO_3**	10	0.05

Source of data: National Atmospheric Deposition Program/NTN, Pinnacles National Monument-Bear Valley, San Benito County (CA66).

SECTION 4
SALT AND NUTRIENT SOURCES

4.1 EXISTING SOURCES

Table 12 summarizes the existing salt and nutrient sources that are/could be introduced into Seaside basin groundwater. Each of the sources are discussed in some detail in the subsections below.

Table 12: Summary of Existing Salt and Nutrient Sources

Potential Salt and/or Nutrient Source	How Introduced to the Basin
Rainfall	Infiltration and percolation in permeable areas
Atmospheric deposition	Deposition, infiltration and percolation
Mineral dissolution	Dissolution of Monterey shale formation
Storm water	Infiltration and percolation
Landscape fertilizer	Fertilization, infiltration and percolation
Golf course fertilizer	Nicklaus Club-Monterey (formerly Pasadera Country Club)
	Bayonet and Black Horse Golf Courses
	Laguna Seca Golf Ranch
Carmel River system water	Injection into Santa Margarita aquifer
	Landscape and sports field irrigation
Salinas Valley groundwater	Return flow of irrigation water from Bayonet/Black Horse Golf Courses
	Landscape and sports field irrigation
City of Sand City desalination plant	Brine disposal into coastal groundwater
Irrigation with recycled water from Pasadera Wastewater/Recycling Facility	Return flow of irrigation water from Nicklaus Club-Monterey
Seaside Basin groundwater	Return flow of water from landscape, golf course, and sports field irrigation
Septic tanks	Leaching and percolation
System losses (water and sewer)	Percolation

4.1.1 DEEP PERCOLATION OF RAINFALL

Rainfall falling on impervious surface has an opportunity to infiltrate into the basin. A large portion of the basin is undeveloped and is underlain by permeable sands, which enhances deep percolation of rainfall. The salts and nutrients contained in rainfall are very low and not a significant loading source in themselves. Percolating rainwater mobilizing salts and nutrients in the vadose zone and atmospheric deposition of salts and nutrients on the ground surface are other potential contributors to loading in the basin.

The amount of deep percolation of rainfall was obtained from the Seaside Basin groundwater model (HydroMetrics LLC, 2009b). Average annual deep percolation occurring over the last five years of the calibrated model (2005 – 2009) was outputted from the model for each of the four subareas.

VADOSE ZONE MOBILIZATION

The processes that mobilize salts and nutrients in the vadose zone are assumed to be stable and occurring under steady-state conditions. This source was therefore not included in the salt and nutrient balance.

ATMOSPHERIC DEPOSITION

The type of surface dictates the transport behavior of salts and nutrients from atmospheric deposition. The UC Davis study on addressing nitrate in California's drinking water (2012) assumed atmospheric deposition of nitrogen in natural areas is retained in the ecosystem and leaching into the groundwater basin is negligible. In urban areas, atmospheric deposition on impervious surfaces is removed by storm water or is sequestered by turf grass. Salts deposited by atmospheric processes are assumed to be insignificant.

4.1.2 MINERAL DISSOLUTION

Section 3.11.1 described groundwater in the Laguna Seca and Southern Coastal subareas as having elevated salts because of the shallow occurrence of Monterey shale formation in these areas of the basin. However, groundwater concentrations in the Laguna Seca and Southern Coastal subareas have remained relatively stable over time, which indicates that this process is in equilibrium and should not be included as a continual salt source.

4.1.3 STORM WATER

Collected storm water in the Seaside basin is either percolated into ponds or subsurface galleries, or flows out to the ocean by means of ocean outfalls and Roberts Lake. Only storm water that percolates down into the aquifers is a source of salts and nutrients to the basin. The water quality and hence the salt and nutrient load from storm water varies depending on the land use within the drainage area.

The volume of runoff generated is not as great as would be expected for a basin of the size of the Seaside basin. A large percentage of the land use is undeveloped, with sandy soils that have high permeability that allows for greater infiltration and less runoff.

The catchments for the various storm water outlets are delineated in Figure 2. The Canyon del Rey catchment that drains into Laguna Grande and Roberts Lake, and ultimately the Monterey Bay, only generates runoff from larger, less frequent storms. This is because the watershed during those storms is considered saturated which causes a larger percentage of runoff to occur as streamflow (Monterey County Flood Control and Water Conservation District, 1977). Rainfall and storm water generated in smaller more frequent storms mostly percolates directly into the basin. Within the Canyon Del Rey catchment there are a couple of percolation ponds that collect storm water that is recharged into the basin (Figure 2).

Available storm water quality data are summarized in Table 2.

4.1.4 LANDSCAPE AND GOLF COURSE FERTILIZATION

Fertilizer applied to residential, commercial, recreational, and public landscapes has the potential to infiltrate the ground surface and percolate into the groundwater basin. Nitrogen losses arise from potential losses to the atmosphere, immobilization, and denitrification of applied fertilizer. However, application rates often exceed actual plant uptake and excess water excess irrigation water in a sufficiently permeable soil root zone will cause nitrogen to leach through the soil profile and into the underlying aquifer.

Although some data suggest nitrate does not leach from highly managed turfs because of nitrogen sequestering, isotope studies have shown that there can be less than 1% leaching (UC Davis, 2012). Golf course fertilization rates are

typically higher than other applications and according to Wu et al. (2007) can apply in excess of 2,180 pounds of nitrogen per acre per year. The UC Davis study (2012) derived a net leaching rate of 8.9 pounds of nitrogen per acre per year for urban landscapes and golf courses.

Based on the land use map (Figure 8), there are approximately 109 acres of sports fields in the Seaside basin. Given nitrogen leaching rate of 8.9 pounds per acre per year, the estimated annual nitrogen leached in to the groundwater from sports fields in the Seaside Basin is 970 pounds.

The leaching of nitrogen from fertilizers in residential and commercial properties was estimating by determining the number of parcels within the urban and rural residential land uses, and assuming an average landscape area of 770 acres to be irrigated (approximately a quarter of the urban, residential, and commercial acreage).

There are four golf courses in the Seaside basin. Table 13 summarizes the sizes and estimated fertilizer use based on the fertilized acreage determined from aerial photographs.

Table 13: Summary of Estimated Seaside Basin Golf Course Fertilizer Application

Golf Course	Operating Since	Approx. Fertilized Area (acres)	Leached Nitrogen * (pounds)
Nicklaus Club-Monterey (formerly Pasadera Country Club)	2000	100	890
Laguna Seca Golf Ranch	1970	99	881
Bayonet	1954	160	1,424
Black Horse	1964	112	997

* Assuming net leaching rate of 8.9 pounds nitrogen per acre per year (UC Davis, 2012)

4.1.5 CARMEL RIVER SYSTEM WATER

MPWMD/CAL-AM AQUIFER STORAGE PROJECT

Due to stresses on the Carmel River system and the State Water Control Board's order for Cal-Am to reduce diversions from the Carmel River, Cal-Am diverts excess winter and spring Carmel River flows for recharge and storage in the Seaside basin. The water is recovered from the basin by the ASR and other Cal-

Am wells in the dry summer months and delivered to Cal-Am customers. The project has two phases. Phase I, includes two ASR wells that inject a combined 920 AFY, under a water rights permit which has a maximum instantaneous diversion rate of 6.7 cfs, and is owned and operated by MPWMD. This first phase was commissioned in 2008.

Phase II of the ASR project has not yet been completely implemented. It consists of an additional two ASR wells that will inject an estimated 1,080 AFY, under a water rights permit which has a maximum instantaneous diversion rate of 8.0 cfs, and is owned by Cal-Am.

Quality of the water being injected is summarized in Table 9. This water is of higher quality than the native water into which is being injected.

RETURN FLOW FROM IRRIGATION

Water imported into the basin by Cal-Am for delivery to customers is from the Carmel River system. It is used for municipal purposes and mostly exported back out of the basin as wastewater. The portion used for domestic and municipal landscape irrigation within the basin has an opportunity to percolate into the aquifers as return flow.

It is assumed that 23% of Carmel River system water supplied to the Seaside basin is used for irrigation. The loading of salts and nutrients from return flow is estimated from the average concentrations provided for each subarea in Table 5 and the assumed volume of applied water.

4.1.6 SALINAS VALLEY GROUNDWATER WATER

BAYONET AND BLACK HORSE GOLF COURSES IRRIGATION

The Black Horse and Bayonet golf courses are adjacent courses that are owned by the City of Seaside and managed by BSL Golf Corporation. Historically, the City of Seaside has pumped two wells near the golf courses for turf irrigation. Because of their historic over-pumping, the City is currently paying back replenishment water to the Seaside Watermaster by purchasing water from Marina Coast Water District (MCWD) in-lieu of pumping their own wells. The source of water supplied by MCWD is Salinas Valley groundwater. This program started in 2011 and is expected to end in 2018.

RETURN FLOW FROM IRRIGATION

Water imported into the basin by MCWD is from Salinas Valley groundwater. It is used for municipal purposes and is mostly exported back out of the basin as wastewater. The portion used for domestic and municipal landscape irrigation within the basin has an opportunity to percolate into the aquifers as return flow.

It is assumed that 23% of Salinas Valley groundwater supplied is used for irrigation. The loading of salts and nutrients from return flow is estimated from the average concentrations provided for each subarea in Table 5 and the assumed volume of applied water.

4.1.7 CITY OF SAND CITY DESALINATION PLANT

The City of Sand City has a 300 acre-foot per year capacity desalination plant located in the dunes off Bay Street. The source water for the desalination plant is shallow brackish water from the Southern Coastal subarea. Sand City was granted rights to pumping this brackish water in the Amended Decision. Byproduct or reject water from the plant is disposed through a horizontal well beneath the beach in Sand City. The plant has been operating since April 2010 for municipal supply.

The reject water has a TDS and chloride concentration similar to seawater and very low nitrate. It is designed to flow into the ocean after being injected beneath the beach, and therefore is designed to have little impact on the basin's groundwater. Because of this, it is not considered in the loading analysis.

4.1.8 IRRIGATION WITH RECYCLED WATER

The only existing use of recycled water in the basin is for irrigation of the Nicklaus Club-Monterey golf course. The recycled water is provided by the Pasadera wastewater treatment and recycling facility. The wastewater is passed through a tertiary treatment process and disinfected with sodium hypochlorite. All recycled wastewater from the facility is reused on the golf course. The recycled water is stored in a lined storage reservoir where it is blended with well water at a ratio of approximately ten parts well water to one part recycled water before application on the golf course (RWQCB, Central Coast, 2011b). The facility is permitted under Waste Discharge and Recycled Water Producer Requirements Order No. 98-58 and application of the recycled water is permitted under Recycled Water User Requirements Order No. 98-59.

According to the RWQCB (2011b), the facility has had trouble with salt violations of its permit due to:

1. Poor water supply quality. The water supply is local groundwater which has elevated hardness and alkalinity,
2. Widespread use of residential self-regenerating water softeners to combat the hard water which increase the salt load to the wastewater collection system,
3. Spa and pool water discharges to the wastewater collection system,
4. Use of sodium hypochlorite to meet disinfection requirements at the treatment facility, and
5. Effluent concentration limits set in the permit.

Effluent concentration limits for recycled water discharged to the lined storage reservoir are: 600 mg/L for TDS, and 125 mg/L for both sodium and chloride. Table 14 shows how the local groundwater quality regularly exceeds these limits.

Table 14: Comparison of Groundwater Supply, Influent, and Effluent from 2006 - 2010

mg/L	Groundwater Supply			Facility Influent			Facility Effluent		
	TDS	Sodium	Chloride	TDS	Sodium	Chloride	TDS	Sodium	Chloride
Min	639	105	132	853	97	146	1,260	257	428
Max	655	149	179	1,970	264	748	1,890	423	702
Ave	647	130	157	1,249	200	352	1,557	314	562

Data is based on 2006 – 2010 coincident semi-annual monitoring data
Source of data: Central Coast RWQCB, 2011b

The 2012 effluent volumes generated are listed in Table 15.

It is noted that the Court assigned Alternative Producer Allocation for the Nicklaus Club Monterey golf course is less than the amount of groundwater required to meet the 10:1 dilution requirement of Recycled Water User Requirements Order No. 98-59.

Table 15: Pasadera Wastewater Treatment and Recycling Facility Effluent Volumes for 2012

Month	Effluent Volume	
	gallons	Acre-feet
January	1,397,965	4.3
February	1,209,034	3.7
March	1,323,776	4.1
April	1,273,185	3.9
May	1,350,383	4.1
June	1,243,437	3.8
July	1,305,065	4.0
August	1,361,143	4.2
September	1,423,123	4.4
October	1,284,403	3.9
November	1,209,140	3.7
December	1,302,107	4.0
Total	15,682,761	48.1

4.1.9 Seaside Basin Groundwater Return Flow

A portion of the native groundwater used for landscape, golf course, and sports field irrigation will infiltrate the ground surface and percolate into the aquifer. In this report, this water is called return flow. It is assumed that 23% of groundwater pumped in each subarea is used for irrigation. The loading of salts and nutrients from return flow is estimated from the average concentrations provided for each subarea in Table 5 and the assumed volume of applied water.

4.1.10 Septic Systems

Only approximately 10-20% nitrogen removal is achievable in conventional septic systems (Siegrist et. al., 2000). Septic systems are designed to overflow to a leach field buried in approximately three feet of soil. Due to anaerobic conditions in the septic tank, nitrogen is predominantly ammonium, with the remainder in organic form (UC Davis, 2000). A number of other nitrogen transformations can occur beneath the leach field. The UC David study assumed that all nitrogen leaching from properly functioning septic systems reaches groundwater as nitrate.

4.1.11 System Losses

Within the water purveyor service areas, there are water and sewer distribution system losses that contribute a small amount to groundwater recharge. Water from system losses is assumed to directly recharge the groundwater basin, and is not involved in evapotranspiration (ET).

4.2 Proposed Sources

Three proposed projects with potential impacts to the Seaside basin are currently in their planning stages. Table 16 summarizes the three projects, which all import water from various sources of better quality than the native groundwater into the Seaside basin.

Table 16: Summary of Foreseeable Salt and Nutrient Sources

Proposed Project	Potential Source of Salt and Nutrients
Regional Urban Water Augmentation Project (RUWAP)	Irrigation of Bayonet/Black Horse Golf Courses with recycled water
Groundwater Replenishment Project by the Monterey Regional Water Pollution Control Agency	Recharge recycled water by injection into both the shallow and deep aquifers
MPWMD/Cal-Am Aquifer Storage Project Phase II	Injection of Carmel River water into the deep aquifer

4.2.1 Regional Urban Water Augmentation

The Regional Urban Water Augmentation Project (RUWAP) comprises a recycled water distribution system by MCWD to provide up to 1,727 AFY of recycled water from MRWPCA's existing Salinas Valley Reclamation Plant (SVRP) to urban users within the Ord Community (former Fort Ord) and the Monterey Peninsula. Approximately 300 AFY would be made available to the Monterey Peninsula with the remainder being supplied for redevelopment of Fort Ord. Between 450 and 500 AFY of irrigation water would be provided to the City of Seaside golf courses (Black Horse and Bayonet).

With the exception of a winter storage reservoir, the project design is essentially complete, and most of the right-of-way for the pipelines has been acquired. Some sections of pipeline have already been installed as components of roadway

projects constructed under the Fort Ord Reuse Plan. The project is three to five years from completion.

Currently, the Seaside golf courses are being irrigated with Salinas Valley groundwater imported into the Seaside basin by MCWD. The change from Salinas Valley groundwater to recycled water will cause a slight increase in salt and nutrient loading.

4.2.2 GROUNDWATER REPLENISHMENT PROJECT

Monterey Regional Water Pollution Control Agency's (MRWPCA) proposed Groundwater Replenishment Project (GWRP) is currently involved in the California Environmental Quality Act (CEQA) process. The GWRP would produce 3,500 AFY of high quality water for injection into both the shallow Paso Robles (four wells) and deeper Santa Margarita (four wells) aquifers in the Seaside basin. To produce this volume of treated water, the GWRP requires a minimum of 4,321 AFY of raw source waters to feed the proposed new GWRP Advanced Water Treatment (AWT) Facility.

The mechanism of recharge is subject to revision during the CEQA process but has initially been planned as 10% into the Paso Robles aquifer through the use of vadose zone wells and 90% injected into the Santa Margarita aquifer. Advanced treatment of wastewater by the AWT plant will include reverse osmosis and microfiltration. The injection water's expected TDS will be less than 200 mg/L, and total nitrogen will be less than 5 mg/L. This water quality is better than the groundwater quality presently occurring in the area where the project is proposed. This means that the project will not cause additional salt and nutrient loading but contribute to improving the groundwater quality.

4.2.3 MPWMD/CAL-AM AQUIFER STORAGE PROJECT PHASE II

Phase II of the aquifer storage project described in Section 4.1.5 will be operational in 2014. It is owned by Cal-Am, and consists of an additional two ASR wells capable of injecting an annual average of approximately 1,080 AFY, under a water rights permit which has a maximum instantaneous diversion rate of 8.0 cfs from the Carmel River. The water quality of the injected water is summarized in Table 9. This water quality is better than the groundwater quality presently occurring in the Santa Margarita aquifer where the injection is targeted. This means that the project will not cause additional salt and nutrient loading but will contribute to improving the groundwater quality, as shown in Figure 12.

SECTION 5
EXISTING GROUNDWATER MONITORING PROGRAMS

Historical groundwater monitoring in the Seaside basin started in the mid-1950's when some records of coastal municipal well production and groundwater levels were kept. In 1980, the MPWMD established a coordinated program of collecting and reporting groundwater production in the basin. The program required the reporting of groundwater and surface water production from all water sources. In the early 1990's MPWMD pioneered a program to install dedicated monitoring wells completed within targeted aquifers in the coastal areas of the basin to monitor water quality and levels in an effort to monitor potential seawater intrusion. Since that time the MPWMD's monitoring network has been expanded to 25 wells at 18 locations in the Northern and Southern Coastal subareas, and 25 wells in 17 locations within the Laguna Seca and Northern Inland subareas.

As part of the Adjudicated Decision for the Seaside Groundwater Basin, the Watermaster was required to prepare a comprehensive monitoring and management program (MMP) to assist the Court in the administration and enforcement of the Decision and to ensure the basin is protected and managed as a perpetual source of water for beneficial uses. On February 9, 2007, the Court approved the Seaside Basin MMP which has continued to be implemented since that time.

The purpose of the monitoring portion of the MMP is to monitor current overdraft conditions and threat of potential seawater intrusion into the coastal subarea of the basin. Groundwater production, groundwater quality, and groundwater levels are included in the MMP. The MMP provides for groundwater level monitoring on at least a quarterly basis. Coastal monitoring well groundwater levels are measured monthly manually and have dataloggers set to record at least daily. Inland monitoring well groundwater levels are manually measured quarterly with some of the wells equipped with dataloggers set to record at least daily. Data are entered into the MPWMD/Watermaster database quarterly. Wells that are monitored are listed in Table 17 through Table 19. Figure 17 shows the location of all wells monitored.

Coastal monitoring wells are sampled quarterly using dedicated low-flow bladder pumps and tested for full general mineral and physical parameters.

Groundwater quality (full general mineral and physical parameters) is only collected from inland monitoring wells after they are completed and at the request of the Watermaster for special studies.

Producers who are Watermaster members are required to record monthly groundwater levels and production volumes from their production wells and report them to the Watermaster at least quarterly. Water quality samples (full general mineral and physical parameters) from active Watermaster producer coastal production wells are collected in the fourth quarter of each water year. All these data are entered into the MPWMD/Watermaster database quarterly.

The MPWMD/Cal-Am Aquifer Storage Project has a groundwater sampling and analysis plan (SAP) that provides for monitoring of ASR operations. The plan is subject to periodic updates, but essentially requires that MPWMD samples specific wells quarterly during periods the ASR wells are operating (Appendix A). The wells that are monitored as part of the SAP are included in Table 17 through Table 19. Figure 17 shows the location of wells monitored.

Another monitoring program in the area, which overlaps with the monitoring already described, is managed by the California Department of Public Health (CDPH), which requires testing of public water supply wells per the State defined monitoring schedule. See online link below to the CDPH monitoring program.
(http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Monitoring.aspx).
The annual data required by the Watermaster from water purveyors for active production wells exceeds the frequency of the CDPH monitoring schedule.

Table 17: Wells in the Laguna Seca Subarea Included in Existing Monitored Programs

					Watermaster MMP					ASR Monitoring by MPWMD	
Watermaster Number	Common Name	Owner	Well Type	Subarea	WL Monitoring Frequency	WL Network	WQ Monitoring Frequency	WQ Network	Monitored By	WL Monitoring Frequency	WQ Monitoring Frequency
135	**Justin Court**	**California American Water**	**Monitor**	**Laguna Seca**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**	**Quarterly**	**none**
209	Bishop #1 (west)	California American Water	Production	Laguna Seca	Monthly	Watermaster	Annually	Watermaster	CAW		
213	Ryan Ranch #7	California American Water	Production	Laguna Seca	Monthly	Watermaster	Annually	Watermaster	CAW		
215	Ryan Ranch #11	California American Water	Production	Laguna Seca	Monthly	Watermaster	Annually	Watermaster	CAW		
216	Ryan Ranch #8	California American Water	Production	Laguna Seca	Monthly	Watermaster	Annually	Watermaster	CAW		
226	Bay Ridge	California American Water	Production	Laguna Seca	Monthly	Watermaster	none	none	CAW		
242	**CalAm Granite Construction**	**California American Water**	**Monitor**	**Laguna Seca**	**Quarterly**	**Watermaster**	**none**	**none**	**MPWMD**		
262	Bishop #3	CAW	Production	Laguna Seca	Monthly	Watermaster	Annually	Watermaster	CAW		
136	**LS Pistol Range**	**County of Monterey**	**Monitor**	**Laguna Seca**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**		
137	**York Rd-West**	**County of Monterey**	**Monitor**	**Laguna Seca**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**		
138	**Seca Place**	**County of Monterey**	**Monitor**	**Laguna Seca**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**		
139	**Robley Shallow (North)**	**County of Monterey**	**Monitor**	**Laguna Seca**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**		
140	**Robley Deep (South)**	**County of Monterey**	**Monitor**	**Laguna Seca**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**		
141	**LS Driving Range**	**County of Monterey**	**Monitor**	**Laguna Seca**	**Quarterly**	**Watermaster**	**Annually**	**Watermaster**	**MPWMD**		
142	**LS No. 1 Subdivision**	**Laguna Seca Resorts**	**Monitor**	**Laguna Seca**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**		
143	**Blue Larkspur-East End**	**Laguna Seca Resorts**	**Monitor**	**Laguna Seca**	**Quarterly***	**MPWMD**	**none**	**none**	**MPWMD**		
144	LS Golf Old #12	Laguna Seca Resorts	Production	Laguna Seca	Monthly	MPWMD	none	none	LSGR		
196	LSRA #2	Monterey County Parks Department	Production	Laguna Seca	Monthly	Watermaster	none	none	MCPD		
197	LSRA #1	Monterey County Parks Department	Production	Laguna Seca	Monthly	Watermaster	none	none	MCPD		
129	**FO-04-Shallow (E)**	**MPWMD**	**Monitor**	**Laguna Seca**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**		
130	**FO-04-Deep (W)**	**MPWMD**	**Monitor**	**Laguna Seca**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**		
133	**FO-06-Shallow**	**MPWMD**	**Monitor**	**Laguna Seca**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**		
134	**FO-06-Deep**	**MPWMD**	**Monitor**	**Laguna Seca**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**		
204	Pasadera Golf - Paddock	Pasadera Country Club, LLC	Production	Laguna Seca	Monthly	Watermaster	none	none	Pasadera		
208	Pasadera Golf - Main Gate	Pasadera Country Club, LLC	Production	Laguna Seca	Monthly	Watermaster	none	none	Pasadera		
212	York School 2001	York School	Production	Laguna Seca	Monthly	Watermaster	Annually	Watermaster	MPWMD		

Bold indicates monitoring well

Table 18: Wells in the Northern Coastal Subarea Included in Existing Monitored Programs

					Watermaster MMP					ASR Monitoring by MPWMD	
Watermaster Number	Common Name	Owner	Well Type	Subarea	WL Monitoring Frequency	WL Network	WQ Monitoring Frequency	WQ Network	Monitored By	WL Monitoring Frequency	WQ Monitoring Frequency
107	**Ord Grove Test**	**California American Water**	**Monitor**	**Northern Coastal**	**Monthly**	**MPWMD**	**none**	**none**	**MPWMD**	**Daily***	**Quarterly**
151	Military	California American Water	Production	Northern Coastal	Monthly	Watermaster	none	none	CAW		
153	Ord Grove #2	California American Water	Production	Northern Coastal	Monthly	Watermaster	Annually	Watermaster	CAW		**Quarterly**
159	Luzern #2	California American Water	Production	Northern Coastal	Monthly	Watermaster	Annually	Watermaster	CAW		
162	Playa #3	California American Water	Production	Northern Coastal	Monthly	Watermaster	Annually	Watermaster	CAW		
163	**Playa #4**	**California American Water**	**Monitor**	**Northern Coastal**	**Monthly**	**CAW**	**none**	**none**	**CAW**		
169	Paralta	California American Water	Production	Northern Coastal	Monthly	Watermaster	Annually	Watermaster	CAW		**Quarterly**
231	**Del Monte Test**	**California American Water**	**Monitor**	**Northern Coastal**	**Monthly**	**CAW**	**Annually**	**Watermaster**	**CAW**		
243	**Luxton**	**California American Water**	**Monitor**	**Northern Coastal**	**Monthly**	**CAW**	**none**	**none**	**CAW**		
173	Seaside Muni #4	City of Seaside	Production	Northern Coastal	Monthly	Watermaster	Annually	Watermaster	City of Seaside		
174	Seaside Muni #3	City of Seaside	Production	Northern Coastal	Monthly	Watermaster	Annually	Watermaster	City of Seaside		
187	Seaside Golf - Reservoir	City of Seaside	Production	Northern Coastal	Quarterly	Watermaster	Annually	Watermaster	Coty of Seaside		
189	Seaside Golf - Coe	City of Seaside	Production	Northern Coastal	Quarterly	Watermaster	Annually	Watermaster	City of Seaside		
152	Target Well	DBO Development	Production	Northern Coastal	Monthly	MPWMD	none	none	MPWMD		
154	**MMP monitor**	**Mission Memorial Park**	**Monitor**	**Northern Coastal**	**Monthly**	**Watermaster**	**none**	**none**	**MPWMD**		
101	**MSC-Shallow**	**MPWMD**	**Monitor**	**Northern Coastal**	**Monthly**	**MPWMD**	**Quarterly**	**Watermaster**	**MPWMD**		
102	**MSC-Deep**	**MPWMD**	**Monitor**	**Northern Coastal**	**Monthly***	**MPWMD**	**Quarterly***	**Watermaster**	**MPWMD**		
103	**PCA-W Shallow**	**MPWMD**	**Monitor**	**Northern Coastal**	**Quarterly**	**MPWMD**	**Quarterly***	**Watermaster**	**MPWMD**		
104	**PCA-W Deep**	**MPWMD**	**Monitor**	**Northern Coastal**	**Quarterly***	**MPWMD**	**Quarterly***	**Watermaster**	**MPWMD**		
105	**PCA-E Shallow**	**MPWMD**	**Monitor**	**Northern Coastal**	**Monthly**	**MPWMD**	**Annually**	**Watermaster**	**MPWMD**	**Daily***	**Quarterly**
106	**PCA-E Deep**	**MPWMD**	**Monitor**	**Northern Coastal**	**Monthly**	**MPWMD**	**Annually**	**Watermaster**	**MPWMD**	**Daily***	**Quarterly****
108	**Paralta Test**	**MPWMD**	**Monitor**	**Northern Coastal**	**Monthly**	**MPWMD**	**none**	**none**	**MPWMD**	**Daily***	**Quarterly**
109	**Ord Terrace-Shallow**	**MPWMD**	**Monitor**	**Northern Coastal**	**Annually**	**MPWMD**	**Annually**	**Watermaster**	**MPWMD**	**Daily***	**Quarterly**
110	**Ord Terrace-Deep**	**MPWMD**	**Monitor**	**Northern Coastal**	**Monthly**	**MPWMD**	**Annually**	**Watermaster**	**MPWMD**		
111	**FO-09-Shallow**	**MPWMD**	**Monitor**	**Northern Coastal**	**Monthly***	**MPWMD**	**Quarterly***	**Watermaster**	**MPWMD**		
112	**FO-09-Deep**	**MPWMD**	**Monitor**	**Northern Coastal**	**Monthly***	**MPWMD**	**Quarterly***	**Watermaster**	**MPWMD**		
251	**CDM MW-1**	**MPWMD**	**Monitor**	**Northern Coastal**	**Monthly**	**Watermaster**	**none**	**none**	**MPWMD**		
252	**CDM MW-2**	**MPWMD**	**Monitor**	**Northern Coastal**	**Monthly**	**Watermaster**	**none**	**none**	**MPWMD**		
261	**ASR - 3**	**MPWMD**	**Monitor**	**Northern Coastal**	**Quarterly**	**MPWMD**	**Annually**	**MPWMD**	**MPWMD**	**Daily***	**Quarterly**
283	**ASR - 4**	**MPWMD**	**Monitor**	**Northern Coastal**	**Quarterly**	**MPWMD**	**Annually**	**MPWMD**	**MPWMD**	**Daily***	**Quarterly**
248	**Sentinel MW #4**	**Seaside Watermaster**	**Monitor**	**Northern Coastal**	**Monthly**	**Watermaster**	**Annually**	**Watermaster**	**MPWMD**		
171	PCA Production	Security National Guaranty Inc	Production	Northern Coastal	Monthly	Watermaster	none	none	Craig Evans		
259	**Seaside Middle School (S)**	**MPWMD**	**Monitor**	**Northern Coastal**						**Monthly**	**Quarterly**
260	**Seaside Middle School (D)**	**MPWMD**	**Monitor**	**Northern Coastal**						**Monthly**	**Quarterly****

Bold indicates monitoring well
* in water level column indicates datalogger is installed
** in water quality column indicates low-flow bladder pump is installed for sampling

Table 19: Wells in the Northern Inland and Southern Coastal Subareas Included in Existing Monitored Programs

					Watermaster MMP					ASR Monitoring by MPWMD	
Watermaster Number	Common Name	Owner	Well Type	Subarea	WL Monitoring Frequency	WL Network	WQ Monitoring Frequency	WQ Network	Monitored By	WL Monitoring Frequency	WQ Monitoring Frequency
115	**FO-01-Shallow**	**MPWMD**	**Monitor**	**Northern Inland**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**		
116	**FO-01-Deep**	**MPWMD**	**Monitor**	**Northern Inland**	**Quarterly**	**MPWMD**	**none**	**none**	**MPWMD**		
118	**FO-07-Shallow**	**MPWMD**	**Monitor**	**Northern Inland**	**Monthly**	**MPWMD**	**none**	**none**	**MPWMD**	**Daily***	**Quarterly**
119	**FO-07-Deep**	**MPWMD**	**Monitor**	**Northern Inland**	**Monthly**	**MPWMD**	**none**	**none**	**MPWMD**	**Daily***	**Quarterly**
188	**ASR - 1**	**MPWMD**	**Monitor**	**Northern Inland**	**Quarterly**	**MPWMD**	**Annually**	**MPWMD**	**MPWMD**	**Daily***	**Quarterly**
256	**ASR - 2**	**MPWMD**	**Monitor**	**Northern Inland**	**Quarterly**	**Watermaster**	**none**	**none**	**MPWMD**	**Daily***	**Quarterly**
257	**ASR MW-1**	**MPWMD**	**Monitor**	**Northern Inland**	**Quarterly**	**Watermaster**	**none**	**none**	**MPWMD**	**Daily***	**Quarterly**
177	Plumas #4	California American Water	Production	Southern Coastal	Monthly	Watermaster	Annually	Watermaster	CAW		
184	La Salle #2	California American Water	Production	Southern Coastal	Monthly	CAW	Annually	Watermaster	CAW		
244	**Hilby MGT**	**California American Water**	**Monitor**	**Southern Coastal**	**Monthly**	**Watermaster**	**none**	**none**	**CAW**	**Daily***	
165	Sand City Corp Yard	City of Sand City	Production	Southern Coastal	Monthly	Watermaster	Annually	Watermaster	MPWMD		
167	Design Ctr.	City of Sand City	Production	Southern Coastal	Monthly	Watermaster	Annually	Watermaster	MPWMD		
150	Cypress Pacific Production	King Venture	Production	Southern Coastal	Monthly	Watermaster	Annually	Watermaster	MPWMD		
156	Mission Memorial	Mission Memorial Park	Production	Southern Coastal	Quarterly	Watermaster	Annually	MPWMD	MPWMD		
124	**Plumas Test 1990**	**MPWMD**	**Monitor**	**Southern Coastal**	**Monthly**	**MPWMD**	**none**	**none**	**MPWMD**		
125	**K-Mart**	**MPWMD**	**Monitor**	**Southern Coastal**	**Monthly**	**MPWMD**	**none**	**none**	**MPWMD**		
238	**CDM MW-4**	**MPWMD**	**Monitor**	**Southern Coastal**	**Monthly**	**Watermaster**	**none**	**none**	**MPWMD**		
239	**CDM MW-3**	**MPWMD**	**Monitor**	**Southern Coastal**	**Monthly**	**Watermaster**	**none**	**none**	**MPWMD**		
240	**MW-BW-08-A**	**U.S.A. Fort Ord**	**Monitor**	**Southern Coastal**	**Monthly**	**Watermaster**	**none**	**none**	**MPWMD**		
241	**MW-BW-09-180**	**U.S.A. Fort Ord**	**Monitor**	**Southern Coastal**	**Monthly**	**Watermaster**	**none**	**none**	**MPWMD**		

Bold indicates monitoring well
* in water level column indicates datalogger is installed
** in water quality column indicates low-flow bladder pump is installed for sampling

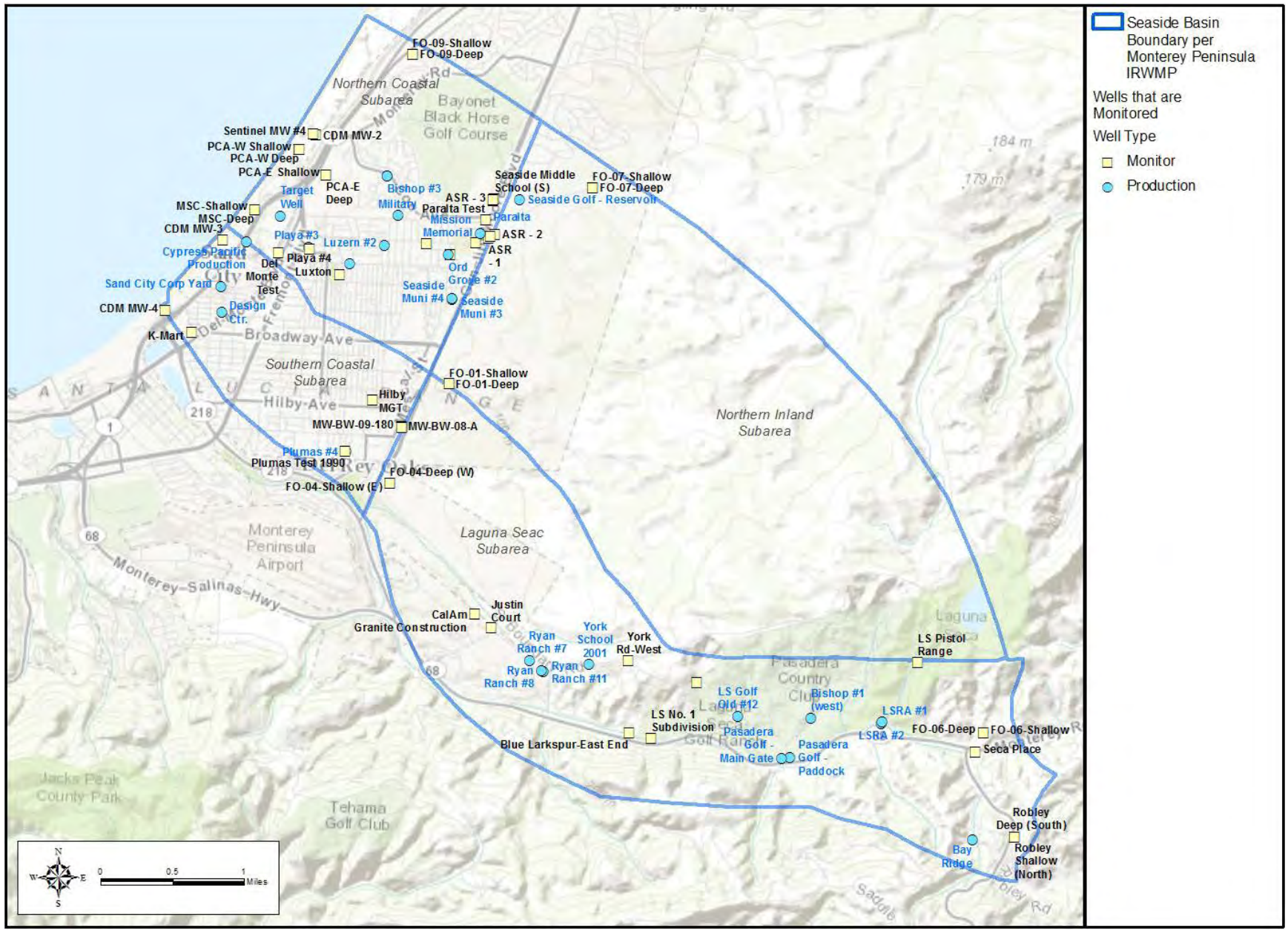


Figure 17: Location of Wells Monitored (Production and Dedicated Monitoring Wells)

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SECTION 6
EXISTING DATABASES

6.1 EXISTING DATABASE IDENTIFICATION AND DESCRIPTION

MPWMD, working with the Watermaster has developed a database that contains groundwater quality and groundwater level data collected within the Seaside Groundwater Basin. The database is in 2010 MS Access format and has been adapted from an earlier database initially developed by Watermaster consultants in 2006. MPWMD maintains the database on a quarterly basis. The database is backed up weekly, with backup tapes rotated, and kept in an off-site lockbox.

Water quality data contained in the MPWMD database includes data collected for Watermaster required monitoring, Carmel River system specific monitoring, ASR specific monitoring, and remaining areas within the MPWMD service area.

Groundwater level data contained in the database includes groundwater levels collected since 2008 for Watermaster-required monitoring and all data MPWMD has historically collected prior to the establishment of the Watermaster and in connection with regulatory requirements for ASR. The database does not contain groundwater level data recorded by dataloggers.

A streamflow database developed and maintained by the MPWMD is separate from the MS Access groundwater database. The streamflow database includes flows and water quality. Of relevance to the Seaside basin is the streamflow record of Arroyo Del Rey at Del Rey Oaks. This streamflow monitoring gage has been maintained by MPWMD since October 2002.

6.2 RECOMMENDED DATABASE

It is recommended that the current MPWMD/Watermaster database be used as the data storage location for any groundwater data collected as part of salt and nutrient monitoring. The database provides a comprehensive, maintained, well-established location for groundwater data collected for the Seaside basin.

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SECTION 7
SALT AND NUTRIENT EVALUATION

7.1 WATER BALANCE

7.1.1 CONCEPTUAL MODEL

The conceptual model used for this salt and nutrient management plan is a simplified representation of the essential features of the basin's physical system, its hydrologic behavior, and man-made components that influence the water balance. These data, interpretations, and simplifications form the basis of the salt and nutrient balance that follows.

The water balance consists of developing quantitative estimates of all of the inflows and outflows for the basin, both natural and man-made. The water balance developed for the Seaside Basin groundwater model (HydroMetrics LLC, 2009b) is used as a primary source with water imports and exports from the basin also included, as these were not part of the original hydrologic water balance prepared for the groundwater flow model. A graphical conceptual depiction of the water balance is provided in Figure 18. The following sections describe each of the water balance components. Table 20 summarizes the annual average water balance components.

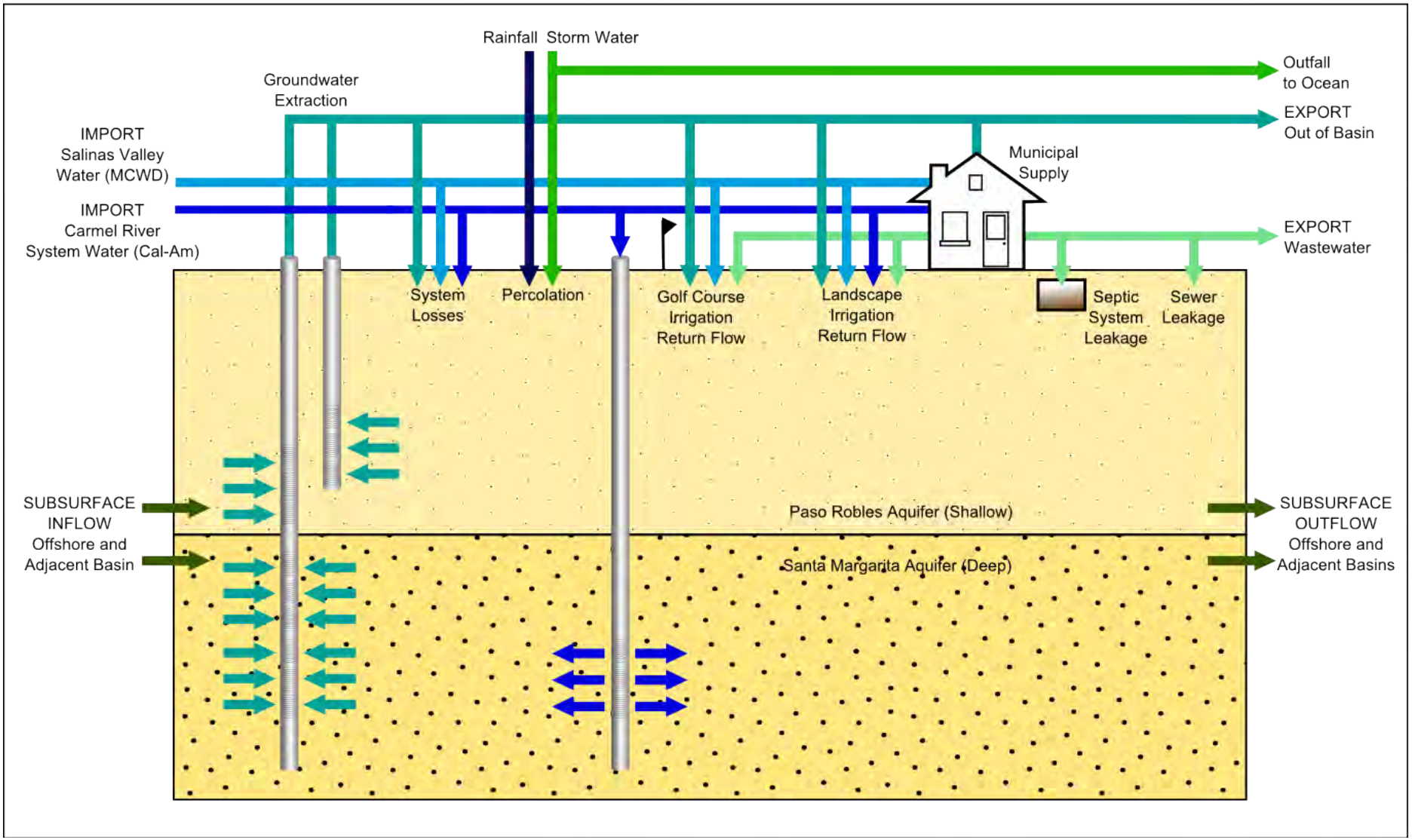


Figure 18: Conceptual Water Balance

7.1.2 INFLOWS

Inflows to the Seaside basin include all water that is naturally and artificially brought into the basin. Natural inflow mechanisms adding water to the groundwater system include:

1. Deep percolation of rainfall, and
2. Underflow from onshore and offshore areas (inflow).

Water introduced into the groundwater basin by artificial or man-made means include:

1. Imported water from outside the basin,
2. Losses from water distribution systems,
3. Losses from sewer system,
4. Septic systems,
5. Return flow from irrigation,
6. Infiltration from storm water ponds.

Although a general discussion of each of the inflow terms have already been included in Section 4, more detail on the quantity and source of flow data is provided in this section.

DEEP PERCOLATION OF RAINFALL

The amount of deep percolation occurring in each subarea of the Seaside basin was extracted from the calibrated Seaside basin groundwater flow model (HydroMetrics LLC, 2009b). The primary source of data for the model was daily rainfall data were obtained from Monterey Co-op Station 45795 and Salinas Co-op Station 47668 (Figure 3). The resultant amount of deep percolation from rainfall was calculated at each model cell using a combination of daily rainfall, monthly evapotranspiration, land use type, and soil classifications. The amount of deep percolation of rainfall in the Seaside basin is approximately 2,258 AFY (Table 20).

Table 20: Seaside Basin Water Balance

Water Balance Component	Northern Coastal	Northern Inland	Southern Coastal	Laguna Seca	Basin Total
Inflows (AFY)					
Precipitation	78	1,450	30	700	2,258
Groundwater Underflow					
From Onshore	2,850	0	450	180	180*
From Offshore	100	0	0	0	100
ASR Wells (Injection)	625	0	0	0	625
Water Distribution System Losses	411	0	21	46	478
Sewer Distribution System Losses	77	0	9	19	105
Septic Systems	0	0	5	22	27
Irrigation Infiltration					
Golf Courses	85	0	0	88	173
Landscaping	461	0	52	114	627
Recycled Water Irrigation	0	0	0	9	9
Storm Water	68	0	37	0	105
Total Inflow	***4,754***	***1,450***	***604***	***1,177***	***7,985***
Outflows (AFY)					
Groundwater Pumping	4,278	0	227	869	5,374
Groundwater Underflow					
To Onshore	0	2,060	790	450	0*
To Offshore	70	0	30	0	100
Total Outflow	***4,348***	***2,060***	***1,047***	***1,319***	***8,774***
Storage Change (Inflow - Outflow)	**406**	**-610**	**-443**	**-142**	**-789**

* This value is not equal to the sum of the four subarea columns; it is a summary for the entire basin which is made up of all four subareas combined. The subarea columns are a summary of the water balance for each subarea. The four subarea columns include exchanges of groundwater between subareas, as they are an important source of loading and removal of salts and nutrients for individual subareas. The basin-wide value, however, only considers inputs to or outputs from the entire basin. The net values (total groundwater inflow less total groundwater outflow) derived from each approach are equivalent.

Underflow from Onshore and Offshore Areas

Inflow to the basin from adjacent basins is limited to the northeastern boundary connection to the Salinas Valley. Between subareas there is also groundwater underflow. The estimated underflow into each subarea is shown on Table 20. A total of 180 AFY of water enters the basin as groundwater underflow from inland areas. The southern basin boundary is considered a no-flow boundary because it

coincides with the Chupines Fault that marks the southernmost extent of the Seaside basin.

A minor amount of groundwater underflow (100 AFY) occurs from the ocean into the basin. This does not constitute seawater intrusion as the basin's aquifers extend offshore. The source of these data is the water balance included in the Seaside basin groundwater flow model report (HydroMetrics LLC, 2009b).

IMPORTED WATER

Approximately 625 AFY of Carmel River system water is imported by MPWMD/Cal-Am for direct injection into the Santa Margarita aquifer. This amount is dependent on water availability in the Carmel River and therefore changes, sometimes significantly, each year.

Municipal and irrigation water is imported into the basin by both Cal-Am and MCWD. The amounts imported over the past two years average: 186 AFY for Cal-Am (Carmel River system water) and 927 AFY for MCWD (Salinas Valley water). The MCWD water is used in the Northern Coastal subarea by the Bayonet and Black Horse golf courses and the residential areas north of Coe Ave. Cal-Am uses its imported water to supply its customers in all the basin's subareas.

Water imported for use in the basin is not a recharge component to the water balance. Various uses of the water become recharge components, such as distribution system losses and irrigation return flow. These are discussed in the following sub-sections.

LOSSES FROM WATER DISTRIBUTION SYSTEMS

Within the water purveyor service areas, there are system losses that contribute a small amount to groundwater recharge. A loss of 8.5% of water distributed to customers by water purveyors was assumed for the water balance. Volumes were provided by MPWMD (groundwater), MCWD (imported Salinas Valley water), and Cal-Am (groundwater and imported Carmel River system water). Water from system losses is assumed to directly recharge the groundwater basin, and is not involved in evapotranspiration. Losses from water distribution systems account for approximately 478 AFY of recharge to the basin (Table 20).

LOSSES FROM SEWER DISTRIBUTION SYSTEMS

The volume of sewer system losses was estimated as 5% of the amount of water remaining from imported water and local groundwater after system losses and irrigation return flow are accounted for. For the Seaside basin this amount is estimated as 105 AFY (Table 20*)*.

SEPTIC SYSTEMS

To estimate the amount of groundwater recharge by septic systems, water use of 140 gallons per day per capita was assumed, with 40% of that use being indoor use that gets disposed in the septic system. The number of people residing in each of the septic tank areas was estimated using 2010 census data. The average recharge from septic systems is 27 AFY.

RETURN FLOW FROM IRRIGATION

Return flow from irrigation was estimated separately for golf courses and landscape irrigation. For golf courses, it was assumed that irrigation efficiencies are 80% and therefore 20% of applied water becomes return flow and recharges the basin. For urban, residential, industrial, and commercial landscape irrigation, it was assumed that of the amount of imported and local groundwater water distributed by water purveyors and private landowners less system losses, 23% becomes irrigation return flow and recharges the groundwater basin. Of the recycled water that is diluted with local groundwater for irrigation of the Nicklaus Club-Monterey golf course, it was assumed that because the recycled water is stored in an open pond, 10% evaporates, and then of the remaining portion, an 80% irrigation efficiency was applied.

Estimates of irrigation return flow as shown in Table 20 are 173 AFY from golf courses, 627 AFY from landscape irrigation, and 9 AFY of recycled water irrigation.

INFILTRATION FROM STORM WATER PONDS

Infiltration of storm water into five storm water ponds in the groundwater basin (Figure 2) was extracted from the groundwater flow model (HydroMetrics LLC, 2009b). The ponds are constructed to capture storm runoff and allow for percolation into the groundwater. Each percolation pond has a catchment area

defined within the model area. Runoff from the catchment is diverted to its corresponding storm water pond. Water diverted to storm water ponds in the area typically infiltrates within 48 hours. Consequently, losses of recharge to ET are assumed to be negligible, and water recharged through the ponds is applied directly to groundwater recharge.

Based on output from the Seaside basin groundwater flow model, the average groundwater recharge from storm water ponds between 2008 and 2012 was 68 AFY for ponds in the northern area and 37 AFY in the southern area.

7.1.3 OUTFLOWS

Outflows from the Seaside basin include all discharge mechanisms that remove water from the groundwater system. Discharge components include:

1. Groundwater pumping by water agencies and private landowners,
2. Underflow to onshore and offshore areas (outflow).
3. Exported wastewater

GROUNDWATER PUMPING BY WATER AGENCIES AND PRIVATE LANDOWNERS

The Seaside basin groundwater producers include Cal-Am, City of Seaside, and a number of private pumpers. Production is reported to the Watermaster annually. For the water balance, it was estimated that based on production data for 2011 and 2012, an average of 5,374 AFY was extracted from the basin. Of note, approximately 60% of groundwater pumped by Cal-Am in the Seaside basin is exported out of the basin.

UNDERFLOW TO ONSHORE AND OFFSHORE AREAS

The same onshore and offshore sources as described in the inflow section above apply to the outflows that occur in the Seaside basin, i.e., across the northeastern boundary and to the ocean. In the water balance, approximately 100 AFY of water flows out of the basin and into onshore and offshore areas (Table 20). The source of these data is the water balance included in the Seaside basin groundwater flow model report (HydroMetrics LLC, 2009b).

EXPORT OF WASTEWATER

Like water imported into the basin, wastewater exported is not part of the groundwater balance but it is used to estimate sewer distribution system losses. Wastewater from the City of Seaside, Del Rey Oaks, Sand City, and Monterey is exported out of the basin to the MRWPCA's wastewater treatment plant to the north of the basin. After system losses, irrigation and consumptive uses are removed from the water imported from outside the basin and pumped from the basin, the remaining amount is assumed to be wastewater that is exported from the Seaside basin (approximately 1,900 AFY).

7.2 SALT AND NUTRIENT BALANCES

The salt and nutrient balance consists of developing quantitative estimates of all of the loadings and removals of salts and nutrients for the Seaside basin, both natural and man-made. The loadings and removals that comprise the salt and nutrient balance follow the components of the water balance. Salts and nutrients are carried into the basin with each of the different sources of water, of which each has a natural quantity of salts and nutrients and possibly an additional man-made source. Salts and nutrients are carried out of the basin with natural outflows and exports of water. A graphical conceptual depiction of the salt and nutrient balance is provided in Figure 19. The following sections describe each of the salt and nutrient balance components.

7.2.1 LOADING

Loadings to the Seaside basin include all salts and nutrients that are naturally and artificially brought into the basin. Natural mechanisms of salt and nutrient loading to the groundwater system include those carried by:

1. Deep percolation of rainfall, and
2. Underflow from onshore and offshore areas (inflow).

Salts and nutrients introduced into the groundwater basin by artificial or man-made means include those carried by:

3. Injection of imported water,
4. Losses from water distribution systems,
5. Losses from sewer systems,
6. Septic systems,
7. Return flow from irrigation,
8. Fertilizer application,
9. Infiltration from storm water ponds.

Although a general discussion of each of the sources has already been included in Section 4, more detail on the data and assumptions used to estimate loading are provided in this section. Table 21 through Table 23 summarize the salt and nutrient balances estimated for the Seaside basin, and Table 24 summarizes the different water source concentrations.

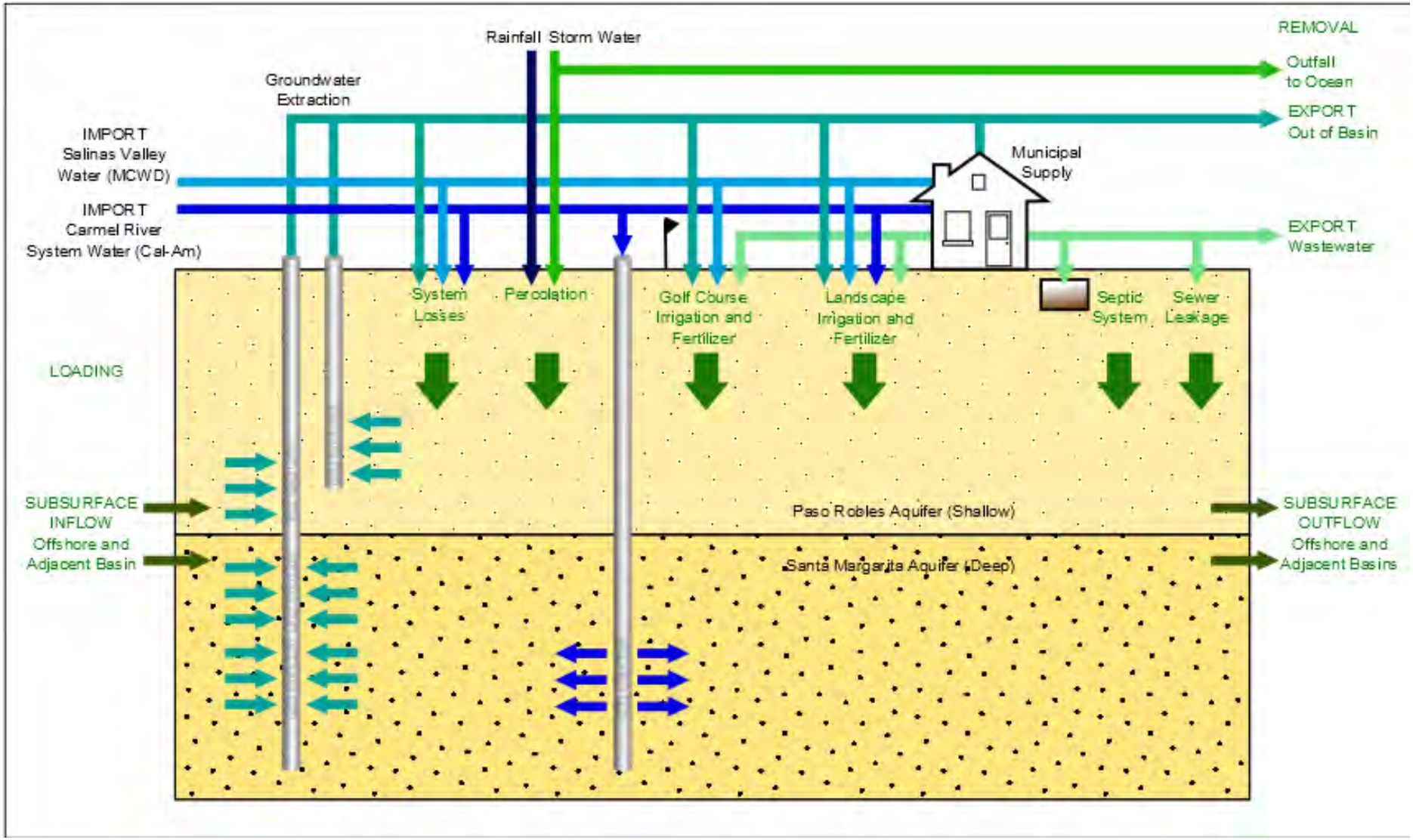


Figure 19: Conceptual Salt and Nutrient Balance

Table 21: Seaside Basin TDS Balance

Salt and Nutrient Balance Component	Northern Coastal	Northern Inland	Southern Coastal	Laguna Seca	Basin Total
Inflows (lb/yr)					
Precipitation	593	11,041	230	5,328	17,191
Groundwater Underflow					
From Onshore	3,388,324	0	1,008,928	193,836	292,260*
From Offshore	98,423	0	0	0	98,423
ASR Wells (Injection)	538,343	0	0	0	538,343
Water Distribution System Losses	408,175	0	38,184	89,934	536,293
Sewer Distribution System Losses	218,731	0	24,527	53,988	297,246
Septic Systems	0	0	13,694	62,423	76,116
Irrigation Infiltration					
Golf Courses	435,570	0	0	0	435,570
Landscaping	462,509	0	94,538	222,666	779,713
Recycled Water Irrigation	0	0	0	29,218	29,218
Storm Water	20,034	0	52,670	0	72,704
Total Inflow	***5,570,702***	***11,041***	***1,232,772***	***657,392***	***7,471,907***
Outflows (lb/yr)					
Groundwater Pumping	4,210,062	0	433,187	1,948,353	6,591,602
Groundwater Underflow					
To Onshore	0	1,880,759	1,507,566	1,008,928	0*
To Offshore	68,896	0	57,249	0	126,146
Total Outflow	***4,278,959***	***1,880,759***	***1,998,001***	***2,957,281***	***11,115,000***
Storage Change (Inflow - Outflow)	**1,291,743**	**-1,869,718**	**-765,230**	**-2,299,889**	**-3,643,094**

* This value is not equal to the sum of the four subarea columns; it is a summary for the entire basin which is made up of all four subareas combined. The subarea columns are a summary of the water balance for each subarea. The four subarea columns include exchanges of groundwater between subareas, as they are an important source of loading and removal of salts and nutrients for individual subareas. The basin-wide value, however, only considers inputs to or outputs from the entire basin. The net values (total groundwater inflow less total groundwater outflow) derived from each approach are equivalent.

Table 22: Seaside Basin Chloride Balance

Salt and Nutrient Balance Component	Northern Coastal	Northern Inland	Southern Coastal	Laguna Seca	Basin Total
Inflows (lb/yr)					
Precipitation	106	1,972	41	951	3,070
Groundwater Underflow					
From Onshore	821,494	0	293,331	41,117	64,270*
From Offshore	23,156	0	0	0	23,156
ASR Wells (Injection)	44,154	0	0	0	44,154
Water Distribution System Losses	94,286	0	11,682	24,440	130,408
Sewer Distribution System Losses	64,518	0	7,235	15,925	87,677
Septic Systems	0	0	4,039	18,412	22,452
Irrigation Infiltration					
Golf Courses	92,505	0	0	0	92,505
Landscaping	104,495	0	28,924	60,511	193,930
Recycled Water Irrigation	0	0	0	8,829	8,829
Storm Water	5,539	0	14,708	0	20,247
Total Inflow	***1,250,252***	***1,972***	***359,960***	***170,186***	***1,782,369***
Outflows (lb/yr)					
Groundwater Pumping	990,482	0	136,124	566,454	1,693,060
Groundwater Underflow					
To Onshore	0	347,760	473,734	293,331	0*
To Offshore	16,209	0	17,990	0	34,199
Total Outflow	***1,006,691***	***347,760***	***627,847***	***859,785***	***2,842,084***
Storage Change (Inflow - Outflow)	**243,561**	**-345,789**	**-267,888**	**-689,600**	**-1,059,715**

* This value is not equal to the sum of the four subarea columns; it is a summary for the entire basin which is made up of all four subareas combined. The subarea columns are a summary of the water balance for each subarea. The four subarea columns include exchanges of groundwater between subareas, as they are an important source of loading and removal of salts and nutrients for individual subareas. The basin-wide value, however, only considers inputs to or outputs from the entire basin. The net values (total groundwater inflow less total groundwater outflow) derived from each approach are equivalent.

Table 23: Seaside Basin Nitrate-N Balance

Salt and Nutrient Balance Component	Northern Coastal	Northern Inland	Southern Coastal	Laguna Seca	Basin Total
Inflows (lb/yr)					
Precipitation	11	197	4	95	307
Groundwater Underflow					
From Onshore	7,927	0	776	783	950*
From Offshore	162	0	0	0	162
ASR Wells (Injection)	170	0	0	0	170
Water Distribution System Losses	781	0	128	65	975
Sewer Distribution System Losses	514	0	14,554	603	15,672
Septic Systems	0	0	700	3,193	3,893
Irrigation Infiltration					
Golf Courses	1,748	0	0	0	1,748
Landscaping	1,033	0	318	162	1,513
Fertilizer Application					
Golf Courses	2,421	0	0	1,771	4,192
Sports Fields	587	0	103	280	970
Commercial and Residential Landscaping	2,492	445	2,136	1,780	6,853
Recycled Water Irrigation	0	0	0	54	54
Storm Water	5	0	49	0	53
Total Inflow	***17,850***	***445***	***18,769***	***8,787***	***45,851***
Outflows (lb/yr)					
Groundwater Pumping	6,919	0	1,507	1,499	9,924
Groundwater Underflow					
To Onshore	0	2,683	5,243	776	0*
To Offshore	113	0	199	0	312
Total Outflow	***7,032***	***2,683***	***6,949***	***2,275***	***18,939***
Storage Change (Inflow - Outflow)	**10,818**	**-2,238**	**11,820**	**6,512**	**26,912**

* This value is not equal to the sum of the four subarea columns; it is a summary for the entire basin which is made up of all four subareas combined. The subarea columns are a summary of the water balance for each subarea. The four subarea columns include exchanges of groundwater between subareas, as they are an important source of loading and removal of salts and nutrients for individual subareas. The basin-wide value, however, only considers inputs to or outputs from the entire basin. The net values (total groundwater inflow less total groundwater outflow) derived from each approach are equivalent.

Table 24: Source Concentrations used for Salt and Nutrient Loading Calculations

Constituent	Imported Water		Rain Water	Recycled Water Irrigation	Storm Water		Sewer and Septic Systems
	Salinas Valley	Carmel System			Bay St.	Hotel	
TDS, mg/L	396	317	2.8	1,241	109	519	1,043
Chloride, mg/L	84	26	0.5	375	30	144	308
Nitrate-N, mg/L	1.6	0.1	0.05	2.3	0.025	0.75	2.45

Deep Percolation of Rainfall

Deep percolation of rainfall carries salts and nutrients into the groundwater system at the concentration of natural rainfall. While percolation of rainfall may actually mobilize salts and nutrients introduced to the soil through fertilizers or other means, these loading sources are discussed separately from rainfall.

Loading estimates were made using concentration values of 2.8 mg/L TDS, 0.5 mg/L chloride, and 0.05 mg/L nitrate-N from Table 24 and volumes of percolation of rainfall from the Seaside basin groundwater flow model. Average annual totals of 17,190 pounds/year TDS, 3,070 pounds/year chloride, and 310 pounds/year nitrate-N are estimated to enter the groundwater system by deep percolation of rainfall.

Underflow from Onshore and Offshore Areas

Salts and nutrients are carried into the groundwater basin through groundwater inflow from adjacent onshore and offshore areas. Onshore groundwater inflow takes place only from the Salinas River Valley along the northeastern boundary of the basin. The quality of this groundwater underflow was obtained from wells along the boundary in the Salinas Valley. Underflow from offshore was considered to have the same water quality as the adjacent onshore area. This assumption was made because coastal monitoring shows no evidence of seawater intrusion (HydroMetrics WRI, 2013), and thus the freshwater aquifer extends some distance offshore. The concentrations of TDS, chloride, and nitrate-N in groundwater from Table 5 were used for groundwater for each subarea.

Groundwater underflow from onshore areas has concentrations of 396 mg/L TDS, 84 mg/L chloride, and 1.6 mg/L nitrate-N. Groundwater inflow from offshore to the Northern Coastal subarea has concentrations of 362 mg/L TDS, 85

mg/L chloride, and 0.59 mg/L nitrate-N. Groundwater inflow from offshore to the Southern Coastal subarea has concentrations of 702 mg/L TDS, 221 mg/L chloride, and 2.4 mg/L nitrate-N.

From the concentrations provided above, an average of 292,260 pounds/year TDS, 64,270 pounds/year chloride, and 950 pounds/year nitrate-N are estimated to be loaded into the groundwater system through groundwater underflow from onshore and offshore areas.

Injection of Imported Water

Some salts and nutrients are introduced into the Seaside basin with Carmel River system water that is imported for direct injection into the Santa Margarita aquifer by MPWMD/Cal-Am. Carmel River system water has concentrations of 317 mg/L TDS, 26 mg/L chloride, and 0.1 mg/L nitrate-N. From these concentrations and volumes described in Section 7.1.2, average annual totals of 538,340 pounds/year TDS, 44,154 pounds/year chloride, and 3,890 pounds/year nitrate-N were estimated to be injected into the groundwater system by the ASR wells.

It should be noted that although the injected water contains salts and nutrients, and is a source of loading to the aquifer, this water is of much better quality than the native groundwater. The injected water has been shown to dilute the salt and nutrient concentrations of the native groundwater and improve its quality (Figure 12).

Losses from Water Distribution Systems

The sources of water that are lost by leakage from water distribution systems include local groundwater, Salinas Valley groundwater, and Carmel River System water. The water qualities applied to each of these sources to estimate salt and nutrient loading are shown in Table 5 and Table 24.

From these concentrations and volumes in Table 20, average loadings of 536,290 pounds/year TDS, 130,410 pounds/year chloride, and 980 pounds/year nitrate-N are estimated to occur through delivery system losses.

Losses from Sewer Distribution Systems

The quality of the water lost from sewer systems is based upon the quality of untreated influent accepted by the Pasadera Wastewater Facility and Regional

Wastewater Treatment Plant. Using a sewer system loss of 105 AFY and concentrations of 1,040 mg/L TDS, 306 mg/L chloride, and 2.5 mg/L nitrate-N, average loadings of 297,250 pounds/year TDS, 87,680 pounds/year chloride, and 15,670 pounds/year nitrate-N are estimated to occur through sewer system losses.

Septic Systems

The quality of the water leached from septic systems was assumed to be the same as that lost from sewer distribution systems. Using a leached volume of 27 AFY, average loadings of 76,120 pounds/year TDS, 22,450 pounds/year chloride, and 3,890 pounds/year nitrate-N are estimated to occur from septic system leaching.

Return Flow from Irrigation

All water used for irrigation contains salts and nutrients, regardless of whether or not fertilizer is added. As a result, fertilizer is treated as an independent loading source and irrigation return flow includes only the salts and nutrients that are present in the water before it is applied as irrigation. The amount of salts and nutrients in this water is based upon the quality of the source water. These sources include Salinas Valley groundwater, Carmel River System Water, local groundwater, and recycled water from the Pasadera Wastewater Treatment Plant. The quality of these water sources are listed in Table 5 and Table 24.

Using the volume irrigation return flow from Table 20, an average of 1,244,500 pounds/year TDS, 295,260 pounds/year chloride, and 3,320 pounds/year nitrate-N are estimated to be added to the basin from irrigation return flow.

Fertilizer Application

Fertilizer application was considered independently of irrigation water and was assumed to only be a source of nitrate-N loading to the groundwater system. As described in Section 4.1.4, fertilizer loading is assumed to occur in the land use categories of residential, commercial, golf course, and sports fields.

Using a net leaching rate of 8.9 pounds of nitrogen per acre per year for urban landscapes and golf courses (UC Davis, 2012), and land use shown in Figure 8, the nitrogen loading from fertilizer application was estimated.

- From the approximately 109 acres of sports fields in the Seaside basin, the estimated annual nitrogen leached in to the groundwater is 970 pounds.

- Approximately one quarter of urban, residential, and commercial acreage was assumed to be fertilized. From the average landscaped area of 770 acres, 6,850 pounds of nitrogen was estimated to be leached into groundwater.

- There are four golf courses in the Seaside basin. Table 13 summarizes the sizes and estimated fertilizer use based on the fertilized acreage determined from aerial photographs.

Table 25: Summary of Estimated Seaside Basin Golf Course Fertilizer Application

Golf Course	Operating Since	Approx. Fertilized Area (acres)	Leached Nitrogen * (pounds)
Nicklaus Club-Monterey (formerly Pasadera Country Club)	2000	100	890
Laguna Seca Golf Ranch	1970	99	881
Bayonet	1954	160	1,424
Black Horse	1964	112	997

* Assuming net leaching rate of 8.9 pounds nitrogen per acre per year (UC Davis, 2012)

A total average annual total of 12,020 pounds/year nitrate-N was estimated to be introduced into the groundwater system through fertilizer application.

Infiltration from Storm Water Ponds

The quality of infiltrating storm water was derived from the storm water quality data collected by Monterey Bay Sanctuary Citizen Watershed Monitoring Network and listed in Table 2. Water quality data from the Bay St. sampling location was applied to all storm water ponds within the Northern Coastal subarea. Water quality data from the Hotel sampling location was applied to all storm water ponds within the Southern Coastal subarea.

For each of the two sampling locations, the average water quality of infiltrating water was assumed to fall at the center of the ranges listed for the "First Flush 2009-2012." Of the three water quality parameters covered in this SNMP, only nitrate-N was measured directly in the storm water. Therefore, it was required to

estimate TDS and chloride concentrations by other means. The average concentration of TDS in the storm water was estimated (in mg/L) by applying a factor of 0.7 to the electrical conductivity (in μS/cm). The average concentration of chloride in the storm water was then estimated by deriving a relationship between chloride and TDS using other available water quality data from the basin. The derived relationship was: chloride = 0.278 x TDS.

The estimated water quality of the Hotel sampling location was 519 mg/L TDS, 144 mg/L chloride, and 0.75 mg/L nitrate-N. The estimated water quality of the Bay St. sampling location was 109 mg/L TDS, 30 mg/L chloride, and 0.025 mg/L nitrate-N. Using a volume of 105 AFY of infiltrating storm water, average loadings of 72,700 pounds/year TDS, 20,250 pounds/year chloride, and 53 pounds/year nitrate-N are estimated.

7.2.2 REMOVAL

Two mechanisms were identified by which salts and nutrients are removed from the basin.

1. Groundwater pumping by water agencies and private landowners,
2. Underflow to onshore and offshore areas (outflow).

GROUNDWATER PUMPING BY WATER AGENCIES AND PRIVATE LANDOWNERS

Salts and nutrients are removed from the groundwater system when groundwater is pumped. Some of this water is exported out of the basin entirely and some of the water is reapplied within the basin. The loading associated with reapplication of pumped groundwater within the basin is covered by the descriptions of the loading sources in the previous section.

Groundwater pumping removes salts and nutrients from the groundwater system according to the concentration of the native groundwater in the subarea of pumping. Groundwater quality for each subarea is listed in Table 5. From the groundwater extracted from the basin each year, an average of 6,591,600 pounds/year TDS, 1,693,060 pounds/year chloride, and 9,920 pounds/year nitrate-N are estimated to be removed from the basin.

UNDERFLOW TO ONSHORE AND OFFSHORE AREAS

Salts and nutrients are removed from the basin as groundwater flows out of the basin and into adjacent areas. Salts and nutrients are removed at the native quality of the groundwater in the subarea from which outflow occurs. Groundwater underflow occurs from the basin through the Northern Coastal and Southern Coastal subareas at the concentrations listed in Table 5.

An average of 100 AFY of groundwater underflow takes place from the basin. Average annual totals of 126,150 pounds/year TDS, 34,200 pounds/year chloride, and 310 pounds/year nitrate-N were estimated to be removed from the groundwater system through groundwater pumping.

7.2.3 DISCUSSION OF OVERALL SALT AND NUTRIENT LOADING

The difference between salt and nutrient loading and removal from the Seaside basin shown at the bottom of Table 21 through Table 23 suggests that there is a net removal of salts (TDS and chloride) from the basin and a net loading of nutrients into the basin.

The net removal of salts is being driven by groundwater pumping. Overall, pumping extracts native groundwater that is relatively high in salts and exports a significant portion of that water away from the basin – to outside customers or to the regional wastewater treatment plant. Groundwater pumping alone, however, will not improve the quality of the basin's groundwater unless a source of imported water is adding higher quality water to the basin's aquifers. Simply removing groundwater will only draw down groundwater levels without improving quality. The ASR project, with its injection of Carmel River water, is a major source of imported high-quality water that complements the extraction of groundwater and leads to a sustainable net removal of salts from the basin. Other future projects, such as the GWRP, provided they import better quality water than the native groundwater will further improve the salt content of groundwater in the Seaside basin.

The nitrate balance suggests a net addition of nitrates to the basin. This is because the groundwater in the basin does not have significantly different nitrate-N concentrations than other imported sources of water, and thus dilution like what occurs with salts does not take place at a noticeable level. Nutrient loading from sewer system losses and fertilization are the largest man-made sources of nutrients to the basin. The estimate of nitrogen loading by fertilization

may be overestimated because it is unlikely all residents fertilize their lawns regularly.

7.3 ASSIMILATIVE CAPACITY

Because assimilative capacity is determined for the entire Seaside basin, the existing groundwater quality estimated for the four subareas in Section 3.11.2 are area-weight averaged to estimate the groundwater quality of the entire basin. Table 26 shows that the basin does not have assimilative capacity for TDS, but there is assimilative capacity remaining for chloride and nitrate-N. The poor TDS quality is influenced mostly by the two southern subareas (i.e., Southern Coastal and Laguna Seca subareas).

Table 26: Seaside Basin Assimilative Capacity

Constituent	Existing Water Quality	Water Quality Objective	Assimilative Capacity
TDS, mg/L	540	500	**-40**
Chloride, mg/L	140	250	**110**
Nitrate-N, mg/L	0.7	10	**9.3**

When looking to implement future water projects in the basin, it is important to ensure that imported or recycled water being irrigated or recharged needs to have a water quality that is better (i.e., lower WQO parameter values) than the native groundwater that will be influenced by the project. Current plans to use recycled water in the basin will generally improve groundwater quality by diluting the native groundwater with better quality water (e.g., GWRP advanced tertiary treated, less than 200 mg/L TDS). Storm water quality generated within the basin is also of better quality than the native groundwater and would contribute to improving the basin's general water quality with appropriate pre-treatment. Carmel River system water imported by MPWMD/Cal-Am is generally less than 385 mg/L TDS and has already been proven to improve the groundwater quality in the area around the existing ASR wells into which it is injected.

7.4 ANTI-DEGRADATION ANALYSIS

This section is not required because native Seaside basin groundwater quality is not a high quality water resource described in the state's Anti-Degradation Policy, Resolution No. 68-16. The three potential projects planned for the Seaside basin will all have positive water quality impacts because they use imported water of better quality than the native groundwater.

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SECTION 8
SALT AND NUTRIENT MANAGEMENT STRATEGIES

8.1 ACTIONS TO MANAGE SALT AND NUTRIENT LOADING

The objective of this section is to develop strategies to manage salt and nutrient loadings on a sustainable basis in order to maintain a long term supply for the basin's beneficial uses. Per the Recycled Water Policy, these strategies should be site specific and have the purpose of:

- Pollution prevention,
- Source load reductions to groundwater basins,
- Treatment and management of areas of impaired water quality,
- Increasing groundwater recharge by storm water, and
- Increasing recycled water use.

In the Seaside basin there is a net export of salts and nutrients from the basin because over 2,400 AFY of groundwater is used outside of the basin. Additionally, the bulk of wastewater generated in the basin is exported to a regional plant outside of the basin. Together with injection of Carmel River system water into the basin, these activities improve the groundwater quality of the basin.

Based on our source assessment in Section 4, the following activities currently contribute salts and nutrients to the basin above what would naturally occur:

- Fertilization in urban areas and golf courses – loads from fertilizers are transported with water from irrigation or precipitation.
- Septic systems and leaking sewer pipes – loads in septic system outflows or leaky septic tanks infiltrate into the groundwater.
- Irrigation of recycled water at the Nicklaus Club-Monterey golf course – recycled water generated at the Pasadera wastewater treatment and recycling facility is diluted with groundwater. The wastewater treated by this facility has a high salt load partly because of the use of residential water softeners in the area.

There are currently no management measures and activities instituted in the basin for reducing either salt or nutrient loads. Management strategies that could be considered are summarized in Table 27.

8.2 MANAGEMENT TRIGGERS

For seawater intrusion in the basin, the Watermaster has developed a Seawater Intrusion Response Plan (SIRP) as a contingency plan for responding to seawater intrusion in the Seaside Groundwater Basin, if and when it occurs (HydroMetrics LLC, 2009a). The SIRP details both the indicators of seawater intrusion, and a list of recommended actions to be taken if seawater intrusion is observed.

Management triggers for salts and nutrients generated by current land use activities are not necessary because of the net export of salts and nutrients from the basin. Future projects such as the GWRP will be permitted by relevant authorities, which will include setting monitoring requirements, limits, and triggers.

Table 27: Proposed Salt and Nutrient Management Measures

Management Measure	Agency/Action	Description	Effect
Source control of nutrients from residential fertilizer	City of Seaside, Laguna Seca subarea landowners, Monterey Peninsula Water Management District, City of Sand City, California American Water, City of Del Rey Oaks, Monterey County/Monterey County Water Resources Agency, Coastal subarea landowners, and the City of Monterey	Outreach on effective use of fertilizers.	Reduces the load of nitrogen that is transported by runoff to surface waters and by infiltration to groundwater.
Source control of salts and nutrients from septic systems	Toro community, City of Seaside - Prohibit installation of new septic tanks	Prohibit installation of new septic tanks. Require tie-in of a septic tank to the sewer if located within 200 feet of a sewer line. Or Consideration of a septic system conversion program to reduce the number of septic systems in the basin.	Reduces the volume of septic system leachate that percolates into shallow groundwater.
Source control of salts in wastewater and recycled water quality from Pasadera WTF	Cal-Am – water softener ban	Outreach, removal and incentive program aimed at reducing the number of self-regenerating water softeners.	Fewer self-regenerating water softeners (or other treatment devices that produce a high mineral waste) will reduce the salt load in residential wastewater.
Storm water recharge	City of Seaside, Laguna Seca subarea landowners,	Storm water is infiltrated onsite where it is generated or conveyed	Provides dilution of groundwater through recharge of surface water

Management Measure	Agency/Action	Description	Effect
	Monterey Peninsula Water Management District, City of Sand City, California American Water, City of Del Rey Oaks, Monterey County/Monterey County Water Resources Agency, Coastal subarea landowners, and the City of Monterey	to a nearby recharge facility.	(flood and storm flows) to potentially lower salt and nutrient concentrations.
Irrigation with recycled water	City of Seaside, City of Sand City	Urban irrigation of schools, parks, golf courses and other locations. Recycled water permit establishes concentration limits for irrigation water that should be lower than native groundwater concentrations.	Limits the concentrations of salts and nutrients in irrigation water.

SECTION 9
SALT AND NUTRIENT MONITORING PROGRAM

9.1 GOALS AND OBJECTIVES

The goals of a salt and nutrient monitoring program for the Seaside basin are:

1. Develop a program that provides an adequate spatial network of monitoring locations through the Seaside basin;
2. Develop a cost-effective means of determining whether the concentrations of salts, nutrients, and other constituents of concern as identified in this salt and nutrient plan are consistent with applicable water quality objectives;
3. Focus monitoring near public water supply wells and large recycled water projects; and
4. Per the Recycled Water Policy, use existing monitoring features where possible.

9.2 LOCATION OF MONITORING FEATURES

The current monitoring features in the Seaside basin described in Section 5 are all recommended as monitoring features for this SNMP. These monitoring features have an adequate spatial distribution to determine impacts from current recycled water use in the basin.

In addition to the wells currently sampled under the Watermater's MMP and MPWMD monitoring programs, there are some dedicated monitoring wells in the Laguna Seca subarea that are excluded from those schedules. These are: FO-4 shallow and deep, and FO-6 shallow and deep.

The RWQCB will require additional monitoring features when future recycled water projects are implemented. These should be included as part of salt and nutrient monitoring for the basin.

9.3 CONSTITUENTS TO BE MONITORED

For all wells in the monitoring network, the same constituents that are required under the Watermaster's MMP are recommended for testing. This is general

physical and minerals, which includes TDS, chloride, nitrate as NO_3, nitrate as N, and nitrite as N.

Per the SWRCB's Recycled Water Policy (2013), CEC monitoring requirements are not designated for recycled water used for landscape irrigation due to the low risk for ingestion of the water. However, the CEC monitoring requirements prescribed in the Recycled Water Policy pertain to the production and use of recycled water for groundwater recharge by surface and subsurface application methods. Currently there are no active projects in the Seaside basin that fall into this category. The proposed GWRP described in Section 4.2.2 is the only planned project that proposes to use recycled water for groundwater recharge. Prior to the implementation of this project, or any other future proposed groundwater recharge with recycled water project, the appropriate agency (or agencies) will monitor the water for CECs as prescribed in the Recycled Water Policy, as applicable, unless an alternative monitoring plan is proposed and approved by the RWQCB.

9.4 SAMPLING FREQUENCY

The groundwater sampling frequency will be at least annually.

9.5 STAKEHOLDER ROLES AND RESPONSIBILITIES

The Seaside basin stakeholders' current responsibilities for collecting and providing production, groundwater levels, and groundwater quality data to the Watermaster are described in Section 5. Because these roles and responsibilities are already in place and well established, it is recommended that the SNMP adopt them and therefore no changes are required.

9.6 REPORTING

The monitoring data collected will be reported to the RWQCB every three years. The SNMP stakeholders will be responsible for preparing the monitoring report. The monitoring report will include relevant monitoring data, comparisons to historical/baseline values, comparisons to applicable water quality objectives, and an update of relevant projects and implementation information.

SECTION 10
IMPLEMENTATION MEASURES

Based on the Seaside basin's native groundwater quality and limited number of recycled water projects, managing salt and nutrient loadings on a sustainable basis is feasible with minimal implementation measures. Best Management Practices (BMPs) and public outreach are recommended implementation measures. If necessary, based on future monitoring results, the implementation measures identified in the following sub-sections will be reevaluated and updated measures recommended for future implementation.

10.1 TOTAL DISSOLVED SOLIDS

Implementation measures to reduce TDS concentrations in groundwater that could be considered include:

- All water imported into the basin should have lower TDS than the native groundwater of the area in which the water is to be used for irrigation or recharge,
- Reducing the amount of salts added to groundwater via source water – wastewater treatments, modified processes such as increased retention time, or blending prior to use for irrigation or basin recharge, and
- Reducing the amount of salts added to water via anthropogenic sources – BMPs, public outreach, and land management guidelines.

10.2 CHLORIDE

Implementation measures to reduce chloride concentrations in groundwater that could be considered include:

- Reducing the amount of chlorides added to water via anthropogenic sources – BMPs, public outreach, and land management guidelines,
- Water softener ordinance or ban, and
- Reducing the amount of chlorides in wastewater - modified processes such as incorporating UV and MF/RO to remove chlorides.

10.3 NITRATE

Implementation measures to reduce nitrate concentrations in groundwater that could be considered include developing BMPs such as limiting excess landscape fertilizing and eliminating over-irrigation to curtail the leaching transport process.

SECTION 11
REFERENCES

Feeney, M.B. 2007. *Seaside groundwater basin watermaster, Seaside Basin monitoring and management program: groundwater modeling component – report on groundwater modeling meeting and recommended approach*: prepared for Seaside Groundwater Basin Watermaster, January 2007.

Fugro West, Inc. 1997. *Hydrogeologic assessment, Seaside coastal groundwater Subareas*, Phase III update, Monterey County, California. Prepared for Monterey Peninsula Water Management District, September 1997.

HydroMetrics LLC. 2009a. *Seawater intrusion response plan, Seaside basin, Monterey County, California*. Prepared for the Seaside Basin Watermaster. February 2009.

_____. 2009b. *Seaside groundwater basin modeling and protective elevations*. Prepared for the Seaside Basin Watermaster. November 2009.

HydroMetrics WRI. 2012. *Water Year 2012 seawater intrusion analysis report, Seaside basin, Monterey County, California*. Prepared for the Seaside Basin Watermaster. November 2012.

_____. 2013. *Water Year 2013 seawater intrusion analysis report, Seaside basin, Monterey County, California*. Prepared for the Seaside Basin Watermaster. December 2013.

Marina Coast Water District. 2012. *2012 Marina Coast Water District consumer confidence report for central Marina and Ord community*. Accessed online at http://www.mcwd.org/docs/ccr/mcwd_ccr_2012_2013-05-03.pdf

Monterey Bay Sanctuary Citizen Watershed Monitoring Network. 2012. *2011 – 2012 MRSWMP monitoring final report*. August 2, 2012.

Monterey County Flood Control and Water Conservation and Water Conservation District. 1977. *Monterey County master drainage plan, Canyon Del Rey watershed drainage and erosion*. Prepared by Monterey County Surveyors, Inc., June 1977.

Muir, K.S. 1982. *Groundwater in the Seaside area, Monterey County, California*. U.S Geological Survey Water Resources Investigation 82-10. Washington D.C. September 1982.

Regional Water Control Board, Central Coast Region. 2011b. *Staff report for regular meeting* March 16-17, 2011. Accessed online at http://www.waterboards.ca.gov/centralcoast/board_info/agendas/2011/march/Item8/enforcement_report_3_16_11.pdf.

Regional Water Quality Control Board, Central Coast Region. 2011a. *Water quality control plan for the Central Coast basin.* June 2011.

Rosenberg, L.I. 2001. *Digital geologic map of Monterey County, California*. Version 1.0. http://www.co.monterey.ca.us/gpu

Siegrist, R.L., Tyler, E.J. & Jenssen, P.D. 2000. *Design and performance of onsite wastewater soil absorption systems*. National Research Needs Conference, St. Louis.

State Water Resources Control Board (SWRCB). 2013. *Recycled water policy*, as modified by State Board Resolution 2013-0003 (January 22, 2013).

University of Davis, Center for Watershed Sciences. 2012. *Nitrogen sources and loading to groundwater. Technical report 2. Assessing Nitrate in California's Drinking Water with a focus on Tulare Lake basin and Salinas Valley groundwater.* Prepared for California State Water Resources Control Board. July 2012.

Wu, L., Green, R., Yates, M.V., Pacheco, P. & Klein, G. 2007. *Nitrate leaching in overseeded bermuda grass fairways*. Crop Science, 47, 2521–2528.

Yates, E.B., M.B. Feeney, L.I. Rosenberg. 2002. *Laguna Seca subarea phase III hydrogeologic update*. Prepared for Monterey Peninsula Water Management District. November 2002.

Yates, E.B., M.B. Feeney, L.I. Rosenberg. 2005. *Seaside groundwater basin: update on water resource conditions*. Prepared for Monterey Peninsula Water Management District. April 14, 2005.

APPENDIX A:
MONTEREY PENINSULA AQUIFER STORAGE AND RECOVERY PROJECT – SAMPLING AND ANALYSIS PLAN

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MONTEREY PENINSULA AQUIFER STORAGE AND RECOVERY PROJECT

SAMPLING AND ANALYSIS PLAN

Prepared for:

December 2012

MONTEREY PENINSULA AQUIFER STORAGE AND RECOVERY PROJECT

GROUNDWATER SAMPLING AND ANALYSIS PLAN

INTRODUCTION

This Groundwater Sampling and Analysis Plan (SAP) has been developed for the Monterey Peninsula Aquifer Storage and Recovery (ASR) Project. The project is cooperatively implemented by the Monterey Peninsula Water Management District (MPWMD or District) and California American Water (CAW), and generally involves the diversion of excess winter/spring flows from the Carmel River system for recharge, storage and subsequent recovery in the Seaside Groundwater Basin (SGB). Treated (potable) drinking water from the CAW distribution system is injected into the Santa Margarita Sandstone aquifer in the SGB via three existing ASR wells located at two ASR facilities in the SGB. The injected water is stored within the aquifer and subsequently recovered into the CAW distribution system during dry periods. The overall objective of the project is to facilitate the conjunctive use of water supplies in the Carmel River system and SGB that will benefit the resources of both systems.

ASR operations generally consist of three components or phases: (1) injection of drinking-quality water into the aquifer through the ASR wells; (2) storage of the injected water within the aquifer; and, (3) recovery of the stored water by pumping at one or more of the ASR wells. Periodic samples of the injected, stored, and recovered waters are to be collected from the ASR wells and associated monitoring wells and analyzed for a variety of water-quality constituents pursuant to requirements of the Central Coast Regional Water Quality Control Board (RWQCB) for the project. The purpose of this SAP is to identify the locations, sample collection frequency, and parameters to be monitored as part of the project's ongoing water-quality data collection program. The project location and associated wells in the SGB are shown on **Figure 1** – Project Location Map.

GROUNDWATER MONITORING

Groundwater Monitoring Wells

ASR Project On-Site Wells. There are two ASR facilities located in the SGB; the Santa Margarita and Seaside Middle School ASR Facilities. Groundwater monitoring wells for collection of on-site water-quality samples include three ASR wells and two associated monitoring wells that have been constructed at the two ASR facilities. Two of the ASR wells are located at the Santa Margarita (SM) ASR Facility and are designated as SM ASR-1 and SM ASR-2. This facility is also referred to as the Phase 1 ASR Project. The third existing ASR well is located at the Seaside Middle School (SMS) ASR Facility and is designated as SMS ASR-3.

This facility is also referred to as the Phase 2 ASR Project[1]. All three existing ASR wells are completed solely within the Santa Margarita Sandstone (Tsm) aquifer.

In addition to the ASR wells, there are two on-site monitoring wells (one located at each ASR facility) that are also completed solely within the Tsm aquifer. SM MW-1 is located at the SM ASR Facility and is located in between SM ASR-1 and SM ASR-2, at distances of approximately 90 and 190 feet, respectively. SMS Deep MW is located at the SMS ASR Facility at a distance of approximately 20 feet from SMS ASR-3. An additional monitoring well is also located at the SMS ASR Facility that is completed within the overlying Paso Robles aquifer, designated as SMS Shallow MW. This well is instrumented with a submersible water-level transducer/data logger unit to observe the water-level response of this aquifer to ASR operations (it is not designed or equipped for collection of water-quality samples). The locations of the ASR wells and on-site monitoring wells are shown on **Figure 2** – Site Location Map. A summary of the on-site wells is presented in **Table 1** below:

Table 1. On-Site Wells Summary

Well ID	Distance from ASR Well (feet)			Aquifer Completed
	SM ASR-1	SM ASR-2	SMS ASR-3	
SM ASR-1	--	280	1,380	Tsm
SM ASR-2	280	--	1,235	Tsm
SM MW-1	90	190	1,325	Tsm
SMS ASR-3	1,380	1,235	--	Tsm
SMS Deep MW	1,380	1,240	20	Tsm
SMS Shallow MW	1,415	1,265	25	QTp

Table 1 Notes:

Tsm – Santa Margarita Sandstone aquifer
QTp – Paso Robles aquifer

Off-Site SGB Wells In addition to the on-site wells at the two ASR facility sites, submersible water-level transducer/data logger units have been installed at seven off-site District monitoring well sites in the SGB to observe the water-level response of the aquifer system to ASR operations. The locations of the off-site monitoring wells are shown on **Figure 1**. The distances from each of the project sites and aquifers monitored by the off-site wells are summarized in **Table 2** below:

[1] The Phase 2 ASR Project will consist of two ASR wells and associated facilities at the SMS ASR Facility. SMS ASR-4 is currently planned to be installed during summer/fall of 2012 and will be added to the SAP when completed and equipped for operation.

Table 2. Off-site Monitoring Wells Summary

Well ID	Distance from ASR Site (feet)		Aquifer Monitored
	SM	SMS	
Paralta Test	680	740	QTp & Tsm
Ord Grove Test	1,540	2,535	QTp & Tsm
Ord Terrace (Deep)	2,275	2,910	Tsm
FO-7 (Deep)	4,265	3,700	Tsm
FO-7 (Shallow)			QTp
PCA East (Deep)	6,390	6,200	Tsm
PCA East (Shallow)			QTp
FO-9 (Deep)	7,290	6,125	Tsm
FO-8 (Deep)	7,585	6,450	Tsm

Table 2 Notes:

Monitoring well distances are measured to centroid of each ASR site.
Tsm – Santa Margarita Sandstone aquifer
QTp – Paso Robles aquifer

In addition to water-level monitoring at the above off-site monitoring wells, CAW's Paralta well and PCA East Deep have been designated as off-site monitoring wells for periodic water-quality sampling as part of this SAP (refer to **Table 4**).

Groundwater Monitoring Equipment

The equipment required to perform the groundwater monitoring as prescribed in the SAP includes:

- Sampling Pumps
- Pressure Transducers/Data Loggers
- Electric Water Level Sounder
- Field Water Quality Monitoring Devices
- Flow-Thru Cell Device(s)
- Sample Containers
- Coolers and Ice

Each of the on-site wells is equipped with a dedicated pump. The ASR wells are equipped with water-lubricated, vertical line-shaft turbine pumps. SM MW-1, SMS Deep MW, and PCA East Deep are equipped with submersible sampling pumps. The flow rates for each monitored wells are measured using in-line flow meters. Sampling ports on the well-head piping at each well allow for the collection of grab samples during injection and pumping operations.

Field water-quality monitoring is to be performed using various instruments that allow for the field analysis of a variety of constituents, including but not limited to: chlorine residual, conductivity, dissolved oxygen, pH, temperature, redox/ORP, and Silt Density Index (SDI). The field water-quality monitoring devices are to be routinely calibrated as prescribed in the operating procedures manual for each device.

All of the ASR and monitoring wells are instrumented with dedicated pressure/level transducers and dataloggers. Reference-point elevations have been established by surveying on each of the monitored wells. Static water-levels in each of the wells are to be measured with an electric sounder on a quarterly basis (minimum) and the transducers calibrated accordingly. The transducers are to be programmed with the reference static water-level and the data-collection interval, which will measure and record the water level in each of the wells a minimum of four times per day.

Purging and Sampling

During injection periods, samples of the injectate are to be collected directly at one of the ASR wellheads while active injection is occurring. During storage periods, each of the ASR wells that has been utilized for injection during the season will be periodically purged and sampled. During recovery periods, one or more of the ASR well pumps will be operating and purging is continuous and sustained. Groundwater samples are also to be collected routinely during all three ASR periods (i.e., injection, storage and recovery) from both the on-site monitoring wells (SM MW-1 and SMS Deep MW) and periodically from the far-field off-site monitoring wells (Paralta and PCA-E Deep).

The existing pumps will be used to purge a volume equivalent to a minimum of three (3) casing volumes from the well prior to sampling. Purge water from the ASR wells during backflushing and sampling is to be discharged to the backflush pit at the SM ASR Facility and percolated back into the SGB. Water produced by the ASR well(s) during recovery period operations is to be discharged to the CAW potable water supply system (in accordance with Department of Public Health approvals). Purge water from the monitoring wells will be directed to either the SM backflush pit or to the ground away from the wellheads and percolated back into the SGB.

During purging and prior to sampling, field water-quality parameters of temperature, pH and specific conductance are to be monitored. Stabilization of these water-quality parameters will indicate when collection of a representative sample is obtainable.

Chain-of-Custody, Sample Handling, and Transport

All samples collected will be labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. All sample shipments for analyses will be accompanied by a chain-of-custody record. Forms will be completed and sent with the samples for each shipment. The chain-of-custody form will identify the contents of each shipment and

maintain the custodial integrity of the samples. Samples will be placed in a cooler for delivery to the laboratory.

Documentation Procedures

Field data will be recorded by field personnel on the attached Field Sampling Log Form and routinely submitted to the Project Manager for review and QA/QC. Field data will include the completed field sampling-log form and chain-of-custody records. At a minimum, documentation of each monitoring and sampling event will include the following information:

- Sample location and description
- Sampler's name(s)
- Date and time of sample collection
- Type of sampling equipment used
- Field instrument calibration procedures and results
- Field instrument readings
- Field observations and details related to analysis or integrity of samples (e.g., weather conditions, noticeable odors, colors, etc.)
- Sample preservation
- Shipping arrangements
- Name(s) of recipient laboratory
- Any deviations from SAP procedures

Project information will be filed by Water Year. The project file will contain project field data, correspondence, survey reports, laboratory reports, charts, tables, permits, and other project-related information. This information will be utilized in the preparation of the annual Summary of Operations Reports for the project.

LABORATORY PROGRAM

A complete list of constituents and constituent "groups" to be monitored as part of the ASR Project for injected, stored, and recovered waters is presented in **Table 3** below. **Table 4** summarizes the planned sample constituent group frequencies for each source for the injection, storage, and recovery periods.

Table 3. Analytic Testing Program Constituent Summary

Constituent	PQL	General Parameters	Disinfection Byproducts	Supple-mental	Field[1]
Group ID		G-1	DBP	S-1	F-1
Major Cations					
Calcium (Ca)	1 mg/L	✓			
Magnesium (Mg)	1 mg/L	✓			
Sodium (Na)	1 mg/L	✓			
Potassium (K)	0.5 mg/L	✓			
Major Anions					
Total Alkalinity (as $CaCO_3$)	10 mg/L	✓			
Sulfate (SO_4)	1 mg/L	✓			
Chloride	1 mg/L	✓	✓		
Nitrate as (NO3)	1 mg/L	✓			
Nitrite as (Nitrogen)	0.1 mg/L	✓			
General Physical					
pH	0.1 units	✓			✓
Temperature	0.5 °C				✓
Specific Conductance (EC)	10 uS	✓			✓
ORP (redox potential / Eh)[2]	10 mV				✓
Total Dissolved Solids (TDS)	10 mg/L	✓			
Metals					
Arsenic (As)	1 ug/L			✓	
Barium (Ba)	0.5 mg/L			✓	
Iron (Fe) (Total and Dissolved)	50 ug/L	✓			
Lithium (Li)	5 ug/L			✓	
Manganese (Mn) (Total and Dissolved)	10 ug/L	✓			
Molybdenum (Mo)	5 ug/L			✓	
Nickel (Ni)	10 ug/L			✓	
Selenium (Se)	5 ug/L			✓	
Strontium (Sr)	5 ug/L			✓	
Uranium (U)	1 pCi/L			✓	
Vanadium (V)	5 ug/L			✓	
Zinc (Zn)	0.5 ug/L			✓	
Miscellaneous					
Ammonia (as N)	0.05 mg/L	✓			
Boron (B)	0.05 mg/L	✓			
Chlorine residual (free)	0.1 mg/L				✓

Constituent	PQL	General Parameters	Disinfection Byproducts	Supple-mental	Field[1]
Group ID		G-1	DBP	S-1	F-1
Chloramines	50 ug/L		✓		
Dissolved Methane	0.5 ug/L			✓	
Dissolved Oxygen (DO)[2]	0.025 mg/L				✓
Gross Alpha	1 pCi/L			✓	
Hydrogen Sulfide (H_2S)	0.05 mg/L				✓
Total Nitrogen (N)	0.2 mg/L	✓			
Total Phosphorous	0.05 mg/L	✓			
Orthophosphate as P	0.05 mg/L	✓			
Radium 226	1 pCi/L			✓	
Silt Density Index (SDI)	0.1 units				✓
Total Kjehldahl N (TKN)	0.2 mg/L	✓			
Organic Analyses					
Total trihalomethanes	1 ug/L		✓		
Bromodichloromethane	1 ug/L		✓		
Bromoform	1 ug/L		✓		
Chloroform	1 ug/L		✓		
Dibromochloromethane	1 ug/L		✓		
Haloacetic Acids (HAA)	1 ug/L		✓		
Monobromoacetic Acid	1 ug/L		✓		
Monochloroacetic Acid	1 ug/L		✓		
Dibromoacetic Acid	1 ug/L		✓		
Dichloroacetic Acid	1 ug/L		✓		
Trichloroacetic Acid	1 ug/L		✓		
Total organic carbon (TOC)	0.1 mg/L	✓			
Dissolved organic carbon (DOC)	0.1 mg/L	✓			

Table 3 Notes:

1 – Field Parameters (Group F-1) must be taken concurrently with collection of all laboratory samples.
2 – ORP and DO must be analyzed utilizing a flow-thru cell device.

Table 4. Analytic Testing Program Schedule

INJECTION PERIOD (active injection)							
Analyte Group	**Injectate**			**SM MW-1**	**SMS Deep MW**	**PCA East (deep)**	
F-1	Bi-Weekly			Bi-Weekly	Bi-Weekly	Semiannually	
DBP	Monthly			Quarterly	Quarterly	Semiannually	
G-1	Quarterly			Quarterly	Quarterly	Semiannually	
S-1	Quarterly			Quarterly	Quarterly	Semiannually	
STORAGE PERIOD (one month duration or longer)							
Analyte Group	**SM ASR-1**	**SM ASR-2**	**SMS ASR-3**	**SM MW-1**	**SMS Deep MW**	**PCA East (deep)**	
F-1	Monthly	Monthly	Monthly	Quarterly	Quarterly	Semiannually	
DBP	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Semiannually	
G-1	Quarterly	Quarterly	Quarterly	Semiannually	Semiannually	Semiannually	
S-1	Quarterly	Quarterly	Quarterly	Semiannually	Semiannually	Semiannually	
RECOVERY PERIOD							
Analyte Group	**SM ASR-1[1]**	**SM ASR-2**	**SMS ASR-3**	**SM MW-1**	**SMS Deep MW**	**Paralta**	**PCA East (deep)**
F-1	Bi-Weekly	Monthly	Monthly	Quarterly	Quarterly	Semiannually[2]	Semiannually
DBP	Quarterly	Quarterly	Quarterly	Semiannually	Semiannually	Semiannually[2]	Semiannually
G-1	Quarterly	Quarterly	Quarterly	Semiannually	Semiannually	Semiannually[2]	Semiannually
S-1	Quarterly	Quarterly	Quarterly	Semiannually	Semiannually	Semiannually[2]	Semiannually

Table 4 Notes:

1 – SM ASR-1 is currently the only ASR well authorized by DPH to recover into the CAW distribution system.
2 – Near the beginning and end of the SGB production/recovery season (e.g., in June and November).



FIGURE 1. PROJECT LOCATION MAP
Monterey Peninsula ASR Project
Sampling and Analysis Plan



FIGURE 2. SITE LOCATION MAP
Monterey Peninsula ASR Project
Sampling and Analysis Plan

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

PUEBLO water resources

Monterey Peninsula ASR Project
Field Sampling Log Form
Water Year: _____

Well ID: _____
Observer: _____
Date: _____
Observation Period: Start: _____ Stop: _____
Weather:

Purging & Water-Level Data		Notes:
ASR Period (injection, storage, recovery)		
Well Status (injecting, idle, pumping)		
Purge Rate (gpm)		
Totalizer Reading Start (gals)		
Totalizer Reading at Sampling (gals)		
Purge Volume (gals)		
Totalizer Reading End (gals)		
Static Water Level (ft btoc)[1]		
Datalogger Water Level (ft btoc)		

Field Water-Quality Parameter Data						
Time:						
Elapsed Time:						
Temperature (°C)						
Conductivity (umhos/cm)						
pH						
ORP (mV)[2]						
Free Chlorine Residual (mg/L)						
Dissolved Oxygen (mg/L)[2]						
Silt Density Index						
Gas Volume (mL)						
H2S (mg/L)						
Visual Observations						

Sampling and Laboratory Data		
Collection Time	Laboratory	Laboratory Analyses Requested (analyte group or other constituents)

Additional Information and Observations

Notes:
1 - Pump must be off a minimum of 10 minutes prior to measuring.
2 - ORP and Dissolved Oxygen must be analyzed utilizing a flow-thru cell device

APPENDIX B:
WATER BALANCE SPREADSHEET

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Water Type	Subarea	Water Source	Component	Imported AFY	Exported AFY	Volume Back into Groundwater AFY	Groundwater Volume Extracted AFY
Imported Salinas Valley	Northern Coastal	Salinas Valley Groundwater	Bayonet and Black Horse Golf Courses	400	0	80	0
			Municipal Supply	527	0	0	0
			Water System Losses	0	0	45	0
			Irrigation Return Flow	0	0	111	0
		Sewer	Sewer Losses	0	0	19	0
			Regional Waste Water Treatment Plant	0	353	0	0
Imported Carmel River System	Northern Coastal	Carmel River System Alluvial Aquifer	Santa Margarita Injection	625	0	625	0
			Municipal Supply	56	0	0	0
			Water System Losses	0	0	5	0
			Irrigation Return Flow	0	0	12	0
		Sewer	Sewer Losses	0	0	2	0
			Regional Waste Water Treatment Plant	0	37	0	0
	Southern Coastal	Carmel River System Alluvial Aquifer	Municipal Supply	19	0	0	0
			Water System Losses	0	0	2	0
			Irrigation Return Flow	0	0	4	0
		Sewer	Sewer Losses	0	0	1	0
			Regional Waste Water Treatment Plant	0	12	0	0
	Laguna Seca	Carmel River System Alluvial Aquifer	Municipal Supply	112	0	0	0
			Water System Losses	0	0	9	0
			Irrigation Return Flow	0	0	23	0
		Sewer	Sewer Losses	0	0	4	0
			Regional Waste Water Treatment Plant	0	75	0	0

Water Type	Subarea	Water Source	Component	Imported AFY	Exported AFY	Volume Back into Groundwater AFY	Groundwater Volume Extracted AFY
Recycled Water	Laguna Seca	Pasadera WTF Recycled Water	Nicklaus Club-Monterey Golf Course Irrigation	0	0	9	0
Precipitation	Northern Coastal	Precipitation	Deep Percolation of Precipitation	0	0	68	0
	Southern Coastal			0	0	30	0
	Laguna Seca			0	0	607	0
	Northern Inland			0	0	1,450	0
Storm Water	Northern Coastal	Storm Water	Storm Water Infiltration	0	0	68	0
	Southern Coastal			0	0	37	0
	Laguna Seca			0	0	0	0

Water Type	Subarea	Water Source	Component	Imported AFY	Exported AFY	Volume Back into Groundwater AFY	Groundwater Volume Extracted AFY
Seaside Basin Groundwater	Northern Coastal	Groundwater	Municipal Supply from Wells	0	0	0	4,278
			Water System Losses	0	0	364	0
			Irrigation Return Flow	0	0	348	0
			Groundwater Exported out of Basin	0	2,421	0	0
		Underflow	Groundwater Inflow - From Onshore	0	0	2,850	0
			Groundwater Inflow - From Offshore	0	0	100	0
			Groundwater Outflow	0	0	0	70
		Sewer	Sewer Losses	0	0	57	0
			Regional Waste Water Treatment Plant	0	1,076	0	0
	Southern Coastal	Groundwater	Municipal Supply from Wells	0	0	0	227
			Water System Losses	0	0	19	0
			Irrigation Return Flow	0	0	48	0
		Underflow	Groundwater Inflow - From Onshore	0	0	450	0
			Groundwater Inflow - From Offshore	0	0	0	0
			Groundwater Outflow	0	0	0	820
		Sewer	Sewer Losses	0	0	8	0
			Regional Waste Water Treatment Plant	0	147	0	0
			Septic Systems	0	0	5	0

Water Type	Subarea	Water Source	Component	Imported AFY	Exported AFY	Volume Back into Groundwater AFY	Groundwater Volume Extracted AFY
Seaside Basin Groundwater	Laguna Seca	Groundwater	Municipal Supply from Wells	0	0	0	869
			Water System Losses	0	0	74	0
			Irrigation Return Flow	0	0	183	0
			Laguna Seca and Nicklaus Club-Monterey Golf Course Irrigation	0	0	88	0
		Underflow	Groundwater Inflow - From Onshore	0	0	180	0
			Groundwater Outflow	0	0	0	450
		Sewer	Sewer Losses	0	0	31	0
			Regional Waste Water Treatment Plant	0	217	0	0
			Septic Systems	0	0	22	0
	Northern Inland	Underflow	Groundwater Inflow - From Onshore	0	0	0	0
			Groundwater Outflow	0	0	0	2,060

APPENDIX C:
SALT AND NUTRIENT LOADING SPREADSHEETS

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Water Type	Subarea	Salt and/or Nutrient Source	Component	TDS In, lb	TDS Out, lb	Chloride In, lb	Chloride Out, lb	Nitrate-N In, lb	Nitrate-N Out, lb
Imported Salinas Valley	Northern Coastal	Salinas Valley Groundwater	Bayonet and Black Horse Golf Courses	430,747	0	91,371	0	1,740	0
			Municipal Supply	0	0	0	0	0	0
			Water System Losses	48,281	0	10,241	0	195	0
			Irrigation Return Flow	119,539	0	25,357	0	483	0
		Sewer	Sewer Losses	52,677	0	15,538	0	124	0
			Regional Waste Water Treatment Plant	0	0	0	0	0	0
Imported Carmel River System	Northern Coastal	Carmel River System Alluvial Aquifer	Santa Margarita Injection	538,343	0	44,154	0	170	0
			Municipal Supply	0	0	0	0	0	0
			Water System Losses	4,089	0	335	0	1	0
			Irrigation Return Flow	10,123	0	830	0	3	0
		Sewer	Sewer Losses	5,572	0	1,644	0	13	0
			Regional Waste Water Treatment Plant	0	0	0	0	0	0
	Southern Coastal	Carmel River System Alluvial Aquifer	Municipal Supply	0	0	0	0	0	0
			Water System Losses	1,363	0	112	0	0	0
			Irrigation Return Flow	3,374	0	277	0	1	0
		Sewer	Sewer Losses	1,857	0	548	0	4	0
			Regional Waste Water Treatment Plant	0	0	0	0	0	0
	Laguna Seca	Carmel River System Alluvial Aquifer	Municipal Supply	0	0	0	0	0	0
			Water System Losses	8,177	0	671	0	3	0
			Irrigation Return Flow	20,245	0	1,661	0	6	0
		Sewer	Sewer Losses	11,145	0	3,287	0	26	0
			Regional Waste Water Treatment Plant	0	0	0	0	0	0

Water Type	Subarea	Salt and/or Nutrient Source	Component	TDS In, lb	TDS Out, lb	Chloride In, lb	Chloride Out, lb	Nitrate-N In, lb	Nitrate-N Out, lb
Recycled Water	Laguna Seca	Pasadera WTF Recycled Water	Nicklaus Club-Monterey Golf Course Irrigation	29,218	0	8,829	0	54	0
Precipitation	Northern Coastal	Precipitation	Deep Percolation of Precipitation	516	0	92	0	9	0
	Southern Coastal			230	0	41	0	4	0
	Laguna Seca			4,623	0	825	0	83	0
	Northern Inland			11,041	0	1,972	0	197	0
Storm Water	Northern Coastal	Storm Water Infiltration	Percolation Pond	20,034	0	5,539	0	5	0
	Southern Coastal			52,670	0	14,708	0	49	0
	Laguna Seca			0	0	0	0	0	0

Water Type	Subarea	Salt and/or Nutrient Source	Component	TDS In, lb	TDS Out, lb	Chloride In, lb	Chloride Out, lb	Nitrate-N In, lb	Nitrate-N Out, lb
Seaside Basin Groundwater	Northern Coastal	Groundwater	Municipal Supply from Wells	0	4,210,062	0	990,482	0	6,919
			Water System Losses	357,855	0	84,191	0	588	0
			Irrigation Return Flow	342,745	0	80,636	0	563	0
		Underflow	Groundwater Inflow - From Onshore	3,388,324	0	821,494	0	7,927	0
			Groundwater Inflow - From Offshore	98,423	0	23,156	0	162	0
			Groundwater Outflow	0	68,896	0	16,209	0	113
		Sewer	Sewer Losses	162,233	0	47,853	0	381	0
			Regional Waste Water Treatment Plant	0	0	0	0	0	0
	Southern Coastal	Groundwater	Municipal Supply from Wells	0	433,187	0	136,124	0	1,507
			Water System Losses	36,821	0	11,570	0	128	0
			Irrigation Return Flow	91,164	0	28,647	0	317	0
		Underflow	Groundwater Inflow - From Onshore	1,008,928	0	293,331	0	776	0
			Groundwater Inflow - From Offshore	0	0	0	0	0	0
			Groundwater Outflow	0	1,564,815	0	491,724	0	5,443
		Sewer	Sewer Losses	22,670	0	6,687	0	14,550	0
			Regional Waste Water Treatment Plant	0	0	0	0	0	0
			Septic Systems	13,694	0	4,039	0	700	0

Water Type	Subarea	Salt and/or Nutrient Source	Component	TDS In, lb	TDS Out, lb	Chloride In, lb	Chloride Out, lb	Nitrate-N In, lb	Nitrate-N Out, lb
Seaside Basin Groundwater	Laguna Seca	Groundwater	Municipal Supply from Wells	0	1,948,353	0	566,454	0	1,499
			Water System Losses	165,610	0	48,149	0	127	0
			Irrigation Return Flow	410,031	0	119,210	0	315	0
			Golf Course Irrigation	197,302	0	57,362	0	152	0
		Underflow	Groundwater Inflow - From Onshore	193,836	0	41,117	0	783	0
			Groundwater Outflow	0	1,008,928	0	293,331	0	776
		Sewer	Sewer Losses	86,785	0	25,598	0	577	0
			Regional Waste Water Treatment Plant	0	0	0	0	0	0
			Septic Systems	62,423	0	18,412	0	3,193	0
	Northern Inland	Underflow	Groundwater Inflow - From Onshore	0	0	0	0	0	0
			Groundwater Outflow	0	1,880,759	0	347,760	0	2,683
Fertilizer	Laguna Seca	Fertilization (Nitrate-N only)	Laguna Seca and Nicklaus Golf-Monterey Golf Course Fertilization	0	0	0	0	1,771	0
			Sports Fields Fertilization	0	0	0	0	280	0
			Residential and Commercial Landscaping Fertilization	0	0	0	0	1,780	0
	Northern Coastal		Bayonet and Black Horse Golf Course Fertilization	0	0	0	0	2,421	0
			Sports Fields Fertilization	0	0	0	0	587	0
			Residential and Commercial Landscaping Fertilization	0	0	0	0	2,492	0
	Southern Coastal		Sports Fields Fertilization	0	0	0	0	103	0
			Residential and Commercial Landscaping Fertilization	0	0	0	0	2,136	0
	Northern Inland		Sports Fields Fertilization	0	0	0	0	0	0
			Residential and Commercial Landscaping Fertilization	0	0	0	0	445	0

Appendix 2-d

San Jose Creek Watershed Assessment

DRAFT

212114 San Jose Creek Watershed Assessment
Draft Report
March 7, 2014

TABLE OF CONTENTS

1. INTRODUCTION 1

1.1 BACKGROUND 1
1.2 STUDY OBJECTIVES 1
1.3 WEATHER AND WATERSHED CONDITIONS DURING THE STUDY 2
1.4 ACKNOWLEDGMENTS 3

2. EXISTING CONDITIONS 5

2.1 WATERSHED DESCRIPTION 5
2.2 GEOLOGY 7
2.2.1 Surface lithology 7
2.2.2 Geologic structure 8
2.2.3 Implications of uplift 8
2.3 SOILS 8
2.4 SLOPE GRADIENTS 11
2.5 INFRASTRUCTURE AND NATURAL RESOURCES 12
2.5.1 Road Networks 12
2.5.1.1 Animas Creek Road Network 12
2.5.1.2 Seneca Creek Road Network 13
2.5.1.3 Van Winkley Canyon Road Network 14
2.5.1.4 Williams Canyon Subwatershed Road Network 14
2.5.1.1 Remaining San Jose Creek Road Network 14
2.5.2 Williams Canyon Infrastructure 15
2.5.2.1 Santa Lucia Conservancy and Private Land Holdings 15
2.5.2.2 California State Park Lands 15
2.6 HISTORIC AERIAL PHOTOGRAPHY REVIEW 16
2.7 OBLIQUE AERIAL PHOTOGRAPHY 17

3. HYDROLOGY AND GAGING 18

3.1 PAST AND CURRENT GAGING WITHIN WATERSHED 18
3.1.1 MPWMD gaging 18
3.1.2 CSUMB gaging 20
3.1.3 Other studies and gaging 22
3.2 TEMPORARY EXTENDED STREAM GAGING AND RAIN GAGE NETWORK 22
3.2.1 San Jose Creek at V-notch weir downstream of Van Winkley Creek 23
3.2.2 Seneca Creek just upstream of confluence with San Jose Creek 24
3.2.3 Water level sensor and flow at mouth of San Jose Creek 24
3.2.4 Rain gages 24
3.3 RESULTS 24
3.3.1 Precipitation 24
3.3.2 Storm flows 27
3.3.3 Base flow 27
3.4 KEY FINDINGS FROM THE GAGING EFFORT 27

4. SEDIMENT ANALYSIS 28

4.1 UPLAND SOURCES 28
4.1.1 Road/trail networks - Overview 28
4.1.2 Road/trail networks – Previous watershed assessments 30
4.1.3 Road/trail networks – Future sediment delivery estimates 33
4.1.4 Hillslope Landslides and Gullies 36
4.2 INSTREAM SOURCES 41

4.2.1 Background Stream Inventories *41*
4.2.2 PWA Instream Sediment Source Site Assessment Objectives and Methodology *42*
4.2.3 PWA Instream Sediment Source Site Assessment Results *43*
4.2.4 Instream Observations and Sediment Source Summary *49*
4.3 SEDIMENT GAGING 51
4.3.1 PWA Sediment Retention Basins (Traps) *51*
4.3.2 Bed Sediment samples *52*
4.4 ESTIMATED SEDIMENT TRANSPORT AND YIELD 53
4.4.1 Sediment transport in channel *53*
4.5 FINDINGS AND RECOMMENDATIONS FOR SALMONID HABITAT RESTORATION 57

5. FISH BARRER ANALYSIS 58

5.1 INTRODUCTION 58
5.2 CDFW BARRIER AND OTHER POTENTIAL BARRIER ANALYSES 58
5.2.1 San Jose Creek Potential Barriers *59*
5.2.1.1 Concrete dam at station # 1.51 upstream of Animas Creek confluence 59
5.2.1.2 CDFW barrier #1: Bedrock falls at station # 2.85 61
5.2.1.3 PWA Site #47 log jam at station # 5.05 65
5.2.1.4 CDFW barrier #2 near CDFW station # 7.5 75
5.2.1.5 CDFW barrier #3 near CDFW station 8.0 79
5.2.2 Seneca Creek Potential Barriers *83*
5.2.2.1 Barrier at 1.74 mile 83
5.2.2.2 CDFW barrier at station 1.9 mile 84
5.3 FINDINGS AND RECOMMENDATIONS REGARDING BARRIERS 85

6. SAN JOSE CREEK LONGSHORE LAGOON 87

6.1 INTRODUCTION AND BACKGROUND 87
6.2 WORK CONDUCTED 87
6.2.1 Unique geomorphology *87*
6.2.2 Similar unique role in salmonid ecology *88*
6.2.3 No role in amphibian or reptile ecology *88*
6.2.4 Pilarcitos Creek Lagoon as site analog *88*
6.3 WATER LEVEL GAGING AND GROUND SURVEY 89
6.4 PHOTO DOCUMENTATION OF LAGOON WITH TIME LAPSE CAMERAS 89
6.5 OBSERVATIONS AND RECOMMENDATIONS 92
6.5.1 Alignment and geometry of San Jose Creek lagoon *92*
6.5.2 Opening and closing of lagoon *93*
6.5.3 Further studies *94*

7. KEY FINDINGS AND RECOMMENDATIONS 95

7.1 SEDIMENT 95
7.2 FISH BARRIERS 95
7.3 LONG-SHORE LAGOON 95
7.4 RECOMMENDATIONS FOR FUTURE WORK 96
7.4.1 Quantitative Road/trail Assessment *96*
7.4.2 Treatment of Identified Instream Sites *96*
7.5 LIMITATIONS 98

8. REFERENCES 100

LIST OF TABLES

Table 2.1. Subwatersheds of San Jose Creek

Table 2.2. Stream Strahler Orders of San Jose Creek Watershed

Table 2.3. Ownership within San Jose Creek Subwatersheds

Table 2.4. Lithology of San Jose Creek Watershed

Table 2.5. Soil types within San Jose Creek Watershed according to USDA NRCS

Table 2.6 Slope gradient area by Subwatershed

Table 2.7. Road/trail Network of San Jose Creek by Subwatershed

Table 3.1. Annual Peak flows for MPWMD gaging site near mouth of San Jose Creek.

Table 3.2. Flood frequency flows based on peak flows from MPWMD gaging.

Table 4.1. Evaluated road/trail Network of San Jose Creek by Subwatershed

Table 4.2. Estimated volume of future sediment delivery for sites and road surfaces assessed within Williams Canyon Subwatershed

Table 4.3. Estimated future erosion anticipated from road related (upslope) sources by subwatershed based on extrapolation of field estimates

Table 4.4. Stream length and average drainage density of San Jose Creek by Strahler order

Table 4.5. Inventoried instream site types

Table 4.6. Estimated past and future sediment delivery from inventoried instream sites

Table 4.7. Summary results of inventoried instream obstructions

Table 4.8. Field estimated sediment delivery from all inventoried instream sites

Table 4.9. Estimated future sediment delivery volumes anticipated from instream sources by Strahler Order based on extrapolation of field estimates

Table 4.10. Particle size analysis for bedload samples and bed samples

Table 5.1. Surveyed fish barriers (FB), San Jose Creek Study, Monterey County, California

Table 6.1. Observed opening and closing of San Jose Creek lagoon at Monastery Beach during salmonid migration season according to review of time-lapse photography

Table 7.1. Inventoried instream sites recommended for treatment

Table 7.2. Recommended treatments for inventoried instream sites

Table 7.3. Estimated heavy equipment and labor requirements based on treatment immediacy and effectiveness for instream inventoried sites recommended for treatment

LIST OF FIGURES

Figure 1.1. Rainfall history at San Clemente Dam, 6 miles east of the San Jose Creek 3

Figure 2.1. Soils within San Jose Creek Watershed by Hydrologic Soil Group (HSG) according to USDA NRCS, San Jose Creek Study, Monterey County, California. 10

Figure 2.2. View of a typical upper slope native, unsurfaced road found within SJC Watershed with insloped road shapes and concentrated runoff. 12

Figure 2.3. View of a typical upper slope native, unsurfaced road found within SJC Watershed with insloped road shapes and concentrated runoff. 13

Figure 2.4. View of a native, unsurfaced streamside road found within Seneca Creek Subwatershed. 14

Figure 2.5. View of a native, unsurfaced roads found within Williams Canyon Subwatershed.. 15

Figure 2.6. Upper Williams Canyon headwater hill slopes underlain by granitic bedrock displaying a high frequency of shallow debris slides. 17

Figure 3.1. Mean daily flow at MPWMD gage, Water Years 1999 to 2013. 19

Figure 3.2. Location of CSUMB gaging sites for water year 2011, courtesy of Emily Paddock (2012). 20

Figure 3.3. Discharge record from CSUMB for Water Year 2011 on upper San Jose Creek, based on Emily Paddock's work (2012). 21

Figure 3.4. Discharge record from CSUMB for Water Year 2011 on Williams Canyon Creek, courtesy of Paddock (2012).. 21

Figure 3.5. Past flow measurements at v-notch weir on San Jose Creek by Balance Hydrologics 22

Figure 3.6. Gaged flow at V-notch weir on San Jose Creek, and precipitation at two nearby rain gages installed for this study during WY2013 and the first four months of WY2014. 25

Figure 3.7. Gaged flow and precipitation on Seneca Creek for Water Year 2013 26

Figure 3.8. Gaged flow and precipitation on San Jose Creek at Highway 1 for Water Year 201326

Figure 4.2. View of hydrologically connected road reach with no permanent drainage structures installed to disperse road runoff.. 32

Figure 4.1. View of undersized culverted stream crossing along Seneca Creek. 32

Figure 4.3. Active hill slope gullies predominately concentrated in Miocene sandstone bedrock on planar, south facing slopes. 37

Figure 4.4. These large active hillslope gullies forming on gentle, planar slopes have over-steepened sideslopes, lack vegetation and are prone to periodic sideslope collapse.. 38

Figure 4.5. View of the upslope initiation point of Gully #2 (Map 5). Note the lack of vegetation, near vertical sideslopes and scarp forming at red arrow. 39

Figure 4.6. View of the upslope initiation point of Gully #2 (Map 5). 40

Figure 4.7. Upslope of the head of active hillslope gullies one can observe linear, mole-like tracks of collapsing ground suggesting sub-surface groundwater piping is occurring. 40

Figure 4.8. Collapse structures such as shown in the photo are common on gentler hill slopes underlain by the Miocene sandstone bedrock..... 41

Figure 4.9. View of inventoried bank erosion site along Seneca Creek, Site #31 (Map 5). 44

Figure 4.10. View of inventoried bank erosion site along San Jose Creek, Site #43 (Map 5). 44

Figure 4.11. Retained sediment behind log jam at Site #24 along Seneca Creek (Map 5). 44

Figure 4.13. View from the right bank of inventoried log jam site along Seneca Creek, Site #41 (Map 5). 45

Figure 4.12. View of inventoried log jam site along Seneca Creek, Site #41 (Map 5). 45

Figure 4.14. View of inventoried log jam site along San Jose Creek, Site #49 (Map 5)..... 46

Figure 4.15. View of retained sediment behind inventoried log jam site along San Jose Creek, Site #50 (Map 5)..... 47

Figure 4.16. View of San Jose Creek. The reach is low gradient with a well-established floodplain along the right bank and bimodal distribution of the channel bottom. 49

Figure 4.17. View of the installation of sediment retention basin (SB #1) placed above the road crossing to capture transported material from the erosion of Gully #1 (Map 5). 51

Figure 4.18. Particle size gradation of bedload samples (blue solid lines), bed samples (red dashed lines), and beach sand (gray solid line) for San Jose Creek 52

Figure 4.19. Estimated bedload rating curve for San Jose Creek 55

Figure 4.20. Estimated suspended-sediment rating curve for San Jose Creek 56

Figure 5.1. View from road across SJC to right bank at low concrete dam (Site #7, Map 5) and channel breach around dam on left bank, in foreground. 60

Figure 5.2. View downstream at concrete dam in center of photo with thalweg in channel to left of large natural boulder in SJC. 61

Figure 5.3. Fish barrier #1, Longitudinal Profile and Cross Section at bedrock falls natural barrier on San Jose Creek. 62

Figure 5.4. View upstream at CDFW barrier #1 (Site #7, Map 5) taken from downstream riffle crest..... 63

Figure 5.5. Close up of 6' tall bedrock chute and falls at CDFW barrier #1 (Site #7, Map 5). d. ... 63

Figure 5.6. Estimate hydraulics from course HEC-RAS model at bedrock falls barrier 64

Figure 5.7. Site #47: View upstream from cross section #1 (Figure 5.18). 66

Figure 5.8. Site#47: View downstream from cross section #1 (Figure 5.18) at upstream end of channel stored sediments (Figure 5.17). 67

Figure 5.9. Site#47: View upstream from cross section #2 (Figure 5.18) at aggraded channel reach. 67

Figure 5.10. Site#47: View downstream from cross section #2 (Figure 5.18) at upper logjam. 68

Figure 5.11. Site#47: View upstream from cross section #3 (Figure 5.18). 68

Figure 5.12. Site#47: View downstream from cross section #3 (Figure 5.18) at upper and lower logjams. 69

Figure 5.13. Site#47: Photo mosaic taken from right end stake of cross section #4 (Figure 5.18) showing the upper and lower logjams and associated channel stored sediment. 70

Figure 5.14. Site#47: Photo mosaic taken from thalweg looking upstream at lower logjam (in center of photo) and developing high flow channel and sediment filled plunge pool on left below exposed redwood roots. 71

Figure 5.15. Site#47: View downstream from near centerline of San Jose Creek illustrating typical SJC riffle characteristics. 72

Figure 5.16. Extensive Sudden Oak Death mortality and fallen trees potentially forming a large log jam 450 ft upstream from PWA Site #47. 72

Figure 5.17.. Longitudinal Profile of Logjam, Site #47 along San Jose Creek. 73

Figure 5.18. Cross Sections #1 through #5 of Logjam, Site #47 along San Jose Creek. 74

Figure 5.19. View upstream from SJC at CDFW log jam barrier #2 in distance and at headcut on right bank terrace where diverted SJC streamflow re-enters the main stem of SJC. .. 75

Figure 5.20. View downstream taken from top of CDFW barrier #2 with 8' vertical step in channel.. 76

Figure 5.21. View downstream from near station #180 in the long profile at aggraded sandy streambed and stored sediment upstream of barrier #2. 76

Figure 5.22. Longitudinal profile of Fish Barrier #2, large redwood logjam with side channel on San Jose Creek. 77

Figure 5.23. View downstream from near station #350 in long profile at diverted SJC stream across old growth terrace. 78

Figure 5.24. View upstream at CDFW barrier #3 taken from top right bank. 79

Figure 5.25. View downstream at crest of log jam (at survey rod) with channel stored sediment covered by litter. 80

Figure 5.26. View downstream taken from station #8.0 in long profile at recently re-incised channel through previously stored sediment. 80

Figure 5.26. Longitudinal Profile at Fish Barrier #3, large multi logjam on San Jose Creek. 82

Figure 5.28. View upstream at concrete dam face and apron on Seneca Creek (Site #37, Map 5) located at stream mile 1.47 near the old homestead. 84

Figure 5.29. View looking upstream at site #41 (Map 5) at station #1.9. Photo taken from Nelson, 2006b. 85

Figure 6.1. San Jose Creek Lagoon survey, time lapse camera locations, and water level recorder location 90

Figure 6.2. San Jose Creek Lagoon surveyed cross sections and profile from May 2, 2013 compared to 2009 – 2011 CA Coastal Conservancy Coastal Lidar Project 91

Figure 6.3. Typical photos from time lapse photography showing relation of lagoon inundation to tidal cycle 92

LIST OF OVERSIZE MAPS

Map 1. Location of the San Jose Creek Watershed

Map 2. Strahler Stream Order of the San Jose Creek Watershed

Map 3. Lithology of the San Jose Creek Watershed

Map 4. Hillslope gradients within the San Jose Creek Watershed

Map 5. Site map of study locations within the San Jose Creek Watershed

APPENDICES

Appendix A. Aerial photographs: Historic Aerials, California Coastal Records Project, and Oblique Fixed-wing flight on February 16, 2013

Appendix B. Stream gaging: Observers logs, notes, photos, and sediment analysis results

Appendix C. Field observations for instream sites

Appendix D. CDFW Memorandum detailing observations of Warden Lester Golden in the summer of 1962 on San Jose Creek

1. INTRODUCTION

1.1 Background

This report identifies current sediment sources within the watershed, based on reconnaissance field and aerial surveys, summarizes past stream and sediment gaging, reports stream gaging for the previous water year, conducts fish barrier analysis, and evaluates fish passage at the mouth of San Jose Creek.

For the Monterey Peninsula Regional Park District (MPRPD), as funded by a 2012 Integrated Regional Water Management Plan grant (IRWMP), the following report provides a broad watershed assessment to investigate runoff and sediment issues within the San Jose Creek Watershed. The main goal of this report is to evaluate the San Jose Creek watershed for sediment and fish passage as it relates to salmonid habitat and make recommendations for improvements.

This study focuses on the portion of the watershed downstream of Van Winkley Creek. This lower portion of the watershed is largely in agency ownership. Most of the private holding in the upper part of the basin have already seen several years of detailed studies in related matters. The channels of the upper watershed are also more distal from key salmonid habitat. To the extent possible, previous studies from the upper watersheds are integrated into this analysis. By leveraging analysis to the lower watershed, a better understanding of areas previously unstudied for sediment loading and salmonid habitat is provided.

MPRPD selected Balance Hydrologics ('Balance') to conduct this assessment on October 17, 2013. The proposed scope included Pacific Watershed Associates ('PWA') as a major and fundamental subcontractor, charged with most of the work on the slopes and road network, and working side by side with Balance on assessment of passage and erodibility in the channels. Rob Thompson of Thompson Wildland Management also served as a subcontractor, assisting in storm monitoring. The contract was approved by the MPRPD on December 3, 2013. Installation of some gages occurred prior to authorization, due to seasonal needs.

1.2 Study objectives

To follow upon findings and recommendations in Nelson (2006a; 2006b) and to fulfill the scope of work for the watershed study, the Project team of Balance and PWA set a field program to address objectives as follows:

- Locate sediment sources in upland areas
- Locate sediment sources from instream bank erosion and morphology
- Install temporary stream gage network to evaluate base flows and storm flows in water year 2013.
- Estimate sediment loading from upland and instream sources
- Prepare recommendations for improvement of salmonid habitat from sediment management
- Provide more detailed study of fish barriers identified by CDFW in 2006

- Make recommendations for fish barriers
- Perform instream survey of stream bank erosion
- Measure rates of erosion and sediment delivery from uplands areas and stream banks
- Provide photography to document opening and closing of lagoon during fish migration period (January - June)
- Conduct ground survey of lagoon cross sections to document geomorphology
- Make recommendations, if warranted, for further lagoon studies

1.3 Weather and Watershed Conditions During the Study

Watershed studies which include gaging, sediment transport, and hillslope sediment contributions typically extend through three or more winters. This study was more abbreviated in concept, in part because of its focus on steelhead habitat. Unfortunately, the one water year initially allowed for this study[1] was WY2013[2], which proved to be one of the drier years on record. Additionally, it followed a dry WY2012. While WYs2010 and 2011 were somewhat wetter than average, it has been 15 years since the watershed experienced a major recharge season – which we have identified as about 165 percent of mean annual rainfall in our work in the Las Garzas, San Clemente and Pine Canyon watersheds nearby. Annual rainfall totals at San Clemente Dam, the area's primary rain gage, are shown in Figure 1.1

[1] The initial deadline for completion of field work, September 30, 2013, was extended to allow collection of additional through January 15, 2014. We continued the monitoring through the first week of February 2014. Field work was terminated on that time to allow completion of the project report by March 31, 2014.

[2] A water year (abbreviated "WY") is the basic period used for hydrologic and sedimentologic analysis. It commences on October 1 and extends through September 30 of the named year. WY2013 began on October 1, 2012 and concluded on September 30, 2013.

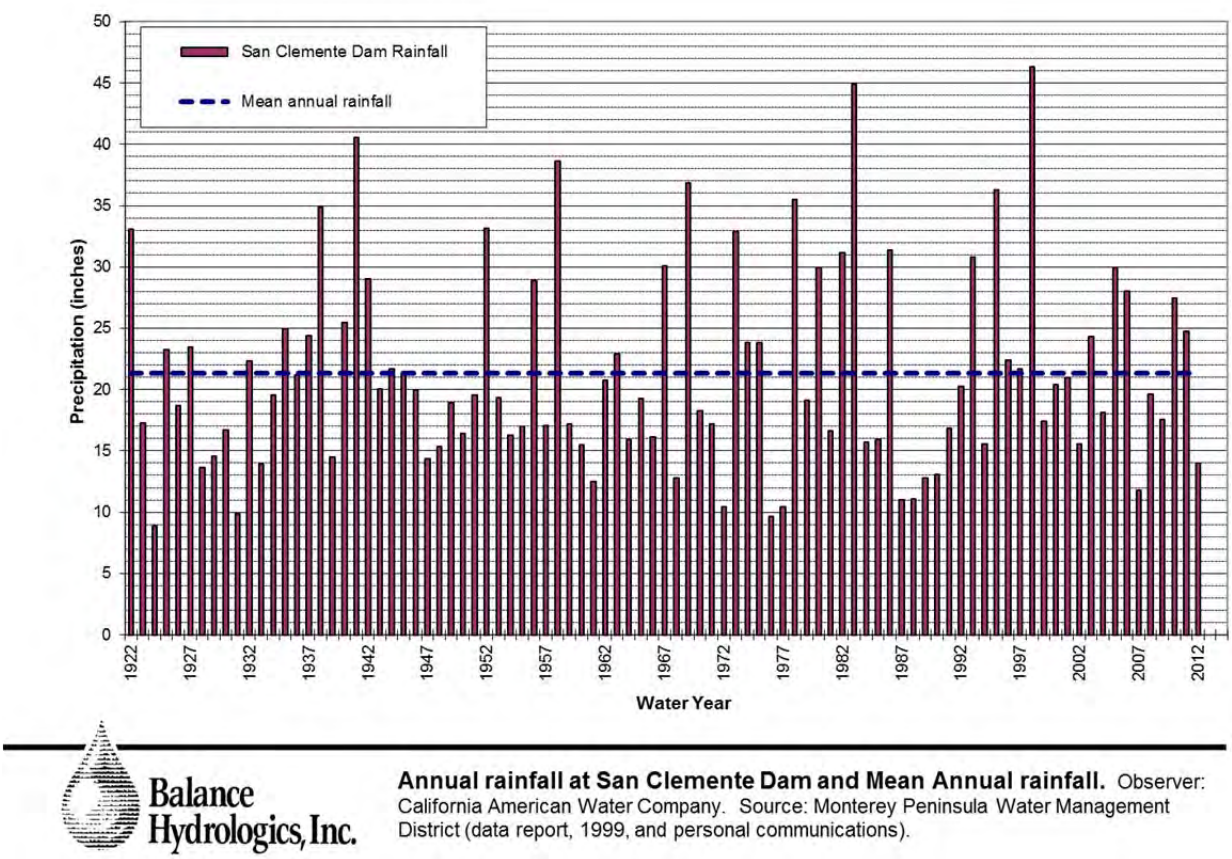


Figure 1.1. Rainfall history at San Clemente Dam, 6 miles east of the San Jose Creek

Watershed conditions were reasonably undisturbed during the period of study. Fires of watershed extent have not been reported from this area since the early 1930s. The last major flooding occurred in 1995 and 1998, so no fresh flood-generated disturbance was noted. Grazing has been sharply curtailed over the past decade or more. No extended multi-year drought capable or weakening stream banks has occurred since the early 1990s. A number of homes and driveways had been constructed within the boundaries of the Santa Lucia Conservancy (Rancho San Carlos).

The one significant environmental disturbance we noted was prevalence of sudden oak death. Several patches of 3 to 5 acres each were observed to be losing all hardwoods. We make note in the report where such patches may have various local effects. Given the steep slopes, the roots of such trees have an important role in slope stability. Continued expansion of areas where interpenetrating roots will be lost will likely lead to additional landsliding and gullying, particularly on the south side of the creek.

1.4 Acknowledgments

Balance and PWA staff appreciate the efforts made by many different individuals to make this study possible. In particular, Tim Jensen, MPRPD Planning and Conservation Manager, has always been a strong advocate for Palo Corona and the San Jose watershed. He developed the concept for this study, then was able to support it with a combination of funding from the MPRPD board and a grant from the Monterey Peninsula Integrated Regional Water Management Program (IRWMP), managed by District Engineer Larry Hampson and his staff at the Monterey

Peninsula Water Management District (MPWMD). Funding for the IRWMP came from Proposition 84 funds awarded to MPWMD (as fiscal agent) by the State Water Resources Control Board.

We also wish to express our gratitude to a number of landowners who allowed us access and permitted installation of a wide variety of instrumentation. Some of our work and much of our instrumentation was installed at the Santa Lucia Conservancy (SLC), which manages the upper one-third of the San Jose Creek watershed under the direction of Christina ("Christy") Fischer. Big Sur Land Trust (BSLT) permitted use of work performed 5 years ago by PWA staff, and allowed access to review conditions at some sites.

Rob Thompson, proprietor of Thompson Wildland Management and a former watershed manager at SLC, assisted with the field work, often under adverse conditions. Lynne Overtree, former resident caretaker at Palo Corona Ranch made several helpful suggestions, and provided historical background and anecdotal accounts which brought life to some parts of our work.

Jennifer Nelson, senior biologist with the California Department of Fish and Wildlife (CDFW), walked and studied San Jose Creek in considerable detail in 2006, a wet year. Her photos and reports provided both context for change over time and for the differences between wet and dry years (Nelson, 2006a; 2006b).

Finally, and most warmly, we wish to thank Greg James, Hydrography Programs Coordinator at MPWMD, who has shared with us his observations, opinions, and the data he has collected over the past 25 years. We suspect that Greg had to make significant changes to his annual schedule of data collection and management to provide us with final data on the schedule required for this short-fuse report.

2. EXISTING CONDITIONS

2.1 Watershed Description

The San Jose Creek Watershed covers approximately 14.42 mi^2 located in northwest Monterey County. The mouth of San Jose Creek (SJC) exits on the north end of Monastery Beach off Highway 1 approximately 2 miles south of Carmel (Map 1). There are 4 major tributaries of San Jose Creek: Animas Creek, Seneca Creek, Van Winkley Canyon, and Williams Canyon. Animas Creek subwatershed is 1.60 mi^2 and is the northern most tributary to SJC. Seneca Creek subwatershed is 2.30 mi^2 and is the largest and most southwestern named tributary to SJC. Van Winkley Canyon subwatershed (0.86 mi^2), located between Seneca and Williams Canyon. Finally, Williams Canyon subwatershed is 1.97 mi^2 and is the most southeastern named tributary to SJC (Table 2.1).

Table 2.1. Subwatersheds of San Jose Creek, San Jose Creek Watershed Assessment, Monterey County, California.

Subwatershed	Area (mi^2)	% area
Animas Creek	1.60	11%
Seneca Creek	2.30	16%
Van Winkley Canyon	0.86	6%
Williams Canyon	1.97	14%
Remaining San Jose Creek	7.69	53%
Total Watershed Area	14.42	**100.00%**

The main stem of San Jose Creek is aligned northwest to southeast and extends for about 8 miles, with the main slope aspects facing northeast and southwest (Map 1). The watershed is bordered by the Carmel River basin to the north and coastal watersheds in the Santa Lucia Range to the south. Average annual rainfall for the watershed is 27.1 inches (USGS, 2014). The topography ranges from elevation 0 to 3173 feet and is typically steep terrain with an average slope of 39-percent, based on the 30 meter DEM of the watershed (USGS, 2014). About 45 percent of the watershed is vegetated in forest. Less than 0.1 percent is impervious area. The hydrologic flow regime is typically sheet flow in the upper elevations on steep pasture land, which then collects into confined channels and forested canyons, ultimately reaching the ocean through a narrow, sand-bedded, long-shore lagoon. The mouth of San Jose Creek opens intermittently and lagoon water levels are linked closely to tide levels.

San Jose Creek watershed includes 70.19 mi of 1st order, 2nd order, 3rd order, 4th order, and 5th order streams. Stream order was identified utilizing GIS generation (3m DEM) and the Strahler stream order system (Table 2.2, Map 2). The Strahler ordering system, developed in 1952, is a simple method of classifying stream segments based on the number of tributaries upstream. A stream with no tributaries (headwater stream) is considered a first order stream. A segment downstream of the confluence of two first order streams is a second order stream. Any n^{th} order stream is always located downstream of the confluence of two $(n-1)^{th}$ order streams (Strahler, 1952).

Table 2.2. Stream Strahler Orders of San Jose Creek Watershed, San Jose Creek Study, Monterey County, California.

Strahler Order	Length (mi²)	% length
1 [3]	36.72	52%
2	14.47	21%
3	7.151	10%
4	4.98	7%
5	6.87	10%
Total Length in Watershed	70.19	**100.00%**

Ownership within the SJC Watershed includes larger holdings of: State of California (State), Monterey Peninsula Regional Park District (MPRPD), Big Sur Land Trust (BSLT), and Santa Lucia Conservancy (SLC). The remaining watershed is held privately or is designated as "unknown" (Table 2.3, Map 1). Access to the Animas Creek subwatershed and lower San Jose Creek areas is from Carmel on Highway 1 through California State Park property and through a MPRPD gate. Seneca Creek is accessed by the MPRPD Palo Corona entrance off Highway 1 or by Rancho San Carlos Road from the north. Van Winkley Canyon and Williams Canyon subwatersheds are accessed via Rancho San Carlos Road and SLC and BSLT properties.

Table 2.3. Ownership within San Jose Creek Subwatersheds, San Jose Creek Study, Monterey County, California.

Ownership	Subwatershed Area (mi²)					% Total area
	Animas	Seneca	Van Winkley	Williams	San Jose	
Big Sur Land Trust	0.15	0.02	0.10	1.43	0.46	15%
Santa Lucia Conservancy	0.00	0.00	0.31	0.30	2.38	21%
Monterey Peninsula Regional Park District	0.45	2.24	0.45	0.05	1.00	29%
State Of California	0.00	0.04	0.00	0.17	1.42	11%
Private Landholdings	1.00	0.00	0.00	0.02	1.99	21%
Unknown	0.00	0.00	0.00	0.00	0.44	3%
Total Area	**1.60**	**2.30**	**0.86**	**1.97**	**7.69**	**100%**

[3] Based on the resolution of GIS –DEM, 1st order stream channels are likely underestimated.

2.2 Geology

2.2.1 Surface lithology

The distribution of mapped lithological units within the SJC watershed is illustrated in Table 2.4 and Map 3. The lithology for the study area was compiled from GIS provided by the MPRPD (Rosenberg, 2001), as used for the Palo Corona Roads Report (CGS, 2010). Within the Animas watershed the primary geologic unit is the Monterey formation from the middle to late Miocene (Tm). The stratigraphy is tilted and uplifted, with differentially eroded beds leaving a characteristic landscape image, as shown on the aerial photos (see Appendix A). The Monterey formation beds extend along the slopes north of San Jose Creek within the upper watershed. The Monterey formation, and underlying Vaqueros sandstone and an associated Unnamed marine sandstone, overlie Cretaceous porphyritic granodiorite (Map symbol **Kgdm**). All three geologic units develop friable soils, with erosion potential, acting as a sediment source.

Table 2.4. Lithology of San Jose Creek Watershed, San Jose Creek Study, Monterey County, California.

Lithology	Area (mi^2)	% area
Qb – Beach sand (Historical)	0.00	0.0%
Qal– Alluvium (Holocene)	0.37	2.6%
Qc– Colluvium (Holocene)	0.09	0.6%
Qls – Landslide deposits (Holocene-Pleistocene)	0.39	2.7%
Qct – Coastal terrace deposits (Pleistocene)	0.13	0.9%
Tc – Carmelo Formation (Early Eocene)	0.00	0.0%
Tm – Monterey Formation (Mid-Late Miocene)	1.99	13.8%
Tts – Marine sandstone (Miocene)	0.82	5.7%
Tvq – Vaqueros Formation – sandstone (Oligocene)	0.03	0.2%
Tva – Basaltic andesite (Oligocene)	0.03	0.2%
Kgdm – Porphyritic granodiorite of Monterey (Cretaceous)	4.37	30.3%
Kgdc –Granodiorite of Cachagua (Cretaceous)	1.75	12.1%
Kqds – Hornblende-biotite quartz diorite of Sobranes Point (Cretaceous)	4.45	30.9%
Total Watershed Area	**14.42**	**100.00%**

In the lower San Jose Creek watershed, the Kgdm unit is also mapped on south side of San Jose Creek and the western side of the Seneca Creek watershed. Continuing southeastward from Seneca Creek, the ridge between Seneca Creek and Van Winkley Creek is mapped as Cretaceous granodiorite of Cachagua. Rounding out the southeast section of the watershed, in the Williams Creek drainage and the headwaters of San Jose Creek, the geologic unit is mapped as hornblende-biotite quartz diorite of Soberantes Point (Cretaceous).

At the bottom of the canyons, along the main stem of San Jose Creek, narrow bands have been mapped as alluvium and mudflow sediments from the Holocene, recent geologic deposits. These deposits are the result of upland erosion as delivered from landslides and fluvial processes.

2.2.2 Geologic structure

San Jose Creek has developed a course more or less along the alignment of the San Francisquito fault zone, one of several faults which accommodate the geologically rapid uplift of the northern Santa Lucia Mountains. The stream has eroded through the fractured rock along the fault zone throughout its course. Other faults, mainly unnamed and only partly mapped likely shape the hydrography of the Animas watershed and other areas north of the creek. (Clark and others, 1997; Rosenberg, 2012)

San Jose Creek is one of four major Monterey Peninsula streams which have asymmetric watersheds, with the south side of the catchment rising to substantially greater heights, and contributing the preponderance of flow, base flow sustained by groundwater, and sediment. Other such streams are Cachagua Creek, the Carmel River in Carmel Valley, and Canyon del Rey. In each case, the streams flow along fault systems which have raised the bedrock block to the southwest much more rapidly than the northern sides of the bedrock in their catchment.

2.2.3 Implications of uplift

The continuing history of uplift prevailing during the past several million years has a number of implications for managing anadromous fish in San Jose Creek. First, the vast majorities of sediment and groundwater entering the stream from its flanks come from the southwestern side, both because the greater elevations impart more potential energy from this side. Streams are longer, because they drain larger watersheds. The longer tributaries run through longer and deeper canyons from which sediment may be delivered. Secondly, terraces deposited along streams (alluvial) or the coastline (marine) occur on both sides of the fault, but extend higher on the southwest side. Elsewhere in the Carmel watershed, terraces are visible to heights of 1500 feet or higher (Hecht, 1981; Richmond, 2009), and they seem to be identifiable throughout the Seneca watershed and along Palo Corona Road, albeit growing fainter with elevation. Terraces are important modifiers of sediment delivery, because they can (1) store sediment, which accumulates on the flattened treads, and (2) develop clay accumulations or 'claypans' in the subsoil over periods of tens or hundreds of thousands of years. The accumulated clays on the tops of ridges south of San Jose Creek are important influences on the erodibility of the deeply-weathered granitic rocks supply much of the sediment to San Jose Creek. This is further described in Sec. 2.3, immediately below and on the soil hydrologic group map. Finally, north-facing slopes on hills southwest of the creek are much damper (more mesic) than the drier (more xeric) slopes to the northeast of the stream. A combination of exposed versus shelter aspect, a drier shale geology to the north of the creek, and less groundwater availability to the north all combine to make contrast across the watershed much more articulated than in many other coastal watersheds.

2.3 Soils

The soils throughout the San Jose Creek (SJC) watershed are primarily loams with varying degrees of slope. A summary of soil types and characteristics within the watershed are summarized on Table 2.5. Also shown on Table 2.5 are K factors for the Universal Soil Loss Equation (USLE). These factors range from 0.02 to 0.69, with higher erosion factors indicating more potential for erosion.

Regarding runoff potential, about 45-percent of the soils are hydrologic group B (moderate infiltration) and 18-percent are in hydrologic soil group A (high infiltration), indicating a

majority of the watershed with significant infiltration rates and lower surface runoff rates (Figure 2.2), mostly on the south side of the main stem of San Jose Creek.

Table 2.5. Soils within San Jose Creek Watershed according to NRCS Websoil Survey (USDA, 2014), San Jose Creek Study, Monterey County, California.

					Universal soil loss K factor	
Map unit	Map unit name	acres	%	HSG	whole soil	rock free
Jc	Junipero-Sur complex	1,728	18.7%	B	0.10	0.17
Ga	Gamboa-Sur complex	1,468	15.9%	A	0.05	0.15
CcG	Cieneba fine gravelly sandy loam, 30 to 75 percent slopes	1,376	14.9%	D	0.15	0.28
SoG	Sheridan coarse sandy loam, 30 to 75 percent slopes	1,039	11.3%	B	0.17	0.17
JbG	Junipero sandy loam, 30 to 75 percent slopes	811	8.8%	B	0.10	0.15
SfF	Santa Lucia channery clay loam, 30 to 50 percent slopes, MLRA 15	667	7.2%	C	0.05	0.17
Sg	Santa Lucia-Reliz association	573	6.2%	C	0.05	0.20
SoE	Sheridan coarse sandy loam, 15 to 30 percent slopes	453	4.9%	B	0.17	0.17
ShE	Santa Ynez fine sandy loam, 15 to 30 percent slopes	213	2.3%	D	0.32	0.32
GkB	Gorgonio sandy loam, 0 to 5 percent slopes	206	2.2%	A	0.10	0.20
GfF	Gazos silt loam, 30 to 50 percent slopes	190	2.1%	C	0.20	0.37
Rc	Rock outcrop-Xerorthent association	151	1.6%	D		
LcG2	Linne-Shedd silty clay loams, 50 to 75 percent slopes, eroded	71	0.8%	C	0.28	0.28
EbC	Elder very fine sandy loam, 2 to 9 percent slopes	60	0.7%	B	0.37	0.37
GfE	Gazos silt loam, 15 to 30 percent slopes	53	0.6%	C	0.17	0.37
LmE	Los Osos clay loam, 15 to 30 percent slopes	43	0.5%	D	0.28	0.28
ScE	San Andreas fine sandy loam, 15 to 30 percent slopes	43	0.5%	B	0.20	0.20
ShC	Santa Ynez fine sandy loam, 2 to 9 percent slopes	29	0.3%	D	0.15	0.32
NcE	Narlon loamy fine sand, 15 to 30 percent slopes	22	0.2%	D	0.28	0.28
Am	Arnold-San Andreas complex	7	0.1%	B		
LeC	Lockwood shaly loam, 2 to 9 percent slopes	12	0.1%	B	0.15	0.28
PdC	Pfeiffer fine sandy loam, 2 to 9 percent slopes	6	0.1%	A	0.20	0.20
ScG	San Andreas fine sandy loam, 30 to 75 percent slopes	5	0.1%	B	0.24	0.24
SoD	Sheridan coarse sandy loam, 5 to 15 percent slopes	1	0.0%	B	0.17	0.17
	Totals for Area of Interest	**9,229**	**100.00%**			
	Hydrologic Soil Group (HSG) A	1,681	18%	High infiltration, low runoff		
	Hydrologic Soil Group B	4,161	45%	Moderate infiltration when wet		
	Hydrologic Soil Group C	1,555	17%	Slow infiltration when wet		
	Hydrologic Soil Group D	1,832	20%	Very slow infiltration when wet		

Areas for moderate to high runoff potential (hydrologic soils groups C and D) are located in the Animas Creek drainage and on the north side of the watershed on the ridge within private land holdings and the Santa Lucia Conservancy. The overall distribution of the higher-runoff soils is similar to ridgetop and terrace areas with more deeply-developed soils which tend to have accumulated clays in their subsoils. Group C soils are found largely in areas where Tertiary sedimentary rock (particularly the Monterey diatomites and shales) is mapped. This area coincides with the Kgdm geologic formation with greater potential for erosion and sediment source, in part because this unit is where most of the older terrace deposits are found, with the related clayey subsoils. Site visits and oblique aerial photography have confirmed piping, rill erosion and gullies occur in this area.

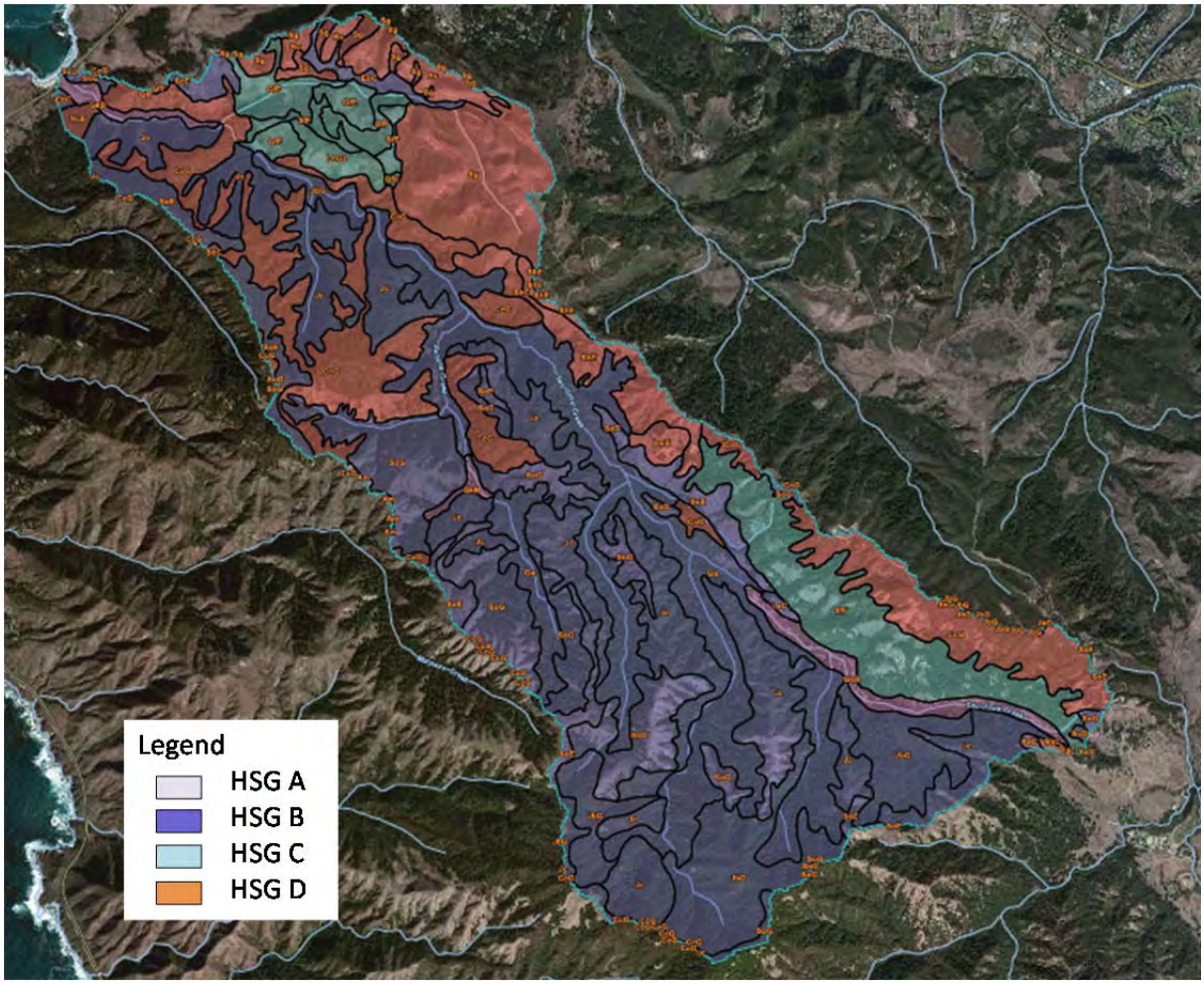


Figure 2.2. Soils within San Jose Creek Watershed by Hydrologic Soil Group (HSG) according to USDA NRCS, San Jose Creek Study, Monterey County, California.

Conventional K factors and USLE analyses – originally developed for low-gradient cropland and weather patterns found east of the Rockies -- tell literally only half the story in the northern Santa Lucias. One-third to one-half the sediment yield in this region is generated solely during episodic events, such as post-fire runoff, major floods, large landslides, and droughts (c.f., Hecht, 2000). For example, our work at Los Padres Reservoir following the 1977 Marble-Cone fire demonstrated that sedimentation in the lake during the first year following the fire equaled the total sedimentation recorded during the prior 38 years (Hecht, 1981). Since the fire cycle averages 40 to 60 years in this region, the data support the conclusion of one-third to one-half of sediment production directly associated with episodes and the importance of integrating episodic sedimentation for habitat or watershed-management purposes. In the San Jose watershed, sediment generation during chronic or normal periods may come predominantly from the ridgetops and soils of Hydrologic Soil Groups C and D; sediment delivery to the stream following fires or major regional storms or following landslides, on the other hand, come largely from the hillslopes above the channels – which almost universally fall within the HSG B in the San Jose watershed.

The work of the Balance/PWA team occurred during a period with virtually no episodic disturbance. Our observations and measurements characterize a period of chronic erosion,

quiescent relative to the periods of episodic sedimentation. Overall- long-term sediment yields may be expected to half-again-as-large, or twice as large, as those measured during this study. Erosion may focus on the hillslopes during periods of episodicity, rather than chronic periods where the ridgetops may be focus of sediment entrainment as identified in the USLE analysis above.

One of the definitions of an episodic period (Hecht 1993) is when processes predominate which otherwise happen very seldom during a more normal, or chronic, period. One only has to walk the lower reaches of Williams Creek – strewn with debris-flow or mudflow lobes – to understand that very different processes can predominate in this watershed following episodic disturbance. What this means for steelhead passage or rearing habitat may warrant consideration as part of the ultimate watershed planning.

2.4 Slope gradients

Slope gradients in the SJC watershed range from very gentle (<5%) to very steep (>65%). Typically the gentlest slopes are found within the low lying valleys of higher order (3rd through 5th) stream channels and along ridgetops (Map 4). The distribution of slope gradients by subwatershed are displayed in Table 2.6. The subwatersheds of Seneca, Van Winkley, and Williams have the highest occurrence (30-35%) of hillslopes with gradients greater than 65% based on overall subwatershed area. Hillslope gradients exceeding 65% in steepness represent only 7% of the Seneca Creek's total area. Based on distribution, steeper slopes are more likely to occur within Cretaceous granitics (Kgdm, Kgdc, Kqds) and along lower order (1st and 2nd) tributaries (Maps 2-4).

Table 2.6. Slope gradient area by Subwatershed, San Jose Creek Study, Monterey County, California.

Slope gradient Range (%)	Subwatershed area (mi²)					
	Animas Creek	Seneca Creek	Van Winkley Canyon	Williams Canyon	Remaining San Jose Creek	Total
<35%	0.78	0.56	0.15	0.33	2.94	4.76
35-49.99%	0.43	0.51	0.20	0.41	1.38	2.93
50-64.99%	0.28	0.55	0.25	0.54	1.23	2.85
≥65%	0.11	0.68	0.26	0.69	2.14	3.88
Total	**1.60**	**2.30**	**0.86**	**1.97**	**7.69**	**14.42**

Hillslope gradient is an important factor when studying slope stability and erosion potential. Erodibility of soils, the competence of underlying geology, and anthropogenic influences may be consistent throughout a portion of a particular subwatershed. However, the erosion potential will be greater in areas where hillslope gradients exceed 65%. In addition, saturated soil conditions, episodic ground shaking events (earthquakes), and forest fire affect slopes with steeper gradients resulting and result in more likelihood of failure. Refer to *Section 4* for additional discussion of slope gradients influence in upslope erosion and sediment delivery.

2.5 Infrastructure and natural resources



Figure 2.3. View of a typical upper slope native, unsurfaced road found within SJC Watershed with insloped road shapes and concentrated runoff.

2.5.1 Road Networks

The majority of road networks within SJC watershed exist on MPRPD, SLC, and BSLT properties within Animas Creek, Seneca Creek, and Williams Canyon subwatersheds as well as along upper and lower SJC main stem. Over 86 miles of road have been constructed throughout SJC for an average road density of 6 mi/mi^2 of watershed area (Table 2.7). The majority of roads within SJC watershed were originally constructed for the purposes of commercial logging and ranching. Other than the approximately 5 mi of paved roads found within the private landholdings located in the upper SJC watershed, the majority of the roads are native and unsurfaced (Figure 2.3 and Figure 2.4). As the State, MPRPD, BSLT, and SLC purchased land and began undertaking the major hurdle of conservation and protection of the watershed's resources, they in turn inherited the serious erosion problems associated with the existing network of poorly constructed, poorly maintained legacy roads that were eroding and delivering sediment directly into SJC and its' tributaries.

The majority of the SJC roads lie within the 10,000 acre Palo Corona Regional Park (Palo Corona). Vehicle access to many of these roads are limited to MPRPD and partnering agency staff. The public can be granted access via permits authorized by MPRPD, with use restricted to foot traffic only. In addition, cattle grazing is permitted throughout Palo Corona between February and June.

2.5.1.1 Animas Creek Road Network

The road density within the Animas Creek subwatershed is 8.53 mi/mi^2, the greatest density of any subwatershed (Table 2.7). Of the nearly 14 mi of road, most consist of native, unsurfaced, and low-use roads. Ownership is dominated to the west by BSLT and MPRPD and to the east by a very large private landholding. Motorized travel along the road network is primarily utilized by BSLT and MPRPD staff to access SJC tributaries and Palo Corona property for maintenance, conservation, protection, and research. In addition, foot traffic along these roads is granted to the public via access permits obtained from MPRPD and cattle can be seen along roads as they graze these lands February to June.



Figure 2.4. View of a typical upper slope native, unsurfaced road found within SJC Watershed with insloped road shapes and concentrated runoff.

Table 2.7. Road/trail Network of San Jose Creek by Subwatershed, San Jose Creek Study, Monterey County, California.

Subwatershed	Estimated length of road/trail (mi)	% total	Road density[a] (mi/mi²)
Animas Creek	13.65	16%	8.53
Seneca Creek	17.49	20%	7.60
Van Winkley Canyon	4.30	5%	5.00
Williams Canyon	13.17	15%	6.69
Remaining San Jose Creek	37.84	44%	4.92
Total Road Mileage in the Watershed	**86.45**	100%	**6.00**

[a] Study area is 14.42 mi

2.5.1.2 Seneca Creek Road Network

Roads found within the Seneca Creek subwatershed represent 20% of all roads in SJC watershed (17.49 mi) and has the 2nd highest road density within the SJC watershed (Table 2.7). Roads found within the subwatershed lie almost entirely within Palo Corona and are primarily used by MPRPD and BSLT staff to access lands for maintenance, conservation, protection, and research. In addition, visitors are granted access to roads for hiking on a permitted basis only.

Roads include streamside, lower, mid, and upper slope roads. Roads exhibit varying degrees of use and maintenance. The streamside road segments in the subwatershed cross the main stem

of Seneca Creek several times. Although the majority of the main stem crossings are fords ("wet" crossings) and do not contain road fill; several culverts remain, which require continued maintenance (Figure 2.5).



Figure 2.5. View of a native, unsurfaced streamside road found within Seneca Creek Subwatershed. Photo depicts road crossing Seneca Creek main stem at inventoried instream site #29 (Map 5).

2.5.1.3 Van Winkley Canyon Road Network

Van Winkley Canyon subwatershed has the fewest road mileage within the of SJC watershed at only 4.3 mi (Table 2.7). Primarily located along the upper slopes of the subwatershed along the ridgelines separating Van Winkley Canyon from Seneca Creek and Williams Canyon, these roads lie within Palo Corona and are infrequently used by motorized vehicles and receive primarily foot traffic only.

2.5.1.4 Williams Canyon Subwatershed Road Network

Approximately 85% of Williams Creek is encompassed by Mitteldorf Preserve, owned and managed by BSLT. Nearly 95% of all roads/trails (12.42 mi) located in the watershed fall within the Preserve, with the exception of approximately 0.75 mi located in the lower extent of the watershed on SLC property. Roads include streamside, lower, mid, and upper slope roads (Figure 2.6). Roads exhibit varying degrees of use and maintenance. All roads are unsurfaced and utilized primarily by BSLT and SLC staff with granted access provided to Preserve visitors by permit only.

2.5.1.1 Remaining San Jose Creek Road Network

The remainder of the SJC watershed contains approximately 44% of all roads/trails in the watershed (Table 2.5). Roads found along the lower SJC main stem consist of a main streamside access road that is maintained and managed by the State utilized primarily by State, BSLT, and MPRPD staff to access their properties for maintenance, conservation, and research. There are several short mid and upper slope road segments that exhibit less frequent use. All roads in the

lower watershed are native and unpaved. However, many roads found within the upper SJC watershed are paved (approximately 5 mi) as they are part of the Rancho San Carlos gated community. All of the most recent (<40 years old) road building has occurred in the upper watershed within this private community.



Figure 2.6. View of a native, unsurfaced roads found within Williams Canyon Subwatershed. Left photo depicts a lower-streamside road and the right photo depicts a mid slope road. Both roads are located on BSLT property.

2.5.2 Williams Canyon Infrastructure

Other than the road and trail network discussed in *Section 2.4.1.5*, there exists a residential lodge, a bunkhouse and barn within the Mitteldorf Preserve located in the Williams Canyon subwatershed. BSLT has future plans to update this infrastructure so it may be utilized to host nature camps and outdoor education and research programs.

2.5.2.1 Santa Lucia Conservancy and Private Land Holdings

The upper watershed and headwater of San Jose Creek are within the Santa Lucia Conservancy and private land holdings. A limited and gated paved road with driveway offshoots runs the length of the watershed. The Santa Lucia Conservancy manages the wildlands for ecosystem protection and interaction with the private land holders. Overall, SLC controls about 20,000 acres, with land-management activities conducted by a knowledgeable staff with a record of continuity. The Conservancy and its board take what may be characterized as a long-term perspective driven by conditions of approval, commitments to owners, and an endowment which makes land-management feasible. The SJC watershed occupies about 20 percent of the Conservancy, including some of its steepest and least developed areas.

2.5.2.2 California State Park Lands

The lower part of the watershed and mouth of San Jose Creek at Monastery Beach is owned by California State Parks. Monastery Beach is actively used for a wide range of day activities, often accessed from parking along Highway 1, with trails running from the road shoulder through the dunes and across the long-shore lagoon. Upstream of the highway the State Parks lands are not open to the public. There is limited access for State Parks staff to ranger residences. About 0.4 miles upstream of the Highway 1 crossing, the MPWMD operates a stream gage. Also, the MPRPD recently acquired a property (Whistler Property) just beyond the State Parks land that

is accessed via the State Parks service road. The MPRPD is currently in discussions which will lead to a plan for managing the new property.

2.6 Historic aerial photography review

PWA reviewed historical aerial photography covering portions of and/or the entire SJC watershed[4]. Sequential historic aerial imagery was reviewed to identify locations of upslope sediment sources in the watershed. Sources of digital imagery used in the review included historical aerial photographs, *Google Earth* imagery (1994-2012), and NAIP imagery (USDA, 2010 and 2012). Historical aerial photographs included the following years and views: 1949 (view of ~1mi^2 of lower watershed and mouth); 1954 (view of lower watershed, downstream from Van Winkley); 1966, 1971 (view of ~95% of watershed, missing uppermost Williams and SJC main stem); and 1985 (view of ~95% watershed, missing central sliver). *Google Earth* imagery provided views of the entire watershed from the following years: 1994, 1998, 2002, 2004, 2005, and 2007-2012. In addition, 2010 and 2012 NAIP imagery of the entire watershed was reviewed.

Due to the lack of stereographic pairs and poor resolution of historical photos, a quantitative analysis identifying the distribution and delivery estimates of upslope erosional features (i.e. landslides) was not completed. However, based on inspection of the available photographs and imagery available for review, PWA can ascertain that the largest identified upslope erosional features have been present since the earliest historical photos. These include many linear gully features associated with headward migration of 1st order streams that are underlain by Miocene sedimentary rock types on the south facing hill slopes in the middle watershed (Gullies #1-3, Map 5). It appears as if some of these gully features have enlarged and continue to develop through "subsurface piping and collapse processes" since their inception. For further discussion of these upslope sediment sources, refer to *Section 4.1.*

In general, shallow debris slide scars are concentrated on the higher elevation and steep, headwater grassland hill slopes within Williams Canyon, Van Winkley Canyon and in Seneca Creek (Figure 2.7, Map 5). The debris slides are found to occur most often within the Cretaceous granitics bedrock types (Kgdm, Kgdc, Kqds) and along hill slopes with gradients >65% (Maps 3 and 4). Very few shallow debris slides are present within the gentler-sloped Animas Creek watershed, as well as on other south facing, non-granitic hillslopes along the north side of the main-stem SJC; most of the deep-seated rotational landslides do occur in these areas of sedimentary bedrock, as discussed below.

[4] Certain years of historical photographs do not cover the entire watershed.



Figure 2.7. Upper Williams Canyon headwater hill slopes underlain by granitic bedrock displaying a high frequency of shallow debris slides.

2.7 Oblique aerial photography

As requested in the Request for Proposals, two fixed oblique photography flights were planned. The first was for initial overhead reconnaissance at the beginning of the study to plan field reconnaissance on the ground and a second after the winter of 2013, to locate any changes from storms and erosion in water year 2013.

On February 16, 2013 the first flight was performed to help identify significant upslope erosional features in the SJC watershed (Appendix A). This flight was conducted after preliminary historical photogrammetry review and study of the 2010/2012 NAIP imagery as discussed in *Section 2.5* above. Observations during the flight taken at the beginning of the study did not reveal any significant features not identified during the photogrammetry review. The second post winter aerial flight was not performed due to the lack of significant and prolonged winter rains that are necessary to trigger hill slope landslide responses. A typical photo from the fixed wing survey is shown on Figure 2.7.

Appendix A documents historic aerial photos, oblique aerial photos, and ground based photographs that show watershed conditions. The photographic appendix further illustrates the results generated through the aerial photogrammetry review.

3. HYDROLOGY AND GAGING

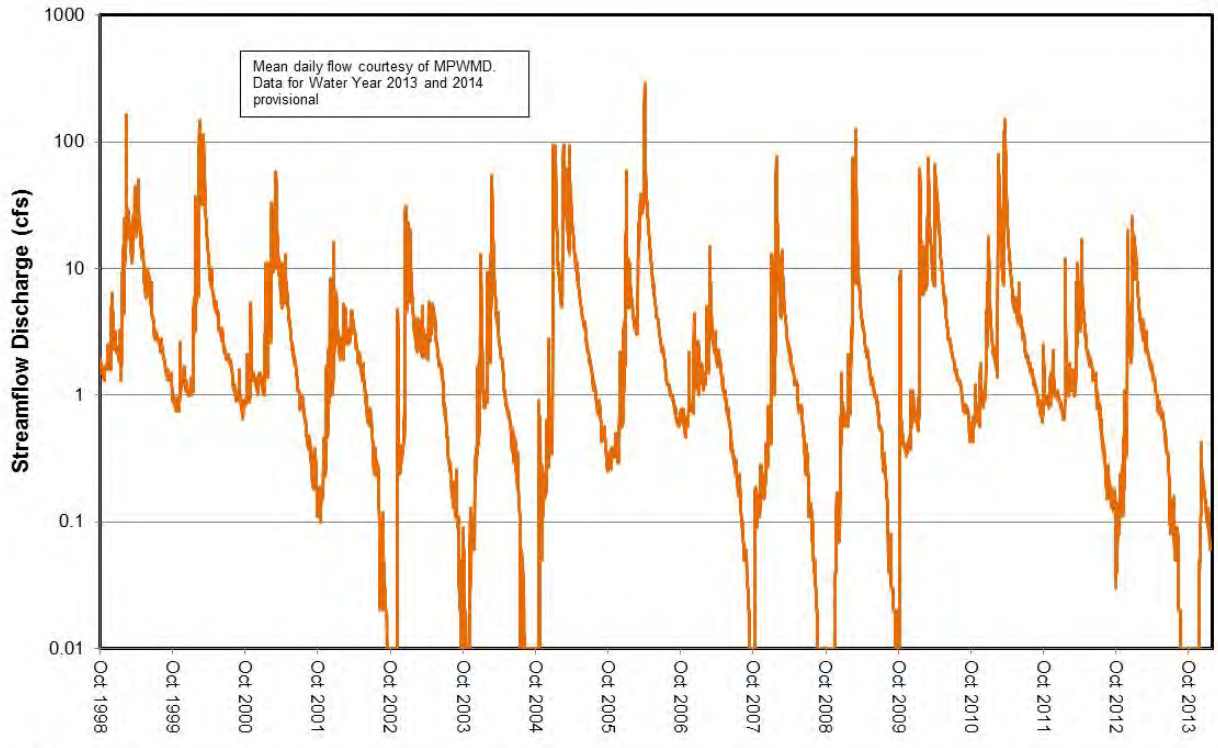
In conjunction with field investigations on sediment sources, fish barrier analysis, and lagoon geomorphology, a network of stream gages was installed and monitored for Water Year 2013 and then continued an additional 4 months through January 2014. This gaging network consisted of three temporary gaging sites, located to work in conjunction with existing gaging and previous gaging activities. In addition, storm measurements were performed throughout the watershed.

3.1 Past and current gaging within watershed

3.1.1 MPWMD gaging

Since 1999, the MPWMD has maintained a stream gage site near the mouth of San Jose Creek on California State Parks land, about 0.4 miles upstream of the Highway 1 bridge and Monastery Beach. During this watershed study, the Balance team worked closely with the MPWMD staff to share flow data and measurements at the lower gage site.

The MPWMD historic average daily flows are shown on Figure 3.1. Annual peak flows from the gaging program are shown on Table 3.1. We applied a Log Pearson Type III distribution to calculate estimated discharges for some commonly-used design intervals. Results are reported in Table 3.2. The 2-year flow is estimated at about 130 cfs and the 100-year flow is estimated at about 700 cfs, as determined from the 15 peak-flow data points (Table 3.2).



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Mean daily flow; San Jose Creek at Monterey Peninsula Water Management District (MPWMD) gage, Monterey County, California, water year 1999 to 2013.

Figure 3.1. Mean daily flow at MPWMD gage, Water Years 1999 to 2013.

Table 3.1. Annual peak flows for MPWMD gaging site near mouth of San Jose Creek. Data Courtesy of MPWMD. Water year 2013 data are provisional.

Water Year	Peak flow date	Gage height (ft)	Peak flow (cfs)
1999	2/9/1999	5.54	400
2000	2/13/2000	5.09	293
2001	3/4/2001	3.85	83
2002	12/2/2001	3.40	40
2003	12/16/2002	4.02	103
2004	2/25/2004	4.35	146
2005	3/22/2005	4.71	204
2006	4/4/2006	5.26	440
2007	2/27/2007	3.09	20
2008	1/28/2008	4.09	122
2009	3/4/2009	4.74	189
2010	1/20/2010	4.56	164
2011	3/24/2011	4.94	232
2012	4/13/2012	3.27	29
2013	12/2/2012	3.81	69

Table 3.2. Flood frequency flows based on peak flows from MPWMD gage near mouth of San Jose Creek and Log Pearson Type III distribution analysis. Source data courtesy of MPWMD.

Recurrence Interval (years)	Peak Discharge (cfs)
1.25	58
2	132
5	267
10	369
25	503
50	604
100	705
200	804

3.1.2 CSUMB gaging

CSUMB maintained two stream gages in Water Year 2011 (October 2010 to October 2011), one on the main stem of upper San Jose Creek about kilometer upstream of Van Winkley creek and the other on Williams Canyon Creek (Figure 3.2) These gages were installed to better understand watershed yield by subwatershed and to optimize conservation strategies (Paddock, 2012). Each gaging station recorded water stage at 15-minute intervals, which were converted to discharge using rating curves. These data are shown on Figure 3.3 and Figure 3.4. Peaks flows at the gages for Water Year 2011 are estimated as 15 and 25 cfs and base flows are estimated to range between 0.1 and 0.7 cfs for Williams Canyon Creek and Upper San Jose Creek, respectively.

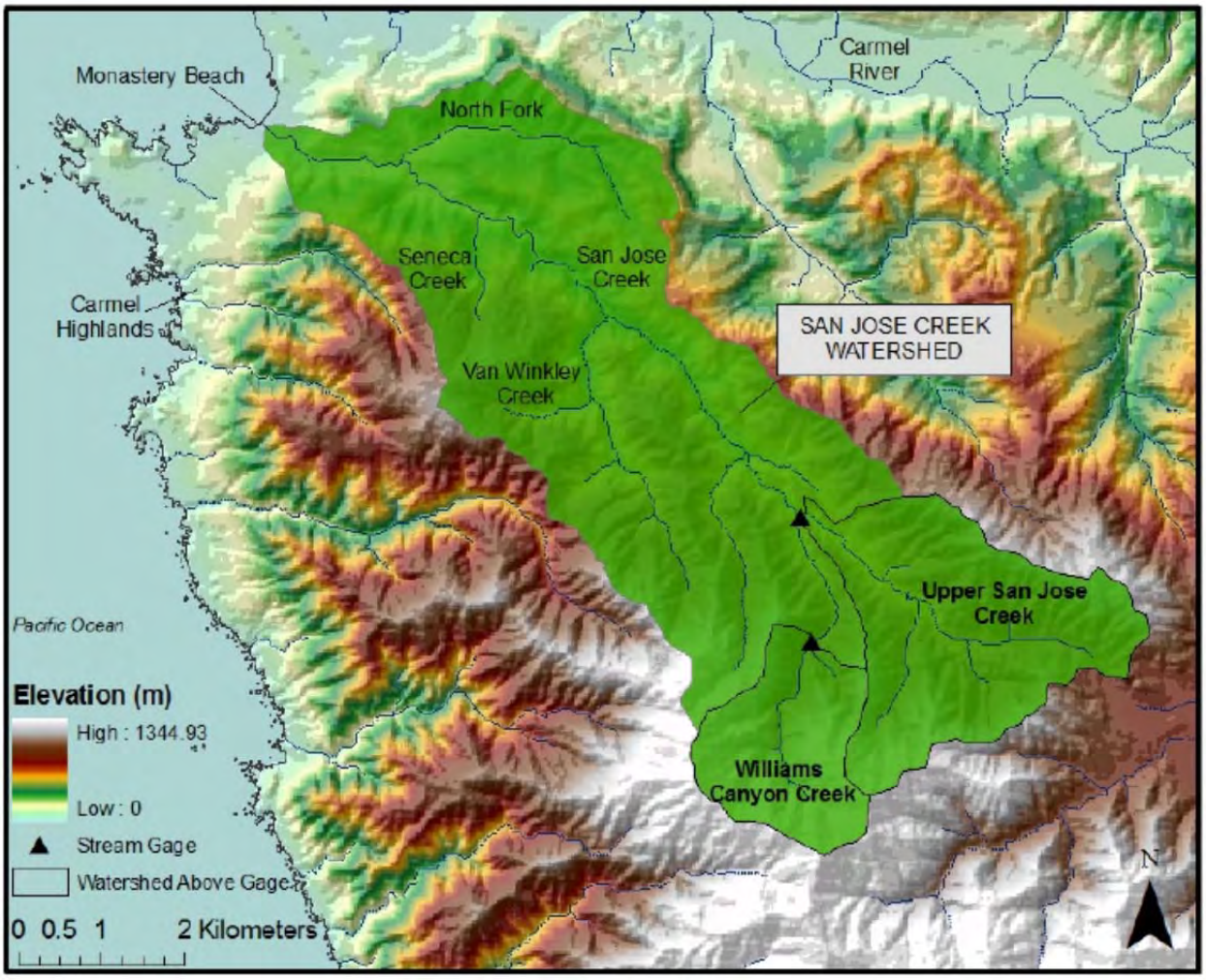


Figure 3.2. Location of CSUMB gaging sites for water year 2011, courtesy of Emily Paddock (2012).

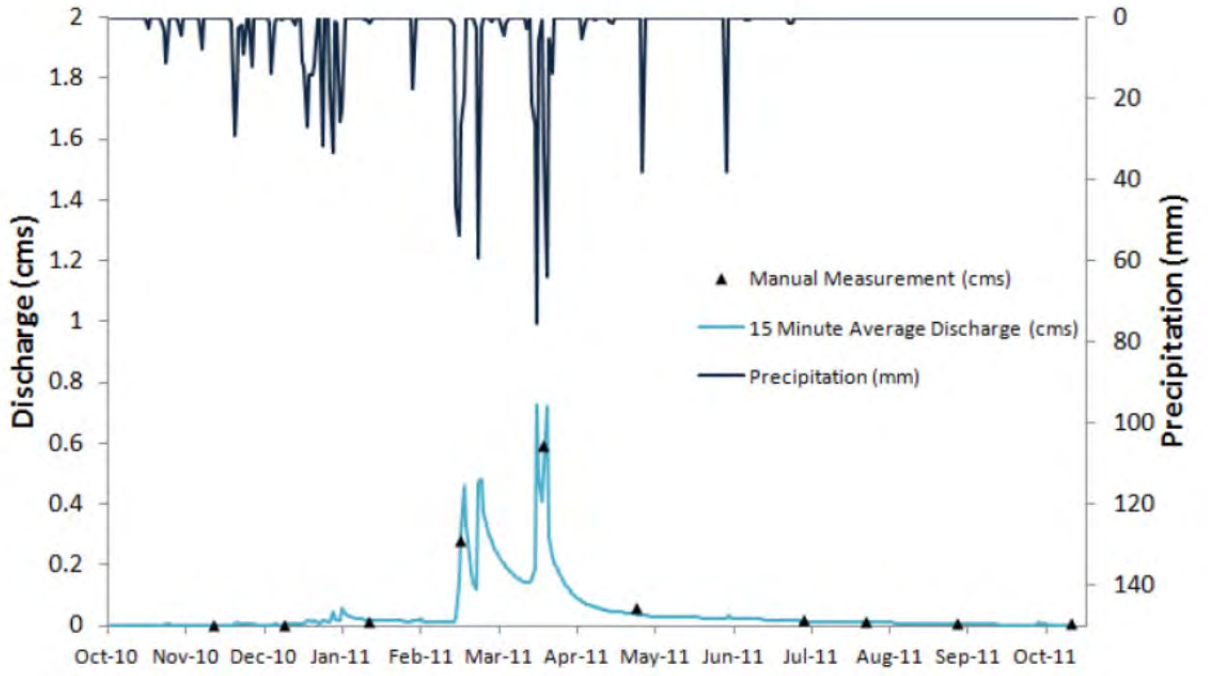


Figure 3.3. Discharge record from CSUMB for Water Year 2011 on upper San Jose Creek, based on Emily Paddock's work (2012). Note that 1 cubic meter per second (cms) is about 35.3 cfs. Rating curve is commented to be accurate up a discharge of 0.59 cms. Peak flow estimated as 25 cfs.

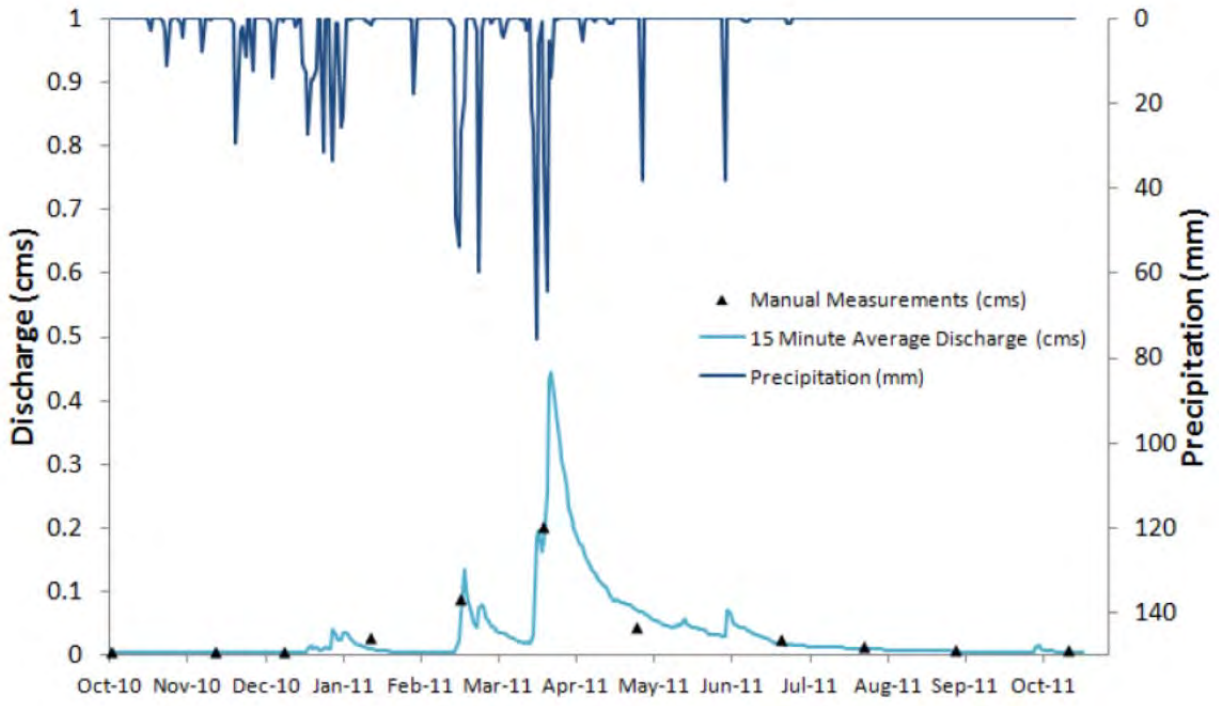


Figure 3.4. Discharge record from CSUMB for Water Year 2011 on Williams Canyon Creek, courtesy of Paddock (2012). Rating curve is commented to be accurate up a discharge of 0.2 cms (or about 14 cfs). Only one stage discharge rating curve was apparently used. Peak flow estimated as 15 cfs.

3.1.3 Other studies and gaging

Balance Hydrologics has assisted the Santa Lucia Conservancy with hydrologic services since the early 1990s, which also includes flow and sediment measurements at the v-notch weir site, about 1 kilometer downstream of the CSUMB upper San Jose Creek gage site (Map 5). Flow measurements from the Balance Hydrologics studies are plotted on Figure 3.5. Base flow at the V-notch site was noted to range from 0.03 to 0.78 cfs (13 to 193 gpm) between 1990 and 1998. For comparison, the base flow from the temporary gage during this study at the v-notch site, ranged from 0.01 to 1.0 cfs, starting in April 2013. See section 3.2 below for more information on the temporary gage.

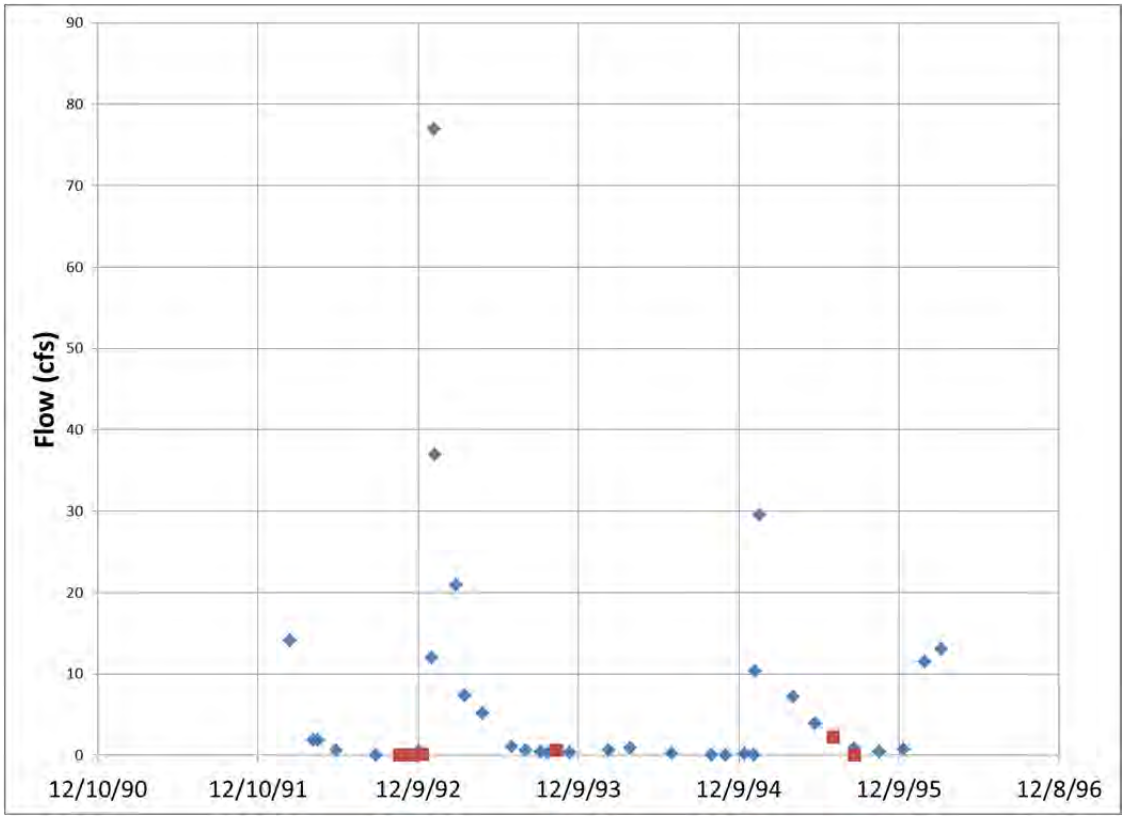


Figure 3.5. Past flow measurements at v-notch weir on San Jose Creek by Balance Hydrologics (Rancho San Carlos, 1994).

3.2 Temporary extended stream gaging and rain gage network

Three temporary gages were installed and maintained for this watershed study. The locations of these gages were strategic to coordinate with field work, sample sediment transport rates, align with gaging from past studies, and expand data collection to areas previously unstudied. For each location depth sensors were installed. Streamflow and sediment-transport rates were measured to develop rating curves, then applied to each day's measured flow depths, as is done to complete a flow record through water year 2013. Locations of these gaging sites are shown on Map 5.

In addition, to provide stronger findings on storm response to precipitation, two temporary rain gages were installed in the San Jose Creek watershed to describe local orographic and other

regional differences in precipitation within the watershed. Data from these gages would then be related to the gaged flows.

3.2.1 San Jose Creek at V-notch weir downstream of Van Winkley Creek

With permission from the Santa Lucia Conservancy, Balance installed several gages near the former gaging site, just upstream of an abandoned concrete v-notch weir in the main stem of San Jose Creek[5] (Map 5 and Appendix B). The gaging instrumentation included:

(a) a pressure –depth sensor at the V-notch weir,[6]

(b) an open channel flow station placed upstream to measure high flows

(c) a non-recording station where periodic measurements could be on an unnamed north-bank tributary approximately 200 feet upstream, and

(d) a non-recording station where periodic measurements could be made on San Jose Creek just upstream of the unnamed north-bank tributary.

Flows in Van Winkley Creek could be estimated by the difference between the upstream and downstream measurements. We arranged this approach as we could not find a good place to establish a temporary stream gage on lower Van Winkley, where much of the flow in the lower portions of this tributary goes through dense root masses or through subsurface channels.

Specific conductance (an index of dissolved solids in a stream) and concurrent water temperature were measured each time that we visited the individual gaging sites in this complex.

Each of the two recording stations was equipped with a second transducer to record water level, to provide redundancy and backup in case one was to fail. The open-channel flow gage provided better measurement conditions for higher flows (exceeding 50 cfs), and would have proved functional if the V-notch weir were to be obstructed by wood or sediment, as it had been during Balance's prior work at this gage in 1990-1995. Also, the upstream open channel flow station provided a location for measuring bedload and suspended sediment. Site visits to this station included monthly visits for maintenance and storm visits for flow and sediment transport calibration points.

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[5] On Sept. 29, 1990 – during the fourth consecutive dry year-- Mr. Hecht walked San Jose Creek from upstream of the Williams confluence to the western boundary of Rancho San Carlos. He found the most baseflow a short distance upstream of the V-notch weir. Since one of this study's objectives was to measure baseflow, we decided to reoccupy this gage, where flow could best be measured.

[6] The V-notch weir was installed in the early 1980s by CDM Engineers, which had planned to measure flow using the same weir equation from measured depth of flow using a transponder positioned about 6 feet above the water level. This proved unworkable, as the weir pool was immediately filled with sediment. Three other weir/transponder stations were constructed on the other main streams of Rancho San Carlos, which sought a water supply for a proposed community of about 3200 homes once envisioned.

As it happened, essential no high flows occurred during the gaging period, so the V-notch weir (with its high precision for measurement) became our primary gage at this site. Stage measurements from the level logger, located in the pool upstream of the V-notch were measured to establish depth of flow above the low point in the v-notch, from which we computed depth using a standard v-notch weir equation. to determine stream flow.

The redundancy of the two set ups provides a more secure data collection, if one setup was compromised by stream conditions or instrument malfunctions.

3.2.2 Seneca Creek just upstream of confluence with San Jose Creek

To evaluate flows on Seneca Creek and expand on previous gaging efforts, a station was installed near the mouth of Seneca Creek (Map 5 and Appendix B). The installation included a level logger placed in a somewhat rectangular cross section, bounded by root-bound stream banks. The gage was installed on MPRPD land. Visits to gage included storm measurements and monthly visits to maintain calibration and check on the status of the sensor.

3.2.3 Water level sensor and flow at mouth of San Jose Creek

A third gaging set up was placed about 30 feet downstream of the Highway 1 bridge in the San Jose Creek Lagoon (Map 1 and Appendix B). The objective was to monitor water levels in the lagoon, to help bracket its role in shaping steelhead populations in San Jose Creek. This was one of MPRPD's study objectives. This sensor also was designated to monitor flow conditions in San Jose Creek as it enters the lagoon. The instrumentation for this station was a perforated PVC pipe with a level logger, a staff plate and a fence post placed into a sand bed and concealed amongst wetland vegetation. The staff plate and station was surveyed in during the lagoon cross sections and profile.

3.2.4 Rain gages

Two rain gages were deployed for the term of the study, located as shown on Map 5. One gage was installed on a fence line at the east end of the old Palo Corona Ranch near Rancho San Carlos Road, on the ridge line, north of San Jose Creek about midway through the watershed. The second rain gage was installed on the ridge on the south side of the watershed in the Palo Corona ranch area. The locations of these gages were based on geographic data gaps from other gages, access, and hydrologic diversity to assess rainfall trends in the watershed as a whole.

The rain gages were Onset rain gages (screened canisters), with event based Hobo data loggers attached to tipping buckets. Dates and times for each tip of the bucket were logged and clustered by bucket tips per hour. Locations for the gages were areas clear of trees and on fence posts above the ground, within or on structures to be secure from curious or itchy cattle.

Will discuss CDFG memo in Appendix D from CDFG. Water year 1961 was 3rd dry year in a row

3.3 Results

3.3.1 Precipitation

Total rainfall for the last water year at the temporary rain gages was 8.54 inches and 16.21 inches on Santa Lucia Preserve and Palo Corona ridge, respectively. The distributions of rainfall through the year are shown on Figure 3.6. This last year and beginning of water year 2014 has been critically dry.

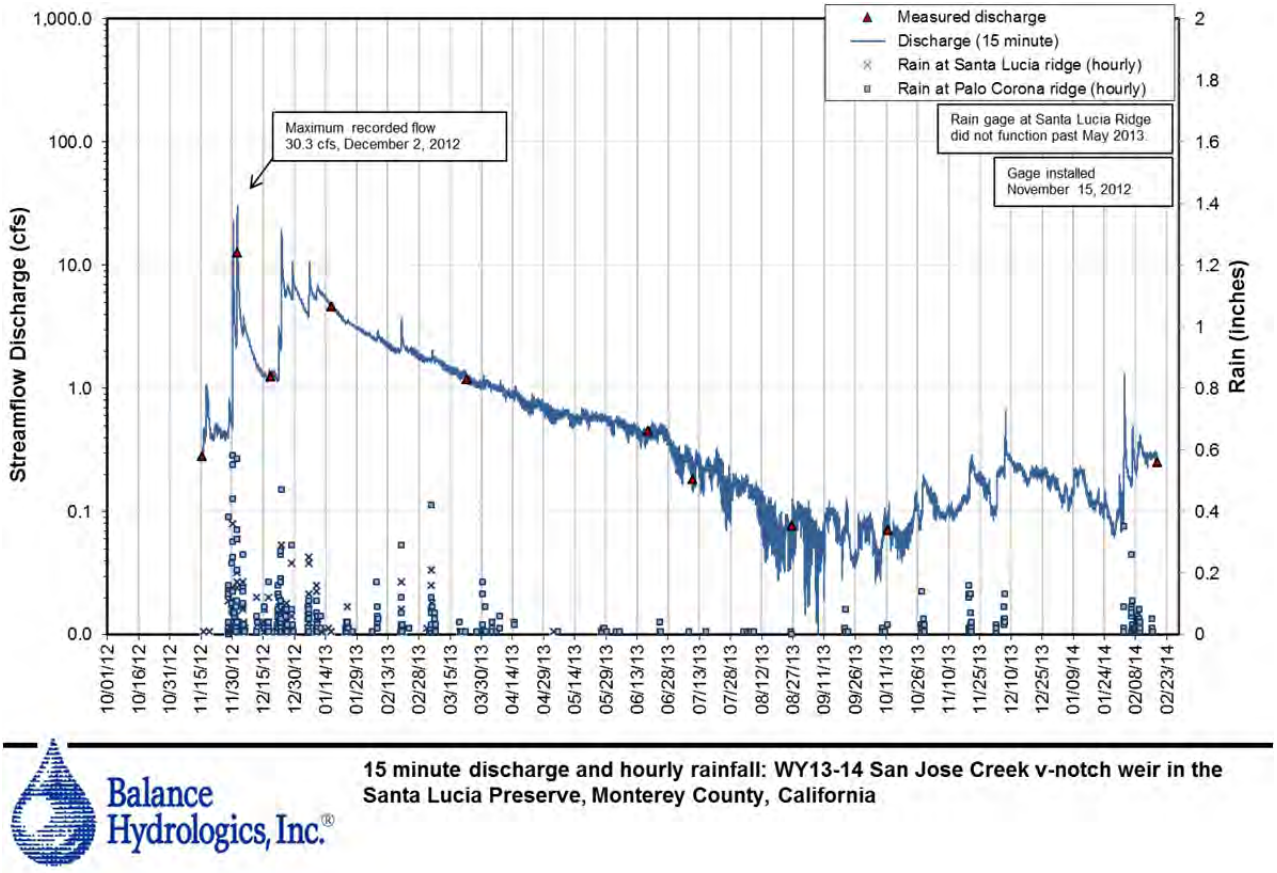
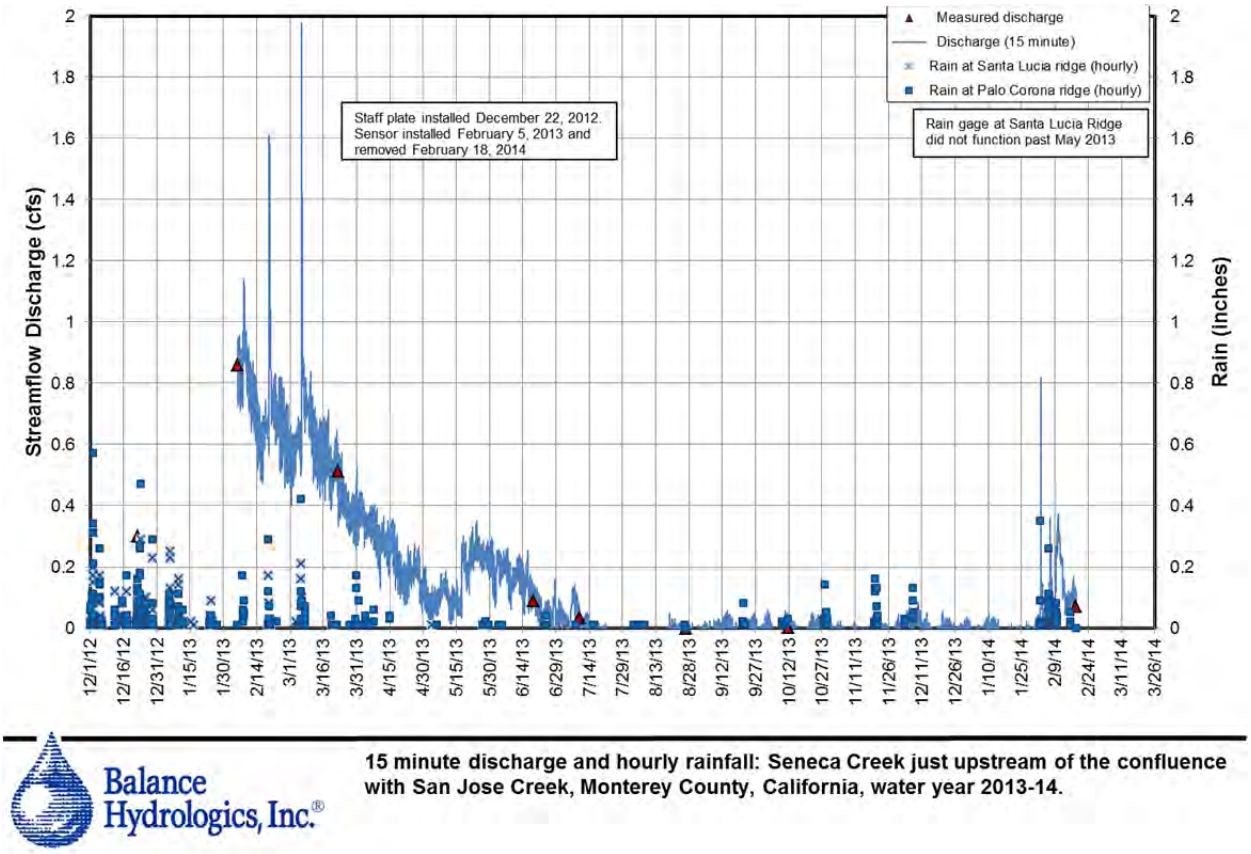


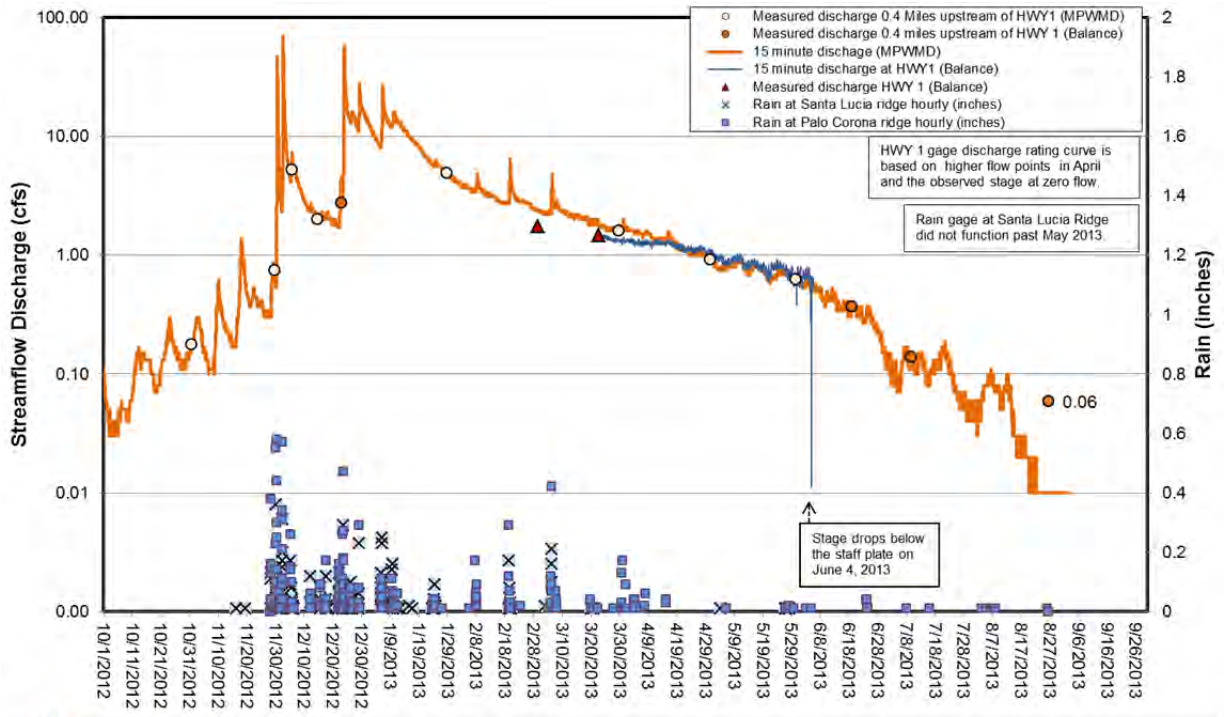
Figure 3.6. Gaged flow at V-notch weir on San Jose Creek, and precipitation at two nearby rain gages installed for this study during WY2013 and the first four months of WY2014.



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15 minute discharge and hourly rainfall: Seneca Creek just upstream of the confluence with San Jose Creek, Monterey County, California, water year 2013-14.

Figure 3.7. Gaged flow and precipitation on Seneca Creek for Water Year 2013



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15 minute discharge and rainfall; San Jose Creek at Highway 1 (Balance) and 0.4 miles upstream at the Monterey Peninsula Water Management District (MPWMD) gage, Monterey County, California, water year 2013-14.

Figure 3.8. Gaged flow and precipitation on San Jose Creek at Highway 1 for Water Year 2013

3.3.2 Storm flows

Discharge records for San Jose Creek and Seneca Creek are shown on Figure 3.6, Figure 3.7, and Figure 3.8. Precipitation records are also plotted on these charts for reference, as well as measured discharges.

The most significant storms occurred during water year 2013. The first was on 12/2/12 and the second was on 12/23/12. Smaller storms occurred in March 2013, but were not significant in terms of generating runoff or peak flows. For the two main storms in December 2012, at the V-notch gaging station, these peak flows were estimated as 30.3 cfs and 19.5 cfs, for December 2 and 23, respectively. Corresponding peaks at the MPWMD station were 69 cfs and 57 cfs for December 2 and 23, respectively. Lag times between the peak flows from the V-notch to the MPWMD site were 1.75 hours for December 2 and 2.25 hours on December 23. Suspended load and bedload samples were taken during these storms.

3.3.3 Base flow

Because this last water year was very dry, the base flow dropped to very low levels and at an earlier time frame. Seneca Creek ranged from 0.3 cfs to 0.1 cfs from April to June, effectively drying out by July. Flow at the V-notch dropped from about 1 cfs to 0.1 cfs from April to August. During the summer flows at the V-notch varied from 0.03 to 0.08 cfs, rising up slightly in the fall, presumably due to reduced uptake (evapotranspiration). At the lagoon, water level records indicate the mouth of San Jose Creek went dry around June 4, 2013, corresponding to a flow of about 0.5 cfs at the MPWMD State Park gage.

3.4 Key findings from the gaging effort

- Water year 2012 was dry, estimated as 66% of mean rainfall at San Clemente Dam (14.0 inches versus 21.3 inches) and water year 2013 was even drier at about 40% of mean precipitation (8 inches, estimated, versus 21.3 inches). These data are based on rainfall records dating to 1922. Water year 2014 is also looking to be critically dry to date.
- During the storms of water 2013 limited bedload movement was observed.
- Based on observations from the initial storms, it appears an initial seasonal pulse of fine sediment is flushed through the system. The ultimate disposition of this fine sediment is indeterminate, but is possibly in-channel or flushed out to sea.
- A small unnamed tributary opposite and just upstream of Van Winkley Creek is visibly incising; it produces significant flow and high sediment concentrations, as observed during storm monitoring.
- As base flow recedes in the lower reach, it eventually sinks into the sandy stream bed, leaving the stream bed dry by the Highway 1 crossing.

4. SEDIMENT ANALYSIS

4.1 Upland sources

4.1.1 Road/trail networks - Overview

Sediment delivery to stream channels from roads, trails, and road/trail networks has been extensively documented, and is recognized as a significant impediment to watershed health and salmonid habitat (Furniss et al., 1991; Higgins et al., 1992; Harr and Nichols, 1993; Flosi et al., 1998; NMFS, 2000, 2001). Road/trail related sources of sediment include both *episodic site specific* and *chronic erosional processes*. Common site-specific sources of road-related sediment production can be, but are not limited to: stream crossings, landslides, point source springs, ditch relief culverts, and sites of downslope concentrated flow (i.e. gullies). Chronic sediment sources are primarily associated with "hydrologically[7] connected road segments" including the road bed, cutbank and inboard ditch (i.e. road surface sites). All road-related erosion, whether from an episodic or chronic sediment source, is man-caused and is deemed controllable, accelerated sediment production in a watershed.

A *stream crossing* is a ford or structure on a road or trail (such as a culverted road prism or bridge) installed across a stream or watercourse (USDA Forest Service, 2000). When they erode, sediment delivery from stream crossings is always assumed to be 100%, because any sediment eroded is delivered directly to the stream. The size of the stream affects the rate of sediment movement, but any sediment delivered to small lower order or ephemeral streams has the potential to be transported to downstream fish-bearing stream channels.

Large volumes of erosion may occur at stream crossings where culverts are too small for the drainage area and storm flows exceed culvert capacity, or when culverts become plugged by sediment and debris. In these instances, flood runoff will spill onto or across the road or trail, eroding the road fill. Alternately, the stream crossing may have a diversion potential, which means that streamflow is diverted down the road or trail, either on the running surface or in the ditch, instead of spilling over the fill and back into the same stream channel. In this case, the roadbed/trailbed, hillslope, and/or stream channel that receives the diverted flow may become deeply gullied or destabilized. These hillslope gullies can become quite large and have the potential to deliver large quantities of sediment to stream channels (Hagans et al., 1986). Diverted streamflows that discharge onto steep, unstable slopes can also trigger large hillslope landslides.

According to the California Forest Practice Rules (CalFire, 2013), stream-crossing culverts must be able to convey a 100-year storm flow[8] as well as sediment and organic debris in transport during high flows to be considered adequately sized (Weaver et al., 2006). Undersized culverts do not have the capacity to convey streamflow during periods of heavy rainfall, and are more

[7] *Hydrologically connected* describes sites or road segments from which eroding sediment is delivered to stream channels (Furniss et al., 2000).
[8] A *100-year flow* is the discharge that can be expected to occur, on average, once every 100 years.

likely to become plugged by sediment and debris. Many stream crossing culverts in the SJC watershed are substandard, i.e., are not large enough to convey a 100-year flow, or are installed at too low a gradient through the stream crossing fill to prevent plugging. Improper culvert installations such as these were once common because they required shorter lengths of pipe to convey flow through the road, and were therefore used to cut costs. However, in the long run these cost-cutting measures prove detrimental to erosion control and maintenance costs because the culvert discharges water onto unconsolidated road fill, rather than into the pre-existing stream channel, which exacerbates erosion of the outboard, downstream fill face.

Road-related *landslides* are masses of road fill (and in some cases additional hillslope material) with the potential to fail during heavy and/or prolonged rainfall events. Sediment delivery as a result of road related landslides are the easiest to correct or prevent, generally requiring excavating the unstable road fill and sidecast material and redepositing it in a stable, permanent location. However, deep-seated landslides are typically more problematic, and usually technically infeasible to treat. Refer to *Section 4.1.2 Hillslope landslides and gullies* for discussion of non-road related landslides.

Point-source springs are erosion sites where spring flow shows potential to produce and deliver road-related erosion. Flow from multiple springs may become concentrated where there are inadequate drainage structures on a road, which can lead to the formation of downslope gullies or fillslope failures. *Ditch relief culverts* (DRCs) are drainage structures that move water from a road or trail inboard ditch to areas beyond the outer edge of the road or trail fill. This results in flow from the inboard ditch, which may include both runoff from the running surface and shallow subsurface flow intercepted by the cutbank, being drained onto slopes below the road or trail (Pacific Watershed Associates, 1994). When properly spaced, DRCs limit the quantity of water available to cause erosion at any single location, allowing flow to disperse and therefore reduce the likelihood of gullies forming at their outlets. *Downslope concentrated flow* refers to sites of focused runoff channeled from road surfaces and other upslope areas during periods of intense rainfall. *Gullies* often form at the point where the concentrated flow exits the road or trail surface. *Refer to Section 4.1.2 Hillslope landslides and gullies* for discussion of non-road related gullies.

Road surface sites are segments of hydrologically connected road or trail with chronic[9], accumulated runoff and uncontrolled flow from long sections of undrained road surface and/or inboard ditch. By definition, road surface sites are not associated with other sediment delivery sites, but rather are individual locations in which accumulated road drainage is the sole source of erosion and sediment delivery. (Segments of hydrologically connected road that are directly adjacent to other delivery sites are categorized separately, as *chronic* sources and discussed below). Sediment discharge at road surface sites typically occurs at low spots in the road where concentrated flow exits the road and travels downslope, often forming gullies.

Chronic sources of road related sediment include the unpaved road surfaces and their associated ditches and cutbanks. The chronic production and delivery of fine sediment to stream channels is the result of: (1) mechanical pulverizing and wearing down of road or trail surface by vehicular, equestrian, bicycle and foot traffic; (2) erosion of unpaved road or trail surfaces by

[9] Erosion from road or trail surfaces and cutbanks occurs on an ongoing basis, and hence is referred to as *chronic*.

raindrop impact and runoff during periods of wet weather; (3) erosion of the inboard ditch by runoff during wet weather; and 4) erosion of the cutbank by dry ravel, rainfall, slope failures, and brushing/grading practices.

4.1.2 Road/trail networks – Previous watershed assessments

Several road assessments have been conducted in recent decades within the SJC watershed. Two of the most recent, comprehensive investigations were conducted by PWA in 2007 and by California Geological Society (CGS) in 2009. Of the approximately 86.45 miles of road/trail identified in the SJC watershed, approximately 47.25 mi or 55% have been inventoried (Table 4.1). Of the 47.25 mi, 34.83 mi have been evaluated based on key structural, hydrological, sedimentological, and environmental characteristics and ranked based on their need for attention (CGS, 2010), and 12.42 mi were evaluated by a quantitative assessment utilizing approved California Department Fish and Wildlife (CDFW) Salmonid Stream Habitat Restoration Manual Chapters IX and X protocols (PWA, 2007). In addition, for the purposes of this study, the Project Team conducted a reconnaissance level evaluation along approximately XX??? miles of the roads within the watershed.

Table 4.1. Evaluated road/trail Network of San Jose Creek by Subwatershed, San Jose Creek Study, Monterey County, California.

Subwatershed	Total Estimated length of road (mi)	Inventoried road length (mi) [a]	% total
Animas Creek	13.65	3.82	28%
Seneca Creek	17.49	17.23	99%
Van Winkley Canyon	4.30	3.85	90%
Williams Canyon	13.17	12.42	94%
Remaining San Jose Creek	37.84	9.93	26%
Total Road Mileage in the Watershed	**86.45**	**47.25**	**55%**

[a] Inventoried roads within Williams Canyon were assessed to identify sources of sediment delivery and quantify future erosion volumes (PWA, 2007). Inventoried roads within the remaining subwatersheds were evaluated and ranked based on need of attention (CGS, 2010). Many of the roads throughout the watershed downstream from the mouth of Williams Canyon were observed by the Project Team during the field reconnaissance (Balance/PWA, 2012-2014).

In 2007, PWA conducted a road related sediment source assessment in the Mitteldorf Preserve, owned and managed by BSLT (PWA, 2007). Mitteldorf Preserve encompasses about 85% of the Williams Creek watershed. Results of PWA's investigations revealed accelerated erosion and sediment delivery has been caused by anthropogenic practices, including logging and rural road construction. PWA field crews inventoried approximately 12.42 mi of roads/trails in the Preserve to evaluate all road/trail-related erosion sites and their potential for delivering sediment to the local stream system. PWA identified 48 sites and 3.78 miles of hydrologically

connected road lengths recommended for treatment[10]. If left untreated, approximately 5,585 yd^3 of sediment was estimated to be delivered from these erosion sites and road surfaces to the stream system over the next decade. The assessment determined that approximately 36% of the roads/trails were hydrologically connected. Of the 48 road/trail related sites, 72% were stream crossings, 10% were landslides, and 18% were "other" sites[11]. Of the approximately 5,585 yd^3 of estimated future sediment delivery from sites recommended for treatment, 66% was attributed to hydrologically connected road surfaces, 29% was attributed to stream crossings, 4% to landslides, and less than 1% to "other" sites (Table 4.2) (PWA, 2007).

Table 4.2. Estimated volume of future sediment delivery for sites and road surfaces assessed within Williams Canyon Subwatershed, San Jose Creek Watershed Study, Monterey County, California[a].

Sediment sources	Estimated future sediment delivery (yd^3)	Percent of total
Stream crossings	1,646	29%
Landslides	235	4%
"Other" sites[b]	13	1%
Hydrologically connected road and cutbank surfaces adjacent to other sediment delivery sites[c]	3,691	66%
Total	**5,585**	**100%**

[a] Data was taken from the Williams Creek Watershed Erosion Prevention Planning Project, Monterey County, California (PWA, 2007) and only includes sites and road surfaces recommended for treatment.
[b] *Other sites* include ditch relief culverts, point source springs, sites of concentrated downslope flow (including gullies), and hydrologically connected road or trail segments not adjacent to other sediment delivery sites ("road-surface sites").
[c] Decadal sediment delivery for unsurfaced roads, assuming a 25 ft wide road surface and cutbank contributing area, and 0.2 ft lowering of road and cutbank surfaces per decade.

As part of the 2007 assessment, PWA assigned treatment priority ratings to sites or groups of sites based on the combined evaluation of 4 criteria that consider different aspects of remediating erosion problems. Higher priority ratings apply when erosion potential, sediment delivery, treatment immediacy, and cost effectiveness are all moderate or high, with lower priority ratings correspondingly based on lower ratings for the combination of these criteria.

Of the 48 sites, 6 (12%) were rated higher priority, 23 (48%) moderate priority, and 19 (40%) low priority.

[10] The discrepancies in reported mileage is due to minor adjustments made to the roads/trails GIS layer between the 2007 assessment report and 2010 implementation.
[11] *Other sites* include ditch relief culverts, point source springs, sites of concentrated downslope flow (including gullies), and hydrologically connected road or trail segments not adjacent to other sediment delivery sites ("road surface sites").

In 2009-2010, the California Geological Survey (CGS) evaluated 42 miles of road within the Palo Corona Regional Park (CGS, 2010). Of the 42 miles of road, nearly 35 miles were located within SJC watershed. Although primarily a GIS analysis project, approximately 14 miles were assessed on the ground. The purpose of the CGS study was to evaluate the roads based on key structural, hydrological, sedimentological, and environmental characteristics and then rank them based on their need for rehabilitation. Roads were evaluated for 58 criteria and hydraulic features (i.e. water bar, x-drain culvert, and ditch lead out) were evaluated for 80 criteria (CGS, 2010). Based on this evaluation, entire road segments were then ranked according to treatment priority (green = low priority, yellow = moderate priority, and red = needs attention).

According to the assessment, 134 road segments and 278 hydrologic features were identified. Of the 42 miles evaluated, 2 (5%) were rated higher priority (red), 15 (36%) moderate priority (yellow), and 25 (59%) were categorized low priority (green). Of the 147 stream crossings identified in the assessment, 71 (48%) were rated higher priority (red), 62 (42%) moderate priority (yellow), and 14 (10%) were categorized low priority (green)[12].



Figure 4.1. View of undersized culverted stream crossing along Seneca Creek.



Figure 4.9. View of hydrologically connected road reach with no permanent drainage structures installed to disperse road runoff. Note ruts forming along outboard edge of road.

Based on the reported results of both road assessments, erosional and sedimentological issues resulting from the decline of these "legacy" roads were identified and the importance of treating them to reduce the continued sediment delivery to SJC streams and overall impact to the health of the watershed was emphasized. Both assessments identified stream crossing sites as the single largest road related problem that directly deliver sediment to streams in the SJC watershed (Figure 4.1). The CGS assessment identified approximately 4 stream crossings per mile of road; PWA assessment identified approximately 3.5 crossings per mile.

[12] Some road segments weave in and out of the watershed boundary. Therefore, for ease of discussion and as to not misrepresent CGS data, results are reported to include all evaluated roads (including the approximately 7 miles located outside the SJC watershed boundary).

In addition, both assessments identified hydrologic connectivity as a major problem in contributing sediment noting that the lack of permanent road drainage features (such as rolling dips, DRCs, roadshaping) or improper spacing of these features exacerbates road surface erosion and results in increased sediment delivery to SJC tributaries (Figure 4.9).

4.1.3 Road/trail networks – Future sediment delivery estimates

Based on recommendations provided in previous road assessments, erosion control and sediment prevention treatments have been implemented by property owners and land managers throughout the watershed. These treatments have effectively reduced anticipated future sediment delivery volumes to the SJC watershed, however, additional work is needed to protect aquatic habitat from anthropogenic sediment sources.

Based on PWA's 2007 assessment in Williams Canyon, BSLT secured funding from CDFW in 2009 to implement sediment reduction treatments along 8.1 mi of assessed road within Williams Canyon. This work, completed in 2010, substantially diminished the delivery of coarse and fine sediment to Williams Creek by preventing approximately 6,030 yd^3 from episodic and chronic sources of erosion[13]. Anecdotal observations have revealed that the waters entering SJC main stem from Williams Canyon are noticeably clearer since the roads were treated in 2010 and therefore are assumed to be transporting much less sediment.

During the 2012-2013 field reconnaissance, additional implemented treatments addressing road-related erosion were identified along road segments within Seneca Creek and the remaining SJC. Unfortunately, there is no quantifiable documentation on how much sediment can be estimated and prevented from entering the system resulting from these implemented treatments. However, if we assume that these treatments are effective, we can make a conservative estimate that approximately 2 mi and 7 mi have been treated within Seneca and remaining SJC, respectively, and exclude those segments from any extrapolations to estimate future sediment delivery volumes.

Utilizing the quantitative data from PWA's 2007 Williams Canyon assessment; site density reported from both the 2007 and 2010 evaluations; observations from the 2012-2013 field reconnaissance; and a GIS analysis of geology, hillslope gradient, road location, and road density, we have developed a very conservative rough estimate of potential future sediment delivery volumes resulting from untreated road related sources from unpaved roads within the SJC watershed. The following lists the assumptions that were used to achieve the very conservative future sediment delivery estimates listed in Table 4.3:

- 3 stream crossing sites per mile of road
- 30 yd^3 of future erosion per stream crossing site
- 25% hydrologic connectivity[14]
- 20 ft wide contributing area (includes road, ditch, and cutbank)
- 0.15 ft road lowering rate per decade[15]

[13] Data taken from PWA Report No. 11085701 (PWA, 2010)

[14] Based on the ~35% hydrologic connectivity of assessed road mileage in Williams Canyon we adjust to 25% for a more conservative extrapolation to other subwatersheds, which on average are not as steep

- Estimated volumes are reported over 30 years for episodic sources 10 years for chronic

There are exceptions to the above list of assumptions; these exceptions include the following:

- 2 mi of road within Seneca Creek: mileage is assumed to have been treated as identified during the 2012-2013 field reconnaissance (refer to footnote "e" in Table 4.3)
- 6,030 yd^3 of sediment delivery to Williams Canyon: volume was prevented as a result of treating 8.1 mi of road in 2010 (refer to footnote "f" in Table 4.3)
- Remaining untreated 5.07 mi within Williams Canyon: a different set of assumptions was used for calculating sediment delivery estimates (refer to footnote "f" in Table 4.3)
- 12 mi of road within the remaining SJC: 5 mi of road is paved and 7 miles is assumed to have been treated as identified during the 2012-2013 field reconnaissance (refer to footnote "g" in Table 4.3)

[15] We are utilizing a moderate-low surface lowering rate of 0.15 ft per decade and a narrower road/cutbank/ditch width as a conservative extrapolation to use in subwatersheds other than Williams Canyon.

Table 4.3. Estimated future erosion anticipated from road related (upslope) sources by subwatershed based on extrapolation of field estimates, San Jose Creek Study, Monterey County, California.

Subwatershed	Estimated length of road (mi)	Estimated future sediment delivery volume per mile (yd³) [a]		Estimated future sediment delivery volume within subwatershed (yd³) [a]		Total future sediment delivery volume within subwatershed (yd³) [d]
		episodic [b]	chronic [c]	episodic [b]	chronic [c]	
Animas Creek	13.65	90	145	1,230	1,980	14,210
Seneca Creek[e]	17.49	90	145	1,575	2,535	4,110
Van Winkley Canyon	4.30	90	145	385	625	1,010
Williams Canyon [f]	5.07	175	340	885	1,725	2,610
Remaining San Jose Creek [g]	25.84	90	145	2,325	3,745	6,070
Total	**66.35**	**--**	**--**	**6,400**	**10,610**	**17,010**

[a] Values are based on the assumptions listed above in the text, rounded to the nearest 5 yds³, and reflect estimates over 30 years for episodic sources and 10 years for chronic sources if left untreated.
[b] Based on 3 sites per mile and 30 yds³ of sediment per site for mileage except as noted under footnote "f" for Williams Canyon.
[c] Based on 25% hydrologic connectivity and utilizing 20 ft contributing area and 0.15 ft road lowering per decade to assume 145 yd³ per mile for all subwatersheds except as noted under footnote "f" for Williams Canyon.
[d] Total combines episodic and chronic estimates.
[e] Estimated future delivery volumes do not include any potential sediment delivering from the ~2 mi of previously treated road segments in Seneca Creek subwatershed.
[f] Estimated future delivery volumes exclude the 8.1 mi of treated roads and use the following estimates based on calculated averages from actual field measurements from the 2007 assessment: 3.5 sites per mile, 50 yds³ of sediment per site, 35% hydrologic connectivity, 25 ft contributing road, 0.2 ft lowering rate.
[g] Estimated future delivery volumes do not include any potential sediment delivering from the ~7 mi of previously treated road segments and ~5 mi of paved road segments within the remaining SJC subwatershed.

Table 4.3 details the extrapolated results of estimated future sediment delivery from road related sources within SJC watershed broken out by subwatershed. It must be clearly stated that these estimates are based on a combination of actual field measurements, extrapolated assumptions based on field measurements, GIS analysis, and observations from field reconnaissance and were not generated by direct field measurements.

Therefore, based on these assumptions and extrapolated data, if the currently untreated roads and trails are not properly re-designed (i.e. storm-proofed) and maintained, we estimate that approximately 6,400 yd³ of sediment will be delivered from sources of episodic erosion and 10,610 yd³ of sediment from sources of chronic erosion during the next decade alone. This leads to an overall estimate of approximately 17,010 yd³ of sediment that can be anticipated to be delivered to SJC watershed by road/trail related sources (Table 4.3).

4.1.4 Hillslope Landslides and Gullies

During the aerial photogrammetry review, the aerial flight, and field reconnaissance of SJC watershed, the Project Team observed landslides and gullies scarring the hillside throughout the watershed. Due to the canopy cover, slim budget and lack of available tools (i.e. stereographic photography) the Project Team was unable to systematically evaluate the occurrence and magnitude of the hillslope erosional features. However, observations as to the location, type, and relative size of these features were noted throughout the watershed.

For the purposes of this investigation we have categorized non road-related upslope erosional features as either *landslides* or *gullies*. *Landslides* refer to "the movement of a mass of rock debris, or earth down a slope" (Cruden, 1991). These features are typically identified as having a "tear drop" shape, or modified ellipse with a measurable geometry of length, width, and depth. For simplicity sake, a landslide can be thought of as having three main features: (1) a surface of rupture, (2) a zone of depletion, and (3) a zone of accumulation. The surface of rupture is the trace along which the original ground surface meets the "mass in motion". The most visible portion of this trace would be the main scarp, or the upper edge of the landslide consisting of undisturbed, usually steep, ground. The zone of depletion is the portion of the landslide where original ground has been displaced (i.e. moved down slope) and this material lies below the original ground surface. Finally, the zone of accumulation is the area where the displaced material has come to rest and lies above the original ground surface (Cruden and Varnes, 1994).

States of landslide activity include "active" or "inactive". Active landslides are those that are currently moving. Inactive landslides have not moved in more than one annual cycle. If the cause of an inactive landslide is still relevant, the slide is dormant; if the cause is no longer relevant the landslide is either abandoned or stabilized (CDMG, 1999). Active landslides typically exhibit denuded surfaces and are visible throughout the watershed when reviewing historical and current photogrammetry. In addition, inactive landslides may or may not exhibit denuded surficial expressions. Even if undetectable through historical or current imagery, large inactive features may be visible throughout the watershed when viewing the landscape using 3m digital elevation models (DEM). The geometry of larger inactive features are visible as altered topography within the outline of the feature (Appendix A).

Landslide potential is affected by a variety of factors, primarily including: underlying geology, stream network characteristics, hillslope gradient, and vegetation (CDMG, 1999). Given these factors, both active and inactive landsliding features have been identified to be predominately located within the portions of the watershed: underlain by Cretaceous granitics (Kgdm, Kgdc, Kqds), along hillslopes with gradients >65%, in steep convergent, headwall swale or zero-order basins, at or below major breaks-in-slopes, and within grassland setting (Maps 3 and 4, Appendix A). The highest concentration of shallow debris slides is located on headwater hillslopes in the Seneca, Van Winkley Canyon and Williams Canyon watersheds (Map 5). The only difference in slope/geologic characteristics in the identification of inactive features is that they are also found within isolated portions of steep forested slopes primarily in the southern half of the watershed.

Another key factor contributing to landslide potential within the watershed is soil saturation that generally requires prolonged precipitation to pre-dispose segments of hill slope to failure. The higher concentration of debris slides in the granitic rock types is influenced by soil characteristics. The granitics are generally deeply weathered resulting in low tenacity or strength of the rock, and the overlying soil profile in a deep sandy soil with clay-rich horizons,

including the C horizon. The high permeability of the sandy soils coupled with the clay mineralogies or cohesion results in the soil mass becoming saturated and gaining considerable weight during intense storms. When the pore pressure exerted by the water exceeds the strength of the soil and rock, the deeply weathered mass can essentially liquefy resulting in an increased potential for failure via gravitational processes (Wagner, 1991).

Non-road hillslope *gullies* are upslope erosional features typically caused by increased concentration of subsurface or surface flow.[16] Although these features have measurable length, width, and depth dimensions their shape is distinctly different from landslides both in plan and cross sectional views. The shape of gullies are linear as opposed to the more elliptical shape of landslides (Figure 4.2).



Figure 4.2. Active hill slope gullies predominately concentrated in Miocene sandstone bedrock on planar, south facing slopes.

Most of the hillslope gullies identified in the SJC watershed were found to be located in the shallower soils on south facing grassland and chaparral slopes located to the north of the main stem SJC. The majority of these hillslopes are either underlain by deeply weathered Miocene sedimentary rock types or the Cretaceous granodiorites (Map 3). Most are occurring upslope of the initiation points of 1st order streams. Several gullies are developing on planar hill slopes, and the gullies are occurring on a wide range of hill slope gradients, from 25% to over 65% in steepness (Map 5, Appendix A). While most of the larger gully networks are visible on the 1950's and 1960's aerial photography, field observations suggest the gullies are continuing to evolve, albeit at a slower rate than in the past. Most of the hillslope gullies have 0.5:1 or steeper sideslopes, exhibit a noticeable lack of vegetation, have semi-active headcuts and exhibit sideslope failures (Figure 4.3, Figure 4.4, and Figure 4.5). Most importantly, subsurface soil pipes or linear cavities are common on the Miocene sandstone rock types, and many appear to be occurring near the base of the soil profile with the underlying weathered bedrock (Figure 4.6

[16] The hillslope gullies are not road-related, i.e. caused by stream diversions at stream crossings along a road, or caused by concentrated runoff along long lengths of road bed or inboard ditch.

and Figure 4.7). As subsurface near surface groundwater enlarges the soil pipes through time, the overlying soil collapses into the void resulting in an expansion of the surface water drainage network (i.e. headward growth of the 1st order drainage network).

Historically, the initiation of hillslope gullies has been attributed to over-grazing practices, changes in the composition of native grassland communities, as well as oceanic salt spray in coastal landscapes (Cook, 1978). Currently, grazing practices are limited in the SJC watershed, and it is unclear how, if at all, cattle could be influencing the widespread observed piping processes.



Figure 4.3. These large active hillslope gullies forming on gentle, planar slopes have over-steepened sideslopes, lack vegetation and are prone to periodic sideslope collapse. The gullies are a major source of fine sediment production in the SJC watershed.

A field reconnaissance was undertaken at three south-facing hillslope gullies located above two 1st order tributaries to SJC main stem located midway between the Seneca Creek and Van Winkley Canyon (Map 5, SB #1-#4). Gully #1 is approximately 260 ft in length, ranges from 30 to 165 ft in width and 1 to 8 ft in depth. Gully #2 has two channels: one 115 ft in length and one 310 ft in length with widths ranging between 10 and 25 ft and depths ranging from 1 to 3 ft. Gully #3 is approximately 420 ft in length, ranges from 5 to 20 ft in width and 1 to 3 ft in depth. Utilizing void measurement techniques, past erosion volume from the gully features ranges from 500yd^3 to approximately 3,000yd^3. Since the gully features are voids on the landscape, and the proximity of these gullies to 1st order streams results in the inevitable annual direct delivery of past and future sediment volumes into SJC.

Hillslope landsliding and gullying is an important and significant upland source of sediment. Based on visual observations and rough estimates of potential sediment delivery volumes from upslope erosional features, hillslope erosional features are more likely to result in larger volumes of sediment delivery than compared to road related sources. However, it is the frequency and the likelihood of occurrence, the proximity to a stream, and causal mechanisms that should be noted.

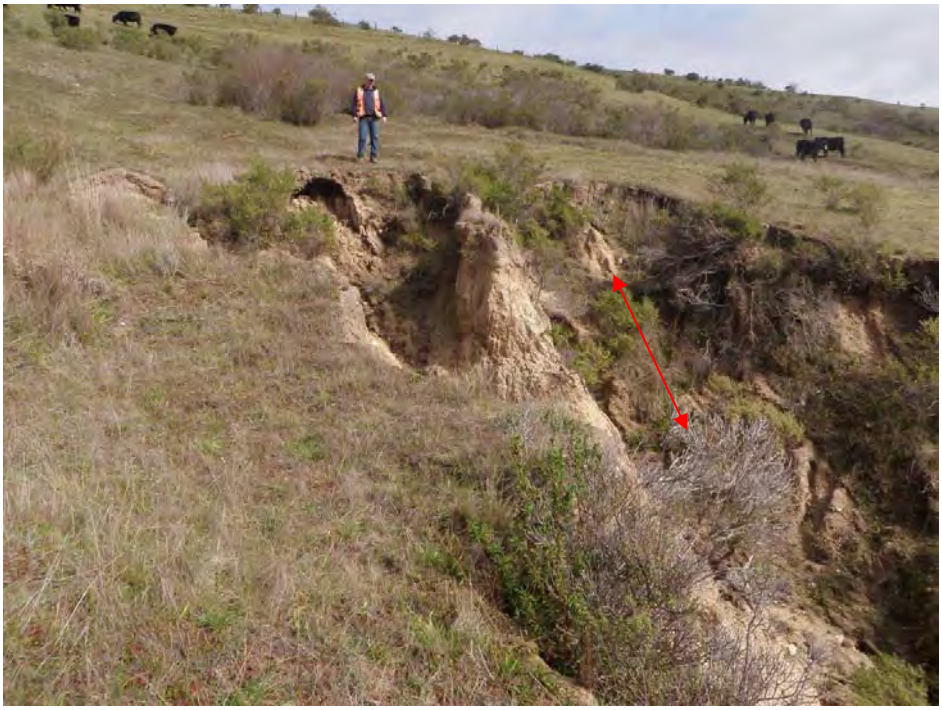


Figure 4.4. View of the upslope initiation point of Gully #2 (Map 5). Note the lack of vegetation, near vertical sideslopes and scarp forming at red arrow.

Hillslope landsliding typically occurs during an episodic event such as: periods of heavy and/or prolonged rainfall, groundshaking (i.e. earthquakes), wildland fire, or any combination thereof. These episodic landslide events occur less frequently than events that would typically cause road related erosion. In addition, many of these landslide features occur in upper slope, headwater locations, far enough away from any watercourse as to have more limited input of sediment into the stream system. Finally, mechanisms that cause these hillslope features to occur are not as strongly linked to anthropogenic activities (compared to road-related sediment sources), and cannot as easily be prevented or mitigated. Therefore, in terms of management recommendations, the focus of reducing upslope sources of sediment should be on addressing mitigations related to existing road and trail networks. See *Section 7.4 Recommendations for future work* for further discussion.



Figure 4.5. View of the upslope initiation point of Gully #2 (Map 5). Note the lack of vegetation, near vertical sideslopes and scarp forming at red arrow.



Figure 4.6. Upslope of the head of active hillslope gullies one can observe linear, mole-like tracks of collapsing ground suggesting sub-surface groundwater piping is occurring.



Figure 4.7. Collapse structures such as shown in the photo are common on gentler hill slopes underlain by the Miocene sandstone bedrock. A combination of animal burrowing and groundwater piping processes may be largely responsible for the observed expansion of the existing gully network.

4.2 Instream sources

4.2.1 Background Stream Inventories

In 2006, staff from CDFW and California Conservation Corps (CCC) conducted stream inventories along SJC from the mouth upstream approximately 8.06 miles (Nelson, 2006a) and along Seneca Creek from the confluence with SJC upstream approximately 2.02 miles (Nelson, 2006b). The purpose of the stream inventories were to document habitat types and channel type; collect stream temperature and stream flow readings; sample fish; and collect estimates of substrate composition and embeddedness, shelter rating, canopy density, bank composition and vegetation. Inventories followed methodologies described in CDFW's California Salmonid Stream Habitat Restoration Manual (Flosi et al., 1998). In addition to the quantitative data collected during the stream inventories, the survey team also documented observations on sources of erosion, land use, landmarks, existing or potential fish barriers, and any other issues that may impact stream habitat. Reported interpretations during the 2006 stream inventories revealed that the most obvious sources of sediment in both inventoried reaches along SJC and Seneca Creek could be attributed to road-related stream crossings and some minor bank erosion. In addition, crews documented visual evidence of turbidity and sediment fans along the lower reaches of unnamed lower order (1st and 2nd) tributaries to both Seneca and SJC.

The Project Team reviewed the comprehensive 2006 stream inventory reports prior to conducting our instream sediment source assessment. The Team documented any changes in identified features and/or the occurrence of new features since the 2006 studies relative to our investigations. In addition, we reviewed the CDFW Memorandum detailing observations of Warden Lester Golden in the summer of 1962 and likewise noted significant changes (CDFW, 1962; reprinted in the present report as Appendix D).

4.2.2 PWA Instream Sediment Source Site Assessment Objectives and Methodology

The instream field assessment had three main objectives: (1) identify instream sources of sediment resulting from erosion; (2) identify instream obstructions that may be causing erosion, causing diversion, and/or retaining sediment; and (3) identify any potential fish barriers. This section will focus on instream sediment sources resulting from erosion and retention. For more detail on identified fish barriers, please refer to *Section 5*.

Instream sources of sediment include: *bank erosion*, streamside *landsliding*, *road crossings*, and retained sediment behind instream obstructions (*log jams* and *dams*). In order to identify instream sources of sediment, PWA assessed 5.45 miles, or 8% of all 1st through 5th order stream mileage in the watershed. This included 13% of 3rd order streams, 16% of 4th order streams, and 54% of all 5th order streams in the SJC watershed (Table 4.4). Stream order was identified utilizing the Strahler stream order system. This system, developed in 1952, is a simple method of classifying stream segments based on the number of tributaries upstream. A stream with no tributaries (headwater stream) is considered a first order stream. A segment downstream of the confluence of two first order streams is a second order stream. Any n^{th} order stream is always located downstream of the confluence of two $(n-1)^{th}$ order streams (Strahler, 1952).

Table 4.4. Stream length and average drainage density of San Jose Creek by Strahler order, San Jose Creek Study, Monterey County, California.

San Jose Creek watershed	Strahler order					Total
	1	2	3	4	5	
Total channel length in San Jose Creek Watershed (mi)	36.72	14.47	7.15	4.98	6.87	70.19 mi
% of total channel length, by order	52%	21%	10%	7%	10%	100%
Length sampled[a] (mi)	--	--	0.90	0.81	3.74	5.45 mi
Length sampled (%)	--	--	13%	16%	54%	8%
					Study area	14.42 mi^2
					Stream density	4.87 mi/mi^2

[a] Of the 5.45 mi of stream assessed, 3.74 mi (5th order channels) was assessed along the San Jose Creek main stem and the remaining 1.71 mi (3rd and 4th order channels) was assessed along Seneca Creek.

Inventoried sites for the instream sediment source assessment were identified and mapped only if they were judged to have delivered > 5 yd^3 of sediment to the stream within the last 20 years, or had the potential to deliver greater than 5 yd^3 of material to the stream in the future. In addition, log jams were only mapped if the feature was: (1) impeding flow or downstream migration of bedload; (2) causing a diversion or resulting in >5 yd^3 of erosion; and/or (3)

presenting a temporary or permanent barrier to fish. For each site identified, PWA staff recorded a series of field observations including: (1) detailed site description; (2) nature and magnitude of past, present, and potential erosion problems (including retained sediment); (3) likelihood and activity of erosion or slope failure; (4) causes of erosion (instream and/or hillslope); and (5) potential to impede fish migration (Appendix C). In addition, where applicable, PWA field staff evaluated the potential for erosion, retention, and sediment delivery and collected field measurements (width, depth, and length of the past/potential sediment source area) to derive erosion/retention and sediment delivery volumes (Table 4.5).

For the purposes of this study, *bank erosion* is defined as stream bank erosion caused by lateral migration of stream flows (i.e. flow deflection or stream undercutting) into alluvial, colluvial or bedrock banks, or stream channel incision (vertical down cutting) caused by fluvial processes. Bank erosion does not include streamside hillslope failures (mass wasting). Hillslope failures were only identified as *landslides* if there was no evidence that active fluvial processes were aggravating the problem.

4.2.3 PWA Instream Sediment Source Site Assessment Results

The instream assessment identified 57 sites: 3 bank erosion, 1 landslide, 38 log jams, 12 road-related stream crossings, 2 dams, and 1 bedrock cascade (Table 4.5; Map5; Appendix C). Of the sites identified during the instream assessment, 4 sites were determined to be potential fish barriers.

The instream assessment identified 200 yd^3 of past sediment delivery from instream erosion sites during the past approximately 20 years, and estimated 155 yds^3 of future sediment delivery from the 57 mapped sites (Table 4.6). Past erosion at bank erosion sites accounted for 87% or 175 yd^3 of the past erosion (Figure 4.8 and Figure 4.9). Future bank erosion sites were estimated to potentially contribute 155 yd^3 or 54% of all future sources of sediment derived from instream sources, with road-related culverted stream crossings sites as the second largest contributor to future sediment delivery volumes at 110 yds^3 or 39% (Table 4.6).

Table 4.5. Inventoried instream site types, San Jose Creek Study, Monterey County, California.

Site types		# of sites	Percent of total	# of sites determined to be a fish barrier[a]
	Bank erosion	3	5%	--
	Landslide	1	2%	--
	Log jam	38	67%	3
Other	Road crossing	12	21%	--
Other	Dam	2	3%	--
Other	Bedrock Cascade	1	2%	1
Total number of sites		**57**	**100%**	**4**

[a] Fish barrier sites include 3 log jams (#33, 41, 50) and 1 "Other" site, a bedrock cascade (#7).



Figure 4.8. View of inventoried bank erosion site along Seneca Creek, Site #31 (Map 5).



Figure 4.9. View of inventoried bank erosion site along San Jose Creek, Site #43 (Map 5).



Figure 4.10. Retained sediment behind log jam at Site #24 along Seneca Creek (Map 5).

In addition to identifying future sediment sources resulting from erosion, there is a similar volume of retained sediment that was measured within the channels behind log jams and dams. This retained volume has the potential to remobilize into the stream system during a singular event. The majority of retained sediment identified during the instream survey was found stored behind log jams and not other obstructions (i.e. dams). Field estimates of the retained sediment behind these log jams typically did not exceed 20 yd^3, such as Site #24 inventoried along Seneca Creek (Figure 4.10). However, the larger dams, such as site #47 which was profiled have resulted in larger retained sediment volumes >100 yd^3. Of the 40 instream obstructions, 38 were log jams and 2 were dams. Of these 40 sites, 33 were found to be retaining sediment upstream, 4 were found to be causing a diversion, 4 were found to be causing erosion, and 3 were found to be potential fish barriers (Table 4.7, Figure 4.12 and Figure 4.11).

Table 4.6. Estimated past and future sediment delivery from inventoried instream sites, San Jose Creek Study, Monterey County, California.

Sources of sediment delivery[a]		Estimated past sediment delivery (yd^3)	Percent of total	Estimated future sediment delivery (yd^3)	Percent of total
	Bank erosion	175	87%	155	54%
	landslide	10	5%	5	2%
	Log jam[a]	15	8%	15	5%
Other	Road crossing[b]	0	0%	110	39%
	Dam	0	0%	0	0%
	Bedrock Cascade	0	0%	0	0%
Total sediment delivery		**200**	**100%**	**285**	**100%**

[a] Sediment delivery associated with log jams refer to erosion of banks or native hillside caused by the jam(s). Volume does not include retained sediment behind the jam(s) which if blown out may mobilize sediment downstream, see Table 4.7 for those volumes.

[b] The only road-related stream crossings that had future sediment delivery >5yd^3 were culverted (Sites #26, 29, 30).



Figure 4.12. View of inventoried log jam site along Seneca Creek, Site #41 (Map 5). This site was also identified as a fish barrier in both PWA's 2013 assessment and CDFW's 2006 assessment (located within Habitat Unit 414). (Photo by Nelson , 2006b)



Figure 4.11. View from the right bank of inventoried log jam site along Seneca Creek, Site #41 (Map 5). This site was identified as a fish barrier in both PWA's 2013 assessment and CDFW's 2006 assessment (located within Habitat Unit 414).



Figure 4.13. View of inventoried log jam site along San Jose Creek, Site #49 (Map 5). This log jam is comprised of SOD affected tan oaks. Log jam was not identified in CDFW's 2006 assessment.

PWA identified several smaller log jams along the 2013 inventoried reaches of SJC that were not observed nor reported on during CDFW's 2006 assessment. There is a large stand of tan oak trees that border the stream on both hillsides around SJC stream mile 7. These trees were struck with sudden oak disease (SOD) and have died as a result. Although the SOD infected trees were observed and noted during CDFW's 2006 instream assessment, it can be ascertained that sometime after the summer of 2006, the tops of these SOD affected tan oaks broke off during a large wind storm and fell into the stream causing the development of the LWD/SWD jams inventoried in the 2013 assessment (Figure 4.13 and Figure 4.14; Sites# 49-53, Map 5).

Retained sediment volume behind instream obstructions was obtained by field measurements and are considered conservative estimates (Figure 4.14). In some cases it was difficult to quantify all retained sediment due to the magnitude and/or configuration of the jam. Log jams that span greater lengths of channel (>25 ft) and/or those that contain a high volume of mixed wood and debris, as found in the recently formed SOD log jams, often obscure pockets of retained sediment.



Figure 4.14. View of retained sediment behind inventoried log jam site along San Jose Creek, Site #50 (Map 5). This log jam is comprised of SOD affected tan oaks. Log jam was not identified in CDFW's 2006 assessment.

Log jam (Site #47) was surveyed by PWA on January 25, 2013. Retained sediment located upstream of the log jam was calculated from the longitudinal profile and cross sections. Profiles and cross sections for Site #47 are found in *Section 5 Fish barrier analysis* (Figure 5.17 and Figure 5.18). The total volume of retained sediment estimated behind all instream obstructions inventoried during the 2013 assessment is approximately 340 yd^3 (Table 4.7).

Table 4.7. Summary results of inventoried instream obstructions by LWD type, San Jose Creek Study, Monterey County, California.

Site type[a]	# of sites	# of sites retaining sediment	Volume of retained sediment[b]	# of sites causing stream diversion	# of sites causing erosion	# of sites acting as barrier to fish[c]
LWD log jam	4	4	25	1	1	0
LWD/SWD log jam	24	19	250	2	3	1
SWD log jam	10	8	25	1	0	1
Dam/falls	3	2	40	0	0	1
Total	**40**	**33**	**340**	**4**	**4**	**3**

[a] LWD = large woody debris (wood ≥ 1' in diameter and ≥ bankful width); SWD = small woody debris (< 1' in diameter); LWD/SWD = large and small woody debris.
[b] Volume of retained sediment poised to mobilize downstream if obstruction is removed (or blown out) was an estimate and not determined by a survey (except site #47). It is quite likely the volume is underestimated. Volume is not included in Table 4.6 claiming volumes of past/future sediment delivery.
[c] Instream sites acting as potential fish barriers are located at log jam sites #41 and 50 and bedrock falls site #7.

Field estimates of sediment delivery volumes from all the inventoried instream features total 200 yds^3 during the past approximately 20 years with another 625 yds^3 estimated to be delivered during the next 30 years (Table 4.8). Approximately 83% of all past delivery volume and 66% of all future is attributed to sources found in 3rd order streams (Table 4.8). Of the 625 yds^3 of future sediment poised to enter or be re-mobilized in the system, 285 yd^3 or 46% will come from instream erosion sources (i.e. bank erosion and landsliding) and 340 yd^3 or 54% will come from retained sediment behind instream obstructions (i.e. log jams and dams) (Tables 4.6 and 4.8).

Table 4.8. Field estimated sediment delivery from all inventoried instream sites by stream order, San Jose Creek Study, Monterey County, California.

Strahler Order	Length of stream (mi)	Length of stream inventoried (mi)	Past sediment delivery volume (yd^3)	% of total	Future sediment delivery volume (yd^3)[a]	% of total
1	36.72	--	--	--	--	--
2	14.47	--	--	--	--	--
3	7.15	0.90	165	83%	315	66%
4	4.98	0.81	5	2%	40	9%
5	6.87	3.74	30	15%	270	25%
Total	**70.19**	**5.45**	**200**	**100%**	**625**	**100%**

[a] Future sediment delivery estimates from instream sources is reported over 30 years and includes retained sediment behind instream obstructions.

4.2.4 Instream Observations and Sediment Source Summary

Field observations during the 1962, 2006 and 2013 instream assessments all conclusively agree on many factors that remain relatively unchanged in regards to channel characteristics, instream sediment sources, and their relation to viable fish habitat. There have, however, been significant changes in potential fish barriers noted by each inventory, please refer to *Section 5* for further discussion.

In general, SJC main stem is a low gradient stream with established and quasi-stable riffle-pool sequences and locally bounded by well-developed terraces. The channel exhibits a generally broad sinuosity and only locally contains tight meanders. Small point bars are present along the inside of these broad bends in the channel. The channel substrate varies as you travel from the mouth upstream to the headwaters. Sand and fine gravel dominate the channel bottoms of the lower watershed, below Seneca Creek. As you move upstream, the channel bottom exhibits a more bimodal distribution (Figure 4.15). However, sand and fine gravels are present throughout the system and are commonly a dominant substrate when viewing long reaches of SJC. Within the higher reaches in the watershed, upstream of Seneca Creek, the channel remains low gradient but becomes more entrenched, with much fewer manifestations of the alluvial terraces and articulation of point bars.



Figure 4.15. View of San Jose Creek. The reach is low gradient with a well-established floodplain along the right bank and bimodal distribution of the channel bottom.

Based on observations from CDFW (2006) instream assessments, observations and quantitative data collected during PWA's 2013 instream field assessment, and GIS analysis of geology and stream density, we have extrapolated data to estimate total sediment delivery volumes

anticipated from instream sources along 3rd, 4th, and 5th order channels throughout the SJC watershed (Table 4.8).

Results from this extrapolation show a conservative estimate of approximately 1,230 yd^3 of sediment can be anticipated from instream sources generated from 3rd order streams and 30 yd^3 of sediment from 4th and 5th order streams (Table 4.9). This estimation supports observations during both the instream assessment and field reconnaissance that lower order streams (1st through 3rd) exhibit more erosion and therefore have increased potential to deliver larger volumes of sediment to the watershed.

Table 4.9. Estimated future sediment delivery volumes anticipated from instream sources by Strahler Order based on extrapolation of field estimates, San Jose Creek Study, Monterey County, California.

Strahler Order	Length of stream (mi)	Length of stream inventoried (mi)	Future Sediment delivery [a] Volume (yd^3)	Sediment delivery volume per stream mile[b] (yd^3/mi)	Estimated Sediment delivery volume within watershed[c] (yd^3)
1	36.72	--	--	--	--
2	14.47	--	--	--	--
3	7.15	0.90	155	172	1,230
4	4.98	0.81	5	6	30
5	6.87	3.74	15	4	30
Total	**70.19**	**5.45**	**175**	**--**	**1,290**

[a] Sediment delivery volume per stream mile is based on inventoried instream sites and reaches only. 110 yd^3 of road related future sediment measured in 3rd order reach (Sites #26, 29, 30) was not included as it is attributed as an upslope source in Table 4.8.
[b] Total estimated delivery volume is an extrapolation of data gathered during the instream inventory (reported over 30 years) and should be not be considered measured estimates.
[c] Total estimated volumes are rounded to the nearest 5 yd^3.

Based on field observations during the instream assessment of 3rd through 5th order channels, quantified sediment volumes resulting from instream sources, and comparing those results to observations made during field reconnaissance of 1st and 2nd order tributaries, greater volumes of instream sediment sources are likely to be generated in lower order (1st and 2nd) tributaries. Instream erosion and sediment sources were observed more frequently and in greater volumes within these lower order tributaries through increased channel incision, bank erosion, channel enlargement due to stream diversions, and headcutting.

Although high volume instream sediment sources were found to be unlikely, 2013 field observations as well as field and laboratory analysis confirm there is a large amount of sand in the stream system. These findings were echoed through observations made in CDFW's 1962 and 2006 instream assessments. For results of sediment analysis of material sampled from the channel bed, floodplain, lagoon, retained lobes or fans, and point bars refer to Section 4.3.

In addition, comparing 2013 observations did not reveal any significant developments of instream sediment sources to have developed since 2006. This supports the conclusion that much of this finer grained material observed and sampled in the system is not found to be in "regular transport" but remains "in residence". This long residence time of material also supports the interpretations that there is great channel stability found throughout the watershed. Refer to *Section 7* for further discussion on how longer residence time and infrequent mobilization of finer grained sediment on an episodic timeline are thought to be the largest factor controlling instream sediment within SJC on a watershed scale.

4.3 Sediment gaging

4.3.1 PWA Sediment Retention Basins (Traps)

After literature review, examination of aerial photogrammetry, and initial field reconnaissance and instream channel surveys, it became quite clear that the primary sources of sediment in the watershed were resulting from roads and hill slope processes occurring outside and upslope of the stream channels. Based on PWA's 2007 road/trail assessment in Williams Canyon, we already had quantifiable data in which to extrapolate to the SJC's watershed wide road/trail network. However, we did not have any quantifiable data on sediment delivery estimates from episodic mass wasting or gully processes unrelated to the road/trail network.

Therefore, in order to collect data reflecting episodic sediment delivery estimates resulting from upslope features and winter storms, PWA staff installed 4 small sediment retention basins below active gullies that have experienced continued erosion as 1st order channels migrate headward and the hillslope structures collapse as a result of concentrated flow from a combination of groundwater piping, burrowing animals, hillslope runoff, and possible perturbation due to grazing and other land use activities.



Figure 4.16. View of the installation of sediment retention basin (SB #1) placed above the road crossing to capture transported material from the erosion of Gully #1 (Map 5).

PWA installed 2 basins just above an access road crossing Gully #1 (SB #2 and SB #3, Map 5) and 2 basins below the confluence of Gully #2 and Gully #3 (SB #1 and SB #4, Map 5). All 4 sediment basins were constructed on January 24-25, 2013 (Figure 4.16; Appendix D). However, since the area did not receive any significant rainfall events during the life of the study, there was no measurable deposition of eroded material from the upslope gullies found transported to the basins during post installation monitoring (September 17, 2013, October 2-3, 2013 and January 2014).

4.3.2 Bed Sediment samples

Given the dry water year, limited bedload samples were taken during live stream flow, as they require an active bed and higher flows. Some bedload samples were taken during the December 2, 2012 storm. Particle size gradations are shown on Figure 4.17 and Table 4.10. To augment a data set for bed load transport, in lieu of bedload storm measurements, samples of bed material were taken from the stream bed in various locations to characterize the bed material previously transported.

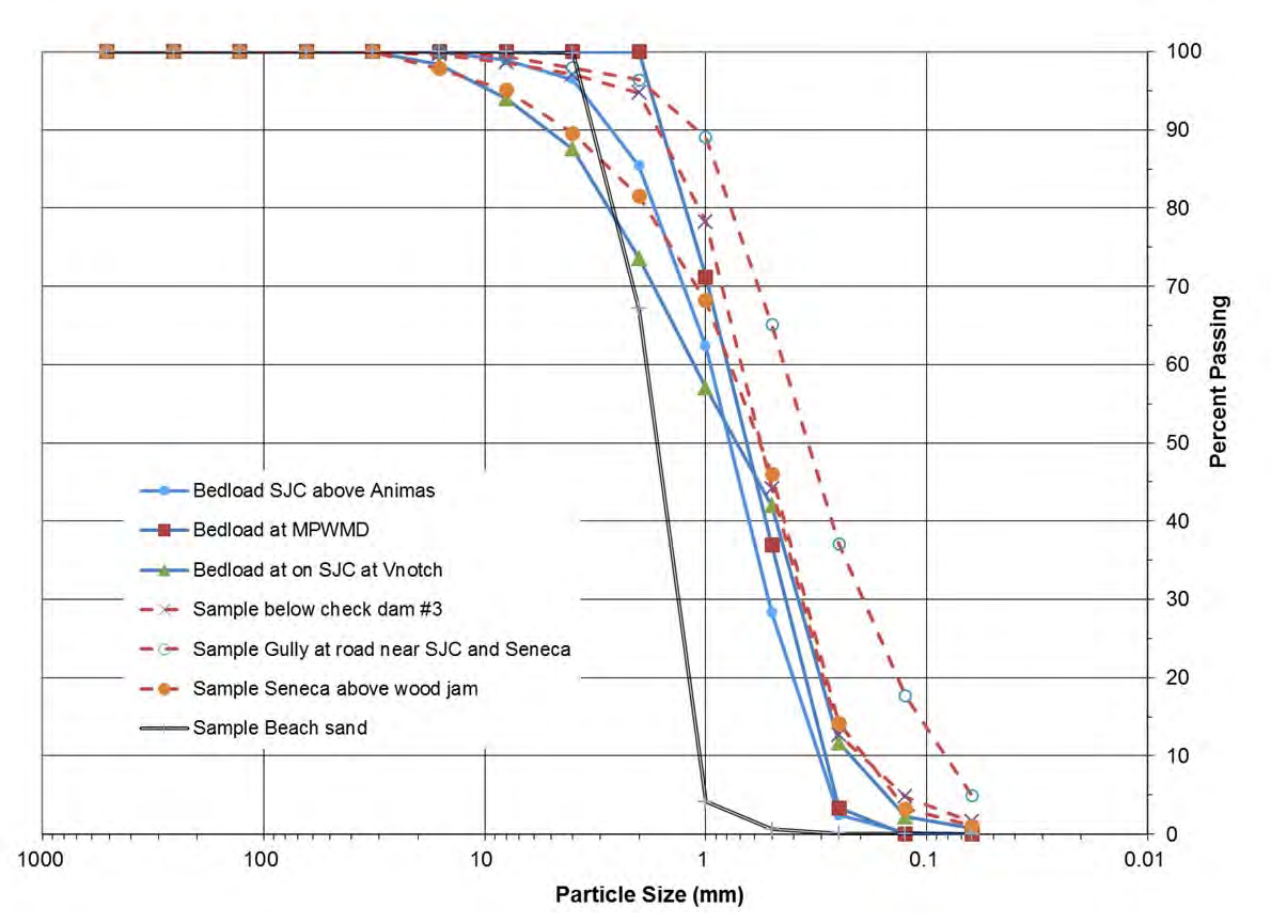


Figure 4.17. Particle size gradation of bedload samples (blue solid lines), bed samples (red dashed lines), and beach sand (gray solid line) for San Jose Creek

Table 4.10. Particle-size analysis for bedload samples and bed samples in mm

	Bedload Samples (storms)			Bed samples (excavated)			
Size	SJC US Animas	SJC at MPWMD	SJC V-notch	SJC below check dam #3	Gully sample 1	Seneca Sample 2 woodjam	Beach Sand
D-16:	0.36	0.32	0.28	0.27	0.11	0.26	1.14
D-50:	**0.78**	**0.65**	**0.72**	**0.56**	**0.34**	**0.57**	**1.66**
D-84:	1.92	1.36	3.35	1.27	0.86	2.48	2.86
D-95	3.65	1.77	9.42	2.16	1.75	7.92	3.61

Based on the data in Table 4.10, the D50 for the bed material is typical sand, with a slightly smaller size for bed samples (excavated), versus transporting bedload (storm sample). Beach sand had a D50 of about 1.7 to 2 mm, or coarse sand, dissimilar from the bedload transporting through the system, reflecting different littoral process on the steep beach.

4.4 Estimated sediment transport and yield

For a summary of upland source deliveries see Table 4.3.

For a summary of instream delivery see Tables 4.7 and 4.9.

4.4.1 Sediment transport in channel

We measured sediment transport at 2 continuous gages, and 4 temporary gages. These included:

a. San Jose Creek at the V-Notch gage, immediately downstream of Van Winkley Creek, where rates of sediment transport had been measured by Mr. Hecht and his colleagues at Balance Hydrologics during water years 1991 through 1995. Both the 2013 and the 1990s gaging efforts at this location included continuous-record flow gaging.

b. San Jose Creek about 100 feet upstream of Van Winkley Creek, and just upstream of the confluence of an unnamed right-bank tributary which was visibly eroding and incising. This temporary station also allowed us to estimate sediment transport in Van Winkley Creek by difference. It also offered a station somewhat comparable to Emily Paddock's measurements about 200 yards upstream (no major tributary confluences).

c. Seneca Creek above the confluence with San Jose Creek. We added this station about in December 2012, about 2 months after the start of the program, after our initial work suggested that it might prove informative. The station initially included a staff plate installed in December 2012, followed by a continuous recording device installed in February 2013.

d. San Jose Creek above Animas Creek. This temporary station proved useful and relatively stable for sediment measurements.

e. Animas Creek above its mouth. This temporary location was measured only several times, primarily during storm events.

f. San Jose Creek at the MPWMD gage, an established continuous-record station operated since 1999. Our measurements of sediment transport were the first to be made at this station. Because the station is located at a bouldery riffle, most of the sediment-transport measurements were made about 100 feet downstream of the gage (see station observers' log in Appendix B).

We measured both bedload and suspended sediment transport. Bedload includes the coarser fraction of sediment, which rolls and saltates along the bed. It is sampled with the a Helley-Smith bedload sampler, with a 0.25 ft opening, and a bag with a 0.250 mm mesh, such that all sediment finer that 0.25 mm is not collected, and considered suspended sediment. Suspended

sediment is supported by turbulence in the flow, and is transported above the bed in the water column. It is collected in a vented nozzled sampler (generally an Federal Interagency Sediment Program DH-48 or DH-81 sampler) using equal transit rate methods. Bedload plus suspended sediment constitutes total sediment load.

Bedload sediment transport rates from this study were combined bedload transport rates as measured in Hecht and Napolitano (1995). Both data sets were measured at the V-notch weir site. The result is a bedload transport rating curve shown on Figure 4.18. In addition, results from suspended sediment measurements were grouped with data from Hecht and Napolitano (1995) and compiled into a rating curve shown on Figure 4.19. Their work, conducted during water years 1991 through 1995, indicated that

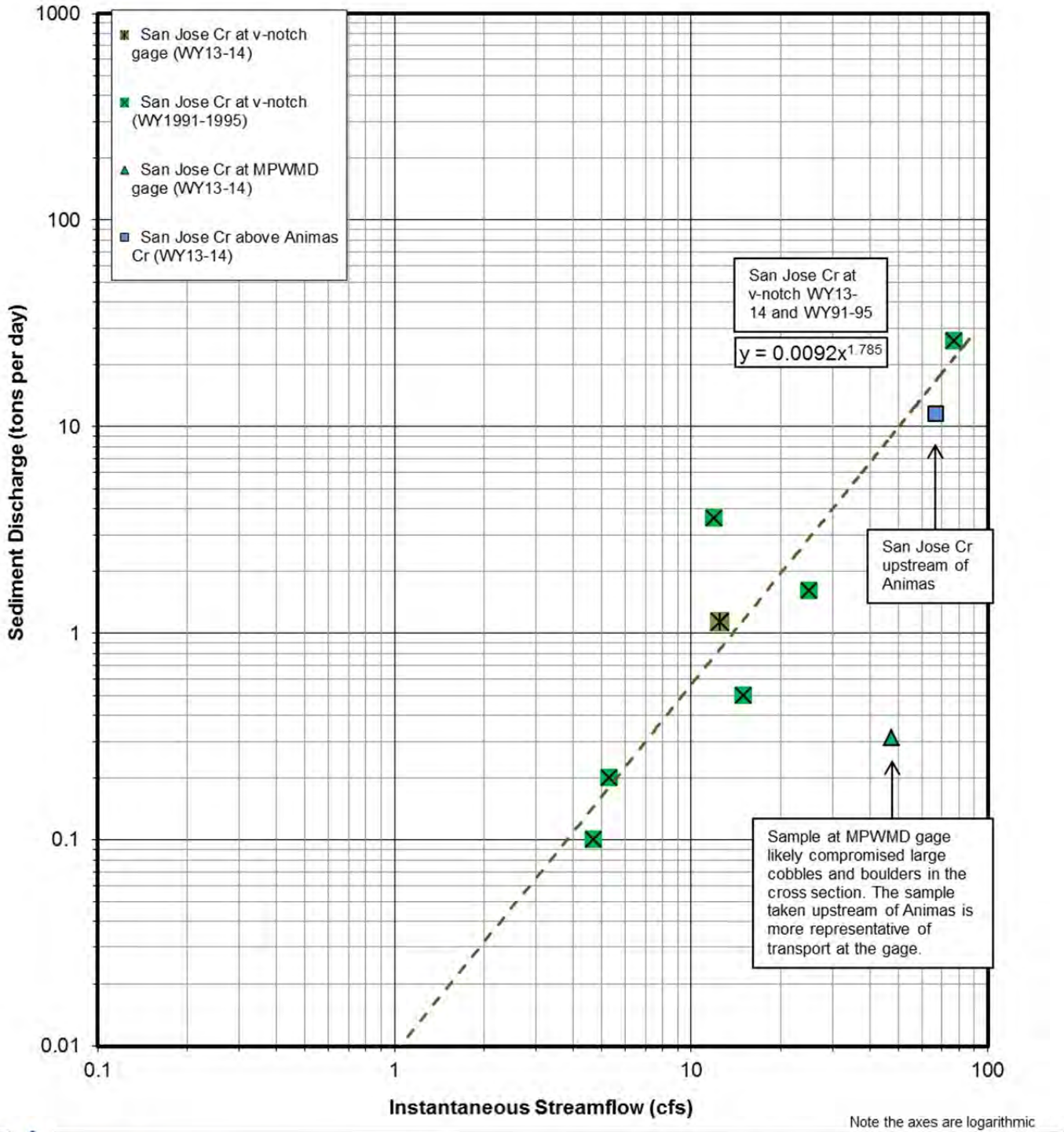
(a) San Jose Creek transported bedload at rates within the low end of those observed in other Carmel-area streams,

(b) bedload constituted almost half of the total sediment load, and

(c) medium and coarse sand constituted most of the bedload.

The rating curve for **suspended sediment** may actually overestimate suspended load, as the data points collected in water year 2013 may actually represent a first flush event, and the not the average transport through the year. Estimates of the annual suspended-sediment load using the most recent water year 2013 data indicate about 165 tons of transport (Appendix B, Form 1 for the V-notch gage). If the curve were shifted towards the 1995 data, total suspended transport for water year 2013 is estimated as 15 tons, indicating a range of an order of magnitude for estimating transport. About 12 tons is estimated to have been transport by bedload processes (Appendix B) during water year 2013.

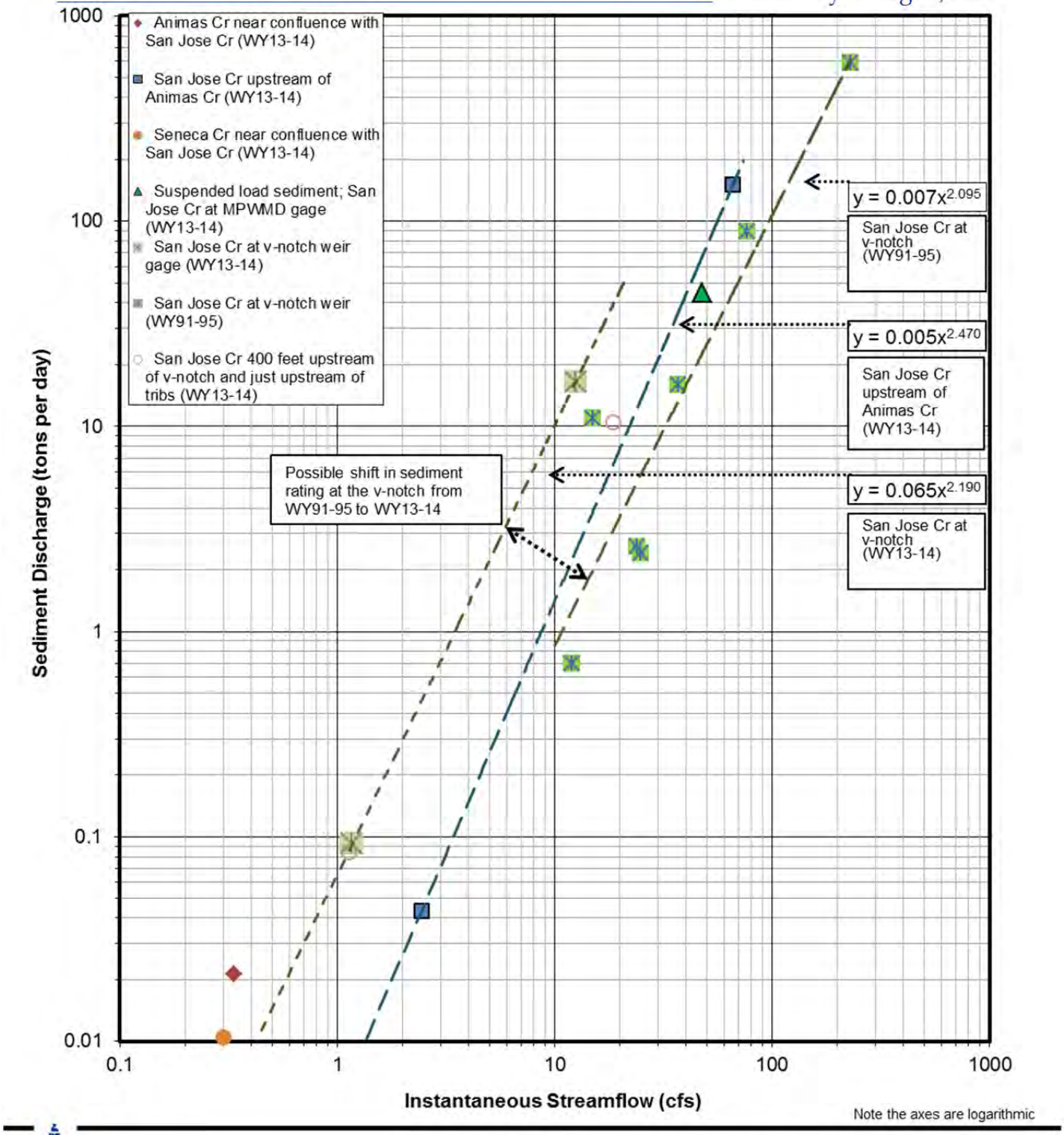
To further explore matters and characterize sediment transport, the risk of fire in the watershed greatly increases the potential for sediment transport. According to Hecht and Napolitano (1995), depositional rates of sediment nearly doubled for post fire watersheds, based on lake deposits below impacted watersheds. Additional considerations are also increases in sediment load due to seismic activity and landsliding. The overall observation here is that a wide range of sediment transport rates could occur, based on episodic activity in the watershed and will vary in time scale. Average annual delivery and transport is not guaranteed.



Balance Hydrologics, Inc.®

Bedload sediment rating, San Jose Creek watershed, Monterey County, CA. The WY13-14 bedload sample appears to fall on the trend created by the WY91-95 data for the gage at the v-notch.

Figure 4.18. Estimated bedload rating curve for San Jose Creek



Balance Hydrologics, Inc.®

Suspended sediment rating, San Jose Creek watershed, Monterey County, CA. The shift between WY91-95 to WY13-14 rating may indicate higher sediment transport rates however due to the low number of flow events during WY13-14 there are very few data points.

Figure 4.19. Estimated suspended-sediment rating curve for San Jose Creek

4.5 Findings and recommendations for salmonid habitat restoration

Tentative findings…

- A major source of sediment in channel is upland sources, such as head cuts, roads, and slope erosion
- There is limited and minor bank erosion, otherwise well secured stream banks with redwood forest was typical of the main stem and major tributaries.
- Supply of gravels for spawning material seemed limited, but present in smaller fractions. The stream bed was typically bimodal, consisting of sand and cobbles

5. FISH BARRER ANALYSIS

5.1 Introduction

Task 3.0 in the MPRPD Scope of Services indicated Balance/PWA team should evaluate the three major fish passage barriers identified by CDFW (Nelson 2006a, b) and other barriers encountered during field transects. In order to adequately evaluate these barriers, we completed longitudinal creek profiles and cross sections near the fish barriers and calculated impounded sediment volumes. In addition to evaluating the barriers, the SOS requested the consultant we present a range of quantified solutions and benefits thereof will be presented to distinguish restoration options and comment on the potential for steelhead habitat improvement. Impounded sediment volume and creek profiles near the fish barriers will be calculated.

5.2 CDFW Barrier and Other Potential Barrier Analyses

In November 2013, after reviewing available literature identifying potential fish barriers, Denis Ruttenberg (Balance) and Danny Hagans (PWA) conducted additional stream surveys to locate and perform a more in depth analysis of site and channel conditions at 1) the 3 major fish barriers in SJC (FB #1 - #3, Map 5) identified by CDFW (Nelson 2006a)[17]; 2) an abandoned small concrete dam (Site #1, Map 5) located on SJC just upstream of the mouth of Animas Creek, and 3) at the largest log jam identified during the 2013 in-stream sediment source inventory (Site #47, Map 5). Table 5.1 and Map 5 provide the location of each of the 5 surveyed in-stream features along San Jose Creek. The concrete dam located upstream of Animas Creek was identified by CDFW (Nelson, 2006a), as well as in the PWA in-stream surveys (Site #1, Map 5), and neither considered the dam to be a barrier to adults, but juvenile salmonid migration is likely impaired during summer low flow periods.

Table 5.1. Surveyed fish barriers (FB), San Jose Creek Study, Monterey County, California.

Type of barrier	Stream	Map identification and location (stream mi)	Figures
Concrete dam	San Jose Creek	Site #1, 1.90	Figures 5.1 and 5.2
Bedrock falls/cascade	San Jose Creek	FB #1, 2.85	Figures 5.3 through 5.6
Log jam	San Jose Creek	Site #47, 5.05	Figures 5.7 through 5.15; Figures 5.17 and 5.18
Log jam	San Jose Creek	FB #2, 7.5	Figures 5.19 through 5.23
Log jam	San Jose Creek	FB #3, 8.0	Figures 5.24 through 5.26
Concrete dam[a]	Seneca Creek	Site #37, 1.74	Figures 5.28
Log jam[a]	Seneca Creek	Site #41, 1.9	Figures 5.29

[a] Longitudinal profiles and/or cross sections were not completed at the two identified barriers along Seneca Creek. However, the sites were evaluated during the instream assessment.

[17] The three surveyed fish barriers (FB) are identified as FB #1, FB#2, and FB #3 and are located on Map 5

Based on the CDFW instream assessment along Seneca Creek (Nelson, 2006b), numerous features (log jams, culverted road crossings, and a flashboard dam) were identified as being potential temporary impediments to fish passage under certain flow regimes. However, the most significant potential fish passage barrier (FB) during most flow regimes for both life phases of steelhead was a LWD log jam located within habitat unit #414 at stream mile 1.9 (Site #41, Map 5).

The results of other smaller log jams encountered during the PWA in-stream sediment sources inventories are presented in Section 4.2.2. The in-stream survey occurred along 5.45 miles of 3rd, 4th, and 5th Strahler Order streams, or along 13% of 3rd order, 16% of 4th order, and 54% of all 5th order streams for a total of 8% of all stream orders in the SJC watershed (Table 4.4; Map 5). None of these smaller log jams identified were considered to be more than minor barriers to juvenile migration at summer low flows (Nelson, 2006 a-b).

5.2.1 San Jose Creek Potential Barriers

Based on the CDFW instream assessment along SJC (Nelson 2006a), three sites were identified as potential impediments to fish passage. The downstream-most barrier is a permanent[18] natural feature, a bedrock falls/cascade (Fish Barrier FB #1 and PWA Site #7, Map 5), located within CDFW habitat unit #305 at stream mile 2.85 that would impede fish passage for both juveniles and adults at low flows. The second barrier is a large natural temporary[19] log jam located at habitat unit #957 at stream mile 7.5 (FB #2, Map 5), and the upstream-most barrier is also a large natural temporary log jam located at habitat unit #1050 at stream mile 8.0 (FB #3, Map 5). The middle log jam (FB #2) was identified by CDFW as the most significant fish barrier along the main stem of SJC (Nelson, 2006a).

Longitudinal profiles were surveyed at each of the 5 SJC features, and estimates of overall stability, persistence, volume of channel stored sediment and habitat improvement potential were evaluated. The 5 features will be discussed in an upstream direction starting with the concrete dam near the mouth of Animas Creek (Site #1, Map 5).

5.2.1.1 Concrete dam at station # 1.51 upstream of Animas Creek confluence

A long-abandoned 3' tall by 12' wide concrete stream diversion dam spans 90% of SJC within a boulder-bedded, average 3% to 4% in gradient "run" reach of the creek (Figure 5.). The dam age is unknown, but likely it was constructed at least four or more decades ago. Over the years since construction, SJC has eroded the alluvial left bank resulting in the creation of a steep gradient, boulder-bedded low flow channel around the dam (Figure 5.2). Winter high flows have resulted in the formation of a 0.5' pool downstream of the dam face. The dam poses minimal potential to impede adult steelhead movement, however, juvenile upstream migration could be limited at a variety of flow regimes.

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[18] *A Permanent fish barrier refers to a barrier that is not likely to "blow out" or "dislodge" during event the largest floods which the creek has experienced.*

[19] *A Temporary fish barrier refers to a barrier that has the potential to "blow out" or "dislodge" as a result of any episodic natural event.*

The flanked dam contains minimal amounts of channel stored sediment, estimated at <6 yd^3 of primarily coarse sand sized particles. The dam itself is of home-made construction, appears to lack any rebar, and consists of <10 yd^3 of concrete. The main, low use access road up SJC main stem is immediately adjacent the dam and channel, providing excellent access to the dam for heavy equipment. It is recommended the dam be removed to fully re-establish the natural flow regime and eliminate any potential fish passage concerns[20]. Refer to *Section 7.4 Recommendations for Future Work* for further discussion of recommended removal of this potential barrier. Impacts to SJC would be very minimal and short lived during and following removal of the relict man-made structure.



Figure 5.1. View from road across SJC to right bank at low concrete dam (Site #7, Map 5) and channel breach around dam on left bank, in foreground.

[20] Mr. Hecht has been told of the pond behind the dam 'blowing out' during 1983 and 1995. We believe it also blew out during 1998. Considering this history, effects on aquatic habitat downstream of the dam are not likely to have a lasting adverse effect.



Figure 5.2. View downstream at concrete dam in center of photo with thalweg in channel to left of large natural boulder in SJC.

5.2.1.2 CDFW barrier #1: Bedrock falls at station # 2.85

The permanent bedrock falls and box canyon barrier #1 (FB#1 and Site #7, Map 5) identified by CDFW (Nelson, 2006a) and PWA during the instream survey confines SJC for a distance of 70′ and contains an elevation change of approximately 6′ over a distance of <20′ (Figure 5.3 and Figure 5.4). The 6′ elevation change consists of a upper 3′ tall, average 45º bedrock chute and a lower near-vertical 3′ bedrock falls that flows into a small 8′ x 80′ x 1′ deep bedrock pool (Figure 5.3). Downstream of the small pool is a large >3′ deep bedrock pool, which at moderately high winter flows will merge with the small pool to improve the potential for adult steelhead to negotiate the chute and falls (Figure 5.3). Near the head of the large pool, besides approaching the 6′ falls and chute, the box canyon shrinks to an averages 10-12′ wide channel. The contraction at the upstream end will result in greatly increased velocities as fish approach the barrier (Figure 5.3 and Figure 5.5).

Upstream from the top of the bedrock chute, the channel of SLC is unconfined and twice as wide as through the box canyon. Stored sediment depths are minimal (<1′ -2′) and the active channel exhibits a broad sinuous pattern with low lying alternating point bars. At the downstream riffle crest, spawning habitat is moderately good and ocular estimates consists of small, well rounded gravels with some sand (Figure 5.4).

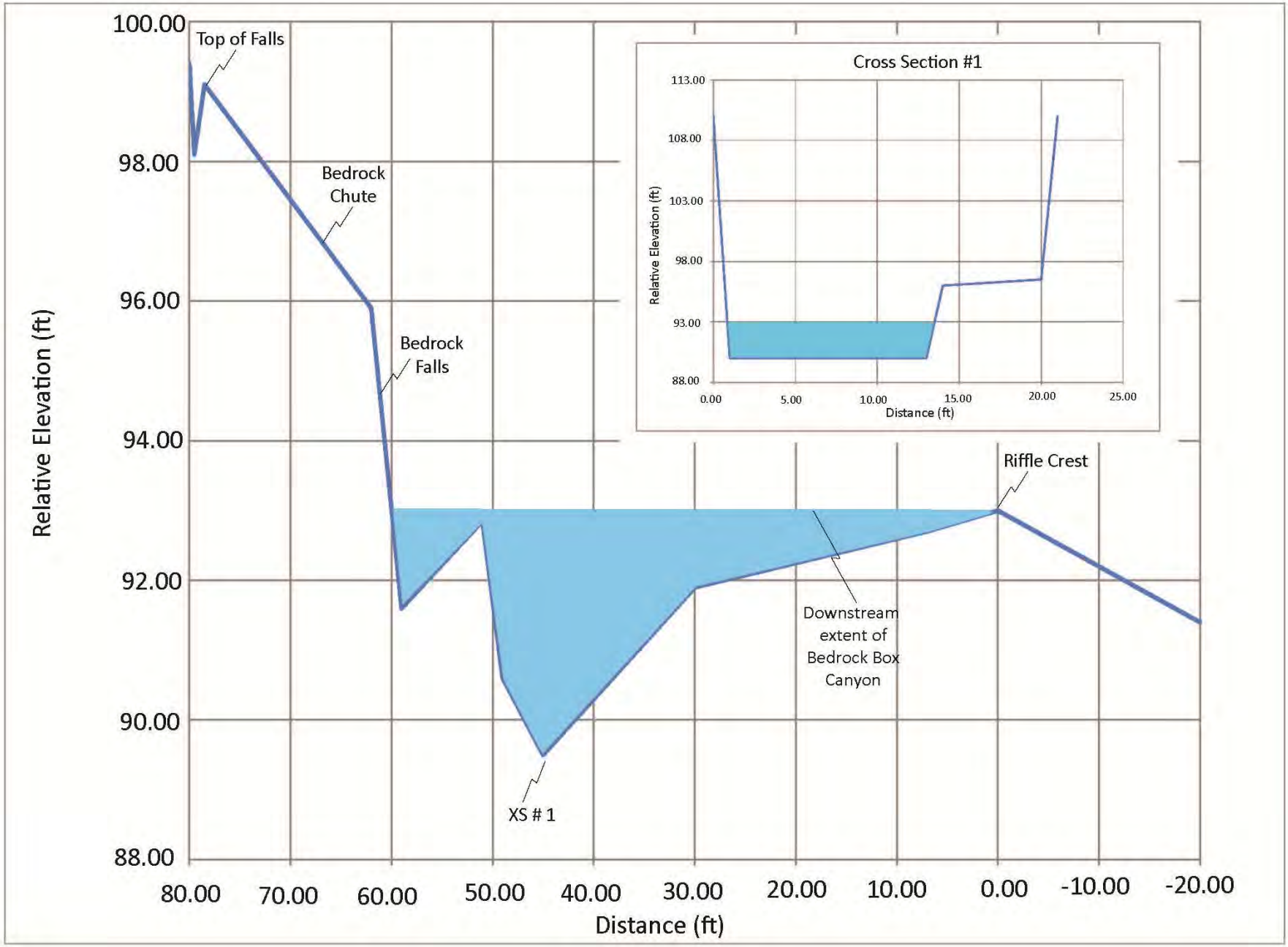


Figure 5.3. Fish barrier #1, Longitudinal Profile and Cross Section at bedrock falls natural barrier on San Jose Creek.



Figure 5.4. View upstream at CDFW barrier #1 (Site #7, Map 5) taken from downstream riffle crest.



Figure 5.5. Close up of 6′ tall bedrock chute and falls at CDFW barrier #1 (Site #7, Map 5). The bedrock box canyon narrows to +/- 11′ just above the large 3′ deep pool in the foreground.

Preliminary hydraulic modelling was performed to estimate the water surface profile and velocities at the bedrock falls barrier. Hydrology for the model was based flood frequency analysis of the peak flows from the MPWMD (Table 3.1). Results of the course HEC-RAS hydraulic model are shown on Figure 5.6.

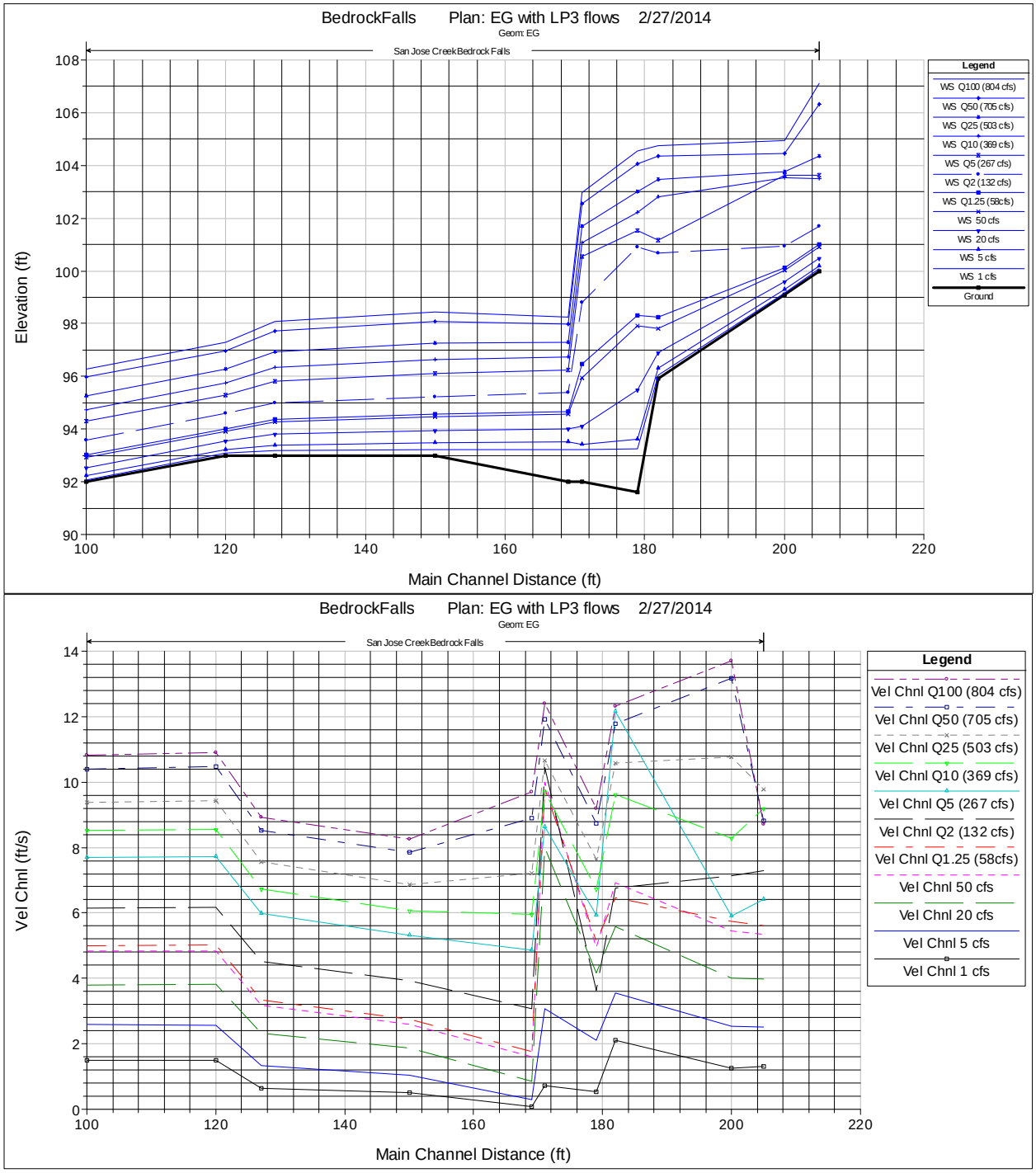


Figure 5.6. Estimate hydraulics from course HEC-RAS model at bedrock falls barrier

The coarse HEC-RAS hydraulic model and field evidence indicates the bedrock falls and chute is a total barrier for juvenile steelhead, by virtue of velocity, depth or hydraulic drop. More adept and athletic fish (juveniles and adults, depending on the flow) could possibly move

through the barrier with burst speed. In general, the barrier seems to begin to back water somewhere around 50 to 60 cfs, estimated as the 1.25 year flow and above, but average channel velocity is high and possibly prohibitive for passage. In addition, there still appears to be a prominent drop in the water surface (greater than 0.5 feet maximum, a guideline for passage of juveniles in CDFG, 2009). More detailed ground survey and advanced hydraulic modeling, beyond the scope of this study, will more clearly define the hydraulic nature of this barrier and implications to passage of juvenile and adult steelhead

Modifying natural bedrock falls/barriers to fish migration that have been present for thousands of years is not routinely embraced by state and federal regulatory agencies. However, if stakeholders desire to increase fish passage over a wider range of streamflows, the bedrock chute portion of the barrier could be most easily eliminated or modified in height by using drilling and explosive techniques. However, additional investigation would be necessary for design considerations and to determine the subsurface conditions and depth to bedrock within the channel upstream of the top of the bedrock barrier.

The barrier is very isolated with no vehicular access to the site other than by walking more than ½ mile up the channel of SJC. Constructing a roughened channel to reduce the height of the barrier would be cost-prohibitive, technically challenging, and result in eliminating one of the largest and deepest pools observed along the main stem of SJC. We recommend discussing the natural barrier with CDFW and NOAA Fisheries. Please refer to *Section 7.4 Recommendations for Future Work* for additional discussion.

5.2.1.3 PWA Site #47 log jam at station # 5.05

The largest temporary log jam observed by PWA during the channel surveys is located approximately 3,200′ upstream from the mouth of Seneca Creek (Site #47, Map 5). The double log jam appears to have formed after 2006 since the CDFW stream surveys (Nelson, 2006a) made no specific mention on the presence of the jam. The key lower log jam is composed of several 2′ to 3′ diameter logs and other rafted woody debris that span the channel of SJC just upstream of two large live redwoods located on the left and right bank of the channel (Figure 5.14). The second upper log jam is located 35′ farther upstream and is composed of a single 2′ to 3′ windfall tree and other rafted debris (Figure 5.13). Cumulatively, the jams elevate the streambed nearly 4′ vertically, and store a wedge of primarily sand sized material for a distance of 100′ upstream from the lower jam (Figure 5.7 through Figure 5.15, Figure 5.17 and Figure 5.18). Currently the jams store approximately 150 to 175 yd^3 of sediment.

The channel aggradation has lowered the channel slope (Figure 5.17) triggered channel widening in the vicinity of the 2 log jams (Figure 5.18), and resulted in the formation of a high-flow channel along the right unconfined, alluvial channel bank (Figure 5.13 and Figure 5.14). The-high flow channel is flowing over former floodplain deposits containing abundant roots from the large adjacent redwood tree.

The log jam is likely a barrier to juvenile fish migration during most summer and winter low flow conditions, however, during normal or greater winter flows, adult steelhead should have minimal difficulty traversing the jam or the high flow channel.

It should be noted that approximately 450′ upstream from the log jam at Site #47, a tremendous amount of recent SOD mortality is occurring along several hundred feet of SJC. The fallen trees have created an impenetrable woody debris accumulation that currently stores minimal amount of sediment (Figure 4.13, Figure 4.14, and Figure 5.16). However, the potential to form a new

large log jam and barrier to fish passage is significant. MPRPD personnel should evaluate the location and evaluate whether some amount of debris removal would be advantageous. Please refer to *Section 7.4 Recommendations for Future Work* for additional discussion.



Figure 5.7. Site #47: View upstream from cross section #1 (Figure 5.18). Start of survey in pool below spanning bay trees (Figure 5.17). Note coarse pebble to cobble riffle crest.



Figure 5.8. Site#47: View downstream from cross section #1 (Figure 5.18) at upstream end of channel stored sediments (Figure 5.17). Note the well sorted sands burying the tail of the riffle upstream, composed of large gravels.



Figure 5.9. Site#47: View upstream from cross section #2 (Figure 5.18) at aggraded channel reach.



Figure 5.10. Site#47: View downstream from cross section #2 (Figure 5.18) at upper logjam.



Figure 5.11. Site#47: View upstream from cross section #3 (Figure 5.18).



Figure 5.12. Site#47: View downstream from cross section #3 (Figure 5.18) at upper and lower logjams.



Figure 5.13. Site#47: Photo mosaic taken from right end stake of cross section #4 (Figure 5.18) showing the upper and lower logjams and associated channel stored sediment.



Figure 5.14. Site#47: Photo mosaic taken from thalweg looking upstream at lower logjam (in center of photo) and developing high flow channel and sediment filled plunge pool on left below exposed redwood roots. Note presence of boulders on natural streambed downstream of the logjam.



Figure 5.15. Site#47: View downstream from near centerline of San Jose Creek illustrating typical SJC riffle characteristics, as well as a small <5 yd3 left bank erosion site at yellow arc, and the end point for the long profile at the arrow.



Figure 5.16. Extensive Sudden Oak Death mortality and fallen trees potentially forming a large log jam 450 ft upstream from PWA Site #47.

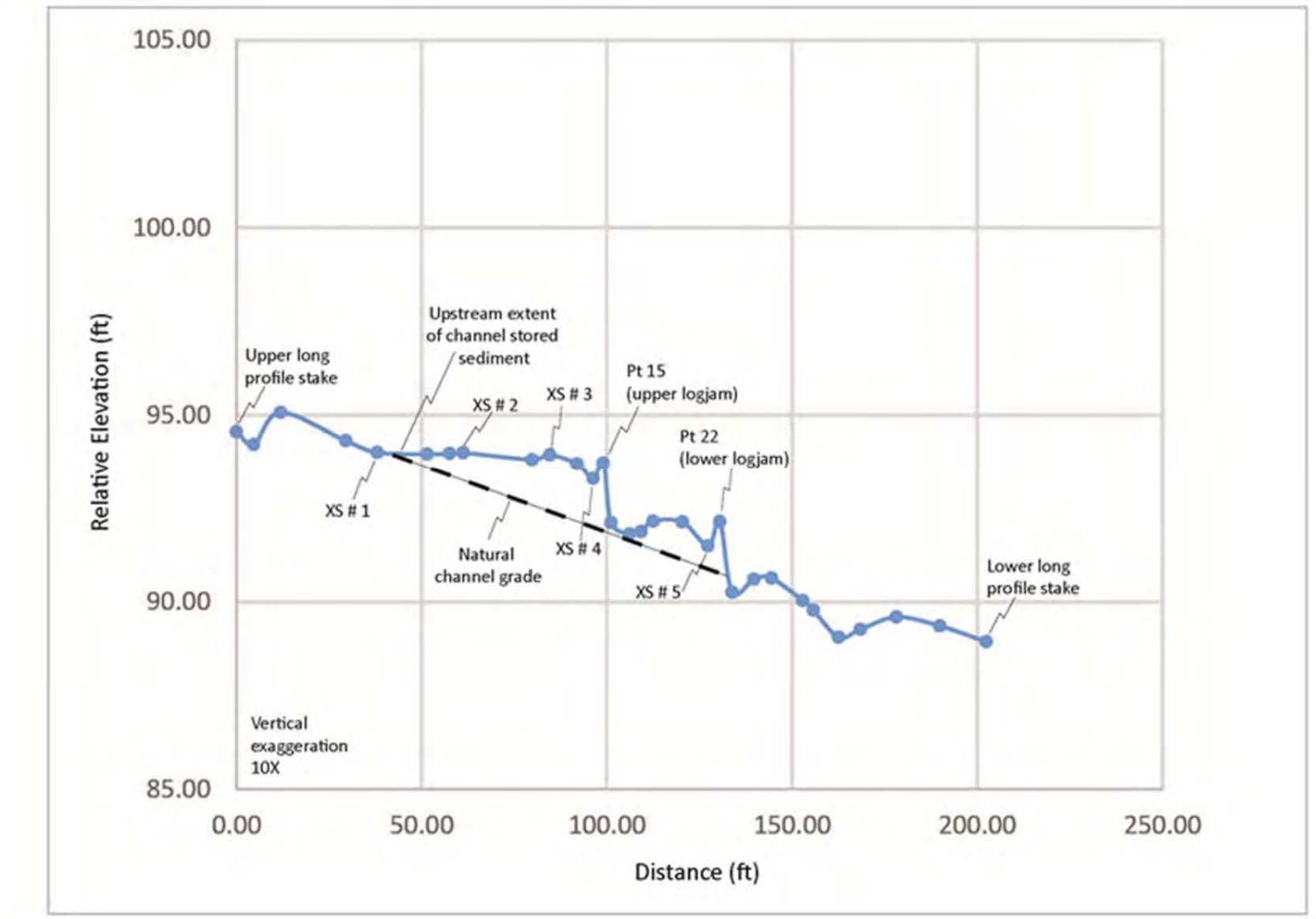


Figure 5.17.. Longitudinal Profile of Logjam, Site #47 along San Jose Creek.

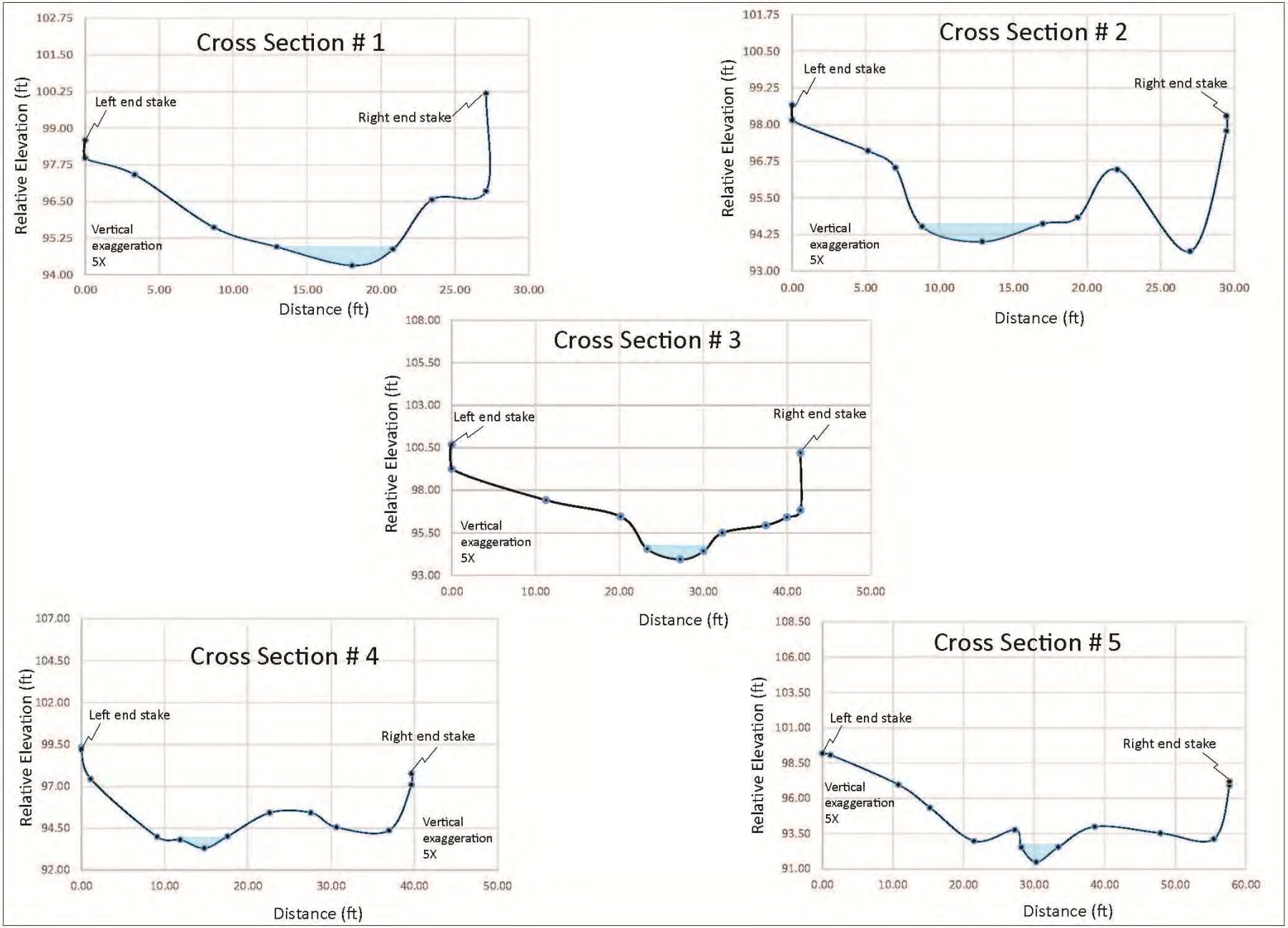


Figure 5.18. Cross Sections #1 through #5 of Logjam, Site #47 along San Jose Creek.

5.2.1.4 CDFW barrier #2 near CDFW station # 7.5

The second barrier identified by CDFW (Nelson, 2006a) consists of a large 8'+/- redwood that fell from the steep left bank hillslope across the channel of upper SJC (Map 5 and Figure 5.19 and Figure 5.20). The tree was located on the outside of a bend in SJC and likely due to bank erosion, the tree and rootwad fell and nearly 100% plugged the well-incised channel of SJC. Based on numerous vertical redwood sprouts growing on the fallen tree trunk, it is estimated the tree fell approximately 25 to 30 years ago, at the minimum. Due to the near complete blockage of the active channel of SJC, it appears woody debris and sediment in transport rapidly backfilled the natural channel to near the height of the downed redwood trunk over the next decade or so. CDFW indicated barrier #2 was probably the most significant barrier to anadromous fish passage in the watershed (Nelson, 2006a).

Currently the temporary log jam barrier is very sound and stable, forms a 8' near vertical step in the channel and is likely to remain intact for many decades, if not much longer. There is evidence of minor seepage from the base of the jam, but this is unlikely to trigger release of the channel stored sediments upstream of the tree truck and rootwad.

Channel aggradation associated with barrier #2 extends approximately 500' upstream based on the presence of a near uniform, fine grained sandy streambed and the lack of visible coarser pebble, cobble and boulder bed materials (Figure 5.21 and Figure 5.22). Upstream of the zone of aggradation, the channel of SJC coarsen to a more typical pebble to boulder streambed and the channel gradient increases slightly.



Figure 5.19. View upstream from SJC at CDFW log jam barrier #2 in distance and at headcut on

right bank terrace where diverted SJC streamflow re-enters the main stem of SJC.



Figure 5.20. View downstream taken from top of CDFW barrier #2 with 8′ vertical step in channel. Note old-growth terrace on right bank where stream diversion flows re-enter SJC.



Figure 5.21. View downstream from near station #180 in the long profile at aggraded sandy streambed and stored sediment upstream of barrier #2. About 50′ downstream of the large leaning redwood is the location where SJC is diverted onto the right bank terrace.

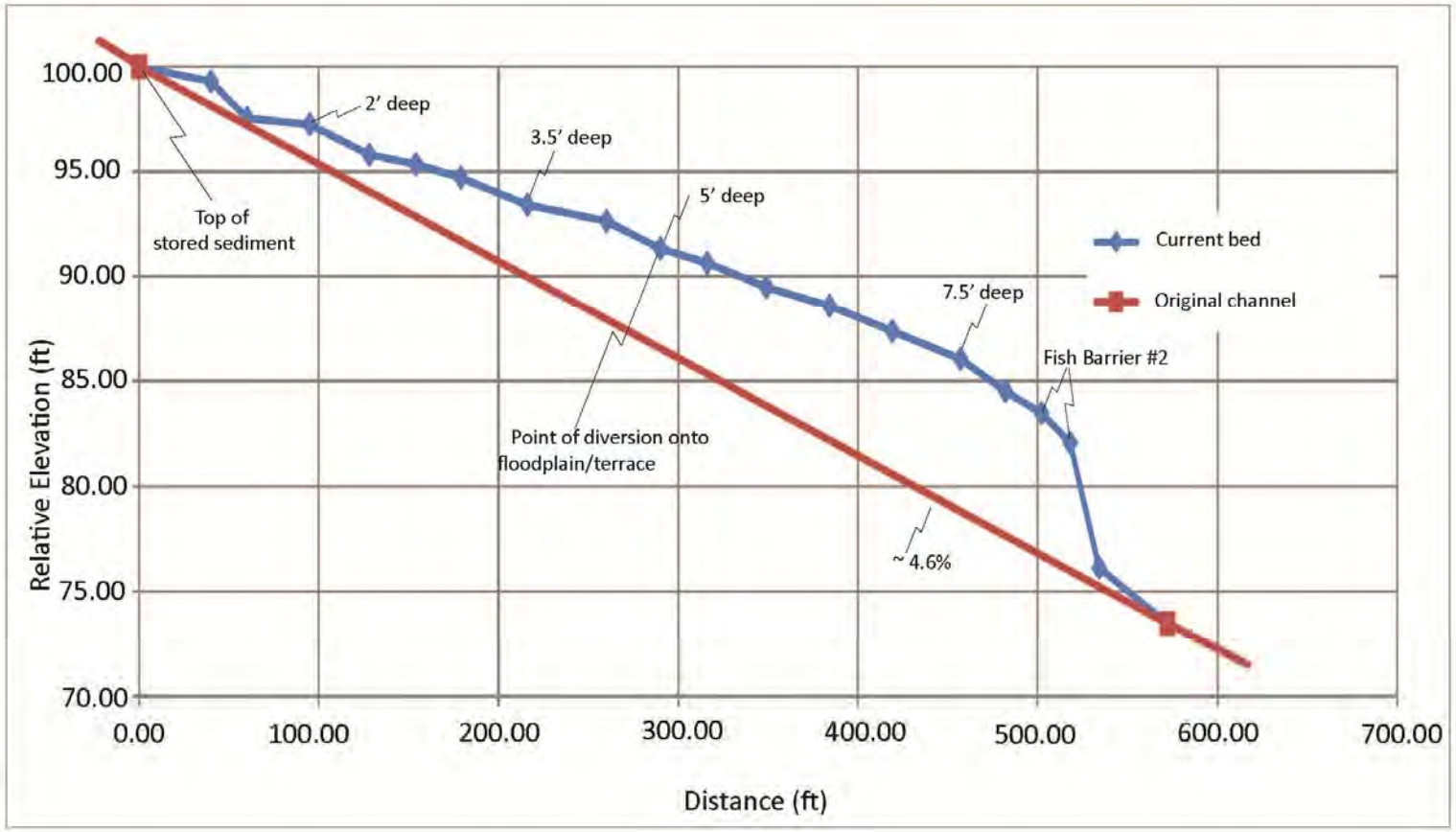


Figure 5.22. Longitudinal profile of Fish Barrier #2, large redwood logjam with side channel on San Jose Creek.

We estimate the volume of channel stored sediment, primarily sand-sized material, that has been deposited upstream of barrier #2 is approximately 1,400 yd^3. It is estimated the original natural channel grade beneath the stored sediment is approximately 4.6% (Figure 5.22).

Approximately 210′ upstream from the log jam, it appears aggradation within the natural channel elevated the natural streambed to equal the floodplain/terrace surface elevation, and SJC streamflow has been diverted onto the right bank surface and out of the natural channel. For at least a decade or so, it appears essentially all of SJC streamflow has been flowing through an average 4′ to 6′ wide, very poorly incised diversion channel along and across the right bank terrace surface that hosts old growth redwoods (Figure 5.23). The diverted SJC streamflow re-enters the main stem of SJC about 30′ downstream from barrier #2 (Figure 5.19). Streamflow has created a quasi-stable approximately 8′ tall headcut off the right bank terrace. The headcut is a maze of dense old growth root systems that are severely limiting migration of the headcut (Figure 5.20).

We consider barrier #2 and the current terrace channel and headcut to be a near permanent, long term barrier to both adult and juvenile steelhead migration. The barrier is located in a very remote portion of upper SJC, there is no easy access for heavy equipment to reach the site, and the quality and extent of habitat upstream of the barrier is likely far less than the habitat located downstream of the barrier. Consequently, the costs to remove the barrier verses instream habitat gains and potential impacts to SJC suggest efforts to modify or remove the barrier are questionable. It is potentially possible to cut a large



Figure 5.23. View downstream from near station #350 in long profile at diverted SJC stream across old growth terrace. The channel averages 4′ to 6′ wide, is very poorly incised and

characterized by a sandy streambed.

Deep, average 10′ wide notch through the trunk of the fallen redwood, but this would result in the release of most of the channel stored sediment, since there is no easy way to excavate the sediment. The large rootwad may also be problematic, since it would likely continue to block the channel and in the future, potentially capture additional organic debris in transport.

5.2.1.5 CDFW barrier #3 near CDFW station 8.0

The third and upstream-most barrier identified by CDFW (Nelson, 2006a) consists of a ½ dozen large old growth logs and trees with rootwads and lots of medium and small wood debris that has been rafted onto the core wood (Figure 5.24). It appears the barrier has been blocking the channel of SJC for 3 or more decades. Formation of the core log jam is difficult to explain in the old growth forest location. The log jam appears very solid and stable and forms a 7′ to 8′ steep in the channel (Figure 5.25). There is a minor amount of seepage at the base of the jam.

The log jam has stored sediment, primarily sand sized material, for a distance of 190′ upstream (Figure 5.27), and all stored sediment is contained within the active channel (Figure 5.26). It appears at some time in the past sediment accumulated in the channel to the current top of the log jam. Subsequently, field evidence indicates some form of piping/sink holes must have occurred/formed immediately upstream of the jam that has resulted in re-incision and transport of a portion of the stored sediment through the jam (Figure 5.25 and Figure 5.26). The incised notch varies in the upstream direction, but averages 1′ to 3′ deep and 5′ to 10′ wide.



Figure 5.24. View upstream at CDFW barrier #3 taken from top right bank. The complex log jam creates a 7′ to 8′ tall fish barrier and total blockage of upper SJC.



Figure 5.25. View downstream at crest of log jam (at survey rod) with channel stored sediment covered by litter. Note inactive sinkhole near dam crest and recently incised channel upstream of the sinkhole.



Figure 5.26. View downstream taken from station #8.0 in long profile at recently re-incised channel through previously stored sediment.

In the past, we estimate the maximum amount of stored sediment behind the jam was approximately 320 yd^3. The more recent incision of the channel stored sediment wedge released approximately 80 to 85 yd^3 of mostly sand sized material through the log jam. Currently, we estimate 235 to 240 yd^3 is still stored behind the barrier. It is estimated that the buried natural channel gradient is approximately 7.5% through the stream reach influenced by the log jam (Figure 5.27).

Based on the evidence of past incision through previously stored sediments, the fate of the remaining stored sediment upstream of the jam is questionable. Unlike at CDFW barrier #2, the remaining stored sediment at barrier #3 has a higher potential to be released during future high flow events. The field evidence suggests the completeness of the debris blockage in the sub-surface above the jam is less tight than at barrier #2.

Currently, barrier #3 is a total barrier to salmonid migration. While the potential for the log jam to fail or breach is extremely low, it exhibits a moderate to high potential to periodically release stored sediment from above the jam. In 2006, Nelson ended her habitat typing surveys at barrier #3 suggesting minimal anadromous habitat is present upstream from this point in the watershed. This is supported by the steeper projected natural channel gradient of 7.5% above the barrier. This coupled with the near permanent blockage of fish passage at barrier #2 suggest treating the feature would be more likely classified as a sediment management project rather than a fish passage project.

Restoration options at barrier #3 are more feasible than at CDFW barriers #1 and #2. While in an old growth setting, the adjacent natural hillslope are not steep, and heavy equipment access to the barrier and its' stored sediment wedge could be fairly easily accomplished. Utilizing heavy equipment to remove the sediment within the lower 90' to 100' of channel above the jam, approximately 75% of the total volume of channel stored sediment upstream of the barrier could be excavated and safely spoiled upon the adjacent right bank terrace/fan surfaces. The log jam could also be fairly easily dis-assembled, and the wood could be re-introduced to the channel reach so as to provide for improved habitat and channel complexity.

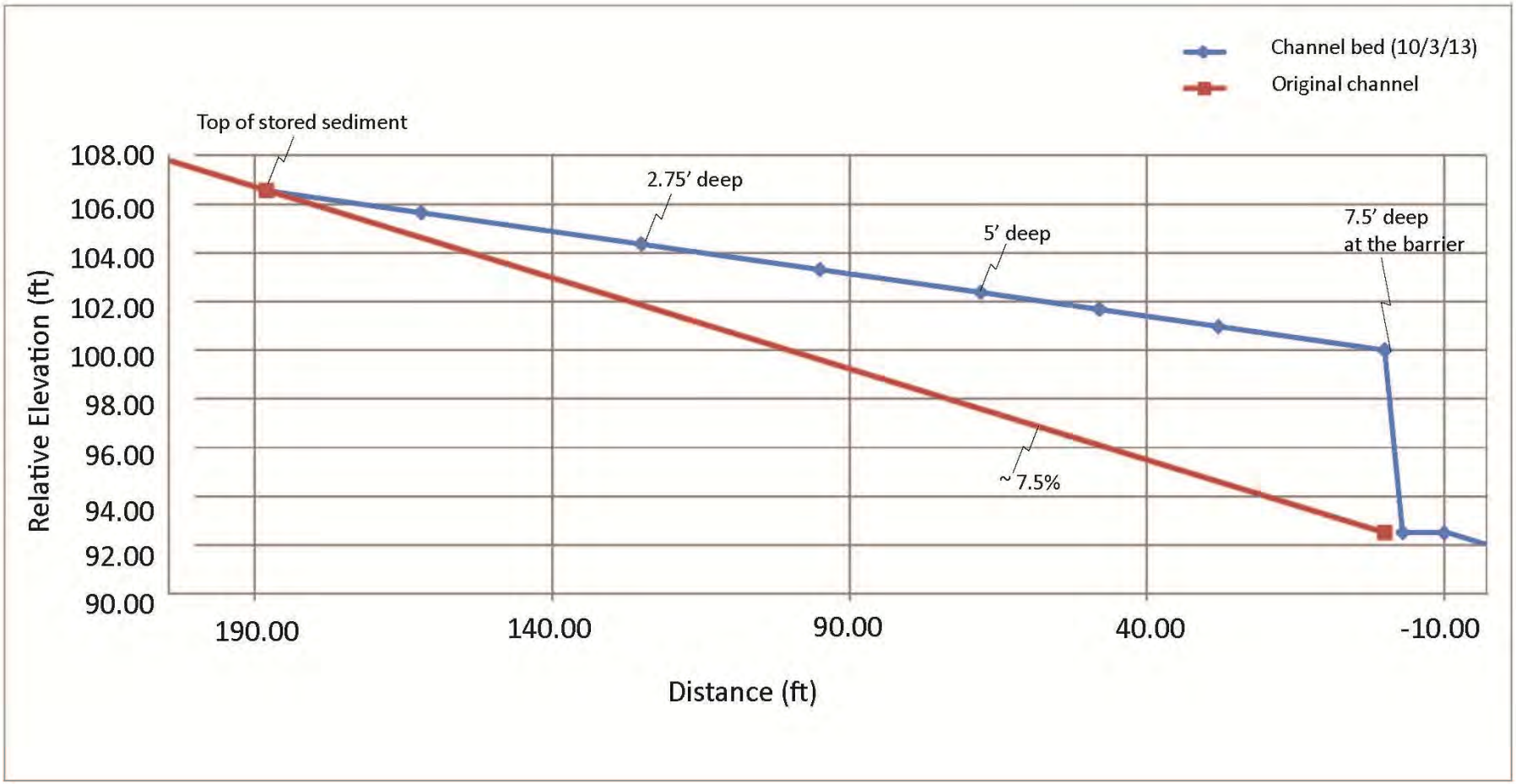


Figure 5.27. Longitudinal Profile at Fish Barrier #3, large multi logjam on San Jose Creek.

5.2.2 Seneca Creek Potential Barriers

There are two potential barriers to fish passage identified by both Nelson (CDFW 2006b) and PWA during 2013. The downstream man-made partial barrier is located in the middle watershed adjacent the old homestead at stream mile 1.74 (Site #37, Map 5). The upper barrier is a temporary barrier at stream mile 1.9 composed of several large root wads and rafted smaller debris (Site #41, Map 5).

5.2.2.1 Barrier at 1.74 mile

The man-made barrier consists of a 4′ tall x 20′ wide concrete dam that spans the channel at a ford road crossing just upstream of the old homestead house (Figure 5.28). There is a 6′ wide opening in the dam face for flashboard installation in order to impound stream flow annually.

A multi-stepped concrete apron creates a 2.5′ vertical step in the channel that extents approximately 13′ downstream from the spillway and results in a shallow and fast water cascade (Figure 5.28) eliminating jump pools and impairing passage. It appears it has been many decades since the dam was fully functional and the dam currently served as a total temporary barrier to upstream adult and juvenile steelhead migration. In its present condition, juvenile fish passage would be very difficult because of high velocities and shallow water depths over the apron during most flows.

Because the homestead is no longer a residence, it may be advantageous and a relatively straight-forward task to completely remove the man-made structure if it is not determined to be a site of cultural and/or historical significance. Vehicular access to the location is easily available and the stream channel is low gradient and poorly incised at the dam location. We estimate approximately 20 yd^3 of primarily sand-sized channel stored sediment is located upstream of the dam. In removing the channel stored sediment, the approaches to the ford crossing may need to be slightly modified, lessened in steepness, in order to accommodate post dam removal vehicular access.



Figure 5.28. View upstream at concrete dam face and apron on Seneca Creek (Site #37, Map 5) located at stream mile 1.47 near the old homestead.

5.2.2.2 CDFW barrier at station 1.9 mile

Based on the 2006 CDFW instream assessment along Seneca Creek, numerous features (log jams, culverted road crossings, and a flashboard dam) were identified as being potential impediments to fish passage under certain flow regimes. However, the only identified feature classified as a barrier to both fish life stages during most flow regimes was a LWD log jam located within habitat unit #414 at stream mile 1.9 (Site # 41, Map 5). This log jam is comprised of 2 LWD stumps with SWD filling interstitial spaces and is 5′ to 7′ high with no jump pool located downstream of the jam (Figure 5.29).

During the instream assessment and field reconnaissance along Seneca Creek streamside roads, we observed many of the log jams that are potential impediments to fish during low flow regimes. In addition, we identified and confirmed that the log jam at stream mile 1.9 was a temporary fish barrier for all life stages at most flows. We did not survey this log jam as part of our fish barrier analysis. However, the log jam is located in a Strather Order 3 stream with an active channel width that rarely exceeds 8′ in width. While still within a perennial stream reach, summer low flows are extremely low thereby limiting the long term benefit of the habitat.



Figure 5.29. View looking upstream at site #41 (Map 5) at station #1.9. Photo taken from Nelson, 2006b.

5.3 Findings and recommendations regarding barriers

- The barrier identified as CDFW #1, or the natural bedrock barrier on San Jose Creek between Animas and Seneca Creeks, appears to be a significant drop in low flow (6 feet total of a chute and 3-foot vertical drop to pool) and a very constricted section of creek. In higher flows the backwater will raise the tailwater and ease the jump heights, but it still may reflect a significant barrier with a drop and a plunging water fall. Only strong swimmers would make it past this lower barrier. If there is concern for passage and restoration, the stakeholders might consider chipping the bedrock to facilitate a lower drop or some other measures. A detailed hydraulic study is recommended at this barrier site to better understand hydraulics and develop recommendations to improve fish passage.
- Two of the other fish barriers identified by CDFW in Nelson (2006) also appear to be significant drops through old log jams. It may not be advantageous to facilitate removal of these log jams in consideration of instream habitat gains versus impacts and level of effort.

- Removal of a lower barrier on San Jose Creek, just downstream of Animas Creek, is suggested. The access is good and impacts to the stream would be minimal to remove a large abandoned concrete structure that is impeding stream flow and passage.
- There is a section of San Jose Creek upstream of the confluence Seneca Creek and PWA site #47 that may be delivering anomalously high wood loadings from sudden oak death and with the potential for formation of future additional wood jams that could impede passage. This area should be monitored for instream impacts.

6. SAN JOSE CREEK LONGSHORE LAGOON

6.1 Introduction and background

We investigated conditions at the San Jose Creek lagoon using a set of study methods developed for other Monterey Bay lagoons supporting anadromous salmonids. Budget available for the lagoon study was equivalent to about 5 days of work. The investigation, summarized below, show that San Jose Creek has a lagoon atypical of the regional norm in that:

- The lagoon occupies the lower portion of backdune river channel. The creek flows north for a distance of about 1200 feet parallel to the beach, then enters Carmel Bay at a point where it is deflected across the dunefield into the bay by a bedrock outcrop. Few other coastal lagoons have this property of flowing parallel to the beach for a distance of about 80 channel widths or more.
- San Jose Creek has developed a channel through the backdune reach with its bed and banks composed of clean, well-sorted coarse sand and fine gravel. Infiltration into the bed and through the dunefield to the ocean occurs throughout this reach. We have observed several occasions in which flows of 3 to 5 cfs (estimated by a hydrologist) a short distance upstream of the Highway 1 bridge have completely infiltrated in the coarse sand and fine gravels before flow can reach the lagoon.
- Once annual flows recede below 3 to 5 cfs, the lower portion of the lagoon is kept watered by tidewater flowing through the sands into the lagoon. The tidal inflows through the dunes cannot keep ponded the upper two-thirds of the channel up to the bridge, where the channel seems to have an elevation of about 10 to 11 feet above mean lower low water (0.14 feet above the NAVD88 datum). In many years, seasonal recession will have formed a flow barrier relatively early during the smolt downmigration period from early April through mid-June.
- The 'lagoon' most resembles that which forms at the mouth of Pilarcitos Creek, near Half Moon Bay. This stream also conveys a coarse-sand sediment with a predominantly granitic origin. It enters the backdune channel reach with a bed elevation of about 15 feet MLLW, and infiltrates 1 to 2 cfs before entering the ocean. Pilarcitos Creek has been studied as part of an enhancement planning process, discussed below.

6.2 Work Conducted

Three monitoring activities were performed in the lagoon during this study.

1. A water level sensor was set up just downstream of the Highway 1 bridge.
2. Two time lapse cameras were set up to monitor the lagoon hydrography during the salmonid migration season
3. Ground survey was performed to monitor geomorphology of the lagoon and compare to Lidar topography.

6.2.1 Unique geomorphology

The hydrography and geomorphology of the lagoon differs from that for most central coast lagoons. As noted above, the lagoon has always formed in a backdune channel with a long reach between the bridge and the ocean. It is underlain by a thick wedge of coarse sand over

bedrock. Our impression, and several observations comparing flows at the MPWMD gage and the Highway 1 bridge, suggest that infiltration occurs upstream of the bridge (see Appendix A).

6.2.2 Similar unique role in salmonid ecology

Relative to other lagoons for streams of similar size along the Santa Cruz and Monterey coasts (such as Aptos or Scott Creek, or the lagoons at the mouths of Watsonville Slough and the Little Sur River) beach bar opening are likely to be more infrequent, with greater daily fluctuations perhaps limiting rearing value, and not sufficient to sustain ponding to near the bridge, where essentially the downstream limit of continuous cover.

6.2.3 No role in amphibian or reptile ecology

It appears to us that the diurnal fluctuations and limit values of the lagoon for amphibians and reptiles. The backdune channel is highly trafficked by visitors, which may also limit use.

6.2.4 Pilarcitos Creek Lagoon as site analog

Work done to enhance Pilarcitos Lagoon can inform the conceptual approach to the San Jose Lagoon. Pilarcitos Lagoon also has a supratidal point of entry into a long backdune channel which ponds intermittently. It has been studied intensively for potential enhancement (Parke and Hecht, 2009; Siegel and others, 2010). Three alternative concepts were assessed to improve steelhead upmigration and smolt downmigration, as part of a larger watershed-enhancement plan directed by the resource agencies:

a. Deflecting flow directly into the Pacific Ocean at the elbow where the backdune channel began, using a set of groins
b. Using step-pool morphology to minimize infiltration into the dune and stabilize a relatively permanent channel.
c. No action for the backdune channel, with enhanced willow planting to provide shade, cover, and resting habitat for the migrating salmonids.

Ultimately, the resource agencies chose to not pursue any of these alternatives, given the level of management that each might need, as well as the general intrusiveness of modifying the stream course. We suspect that much can learned from the Pilarcitos experience. An effort to define the biological values of the lagoon would be a good place to direct further progress in working with the San Jose Lagoon.

6.3 Water Level Gaging and Ground Survey

In December 2012 a staff plate was installed downstream of the Highway 1 bridge. On February 5, 2013 Balance installed a water level recorder at the same location, about 30 feet downstream of the Highway 1 bridge, within a thicket of (cattails/bulrush). The flow pattern under the bridge appears to be wide flat channel on a sand bed, which then enters thick aquatic vegetation and emerges on the beach to follow a long path northward through the dunes to the mouth at the ocean. The water level sensor was installed to monitor the lagoon/outlet levels. The gaging record is shown on Figure 3.8. Water-level data were adjusted vertically to approximately NAVD 88, based on ground survey performed May 2, 2013 and datum corrections to match Lidar data from the 2009 - 2011 CA Coastal Conservancy Coastal Lidar Project. NGS survey benchmarks were not recoverable near the site, so vertical adjustments are based survey shots on the bridge deck, compared to the Lidar data.

As shown on Figure 3.8, the water levels fluctuate daily. During WY2013, pools dried up on June 4, 2013, and remained subsurface through January 2014. The low water level and dry creek at the Highway 1 bridge is primarily linked to the critically dry two year period of this study and stream gaging effort.

Ground surveys were also used at the lagoon to monitor changes in the channel cross section and profile through the study and during openings of the creek, as available. Five cross sections and a long profile of the creek were performed on May 2, 2014 (Figure 6.1). At the time of the ground survey, the creek was not flowing to the ocean and had not been since March, due to the critically dry year. The surveyed cross sections are shown on Figure 6.2, in comparison to Lidar data developed from the 2009 - 2011 CA Coastal Conservancy Coastal Lidar Project.

6.4 Photo documentation of lagoon with time lapse cameras

Two remote time-lapse cameras were set up and recorded images at 5-minute intervals from February 16 to June 4, 2013, to document the anticipated opening and closing of the mouth of San Jose Creek during the salmonid migration/passage season. One camera was positioned to monitor the lagoon water levels, lagoon hydrography, and geomorphology and the other was oriented to monitor the opening and closing of the mouth of San Jose Creek. A typical cycle of tidal inundation and cycling of lagoon water is shown on Figure 6.3.

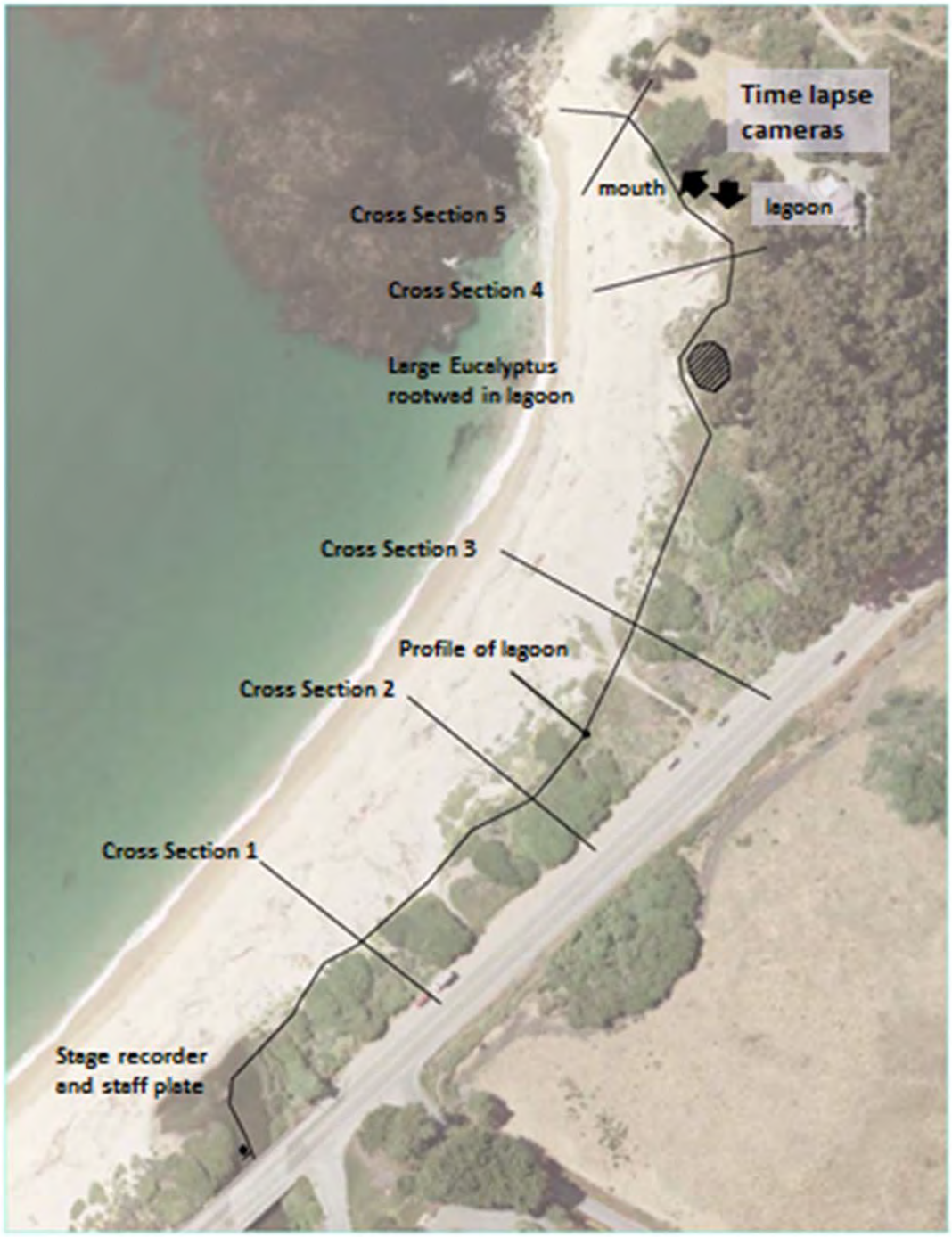


Figure 6.1. San Jose Creek Lagoon survey, time lapse camera locations, and water level recorder location

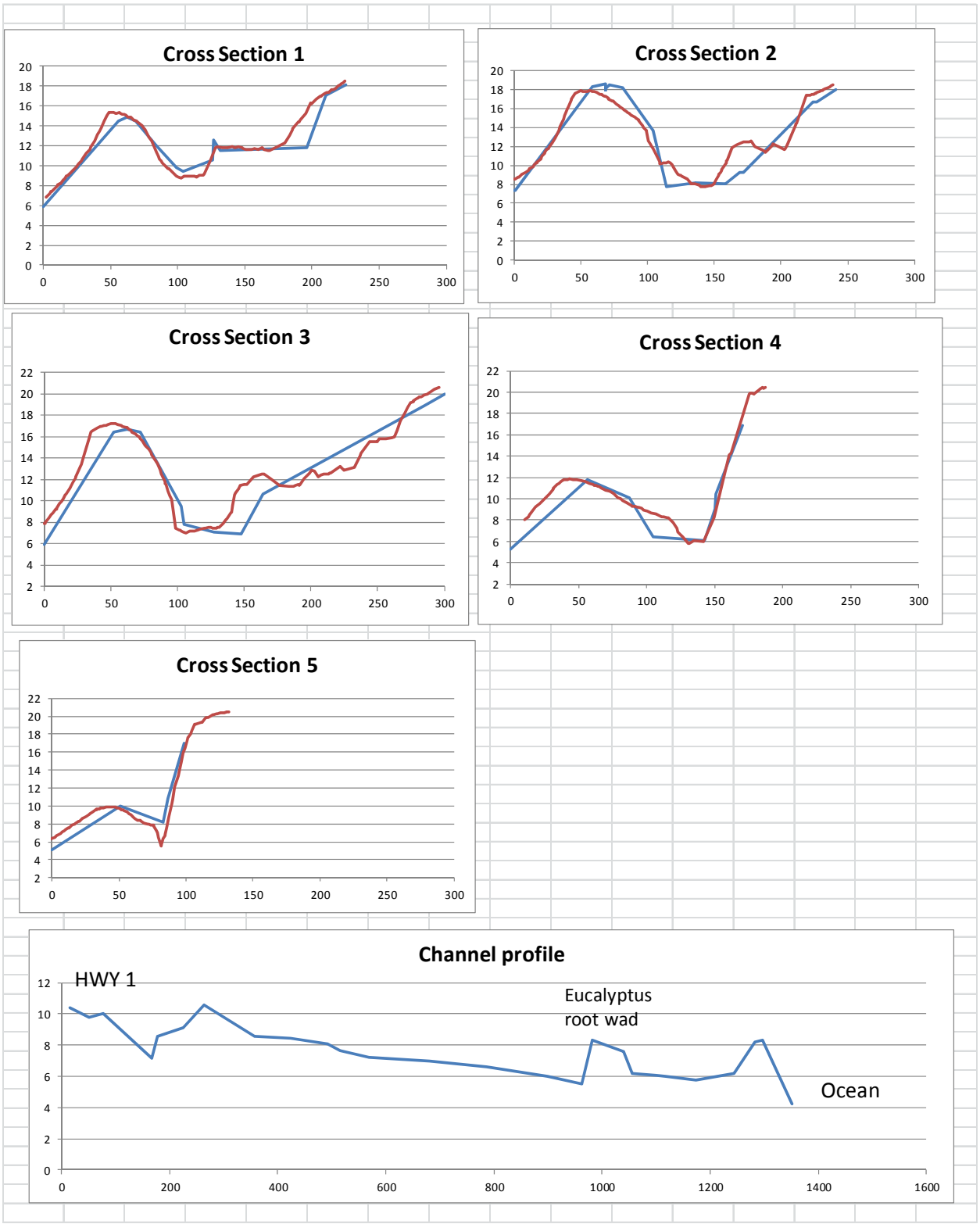


Figure 6.2. San Jose Creek Lagoon surveyed cross sections and profile from May 2, 2013 (blue lines), compared to 2009 – 2011 CA Coastal Conservancy Coastal Lidar Project (red lines). Elevations in NAVD 88, approximately MLLW datum.



Figure 6.3. Typical photos from time lapse photography showing relation of lagoon inundation to tidal cycle.

6.5 Observations and Recommendations

6.5.1 Alignment and geometry of San Jose Creek lagoon

As shown on historic aerial photography and historic oblique photography from the Coastal Project (see Appendix A), the lagoon retains a long-shore orientation in water year 2013, running northward from the Highway 1 crossing along the back side of the beach for about 1,200 feet until a bedrock formation pushes deflects the flow in the lagoon seaward through a low spot in the barrier dune. The cross section geometry and profile did not change appreciably in during this dry water year.

The cross section and profile of the lagoon seemed to remain somewhat unchanged during the course of this study, with the exception of wave over-run that altered dune structure near the mouth of the creek, at the northern end of Monastery Beach. In addition, about 300 feet from the mouth, a large 15' diameter (estimated) rootwad from fallen eucalyptus trees is blocking and deflecting flow in the lagoon and forming a sediment plug within the lagoon. Beyond these geomorphic features, aeolian processes and public access are the next most influential factors affecting lagoon geomorphology.

Also note that ground survey on May 2, 2013 is not that different from the LiDAR cross sections (Figure 6.2), with the prominent dune between the lagoon and the ocean. There are some minor topographic differences between the lagoon and highway, but this can possibly be explained by limited survey shots due to poison oak, or LiDAR inaccuracies from vegetation interference. A comparison of the two data sets set suggests and supports the concept that the lagoon is typically a narrow long-shore lagoon that is deflected north, bounded by a barrier dune and impacted by tidal seepage.

6.5.2 Opening and closing of lagoon

Opening and closing of the lagoon is complex interaction of tidal dynamics, wave energy, fluvial activity, groundwater levels, hyperheic flow, and site lithology. An attenuated shallow opening of the mouth of San Jose Creek appears mostly frequently with a high tide of above 4.5 MLLW. A summary of observed openings and closings of the lagoon in the salmonid migration season is shown on Table 6.1. The process of lagoon opening appears to be related to tidal water permeating through the dune structure into the lagoon and waves that manage to traverse the dune structure to strengthen the opening. Inflow from San Jose Creek also has an influence, but the baseline sequence for opening seems to be a function of the tide and wave interaction.

Table 6.1 Observed opening and closing of San Jose Creek lagoon at Monastery Beach during salmonid migration season for water year 2013, according to review of time-lapse photography

Dates	Open/closed	observations
2/17 – 2/27	Partial day opening	Changes with high tide, outflow shallow, 0.5' or less
3/7 – 3/12	Partial day opening	Changes with high tide, outflow shallow, likely opening due to wave activity
3/22 – 3/23	Partial day opening	Wave overrun imported sand and filled remnant channel, flow does not extend further inland anymore
4/8	Partial day opening	Wave overrun and short duration impoundment
4/9	Closed	Closed for rest of summer and fall , time lapse camera removed 6/4/13

Opening of the lagoon also appears related to a bedrock structure about 100 feet from the mouth that deflects outbound flow ocean-ward. Periods of higher baseflow and peaking flows

from storms from San Jose Creek appear to provide a setting for more frequent openings of the lagoon.

Based on comparison of tidal peaks and recorded images from the time-lapse cameras, it is estimated a high tide of about 4.5 feet MLLW typically raises the ocean level sufficiently and permeates through 50 to 70 feet of beach dunes to create a temporary lagoon.

According to a sample of beach sand, the average diameter (D50) of the poorly-graded (somewhat uniform grain size) coarse sand is about 2 mm, which correlates to a permeability of 20 to 50 feet per hour, or about one to three hours of travel time to traverse the barrier dune to the narrow long-shore lagoon. The short travel time through the coarse dune sand links tidal cycles and the presence of water in the lagoon, also evidenced by time lapse photo sequences, as shown on Figure 6.3. Unlike in many coastal lagoons, flow in San Jose Creek has relatively little effect on the depth and extent of the lagoon. We do not have sufficient data to establish the range of flows which open the barrier beach; our impression is that even small freshets generate sufficient flow to open the lagoon in April, May and June, the months when steelhead smolt outmigrate, provided that flow at the bridge exceeds 34 to 5 cfs. On two separate occasions, we observed flows of 2.5 to 3 cfs upstream of the bridge infiltrating into the sands before reaching the lagoon.

6.5.3 Further studies

Based on monitoring performed within the scope of this study, we doubt whether the physical attributes of the lagoon will support the same suite of habitat values characterizing other coastal lagoons. We suggest that a biological reconnaissance identify the potential uses of the lagoon, such that a more site-specific set of observation can be made. The anomalously dry year in which our necessarily limited study was conducted should be balanced with an additional more thorough coastal dynamic and fluvial study will better answer how often the lagoon will open. Littoral processes and tidal dynamics play a large role in lagoon opening. A recommended study to understand the lagoon cycling and evolution would combine a study of coastal dynamics, hydrologic analysis, and further geologic investigations of the Monastery Beach area.

7. KEY FINDINGS AND RECOMMENDATIONS

7.1 Sediment

As suggested by prior work in the early 1990s, sediment transport in San Jose Creek is relatively low relative to other Carmel-area channels, at about 3 to 30 tons per square mile during typical years. Lower values were measured in WY2013 and the first 4 months of WY2014. About half of the transport is sand.

Very little coarse gravel, cobbles or boulders are transported during typical years. Most of cobbles and boulders are in a position suggesting that they have not moved for many tens or perhaps 100s of years, with many being shaped by sandblasting, suggesting many, many years of immobility.

Bedload transport rates at the V-Notch gage suggest that the stream is now transporting higher loads at a given streamflow than were measured in 1991-1995 using similar equipment and methods. Because flows were so low during the recent sampling, this finding should be verified at higher flows before it is accepted. We believe that most of the additional sediment originates from a single actively-incision tributary which enters San Jose Creek from the north side just upstream of Van Winkley Creek, at Mile 5 on Rancho San Carlos Road. If so, the additional sediment could be mitigated by restoring this channel .

The work of the Balance/PWA team occurred during a period with virtually no episodic disturbance. Our observations and measurements characterize a period of chronic erosion, quiescent relative to the periods of episodic sedimentation. Overall- long-term sediment yields may be expected to half-again-as-large, or twice as large, as those measured during this study. Erosion may focus on the hillslopes during periods of episodicity, rather than chronic periods where the ridgetops may be focus of sediment entrainment as identified in the USLE analysis above.

7.2 Fish Barriers

A detailed hydraulic study is recommended for the bedrock falls barrier, identified as CDFW #1. The site presents complexities of hydraulics beyond the scope of this study. Because this barrier is low in the watershed, a better understanding of existing hydraulic conditions and required swimming performance will inform access to the rest of the watershed for spawning and rearing habitat.

Regarding fish barriers CDFW #2 and CDFW #3, based on field observations, it is suggested that these are left in place. See *Section 5* for more information.

Additional discussions on treatment for instream structures are provided below in *Section 7.4.2*.

7.3 Long-shore Lagoon

We suggest that a biological reconnaissance identify the potential uses of the lagoon, such that a more site-specific set of observation can be made. The anomalously dry year in which our necessarily limited study was conducted should be balanced with an additional more thorough

coastal dynamic and fluvial study will better answer how often the lagoon will open. Littoral processes and tidal dynamics play a large role in lagoon opening. A recommended study to understand the lagoon cycling and evolution would combine a study of coastal dynamics, hydrologic analysis, and further geologic investigations of the Monastery Beach area.

7.4 Recommendations for future work

7.4.1 Quantitative Road/trail Assessment

This study has determined that upslope erosional features are the most likely sources of sediment in the SJC watershed. One of the most important watershed management elements of long-term restoration and maintenance of both water quality and fish habitat is the reduction of future impacts from upland erosion and sediment delivery. Unlike many watershed improvement and restoration activities, erosion prevention through "storm-proofing" rural, ranch, and forest roads provides immediate benefits to the streams and aquatic habitat of a watershed (Weaver and Hagans, 1994, 1999; Weaver et al., 2006). It measurably diminishes the impact of road related erosion on the biological productivity of the watershed's streams, and allows future storm runoff to cleanse the streams of accumulated coarse and fine sediment, rather than allowing continued sediment delivery from managed areas.

We have seen the benefit of implementing erosion prevention and sediment reduction treatments along roads and trails through the successful storm-proofing of approximately 8 mi within Williams Canyon subwatershed. Since implementing these treatments, approximately 6,030 yd^3 of sediment was saved from entering Williams Canyon and keeping residence within SJC.

We recommend that future efforts be made to assess the remaining approximately 74 mi of road/trail within the watershed. The assessment(s) should identify and quantify all sources of future erosion and provide recommended treatments to reduce erosion and prevent future sediment delivery. In addition, a prioritized, treatment plan complete with a cost estimate and necessary labor and equipment needs should be a deliverable product.

7.4.2 Treatment of Identified Instream Sites

Although instream sources were not determined to be a significant input of sediment into the SJC watershed, based on the instream assessment we recommend that 14 of the 57 inventoried sites be treated to reduce sediment, improve instream habitat, and/or improve fish migration. Of the 14 sites recommended for treatment, 8 are road crossings, 5 are log jams, and 1 is a concrete instream dam (Table 7.1).

Table 7.1. Inventoried instream sites recommended for treatment, San Jose Creek Study, Monterey County, California.

Problem type		Instream sites	
		Inventoried (#)	**Recommended for treatment (#)**
Bank erosion		3	--
Landslide		1	--
Log jam		38	5
Other	Road crossing	12	8
	Dam	2	1
	Bedrock Cascade	1	--
Total		**57**	**14**

We recommend 4 different types of instream treatments along the inventoried reaches of SJC and Seneca Creek. Recommended treatments primarily consist of removing instream obstructions and excavating/removing material from the stream channel (Table 7.2). Including moving a small track driven excavator to and from the dam site, it is estimated approximately 10 hours of work will allow for demolishing the dam, and loading the concrete into a dump truck for removal from the SJC watershed to a proper spoil disposal location. It is unlikely any of the stored sediments behind the dam could be retrieved primarily because it is deposited in and amongst the natural boulders contained in the streambed. Temporary coffer dams will need to be constructed both upstream and downstream of any instream construction sites (i.e. the dam removal) site in order to isolate the work area and maintain water quality. In addition, electrofishing will be required to relocate fish and amphibians.

For additional treatment information, treatment summaries are provided in Table 7.2, which refer to information in Appendix C.

Table 7.3 details the 14 sites recommended for treatment and lists treatment immediacy, complexity, and effectiveness as well as the total estimated volume of excavated material and estimated hours for heavy equipment. The equipment needs are reported as equipment times, in hours, to treat sites. These estimates only include the time needed for the actual treatment work, and do not include additional construction activities such as mobilizing equipment and/or crews and traveling between sites. The estimated total cost to implement the recommended instream treatments for the project was not developed.

Table 7.2. Recommended treatments for inventoried instream sites, San Jose Creek Study, Monterey County, California.

Treatment type	No.	Comments
Remove existing culvert and install armored ford (wet) crossing	3	Remove existing culvert and all road fill and convert into a ford crossing (Site #26, 29, and 30)
Soil excavation	4	At 4 sites, excavate and remove a total of 225 yd^3 of sediment at 3 stream crossings (Site #26, 29, and 30) and concrete at 1 dam (Site #1) [a].
Remove, clear, or cut notch in LWD/SWD log jam	5	At 5 sites, Remove, clear a portion, or cut a notch in the existing log jam to allow for fish passage (Site #33, 49, 50, 51, and 52)
Rolling dip	17	Install to improve road drainage and reduce delivery of road related sediments to streams.
[a] Dam removal at Site #37 is not included in these recommendations due to the likelihood of it being designated a site of cultural and/or historical significance.		

7.5 Limitations

To be developed in the final draft

Table 7.3. Estimated heavy equipment and labor requirements based on treatment immediacy and effectiveness for instream inventoried sites recommended for treatment, San Jose Creek Study, Monterey County, California.

Site #	Treatment immediacy	Complexity	Effective-ness	Excavated volume[a] (yd^3)	Excavator (hr)	Dozer (hr)	Dump truck (hr)	Labor (hr)[b]
1	Moderate	Moderate	High	10	8	--	4	8
2	Low	Low	High-moderate	--	--	6	--	--
15	Low	Low	High-moderate	--	--	2	--	--
26	High-moderate	Moderate-low	High	70	3	2	--	2
29	High-moderate	Low	High	75	3	2	--	--
30	High-moderate	Moderate-low	High	70	2	2		2
33	Moderate	Low	High	--	--	--	--	2
38	Low	Low	Moderate	--	--	5	--	--
42	Moderate	Low	Moderate	--	--	2	--	--
46	Moderate - low	Low	Moderate	--	--	2	--	--
49	High-moderate	Moderate	High	--	--	--	--	60
50	High-moderate	Moderate	High	--	--	--	--	40
51	Moderate	Moderate-low	High-moderate	--	--	--	--	6
52	Moderate	Low	High-moderate	--	--	--	--	6
Total				**225**	**16**	**23**	**4**	**126**

Note: Equipment and labor times do not include hours necessary to move in and out of the project area and traveling between sites.

[a] Excavated volume includes material permanently removed and/or stored at a stable location out of the floodplain.

[b] Labor time includes using chainsaws and other hand tools.

8. REFERENCES

(Alphabetized)

Calfire, 2013, California Forest Practice Rules Title 14, California Code of Regulations Chapters 4, 4.5 and 10. Prepared for: California Licensed Timber Operators and California Registered Professional Foresters Compiled by: The California Department of Forestry and Fire Protection Resource Management, Forest Practice Program. Available from: www.fire.ca.gov

California Department of Fish and Game, 1962. Memorandum on instream survey of San Jose Creek

California Geological Survey, 1999, Factors affecting landslides in forested terrains: Department of Conservation, Division of Mines and Geology Note 50, 5 p. Available from: http://www.conservation.ca.gov/cgs/information/publications/cgs_notes/note_50/Documents/note50.pdf

California Geological Survey, 2010, Palo Corona Regional Park, Back-Country Parcel, Draft Final Wild Lands Road Assessment: Report prepared for MPRPD, 30?p.

Cook, T.D. 1978. Soil survey of Monterey County, California. U.S. Department of Agriculture Soil Conservation Service and Forest Service in cooperation with the University of California Agricultural Experiment Station. Washington, D.C

Cruden, D.M. 1991. A Simple Definition of a Landslide. Bulletin of the International Association of Engineering Geology, No. 43, pp.27-29.

Cruden, D.M., and Varnes, D.J., 1996, Landslide types and processes, *in* Turner A.K., and Shuster, R.L., eds., Landslides: investigation and mitigation: Washington, D.C., Transportation Research Board Special Report 247, p. 36-75.

Flosi, G., Downie, S., Hopelain, J., Bird, M., Coey, R., and Collins, B., 2010, California Salmonid Stream Habitat Restoration Manual, 4th edition. California Department of Fish and Game, Sacramento, California: Report, Volumes 1 and 2.

Furniss, M., Flanagan, S., and McFadin, B., 2000, Hydrologically-connected roads: An indicator of the influence of roads on chronic sedimentation, surface water hydrology and exposure to toxic chemicals: Fort Collins, CO, USDA Forest Service, Rocky Mountain Research Station, Stream Systems Technology Center, Stream Notes, July, 2000, p. 5-7.

Furniss, M.J., Roelofs, T.D., and Yee, C.S., 1991, Road construction and maintenance, *in* Meehan, W. R., ed., Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19, p. 297-323.

Hagans, D.K., Weaver, W.E., and Madej, M.A., 1986, Long-term on-site and off-site effects of logging and erosion in the Redwood Creek Basin, Northern California, *in* Papers presented at the American Geophysical Union meeting on cumulative effects (December 1985): New York, NY, National Council for Air and Stream Improvement Technical Bulletin, no. 490, p. 38-66. Available from: http://www.krisweb.com/biblio/gen_ncasi_hagans_etal_1986_roadsed.pdf

Harr, R.D., and Nichols, R.A. 1993, Stabilizing forest roads to help restore fish habitats: A northwest Washington example: Fisheries, v. 18, no. 4, p. 18-22.

Hecht, B., 2000, Drought, fire, and geology – key watershed influences in the northern Santa Lucia Mountains, California: Peninsula Geological Socienty, Spring Field Trip, Big Sur Coast, 2000 Guidebook, Salinia?Nacimiento Amalgamated Terrane, 7 p.

Hecht, B., 1981, Sequential changes in bed habitat conditions in the upper Carmel River following the Marble-Cone fire of August 1977, in Warner, R.E. and Hendrix, K.M., eds., California Riparian Systems: Ecology, Conservation and Productive Management, University of California Press, pp. 134-141.

Hecht, B., 1993, South of the Spotted Owl - restoration strategies for episodic channels and riparian corridors in Central California: proceedings of the Society of Wetlands Scientists, Western Wetlands Conference, Davis, California, March 25-27, 1993, 7 p., 7 figs.

Hecht, B. and Napolitano, M., 1995, Baseline characterization of sediment transport and sedimentation at the Santa Lucia Preserve, Monterey County: Interim Report prepared by Balance Hydrologics, Inc. for Santa Lucia Preserve, 58p.

Hecht, B., Woyshner, M., Brown, S., Donaldson, E., Richmond, S., and Owens, J., 2013: Deeply weathered granitics: Resilient aquifer storage for a changing climate: State of the Estuary Conference, Oakland, CA, Oct. 28-30, 2013. Poster and abstract.

Higgins, P.T., Dobush, S., and Fuller, D, 1992, Factors in Northern California threatening stocks with extinction: Arcata, CA, American Fisheries Society, Humboldt Chapter, 25 pp.

NMFS (National Marine Fisheries Service), 2000, Salmonid guidelines for forestry practices in California: Long Beach, CA, National Marine Fisheries Service, Southwest Regional Office, 16 p. Available from: http://swr.nmfs.noaa.gov/psd/sgfpc.htm

NMFS (National Marine Fisheries Service), 2001, Guidelines for salmonid passage at stream crossings: Long Beach, CA, National Marine Fisheries Service, Southwest Regional Office, 14 p. Available from: http://swr.nmfs.noaa.gov/hcd/NMFSSCG.PDF

Nelson, J., 2006a, Stream Inventory Report, San Jose Creek, California Department of Fish and Game: Report, 42p.

Nelson, J., 2006b, Stream Inventory Report, Seneca Creek, California Department of Fish and Game: Report, 24p.

Pacific Watershed Associates, 2007, Williams Creek Watershed Erosion Prevention Planning Project Mitteldorf Preserve, Monterey County, California PWA Report No. 07074101 [prepared for the California Department of Fish and Wildlife]. # of pages?

Pacific Watershed Associates, 2010, Mitteldorf Preserve Sediment Reduction Project, Monterey County, California PWA Report No. 11085701 [prepared for the California Department of Fish and Wildlife]. # of pages?

Paddock, E., Stoner, K., and Smith, D., 2012, Installation and initial analysis of two stream gages on San Jose Creek, Monterey County, CA. Central Coast Watershed Studies (CSUMB): Report, 25p.

Rosenberg, Lewis I., 2001, Digital geologic map of Monterey County, California.

Strahler, A. N., 1952. "Dynamic basis of geomorphology". *Geological Society of America Bulletin* 63: 923–938.

Titus, R. G., Erman, D. C.,, and Snider, W. M., 2011, History and status of steelhead in California coastal drainages south of San Francisco Bay. Report for California Department of Fish 'And Game, in preparation, 302p.

University of California Santa Cruz, 2013. Access to aerial photography reserves and scanning of historic aerial photos by Balance staff.

USDA Forest Service, 2000, Water/road interaction field guide: San Dimas, CA, San Dimas Technology and Development Center, 68 p. Available from: http://www.fs.fed.us/eng/pubs/pdf/00771803.pdf

USDA National Agriculture Imagery Program (NAIP), 2010, Digital orthoimagery of Monterey County, California: ortho_1-1_1n_s_ca085_2010_1, USDA-FSA Aerial Photography Field Office, Salt Lake City, Utah (downloaded on 8/29/2011 from http://datagateway.nrcs.usda.gov/)

USDA National Agriculture Imagery Program (NAIP), 2012, Digital orthoimagery of Monterey County, California: ortho_1-1_1n_s_ca097_2012_1, USDA-FSA Aerial Photography Field Office, Salt Lake City, Utah (downloaded on 8/08/2012 from http://datagateway.nrcs.usda.gov/)USGS, 1995, Mount Carmel, California [map]: Washington, D.C., U.S. Geological Survey, 7.5 Minute Map 36121D7, scale 1:24,000.

USDA NRCS Websoil Survey online server, 2014. Accessed February 24, 2014 to list soils and soil properties of areas within San Jose Creek Watershed. Website: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

USGS Streamstats online server, 2014. Accessed February 23, 2014 to tabulate watershed characteristics and estimate peak flows at mouth of San Jose Creek and at bedrock falls per Nelson (2006). Website: http://water.usgs.gov/osw/streamstats/california.html

Wagner, David L., Cal Geology Nov 1991/vol.44/no 11. "Decomposed Granite" p243-249.

Weaver, W.E., and Hagans, D.K., 1994, Handbook for forest and ranch roads: a guide for planning, designing, constructing, reconstructing, maintaining and closing wildland roads: Ukiah, CA, Mendocino County Resource Conservation District, 198 p. Available from: http://www.mcrcd.org/publications/

Weaver, W.E, and Hagans, D.K., 1999, Storm-proofing forest roads, in Sessions, J., and Chung, W., eds., Proceedings of the International Mountain Logging and 10th Pacific Northwest Skyline Symposium, Corvallis, Oregon, April 1999: Oregon State University, Forest Engineering Department, p 230-245. Available from: http://www.iufro.org/science/divisions/division-3/30000/30600/publications/

Weaver, W.E., Hagans, D.K., Weppner, E., 2006, Part X: Upslope erosion inventory and sediment control guidance, in Flosi, G., Downie, S., et al., eds., California salmonid stream habitat restoration manual, 3d. ed.: Sacramento, CA, California Department of Fish and Game, 207p.

Google Earth, May 12, 1994, September 6, 1998, June 6, 2002, October 1, 2002, July 30, 2003, July 30, 2004, December 30, 2005, June 19, 2007, August 14, 2008, June 5, 2009, July 13, 2010, December 2, 2011, and May 5, 2012. Accessed between December 2012 and January 2014.

Appendix 2-e

Canyon Del Rey Master Drainage Plan Update

DRAFT

MEMO

To: Mr. Larry Hampson, District Engineer, Monterey Peninsula Water Management District

From: Benjamin Roberts, Ph.D., P.E. and Edward Ballman, P.E.

Date: February 14, 2014

Subject: Canyon del Rey Task 1 Deliverables and Memo Report

The deliverables for Task 1 of the Canyon del Rey Master Drainage Plan Update project are as follows:

- Digital submittal of the spatial data collected for use in the study (provided at the completion of the study).
- Draft versions of updates to the watershed maps, sub-watershed maps, and hill shade map (final versions will be provided in the report completed under Task 5.4.2).
- Database of collected and processed rain gage data in excel format.
- Memo summarizing precipitation analysis and results including depth-duration frequency tables and graphs for 2-, 5-, 10-, 25-, 50-, 100-, and 500-year events and an updated isohyet map.

As requested, we are providing in this memo the text, tables and figures relating to Task 1 which will be part of the updated Master Drainage Plan. The digital files, map revisions, and rain gage database will be provided in separate submittals with the final plan.

1. WATERSHED AND FACILITIES DESCRIPTIONS

1.1 Hydrologic setting

High flows during the extremely wet years of 1995 and 1998 exposed several drainage problems and confirmed some of the predictions made in the 1977 study, especially concerning head-cutting in Canyon Del Rey Creek (the creek or CdR creek) and culvert sedimentation of road drainage facilities. Laguna Grande and Roberts Lakes, located at the terminus of the watershed, continue to experience sedimentation and have a reduced flood control capacity.

It should be noted that Monterey County implemented regulations to prevent or reduce sediment and runoff from new development beginning in the 1960's. In addition, since completion of the 1977 drainage plan, the City of Monterey has implemented all recommendations from that plan for new development within the city limits of Monterey.

Along the Central California Coast, which contains a significant number of watersheds underlain with sandy soils, it has been noted recently that the hydrologic effects of development may be much greater in deep sandy soils than in loamy, clay and/or shallow soils. At the time of the 1977 drainage study, little or no information was available about this effect and no data on lake sedimentation, or bed load and suspended load in the creek, were available.

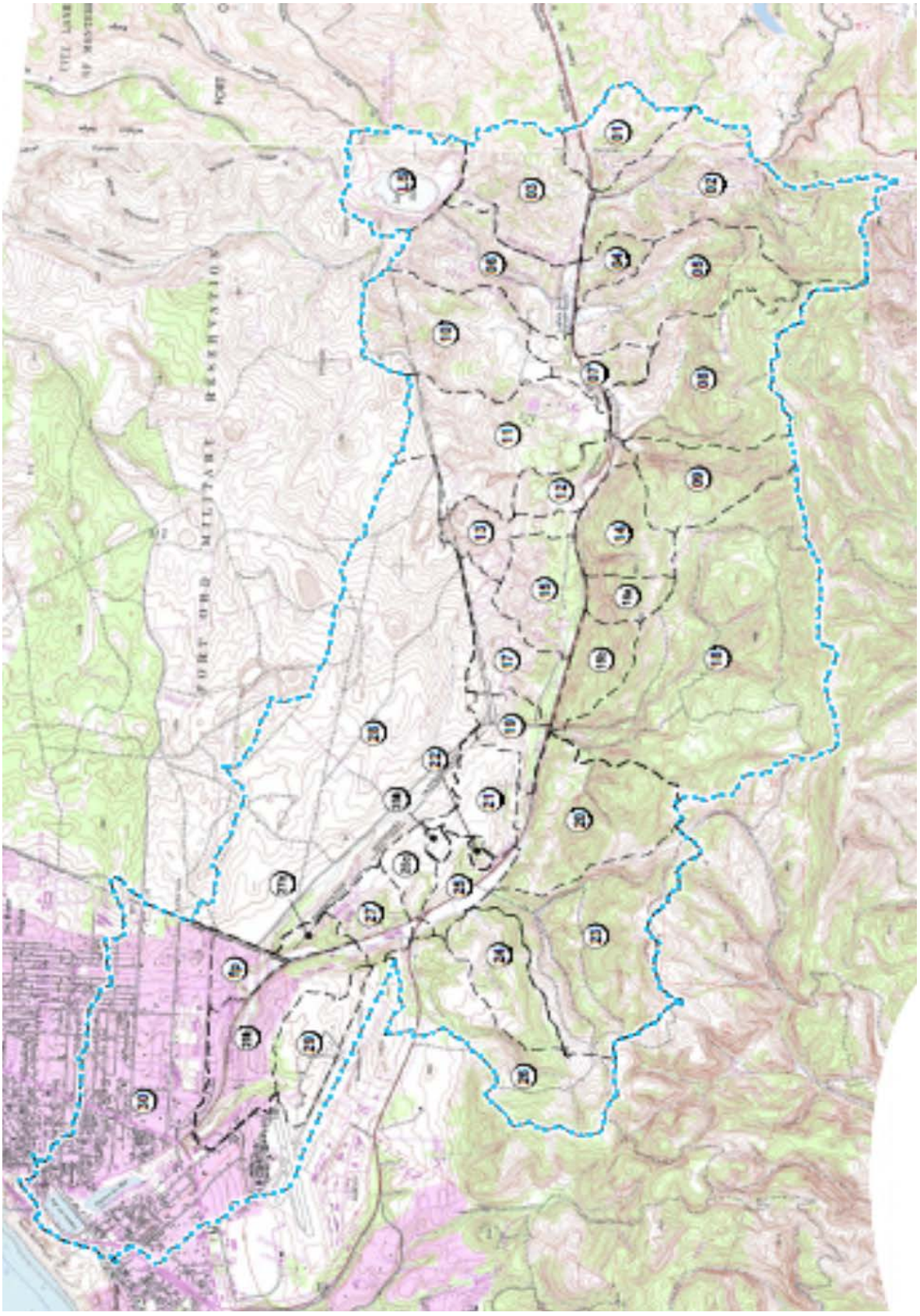
The area of initial concern in the creek bottom begins near the north end of Silver Cloud Court near the intersection of Highway 68 and York Road in Monterey County. The stream channel suffers from bank instability, head-cutting, and erosion problems during high flows along adjacent private properties due to a variety of factors such as increased stream flows during rain events, changes in sediment supply in the watershed, and creek side development.

1.2 Watershed description

The study area is made up of 37 sub-watersheds. Of these, 16 flow into CdR creek from the south and 19 from the north. The size of these sub-watersheds varies from 8 acres to 1.88 square miles. The delineations of these sub-watersheds are shown in Figure 2-1.

Significant portions of the watershed to the south of Highway 68 are sparsely developed and contain steep slopes (>25%) rising up to 1,300 feet in elevation with a mix of coastal scrub, pine, and oak woodlands. Most of the runoff to the creek is from this area, which is rated as a fire hazard and thus can undergo episodes with high rates of erosion. Areas to the north of Highway 68, are generally low rolling grassy hills covered with sandy soils that provide little runoff to the creek, except during the wettest periods. The west end of the basin, in the Cities of Monterey, Seaside, and Del Rey Oaks there is a high degree of urbanization with a mix of single- and multi-family units and commercial development.

Figure 2-1 Canyon del Rey Sub-watershed Delineations



The peak 100-year flow in the creek (from the 1977 drainage study) ranged from 800 cfs (existing) to 1,000 cfs (future conditions). Many of the primary facilities surveyed in 1977 could pass less than one-half of the 100-year peak. The most recent update of the FEMA Flood Insurance Rate Map (April 2, 2009) shows zones of shallow flooding in the 100-year event that would affect residences and businesses adjacent to the creek between Roberts Lake and the intersection of Highway 68/Highway 218. Portions of both highways would be inundated during a 100-year flood.

Geologic evidence and soil moisture budget analyses both indicate the presence of a shallow alluvial aquifer system that sustains wetlands and phreatophytic vegetation and also supports base flow in Canyon Del Rey in wet years[1]. Hydro-geologic conditions along Canyon Del Rey suggest that infiltration into the aquifer system from the channel is dominant and runoff in the creek normally represents a small fraction of the annual rainfall.

1.3 Development within the watershed

Since 1977, a significant amount of development has occurred and many of the recommended improvements have been implemented. General Plans for development in the cities and unincorporated areas have changed, water quality standards for storm water runoff have increased, and tools to understand and predict water and sediment flows have improved.

Monterey County implemented regulations to prevent or reduce sediment and runoff from new development beginning in the 1960's. In addition, since completion of the 1977 drainage plan, the City of Monterey has implemented all recommendations from that plan for new development within the city limits of Monterey. It is unknown which improvements have been implemented within the city of Del Rey Oaks.

1.4 Facilities description

Existing storm water conveyance and management facilities within the study area which were evaluated in this study and included in the modeling consist of: 51 culverts (primarily under roadway crossings), 32 water and sediment detention basins, and the Roberts and Laguna Grande impoundments. These facilities vary greatly in size, design, and physical condition. Table 2-1 provides a list of the storage basins. Table 2-2 provides a list of the road crossing culverts. Details of these facilities and their condition are provided in Chapter 6.

[1]. See "Laguna Seca Subarea Phase III Hydrogeologic Update," prepared for the Monterey Peninsula Water Management District, prepared by Eugene B. Yates, Martin B. Feeney, and Lewis L. Rosenberg, November 2003.

Table 2-1 Water and Sediment Detention Basins in Canyon del Rey Watershed

Facility ID	Location
LS_B_01	Lake at Laguna Seca Raceway.
04_B_01	South of Hwy 68 at S.P.C.A. facility.
04_B_02	South of Hwy 68 at S.P.C.A. facility.
05_B_01	South of Hwy 68, approx. 1'650 feet west of S.P.C.A. entrance road.
06_B_01	North of Hwy 68, approx. 500 feet west of S.P.C.A. entrance road.
07_B_01	
08_B_01	South of Hwy 68. Approx. 250 feet southeast of Boots Road.
08_B_02	South of Hwy 68. Approx. 250 feet southeast of Boots Road. Not modeled.
09_B_01	Approx. 200 feet south of where Boots Road and Whip Road meet near Hwy 68.
10_B_01	Pasadera golf course pond, approx. 200 feet south of Las Laderas Drive.
10_B_02	Pasadera golf course pond, approx. 230 feet west of Las Brisas Drive.
10_B_03	Pasadera golf course pond, approx. 200 feet southeast of Pasadera Country Club.
11_B_01	Pasadera golf course pond, approx. 180 feet west of Mirasol Ct. Not modeled.
11_B_02	Pasadera golf course pond, at the intersection of Pasadera Drive and Via Del Milagro. Modeled as one (10_B_04).
10_B_04	
11_B_03	1'400 feet west of Pasadera Drive and 180 feet north of Hwy 68. Part of the Laguna Seca Golf Ranch.
12_B_01	1'650 feet west of Pasadera Drive and 270 feet north of Hwy 68. Part of the Laguna Seca Golf Ranch.
12_B_02	2'050 feet west of Pasadera Drive and 270 feet north of Hwy 68. Part of the Laguna Seca Golf Ranch.
14_B_01	Canyon del Rey reach west of Pasadera Road and South of Hwy 68.
19_B_01	Directly west of where Wilson Road and York Road meet.
21_B_01	North of Hwy 68. Approx. 1'300 feet east of Ragsdale Drive.
22_B_01	North of Hwy 68. Approx. 1'000 feet east of Ragsdale Drive.
24_B_01	West side of Hwy 218. Approx. 1'400 feet south of the Hwy 68 and Hwy 218 interchange.
24_B_02	West side of Hwy 218. Approx. 1'400 feet south of the Hwy 68 and Hwy 218 interchange.
25_B_01	Approx. 650 feet northwest of the Ragsdale Drive and Lower Ragsdale drive T intersection. South of the Harris Ct business development.
25_B_02	Directly south of the Hwy 68 and Hwy 218 interchange. South of the Monterra Subdivision.
26_B_01	South of Hwy 68 and west of 218 at interchange. North of the Monterra subdivision entrance.
27b_B_01	Directly east of Hwy 218 at Pheasant Ridge Road.
29_B_01	Frog Pond Wetland Preserve.
29_B_02	Northeast of the Monterey Airport. North of N road.
29b_B_01	Park behind Safeway, west of hwy 218 and south of Wilson Way.
30_B_01	Laguna Del Rey and Roberts Lake combined. North and south of Del Monte Blvd.

Table 2-2 Roadway Crossing Culverts in Canyon del Rey Watershed

Facility ID	Location	Description
LS_C_01	Lake at Laguna Seca Raceway	15" circular CPP
01_C_01	Crossing under Hwy 68, approx. 1'240 feet east of Laureles Grade	18" circular CMP
01_C_02	North of Hwy 68 across from Laureles Grade. Parallel to Hwy 68.	18" circular CMP
01_C_03	Crossing under Laureles Grade.	24" circular CMP
02_C_01	Crossing under Hwy 68, just west of Laureles Grade.	double 28" x 20" oval CMP
02_C_02	Crossing just east of the S.P.C.A. entrance and parallel to Hwy 68. South	18" circular CMP
02_C_03	Crossing under S.P.C.A. driveway entrance.	18" circular CPP
03_C_01	Crossing under the east gate to Laguna Seca Raceway.	48" x 30" oval CMP
03_C_02	Crossing under the main entrance to the Laguna Seca Raceway.	40" circular HDPE
04_C_01	Crossing under Hwy 68 just west of S.P.C.A.	24" circularCMP
04_C_02	Crossing under Hwy 68, approx. 770 feet west of S.P.C.A.	24" circular CPP
05_C_01	Crossing under Hwy 68, approx. 1'750 feet west of Laguna Seca Raceway	24" circular CMP
06_C_01	Crossing under gated access road, approx. 2'130 feet west of Laguna Seca	48" and 30" circular CMP
07_C_01	Crossing under Hwy 68, approx. 1'160 feet east of Pasadera entrance.	24" circular HDPE
08_C_02	Crossing under Hwy 68, just west of Boots Road.	52" circular RCP
09_C_01A	Crossing under Whip Road and Boots Road.	40" circular HDPE
10_C_01	Crossing diagonally under Hwy 68, approx. 950 feet east of Pasadera entr	36" circular CMP
10_C_02	Crossing under Boots Road, south of Hwy 68.	60" circular RCP
10_C_03	Crossing under Pasadera entrance, north of Hwy 68. Flows from Pasadera	36" circular CMP
12_C_01	Crossing under Hwy 68 at Laguna Seca Golf Ranch.	48" circular CMP
14_C_01	Crossing under Hwy 68 at Laguna Seca Golf Ranch. West of 12_C_01.	48" circular CMP
15_C_01	Crossing parallel to Hwy 68, approx. 2'800 feet east of York Road. North c	48" circular CMP
16_C_01	Crossing under Hwy 68, approx. 3'600 feet east of York Road.	24" circular CMP
17_C_01	Crossing under York Road.	14.4' x 8' concrete box with earth floor
18_C_01	Crossing under Hwy 68, just west of York Road.	6' x 4' concrete box
21_C_01	Crossing under Hwy 68, approx. 1'800 feet west of York Road.	triple 28" x 24" synthetic fiberglass pipes
25_C_01	Crossing under Monterra entrance (Hwy 218).	double 48" and triple 18" circular RCP
25_C_02	Crossing under Hwy 68, just west of Monterra entrance.	double 48" circular RCP

Table 2-2 Roadway Crossing Culverts in Canyon del Rey Watershed (continued)

Facility ID	Location	Description
25_C_03	Crossing under southeast entrance of the Stone Creek Center. Parallel to	14' x 7.7' concrete box
26_C_01	Crossing under Hwy 68. Starting approx. 650 feet northwest of Monterra	36" circular CPP
27_C_01	Crossing under northeast entrance of the Stone Creek Center. Parallel to	14' x 8' concrete box
27_C_02	Crossing under entrance to storage lot, just north of the Stone Creek Cer	14' x 6.7' concrete box
27_C_03	Crossing under Del Rey Gardens Drive, west of Hwy 218. Parallel to Hwy	87.6" circular CMP
27_C_04	Crossing under Hwy 218, approx. 520 feet southeast of General Jim Moor	6' x 8' concrete box
28_C_01	Crossing under General Jim Moore Blvd. at Hwy 218.	10.1' x 8' concrete box
28_C_02	Crossing under General Jim Moore Blvd approx. 500 feet northeast of Hw	3' x 3' concrete box
29_C_01	Crossing under Hwy 218 at the Frog Pond, approx. 50 feet northwest of V	6' x 8' concrete box
29_C_02	942 Angelus Way.	not modeled
29_C_03	938/934 Angelus Way driveway.	wooden bridge with concrete walls
29_C_04	930/926 Angelus Way.	wooden bridge with concrete walls
29_C_05	Across Angelus Way from Altura Pl.	48" circular CMP
29_C_05A	Across Angelus Way from Altura Pl.	12' x 8' concrete bridge
29_C_06	Angelus Way, just west ofAvalon Pl.	concrete bridge
29_C_07	Crossing under Rosita Road at Angelus and Rosita intersection.	6' x 8.25' concrete box
29_C_08	Crossing under Fremont Blvd, starting at the park behind Safeway.	8' x 8' concrete box
30_C_01	Crossing at the southeast end of Laguna Grande Park. East of Laguna Gran	6' x 6' concrete box
30_C_02	Bridge crossing at Laguna Grande Park southeast of Branner Ave.	100' x 7'(in middle) Wooden arched bridge
30_C_03	Laguna Del Rey Lake crossing under Del Monte Avenue.	double 16' x 7' concrete boxes
30_C_03B	Laguna Del Rey Lake crossing under Del Monte Avenue.	double 21.36' x 7' concrete boxes
30_C_04	Roberts Lake crossing under Roberts Avenue.	double 8' x 6' concrete boxes
30_C_05	Crossing under Hwy 1 off-ramp at Hwy 218. Outlet at Seaside beach east	Quad 6' x 6' concrete boxes
CMP =	Corrugated Metal Pipe	
CPP =	Corrugated Polyethylene Pipe	
HDPE =	High-density Polyethylene	
RCP =	Reinforced Concrete Pipe	

2. HYDROLOGIC CONDITIONS AND PRECIPITATION ESTIMATES

2.1 Available precipitation gages and data

The following rainfall records were found for the vicinity of Canyon Del Rey.

Salinas Airport (Hrly) - 7/1/48-9/1/1951, 4/1/2001-11/20/2011 - incomplete

Del Monte, Monterey (15 min) - 5/2/1971 - 6/29/1995 generally complete, some missing data

Naval Post Graduate School (Daily) - 1970 – 2010 generally complete, some missing data

Monterey County ALERT Data Stations (Cumulative Rainfall) - Point Pinos : 1/3/2007 - 2/11/2013 readings every approximately 12 hrs

Mt Toro: 7/27/2006 - 2/11/2013 readings every approximately 12 hrs - Blanco Circle: 7/27/2006 - 2/11/2013 readings every approximately 12 hrs

CIMIS Data - Carmel, #210: 10/24/2008 – current, hourly; Pacific Grove, #193: 10/26/2011 – current, hourly

Fort Ord CDEC Station (Hourly Rainfall) - WY 2002 -2011, Full record, good quality

KMRY - Monterey Regional Airport, NWS (Daily Rainfall) - 1/1/1970 - 12/31/2010, Full record, good quality

MPWMD - 187 Eldorado (Daily Rainfall) - 10/25/1991 - 9/23/2000 Hand recorded, good quality

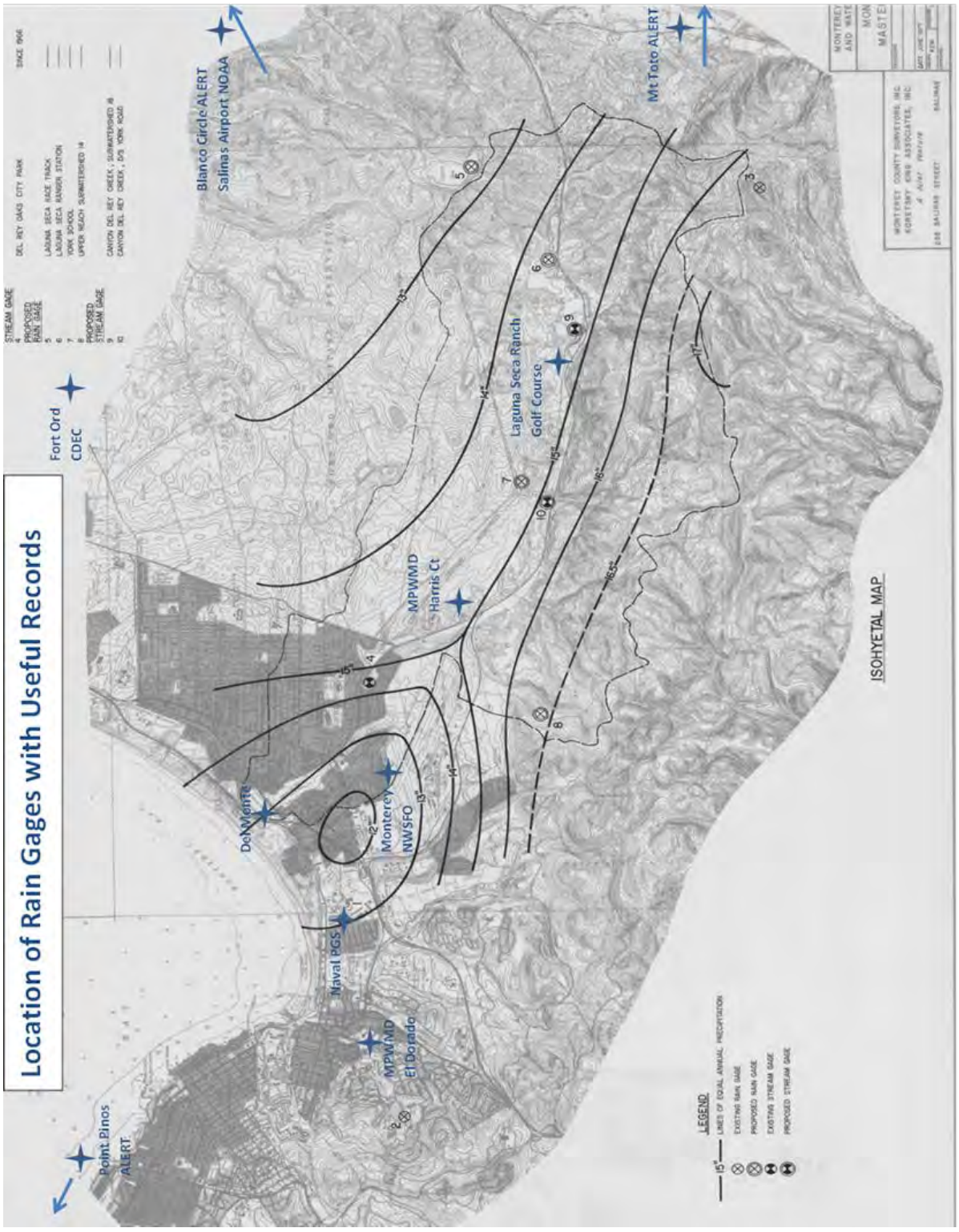
MPWMD - 5 Harris Ct., Ryan Ranch, Monterey (Daily Rainfall) - 10/10/2000 - 9/11/2012, Hand recorded, good quality

Laguna Seca Golf Course (Daily Rainfall) - obtained limited data set: WY2012 - current

Weather Underground data sources - daily data, short term records

The locations of rain gages with useful records are shown in Figure 3-1, which is a reproduction of the 1977 master plan isohyet map with gage locations added.

Figure 3-1 Rainfall Gages with Useful Records



2.2 Precipitation data quality and utility

Long term rainfall records are required to generate usable depth/duration/frequency relationships. With the exception of the NOAA del Monte and the NOAA Monterey gages, none of the gage records have a long enough duration to yield usable statistics. In addition, most of the records provide only daily values, rather than the hourly and 15 minute records needed for frequency analyses. Correlations between records (gage cross-correlation) can sometimes be used to fill and extend missing data in a gage records using the full data set for another gage record. Such correlations can also be used, when records are sufficiently long and detailed, to create hourly or 15 minute data for a gage record which is limited to daily or hourly data.

In order to quickly assess the potential for record filling using correlations, the annual precipitation values for all of the useful gages over the overlapping record periods were correlated, producing correlation coefficients for each gage pair. Table 3-1 provides the results of that exercise.

Table 3-1: Correlations of annual precipitation values between gage records

	CDEC Fort Ord	MPWMD Harris	MPWMD El Dorado	NOAA del Monte	NOAA Monterey	Naval Post Grad School	Laguna Seca Golf Course
CDEC Fort Ord		0.91			0.84	0.94	
MPWMD Harris	0.91				0.75	0.98	
MPWMD El Dorado				0.9	0.95	1	
NOAA del Monte			0.9		0.97	0.82	
NOAA Monterey	0.84	0.75	0.95	0.97		0.88	
Naval Post Grad School	0.94	0.98	1	0.82	0.88		
Laguna Seca Golf Course							

For most gage pairs, the number of values in the calculations varied from 3-12. The lightly shaded results are for gage pairs using 23-39 values. Higher numbers of values produce correlation estimates which are more reliable, so that a number close to 1 for a gage pair with over 23 values indicates a well correlated gage pair. The strengths of the correlations, with the exception of the NOAA del Monte – NOAA Monterey pair, are poor to fair. Together, these two gages provide a record spanning 1949-2012, which is sufficient to generate long term statistics. However, poor correlations with the other useful gage records make extending and filling the other gage records unrealistic.

Conclusions regarding the utility of the available rainfall gage data for generating depth/duration/frequency estimates and other statistics are summarized below.

- Record lengths vary from 2 to 40 years; gage correlations only fair

- Measurement frequencies are mostly daily; exceptions: Salinas AP is hourly; Monterey NWS is 15 min; ALERT twice daily

- Gage locations are mostly near sea level; exceptions: Laguna Seca Golf gage is at 370 ft, Ft Ord at 490 ft

- Quality of the data is generally good, but not tested

- Extension of short gage records using longest records is possible, but the quality of results questionable; correlations are based on < 12 yrs

- Poor spatial distribution of gages and inconsistency between gages limits use of gages for isohyet development

- Adjustment of precipitation estimates for elevation and topographic orientation problematic due to lack of data

- Production of adequate precipitation/ frequency estimates from gage data seems unlikely

The conclusion is that wholesale modification of the 1977 isohyet map cannot be supported by the available data. This is particularly true because the gage data produces substantially different MAP estimates over much of the watershed, so that isohyet map modifications would be controversial and difficult to support with the data. Further, the precipitation records are not sufficient to enable development of depth/duration/frequency relationships.

2.3 Selected methodology for developing rainfall depth estimates and storm hyetographs

NOAA Atlas 14 is the data server implemented precipitation-frequency atlas for the United States; Volume 6 of the atlas provides the data for California. The details of the atlas, including technical bases for its development, are provided in a very thorough report (National Weather Service, 2012). NOAA Atlas 14 contains precipitation frequency estimates for a range of durations and frequencies and other information on temporal distribution of rainfall in California. Estimates are provided with 90% confidence intervals and at a 30 arc-second (approximate ½ mile) spatial resolution. Event durations range from 5 minutes to 60 days. Recurrence intervals range from 1 year to 1,000 years.

Locations for estimates are selected graphically on a California map, by specifying latitude and longitude, or by selecting specific stations where the detailed analyses were developed.

Complete documentation of the NOAA Atlas 14 server is available at http://www.nws.noaa.gov/oh/hdsc/PF_documents/Atlas14_Volume1.pdf. Precipitation-frequency estimates are obtained from the Atlas using a graphical user interface available at the following URL: http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ca.

Examples of Atlas 14 results for the Canyon Del Rey watershed are provided in Table 3-2, which shows precipitation depths for specific storm durations and frequencies at 10 points which represent a variety of elevations and orientations to incoming storm events.

Table 3-2: Precipitation-Duration-Frequency results for Canyon Del Rey watershed

Grid Results from NOAA Atlas 14									
Location	Lattitude	Longitude	Elevation	100 yr 24 hr	100 yr 6 hr	100 yr 60 day	10 yr 24 hr	10 yr 6 hr	10 yr 60 day
Laguna Del Rey	36.6037	-121.8556	13	4.78	2.76	21.2	2.95	1.73	14.5
Naval Post Graduate School	36.5972	-121.8776	35	4.7	2.74	21.1	2.89	1.72	14.2
Hwy 68/ 218 junction	36.5812	-121.8279	123	5.13	2.92	22.9	3.16	1.84	15.8
Hwy 218/ Moore Blvd Jct	36.5911	-121.8322	146	5	2.86	22.3	3.08	1.8	15.3
Laguna Seca Golf Ranch	36.572	-121.7876	382	5.54	3.08	24.5	3.43	1.96	17.2
Fort Ord CDEC gage	36.627	-121.786	480	5.12	2.87	22.7	3.17	1.81	15.9
S Boundary Rd, N of Laguna Seca Ranch	36.5795	-121.7885	600	5.48	3.05	24.5	3.39	1.94	17.2
Tehama Golf, S of 68/218 Jct	36.5587	-121.8329	750	5.34	3	24.1	3.29	1.9	16.7
Boots and Saddle Rd Jct, S of Laguna SR	36.5528	-121.7825	1056	5.76	3.15	25.4	3.58	2.02	17.9
Laureles Grade, top of grade	36.5446	-121.7534	1243	5.83	3.16	25.7	3.65	2.04	18.1

These results are internally consistent and reasonable when compared with PRISM results and the San Francisco Bay Depth-Duration-Frequency (DDF) tables which were used in the 1977 Master Plan. Table 3-3 provides a brief comparison of results for locations at low, moderate and higher elevations.

Table 3-3: Comparison of Atlas 14 and 1977 Master Plan DDF estimates

Comparison of NOAA Atlas 14 DDF Results with 1977 Master Plan - SF Bay DDF Table										
Longitude	Lattitude	Elevation	Mean Ann Precip (PRISM)	Precip from Plan Table	Atlas 14 100yr 12 hr	Master 100yr 12 hr	Atlas 14 10yr 12 hr	1977 Master 10yr 12 hr	Atlas 14 100yr 1 hr	1977 Master 100yr 1 hr
-121.75	36.546	668	20.18	20	4.17	3.45	2.63	2.6	1.33	1
-121.8131	36.5818	279	17.85	18	3.75	3.23	2.34	2.42	1.4	0.96
-121.8776	36.5972	36	15.95	16	3.35	3.01	2.08	2.24	1.43	0.91

The Atlas 14 results are generally higher than the Plan results for less frequent events and very similar for more frequent events. The variation of precipitation

depths with mean annual precipitation is similar. The differences appear to be within the estimation error range.

2.4 Mean annual precipitation estimates

Table 3-4, below, summarizes the mean annual precipitation statistics for the useful gaging stations and compares them with the average annual precipitation estimates taken from the 1977 Master Drainage Plan.

Table 3-4: Comparison of Mean Annual Precipitation Estimates

	CDEC Fort Ord	MPWMD Harris	MPWMD El Dorado	NOAA del Monte	NOAA Monterey	Naval Post Grad School	Laguna Seca Golf Course
Record Duration	WY 2002-2011	WY 2001-2012	WY 1992-2000	WY 1949-1994	WY 1996-2011	WY 1971-2010	WY 2012-2013
Avg Ann Precip (inch)	11.53	15.04	23.2	12.44	14.48	20.29	14.91
Long Term Avg Ann Precip		17.8	20.4				15.63
Location in watershed	NE of bndry	Central	W of bndry	N edge	W Central	NW Edge	E Central
Avg Ann Precip from Map	13-14	15	14-15	12.5	12.5	13	14.8
Ratio of gage to isohyet	85.4%	100.3%	160.0%	99.5%	115.8%	156.1%	100.7%

Long term average annual precipitation estimates were computed for three of the gages (MPWMD at Harris Court, MPWMD at El Dorado Way, and Laguna Seca Golf Course) by taking the ratio of mean annual precipitation (MAP) for each of these gages to the MAP for the NOAA Monterey gage for the same period of record and then multiplying that ratio times the long term average MAP for the NOAA Monterey gage.

Figure 3-2 provides the MAP at these gages on the 1977 Isohyetal map, allowing a quick comparison between the 1977 MAP estimates and those obtained from the gage data. Several observations can be made from Figure 3-2 and Table 3-4:

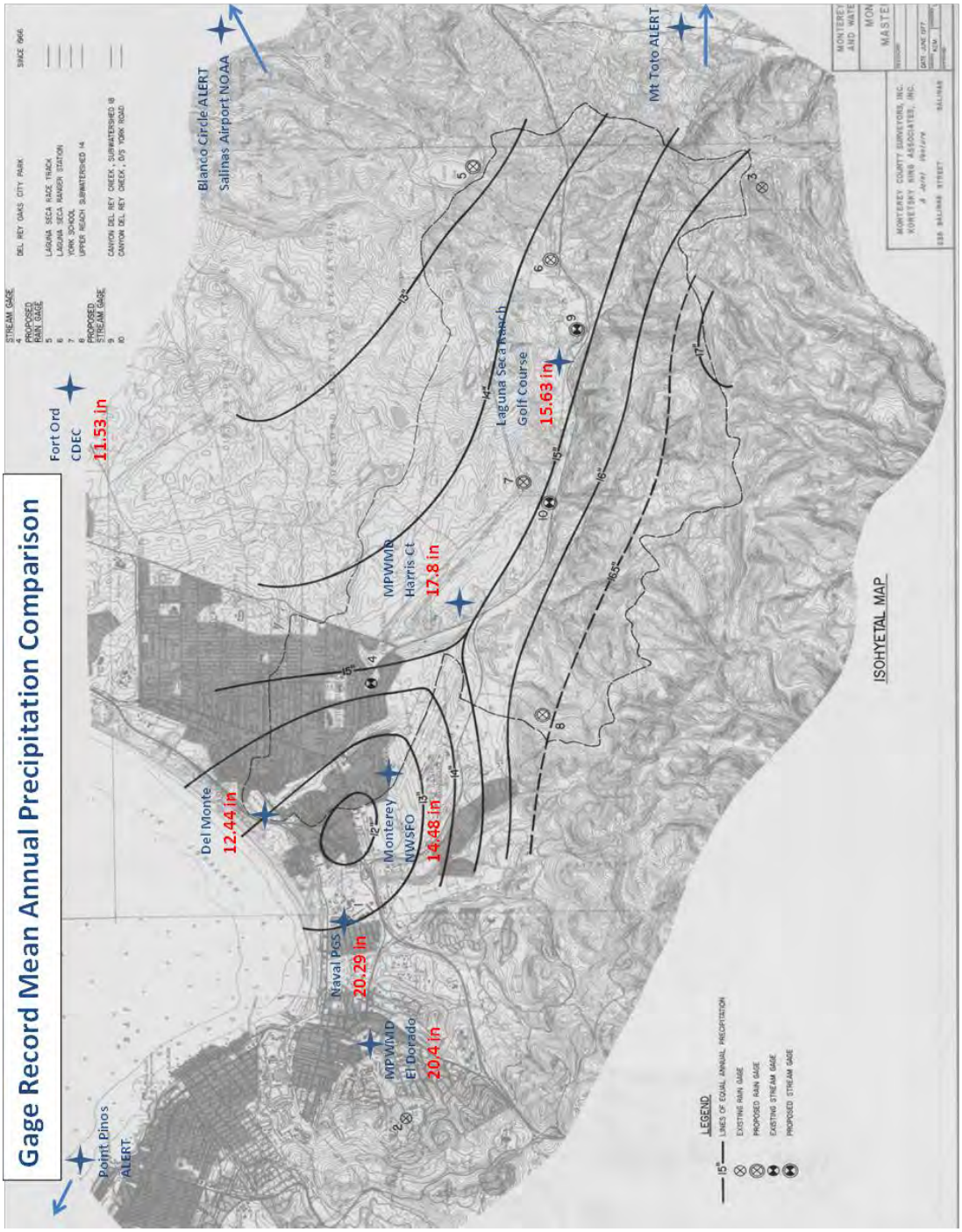
- The MAP for each gage is similar to the values shown on the isohyetal map in the 1977 Master Drainage Plan at only a few points: MPWMD Harris Court, NOAA del Monte, and Laguna Seca Golf Course. These gages are located along the centerline of the watershed.

- Gages located away from the watershed centerline have large variations from the isohyetal map. The reasons for this variation are not obvious; possibilities include: much longer records are now available for some gages – resulting in shifts in gage statistics, the 1977 map utilized gages whose records are no longer available, and more gage locations are available now.

- The table shows large differences in MAP for gages in close proximity, making interpretation of the results problematic.

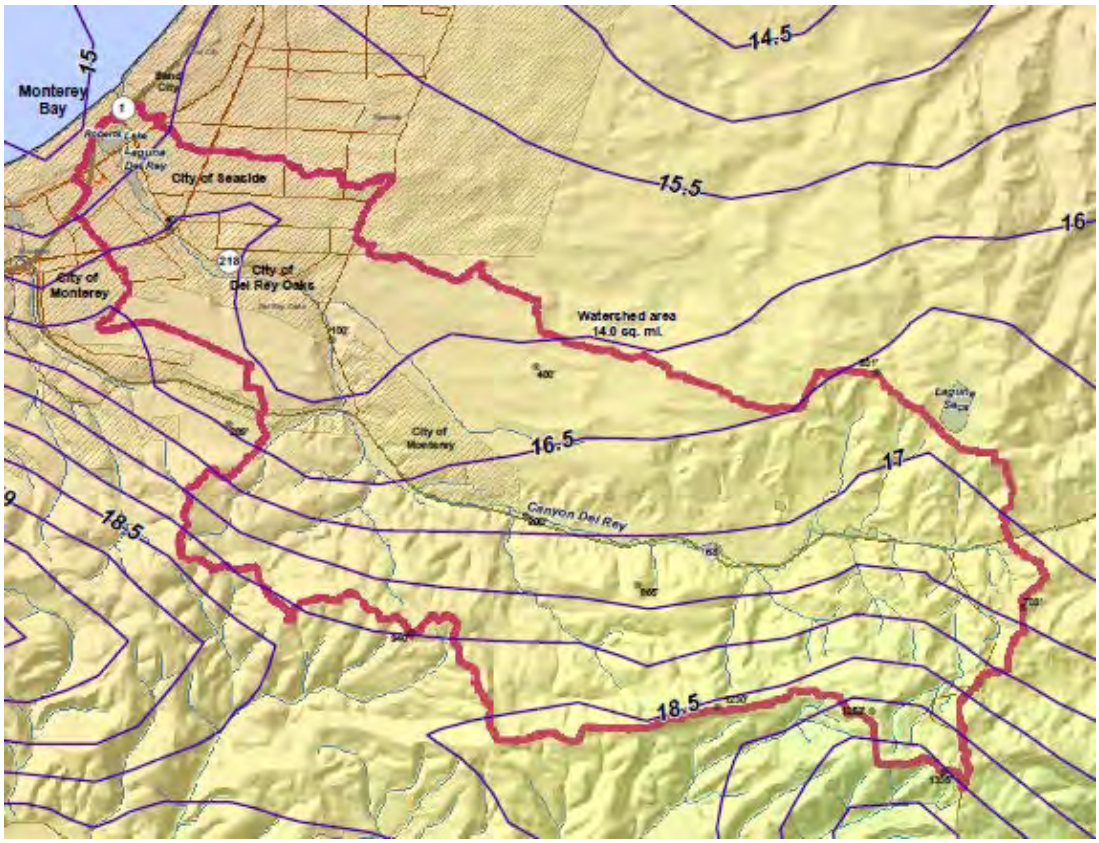
- The spatial distribution of the gage sites is inadequate for defining new isohyet contours and, therefore, for generating a revised isohyet map.

Figure 3-2 – Mean Annual Precipitation statistics overlain on the 1977 isohyet ma



The PRISM (Parameter-elevation Regressions on Independent Slope Model) climate mapping system produces estimates of long term climate parameter statistics and time series for any location in the United States. The technical basis for the PRISM methodology is published in Daly, et al, 2008. The PRISM data can be found at http://prism.oregonstate.edu/normals/, while descriptions of the PRISM data sets can be found at: http://prism.oregonstate.edu/documents . Mean annual precipitation (MAP) is one of the available parameters, making PRISM a possible source for long term annual precipitation estimates. The PRISM data server was queried for points within the Canyon Del Rey watershed. The resulting MAP data is shown as isohyetal lines in Figure 3-3. The PRISM results, when compared with the gage data, appear to under-predict the effects of orientation and elevation and generally reduce the spatial variability of rainfall within the watershed. The correlation between gage annual means and PRISM results is also relatively low. However, the PRISM system uses all of the long term precipitation gage records in the vicinity of the study area and, as a result, is the most complete estimate of mean annual precipitation.

Figure 3-3 – Mean Annual Precipitation Isohyets for Canyon del Rey



2.5 Depth-Duration-Frequency estimation from NOAA Atlas 14 results

Rainfall depth estimates were generated from NOAA Atlas 14 output for each sub-watershed within the Canyon del Rey watershed. The centroid of each sub-watershed was used for the estimation location, which was input into the NOAA Atlas application. The depth values were extracted for return periods of 10 and 100 years and durations of 15 minutes through 24 hours. Table 3-5 provides a summary of generated depths for each of the sub-watersheds for 10 year and 100 year return periods and 24 hour durations.

Table 3-5 – 10 year and100 year, 24 hour duration rainfall depth estimates

TOTAL 24 HOUR RAINFALL DEPTHS (*inches)*

Sub-watershed	10-year	100-year	Sub-watershed	10-year	100-year
Sub_LS	3.42	5.50	**Sub_17**	3.38	5.47
Sub_01	3.49	5.60	**Sub_18**	3.50	5.65
Sub_02	3.56	5.72	**Sub_19**	3.32	5.39
Sub_03	3.47	5.58	**Sub_20**	3.32	5.39
Sub_04	3.51	5.65	**Sub_21**	3.27	5.30
Sub_05	3.57	5.74	**Sub_22**	3.21	5.22
Sub_06	3.48	5.61	**Sub_23**	3.24	5.27
Sub_07	3.50	5.68	**Sub_24**	3.17	5.16
Sub_08	3.56	5.74	**Sub_25**	3.21	5.22
Sub_09	3.51	5.66	**Sub_25b**	3.21	5.21
Sub_10	3.44	5.54	**Sub_25c**	3.16	5.13
Sub_11	3.47	5.60	**Sub_26**	3.15	5.12
Sub_12	3.51	5.66	**Sub_27**	3.16	5.13
Sub_13	3.43	5.54	**Sub_27b**	3.08	5.00
Sub_14	3.47	5.61	**Sub_28**	3.27	5.31
Sub_15	3.43	5.54	**Sub_FP**	3.08	5.00
Sub_16a	3.47	5.61	**Sub_29**	3.04	4.95
Sub_16b	3.43	5.54	**Sub_29b**	3.04	4.95
			Sub_30	2.97	4.82

MEMO

To: Mr. Larry Hampson, District Engineer, Monterey Peninsula Water Management District

From: Benjamin Roberts, Ph.D., P.E. and Edward Ballman, P.E.

Date: February 18, 2014

Subject: Canyon del Rey Task 2 Deliverables and Memo Report

The deliverables for Task 2 of the Canyon del Rey Master Drainage Plan Update project are as follows:

- Presentation of hydrologic modeling approaches to MCWRA.
- Memo summarizing modeling approach and results including a table of existing flows at key locations in the watershed for 10 and 100 year recurrence interval events.
- Digital hydrologic modeling files.
- Select survey data in digital format.

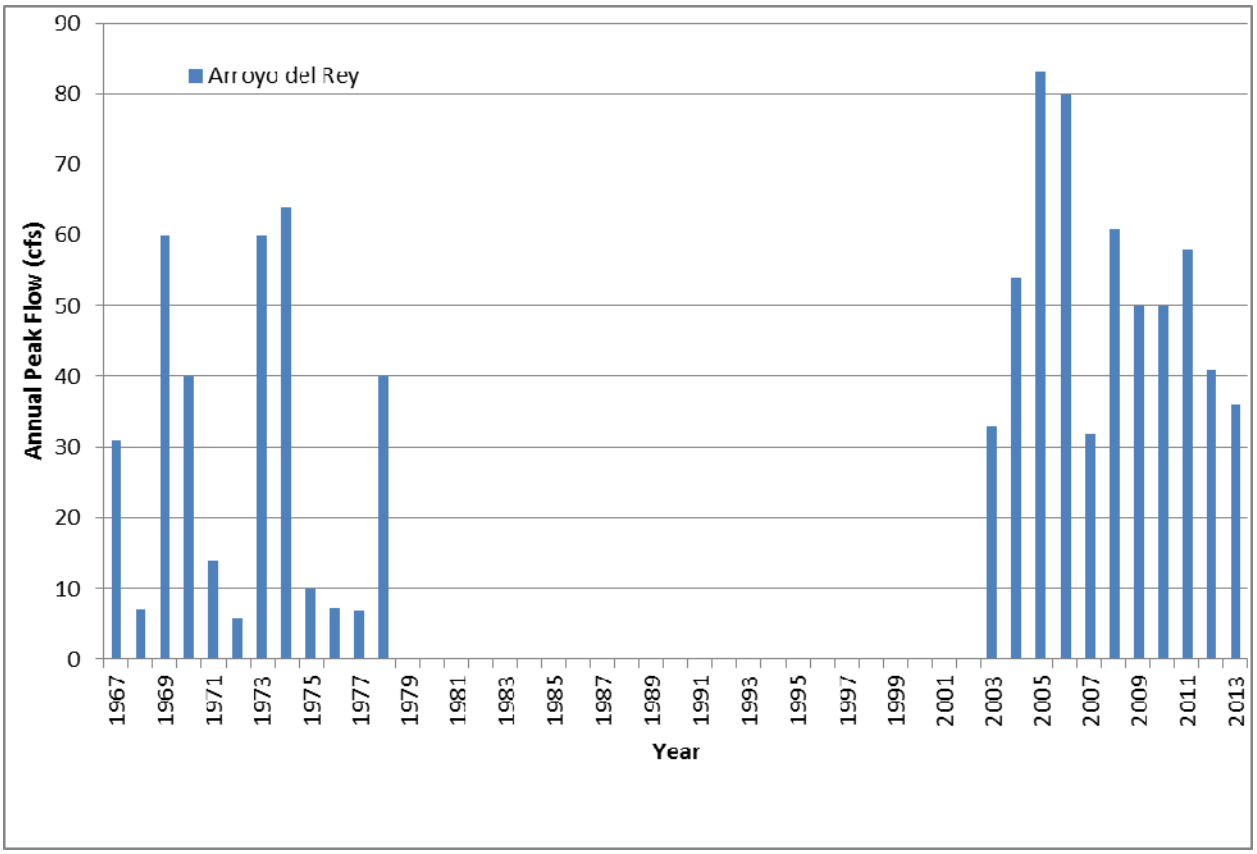
As requested, we are providing in this memo the text, tables and figures relating to Task 2 which will be part of the updated Master Drainage Plan. The digital files and survey data will be provided in separate submittals with the final plan.

1. HYDROLOGIC ANALYSES AND MODELING

1.1 Available data

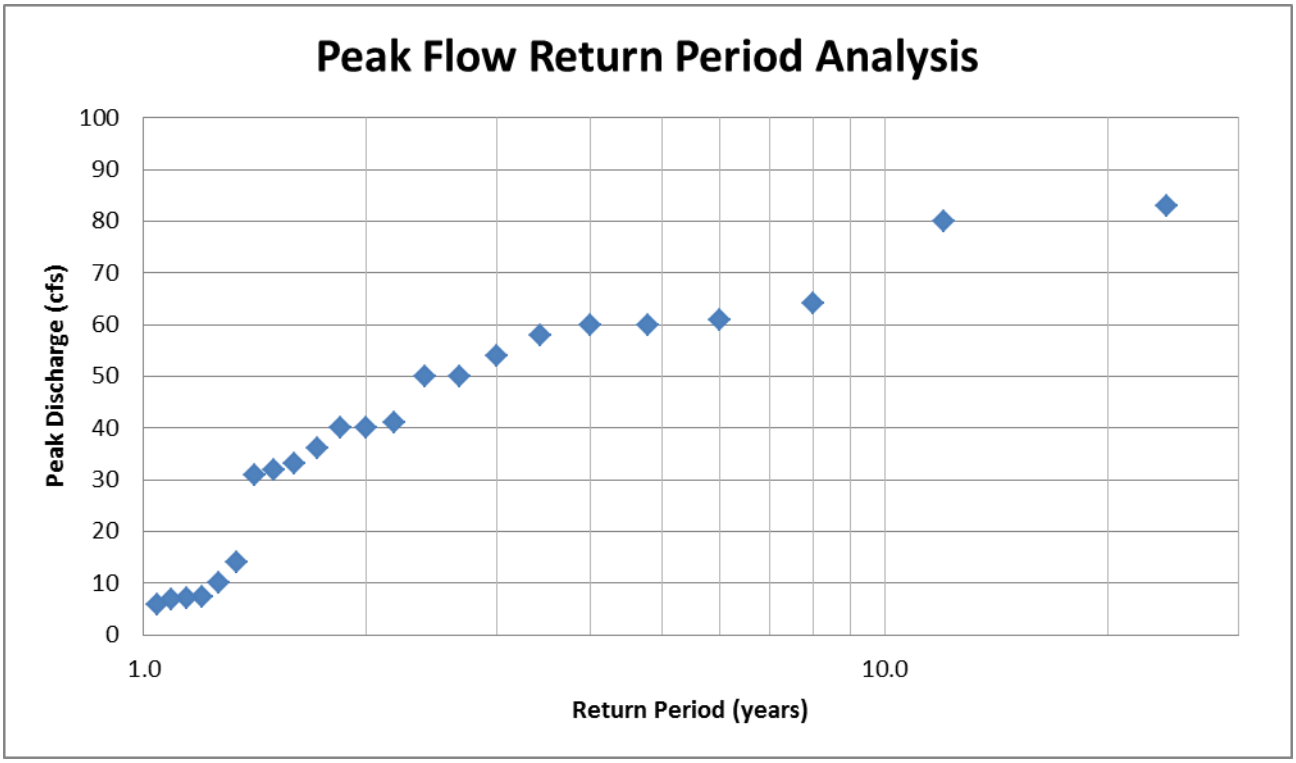
Available stream flow gage data is limited to peak flow records for 1967-1978 and 2003-present and 15 minute stream flow data for 2003-2013. All records are for the Arroyo del Rey gage at Del Rey Oaks. Figure 4-1 shows the peak flow at this gage for the years of record. No large storm events are included in the years of record (in particular, the 1995 and 1998 events are missing), resulting in relatively low peak flows.

Figure 4-1: Annual peak flows for Arroyo del Rey at Del Rey Oaks gage



Based on the available gage data, a return period analysis can be made, producing the relationship in Figure 4-2. While this relationship may be representative of frequent events (recurrence intervals of 5 years and less), it is not descriptive of less frequent events.

Figure 4-2: Arroyo del Rey at Del Rey Oaks annual peak flows plotted against return period



1.2 Description of alternative methodologies

The 1977 drainage plan used the following methods to develop runoff estimates:

- Define 28 sub-watersheds based on drainage divides, slope, land use
- Create a mean annual precipitation (MAP) isohyetal map from rainfall gage data
- Develop MAP for sub-basins from USGS MAP data (from Rantz)
- Estimate total storm precipitation from regional Depth Duration Frequency tables (Rantz)
    - 100 yr return period event used for primary structures
    - 10 yr return period event used for secondary structures
- Create design storm runoff for each sub-watershed using synthetic unit hydrograph method
- Obtain rainfall excess (volume of runoff) using: loss rates from USGS tables (Rantz) and times of concentration adjusted for urbanization
- Route runoff through the basin using Muskingum method, including effects of temporary storage above structures

For this study, both precipitation gage and stream flow gage data were collected and analyzed for application to the hydrologic analyses. Neither of these data sets were deemed adequate for use in developing design storm flows, due to short periods of record and inadequate areal coverage of the study area. As was true for the 1977 study, synthetic hydrologic methods are necessary.

Alternative hydrologic computation methods include:

- Frequency Analysis of Recorded Peak Flows for Study Stream
    - Adequate long, consistent time series record not available
- Correlation with Frequency of Recorded Peak Flows in Nearby Watershed
    - A 40 year stream gage record on El Toro Creek is available but no suitable gage within Canyon del Rey is available for correlation
- Regional Rainfall Frequency Analysis
    - PRISM and NOAA Atlas on line datasets available and accepted
- Rational Method
    - Accepted today only for very small watersheds
- Synthetic Unit Hydrograph
    - Method of choice for many settings; can be readily adjusted for variety of watershed conditions; provides complete hydrograph
    - Implementation via HEC-HMS, a widely used and accepted simulation package
- Continuous Simulation Modeling Using Detailed Moisture Accounting
    - Most robust method, representing detailed variations
    - Costs not within in current project scope

Considering the above methods, the most appropriate approach involves: development of design storm precipitation hyetographs, computation of runoff and stream flow from the rainfall for each sub-watershed, and routing of the runoff through the channel network. For this approach, selection of a rainfall loss method is required. Alternative methods include:

- Initial and Constant
    - Appropriate only for watersheds lacking soil details
- Housing and Urban Development Methodology
    - Similar to SCS method, but oriented specifically to central coastal region of California
- SCS Curve Number

    - Curve numbers assigned to different soil-cover complexes; pervious losses built into curve numbers
    - Works well for highly pervious soils
- Soil Moisture Accounting (continuous, long term simulation)
    - Most complex; costs not included in project scope

Rainfall temporal distributions must also be developed and storm return periods selected. Methods for developing rainfall distributions include:

- Individual rainfall distributions for each storm duration and frequency, based on historical storms
    - Available storm rainfall data is inadequate to enable this method
- Balanced rainfall distribution with one distribution for all events
    - Includes 3, 12, 24 hour peaks in one hyetograph
    - Conservative; usually adequate for flood planning

1.3 Modeling methodology applied for this work

The following methodology was selected from the methods previously described. This methodology incorporates generally accepted best practices for flood analysis, management, and design which can be executed with available information regarding the local rainfall and watershed conditions.

- Storm rainfall depths obtained from the NOAA Atlas 14 regional rainfall frequency analysis application
    - Comprehensive and well documented; makes maximum use of available rainfall data
- Synthetic Unit Hydrograph for hyetograph development
    - Provides full storm hydrograph; allows for routing and variable losses
- Balanced storm hyetograph for 24 hr rainfall event
    - Includes shorter duration events; commonly accepted for flood control planning
- 10 year and 100 year return period events
    - Represent appropriate range of risk; typically used in flood management planning and design
- SCS Curve Number method for rainfall loss estimation
    - Widely accepted for sue with permeable soils
- Muskingum routing of flows through channel system
    - Properly represents runoff timing, storage, and travel lag times in natural channels

- Use HEC-HMS simulation platform to develop stream flow hydrographs in locations within the study area
    - Widely accepted as appropriate for runoff simulation and routing
- Calibrate HEC-HMS against Del Rey Oaks and Frog Pond gage data
    - Rainfall and stream flow gage data available for several events
    - Improves and demonstrates representativeness of simulation results

1.4 HMS model development

The HEC-HMS simulation platform used in this study is thoroughly described in the program user manual available at

http://www.hec.usace.army.mil/software/hec-hms/documentation/HEC-HMS_Users_Manual_3.5.pdf

and the technical reference manual available at

http://www.hec.usace.army.mil/software/hec-hms/documentation/HEC-HMS_Technical%20Reference%20Manual_(CPD-74B).pdf.

In this platform, a stream channel network and associated watershed is described as a series of sub-watersheds with connecting flow paths in a dendritic construction. Runoff is calculated from precipitation in each sub-watershed using parameters including slope, sub-watershed geometry, percent impervious area, soil type, ground cover, and antecedent moisture. A runoff hydrograph is produced at the downstream end of each sub-watershed for a specific rainfall history (hyetograph). The hydrograph is then routed from the downstream end of the sub-watershed to a channel junction, combined at the junction with flows from other sub-watersheds and junctions, and then routed to a further downstream junction. Flow routing is calculated in the Muskingam-Cunge method using parameters including channel roughness, length, slope, and cross section.

Figure 4-3 depicts the HEC-HMS model used to simulate runoff and stream flow in the Canyon del Rey basin. The model is built using runoff elements (sub-basins), stream channel routing elements (reaches), stream confluence elements (junctions), and water storage or detention elements (reservoirs). All of these elements are shown in the figure. Water sources, sinks and diversions can also be simulated, but are not used in this study. The connectivity between sub-basins, reaches, junctions, and reservoirs are shown in the figure.

Runoff related parameters, including slope, ground cover, soil type, percent impervious, and surface roughness were developed from aerial photographs, topographic mapping, and geologic mapping. Specific input parameters for the HEC-HMS simulation platform were assigned, based on the above attributes, to each sub-watershed. The parameters used for the watersheds are provided in Table 4-1.

Figure 4-3: HEC-HMS model structure for the Canyon del Rey basin

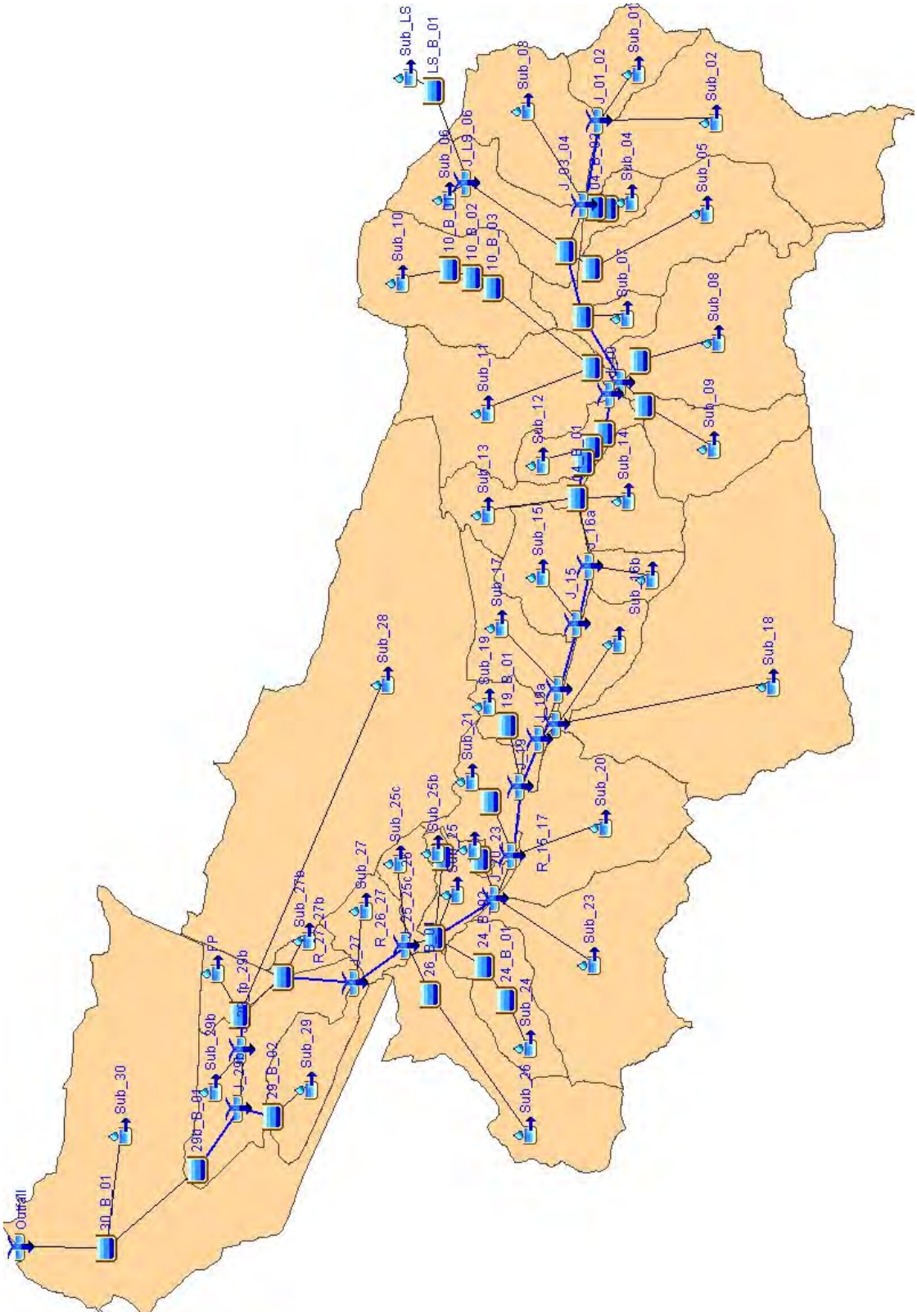

Sub_LS
LS_B_01
Sub_01
J_01_02
Sub_02
Sub_08
J_03_04
Sub_04
Sub_05
J_LS_06
Sub_06
10_B_01
10_B_02
10_B_03
Sub_10
Sub_07
Sub_08
Sub_11
Sub_12
Sub_09
Sub_13
Sub_14
Sub_15
J_15
Sub_16b
Sub_17
Sub_19
19_B_01
Sub_18
Sub_21
Sub_20
Sub_25c
Sub_25b
R_16_17
Sub_27
R_26_27
Sub_23
24_B_01
Sub_24
Sub_26
Sub_28
Sub_27b
J_27
FP
fp_29b
Sub_29b
29_B_02
Sub_29
29b_B_01
J_29b
Sub_30
30_B_01
Outfall

Table 4-1: Runoff related HEC-HMS input parameters for Canyon del Rey sub-watersheds

Sub-Watershed ID	Area (sq miles)	Time Lag (min)	Curve Number	Percent Impervious
Sub_LS	0.293	2	45.6	55
Sub_01	0.2	21.4	61.3	8
Sub_02	0.757	37.2	56.4	6
Sub_03	0.391	29	64	2
Sub_04	0.083	11	61.9	10
Sub_05	0.454	28.8	54	2
Sub_06	0.358	26.8	63.9	6.1
Sub_07	0.134	7.3	64.1	3
Sub_08	0.606	29.9	53.8	10
Sub_09	0.295	20	51.7	5
Sub_10	0.481	25.2	58.7	8
Sub_11	0.538	26.9	52.5	20
Sub_12	0.14	9.9	60.1	5
Sub_13	0.154	19	54.2	8
Sub_14	0.231	12.6	50.6	3
Sub_15	0.244	21	45.4	15
Sub_16a	0.101	11.5	48.8	0.5
Sub_16b	0.162	22.5	51	1
Sub_17	0.233	12.8	47.4	25
Sub_18	1.506	41.6	50.1	1.5
Sub_19	0.127	11.8	52.1	15
Sub_20	0.5	23.7	50.7	1
Sub_21	0.192	13.3	57	35
Sub_22	0.015	4	61.5	25
Sub_23	0.71	25	53	3.5
Sub_24	0.25	25.6	58.9	3.1
Sub_25	0.131	17.3	60.5	54
Sub_25b	0.018	5.4	56.2	75
Sub_25c	0.103	14.3	53.3	10
Sub_26	0.507	38.7	51.7	5
Sub_27	0.146	8.5	52.3	55
Sub_27b	0.056	12.2	42.6	20
Sub_28	1.876	60.5	28.8	2
Sub_FP	0.105	8	24.6	65
Sub_29	0.215	10.7	21.8	19
Sub_29b	0.385	12.4	28.4	35

Sub_30	1.579	17.4	22.6	75

Stream flow routing parameters, including channel length and geometry, hydraulic roughness, and channel slope, were developed from field reconnaissance, surveying of key cross sections, topographic mapping, and data from local agencies. Specific input parameters for the HEC-HMS simulation platform were assigned, based on the above attributes, to each routing reach. The parameters used for the reaches are provided in Table 4-2.

Table 4-2: Stream flow routing related HEC-HMS input parameters for the Canyon del Rey basin

Reach	Length (ft)	Slope (ft/ft)	Manning's n	Shape
R_02_03	545	0.022	0.05	Trapezoid
R_06_07	807	0.0223	0.075	Trapezoid
R_07_08	1120	0.011	0.075	Trapezoid
R_11_12	1117	0.0143	0.075	Trapezoid
R_12_14	2122	0.029	0.075	Trapezoid
R_16a_15	2665	0.0056	0.075	Trapezoid
R_15_17	2086	0.012	0.075	Trapezoid
R_17_19	2064	0.0116	0.075	Trapezoid
R_19_20	1846	0.013	0.085	Trapezoid
R_23_25	3334	0.0093	0.15	Trapezoid
R_26_27	1650	0.00485	0.075	Trapezoid
R_27_27b	945	0.0106	0.075	Trapezoid
R_29	2900	0.0152	0.075	Trapezoid
R_29b	1060	0.0622	0.075	Trapezoid
R_29_30	268	0.0373	0.075	Trapezoid

A large number of detention basins currently exist in the watershed. Table 4-3 provides a list of the basins, with their location described. Some of the basins developed naturally and certain of those basins were further defined by culverts acting as outlet structures. Other basins were built specifically as storm water detention basins with engineered outlet structures.

Basins were characterized in the model by a stage-storage table and outlet parameters. Two of the basins were not included in the HEC-HMS model. Table 4-4 provides information about how these basins were represented in the HEC-HMS model. As water flows into each basin, the basin begins to fill. As water level in the basin rises, water begins to flow out of the basin, with outflow increasing as the water level in the basin increases. When a basin overflows,

then the outflow relationship changes to represent overbank or overtopping flow.

Table 4-3: Detention basins within the Canyon del Rey watershed

	BASINS
Facility ID	**Location**
LS_B_01	Lake at Laguna Seca Raceway.
04_B_01	South of Hwy 68 at S.P.C.A. facility.
04_B_02	South of Hwy 68 at S.P.C.A. facility.
05_B_01	South of Hwy 68, approx. 1'650 feet west of S.P.C.A. entrance road.
06_B_01	North of Hwy 68, approx. 500 feet west of S.P.C.A. entrance road.
07_B_01	
08_B_01	South of Hwy 68. Approx. 250 feet southeast of Boots Road.
08_B_02	South of Hwy 68. Approx. 250 feet southeast of Boots Road. Not modeled.
09_B_01	Approx. 200 feet south of where Boots Road and Whip Road meet near Hwy 68.
10_B_01	Pasadera golf course pond, approx. 200 feet south of Las Laderas Drive.
10_B_02	Pasadera golf course pond, approx. 230 feet west of Las Brisas Drive.
10_B_03	Pasadera golf course pond, approx. 200 feet southeast of Pasadera Country Club.
11_B_01	Pasadera golf course pond, approx. 180 feet west of Mirasol Ct. Not modeled.
11_B_02	Pasadera golf course pond, at the intersection of Pasadera Drive and Via Del Milagro. Modeled as one (10_B_04).
10_B_04	
11_B_03	1'400 feet west of Pasadera Drive and 180 feet north of Hwy 68. Part of the Laguna Seca Golf Ranch.
12_B_01	1'650 feet west of Pasadera Drive and 270 feet north of Hwy 68. Part of the Laguna Seca Golf Ranch.
12_B_02	2'050 feet west of Pasadera Drive and 270 feet north of Hwy 68. Part of the Laguna Seca Golf Ranch.
14_B_01	Canyon del Rey reach west of Pasadera Road and South of Hwy 68.
19_B_01	Directly west of where Wilson Road and York Road meet.
21_B_01	North of Hwy 68. Approx. 1'300 feet east of Ragsdale Drive.
22_B_01	North of Hwy 68. Approx. 1'000 feet east of Ragsdale Drive.
24_B_01	West side of Hwy 218. Approx. 1'400 feet south of the Hwy 68 and Hwy 218 interchange.
24_B_02	West side of Hwy 218. Approx. 1'400 feet south of the Hwy 68 and Hwy 218 interchange.
25_B_01	Approx. 650 feet northwest of the Ragsdale Drive and Lower Ragsdale drive T intersection. South of the Harris Ct business development.
25_B_02	Directly south of the Hwy 68 and Hwy 218 interchange. South of the Monterra Subdivision.
26_B_01	South of Hwy 68 and west of 218 at interchange. North of the Monterra subdivision entrance.
27b_B_01	Directly east of Hwy 218 at Pheasant Ridge Road.
29_B_01	Frog Pond Wetland Preserve.
29_B_02	Northeast of the Monterey Airport. North of N road.
29b_B_01	Park behind Safeway, west of hwy 218 and south of Wilson Way.
30_B_01	Laguna Del Rey and Roberts Lake combined. North and south of Del Monte Blvd.

Table 4-4: Detention basin parameters used in the HEC-HMS model

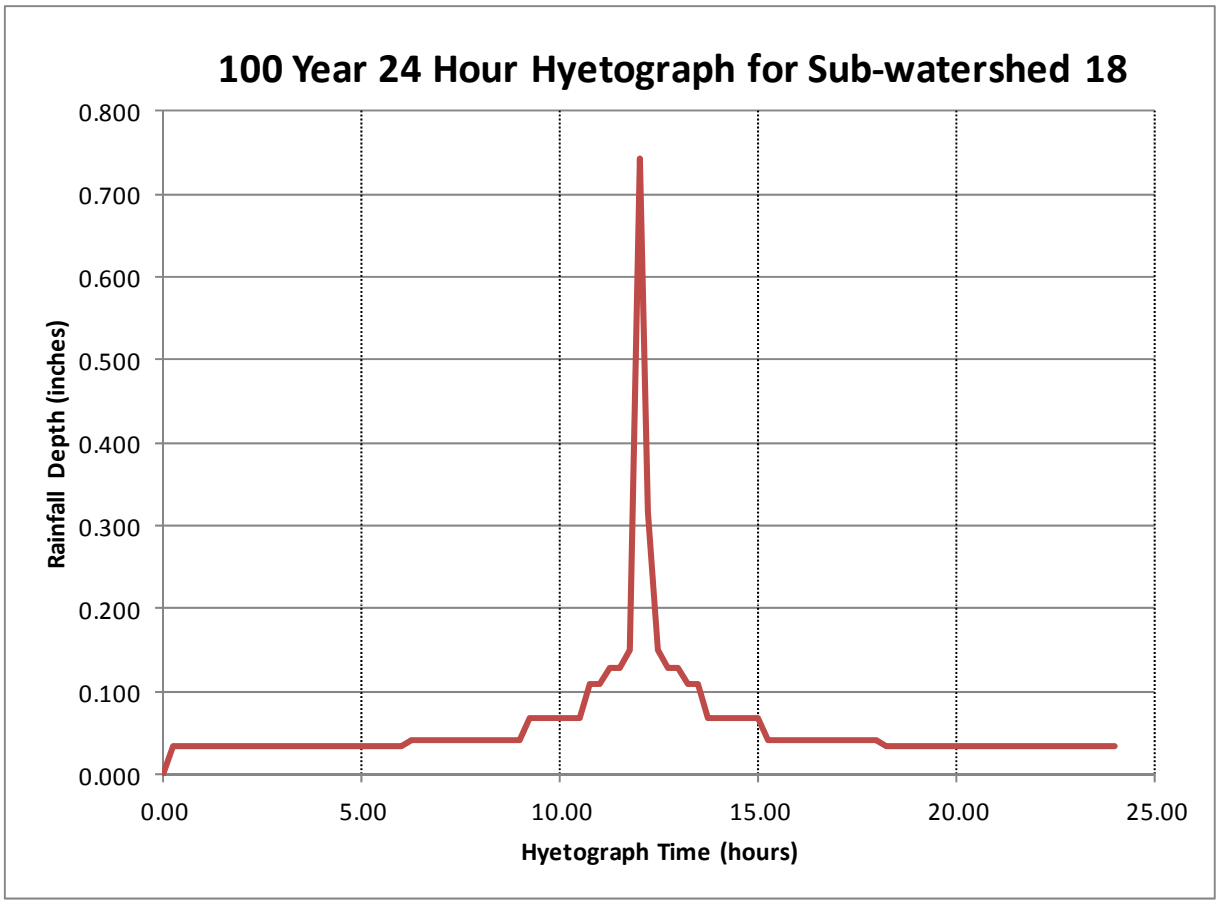
Basin ID	Sub-watershed location	Peak Storage Elevation Before Overflow (ft)	Max Storage Capacity (acre-feet)	Modeling Method	Outlet Type
LS_B_01	Sub_LS	748	12.8	Outflow Structures	Culvert
04_B_01	Sub_4	413	0.2	Outflow Structures	Spillway, horizontal grate, & orifice
04_B_02	Sub_5	400	0.1	Outflow Structures	Culvert
05_B_01	Sub_5	388	14.7	Outflow Structures	Culvert
06_B_01	Sub_6	388	28.7	Outflow Structures	2 Culverts
07_B_01	Sub_7	356	7.9	Outflow Structures	Culvert
08_B_01	Sub_8	348	2.3	Outflow Curve	Horizontal grate
09_B_01	Sub_9	375	1.7	Outflow Structures	Weir & orifices
10_B_01	Sub_10	464	2.4	Outflow Curve	Horizontal grate
10_B_02	Sub_10	449	0.7	Outflow Curve	Horizontal grate
10_B_03	Sub_10	409	1.3	Outflow Curve	Horizontal grate and weir
10_B_04	Sub_11	358	3.4	Outflow Curve	Horizontal grate
11_B_03	Sub_12	318	0.4	Outflow Structures	Spillway
12_B_01	Sub_12	318	1.6	Outflow Structures	2 Culverts
12_B_02	Sub_12	314	1.2	Outflow Structures	2 Culverts
14_B_01	Sub_14	304	64.6	Outflow Structures	Culvert
19_B_01	Sub_19	194	0.2	Outflow Structures	Spillway
21_B_01	Sub_21	142	1.3	Outflow Structures	Weir & 2 orifices
22_B_01	Sub_22	140	0.1	Outflow Structures	Weir
24_B_01	Sub_24	142	4.4	Outflow Curve	Spillway and riser culvert
24_B_02	Sub_24	128	1.2	Outflow Structures	3 Culverts
25_B_01	Sub_25b	226	0.7	Outflow Structures	2 Culverts
25_B_02	Sub_25	122	7.6	Outflow Structures	5 culverts
26_B_01	Sub_26	210	4.0	Outflow Curve	3 Riser culverts & spillway
27b_B_01	Sub_27b	90	70.1	Outflow Structures	Culvert
29_B_01	Sub_FP	82	32.5	Outflow Structures	Box culvert
29_B_02	Sub_29	108	3.5	Outflow Structures	2 Culverts & Spillway
29b_B_01	Sub_29b	34	43.7	Outflow Structures	Culvert
30_B_01	Sub_30	14	177.6	Outflow Structures	2 Box culverts

The total precipitation depths for the 10 and 100 year events, described in Chapter 3 and Table 3-5, provided the basis for developing balanced 24 hour storm hyetographs. These hyetographs provided the temporal rainfall pattern used in the model for each sub-basin. Consequently, runoff and routing simulations used a 24 hour period. Given the relatively small size of the

watershed (16.8 square miles) and the relatively short maximum stream length (6.9 miles), a 24 hour period was sufficient to adequately represent variations in both runoff and stream flow during the selected design events.

Balanced 24 hour storm hyetographs were generated using standard methods. An example of a typical application of this method can be found at: http://onlinemanuals.txdot.gov/txdotmanuals/hyd/hyd_apxf.pdf. Specifically, rainfall depths are obtained for durations ranging from 15 minutes to 24 hours from the NOAA Atlas 14 application. The differences between rainfall depths are then plotted, with the first (and largest) difference plotted at 12 hours and then succeeding differences plotted at alternating later and earlier times until all values are used and the 24 hour hyetograph is completely specified. In this way a hyetograph which represents the 24 hour storm as well as the lesser duration storms is defined. While this hyetograph does not represent any particular storm event, it is representative of the rainfall depths which can be expected for storms of 24 hour and lesser duration. Figure 4-4 provides an example hyetograph for a 100 year, 24 hour rainfall event in one of the sub-watersheds in Canyon del Rey. Rainfall depths shown are for 15 minute periods.

Figure 4-4: Example 100 year, 24 hour rainfall hyetograph, sub-watershed 18



1.5 Conditions modeled

The highly pervious nature of watershed soils, particularly on the north side of the valley enables the watershed to absorb and retain large amounts of rainfall before substantial runoff is initiated. However, a long duration rainfall event or series of rainfall events will saturate the soils and cause much higher runoff to result from additional rainfall events. The 24 hour hyetograph that is used in this study is insufficiently long to create fully saturated soil conditions and thus can under-predict runoff. This behavior was confirmed in simulations which were initiated with minimal antecedent rainfall. Comparison of this behavior with available stream gage data indicated that more substantial antecedent rainfall (and high soil saturation) was needed to achieve results similar to gage data. Therefore, the SCS moisture accounting calculations were set to use Antecedent Moisture Condition I instead of condition II.

Impervious versus pervious conditions in each sub-watershed were assessed by calculating paved area for each sub-watershed using GIS databases. The results were than adjusted based on inspection of aerial photography for the watershed. It was found that model results were quite sensitive to percent impervious specification, due to the highly pervious nature of the soils. Adjustment of this parameter was used in the model calibration process.

The constructed model was used to simulate the following conditions:

- 10 year, 24 hour storm with existing land use and flood management infrastructure
- 100 year, 24 hour storm with existing land use and flood management infrastructure
- 10 year, 24 hour storm with projected future land use and existing flood management infrastructure
- 100 year, 24 hour storm with projected future land use and existing flood management infrastructure
- 10 year, 24 hour storm with projected future land use and proposed flood management infrastructure improvements
- 100 year, 24 hour storm with projected future land use and flood management infrastructure improvements

Runoff and routing simulations using HEC-HMS were used to provide flow data for hydraulic calculations and assess performance of detention facilities and ponding areas. These data were produced for both existing conditions and potential future conditions. After hydraulic assessments were made and potential upgrades to the flood management infrastructure identified, the effects of such changes on runoff and routing of flows were calculated using the model.

1.6 HEC-HMS model calibration

The HEC-HMS model was calibrated by comparing model results with measured stream flow at the CSUMB "Frog Pond" gage. This stream flow gage record included adequate data for two short storm events: on April 3-4, 2006 and March 3-4, 2005. Corresponding data was available from the Fort Ord rain gage.

Antecedent moisture conditions were adjusted to decrease rainfall loss rates in the watershed; AMC II conditions were used initially and then changed to AMC I to allow for the effect of multiple and longer duration rainfall events on soil moisture. Percent impervious calculations were also reviewed using aerial photographs and field investigation, resulting in increases in percent impervious for many sub-watersheds. These changes increased sub-watershed runoff and stream discharge results in the model. The calibration results are summarized in Table 4-5. Figures 4-5 and 4-6 show the correspondence between measured flow and HEC-HMS model results for the two events.

Both peak flow rates and total discharge volume correspond well with the gage results for the two rainfall events. The shapes of the HEC-HMS hydrographs correspond quite well with the gage record graphs. The model does appear to be somewhat more responsive to rainfall variations, as indicated by the somewhat larger response to early rainfall and the faster decline in flow after rainfall rates diminish. This level of calibration was deemed satisfactory for the current study purposes.

Table 4-5: HEC-HMS model calibration results

Calibration Results- April 2006 Storm		
	Peak Flows (cfs)	**Total Volume (ac-ft)**
Known flow gage	80	191
HEC_HMS flow	96	214
Calibration Results - March 2005 Storm		
	Peak Flows (cfs)	**Total Volume (ac-ft)**
Known flow gage	83	79
HEC-HMS flow	78	80

Figure 4-5: Stream flow at Frog Pond Gage for the March 2006 Calibration Event

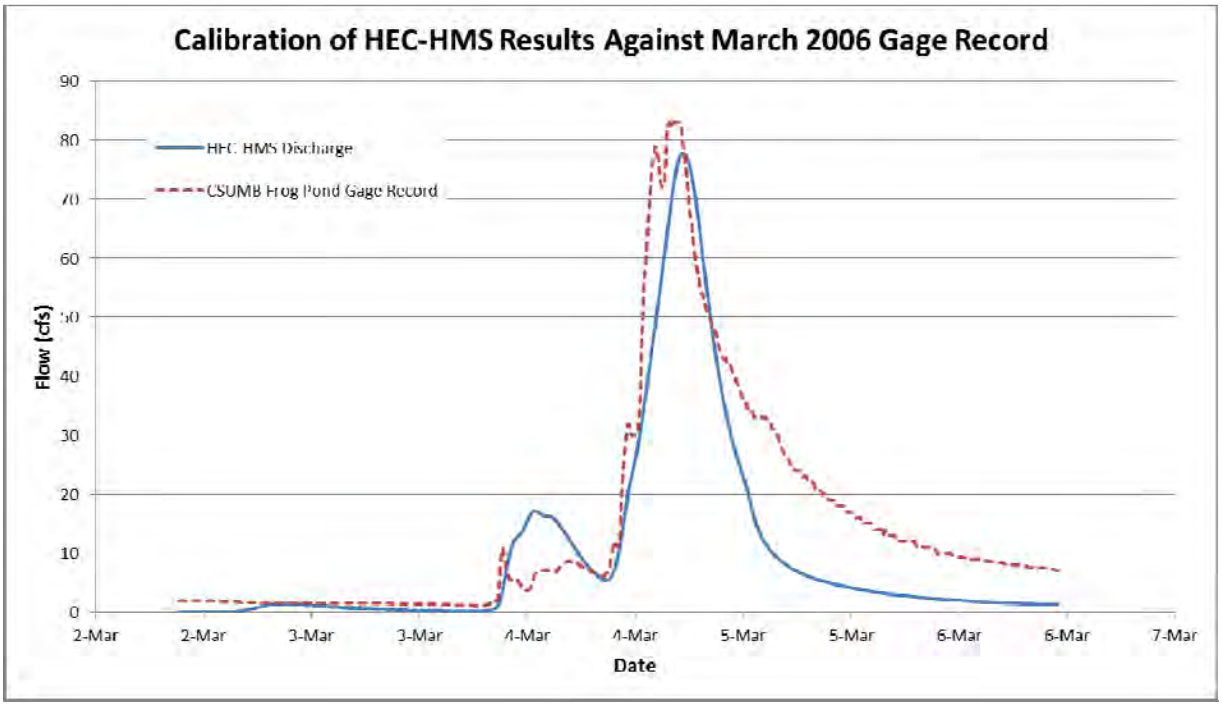
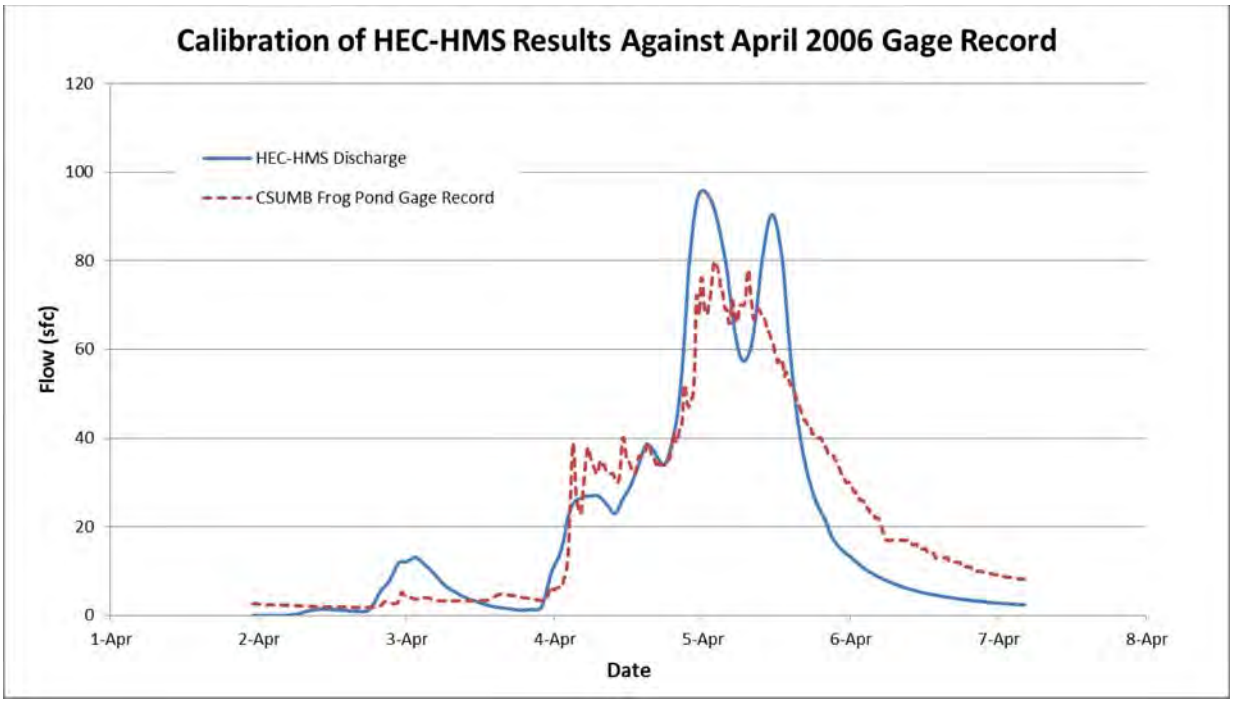


Figure 4-6: Stream flow at Frog Pond Gage for the April 2006 Calibration Event



1.7 Runoff modeling results

The HEC-HMS model of the watershed was used to produce runoff rates and volumes for the sub-watersheds, flow results for stream channels, operational data for the storage basins, and performance data for the culverts. Runoff statistics for each of the sub-watersheds is provided in Table 4-6. Peak flow and total flow volume in the stream channels (routing reaches), at confluences of channels (junctions), and from storage basins (basins) are provided in Table 4-7. Figure 4-7 provides HEC-HMS output hydrographs for reach 29, which is immediately downstream of the "frog pond" basin.

A graph of peak flow at each stream channel location for the 10 year and 100 year events is provided in Figure 4-8. The locations along the channel from most upstream to most downstream (outlet) are identified with the station (facility) ID number. While stream flow generally increases from upstream to downstream, significant variations in stream flow can be seen and are caused by tributary flows from sub-watersheds and storage in basins within the channel sections.

Performance statistics for the storage basins – peak discharge, total outflow, peak storage, and peak water surface elevation – are shown for the 10 year and 100 year events in Table 4-8. The details of the basins are described in Chapter 6. The performance and adequacy of the basins will be discussed in Chapter 7.

The impact of culverts at stream crossings on routing of flow is included in these results. Details of culvert geometry are provided in Chapter 6. The performance and adequacy of each culvert will be discussed in Chapter 7.

Table 4-6: Canyon del Rey sub-watershed runoff before routing

Sub-watershed ID	10-year Peak Runoff (cfs)	10-year Runoff Volume (ac-ft)	100-year Peak Runoff (cfs)	100-year Runoff Volume (ac-ft)
Sub_LS	143	29.9	240	51.7
Sub_01	22	8.6	76	21.9
Sub_02	42	23.4	178	67.5
Sub_03	40	15.2	139	41.8
Sub_04	13	4.0	39	9.8
Sub_05	14	9.4	93	32.8
Sub_06	45	16.1	141	41.4
Sub_07	23	5.7	80	15.4
Sub_08	42	20.5	157	54.8
Sub_09	11	6.3	63	20.5
Sub_10	42	17.5	154	46.8
Sub_11	65	25.5	173	57.0
Sub_12	16	5.1	62	14.2
Sub_13	10	4.4	44	12.6
Sub_14	5	3.7	47	13.9
Sub_15	24	7.5	49	17.8
Sub_16a	1	0.9	15	4.8
Sub_16b	3	2.0	25	8.8
Sub_17	42	11.5	86	23.8
Sub_18	22	18.8	174	81.1
Sub_19	14	4.5	43	11.1
Sub_20	6	5.2	70	24.7
Sub_21	53	13.9	119	27.3
Sub_22	4	0.9	11	2.0
Sub_23	18	11.6	136	42.3
Sub_24	13	5.8	71	18.8
Sub_25	55	13.4	106	24.3
Sub_25b	13	2.4	23	4.0
Sub_25c	8	2.7	30	7.4
Sub_26	13	7.9	72	27.5
Sub_27	73	14.1	132	25.0
Sub_27b	8	1.9	15	3.8
Sub_28	16	6.4	25	10.6
Sub_FP	64	11.2	107	18.2
Sub_29	32	6.6	55	10.8
Sub_29b	101	21.8	170	35.5
Sub_30	867	186.7	1474	303.0

Table 4-7: Stream flow statistics for 10 year and 100 year simulated events

HEC-HMS Station ID	10-year Peak Flow (cfs)	Runoff Volume (ac-ft)	100-year Peak Flow (cfs)	Runoff Volume (ac-ft)
J_01_02	59.9	0.63	241.4	1.75
R_02_03	59.8	0.63	238.5	1.75
J_03_04	110.1	0.67	412.5	1.84
06_B_01	54.3	0.31	377.7	1.26
R_06_07	54.1	0.3	375.2	1.26
07_B_01	56.4	0.32	389.2	1.23
R_07_08	56.3	0.32	371.7	1.23
J_08_09	77.3	0.38	494.1	1.31
J_10	139.3	0.47	684.8	1.43
R_11_12	138.4	0.47	669.5	1.43
11_B_03	138.1	0.46	660.9	1.42
12_B_01	145.4	0.46	662.2	1.42
12_B_02	144.7	0.45	660	1.4
R_12_14	143.1	0.45	648.9	1.4
14_B_01	143.4	0.44	480.4	1.19
J_16a	144.3	0.44	484.9	1.19
R_16a_15	144.1	0.43	471.1	1.17
J_15	149.1	0.44	482.6	1.18
R_15_17	149	0.43	477.4	1.17
J_17	156.4	0.45	489.1	1.2
J_19a	180.5	0.4	583.2	1.16
R_17_19	180.4	0.4	572.3	1.15
J_19	183.8	0.4	578.2	1.15
R_19_20	183.6	0.4	576.1	1.14
J_19_20	205	0.4	619.4	1.16
J_20_23	218.3	0.4	670.7	1.16
R_23_25	217.9	0.37	662.1	1.11
25_B_02	227.3	0.39	702.5	1.11
J_25_25c_26	236.5	0.39	760.4	1.11
R_26_27	236	0.38	745.7	1.1
J_27	240.7	0.4	768.9	1.13
R_27_27b	240.5	0.4	764.6	1.13
27B_B_01	232.3	0.39	756.4	1.08
29_B_01	197	0.29	723.9	0.86
R_29	197	0.29	712.6	0.85
J_29_fp_29b	203.2	0.31	731.1	0.87
J_29b	205.3	0.32	741.9	0.87
R_29_30	205.3	0.32	741.8	0.87
29b_B_01	205.3	0.31	694.1	0.86
30_B_01	257.5	0.37	758.4	0.89
Outfall	257.5	0.37	758.4	0.89

Figure 4-7: Sample HEC-HMS output hydrographs for Reach 29

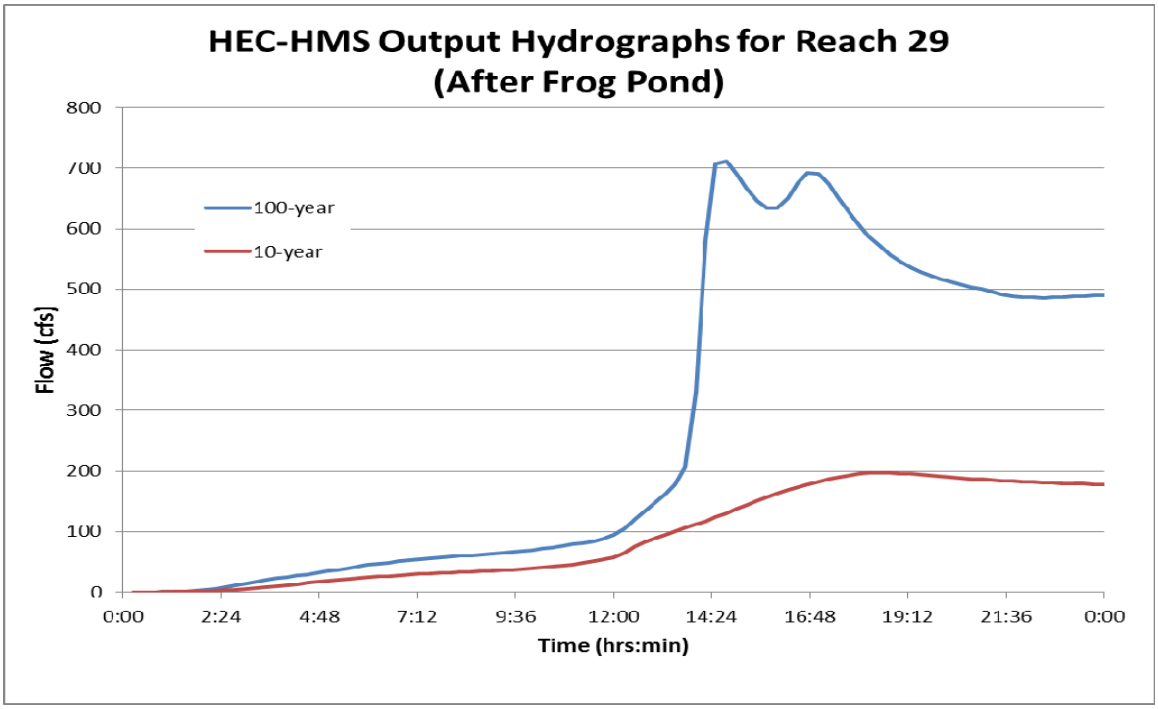


Figure 4-8: Simulation peak discharge results for Canyon del Rey

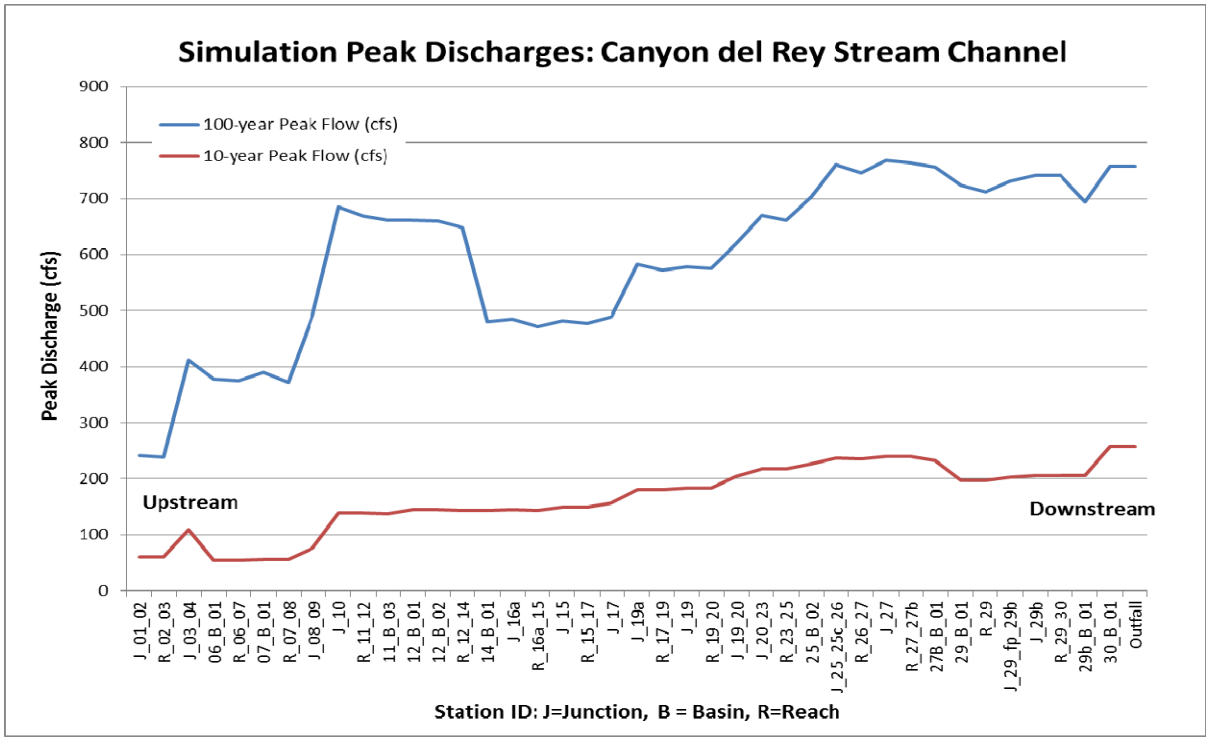


Table 4-8: Storage basin performance statistics for the 10 year and 100 year events

Basin ID	10-year Peak Discharge (cfs)	10-year Total Outflow (ac-ft)	10-year Peak Storage (ac-ft)	10-year Peak Elevation (ft)	100-year Peak Discharge (cfs)	100-year Total Outflow (ac-ft)	100-year Peak Storage (ac-ft)	100-year Peak Elevation (ft)
LS_B_01	10	7.8	22.2	749	14	14.4	37.38	750.5
04_B_01	13	3.7	0.38	414	39	9.5	0.45	415
04_B_02	12	3.7	0.06	399	35	9.4	0.79	400
05_B_01	2	1.5	12.80	388	24	12.8	24.97	390
06_B_01	54	41.3	37.43	389	378	170.6	48.43	390
07_B_01	56	46.1	0.48	347	389	175.5	12.05	358
08_B_01	41	20.5	2.48	348	158	54.6	2.99	349
09_B_01	9	6.3	0.21	370	61	20.3	1.03	373
10_B_01	38	17.3	0.76	463	119	46.2	3.66	465
10_B_02	33	17.1	0.65	449	131	45.9	2.70	452
10_B_03	32	17.5	1.24	409	107	45.8	2.77	410
10_B_04	64	42.3	2.92	358	199	101.5	11.66	362
11_B_03	138	113.1	0.31	318	661	347.4	0.66	319
12_B_01	145	116.2	1.52	318	662	358.1	3.29	320
12_B_02	145	114.2	1.37	314	660	354.3	2.49	316
14_B_01	143	120.6	1.48	276	480	325.1	64.28	304
19_B_01	14	4.5	0.32	195	41	11.1	0.41	195
21_B_01	20	12.6	3.85	144	44	25.0	7.26	145
22_B_01	3	0.9	0.25	141	9	1.9	0.33	142
24_B_01	7	5.6	0.85	137	28	14.5	5.22	143
24_B_02	7	5.1	1.67	129	20	13.4	3.01	130
25_B_01	7	2.4	0.77	226	12	4.0	1.02	227
25_B_02	227	193.8	5.11	121	703	553.1	15.05	124
26_B_01	11	7.6	0.53	205	93	26.1	1.69	207
27b_B_01	232	208.9	12.76	89	756	583.3	27.53	92
29_B_01	197	189.0	43.80	83	724	551.9	65.18	85
29_B_02	14	6.1	2.06	107	23	10.2	2.99	108
29b_B_01	205	211.5	1.58	22	694	581.9	15.78	29
30_B_01	258	282.4	154.27	13	758	679.7	253.13	16

Appendix 2-f

Special Status Species

DRAFT

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad is (Moss Landing (3612177) or Prunedale (3612176) or San Juan Bautista (3612175) or Natividad (3612165) or Salinas (3612166) or Marina (3612167) or Spreckels (3612156) or Seaside (3612157) or Monterey (3612158) or Soberanes Point (3612148) or Mt. Carmel (3612147))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S3	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	None	G2G3	S2	SSC
Agrostis lacuna-vernalis vernal pool bent grass	PMPOA041N0	None	None	G1	S1	1B.1
Allium hickmanii Hickman's onion	PMLIL02140	None	None	G2	S2	1B.2
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	SSC
Ambystoma macrodactylum croceum Santa Cruz long-toed salamander	AAAAA01082	Endangered	Endangered	G5T1	S1	FP
Anniella pulchra nigra black legless lizard	ARACC01011	None	None	G3G4T2T3Q	S2	SSC
Anniella pulchra pulchra silvery legless lizard	ARACC01012	None	None	G3G4T3T4Q	S3	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Arctostaphylos edmundsii Little Sur manzanita	PDERI04260	None	None	G2?	S2?	1B.2
Arctostaphylos hookeri ssp. hookeri Hooker's manzanita	PDERI040J1	None	None	G3T2?	S2?	1B.2
Arctostaphylos montereyensis Toro manzanita	PDERI040R0	None	None	G2?	S2?	1B.2
Arctostaphylos pajaroensis Pajaro manzanita	PDERI04100	None	None	G1	S1	1B.1
Arctostaphylos pumila sandmat manzanita	PDERI04180	None	None	G1	S1	1B.2
Asio flammeus short-eared owl	ABNSB13040	None	None	G5	S3	SSC
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T2	S2	1B.2
Astragalus tener var. titi coastal dunes milk-vetch	PDFAB0F8R2	Endangered	Endangered	G2T1	S1	1B.1
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S2	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
California macrophylla round-leaved filaree	PDGER01070	None	None	G2	S2	1B.1
Castilleja ambigua var. insalutata pink Johnny-nip	PDSCR0D403	None	None	G4T1	S1	1B.1
Central Dune Scrub Central Dune Scrub	CTT21320CA	None	None	G2	S2.2	
Central Maritime Chaparral Central Maritime Chaparral	CTT37C20CA	None	None	G2	S2.2	
Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1	None	None	G3T2	S2	1B.1
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2	SSC
Chorizanthe pungens var. pungens Monterey spineflower	PDPGN040M2	Threatened	None	G2T2	S2	1B.2
Chorizanthe robusta var. robusta robust spineflower	PDPGN040Q2	Endangered	None	G2T1	S1	1B.1
Clarkia jolonensis Jolon clarkia	PDONA050L0	None	None	G2	S2.2	1B.2
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Coelus globosus globose dune beetle	IICOL4A010	None	None	G1	S1	
Collinsia multicolor San Francisco collinsia	PDSCR0H0B0	None	None	G2	S2.2	1B.2
Cordylanthus rigidus ssp. littoralis seaside bird's-beak	PDSCR0J0P2	None	Endangered	G5T2	S2	1B.1
Cypseloides niger black swift	ABNUA01010	None	None	G4	S2	SSC
Danaus plexippus monarch butterfly	IILEPP2010	None	None	G5	S3	
Delphinium californicum ssp. interius Hospital Canyon larkspur	PDRAN0B0A2	None	None	G3T3	S3	1B.2
Delphinium hutchinsoniae Hutchinson's larkspur	PDRAN0B0V0	None	None	G2	S2.1	1B.2
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T3Q	S3	WL
Ericameria fasciculata Eastwood's goldenbush	PDAST3L080	None	None	G2	S2.1	1B.1
Eriogonum nortonii Pinnacles buckwheat	PDPGN08470	None	None	G2	S2.3	1B.3
Erysimum ammophilum sand-loving wallflower	PDBRA16010	None	None	G2	S2.2	1B.2
Erysimum menziesii Menzies' wallflower	PDBRA160R0	Endangered	Endangered	G1	S1	1B.1
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S2S3	SSC
Euphilotes enoptes smithi Smith's blue butterfly	IILEPG2026	Endangered	None	G5T1T2	S1S2	
Falco mexicanus prairie falcon	ABNKD06090	None	None	G5	S3	WL
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Gilia tenuiflora ssp. arenaria Monterey gilia	PDPLM041P2	Endangered	Threatened	G3G4T2	S2	1B.2
Helminthoglypta sequoicola consors redwood shoulderband	IMGASC2421	None	None	G2T1	S1	
Hesperocyparis goveniana Gowen cypress	PGCUP04031	Threatened	None	G1	S1	1B.2
Hesperocyparis macrocarpa Monterey cypress	PGCUP04060	None	None	G1	S1	1B.2
Holocarpha macradenia Santa Cruz tarplant	PDAST4X020	Threatened	Endangered	G1	S1	1B.1
Horkelia cuneata var. sericea Kellogg's horkelia	PDROS0W043	None	None	G4T2	S2?	1B.1
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4?	
Lasthenia conjugens Contra Costa goldfields	PDAST5L040	Endangered	None	G1	S1	1B.1
Layia carnosa beach layia	PDAST5N010	Endangered	Endangered	G2	S2	1B.1
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2.2	1B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G3	S2S3	
Lupinus tidestromii Tidestrom's lupine	PDFAB2B3Y0	Endangered	Endangered	G1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Malacothamnus palmeri var. involucratus Carmel Valley bush-mallow	PDMAL0Q0B1	None	None	G3T2Q	S2.2	1B.2
Malacothamnus palmeri var. palmeri Santa Lucia bush-mallow	PDMAL0Q0B5	None	None	G3T2Q	S2.2	1B.2
Malacothrix saxatilis var. arachnoidea Carmel Valley malacothrix	PDAST660C2	None	None	G5T2	S2	1B.2
Microseris paludosa marsh microseris	PDAST6E0D0	None	None	G2	S2.2	1B.2
Monardella sinuata ssp. nigrescens northern curly-leaved monardella	PDLAM18162	None	None	G3T2	S2	1B.2
Monolopia gracilens woodland woollythreads	PDAST6G010	None	None	G2G3	S2S3	1B.2
Monterey Cypress Forest Monterey Cypress Forest	CTT83150CA	None	None	G1	S1.2	
Monterey Pine Forest Monterey Pine Forest	CTT83130CA	None	None	G1	S1.1	
Monterey Pygmy Cypress Forest Monterey Pygmy Cypress Forest	CTT83162CA	None	None	G1	S1.1	
Northern Bishop Pine Forest Northern Bishop Pine Forest	CTT83121CA	None	None	G2	S2.2	
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Oceanodroma homochroa ashy storm-petrel	ABNDC04030	None	None	G2	S2	SSC
Oncorhynchus mykiss irideus steelhead - south/central California coast DPS	AFCHA0209H	Threatened	None	G5T2Q	S2	SSC
Optioservus canus Pinnacles optioservus riffle beetle	IICOL5E020	None	None	G1	S1	
Pelecanus occidentalis californicus California brown pelican	ABNFC01021	Delisted	Delisted	G4T3	S1S2	FP
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G3G4	S3S4	SSC
Pinus radiata Monterey pine	PGPIN040V0	None	None	G1	S1	1B.1
Piperia yadonii Yadon's rein orchid	PMORC1X070	Endangered	None	G2	S2	1B.1
Plagiobothrys uncinatus hooked popcornflower	PDBOR0V170	None	None	G2	S2	1B.2
Potentilla hickmanii Hickman's cinquefoil	PDROS1B0U0	Endangered	Endangered	G1	S1	1B.1
Rallus longirostris obsoletus California clapper rail	ABNME05016	Endangered	Endangered	G5T1	S1	FP

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Reithrodontomys megalotis distichlis Salinas harvest mouse	AMAFF02032	None	None	G5T1	S1	
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2S3	
Rosa pinetorum pine rose	PDROS1J0W0	None	None	G2Q	S2.2	1B.2
Sidalcea malachroides maple-leaved checkerbloom	PDMAL110E0	None	None	G3G4	S3S4.2	4.2
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	SSC
Stebbinsoseris decipiens Santa Cruz microseris	PDAST6E050	None	None	G2	S2.2	1B.2
Taricha torosa Coast Range newt	AAAAF02032	None	None	G4	S4	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S4	SSC
Thamnophis hammondii two-striped garter snake	ARADB36160	None	None	G4	S2	SSC
Tortula californica California screw moss	NBMUS7L090	None	None	G2?	S2	1B.2
Trifolium buckwestiorum Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Trifolium polyodon Pacific Grove clover	PDFAB402H0	None	Rare	G1	S1	1B.1
Trifolium trichocalyx Monterey clover	PDFAB402J0	Endangered	Endangered	G1	S1	1B.1
Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2G3	S2S3	
Valley Needlegrass Grassland Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	

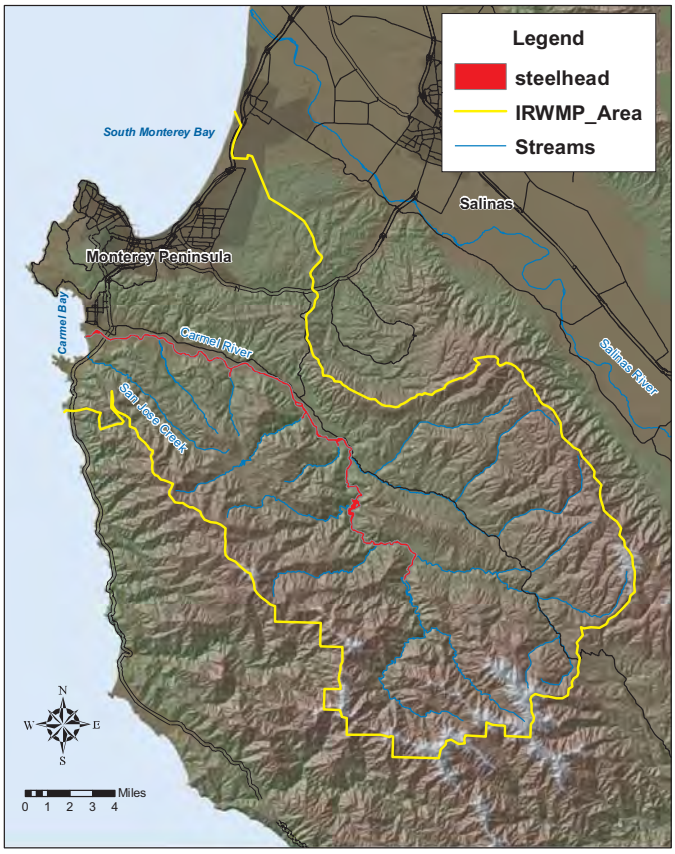
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Appendix 2-g

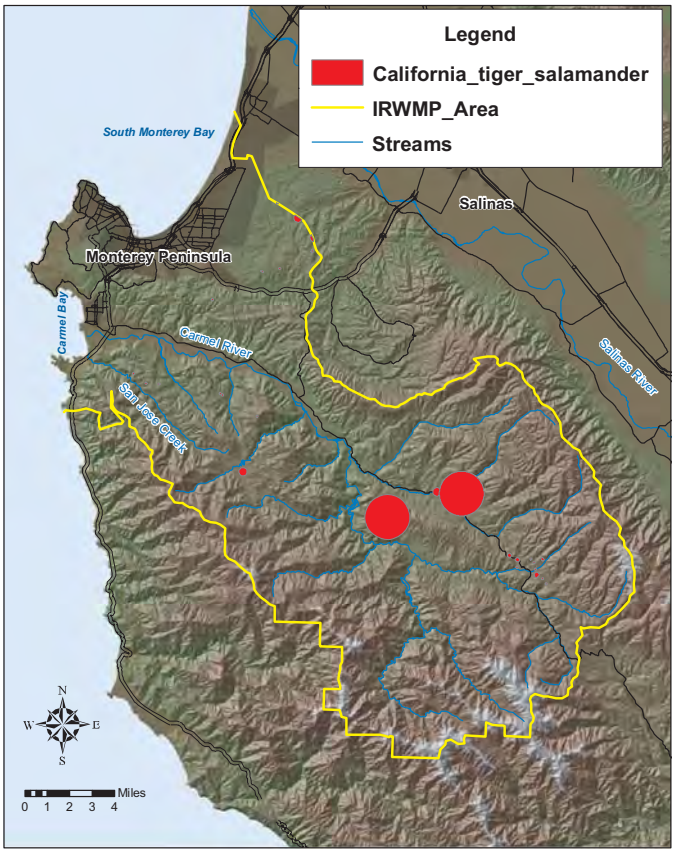
Potential Distribution of Special Status Species Based on Habitat Type

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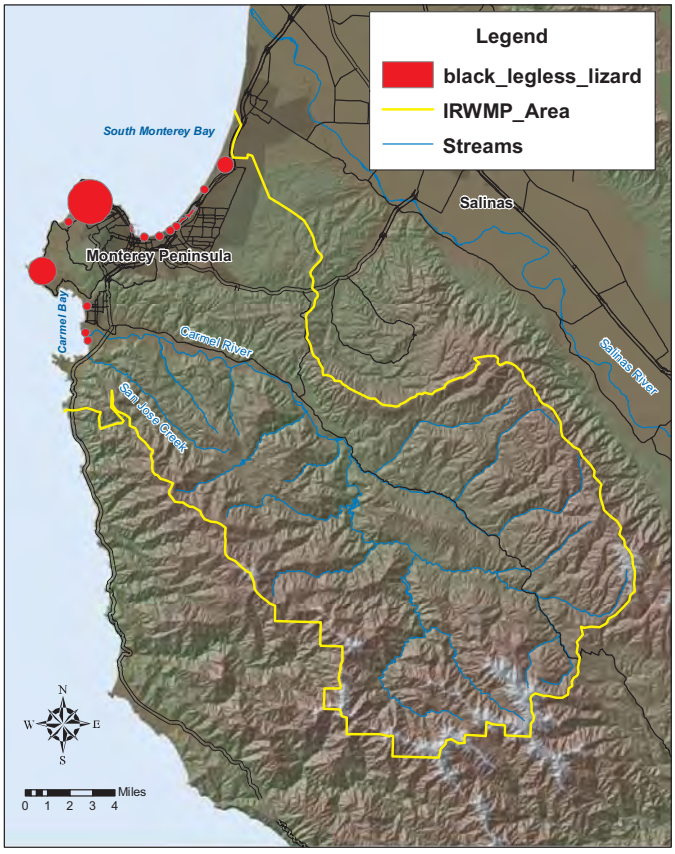
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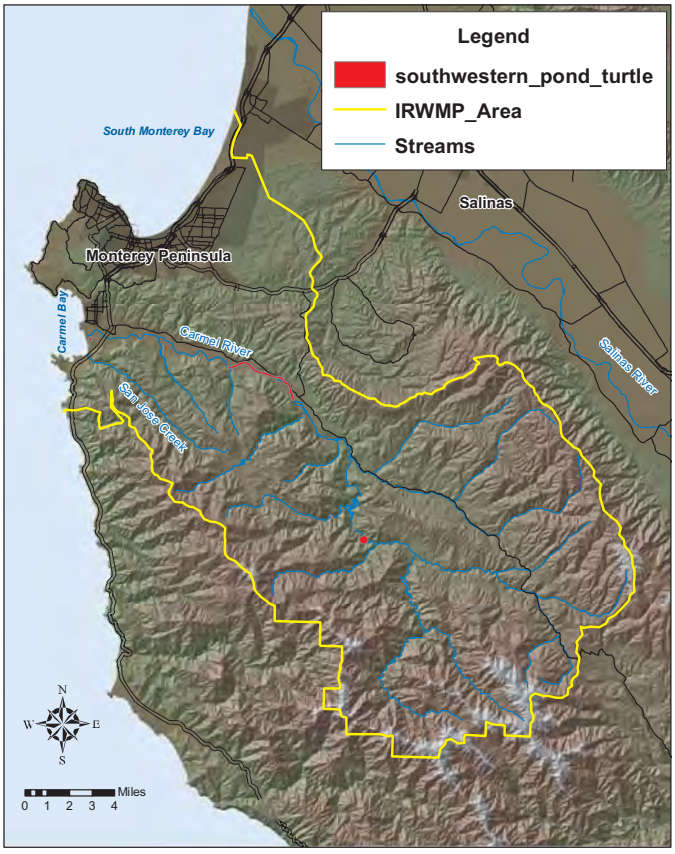
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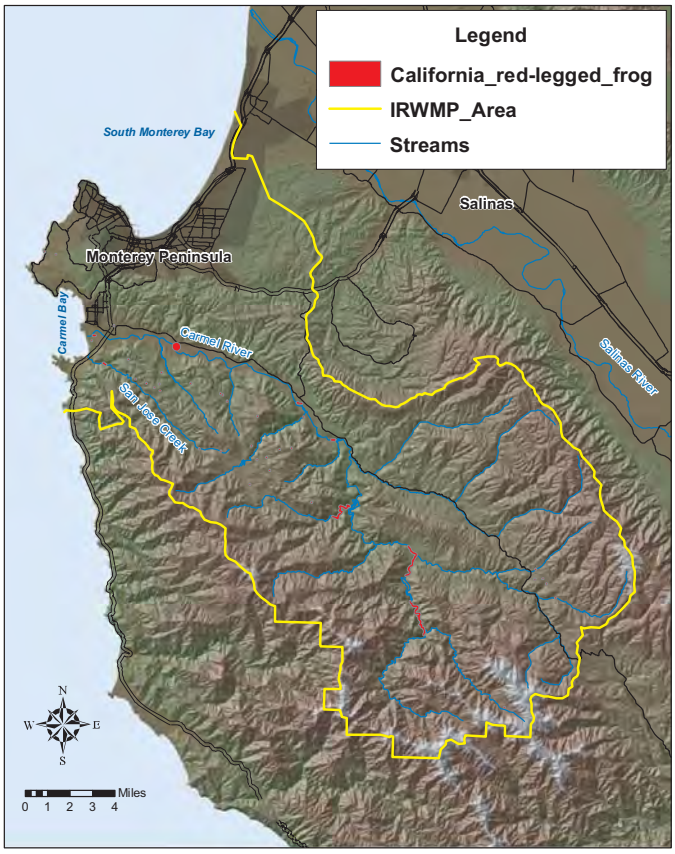
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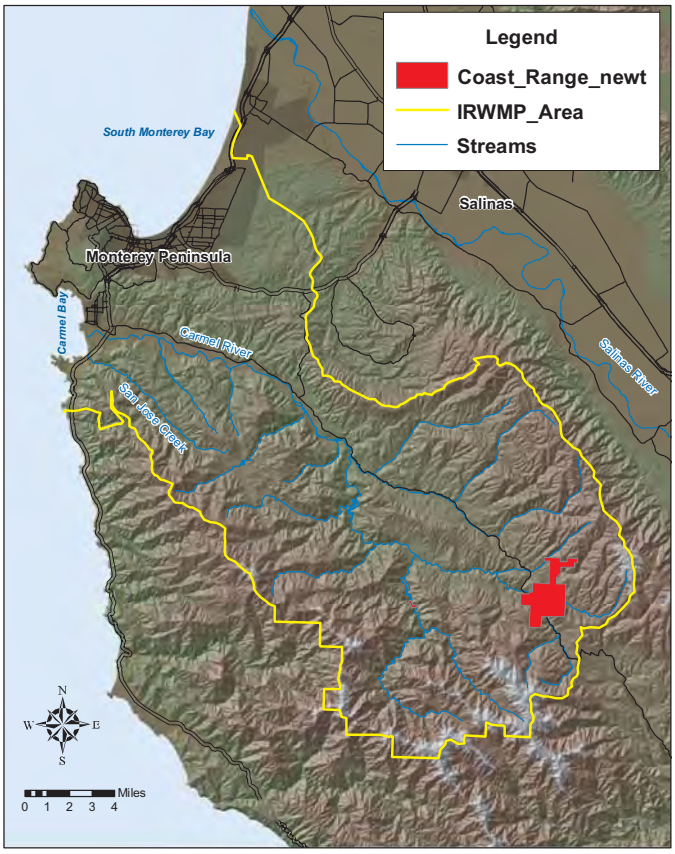
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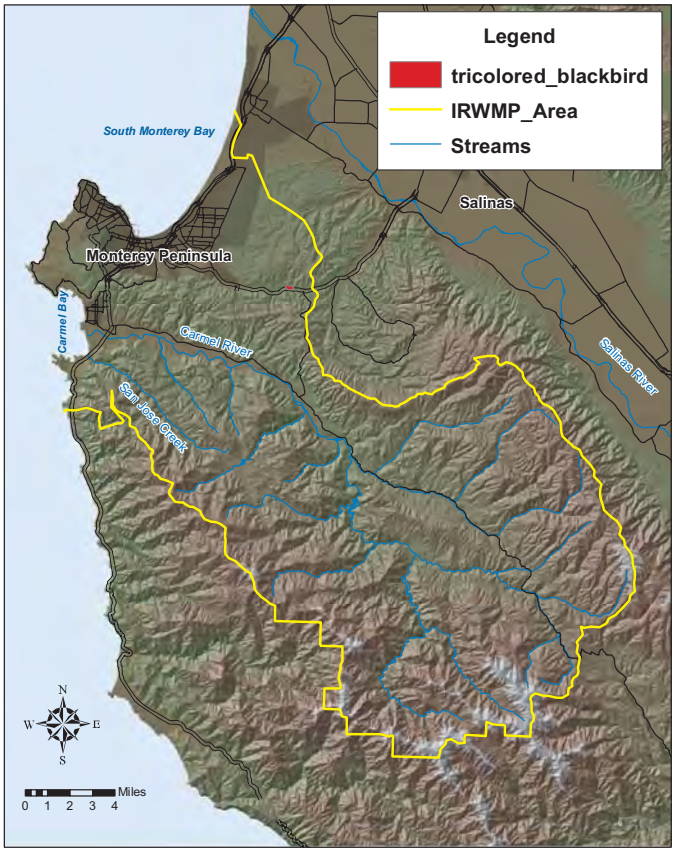
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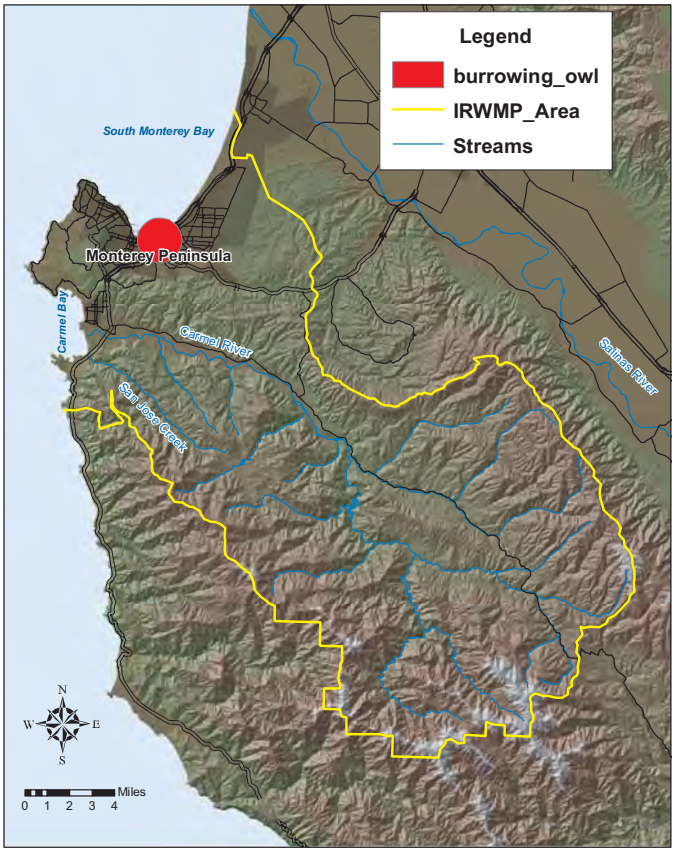
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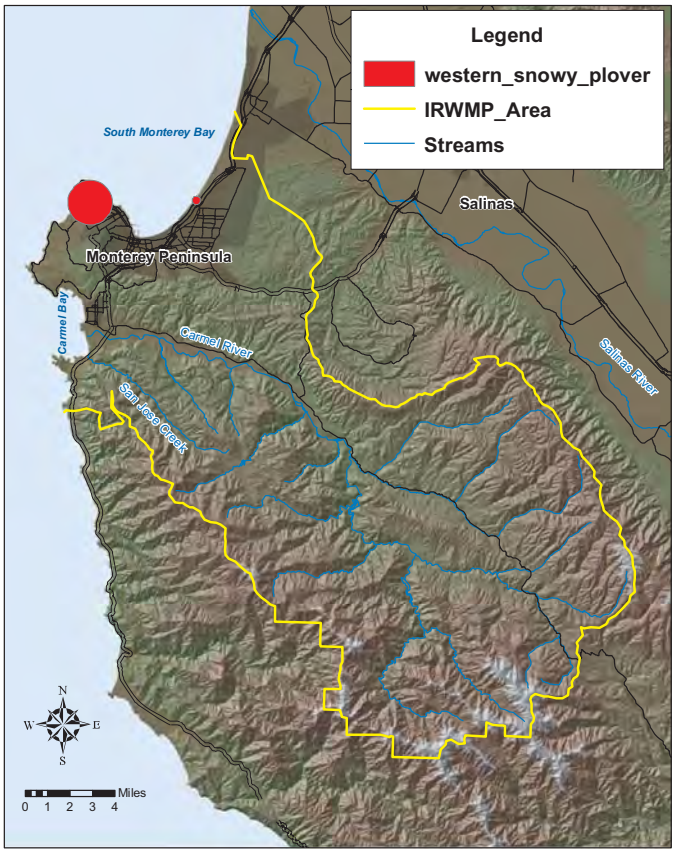
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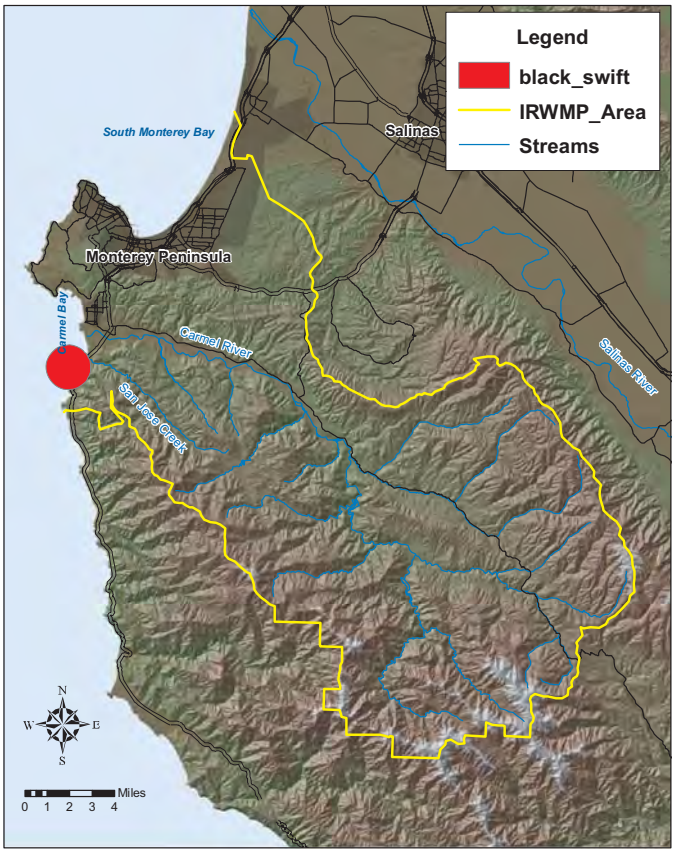
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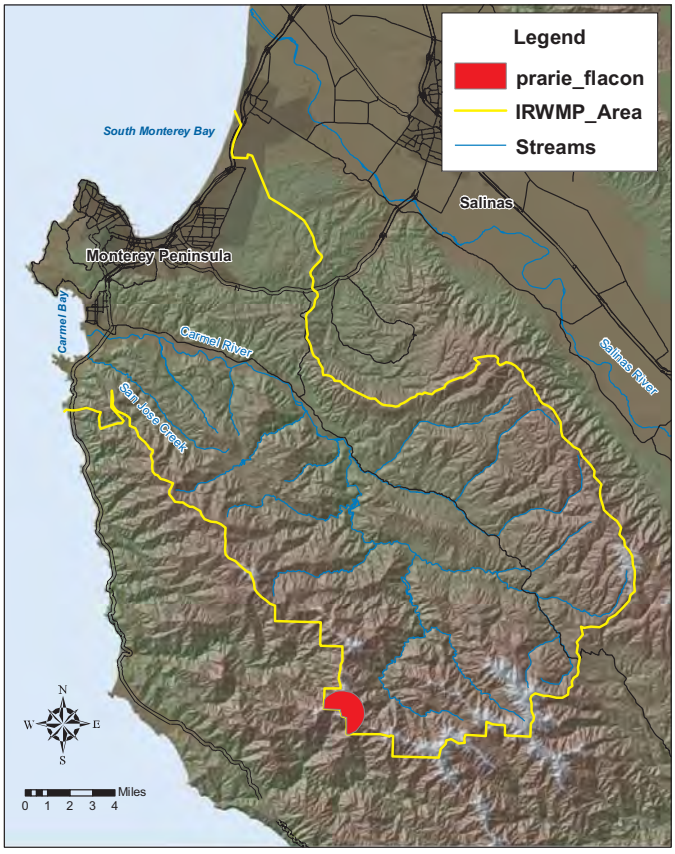
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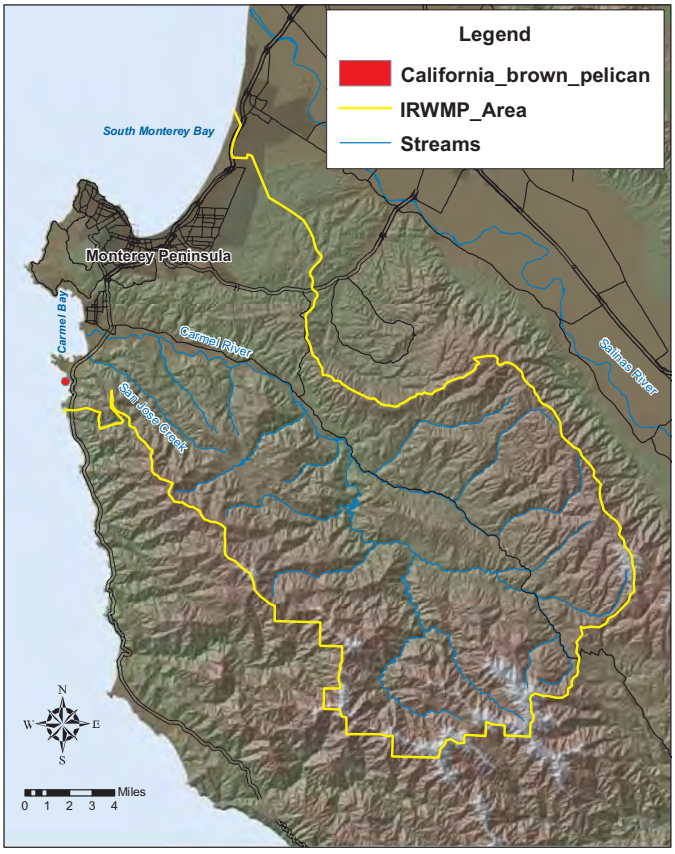
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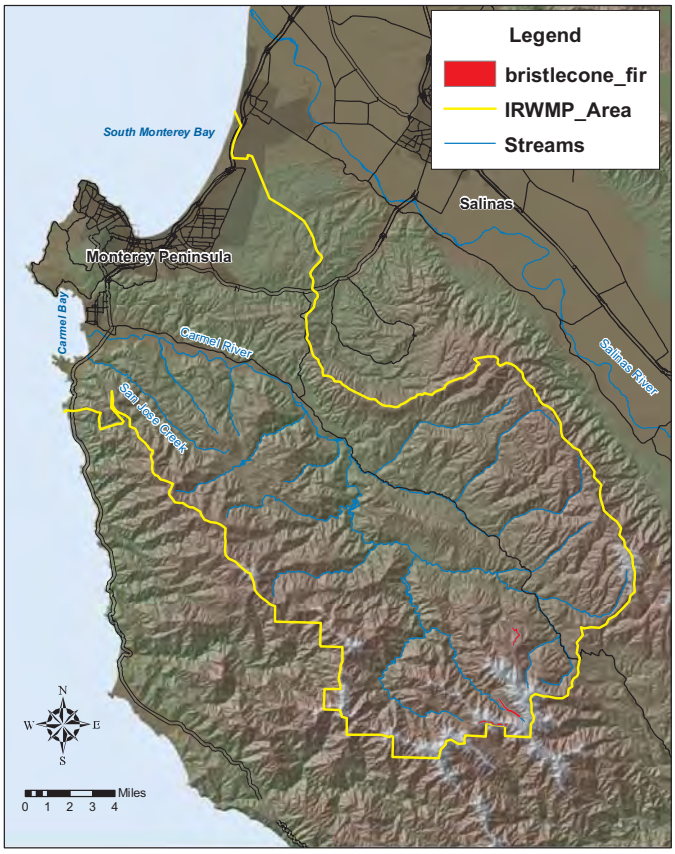
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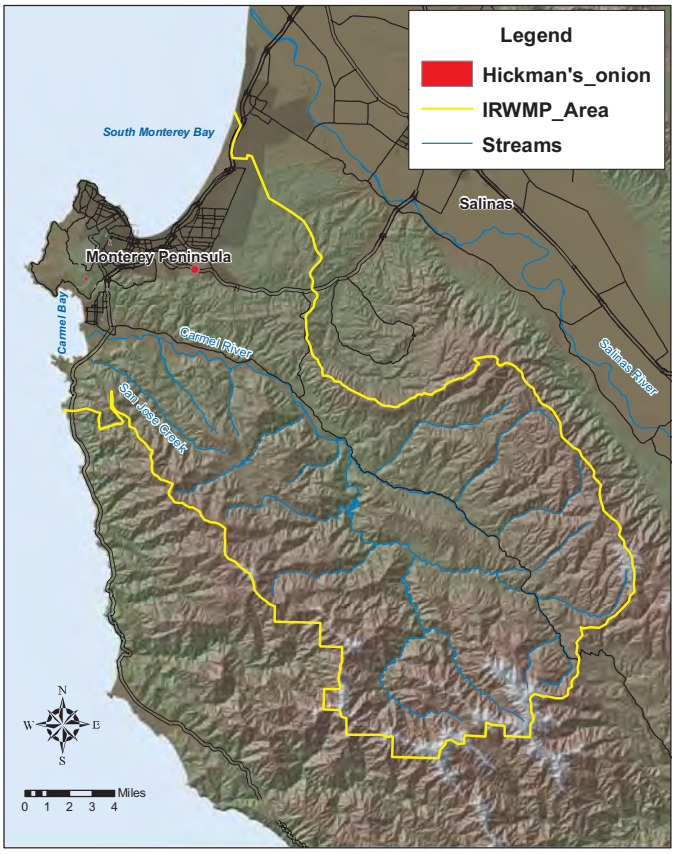
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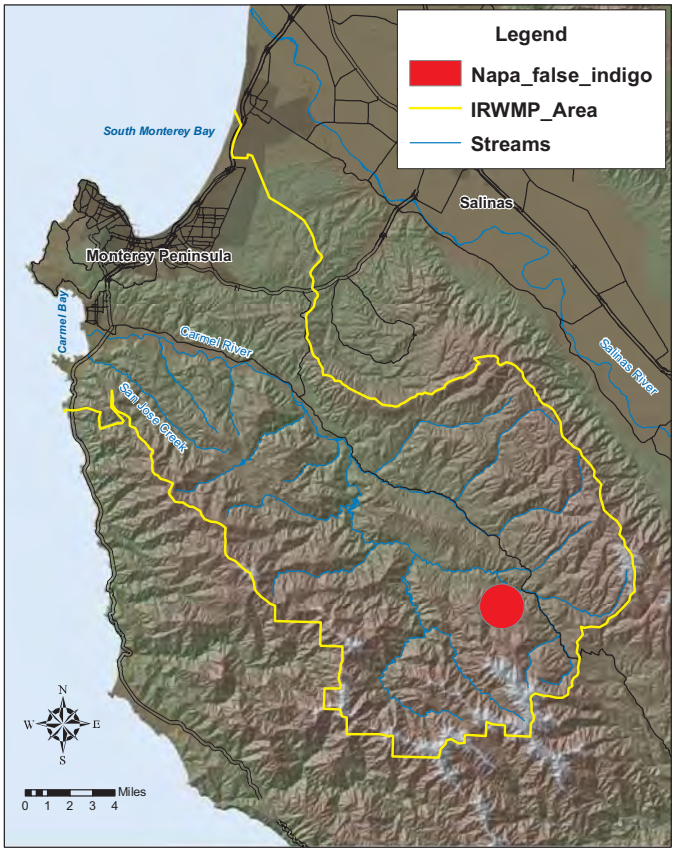
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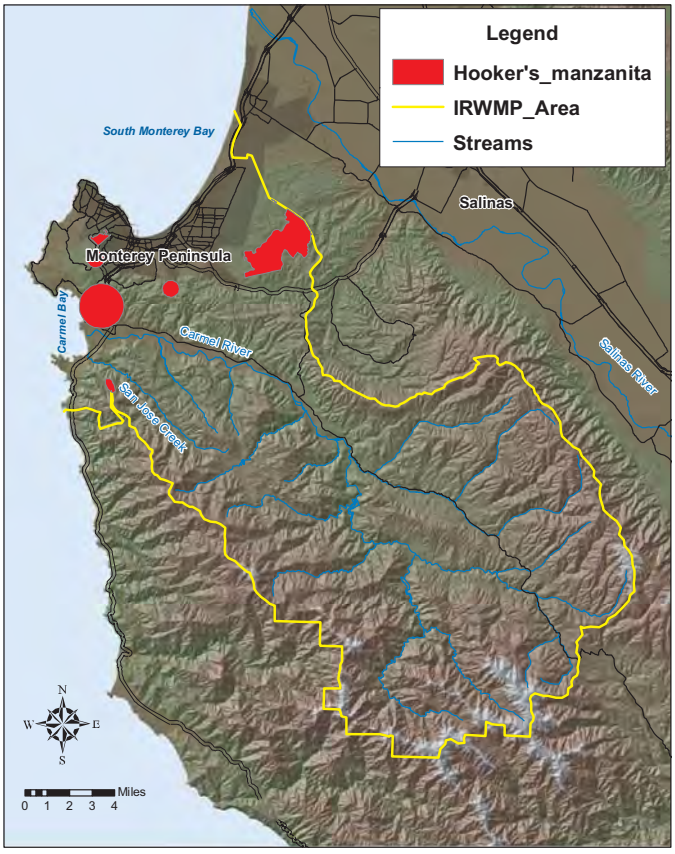
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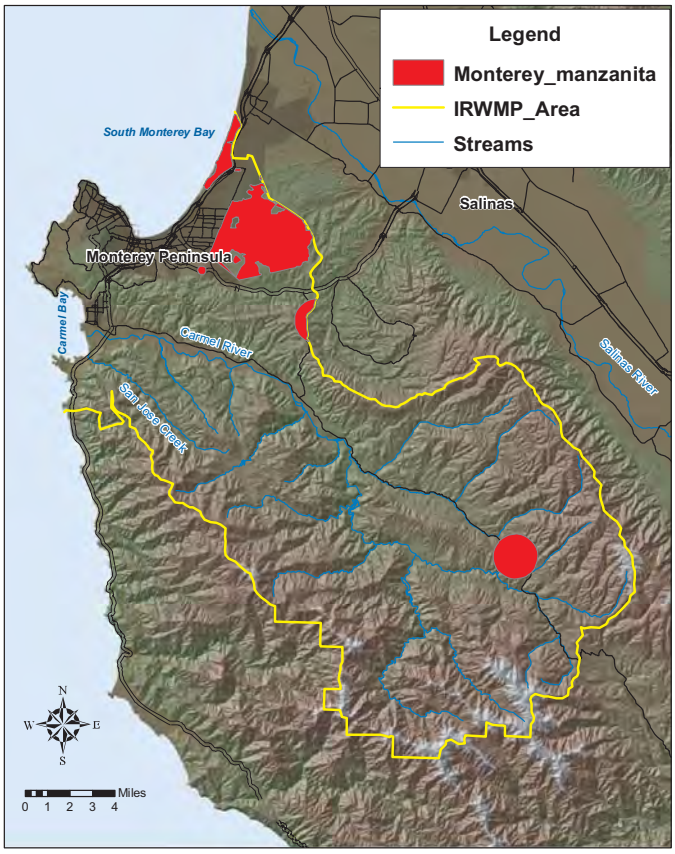
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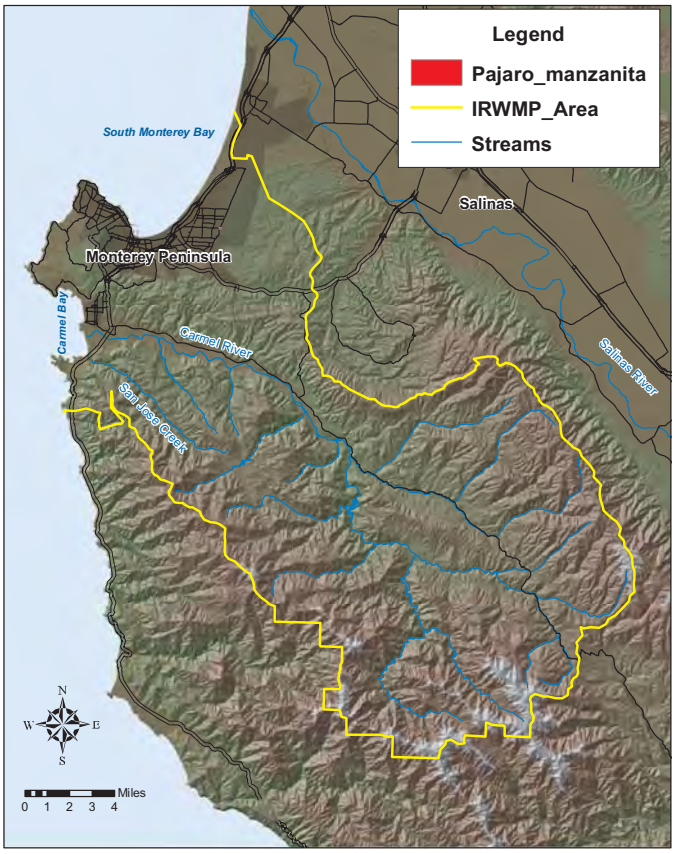
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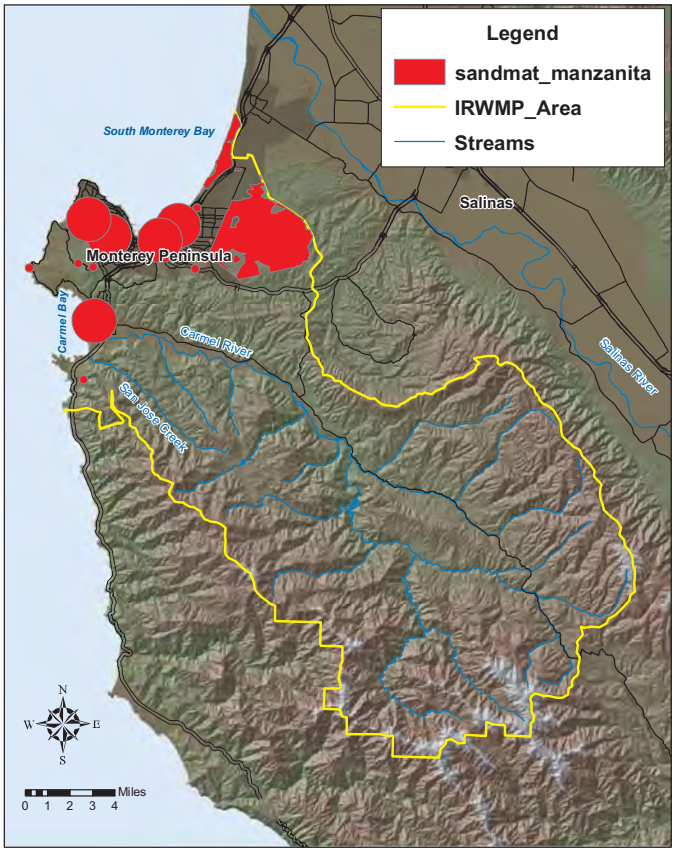
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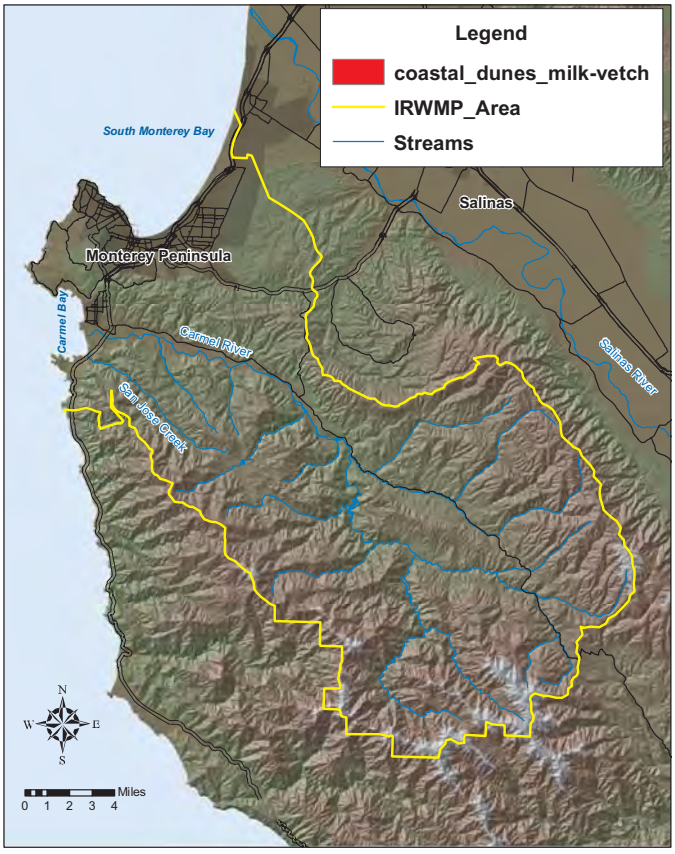
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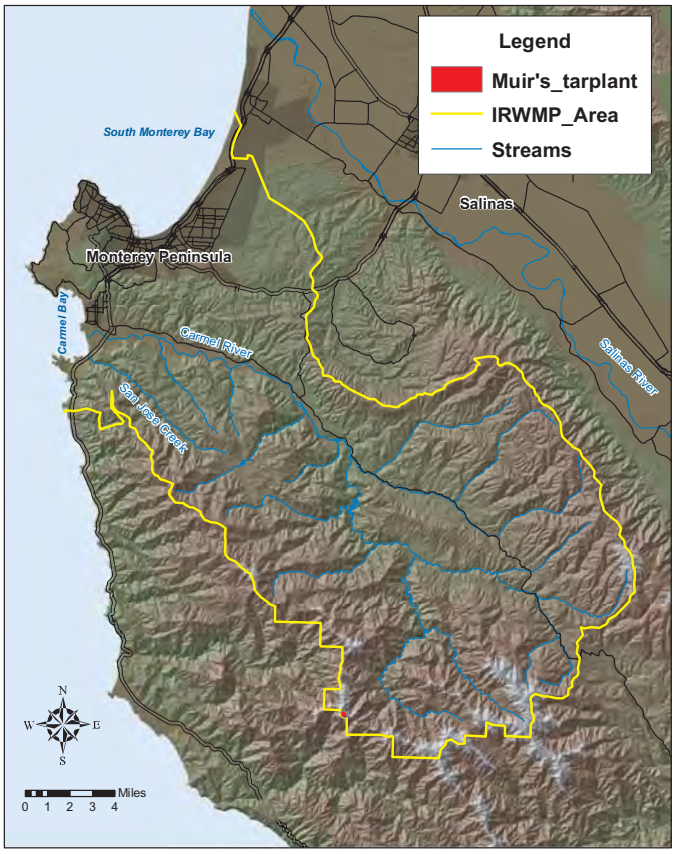
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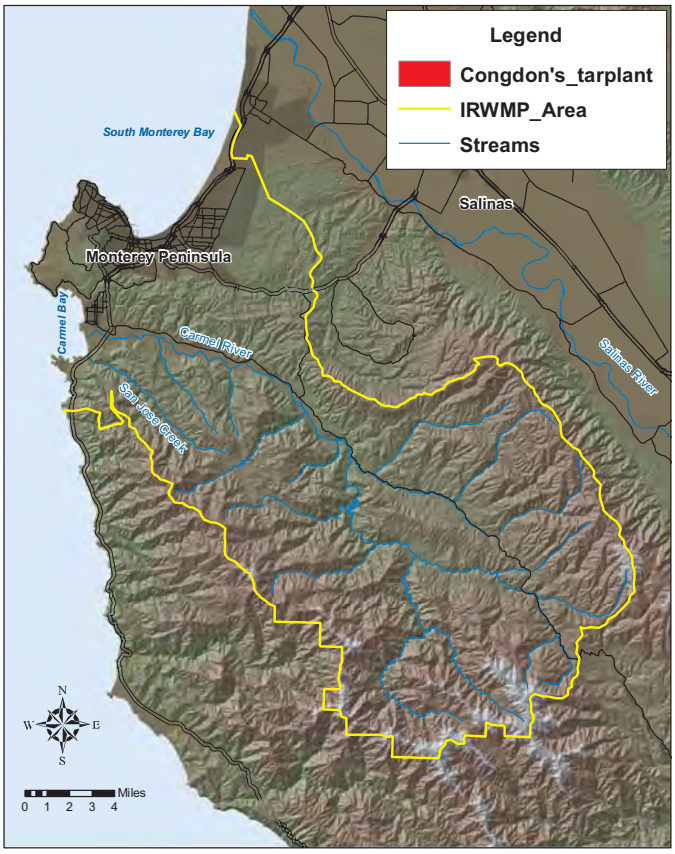
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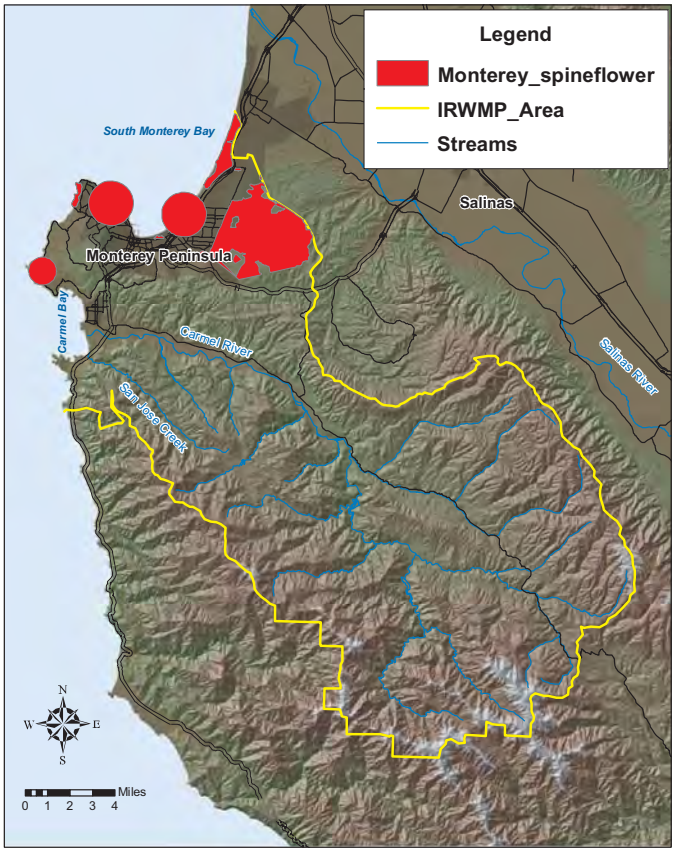
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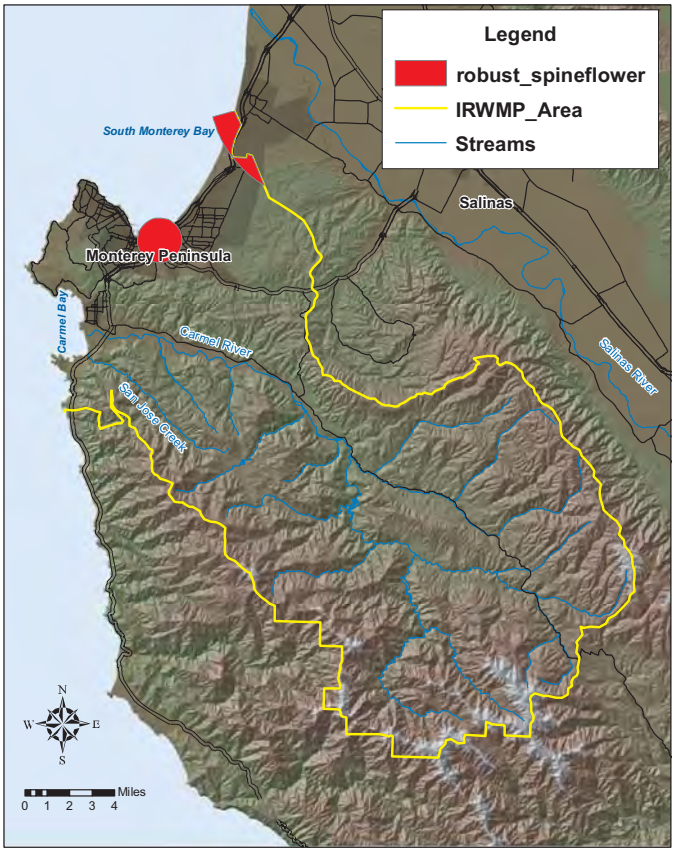
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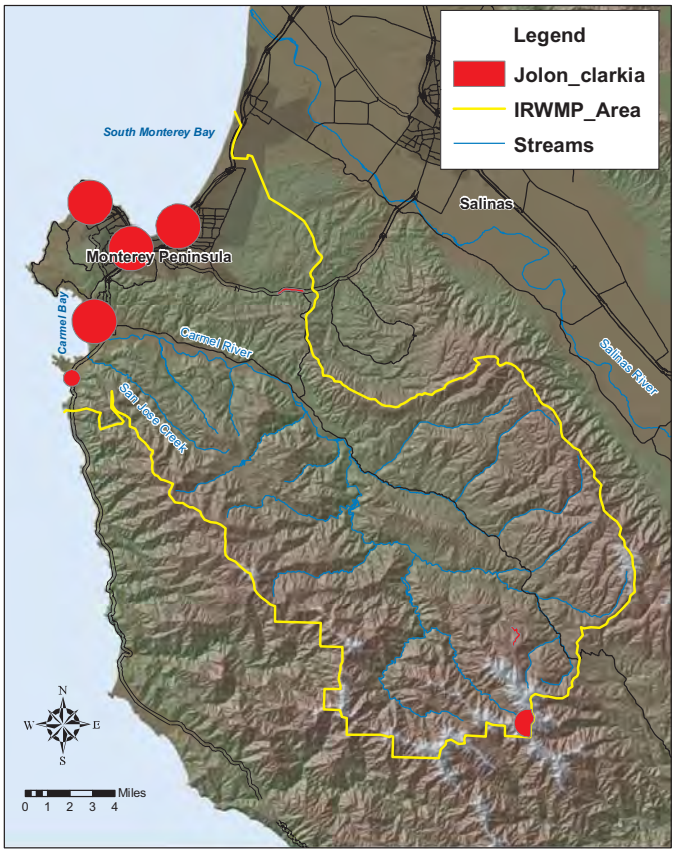
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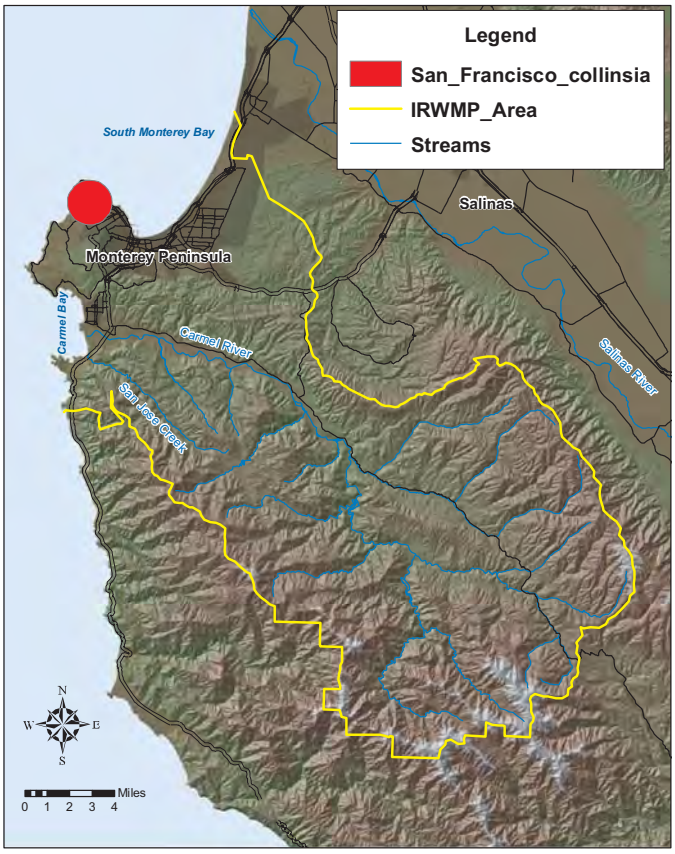
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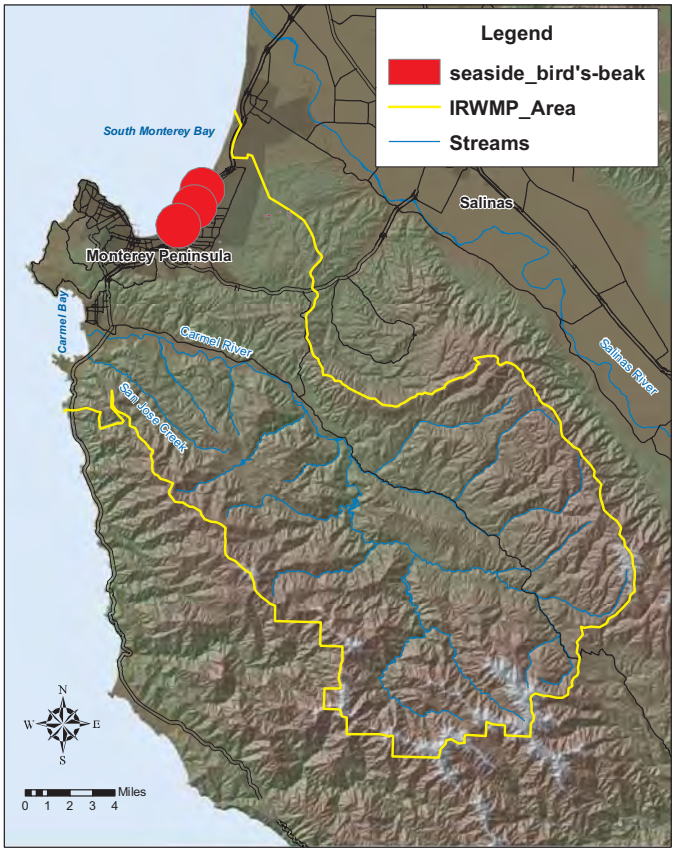
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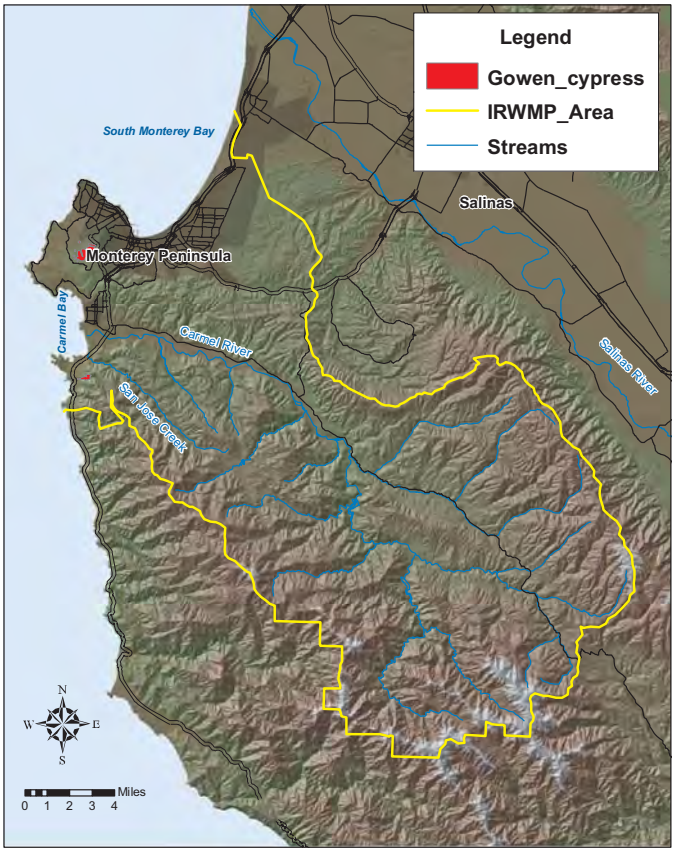
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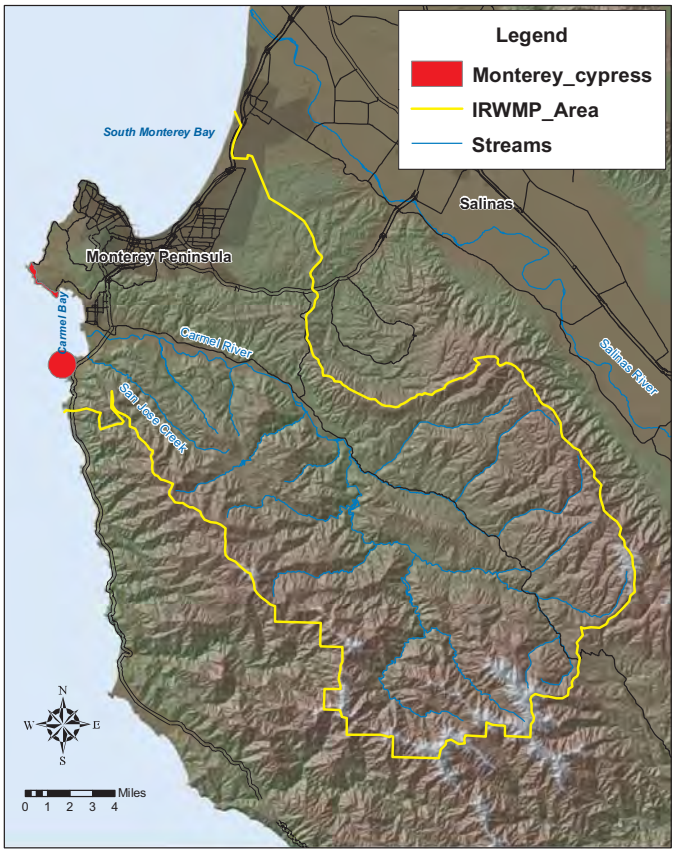
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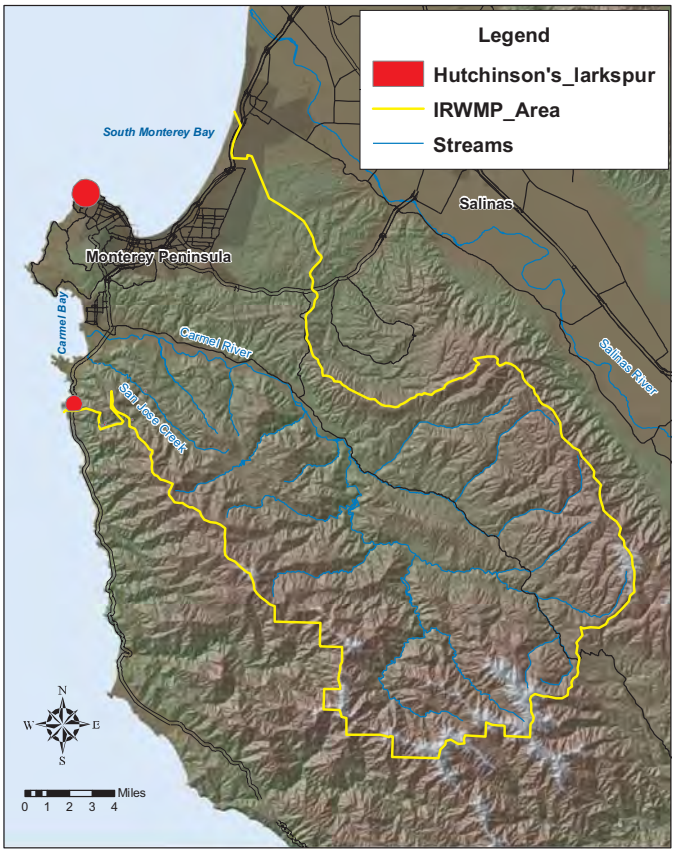
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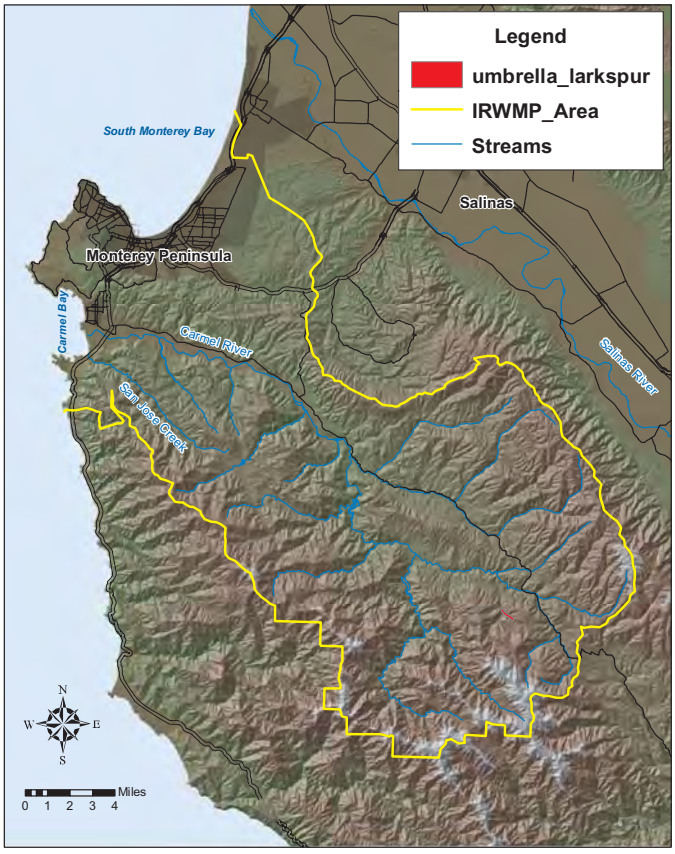
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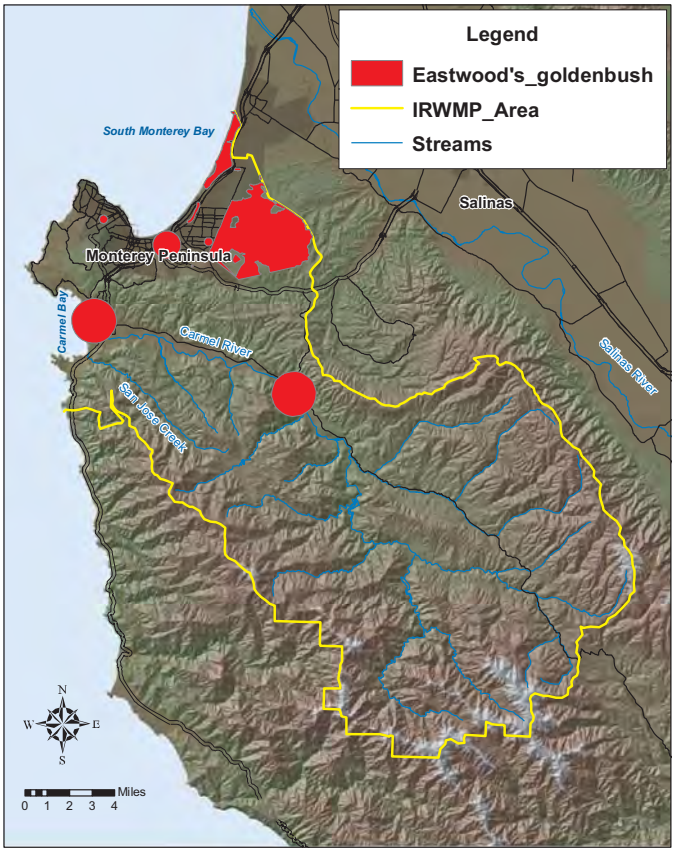
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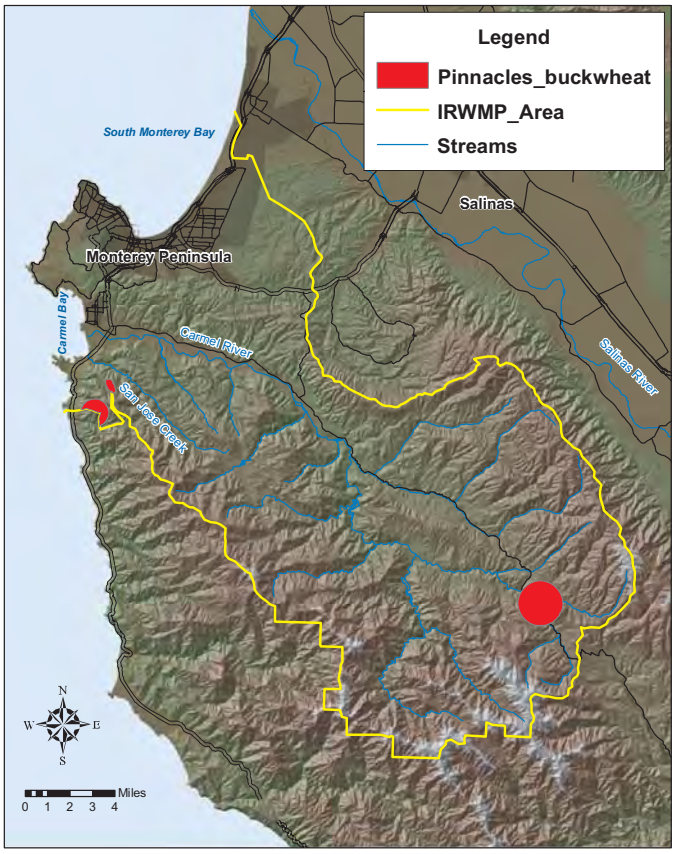
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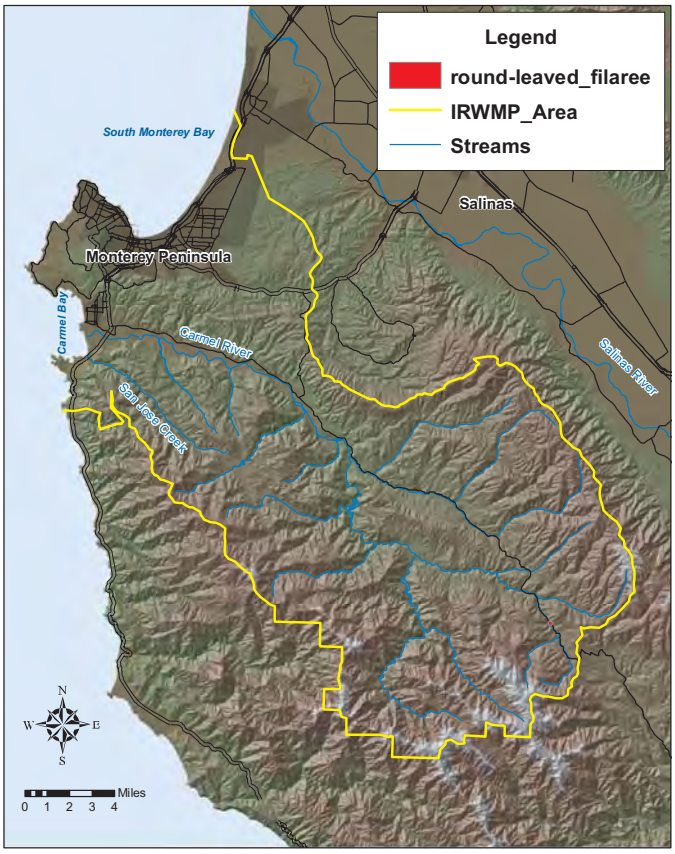
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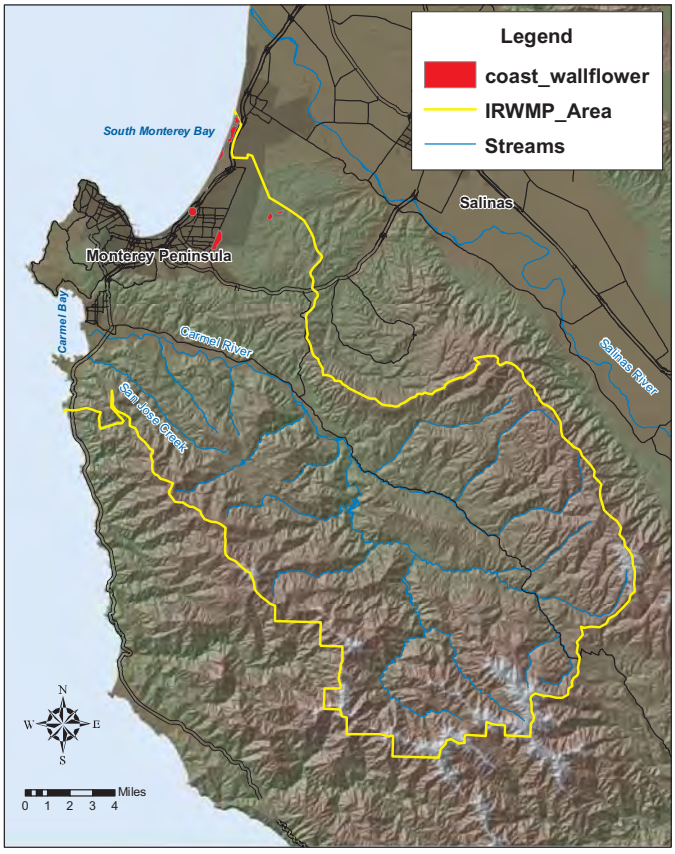
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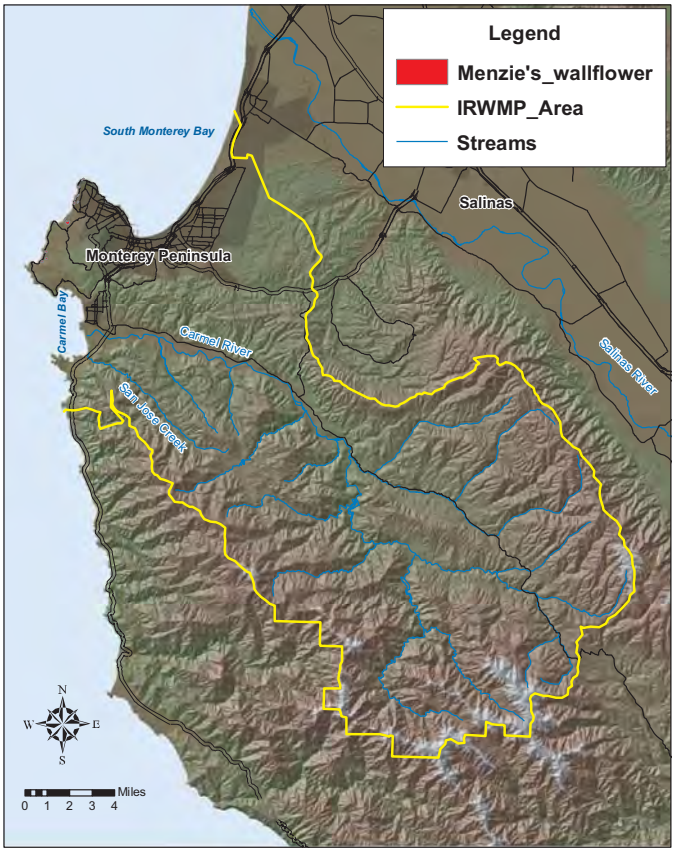
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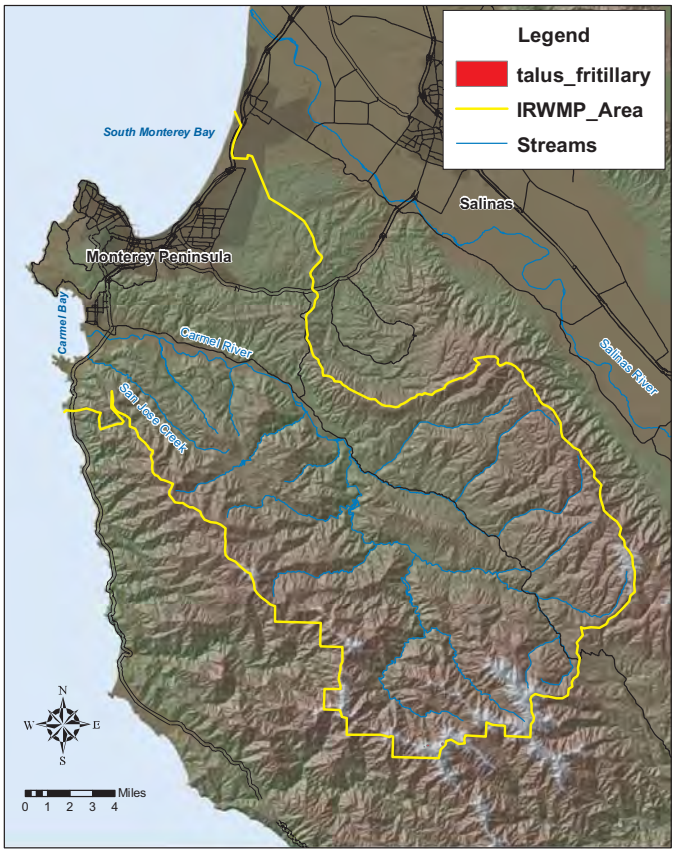
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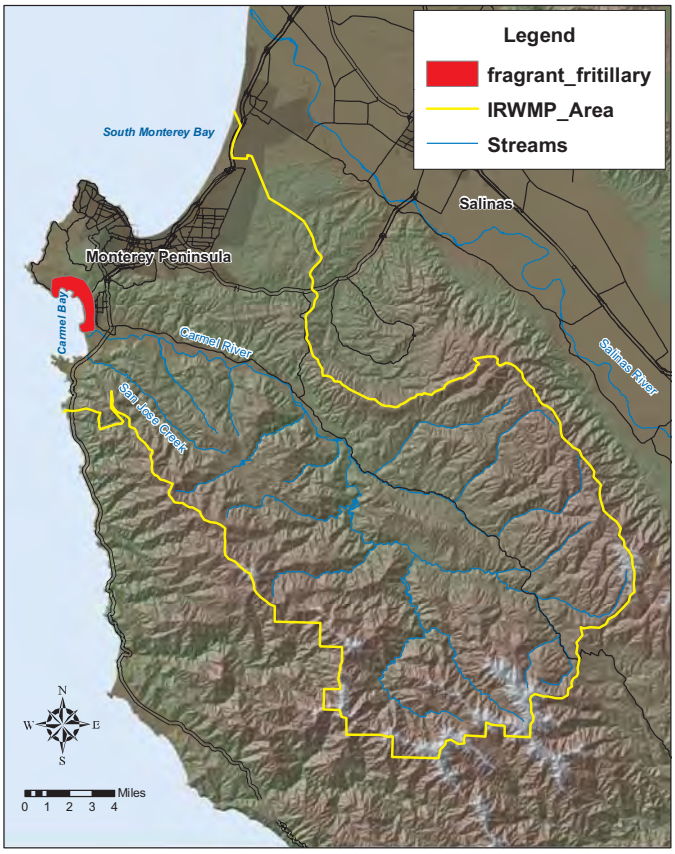
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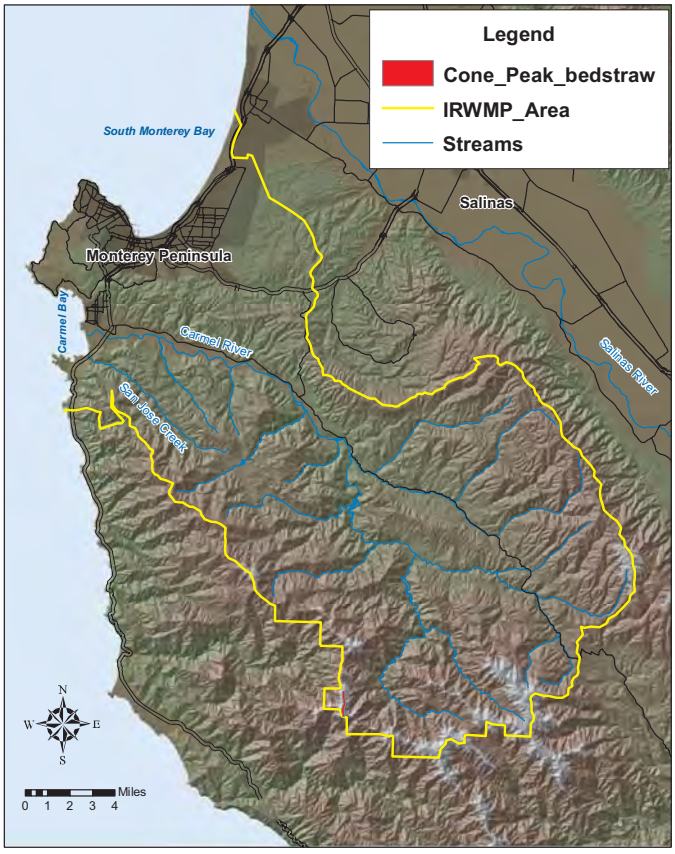
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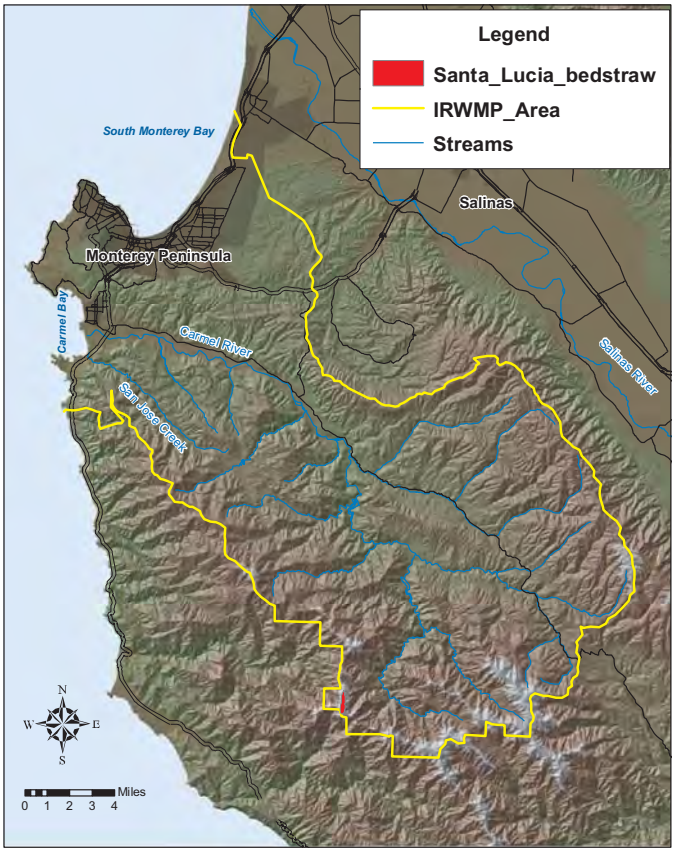
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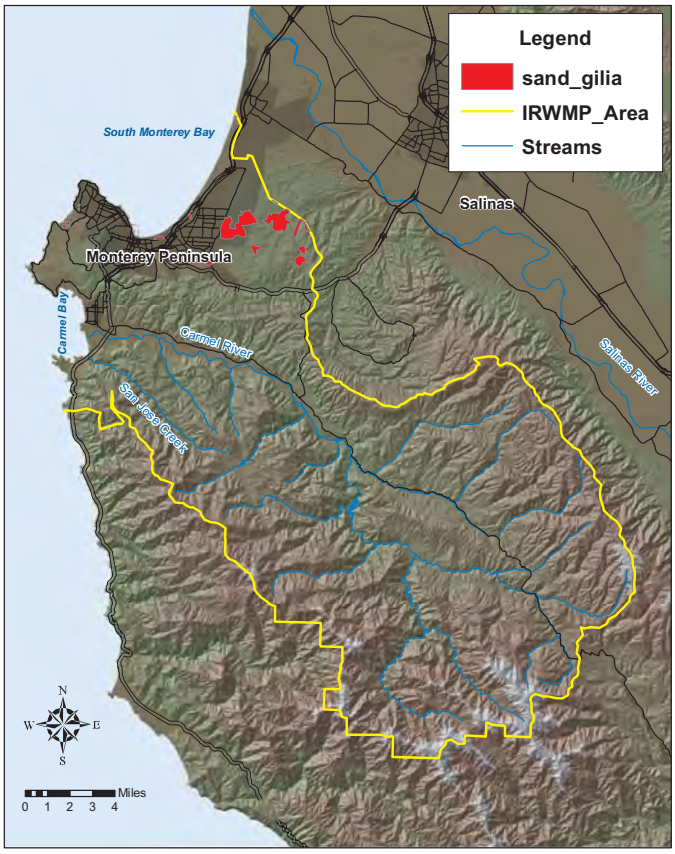
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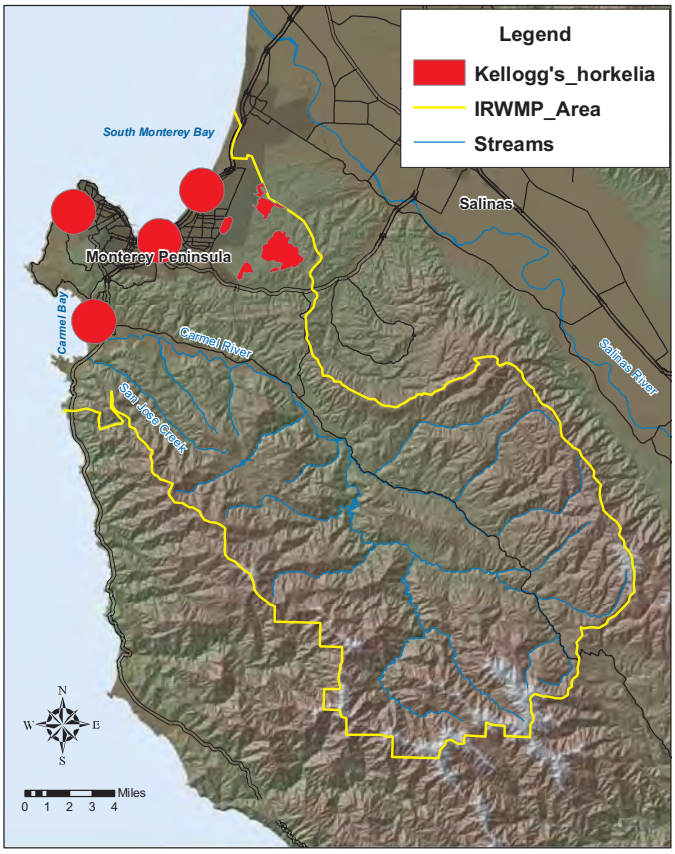
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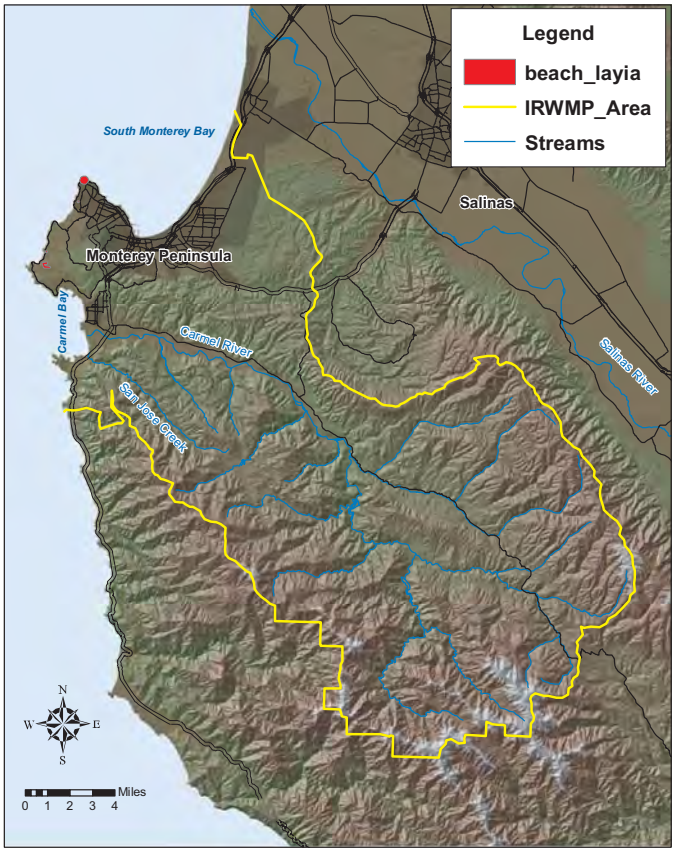
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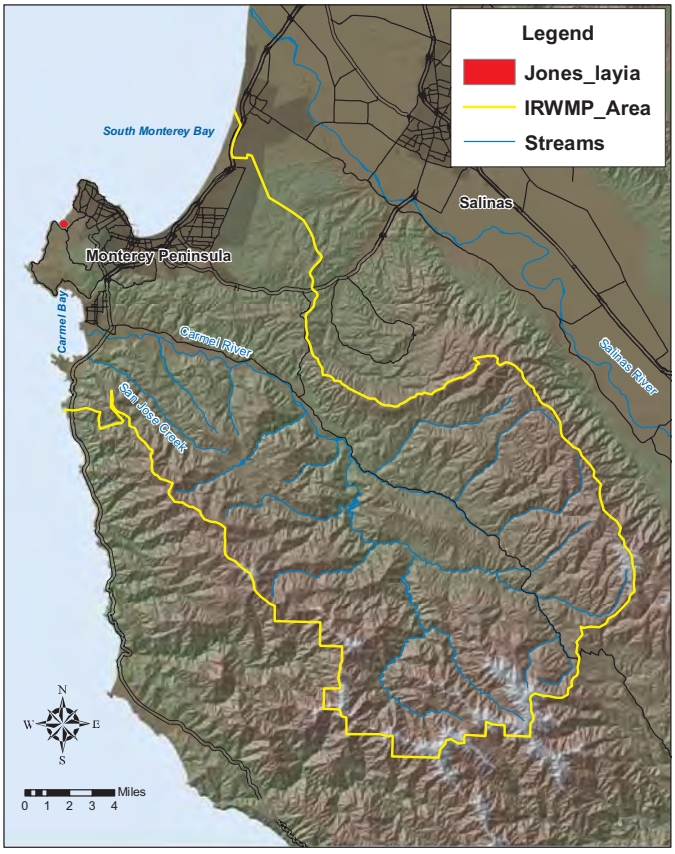
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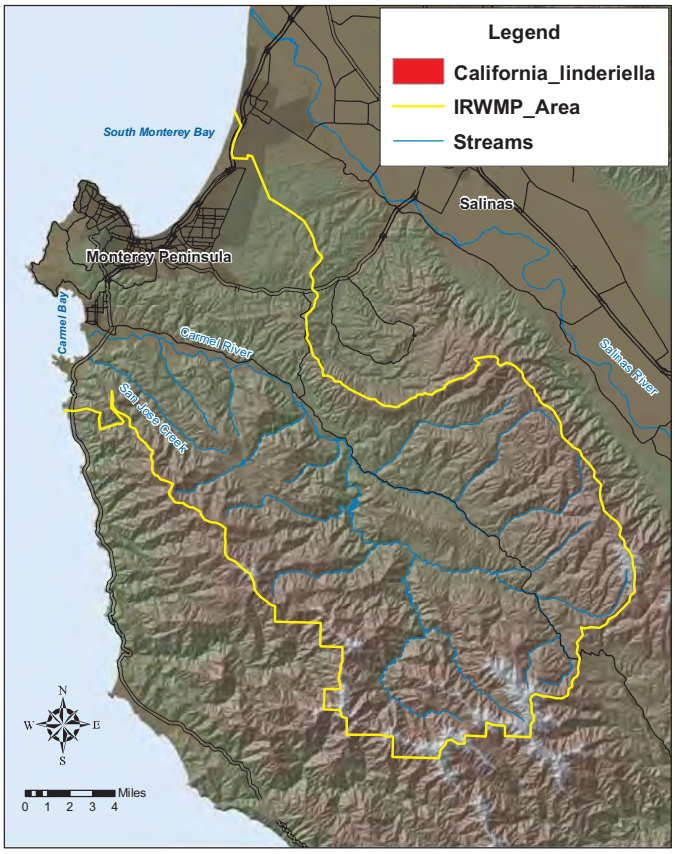
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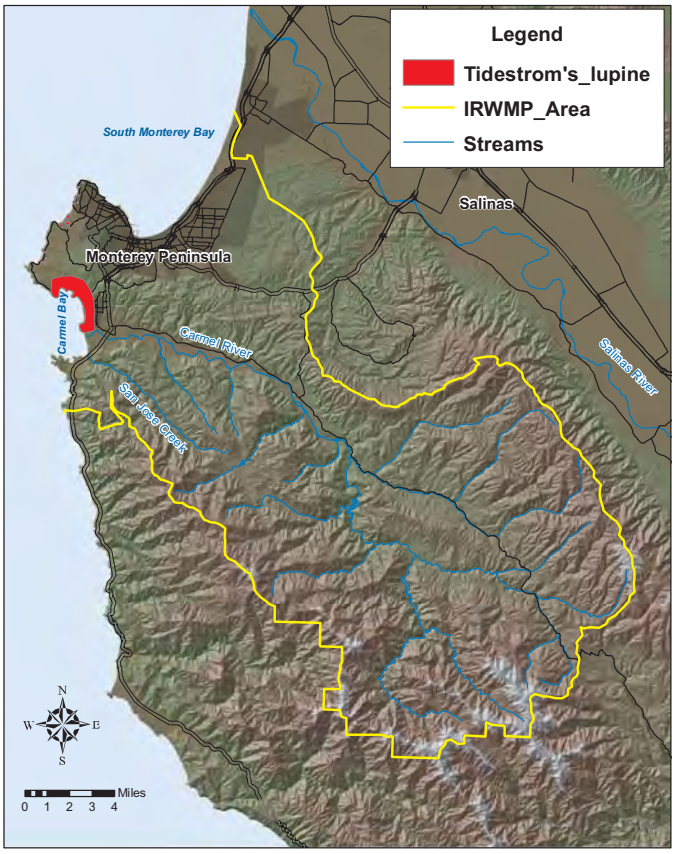
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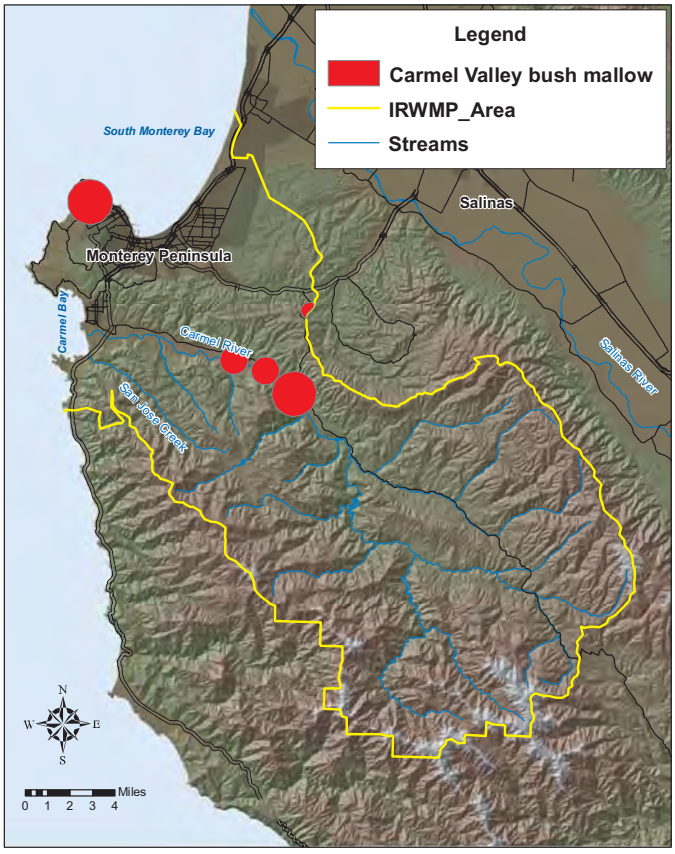
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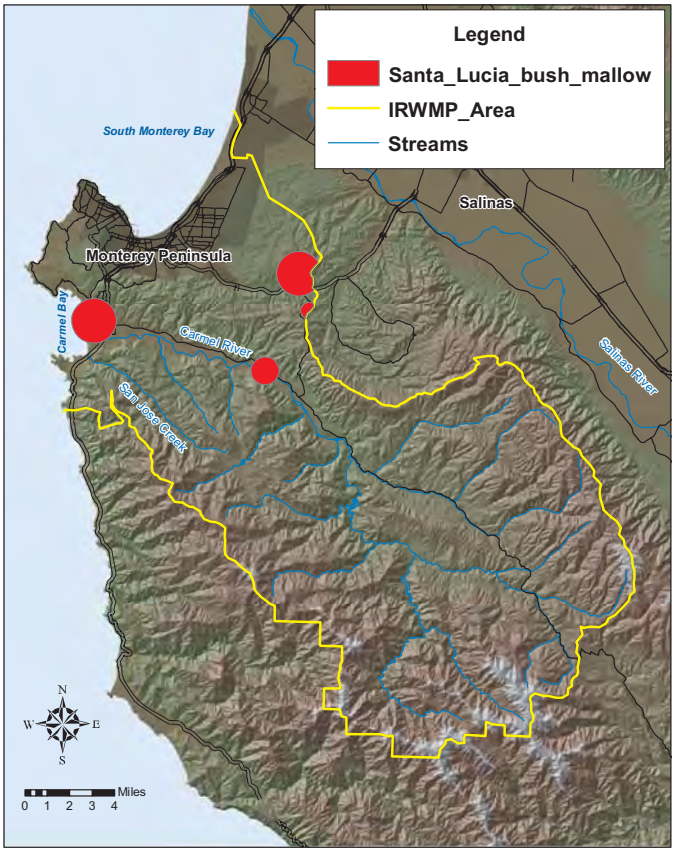
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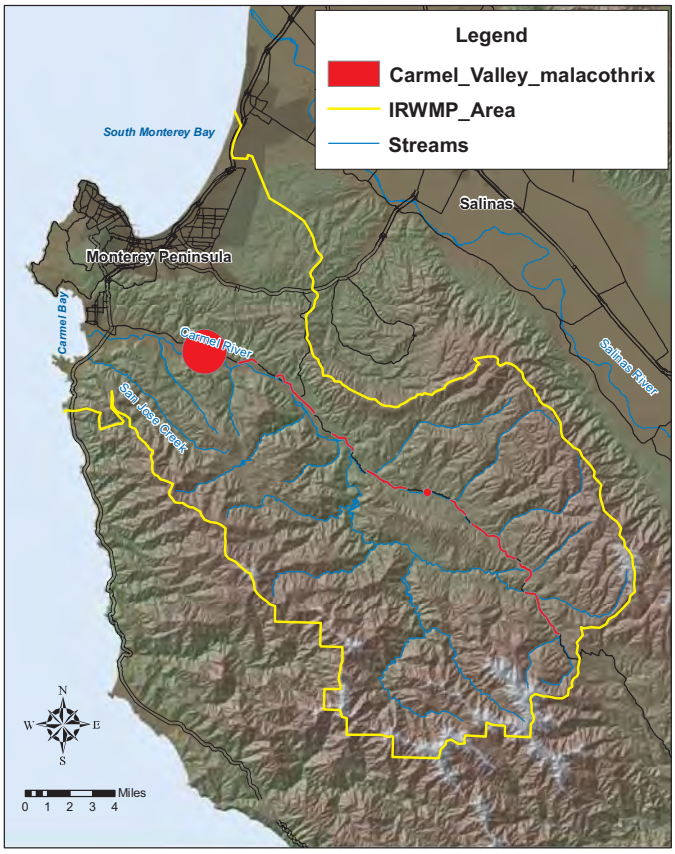
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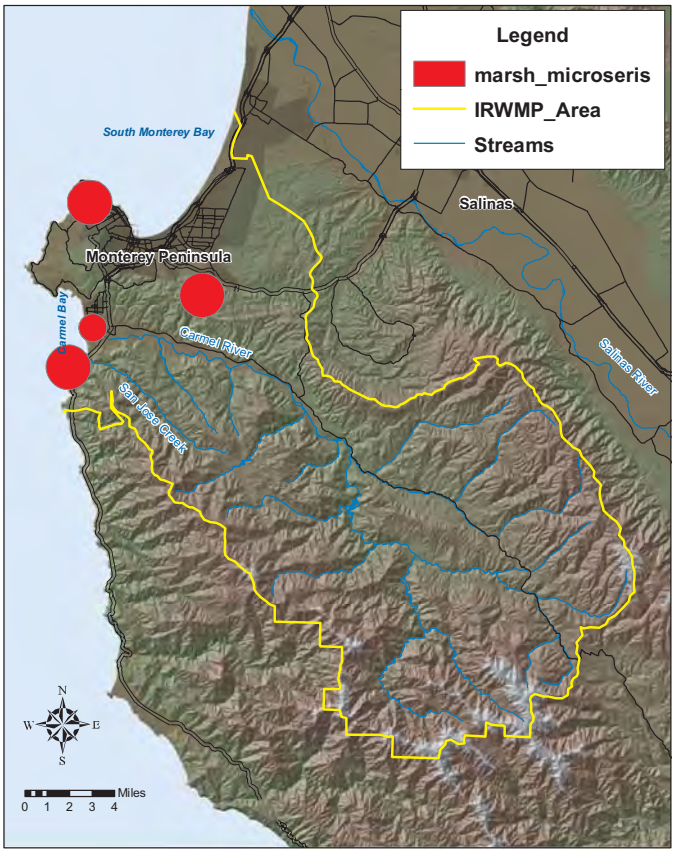
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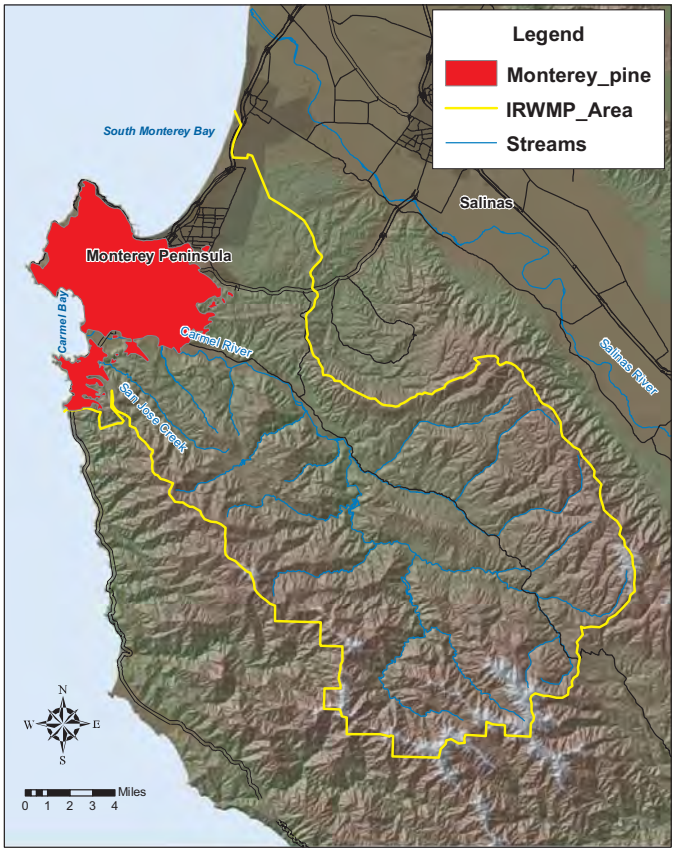
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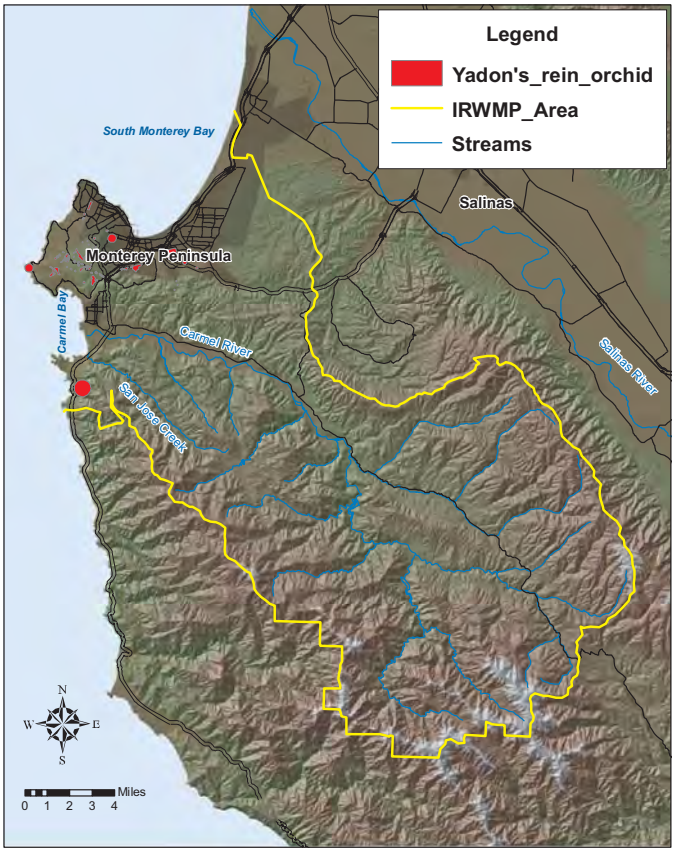
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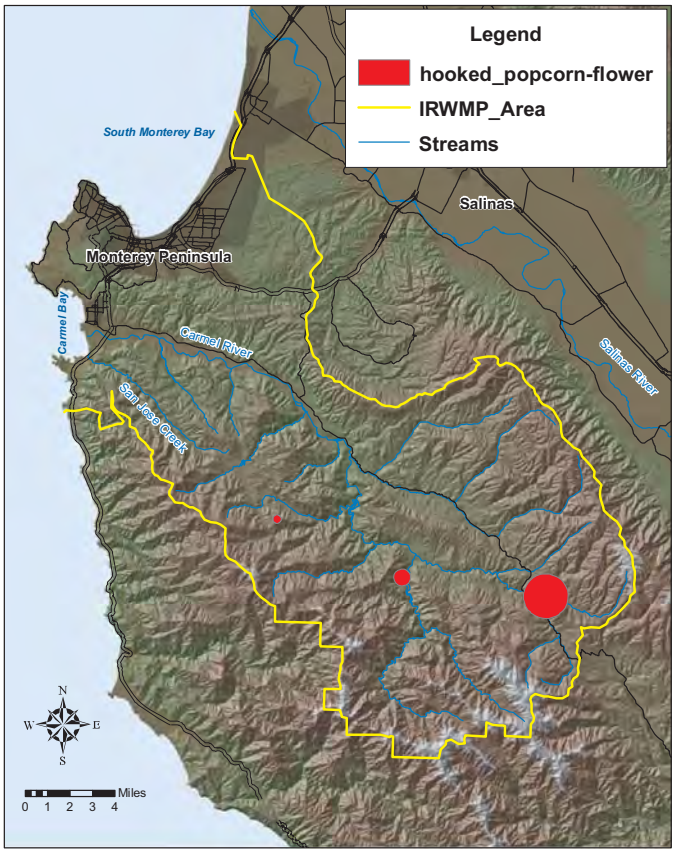
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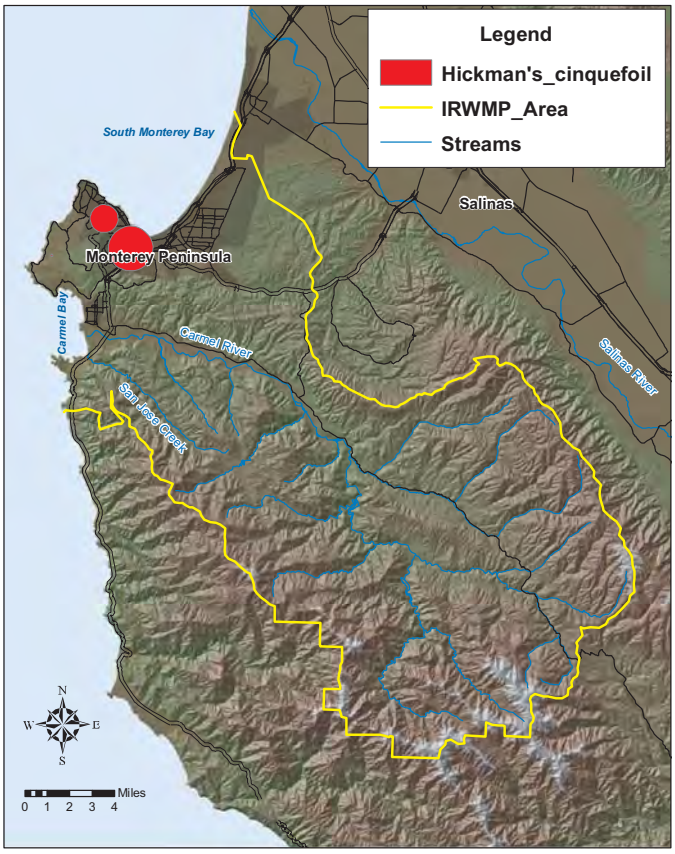
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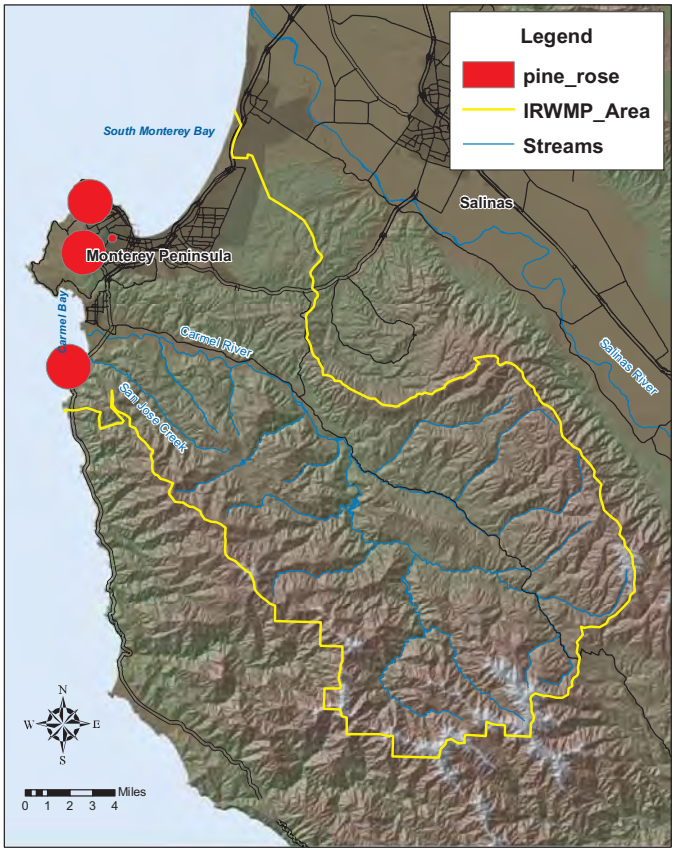
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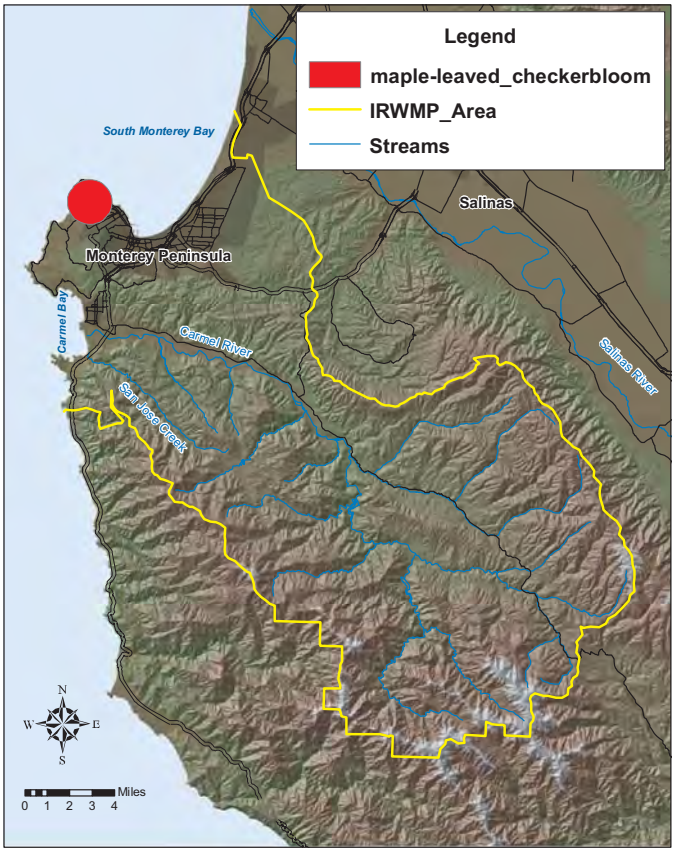
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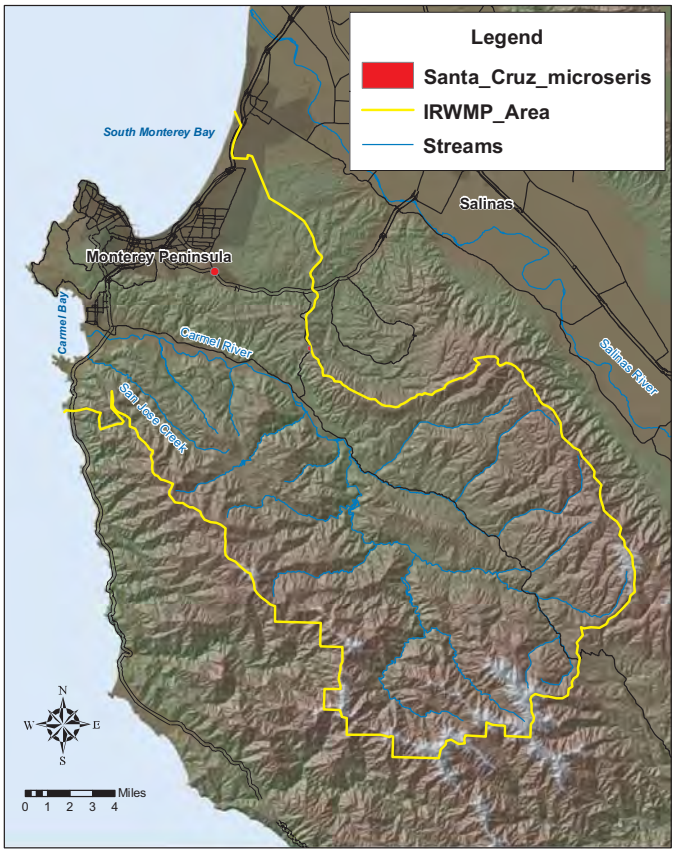
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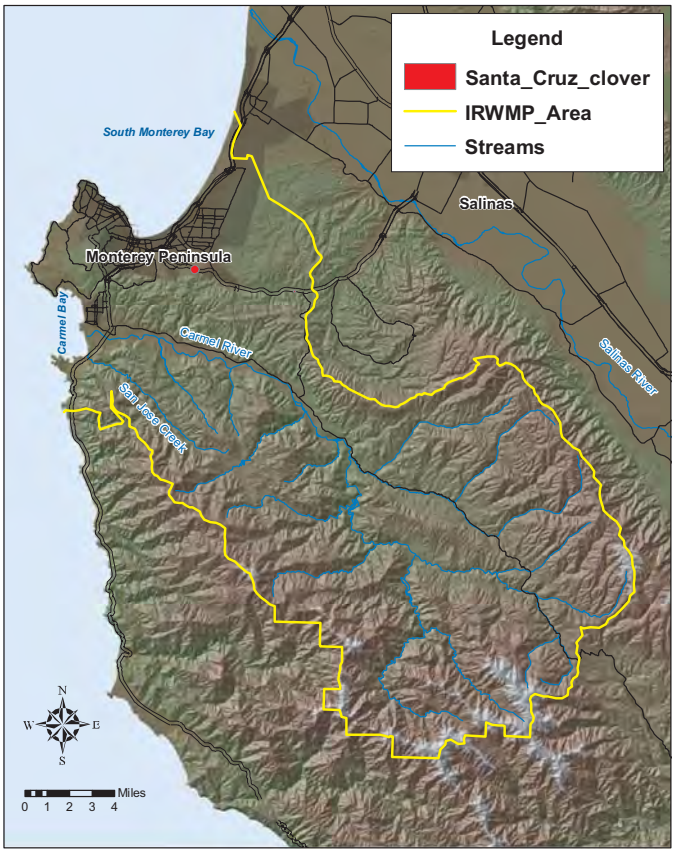
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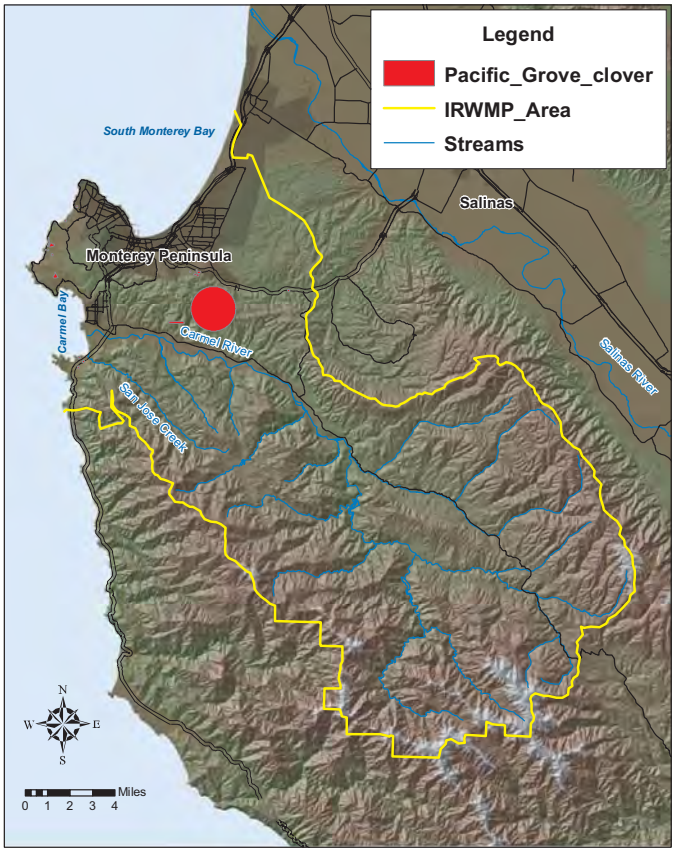
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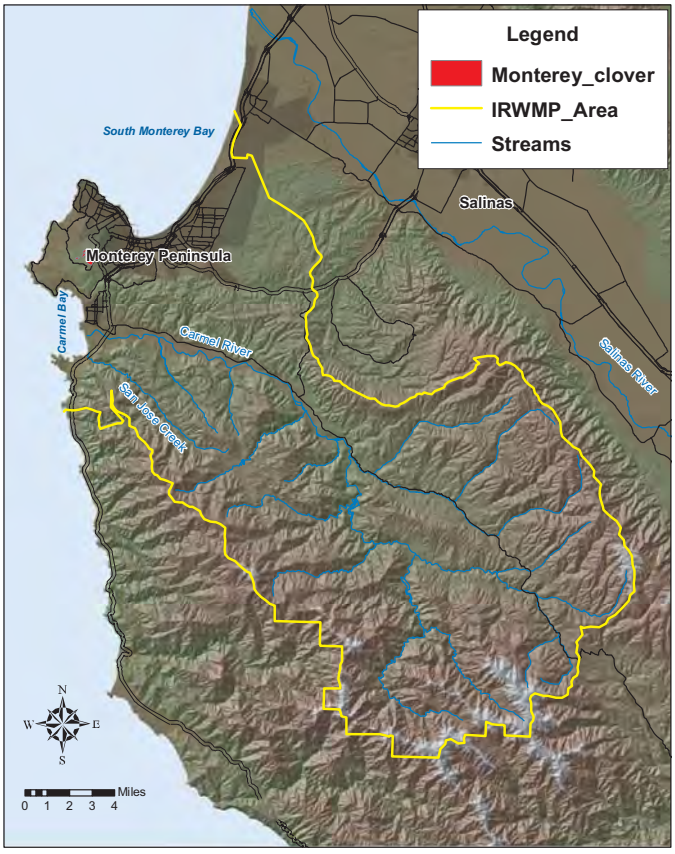
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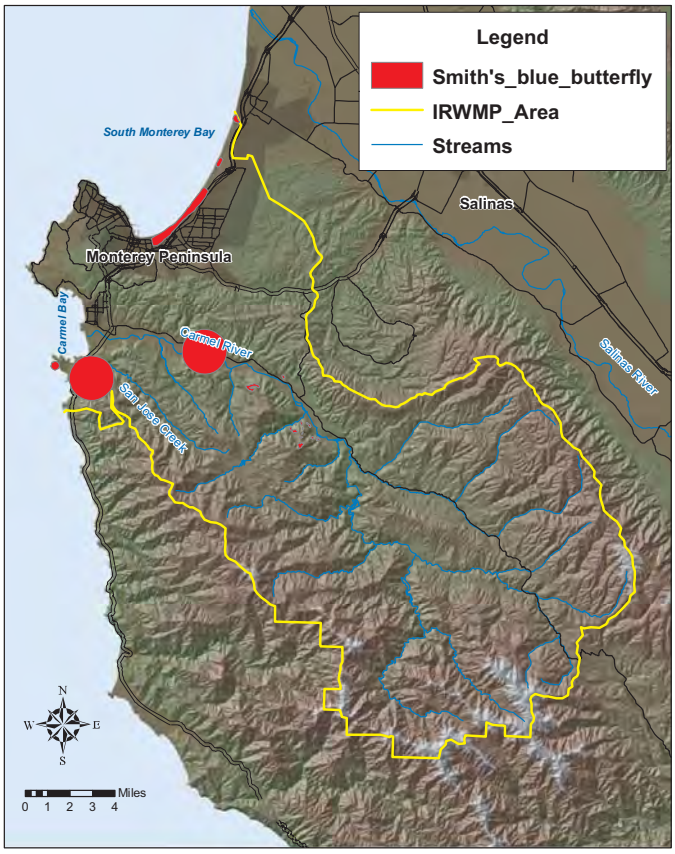
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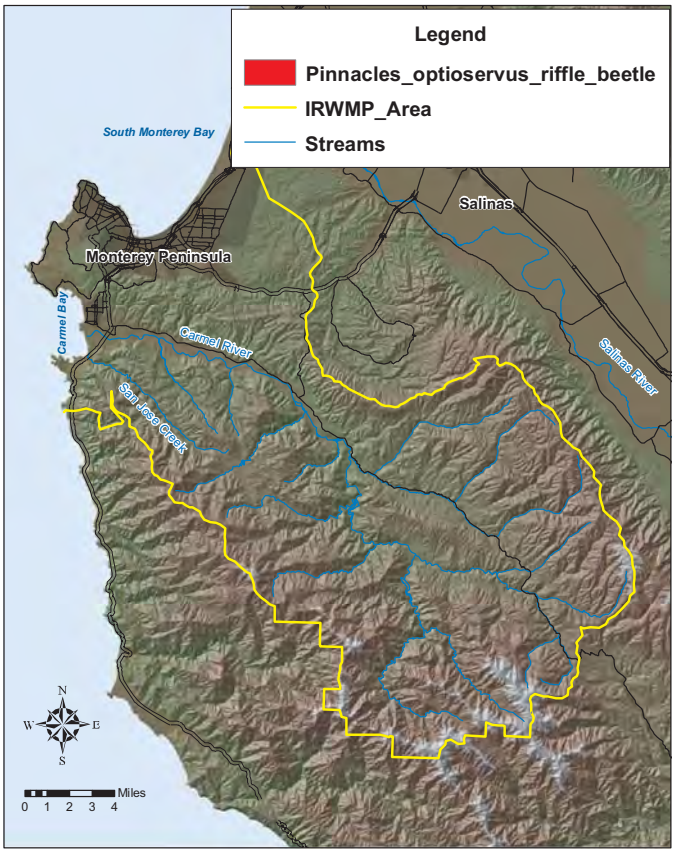
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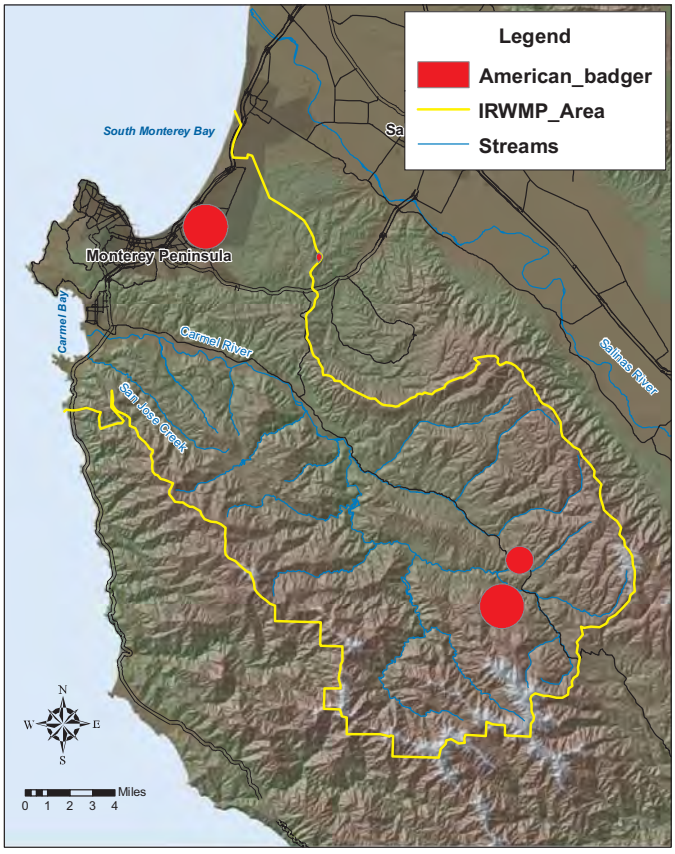
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Appendix 3-a

Objectives Feedback Results

DRAFT

IRWM Plan Stakeholder Meeting - Objectives Feedback (July 25, 2012)

Name: _____ **Affiliation:** _____

Email: _____

Water Supply (WS)

Objectives	*High Priority*	*Low Priority*	*Not a Priority*
WS-1. Meet existing water supply replacement needs and adopted future demand estimates.**			
WS-2. Maintain the quality and quantity of water in the Seaside Groundwater Basin.**			
WS-3. Minimize the impacts to sensitive species and habitats from diversions of surface water.*			
WS-4. Maximize use of recycled water.*			
WS-5. Optimize conjunctive use of surface and groundwater.*			
WS-6. Evaluate, advance, or create water conservation throughout the Region in compliance with the State's 20x2020 Water Conservation Plan.*			

* Objective is closely aligned with the Statewide Priorities.

** Objective is closely aligned with the Statewide Priorities and was identified as a 2007 regional priority

Water Quality (WQ)

Objective	*High Priority*	*Low Priority*	*Not a Priority*
WQ-1. Minimize impacts from stormwater (or urban) runoff water quality.**			
WQ-2. Improve stream and near-shore water quality; address stormwater discharges into Areas of Special Biological Significance (ASBS).**			
WQ-3. Meet or exceed applicable water quality standards established by regulatory processes or by stakeholders (whichever is more protective).*			
WQ-4. Improve water quality for environmental resources (e.g. steelhead). Protect surface and groundwater basins from contamination and threat of contamination.*			
WQ-5. Meet or exceed recycled water quality targets established by stakeholders *			

* Objective is closely aligned with the Statewide Priorities.

** Objective is closely aligned with the Statewide Priorities and was identified as a 2007 regional priority.

Flood Protection and Erosion Prevention (FP)

Objectives	*High Priority*	*Low Priority*	*Not a Priority*
FP-1. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from flood damage, erosion, and sea level rise; reduce the potential for flooding in Carmel Valley and the Carmel River Lagoon.**			
FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).*			
FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.*			
FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.			

* Objective is closely aligned with the Statewide Priorities.

** Objective is closely aligned with the Statewide Priorities and was identified as a 2007 regional priority

Environmental Protection and Enhancement (EV)

Objective	***High Priority***	***Low Priority***	***Not a Priority***
EV-1: Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.**			
EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when developing water management strategies and projects.*			
EV-3. Minimize adverse effects on biological and cultural resources when implementing strategies and projects.*			
EV-4. Identify opportunities for open spaces, trails and parks along streams and other recreational areas in the watershed that can be incorporated into projects.			
EV-5. Identify and integrate elements from appropriate Federal and State species protection and recovery plans .*			

* Objective is closely aligned with the Statewide Priorities.

** Objective is closely aligned with the Statewide Priorities and was identified as a 2007 regional priority.

Climate Change (CC)

Objectives	***High Priority***	***Low Priority***	***Not a Priority***
CC-1. CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.*			
CC-2. Support increased monitoring and research to obtain greater understanding of long-term impacts of climate change in the region.*			
CC-3. Support efforts to research alternative energy and to diversify energy sources appropriate for the region.*			
CC-4. Seek long-term solutions to reduce greenhouse gas (GHG) producing energy use.*			

* Objective is closely aligned with the Statewide Priorities.

Regional Communication and Cooperation (RC)

Objective	*High Priority*	*Low Priority*	*Not a Priority*
RC-1. Meet or exceed State and Federal regulatory orders (including Basin Plan Objectives and 20x2020 goals), provided that mandates are funded.			
RC-2. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change impacts.			
RC-3. Foster collaboration between regional entities.			
RC-4. Build relationships with State and Federal regulatory agencies and other water forums and agencies.			
RC-5. Identify opportunities for public education on water resource management, including extra effort focused on disadvantaged communities.*			
RC-6. Continually seek to expand outreach and communication to disadvantaged communities and stakeholders with interests in water management issues.*			

* Objective is closely aligned with the Statewide Priorities.

Monterey Peninsula IRWM Plan Update - Objectives Feedback Results from 25July2012 Stakeholder Meeting

Affiliation	Water Supply (WS)						Water Quality (WQ)					Flood Protection (FP)				Environmental Protection (EP)					Climate Change (CC)				Regional Communication (RC)						Notes or Comments
	1	2	3	4	5	6	1	2	3	4	5	1	2	3	4	1	2	3	4	5	1	2	3	4	1	2	3	4	5	6	
RCD Monterey County	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	0	1	1	1	2	2	2	2	2	2	
Lee & Pierce Inc.	2	1	1	2	1	1	1	2	1	2	2	2	2	2	2	2	2	1	0	2	0	0	0	0	2	1	2	2	2	1	CC these objectives are being addressed by other agencies and Government levels- Need to be aware of incorporating these goals into projects
Monterey Peninsula Airport	2	2	2	2	2	2	2	2	2	2																					
Concerned Citizen	2	2	1		1	2	1	1	2	1.5	2	1	1	2	2	2	1	2	1	2	2	2	2	1	2	2	2	2	1	1	RC-3 if only 2, If more than 5. RC-5 & RC-6 ??
MPWMD	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	0	1	2	2	2	2	2	2	
MCWRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Do Not Prioritize
Monterey County Planning	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Carmel River Watershed Conservan	2	1	2	2	2	1	1	2	1	2	2	2	2	2	1	2	1	2	1	2	2	2	1	2	1	2	2	2	1	2	
City of Monterey	2	2	1	2	2	1	2	2	1	2	2	2	2	1	1	1	1	1	1	1	2	2	1	1	1	2	2	2	1	1	
Coastal Watershed Council	1	1	2	2	2	2	2	1	2	2	2		0	2	1	2	2	2	2	1	2	2	2	2	2	2	2	1	2	2	
Planning & Conservation League Fo	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	1	2	2	1	1	2	2	2	2	1	2	1	1	2	2	
	2	1	2	2	1	2	2	2	1	2	2	2	1	2	1	2	1	2	1	2	2	1	2	1	2	2	2	2	1	1	
Monterey County Dept. of Public W	2	1	1	2	1	2	2	2	2	2	1	2	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	
Monterey Bay Youth Camp	2	2	2	1	1	2	2	2	2	2	1	1	2	1	1	0	1	1	2	1	2	2	2	1	1	2	2	2	2	2	RC-5 (including extra affort focused on disadvantaged Communities) Take out. CC-3 & CC-4 TIE into projects of IRWM
RCD of Monterey Co.	2		2	1	1	1	2	1	2	2	1	2	1		2	2	2	1	1	1	2	2	1	1	2	2	2	1	2	1	FP-3 Already Addressed Under Quality & Supply?
Resudential Water User	2	2	0	2	1	1	2	1	2	1	2	2	1	2	0	1	2	2	1	2	0	0	0	0	2	2	2	2	2	2	EV-5 Is there a choice NOT to meet State & Federal "plans" (requirements). CC None of these should be involved with the MPWMD. RC-1 Not for MPRWD. RC-2 RE1 is there any choice "not to"?
resident/citizen	2	2	1	2	2	1	2	1	2	2	2	2	2	2	1	1	2	2	1	1	0	0	1	0	2	2	2	2	1	2	
resident/citizen	2	2	1	2	1	2	1	1	2	2	2	2	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	1	1	
MPWMD/citizen	2	2	2	2	2	2	2	1.5		2	1	2	2	1	2	2	2	2	2	2	2	2	0	0		2	2	2	2	2	FP-1 Maybe parse these out. FP-3 These go hand in hand with see other side. FP-4 esp. for Fort Ord. CC-3 & CC-4 Not for IRWM. RC-1 Seems like there is legd. Anyway. RC-3 despite litigations. EV-5 Required
MRWPCA	2	2	1	2	2	1	2	2	0	1	2	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	2	2	2	2	
CSA H50	2	2	1	2	2	2	2	2	2	1	2	2	2	2	1	2	2	1	1	1	2	2	2	2	2	1	1	2	2	2	
Pebble Beach Community Service D	2			2							1																				
Citizen for Public Water	2	2	2	2	1	0	1	2	0	1	1	2	1	2	1	0	1	2	1	1	1	1	2	1	1	2	2	0	1	1	
MCWD	2	2	1	2	1	1	1	1	1	1	2	2	1	1	2	1	1	1	2	1	1	1	1	1	1	2	1	1	1	1	
MPWMD	2	2	1	2	2	1	1	2	2	2	2	2	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	
City of Seaside	2	2	1	2	1	1	2	2	1	1	2	2	2	1.5	1.5	1.5	1	2	2	2											
	2	2	1	1	1	1	2	2	1	1	1	2	1	1	0	2	1	1	0	1	1	1	1	1	1	1	2	2	2	2	
City of Pacific Grove	2	2	1	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1	0	1	2	1	1	2	1	2	1	2	2	
TOTAL	**53**	**45**	**36**	**49**	**40**	**39**	**45**	**44.5**	**39**	**43.5**	**45**	**43**	**38**	**39.5**	**32.5**	**34.5**	**40**	**38**	**32**	**36**	**34**	**35**	**31**	**27**	**37**	**43**	**44**	**40**	**39**	**39**	
	*	*					*	*				*				*															
Breaking points analysis:	*	*					*	*		*	*	*														*	*				

Appendix 5-a

Integrated Regional Water Management Inter-Regional Coordination Summary Report

DRAFT

Draft Summary Report (April 18, 2014)

Project 5. Integrated Regional Water Management Inter-Regional Coordination: Greater Monterey County and Monterey Peninsula, Carmel Bay, and South Monterey Bay Regions

Abstract: The Greater Monterey County Integrated Regional Water Management (IRWM) region shares a border with the Monterey Peninsula, Carmel Bay, and South Monterey Bay (Monterey Peninsula) IRWM region. Along this border, the 45-square-mile Ord Community is a geographical transition zone containing areas and resources that are managed by many agencies, including some that are in both IRWM Regional Water Management Groups (RWMG). Fundamental challenges are: 1) determining which regional IRWM Plan proposed projects should be described in each IRWM Plan; 2) prioritizing projects in each region; 3) how to cooperate between regions in order to ensure that Ord Community projects do not fall into a "no man's land" between the regions; and 4) moving projects forward that benefit both regions. This report describes the relationship between the regions, identifies resource challenges, and outlines areas of potential coordination between the regions.

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Prepared for:

Monterey Peninsula Water Management District

District Engineer: Larry Hampson

on behalf of the

Regional Water Management Group of the Monterey Peninsula, Carmel Bay, and South Monterey Bay

Version Date: April 18, 2014

DRAFT

Contents

Introduction and Background 3
Relationship between IRWM Regions 5
Boundary Region Description 6
Physical Setting 6
Jurisdictional Boundaries 7
Water Supplies 8
Water Supply Projects and Plans Related to Both IRWM Regions 9
Monterey Peninsula Water Supply Project (MPWSP) 9
Monterey Peninsula Groundwater Replenishment Project. 10
Salinas and Carmel River Basins Study 12
Regional Urban Water Augmentation Project (RUWAP) 14
Future Wastewater Recycling and Water Quality Projects 14
Surface Water / Recycled Water Storage 15
Storm Water Capture and Reuse ..... **Error! Bookmark not defined.**
Inter-Regional Prioritization Processes 16
Monterey Peninsula Region Objectives Prioritization 16
Greater Monterey County Region Objectives Prioritization 17
Ord Inter-Regional Project Coordination Activities 18
Conclusions and Recommendations 19
References 20

Introduction and Background

In the physical transition zone between the Greater Monterey County and the Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM planning regions, a fundamental issue affecting water resource management is that the Ord Community is served water from the Salinas Valley Groundwater Basin (SVGB), which is in the Greater Monterey County region, while approximately one third of the area and water demand for the Ord Community is within the Monterey Peninsula region (see Figure 1: Jurisdictional Boundaries in the Ft. Ord Area). Another geographical peculiarity is that a portion of the Ord Community overlies the Seaside Groundwater Basin (SGB), which is a place of water supply storage and extraction for the Monterey Peninsula; however, the Ord Community portion overlying the SGB is not supplied from the SGB. This arrangement was agreed to in 1993 with the transfer of the responsibility for water supply from the United States Army (the Army) to the Monterey County Water Resources Agency (MCWRA).[1]

It is critical for both IRWM regions to have an understanding of the physical and jurisdictional interactions between the planning regions and for each region to understand each other's objectives and priorities. The following sections describe the work conducted by Monterey Peninsula Water Management District (MPWMD) on behalf of the Monterey Peninsula RWMG and by Susan Robinson, Program Manager for the Greater Monterey County IRWM Plan on behalf of the Greater Monterey County RWMG, to provide both regions with the basic information necessary to understand proposals within the regional and inter-regional context and to prioritize future management actions. Bulleted items indicate information to be developed or updated for the joint chapter.

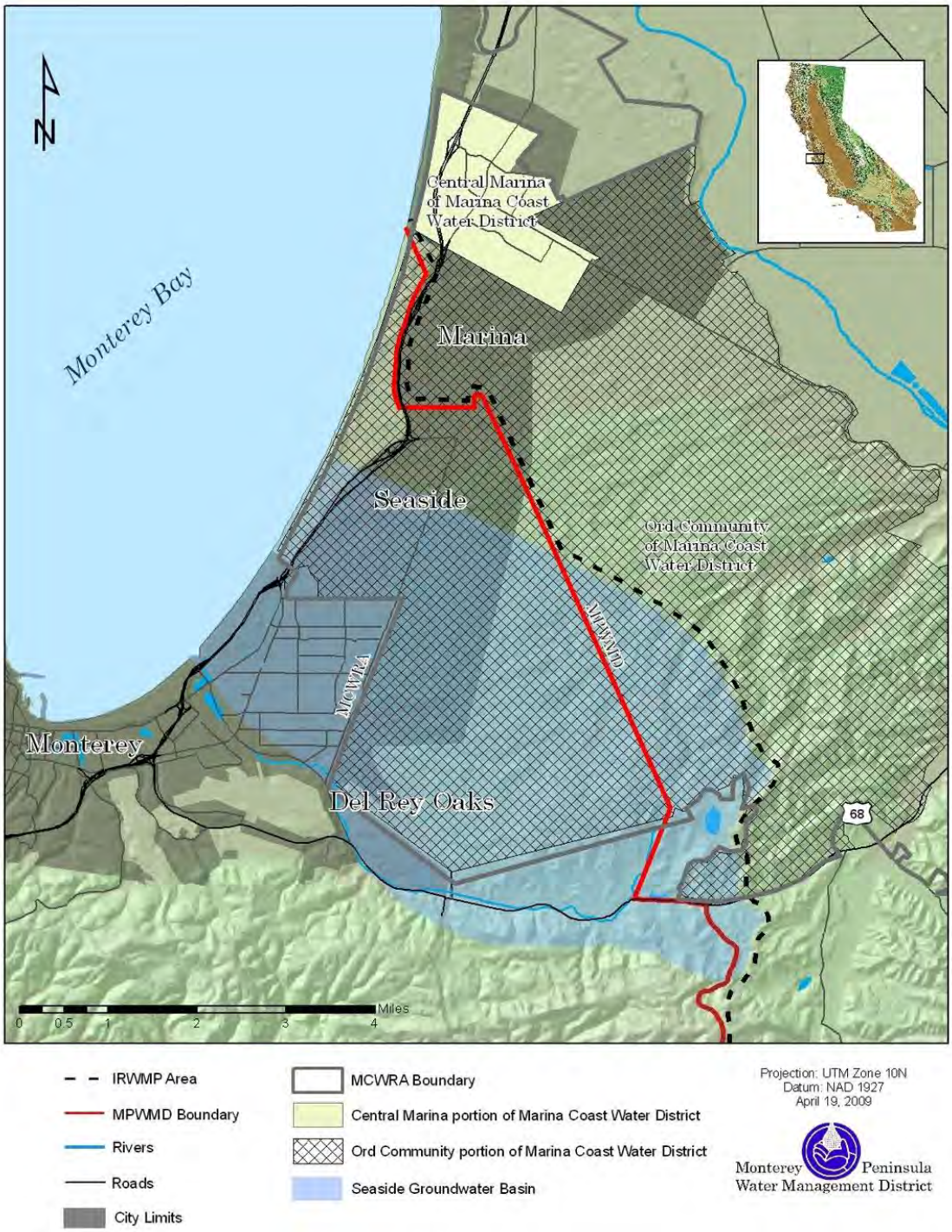
The purpose of the Project Summary Report is to document how the two regions have coordinated:

- to help identify inter-regional opportunities and projects;
- to promote the cooperative development of projects that benefit both regions;
- to ensure consistency in project evaluation; and
- to promote cooperation and coordination between regions in the development and sustainable management of water resources (see pages 20, 24 and 41 of Final Guidelines).

The original nexus of this component of the IRWM planning process was the recognition in 2010 by both regions that Ord Community needs and resources were shared between the regions. For the 2010 DWR Planning Grant solicitation, both regions submitted a proposed scope of work that included addressing inter-regional issues. Subsequently, MPWMD agreed to take the lead with support from the Greater Monterey County region. At the time that the Planning Grant work was initiated, the Monterey Bay Regional Water Program/Project, the goal of which was to address water supply issues within both the Greater Monterey County and Monterey Peninsula regions, was moving through the approval process. That project is no longer being pursued by regional stakeholders, as discussed further, below. However, there are other projects being pursued by stakeholders in the region that have similar objectives, would achieve similar results if implemented, and involve regional integration, cooperation, and collaboration.

[1] The Marina Coast Water District (MCWD) subsequently won the right to provide water and sewer service to the Ord Community.

Figure 1: Jurisdictional Boundaries in the Ft. Ord Area



Relationship between IRWM Regions

This section summarizes the information presented in the Regional Acceptance Process and other communications to California Department of Water Resources (DWR) about the formation of the two regions.

The primary area where overlap may occur between the Greater Monterey County IRWM Plan and the Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM Plan is in the vicinity of the Seaside/Salinas Valley Groundwater Basin divide and in particular, the management of the Seaside Basin as a place of storage and extraction (see Figure 1: Jurisdictional Boundaries in the Ft. Ord Area). The Seaside Basin and Fort Ord area constitutes a geographic area within which a significant opportunity exists for stakeholders in the two IRWM planning regions to collaborate and coordinate on projects of interest to both regions.

In Bulletin 118, DWR considers the Seaside Groundwater Basin (Basin 3-4.08) to be a sub-basin of the Salinas Valley Basin (Basin 3-4). Physically, a regional analysis of groundwater levels found that the boundary between the Seaside and Salinas Valley Groundwater Basins is represented by a groundwater flow divide, which is simply the high point in the regional water-level surface between pumping depressions in Seaside, the Salinas Valley, and the El Toro Creek area. The lack of wells and water extraction in proximal areas of the former Fort Ord lands and highland areas adjacent to the Salinas Valley may encourage this divide, which acts as a "ridge" of higher groundwater levels between lower groundwater level areas in adjacent areas of Seaside and Salinas Valley. Because a large portion of these lands is controlled by the Bureau of Land Management (BLM) or are not arable lands, it is unlikely that groundwater extraction in this area would increase in the foreseeable future. It is beyond the scope of this report to describe these interactions, but extensive information may be found in the following documents:

- *Laguna Seca Subarea Phase III Hydrogeologic Update*, Prepared for the Monterey Peninsula Water Management District by Eugene B. Yates, Martin Feeney, and Lewis I. Rosenberg, November 2002
- *Seaside Groundwater Basin: Update on Water Resource Conditions*, prepared for the Monterey Peninsula Water Management District by Eugene B. Yates, Martin Feeney, and Lewis I. Rosenberg, April 14, 2005
- *Seaside Groundwater Basin Salt & Nutrient Management Plan* prepared for the Monterey Peninsula Water Management District by Hydrometrics WRI, April 2014.

Potable water is provided to customers in the Seaside basin by several dozen water distribution systems. Water production and delivery are reported annually to MPWMD by all water system operators. Over 90% of the water is delivered by a single purveyor (Cal-Am). Cal-Am operates several water distribution systems in the area, some of which are interconnected. The main system serves the Carmel Valley, Monterey Peninsula, and coastal subareas of the Seaside basin. Presently, water is obtained from approximately 17 wells along the Carmel River and eight wells in the Seaside coastal subareas. The Carmel Valley wells extract groundwater from the Carmel Valley alluvium and operate year-round. Wells in the Seaside coastal subareas are used primarily in late spring, summer, and fall. Cal-Am also operates several other water distribution systems in the Laguna Seca Subarea that it acquired from previous operators during the past 15 years, including the Hidden Hills, Ryan Ranch, and Bishop systems. The first two of these have interties with the main system, but the Bishop system does not.

The City of Seaside operates a single well in the Seaside Groundwater Basin to serve residential customers in part of the city. The principal nonpotable use of water in the basin is irrigation of golf courses. The Laguna Seca and Pasadera golf courses are in the Laguna Seca

Subarea and are supplied by nearby wells. The Bayonet and Black Horse golf courses are located on the former Fort Ord military base north of Seaside and are currently being supplied with irrigation water from Marina Coast Water District (MCWD) under a five-year agreement that is set to expire in 2015.

MCWD provides municipal supply water to existing and future developed areas on the former Fort Ord military base. Within the Seaside basin, this includes the residential areas and schools surrounding the Bayonet and Black Horse golf courses. The water is obtained from wells near Marina, in the Salinas Valley Groundwater basin. Although there is currently a general prohibition on groundwater exportation from the Salinas Valley, Section 52-9 "Powers of Agency" of the MCWRA Act enabling legislation states:

> *The Agency has perpetual succession and may do any of the following:*
>
> *(u) Prevent the export of groundwater from the Salinas River Groundwater Basin, except that use of water from the basin on any part of Fort Ord shall not be deemed an export. Nothing in this act prevents the development and use of the Seaside Groundwater Basin for use on any lands within or outside that basin.*

There are a number of proposals that would link water resources in the Salinas Valley with supplies to the Seaside Groundwater Basin. Currently wastewater from the Monterey Peninsula region is conveyed to the Salinas Valley and reused for irrigating crops. There are ongoing discussions among agencies with responsibilities over these supplies, which include desalinated water, brackish groundwater near the coast, and recycled water. In addition, surface flow from the Salinas River under the unexercised SWRCB Permit No. 11043 issued to MCWRA is being considered for supplying additional water to MCWD. The following section details these water supply projects and plans.

Boundary Region Description

Fort Ord was established as a U.S. Army post by the Department of Defense in 1917 and proposed for closure in 1991 by the Base Realignment Commission. In 1994, the state legislature created the Fort Ord Reuse Authority (FORA) to oversee the reuse and redevelopment of the former military base, which includes more than 45 square miles of the former Fort Ord (also referred to as the Ord Community). A small portion of the former Ft. Ord remains under Army control and is now called the Presidio of Monterey Annex. Other property within the former Fort Ord falls under the following jurisdictions: the Bureau of Land Management, the cities of Seaside, Marina, Monterey, and Del Rey Oaks, the County of Monterey, the University of California, California State University at Monterey Bay, and the Presidio of Monterey Annex. The California Department of Parks and Recreation administers the Fort Ord Dunes State Park area that stretches along the western portion of the former Fort Ord between Highway 1 and the ocean.

Physical Setting

Former Fort Ord lands lie between Canyon del Rey and Toro Creek to the south, the Salinas Valley to the northeast, and the Pacific coast to the west. The landscape slopes gradually down toward the northwest through moderately dissected rolling hills from approximately 900 feet above sea level near Impossible Canyon to sea level. On the eastern portion of the base lie canyons and ridges that drop steeply into the bottom of the Salinas Valley. The northeast portion of the base borders ancient sand dunes within the City of Marina.

Most of the area is underlain by young terrestrial deposits. The stratigraphy includes Eolian deposits, Upper Tertiary Santa Margarita Sandstone, Plio-Pleistocene Paso Robles Formation, and Quaternary Aromas Sandstone. Interdune areas have internal drainage, whereas the dissected areas drain to the Salinas Valley either directly, or by way of Toro Creek along Highway 68 (Smith et al., 2002). A very small amount of stormwater runoff from the Fort Ord lands may enter Canyon Del Rey near the southwest corner of the former base; however, this is likely to be from roadway runoff during intense storms.

The western portion of the base, where most development has occurred, contains deposits of Type A soils with infiltration rates of 6 to 20 inches per hour. The 85th percentile 24-hour rainfall depth is estimated at 0.7 inches (PRISM Climate Group). Currently, all rainfall percolates into this area and there is no stormwater runoff to the ocean through the barrier beach, as the last of the storm drain outfalls built for the Army base have been removed by CSUMB. Type B soils are present over the remainder of the base and have a permeability of 0.6 to 6 inches per hour. This latter area has locally resistant beds, but the overall geologic substrate has a high erosion and mass-wasting potential, as evinced by the great number of gullies, and the local presence of badlands topography and shallow landslides (Smith et al., 2002; 2004).

Because all stormwater runoff from impervious areas in the Ord Community percolates, it tends to recharge the shallow dunes aquifer in the SVGB and the shallow dunes aquifer and the upper portion of the Paso Robles formation overlying the SGB.

Jurisdictional Boundaries

Within the area shared by the two IRWM regions, responsibility for and management of groundwater, potable water, wastewater, recycled water, stormwater, desalinated water, and resources dependent on all of these waters, are divided among many stakeholders. These stakeholders range from private water distribution systems to federal agencies involved in the reuse of the former Fort Ord. However, most management responsibilities lie with the Cities of Seaside and Marina, California American Water (Cal-Am), Marina Coast Water District (MCWD), MPWMD, County of Monterey, Monterey County Water Resources Agency (MCWRA), Monterey Regional Water Pollution Control Agency (MRWPCA), Fort Ord Reuse Authority (FORA), the Bureau of Land Management (BLM), and the Department of Defense (primarily, the U.S. Army).

MCWD provides potable water and sanitary sewer collection services to existing and most future developed areas of the Ord Community. Within land overlying the SGB, this includes the residential areas and schools surrounding the Bayonet and Blackhorse golf courses. The Seaside Community Services District is currently the designated entity to provide wastewater collection service to areas east of General Jim Moore Boulevard and south of Eucalyptus Road (through a service area amendment issued by the Monterey County Local Agency Formation Commission in 1997). Water is obtained from wells near “central” Marina (the area outside of the former Fort Ord military base), in the SVGB. Both Cal-Am and the City of Seaside operate municipal supply systems in the SGB to serve residential customers within the City of Seaside (but not residents of the Ord Community overlying the SGB). Water is produced from the SGB under the supervision of a Watermaster appointed by the Superior Court. The Watermaster is comprised of overlying pumpers including the City of Seaside and Cal-Am, MPWMD, and MCWRA.

Wastewater from the Ord Community is taken to the Regional Treatment Plant operated by MRWPCA along with other communities’ wastewater, where a majority of it is recycled and used to irrigate crops in the Castroville area through the Castroville Seawater Intrusion Project

(CSIP). Use of recycled water with the CSIP reduces the need for groundwater production in the Salinas Valley aquifers closest to the coast that are impacted by seawater intrusion.

Recently, there has been a focus on recreation associated with the creation of the Fort Ord Dunes State Park west of Highway 1 and the Fort Ord National Monument in the eastern half of the former Army base. Competing ballot initiatives in the November 2013 sought to modify portions of the Base Reuse Plan by re-designating how certain lands could be used. Neither measure passed, so the Reuse Plan was not amended. However, the issues raised during the election campaign remain, including water availability, preservation or development of open space, jurisdictional claims, and the economics of base redevelopment. These issues are shared by both IRWM regions.

Water Supplies

Monterey Peninsula. The Monterey Peninsula has a current water supply replacement need of about 9,750 AFY with an additional 3,400 AFY needed for 20-year General Plan development (2014 MPWMD estimate). The Monterey Peninsula region's water supplies are legally constrained by orders from the SWRCB to cut back production from Carmel Valley and an adjudication of the SGB (currently the two primary supplies for the Monterey Peninsula). Physically, the water supply system is also old in many areas and requires re-plumbing in order to deliver water from the north (in Seaside) to the southern and eastern portions of the region. The region has evaluated up to about 150 alternatives over more than 50 years to increase supplies, but only the following projects have proven to be viable and thus have been constructed:

(1) Aquifer Storage and Recovery - cooperatively implemented by MPWMD and Cal-Am, this project includes the diversion of excess winter/spring flows from the Carmel River system for recharge of, storage in and subsequent recovery from the SGB;

(2) Carmel Area Wastewater District/Pebble Beach Community Services District/Pebble Beach Company Recycled Water Projects - provision of tertiary-treated, recycled wastewater for irrigation of golf course and some other recreational areas within Pebble Beach; and

(3) Sand City Desalination Plant - provides 300 AFY to the community, including 94 acre-feet that have been committed long-term for use in areas outside the City.

The Ord Community has been allocated 6,600 AFY from the SVGB, of which just over 5,600 AFY has been committed; however, many of these commitments are intended for future developments that have not been built. As shown in **Attachment 2**, over 4,000 AFY has remained unused since the allocation system was created and water use tracked. FORA manages its groundwater allocation and sub-allocations through a Development and Resource Management Plan that annually tracks water use. The Reuse Plan anticipated that a total of 9,000 AFY would be needed to provide water for redevelopment of the former Fort Ord; therefore, a balance of 2,400 AFY of water is needed to augment the 6,600 AFY of available groundwater. A more recent analysis in the MCWD Urban Water Management Plan based on jurisdictional surveys projects that total demand in 2030 for the Ord Community will be about 8,200 AFY, which is 800 AFY less than the original Reuse Plan. It is likely that the economic downturn beginning in 2007 has influenced the perceived future demand.

Greater Monterey County. All of the water supplied to the Ord Community area of the Greater Monterey County IRWM region originates from the Salinas Valley Groundwater Basin, specifically wells in the 400-foot and deep aquifers. Two of the aquifers in the SVGB are in a

condition of long-term overdraft (the 180- and 400-foot aquifers) near the coast, with seawater intrusion in the 180-foot aquifer extending more than 7 miles inland to the outskirts of the City of Salinas. MCWRA has taken steps to address this, including use of recycled water for agricultural irrigation (through the wastewater recycling facility, called the Salinas Valley Reclamation Project, and the CSIP) and use of Salinas River water to supply the CSIP area irrigators using an inflatable (rubber) dam to make seasonal impoundments from which to divert water. However, to date, seawater intrusion has not been reversed although the rate of intrusion appears to be slowing (MCWRA, 2013). MCWRA requires that MCWD take no more than 5,200 AFY from the 180- and 400-foot aquifers in order to reduce the risk of exacerbating seawater intrusion.

Although MCWD can develop additional hydraulic capability to meet demand (i.e., install more wells) by tapping the "deep aquifer" in the SVGB to supply the allocated amount for the Ord Community, there is concern that recharge mechanisms in this aquifer may not be adequate to support additional extraction – in other words the deep aquifer could become overdrafted by additional production. MCWD has pursued a Seawater Desalination Project and a Recycled Water Project, and is also pursuing surface water rights in the Salinas Valley to meet its obligations to supply the Ord Community. Additional background on MCWD's water supply planning for the Ord Community is provided in **Attachment 1**, including past efforts at developing regional water supply projects that provide mutual benefits to both the Greater Monterey County and Monterey Peninsula IRWM regions. The following section describes additional inter-regional water management planning efforts that have occurred due to the IRWM programs.

Water Supply Projects and Plans Related to Both IRWM Regions

The following water supply-related projects and studies are considered relevant to both the regions and/or are related to the water supply issues of the two regions.

Monterey Peninsula Water Supply Project (MPWSP)

The MPWSP proposal consists of a Cal-Am-only 9.6 million gallon per day (MGD) desalination project at a location different from the Coastal Water Project or a combination of a Cal-Am 6.4 MGD desalination project and a groundwater replenishment project (Groundwater Replenishment Project), described below.

The Cal-Am project proposal to locate a desalination plant in north Marina to supply the Monterey Peninsula region is one of the largest in California. It includes the following features: subsurface slant source water intake wells; extraction of brackish water from the SVGB; and discharge of hyper-saline brine concentrate into the Monterey Bay National Marine Sanctuary (MBNMS). A critical aspect of the Cal-Am desalination proposal is to determine what effect that extraction of subsurface water near the coast would have on Salinas Valley Groundwater Basin aquifers. Due to seawater intrusion into the aquifers, agricultural interests in the Salinas Valley are strongly opposed to removal of any water from the 180- or 400-foot aquifers near the coast and currently, MCWRA has a prohibition against new wells in the 180-foot aquifer. In addition, extraction of seawater using slant wells extending below the seafloor requires wells to be installed and operated in areas potentially affected by climate change and the associated coastal erosion triggered in part by both large storm events and rising sea levels. Discharge of brine to the MBNMS must meet newly proposed Ocean Plan Amendment standards that include dilution of the brine to no more than 5%

above natural salinity at 100 meters from the discharge point (the zone of initial dilution).

The review and project selection process for the Cal-Am proposal is being conducted at the local level through a Governance Committee formed with Cal-Am, the Monterey Peninsula Regional Water Authority (MPRWA), the Monterey Peninsula Water Management District, and the Monterey County Board of Supervisors (an example of inter-regional coordination). The Governance Committee was formed to ensure efficient and effective public input to the project.

The MPRWA is a Joint Power Authority (the Authority) that consists of the six Monterey Peninsula cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside, and the County of Monterey. The purpose of the MPWRA is to study, plan, develop, finance acquire, construct, maintain, repair, manage, operate, control and govern water projects either alone or in cooperation with other public or private non-member entities. In addition, the MPRWA established a Technical Advisory Committee to assist in carrying out the purposes and objectives of the Authority.

The CPUC will eventually rule on whether a Groundwater Replenishment Project (see description below) would be implemented to reduce the scale of the desalination and be part of the water supply solution for the Monterey Peninsula. Hearings for the Groundwater Replenishment Project are scheduled for December 2014. As Lead Agency, the CPUC will also rule on the MPWSP EIR as part of the ratemaking process for the Cal-Am project. Certification of an EIR and issuance of a Certificate of Public Convenience and Necessity is anticipated in 2015.

Monterey Peninsula Groundwater Replenishment Project.

The proposed Monterey Peninsula Groundwater Replenishment Project (Groundwater Replenishment Project) would create a reliable source of water supply by taking highly-treated water from a new advanced water treatment plant, and injecting it into the Seaside Groundwater Basin using a series of shallow and deep injection wells. The Groundwater Replenishment Project is being proposed by the Monterey Regional Water Pollution Control Agency (MRWPCA) in partnership with the MPWMD. See http://www.mpwaterreplenishment.org for more information and maps. Once injected into the Seaside Basin, the treated water would mix with the groundwater present in the aquifers and be stored for future use. The primary purpose of the proposed project is to provide 3,500 acre-feet per year (AFY) of high quality replacement water to the Seaside Basin to allow Cal-Am to extract the same amount for delivery to its customers in the Monterey District service area, thereby enabling Cal-Am to reduce its diversions from the Carmel River system by this same amount.[2] Cal-Am is under a state order to secure replacement water supplies and cease overpumping of the Carmel River by January 2017. The proposed project components include the following (the geographic location in relationship to the two regions is provided in parenthesis):

[2] CalAm is an investor-owned public utility with approximately 38,500 connections in the Monterey Peninsula area.

- source water collection and conveyance - some proposed source waters, such as Lake El Estero Storage Management Water, would originate from land located within the Monterey Peninsula IRWM region and some alternative source waters are located in the Greater Monterey County IRWM region[3],
- treatment facilities - including both existing and proposed facilities to be located within the Greater Monterey County IRWM region at the MRWPCA's regional treatment plant,
- treated water conveyance system, including pipelines and pump station - conveyance systems would be located and pass through both IRWM regions to carry the high quality, advanced-treated water between the regional treatment plant and the SGB,
- injection wells for recharging the SGB – these would be located within the city of Seaside's portion of the former Fort Ord south of Eucalyptus Road and east of General Jim Moore Boulevard, and
- potable water distribution system improvements outside of, and south of, the Ord Community within the cities of Seaside, Monterey, and Pacific Grove.

The Groundwater Replenishment Project would assist both the Greater Monterey County and the Monterey Peninsula regional stakeholders, including RWMGs, in complying with numerous state and federal policies aimed at improved water resource management and associated societal benefits. In addition to the project objectives, the Groundwater Replenishment Project may provide public benefits and important progress toward meeting the following statewide environmental goals, policies and orders:

- The State Water Resources Control Board (SWRCB) supports the use of reclaimed water to reduce discharges of wastewater. In particular, Order WQ 84-7 says dischargers in water-short areas that propose to release treated wastewater to the ocean must evaluate the potential for water reclamation. This order was specifically recognized within the SWRCB Cease and Desist Order issued to Cal-Am (see section 19.1). The Groundwater Replenishment Project would assist in compliance with this statewide order by creating a water supply use for treated wastewater that is presently discharged to the ocean during periods when the Salinas Reclamation plant doesn't use all the secondary effluent to produce tertiary-treated wastewater for agricultural irrigators in the CSIP areas.
- The SWRCB's Recycled Water Policy (adopted May 2009 and amended April 2013) states: "We strongly encourage local and regional water agencies to move toward clean, abundant, local water for California by emphasizing appropriate water recycling." It also says, "Included in these goals is the substitution of as much recycled water for potable water as possible by 2030." The policy also states, "Groundwater recharge with

[3] There are several raw or source waters that would require agreements from Salinas Valley stakeholders, such as MCWRA and the City of Salinas, and others would require appropriative water rights from the SWRCB.

recycled water for later extraction and use in accordance with this policy and state and federal water quality law is to the benefit of the people of the state of California. The State Water Board and Regional Water Boards will exercise the authority granted to them by the Legislature to the fullest extent possible to encourage the use of recycled water, consistent with state and federal water quality laws." The Groundwater Replenishment Project would satisfy this statewide policy (see: http://www.swrcb.ca.gov/water_issues/programs/water_recycling_policy/, accessed April 11, 2014).

- In 2006, Gov. Arnold Schwarzenegger signed AB 32, the Global Warming Solutions Act of 2006, which set the 2020 greenhouse gas emissions reduction goal into law. It directed the California Air Resources Board to begin developing discrete early actions to reduce greenhouse gases while also preparing a scoping plan to identify how best to reach the 2020 limit. Groundwater Replenishment requires much less electricity that desalination requires for the same amount of processed water. Therefore, the Groundwater Replenishment Project would help satisfy this statewide goal.
- The City of Salinas's Industrial Wastewater Treatment Facility is currently unable to meet its National Pollutant Discharge Elimination System/Waste Discharge Requirements of the Regional Water Quality Control Board on a year-round basis (City of Salinas, Industrial Wastewater Treatment Facility, 2013 Annual Report, Waste Discharge Number R3 2003 0008, WDID NO. 3 27011003, January 30, 2014). The Groundwater Replenishment Project proposes to utilize that water to augment wastewater flows to the Regional Treatment Plant to enable year-round, advanced treatment and recharge operations.

Potential sources of water for recycling include stormwater and urban runoff, and agricultural wash water that is treated, evaporated, and percolated near the Salinas River at Davis Road (about four miles upstream of the ocean). In addition, a detailed alternatives analysis is being prepared for both the Groundwater Replenishment Project Environmental Impact Report and for a U.S. Bureau of Reclamation WaterSMART Grant Feasibility Study and State Water Resources Control Board Facility Plan that includes analyzing the diversion and reuse of polluted waters in the Salinas Reclamation Ditch, the Tembladero Slough, and Blanco Drain. These sources are impaired waters on the Central Coast Region of the RWQCB list of 303(d) streams and include a variety of contaminants associated with agricultural and urban runoff. More details of the analysis of these projects will be available in the Fall of 2014. These alternatives are also discussed below under "Future Wastewater Recycling and Water Quality Projects."

Salinas and Carmel River Basins Study

In February 2014, the Monterey Peninsula Water Management District, the Monterey Regional Water Pollution Control Agency, the Monterey County Water Resources Agency, and the San Luis Obispo County Public Works Department submitted a WaterSMART grant proposal to the U.S. Bureau of Reclamation

(Reclamation) for an inter-regional water supply planning study called a Basin Study.

According to Reclamation, basin studies entail basin-wide efforts to evaluate and address the impacts of climate change on future water supplies and sea level rise. Funding is available for comprehensive water studies that define options for meeting future water demands in river basins in the western United States where imbalances in water supply and demand exist or are projected. Each study would include four key segments:

- State-of-the-art projections of future supply and demand by river basin.
- An analysis of how the basin's existing water and power operations and infrastructure will perform in the face of changing water realities.
- Development of options to improve operations and infrastructure to supply adequate water in the future.
- Recommendations on how to optimize operations and infrastructure in a basin to supply adequate water in the future. (U.S. Bureau of Reclamation website, http://www.usbr.gov/WaterSMART/bsp/, accessed on April 10, 2014)

The study proposed by the three IRWM planning regions (Greater Monterey County, Monterey Peninsula, and San Luis Obispo County) is titled the Carmel and Salinas River Basins Study and its goals include providing an opportunity to improve collaboration between the project partners, collectively estimating and planning for changing conditions, and cooperatively identifying regional water supply opportunities in both basins. The Ord area is a key link between two of the regions as discussed elsewhere in this report and would benefit from this study as it is situated between key areas of water demand. The Ord Community overlies the Seaside Groundwater Basin (with its unique subsurface storage characteristics) and overlies and utilizes the northern area (or Pressure subarea) of the Salinas Valley Groundwater Basin.

The complexity and numerous challenges of operating the Salinas and Carmel River Basins and sub-basins have resulted in studies by the US Bureau of Reclamation (Reclamation), US Geological Survey (USGS), the US Army Corps of Engineers (Corps), US Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), Monterey Bay National Marine Sanctuary (MBNMS) and state and local agencies. The proposed Basin Study will help water management agencies having jurisdiction in one or both basins to better collaborate and develop long-term strategies that build on an extensive array of existing analyses to focus on the imbalances between water supply and demand under the projected impacts of climate change, such as sea level rise and variations in marine influence. The goal of the study is to understand, anticipate and adapt to climate change effects on coastal resources and to support management practices that will yield sustainable water surface and groundwater supplies capable of meeting the needs of agriculture, municipal users, the environment, and recreation. A significant amount of recent and on-going work funded by the non-federal partners will contribute to the "in-kind services" cost share (in excess of $1.2 million planned and a total of $4.7 million since June 2013). In addition, the nonfederal partners are committed to

participating and collaborating with Reclamation on data and technical needs, stakeholder engagement through the ongoing IRWM plan groups, and performing model runs with existing watershed and groundwater models to determine the projected impacts of climate change scenarios, as well as improvements due to proposed adaptation strategies.

Information on the San Luis Obispo County region's IRWM program can be found at the following website: http://www.slocountywater.org/site/Frequent%20Downloads/Integrated%20Regional%20Water%20Management%20Plan/IRWM%20Plan%20Update%202014/.

Regional Urban Water Augmentation Project (RUWAP)

The RUWAP is a joint water supply planning effort of the Marina Coast Water District and the Fort Ord Reuse Authority. The project proposes construction and operation of both a desalination component and a recycled water distribution component. The desalination component would include a plant producing between 1,273 and 1,500-acre-foot-per-year of potable water at the Marina Coast Water District Armstrong Ranch property, north of the city of Marina in Monterey County. The RUWAP desalination project component was proposed to extract seawater and potentially brackish water, produce desalinated water, and convey it to the existing District distribution systems. During the 2008-2011 timeframe, MCWD pursued a regional collaborative version of the RUWAP called the Monterey Bay Regional Desalination Project that would have provided water to areas of the Greater Monterey County and Monterey Peninsula regions. That project is no longer being pursued. Additional details about the RUWAP are provided in **Attachment 1**, Overview of the Ord Community Water Supply Planning.

Future Wastewater Recycling and Water Quality Projects

Future water supply and water quality enhancement projects also have the potential to enhance water supplies for the Salinas Valley, including the Ord Community, and to enhance water quality and habitat in the northernmost portions of the Salinas Valley and the Monterey Bay. The following potential water resources strategies could be future components of one or more regional water solutions projects. Some of these are currently being evaluated by the relevant agencies as components of recycled and potable water supply projects:[4]

1. Shared use of infrastructure for multiple benefit projects, such as RUWAP Recycled Water and/or Monterey Peninsula Groundwater Replenishment Projects, for delivering recycled water to urban irrigation users in the Marina Coast Water District's service area.
2. Provision of excess raw source water collected by Groundwater Replenishment Project facilities or facilities constructed by other local jurisdictions to existing or future agricultural irrigation users within the

[4] These opportunities are being pursued outside of the current planning process for the Monterey Peninsula Groundwater Replenishment Project Environmental Impact Report. The current proposed project for that EIR does not include these components, except as alternatives to the proposed project.

Castroville area of northern Salinas Valley. Excess Groundwater Replenishment-collected runoff and wastewaters would be treated by the primary and secondary wastewater systems and the Salinas Valley Reclamation Project tertiary treatment system prior to storage and delivery to CSIP.

3. Increased reuse of wastewater effluent disposed via the MRWPCA's ocean outfall through increased wintertime diversion and recycling of secondary effluent.
4. Diversion, treatment, and reuse of polluted waters from several source water bodies listed on the regions list of impaired water bodies, Clean Water Act Section 303 (d) for the benefit of irrigation users or for use to augment potable supplies through groundwater replenishment (i.e., indirect potable reuse).

Regarding item #3, above, the State Water Resources Control Board prioritizes protection of the quality of the ocean waters for use and enjoyment by the people of the state, and requires control of the discharge of waste to ocean waters in accordance with the provisions contained in the California Ocean Plan 2012 (SWRCB, effective August 19, 2013). The Ocean Plan specifically seeks to limit discharges to the ocean. Increased water recycling for potable reuse associated with the Groundwater Replenishment Project has the dual benefit of reducing wastewater discharge pollutant loads and, by decreasing the size of a proposed desalination plant required to meet local water supply need, the discharge of desalination brine to the MBNMS can be reduced. These future water supply projects could capture a variety of sources for beneficial drinking water use that would otherwise flow to the ocean.

Regarding item #4 above, the Central Coast Regional Water Quality Control Board is in the process of amending its Basin Plan to include Total Maximum Daily Loads (TMDL) that will apply to several of the surface water bodies in the vicinity of the proposed project that are affected by existing "impaired" flows (RWQCB, Notice of Opportunity to Comment on the Proposed Approval of an Amendment to the Water Quality Control Plan for the Central Coastal Basin to Establish Total Maximum Daily Loads in the Lower Salinas River and Reclamation Canal Basin, and the Moro Cojo Slough Subwatershed for Nitrogen Compounds and Orthophosphate, September 3, 2013). The Groundwater Replenishment Project or one or more of these futures projects would potentially capture, treat and reuse one or more of the impaired flows as source waters for influent to the existing RTP, then for further treatment and reuse using the SVRP tertiary treatment plan, and/or the proposed Groundwater Replenishment advanced treatment facility.

Surface Water / Recycled Water Storage

The MCWD service area is located near the Salinas River, and MCWD Board of Directors has considered purchasing surface water rights in the Salinas River Basin as a means of meeting long-term (beyond 2030) demands. MCWD has previously been in negotiations with a senior (pre-1914) water right holder. No decisions have been made as to the purchase of surface water supplies, but that option is potentially available to meet additional demands beyond the 20-year

planning horizon. A constraint to use of surface water is that it is unlikely to be a year-round supply due to demands by agricultural users and instream flow requirements for fisheries. Also, a second phase of the SVWP, examined at a program level in the SVWP EIR, calls for surface water to be made available to coastal urban water agencies in the future.

Monterey County Water Resources Agency holds water right permit #11043 for 135,000 AFY of Salinas River surface water that was to be revoked by the State Water Resources Control Board (SWRCB) in August 2013. Through MCWRA staff and counsel efforts, a settlement agreement was signed and the Permit will be valid, as long as the Agency adheres to a strict, aggressive set of milestones for water project implementation. The milestones end with a project being developed and delivering water by July 2026. The water allocated to the Permit will be used to continue to remedy seawater intrusion in the Salinas Valley.

MCWD and MCWRA are also considering the potential to construct a seasonal surface water and/or recycled water storage reservoir on MCWD land south of the Regional Treatment Plant. Currently, adequate water supplies are available in the winter time; however, peak demands occur in the summer. A surface storage reservoir would reduce the seasonal inconsistencies between supply and demand (Brian True, personal communication, April 2014 and MCWRA, Regional Advisory Committee Meeting April 17, 2014 Agenda and Packet, April 2014).

Conclusion. The above projects can provide a significant opportunity for stakeholders in both IRWM planning regions to collaborate and coordinate on water management projects with potential long-term benefits for both regions.

Inter-Regional Prioritization Processes

In 2011 and 2012, the Monterey Peninsula and Greater Monterey County IRWM planning regions met separately to develop their respective IRWM Plan objectives. The following describes the activities of each region regarding prioritization of their regions' objectives.

Monterey Peninsula Region Objectives Prioritization

At the July 2012 Stakeholder meeting, stakeholders were asked to provide general comments and input to a draft set of goals and objectives revised in accordance with the 2011/2012 Guidelines from DWR and new regional circumstances and conditions. To gather meaningful feedback, the participants were also provided written forms and asked to rank draft objectives as high, medium or low priorities for the Monterey Peninsula region. In addition, the Objectives Feedback form was provided to the full list of stakeholders via email to enable those who could not attend the meeting to provide feedback on the draft objectives. The results of the July 25, 2012 stakeholder meeting, including the Objectives Feedback/Prioritization Exercise Results, are available in the Monterey Peninsula IRWM Plan, Chapter 3, Goals and Objectives.

Based upon stakeholder input (including verbal and written comments) and the Objectives Feedback/Prioritization Exercise, the draft objectives were modified and re-ordered. The 2012 objectives review process resulted in twenty five (25) total objectives, including eight (8) considered "high priority." The result of the objectives review and prioritization effort is shown in **Attachment 3**, under the column labeled: "Monterey Peninsula, Carmel Bay, and South Monterey Bay Region."

Greater Monterey County Region Objectives Prioritization

After much debate and careful consideration, the RWMG made a decision to not prioritize objectives. The rationale for this decision is as follows. The Greater Monterey County IRWM region is a broad geographic area made up of a very diverse group of stakeholders. The RWMG itself reflects that diversity. The RWMG has aimed to be as inclusive as possible of all stakeholders in the region, encouraging their active participation in the IRWM planning process and promising serious consideration of their concerns and needs. The 57 objectives included in the IRWM Plan were based on the "issues and conflicts" perceived to exist throughout the region, as described by different groups of stakeholders in all corners of the region. The RWMG therefore recognizes that each of the objectives carries special weight and significance for at least some groups of stakeholders. By prioritizing some objectives over others, the RWMG feels they would effectively be prioritizing the needs of certain stakeholders over others. In order to maintain inclusivity, and to avoid the possibility of alienating certain groups of stakeholders or discouraging their participation in the IRWM planning process, the RWMG has therefore decided not to prioritize objectives. The project ranking system reflects that decision (Greater Monterey County RWMG, *Greater Monterey County Integrated Regional Water Management Plan*, March 2013).

Inter-Regional Coordination of Prioritization Efforts. After each region developed their individual objectives (and prioritization, as applicable), representatives of both regions developed a comparison of objectives, which is presented in **Attachment 3**. The comparison was presented at a meeting of RWMG and Ord Community representatives on February 7, 2013 (see Attachment 4 which contains the agenda, presentation, draft matrix of objectives, and summary meeting notes). In general, the two regions have similar, but region-specific, objectives in the broad categories of water supply, water quality, flood management, environmental protection, and climate change. As shown in **Attachment 3**, the revised draft matrix of objectives, the two regions have both developed objectives covering the key statewide priorities of the IRWM planning program. Some key differences in the objectives include the following:

<u>Water Supply</u>

- The Greater Monterey County region's objectives are heavily influenced by the large agricultural industry throughout Monterey County's Salinas Valley; therefore, numerous objectives are focused on issues related to agriculture production, and the environmental and water supply issues of that industry.
- Each region prioritized water supplies; however, the Monterey Peninsula includes specific requirements for meeting replacement and future demands.

<u>Water Quality</u>

- The Monterey Peninsula focuses more on protecting water quality for habitat and Areas of Special Biological Significance, while the Greater Monterey Plan has more of an emphasis on reducing the impacts associated with agriculture production on water quality.

<u>Flood Protection, Floodplain Management, and Erosion Prevention</u>

- Each region seeks to protect infrastructure and property; however, the Monterey Peninsula includes protecting habitat and taking into consideration sea level rise.

<u>Environmental Protection and Enhancement</u>

- The Monterey Peninsula region includes climate change in its discussion of environmental protection and in its own goal category. The Greater Monterey County region includes protection of existing pristine natural resources in its climate change category. The Greater Monterey County region includes specific objectives addressing research and monitoring, sedimentation, native/non-native species, purchasing fee titles/easements and wildfire that are not included in the Monterey Peninsula region.

Climate Change

- The Greater Monterey County region addresses implementation of efforts such as carbon sequestration that are not addressed in the Monterey Peninsula region.

Regional Communication and Cooperation

- The Monterey Peninsula region has a more comprehensive goal statement with objectives that relate to building relationships, cooperating, collaborating integrating, and public outreach, education, and communication (including with DACs). The Greater Monterey County region has more specific details, including focusing on collaboration and reducing regulatory inconsistencies to facilitate compliance and permitting.

Disadvantaged Communities

- The Greater Monterey County region has an entire goal category dedicated to DAC objectives while the Monterey Peninsula region includes discussion of DACs in the Regional Communication and Cooperation category, above.

Ord Inter-Regional Project Coordination Activities

To adequately incorporate the priorities and select projects for the Ord Community, this report is intended to be included in the development and update of the Monterey Peninsula IRWM Plan. During the development of the updated plan, the RWMG representatives conducted additional outreach to numerous Ord Community stakeholders and engaged RWMGs and stakeholders with interest and purview in the Ord Community to meet and discuss issues. The following tasks were carried out in connection with the development of this Project Report, and in parallel with the development and update of the IRWM Plan:

- A sub-committee was established of members of the RWMG and plan preparers (Susan Robinson and Alison Imamura, DD&A) from each region that were familiar with the Ord Community area. The purpose of the sub-committee was to identify objectives and priorities and plan for Ord Inter-Regional Project activities. Both regions' representatives agreed to actively solicit projects within the Ord Community, and set a meeting to prioritize objectives. This planning occurred during meetings in January and April 2012.
- The Monterey Peninsula RWMG Representative, Larry Hampson, attended a Fort Ord Reuse Authority Water and Wastewater Oversight Committee Meeting in April 2012 to present an overview of the Monterey Peninsula IRWM Plan process and the purpose and goals of the Inter-Regional Coordination Project. Additional participation in the Inter-Regional process, including stakeholder meetings, was solicited.
- Stakeholders that have not been represented in one or the other IRWM Plan were invited to an Ord Inter-Regional Stakeholder Meeting on February 7, 2013. A list of key Ord Community Stakeholders that were invited by email and personal phone call to attend the meeting is provided in **Attachment 4** (in addition they were invited to the February 6, 2013 general stakeholder meeting about project review process for the Monterey Peninsula region).

- A focused Ord Community inter-regional public/stakeholder meeting was held on February 7, 2013 to take input on issues and to comment on priorities and objectives for the Ord Community. Meeting agendas, presentation materials, and meeting notes are provided in **Attachment 3**. Fifteen people attended the meeting, including officials from the Army, Marina Coast Water District, City of Monterey, and the Monterey Regional Water Pollution Control Agency. The Greater Monterey County region RWMG was represented by Bridget Hoover (Monterey Bay National Marine Sanctuary) and Susan Robinson (Coordinator for Greater Monterey County). Both IRWM regions investigated any environmental justice concerns associated with the reuse of Fort Ord including noting that several areas of Fort Ord have unexploded ordnance, pre-World War II lead paint contamination, and groundwater plumes of toxic substances. However, the primary focus was on improving water supply infrastructure and augmentation of the water supply to meet anticipated Ord Community requirements.
- The issues, objectives, priorities, and projects for the Ord Community, which lies astride the common regional boundary, were identified during the meeting through the use of a draft matrix shown in **Attachment 3**, Comparison of Objectives. In addition, the meeting participants identified additional issues, constraints, and objectives for the Ord Community as described in the Summary meeting notes from the meeting that are included in **Attachment 4**.
- Certain project components described above can most appropriately fit within one region or the other; however, several have a place in both IRWM plans. Using the respective ranking system and prioritization process from each region, these components will be prioritized within the respective region.
- This project report will be presented to each of the Monterey Peninsula IRWM RWMG members prior to and as part of public hearing for plan adoption of the plan by the MPWMD Board. The draft project report will also be provided to Greater Monterey County RWMG and they will be asked to update their plan to include the results of this project.
- Each IRWM Plan will be updated to include the results of this inter-regional coordination effort, including a summary within relevant sections of the plan and attaching this report to the plan, if appropriate.
- A total of four meetings were held with representatives of the Ord Community (including one Ord-specific inter-regional meeting and three MP IRWM stakeholder meetings that included numerous representatives of the Ord Community as documented in **Attachment 5**).

Conclusions and Recommendations

The Monterey Peninsula Groundwater Replenishment Project, the Ord Community Water Supply solution (i.e., RUWAP or another solution), and the Reclamation Basin Study hold the most promise for a truly integrated water management effort with multiple benefits that would involve inter-regional cooperation between the Monterey Peninsula and the Greater Monterey County region. In the case of the Basin Study, the inter-regional coordination would extend to the San Luis Obispo IRWM Region. Other projects can provide a significant opportunity for stakeholders in both IRWM planning regions to collaborate and coordinate on water management projects with potential long-term benefits for both regions.

References

City of Salinas, *Industrial Wastewater Treatment Facility, 2013 Annual Report, WDR NO. R3 2003 0008, WDID NO. 3 27011003*, January 30, 2014

MCWRA, *Coastal Salinas Valley Seawater Intrusion Program and Update,* February 2013.

RWQCB, *Notice of Opportunity to Comment on the Proposed Approval of an Amendment to the Water Quality Control Plan for the Central Coastal Basin to Establish Total Maximum Daily Loads in the Lower Salinas River and Reclamation Canal Basin, and the Moro Cojo Slough Subwatershed for Nitrogen Compounds and Orthophosphate*, September 3, 2013

SWRCB, *California Ocean Plan 2012 found in Section 13000 of Division 7 of the California Water Code [Stats. 1969, Chap. 482] pursuant to the authority contained in Section 13170 and 13170.2 [Stats.1971, Chap. 1288] Effective August 19, 2013 (at http://www.swrcb.ca.gov/water_issues/programs/ocean/, accessed April 12, 2014)*

SWRCB, *Recycled Water Policy*, adopted May 2009 and amended April 2013. (at http://www.swrcb.ca.gov/water_issues/programs/water_recycling_policy/ , accessed April 11, 2014.

U.S. Bureau of Reclamation website, *Basin Study Grant Application website*, at http://www.usbr.gov/WaterSMART/bsp/, accessed on April 10, 2014.

Yates, Eugene B., Feeney, Martin, and Rosenberg, Lewis I., *Laguna Seca Subarea Phase III Hydrogeologic Update*, Prepared for the Monterey Peninsula Water Management District by, November 2002.

Yates, Eugene B., Feeney, Martin, and Rosenberg, Lewis I., *Seaside Groundwater Basin: Update on Water Resource Conditions*, prepared for the Monterey Peninsula Water Management District, April 14, 2005.

Attachments to the:

Draft Summary Report (April 16, 2014)

Project 5. Integrated Regional Water Management Inter-Regional Coordination:

Greater Monterey County and Monterey Peninsula, Carmel Bay, and South Monterey Bay Regions

Attachment 1. Draft Overview of the Ord Community Water Supply Planning

Attachment 2. Marina Coast Water District, 10-Year Annual Consumption Report by Land Use Jurisdiction Summary

Attachment 3. Comparison of Objectives: Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWMP and the Greater Monterey County IRWMP

Attachment 4. Ord Inter-Regional Coordination Meeting (February 7, 2013) Agenda, Packet, and Meeting Notes

Attachment 1. Draft Overview of the Ord Community Water Supply Planning

Attachment 1.

Draft Overview of the

Ord Community Water Supply Planning

for the

Project 5 –Monterey Peninsula, Carmel Bay, and South Monterey Bay: IRWM Plan Interregional Coordination Summary Report

DRAFT

Introduction

The purpose of this report is to provide background and context to the discussions of the Ord Interregional Project in relationship to past water supply planning for the geographic area of interest for this project, the former Fort Ord.

Salinas Valley Groundwater Use by Ord Community

Water supplies for the Ord Community area (i.e., roughly equivalent to the former military base, called Fort Ord) are comprised exclusively of groundwater from the Salinas Valley. Seawater intrusion in the Salinas Valley Groundwater Basin has been documented since the 1930's .Seawater intrusion occurs when the naturally occurring offshore flow of fresh groundwater in a coastal aquifer is reversed and seawater begins moving inland .The flow reversal occurs when onshore groundwater levels are consistently below sea level as a result of extractions (i.e., cumulative pumping from wells) .Regionally, water levels can drop below sea level as a result of extractions that exceed the recharge to the aquifer .At local well sites within the region, water levels can drop below sea level because of well operations and specific aquifer properties .In the Pressure Subarea of the Salinas Valley Groundwater Basin that serves the Ord Community, the flow reversal allowing seawater intrusion is the result of both processes.

The Ord Community area is served by the Marina Coast Water District (MCWD) .MCWD and the agricultural and municipal users throughout the Salinas Valley Groundwater Basin rely on wells that extract water from the basin as their primary water supply source in accordance with agreements with the Monterey County Water Resources Agency .More information on the

groundwater system can be found in the MCWD 2010 Urban Water Management Plan (MCWD, 2011).

When Fort Ord was active, the US Army had a 6,600 acre-feet per year (AFY) groundwater entitlement. When the base closed, that 6,600 AFY of groundwater was retained for redevelopment and allocated to the land use jurisdictions. The Fort Ord Base Reuse Plan (Reuse Plan) identified water availability as a resource constraint, meaning only a certain amount of redevelopment may occur within the amount of water available. The Reuse Plan anticipated that full build-out would utilize the entire 6,600 AFY of available groundwater supply – and – an additional 2,400 AFY from another water source would be required to achieve the level

of reuse permitted in the Reuse Plan and ensure that landscaping and golf courses do not use up potable water .The following table shows the total Salinas Valley Groundwater used for the Ord Community since 2001.

Year	Groundwater use (AF)
2001	2,228
2002	2,137
2003	2,144
2004	2,423
2005	1,994
2006	2,509
2007	2,941
2008	2,269
2009	2,076
2010	2,389
2011	2,219
2012	1,998
2013	2303

Use of Recycled Water in Salinas Valley

The Salinas Valley Reclamation Plant (Reclamation Plant) was originally developed to provide recycled water for agricultural purposes .It was funded by the Bureau of Reclamation (Reclamation), the State Water Resources Control Board (SWRCB), and the Monterey County Water Resources Agency .On June 2, 1995, a contract was made between Reclamation and the Monterey Regional Water Pollution Control Agency (Pollution Control Agency) to set terms for a loan from Reclamation to the Pollution Control Agency to allow development of water facilities associated with the Salinas Valley Seawater Intrusion Program (later renamed as the Castroville Seawater Intrusion Project) and Salinas Valley Reclamation Project (Reclamation Project) .

Wastewater from the Pollution Control Agency's Regional Treatment Plant (RTP) is recycled by the Reclamation Project for irrigation of 12,000 acres of farmland in the northern Salinas Valley. The Reclamation Project is designed to produce up to 29.6 mgd of recycled water using a tertiary treatment plant and an 80 acre-foot storage pond that holds tertiary-treated and Salinas River water before it is distributed to farmland by a distribution system which is also part of the Castroville Seawater Intrusion Project. The use of recycled wastewater for irrigation reduces regional dependence on and use of local groundwater, which in turn, reduces groundwater pumping-related seawater intrusion into the Salinas Valley aquifers.

RUWAP Planning and Environmental

As far back as the early 1990s, the use of recycled water for urban irrigation has been considered as a water supply solution .In 2002, in cooperation with the Fort Ord Reuse Authority (Reuse Authority), MCWD initiated the Regional Urban Water Augmentation Project (RUWAP) .The RUWAP was a programmatic evaluation of water supply alternatives in order to identify feasible water augmentation supplies capable of meeting the water demands for redevelopment of the former Fort Ord as anticipated by the Fort Ord Reuse Plan (Reuse Plan) and its accompanying Final Environmental Impact Report (EIR) .The amount of groundwater currently available from the Salinas Valley Ground Water Basin for MCWD to use at the former Fort Ord is limited to 6,600 acre-feet per year (AFY) pursuant to the Annexation Agreement of Fort Ord .The Reuse Plan anticipates that a total of 9,000 AFY would be needed to provide water for redevelopment of the former Fort Ord; therefore, a balance of 2,400 AFY of water is needed to augment the 6,600 AFY of available groundwater .The RUWAP's key objective is to provide 2,400 AFY of water to meet anticipated demands in the former Fort Ord area .An additional 300 AFY of water was planned to supply the Monterey Peninsula, and 300 AFY of water was being considered to supply MCWD's other service areas .Therefore, an additional 3,000 AFY of water was assumed to be needed to meet RUWAP project objectives.

A multi-tiered alternatives analysis was conducted as described in the RUWAP Alternatives Analysis (MCWD/Denise Duffy & Associates [DD&A]/RBF Consulting [RBF], March 2003) .The analysis found that the two most viable alternatives that could be implemented by the MCWD were a Seawater Desalination project and a Recycled Water project .Consequently, an EIR was prepared by MCWD for the primary alternatives: a 3,000 AFY Recycled Water Alternative and a 3,000 AFY Seawater Desalination Alternative .

Further, three additional alternatives, including a Hybrid Alternative (a combination of recycled water and seawater desalination), were also evaluated .The *Draft Environmental Impact Report Regional Urban Water Augmentation Project*, State Clearinghouse Number #2003081142 (MCWD 2004a); was prepared by MCWD pursuant to the California Environmental Quality Act (CEQA) and was released in June 2004 .A Final EIR was certified in October 2004 (hereafter referred to as the "RUWAP EIR") (*MCWD Resolution 2004-56)*, and the RUWAP Plan was approved in May 2005 (*MCWD Resolution 2005-27*) and was also approved by the Reuse Authority .As part of the RUWAP approval, MCWD and the Reuse Authority identified the Hybrid Alternative as the recommended alternative to satisfy the RUWAP objectives .

DRAFT

RUWAP Recycled Water Project

Based on the analysis and CEQA process above, MCWD, in cooperation with the Pollution Control Agency, proposed the Regional Urban Recycled Water Project (RWP) to the U.S. Bureau of Reclamation .The RWP (a component of the Hybrid Alternative of the RUWAP) proposed the construction of a distribution system to provide up to 1,727 AFY of recycled water from the existing Pollution Control Agency's Reclamation Plant to urban users .This recycled water would be delivered initially to the former Ford Ord (Ord Community), which includes lands within the jurisdictions of the Cities of Marina, Seaside, and Del Rey Oaks; California State University, Monterey Bay (CSUMB); University of California, Monterey Bay Education, Science, and Technology Center; and the County of Monterey .Of the total 1,727 AFY, 300 AFY of recycled water was proposed to be provided to the Monterey Peninsula (outside of the former Fort Ord) once that portion of the distribution system was operational.

On October 25, 2006, the Board adopted Addendum No. 1 to the RUWAP EIR (*MCWD Resolution 2006-91*), and on November 15, 2006, approved the RWP (including associated changes to the RUWAP), and adopted the Mitigation Monitoring and Reporting Program (*MCWD Resolution 2006-93*) .On February 14, 2007, the Board adopted Addendum No. 2 to the RUWAP EIR, approved the changes to the RWP (including associated changes to the RUWAP), and adopted the Mitigation Monitoring and Reporting Program (*MCWD Resolution 2007-18*) .Changes analyzed in Addendum No. 2 and approved on February 14, 2007 include a change to the maximum quantity of recycled water delivery (from 1,500 AFY to 1,727 AFY), minor changes to the Area of Potential Effect (area of construction disturbance), and refinement of cultural resources mitigation measures.

Section 10(b) of the contract between Reclamation, SWRCB, and the Monterey County Water Resources Agency (MCWRA) stipulates that recycled water from the Salinas Valley Reclamation Project for municipal and industrial (M&I) uses can only be delivered after compliance with the National Environmental Policy Act (NEPA) and other federal regulations (U.S. Department of Interior, 1995) .Under these conditions, an Environmental Assessment (EA) was prepared with Reclamation as the NEPA lead agency and MCWD as a cooperating agency and circulated for public review between July 9 and August 5, 2009 .The State Historic Preservation Officer made a finding of No Historic Properties Affected on March 24, 2008, the U.S. Fish and Wildlife Services issued a Biological Opinion on November 24, 2009, and Reclamation signed the Finding of No Significant Impact in December 2009.

The recycled water component would supply up to 1,500 to 1,727 AFY of recycled water for urban irrigation demands within Marina Coast Water District and potentially the Monterey

Peninsula areas. The Recycled Water element of RUWAP includes the following primary component facilities:

1. a connection to the SVRP that includes a pump station referred to as the Water Augmentation Pumping Plant,
2. a new distribution pipeline system consisting of approximately 40,000 LF of 16- to 20-inch ductile iron and plastic pipe installed within existing roadway right-of-ways and easements.[1]
3. One intermediate pump station referred to as the Fifth Avenue Pump Station (FAPS) located in the City of Marina near CSUMB.
4. One 1.5 million gallon storage tank referred to as the Blackhorse Reservoir at an existing MCWD storage tank site east of General Jim Moore Boulevard.

RUWAP Desalination Project

The RUWAP desalination project component was proposed to extract seawater and potentially brackish water, produce desalinated water at a plant, and convey it to the existing MCWD distribution systems. The desalination plant location evaluated in the RUWAP EIR was planned to be located at the existing MCWD desalination plant (currently inoperable) at 10 Reservation Road in Marina collocated with MCWD's administrative offices .That site is subject to ongoing beach and bluff coastal erosion, and is within the City of Marina coastal zone and thus subject to restrictions on placement of non-coastal dependent land uses; therefore, that site is no longer considered viable for development and operation of a desalination plant.

Following the RUWAP approvals, several factors caused reconsideration of the water augmentation program: 1) increased project costs as designs were refined; 2) MCWD and Pollution Control Agency negotiations regarding the recycled component of the project were not accomplished; and 3), the significant economic downturn (2008-2012). These factors deferred the need for the augmentation program and provided an opportunity to consider a more regional alternative as the preferred project for the water augmentation program.

Monterey Bay Regional Desalination Project

During the 2008-2011 timeframe, MCWD collaborated with other water agencies and water purveyors to pursue a regional water supply planning effort .In lieu of the RUWAP project,

[1] Thousands of linear feet of Recycled Water conveyance pipelines have already been installed throughout the community, in particular a small section of back-bone facility within CSUMB within 3rd Street and 5th Avenue south to Divarty Street) and an approximately 3-mile extension of the back-bone facility southerly from Normandy down General Jim Moore Boulevard to the boundary of the city of Del Rey Oaks.

MCWD decided to join in a more regionally-oriented, Monterey Bay Regional Desalination Project (MBRDP)by entering into a Water Purchase Agreement with Monterey County Water Resources Agency and the California American Water Company (CalAm) .The MBRDP was an alternative to CalAm's proposed Coastal Water Project considered in the CPUC's 2009 Final Coastal Water Project EIR .The MBRDP included a proposed desalination plant that would provide water for future demands within Marina Coast Water District's service area and for other regional water demands .These other regional demands included Monterey Peninsula's water supply needs related to a State Water Resources Control Board order requiring dramatic reductions in Carmel River alluvial aquifer pumping and a groundwater basin adjudication requiring reduced pumping from the Seaside Groundwater Basin in compliance with court-ordered reductions .The plant was proposed to be located in the area immediately south of the Pollution Control Agency's Regional Wastewater Treatment Plant north of Marina and would have provided water to areas of the Greater Monterey County and Monterey Peninsula regions. That project is no longer being pursued.

In July 2012, the California Public Utilities Commission granted Cal-Am's petition to withdraw its application for the MBRDP. The CPUC instructed Cal-Am to file a new application for a replacement project entitled the "Monterey Peninsula Water Supply Project," a portfolio of projects including groundwater replenishment with recycled water, an expansion of aquifer storage and recovery, and construction of a desalination plant.

DRAFT

Attachment 2. Marina Coast Water District, 10-Year Annual Consumption Report by Land Use Jurisdiction Summary

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

Report Modified: 1/8/2014

LAND USE	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013 as of Dec 31
* represents year to date consumption figures which have been billed to customers					* Report includes 2009 CSUMB metering progress transitioned to zero residential unmetered accounts					
TOTALS FOR ORD COMMUNITY - ARMY										
Metered Consumption	86.15	157.54	206.17	231.41	212.02	248.47	269.62	276.47	291.93	329.74
Army Retention (af)	1,577	1,577	1,577	1,577	1,577	1,577	1,577	1,577	1,577	1,577
Water Used (%)	31%	36%	39%	41%	39%	42%	43%	44%	45%	47%
Unmeterd Water Use (af)	518.00	456.00	410.00	410.00	410.00	410.00	410.00	410.00	377.00	377.00
TOTALS FOR ORD COMMUNITY - CITY OF MONTEREY										
Metered Consumption	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORA Allocation (af)	65	65	65	65	65	65	65	65	65	65
Water Used (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0
Unmeterd Water Use (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS FOR ORD COMMUNITY - COUNTY/STATE PARKS										
Metered Consumption	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORA Allocation (af)	45	45	45	45	45	45	45	45	45	45
Water Used (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0
Unmeterd Water Use (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS FOR ORD COMMUNITY - CSUMB										
Metered Consumption	126.91	158.01	121.51	129.20	142.10	270.73	398.85	460.17	426.02	441.85
FORA Allocation (af)	1,035	1,035	1,035	1,035	1,035	1,035	1,035	1,035	1,035	1,035
Water Used (%)	58%	61%	58%	58%	60%	60%	39%	44%	41%	43%
Unmeterd Water Use (af)	475.00	475.00	475.00	475.00	475.00	350.00	0.00	0.00	0.00	0.00

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

Report Modified: 1/8/2014

LAND USE	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013 as of Dec 31
TOTALS FOR ORD COMMUNITY - DEL REY OAKS										
Metered Consumption	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORA Allocation (af)	243	243	243	243	243	243	243	243	243	243
Water Used (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0
Unmeterd Water Use (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS FOR ORD COMMUNITY - MARINA										
Metered Consumption	257.22	228.75	288.16	434.88	323.86	289.81	271.26	263.37	264.11	272.63
FORA Allocation (af)	1,325	1,325	1,325	1,325	1,325	1,325	1,325	1,325	1,325	1,325
Water Used (%)	19%	17%	22%	33%	24%	22%	20%	20%	20%	21%
Unmeterd Water Use (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS FOR ORD COMMUNITY - MONTEREY COUNTY										
Metered Consumption	4.85	8.04	5.89	196.96	36.57	4.31	10.37	11.38	9.85	15.32
FORA Allocation (af)	720	720	720	720	720	720	720	720	720	720
Water Used (%)	1%	1%	1%	27%	5%	1%	1%	2%	1%	2%
Unmeterd Water Use (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* represents year to date consumption figures which have been billed to customers

* Report includes 2009 CSUMB metering progress transitioned to zero residential unmetered accounts

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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TOTALS FOR ORD COMMUNITY - SEASIDE										
Metered Consumption	468.23	456.60	414.91	451.22	483.56	429.61	793.72	807.42	632.68	865.44
FORA Allocation (af)	1,012	1,012	1,012	1,012	1,012	1,012	1,012	1,012	1,012	1,012
Water Used (%)	46%	45%	41%	45%	48%	42%	78%	80%	63%	86%
Unmeterd Water Use (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS FOR ORD COMMUNITY - UCMBEST										
Metered Consumption	4.15	5.28	5.36	2.49	1.53	1.61	2.43	1.12	2.57	1.29
FORA Allocation (af)	230	230	230	230	230	230	230	230	230	230
Water Used (%)	2%	2%	2%	1%	1%	1%	1%	0%	1%	1%
Unmeterd Water Use (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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ORD COMMUNITY - ARMY										
CSUMB										
Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.32
No. of Connections	0	0	0	0	0	0	0	1	1	1
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	475.00	475.00	475.00	475.00	475.00	350.00	0.00	0.00	0.00	0.00
Army Facilities & Businesses - Ord										
Total Consumption (af)	62.18	37.32	36.49	46.42	39.16	44.94	45.29	35.91	24.80	27.53
No. of Connections	28	28	28	29	29	29	30	31	28	28
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	518.00	456.00	410.00	410.00	410.00	410.00	410.00	410.00	377.00	377.00

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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Army Construction Water - Ord										
Total Consumption (af)	21.72	20.88	0.78	0.03	3.54	40.48	2.73	0.13	0.00	0.00
No. of Connections	1	4	2	1	1	3	1	1	0	0
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fitch Park Army - Ord										
Total Consumption (af)	0.00	1.31	63.96	81.79	78.91	75.03	73.38	78.01	70.22	80.04
No. of Connections	0	72	211	213	213	213	213	213	213	213
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hayes Park Army - Ord										
Total Consumption (af)	2.26	98.03	104.95	103.17	90.42	87.52	75.30	78.31	74.79	77.31
No. of Connections	48	164	164	164	164	164	164	164	164	164
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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Lower Stilwell										
Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	27.37	44.44
No. of Connections	0	0	0	0	0	0	0	66	100	100
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kidney - Ord										
Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	0.50	72.92	83.30	94.56	100.10
No. of Connections	0	0	0	0	0	54	288	291	292	332
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS FOR ORD COMMUNITY - ARMY										
Metered Consumption	**86.15**	**157.54**	**206.17**	**231.41**	**212.02**	**248.47**	**269.62**	**276.47**	**291.93**	**329.74**
Army Retention (af)	**1,577**	**1,577**	**1,577**	**1,577**	**1,577**	**1,577**	**1,577**	**1,577**	**1,577**	**1,577**
Water Used (%)	**31%**	**36%**	**39%**	**41%**	**39%**	**42%**	**43%**	**44%**	**45%**	**47%**
Unmeterd Water Use (af)	**518.00**	**456.00**	**410.00**	**410.00**	**410.00**	**410.00**	**410.00**	**410.00**	**377.00**	**377.00**

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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ORD COMMUNITY - CITY OF MONTEREY

City of Monterey - Ord

Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No. of Connections	0	0	1	0	0	0	0	0	0	0
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TOTALS FOR ORD COMMUNITY - CITY OF MONTEREY

Metered Consumption	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
FORA Allocation (af)	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**65**	**65**
Water Used (%)	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
Unmeterd Water Use (af)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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ORD COMMUNITY - COUNTY/STATE PARKS

County/State Parks - Ord

Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No. of Connections	0	0	1	0	0	0	0	0	0	0
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TOTALS FOR ORD COMMUNITY - COUNTY/STATE PARKS

Metered Consumption	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
FORA Allocation (af)	**45**	**45**	**45**	**45**	**45**	**45**	**45**	**45**	**45**	**45**
Water Used (%)	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
Unmeterd Water Use (af)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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ORD COMMUNITY - CSUMB										
CSUMB										
Total Consumption (af)	108.13	139.72	106.07	113.27	118.71	157.88	131.29	181.40	178.73	197.35
No. of Connections	74	81	78	84	83	87	89	113	106	121
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	475.00	475.00	475.00	475.00	475.00	350.00	0.00	0.00	0.00	0.00
CSUMB - Frederick Park										
Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	16.63	96.49	104.33	90.98	88.90
No. of Connections	0	0	0	0	0	131	135	133	133	133
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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* represents year to date consumption figures which have been billed to customers						* Report includes 2009 CSUMB metering progress transitioned to zero residential unmetered accounts				
CSUMB - Schoonover I										
Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	67.25	137.35	140.72	127.42	123.48
No. of Connections	0	0	0	0	0	245	246	246	246	246
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CSUMB - Schoonover II										
Total Consumption (af)	18.78	18.30	15.44	15.93	23.39	28.97	33.71	33.73	28.88	32.12
No. of Connections	66	66	66	66	152	152	155	156	153	156
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS FOR ORD COMMUNITY - CSUMB										
Metered Consumption	**126.91**	**158.01**	**121.51**	**129.20**	**142.10**	**270.73**	**398.85**	**460.17**	**426.02**	**441.85**
FORA Allocation (af)	**1,035**	**1,035**	**1,035**	**1,035**	**1,035**	**1,035**	**1,035**	**1,035**	**1,035**	**1,035**
Water Used (%)	**58%**	**61%**	**58%**	**58%**	**60%**	**60%**	**39%**	**44%**	**41%**	**43%**
Unmeterd Water Use (af)	**475.00**	**475.00**	**475.00**	**475.00**	**475.00**	**350.00**	**0.00**	**0.00**	**0.00**	**0.00**

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

Report Modified: 1/8/2014

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ORD COMMUNITY - DEL REY OAKS										
Del Rey Oaks - Ord										
Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No. of Connections	0	0	1	0	0	0	0	0	0	0
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS FOR ORD COMMUNITY - DEL REY OAKS										
Metered Consumption	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
FORA Allocation (af)	**243**	**243**	**243**	**243**	**243**	**243**	**243**	**243**	**243**	**243**
Water Used (%)	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
Unmeterd Water Use (af)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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ORD COMMUNITY - MARINA										
CSUMB										
Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.35	0.20
No. of Connections	0	0	0	0	0	0	0	1	2	1
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	475.00	475.00	475.00	475.00	475.00	350.00	0.00	0.00	0.00	0.00
Abrams Park - Ord										
Total Consumption (af)	89.26	76.31	71.97	70.11	80.39	83.78	72.57	70.61	77.82	74.25
No. of Connections	226	226	227	229	228	228	228	228	228	228
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

Report Modified: 1/8/2014

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CHOMP - Ord										
Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.04	8.19	7.14
No. of Connections	0	0	0	0	0	0	0	3	3	3
Land Use Agency	21	21	21	21	21	21	21	21	21	21
Water Used (%)								53%	39%	34%
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cypress Knolls - Ord										
Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No. of Connections	0	0	1	0	0	0	0	0	0	0
Land Use Agency	156	156	156	156	156	156	156	156	156	156
Water Used (%)			0%							
MCWD WSA Estimate	156	156	156	156	156	156	156	156	156	156
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marina - Ord										
Total Consumption (af)	24.65	31.92	25.59	23.33	17.44	17.36	17.08	15.03	16.81	23.89
No. of Connections	35	44	44	41	38	39	38	35	32	33
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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Marina Airport - Ord										
Total Consumption (af)	6.11	5.36	4.99	5.24	5.32	7.94	9.76	6.90	5.26	4.08
No. of Connections	16	21	21	22	18	20	23	22	23	21
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marina Construction Water - Ord										
Total Consumption (af)	14.29	8.63	47.21	86.98	13.86	18.26	17.25	4.87	7.71	10.61
No. of Connections	10	11	12	22	16	10	16	8	2	2
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marina Heights - Ord										
Total Consumption (af)	0.00	0.00	6.94	85.07	47.92	8.34	8.70	9.41	8.97	13.61
No. of Connections	0	0	4	9	7	7	7	7	7	7
Land Use Agency	293	293	293	293	293	293	293	293	293	293
Water Used (%)			2%	29%	16%	3%	3%	3%	3%	5%
MCWD WSA Estimate	350	350	350	350	350	350	350	350	350	350

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Preston Park - Ord										
Total Consumption (af)	122.91	105.71	100.71	100.78	106.09	111.16	103.85	102.95	109.25	107.45
No. of Connections	388	380	379	380	379	378	378	382	384	382
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
School - Ord										
Total Consumption (af)	0.00	0.00	0.00	0.60	0.50	0.46	0.51	4.47	3.89	5.48
No. of Connections	0	0	0	2	2	2	2	4	4	4
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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University Villages - Ord										
Total Consumption (af)	0.00	0.83	30.75	62.77	52.34	42.51	41.55	37.97	25.87	25.91
No. of Connections	0	1	3	26	14	13	13	13	15	16
Land Use Agency	572	572	572	572	572	572	572	572	572	572
Water Used (%)		0%	5%	11%	9%	7%	7%	7%	5%	5%
MCWD WSA Estimate	732	732	732	732	732	732	732	732	732	732
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UV Specific Plan - Ord										
Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
No. of Connections	0	0	1	0	0	0	0	0	0	0
Land Use Agency	124	124	124	124	124	124	124	124	124	124
Water Used (%)			0%							
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS FOR ORD COMMUNITY - MARINA										
Metered Consumption	**257.22**	**228.75**	**288.16**	**434.88**	**323.86**	**289.81**	**271.26**	**263.37**	**264.11**	**272.63**
FORA Allocation (af)	**1,325**	**1,325**	**1,325**	**1,325**	**1,325**	**1,325**	**1,325**	**1,325**	**1,325**	**1,325**
Water Used (%)	**19%**	**17%**	**22%**	**33%**	**24%**	**22%**	**20%**	**20%**	**20%**	**21%**
Unmeterd Water Use (af)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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ORD COMMUNITY - MONTEREY COUNTY

County - Ord

Total Consumption (af)	4.85	4.07	2.96	5.02	7.05	2.88	10.14	5.93	5.34	9.75
No. of Connections	6	6	6	6	4	5	6	6	6	5
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

County Construction Water - Ord

Total Consumption (af)	0.00	2.56	0.43	0.00	0.02	0.73	0.17	4.32	1.71	0.57
No. of Connections	0	2	1	0	1	1	3	2	1	1
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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East Garrison - Ord										
Total Consumption (af)	0.00	1.41	2.50	191.94	29.51	0.70	0.06	1.13	2.80	5.00
No. of Connections	0	1	3	4	5	3	1	1	1	82
Land Use Agency	470	470	470	470	470	470	470	470	470	470
Water Used (%)		0%	1%	41%	6%	0%	0%	0%	1%	1%
MCWD WSA Estimate	470	470	470	470	470	470	470	470	470	470
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS FOR ORD COMMUNITY - MONTEREY COUNTY										
Metered Consumption	**4.85**	**8.04**	**5.89**	**196.96**	**36.57**	**4.31**	**10.37**	**11.38**	**9.85**	**15.32**
FORA Allocation (af)	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**	**720**
Water Used (%)	**1%**	**1%**	**1%**	**27%**	**5%**	**1%**	**1%**	**2%**	**1%**	**2%**
Unmeterd Water Use (af)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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ORD COMMUNITY - SEASIDE										
Bay View Mobile Park - Ord										
Total Consumption (af)	72.19	60.14	59.89	63.10	66.34	63.61	60.11	59.25	60.85	64.05
No. of Connections	223	223	223	223	223	223	223	223	223	223
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seaside Golf Course - Ord										
Total Consumption (af)	0.60	1.28	10.56	21.01	1.39	1.05	349.21	429.63	265.40	457.44
No. of Connections	1	6	7	6	3	2	3	3	3	3
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MARINA COAST WATER DISTRICT

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School - Ord										
Total Consumption (af)	113.86	114.78	82.11	90.17	126.82	94.82	100.39	77.96	79.34	102.72
No. of Connections	7	9	12	12	13	16	17	17	17	16
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seaside - Ord										
Total Consumption (af)	3.96	3.12	2.61	6.67	5.26	6.03	5.10	4.69	6.42	4.98
No. of Connections	3	4	8	7	8	9	9	9	9	9
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seaside Resort - Ord										
Total Consumption (af)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.31	0.44
No. of Connections	0	0	0	0	0	0	0	2	2	2
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MARINA COAST WATER DISTRICT

10 YEAR ANNUAL CONSUMPTION REPORT BY LAND USE JURISDICTION - SUMMARY

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Seaside Construction Water - Ord										
Total Consumption (af)	21.46	1.65	10.48	7.04	19.55	26.79	52.84	0.94	0.41	1.27
No. of Connections	17	7	8	7	13	9	10	4	1	1
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seaside Highlands - Ord										
Total Consumption (af)	166.50	194.54	170.89	185.72	192.72	166.66	156.69	154.50	146.56	158.75
No. of Connections	326	392	392	391	392	391	389	391	390	392
Land Use Agency	169	169	169	169	169	169	169	169	169	169
Water Used (%)	99%	115%	101%	110%	114%	99%	93%	92%	87%	94%
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seaside Highlands Soaper Field - Ord										
Total Consumption (af)	24.26	18.35	16.77	13.42	11.67	10.82	9.14	11.15	6.86	11.38
No. of Connections	1	1	1	1	1	1	1	1	1	1
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										

MARINA COAST WATER DISTRICT

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Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sun Bay (300 units) - Ord										
Total Consumption (af)	65.40	62.74	61.60	64.09	59.81	59.83	60.25	69.17	66.53	64.40
No. of Connections	300	300	300	300	300	300	300	300	300	300
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTALS FOR ORD COMMUNITY - SEASIDE										
Metered Consumption	**468.23**	**456.60**	**414.91**	**451.22**	**483.56**	**429.61**	**793.72**	**807.42**	**632.68**	**865.44**
FORA Allocation (af)	**1,012**	**1,012**	**1,012**	**1,012**	**1,012**	**1,012**	**1,012**	**1,012**	**1,012**	**1,012**
Water Used (%)	**46%**	**45%**	**41%**	**45%**	**48%**	**42%**	**78%**	**80%**	**63%**	**86%**
Unmeterd Water Use (af)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

MARINA COAST WATER DISTRICT

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ORD COMMUNITY - UCMBEST

U C MBEST - Ord

Total Consumption (af)	4.15	5.28	5.36	2.49	1.53	1.61	2.43	1.12	2.57	1.29
No. of Connections	3	3	3	3	3	3	3	3	3	3
Land Use Agency										
Water Used (%)										
MCWD WSA Estimate										
Unmetered Water Use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TOTALS FOR ORD COMMUNITY - UCMBEST

Metered Consumption	**4.15**	**5.28**	**5.36**	**2.49**	**1.53**	**1.61**	**2.43**	**1.12**	**2.57**	**1.29**
FORA Allocation (af)	**230**	**230**	**230**	**230**	**230**	**230**	**230**	**230**	**230**	**230**
Water Used (%)	**2%**	**2%**	**2%**	**1%**	**1%**	**1%**	**1%**	**0%**	**1%**	**1%**
Unmeterd Water Use (af)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Attachment 3. Comparison of Objectives: Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWMP and the Greater Monterey County IRWMP

Attachment 3. Comparison of Objectives:

Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWMP and the Greater Monterey County IRWMP

(Note: Objectives in BOLD indicate high priority objectives, objectives with a * indicate alignment with Statewide Priorities)

Water Supply

General Category	Monterey Peninsula, Carmel Bay, and South Monterey Bay	Greater Monterey County	Comments
GOAL	***Improve regional water supply reliability through environmentally responsible solutions that promote water and energy conservation. Protect the community from drought and climate change effects with a focus on interagency cooperation and conjunctive use of regional water resources.***	***Improve water supply reliability and protect groundwater and surface water supplies.***	***Monterey Peninsula (Monterey Peninsula) includes consideration of climate change in its goal statement***
water supply needs	**WS-1 Meet existing water supply replacement needs of the Carmel River system and Seaside Groundwater Basin.***	Support research and monitoring to better understand identified water supply needs	Greater Monterey County Goal is to "improve water supply reliability" but there is no particular objective for meeting existing/future water supply needs. High priority for Monterey Peninsula that includes specific replacement supply and future demand.
	WS-3. Seek long-term sustainable supplies for adopted future demand estimates.*	Support the creation of water supply certainties for local production of agricultural products.	Greater Monterey County includes focus on agricultural use
		Support planning efforts to provide emergency drinking water to communities in the region in the event of a disaster.	Greater Monterey County includes planning for disaster preparation
groundwater	See WS-1 and WS-4	Increase groundwater recharge and protect groundwater recharge areas.	Both plans have recharge/replenishment objectives for groundwater basins
storage/conveyance	See WS-1 and WS-4	Optimize the use of groundwater storage with	Monterey Peninsula: diversion of

General Category	Monterey Peninsula, Carmel Bay, and South Monterey Bay	Greater Monterey County	Comments
		infrastructure enhancements and improved operational techniques.	Carmel River water to aquifer storage in the Seaside basin
	See WS-1 and WS-4	Increase and optimize water storage and conveyance capacity through construction, repair, replacement, and augmentation of infrastructure.	
conjunctive use	WS-4 Optimize conjunctive use of surface and groundwater*.	Optimize conjunctive use where appropriate.	
recycled	**WS-2 Maximize use of recycled water (includes wastewater, stormwater)*.**	Diversify water supply sources, including but not limited to the use of recycled water.	Monterey Peninsula high priority
conservation	WS-5 Evaluate, advance, or create water conservation throughout the Region in compliance with the State's 20x2020 Water Conservation Plan*.	Maximize water conservation programs.	
storm water	Use of stormwater falls under WS-1 through WS-4	Capture and manage storm water runoff.	Greater Monterey County includes storm water objective
public education	See RC-3	Promote public education about water supply issues and needs.	Greater Monterey County includes public education objective; Monterey Peninsula includes it in another category

Water Quality

General Category	Monterey Peninsula, Carmel Bay, and South Monterey Bay	Greater Monterey County	Comments
GOAL	***Protect and improve water quality for beneficial uses consistent with regional community interests and the Regional Water Quality Control Board Basin Plan through planning and implementation in cooperation with local and state agencies and regional stakeholders.***	***Protect and improve surface, groundwater, estuarine, and coastal water quality, and ensure the provision of high-quality, potable, affordable drinking water for all communities in the region.***	
runoff	**WQ-2. Improve inland surface water quality for environmental resources (e.g. steelhead) and potable water supplies.***	Promote programs and projects to reduce the quantity and improve the quality of urban and agricultural runoff and/or mitigate their effects in surface waters, groundwater, and the marine environment.	Monterey Peninsula high priority
		Incorporate or promote principles of low impact development where feasible, appropriate, and cost effective.	
Near shore environment	**WQ-1. Improve ocean water quality, including Areas of Special Biological Significance (ASBS), by minimizing pollutants in stormwater discharges.***		Monterey Peninsula high priority. Both regions include discharges and objectives related to ocean water quality, but Monterey Peninsula includes ASBS
meet/exceed WQ standards/targets	WQ-4. Meet or exceed water quality standards established by regulatory agencies and stakeholders. *	Promote practices necessary to meet, or where practicable, exceed all applicable water quality regulatory standards (for drinking water, surface and groundwater quality).	Monterey Peninsula goes a step beyond the regulatory WQ standards; Monterey Peninsula adds recycled WQ targets
protect environmental resources; protect source water from contamination	See WQ-1 through WQ-3	Protect surface waters and groundwater basins from contamination and the threat of contamination.	
seawater intrusion	**WQ-3. Protect and improve water quality in groundwater basins.***	Promote projects to prevent seawater intrusion.	Greater Monterey County includes specific issues of: seawater intrusion, nitrates, food safety, salinity

General Category	Monterey Peninsula, Carmel Bay, and South Monterey Bay	Greater Monterey County	Comments
			management, erosion. No known issues with nitrates or food safety in Monterey Peninsula.
reduce nitrates		Improve septic systems, sewer system infrastructure, wastewater treatment systems, and manure management programs to prevent water quality contamination.	No known nitrate issues in Monterey Peninsula region, but Monterey Peninsula region includes several thousand septic systems in Carmel Valley.
food safety		Support research and pilot projects for the co-management of food safety and water quality protection.	Greater Monterey County includes food safety as an issue; Monterey Peninsula region has minimal food production industry.
salinity mgmt	Salt and Nutrient Management Plan being developed for Seaside Basin. No similar plan for Carmel Valley Aquifer.	Support research and other efforts on salinity management.	Monterey Peninsula addressing salt and nutrient loading in Seaside basin only
erosion control	See FP-1	Support monitoring to better understand major sources of erosion, and implement a comprehensive erosion control program.	Erosion prevention in Monterey Peninsula focused primarily on main stem Carmel River and during construction
monitoring	See Chapter 8, IRWM Plan	Promote regional monitoring and analysis to better understand water quality conditions.	Greater Monterey County includes monitoring and research/emerging technologies. Monitoring is considered a requirement in Monterey Peninsula.
research/emerging technologies		Support research and utilization of emerging technologies (enzymes, etc.) to develop effective water pollution prevention and mitigation measures, and source tracking.	
public education	See RC-3	Promote public education about water quality issues and needs.	

Flood Protection, Floodplain Management, and Erosion Prevention

General Category	Monterey Peninsula, Carmel Bay, and South Monterey Bay	Greater Monterey County	Comments
GOAL	***Ensure that flood protection and erosion prevention strategies are developed and implemented through a collaborative and watershed-wide approach and are designed to consider climate change effects and maximize opportunities for comprehensive management of water resources.***	***Develop, fund, and implement integrated watershed approaches to flood management through collaborative and community supported processes.***	***Monterey Peninsula includes consideration of climate change in its goal statement***
protect infrastructure and habitats	**FP-1. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from flood damage, erosion, and sea level rise, in particular, along the southern Monterey Bay shoreline and Carmel Valley.***	Promote projects and practices to protect infrastructure and property from flood damage.	Monterey Peninsula goes a bit further, adding habitats, reducing potential for flooding, and taking into specific consideration sea level rise (climate change)
improve infrastructure/ approach	FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).*	Improve flood management infrastructure and operational techniques/strategies.	Comparable/consistent
ecologic/stream function	FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.*	Develop and implement projects to protect, restore, and enhance the natural ecological and hydrological functions of rivers, creeks, streams, and floodplains.	
provide other benefits	FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.	Implement flood management projects that provide multiple benefits such as public safety, habitat protection, recreation, agriculture, and economic development.	
impact on ag		Support research and monitoring efforts to understand the effects of flooding on transport and persistence of pathogens in food crop production areas. Support management of flood waters to avoid contaminating fresh produce in the field.	Greater Monterey County includes focus on agriculture; whereas Monterey Peninsula does not due to minimal agricultural production in Monterey Peninsula region.

General Category	Monterey Peninsula, Carmel Bay, and South Monterey Bay	Greater Monterey County	Comments
public educ.	See RC-3	Promote public education about local flood management issues and needs.	Greater Monterey County includes public education objective. Monterey Peninsula covers public education under separate category.

Environmental Protection and Enhancement

General Category	Monterey Peninsula, Carmel Bay, and South Monterey Bay	Greater Monterey County	Comments
GOAL	***Preserve the environmental health and well-being of the Region's streams, watersheds, and the ocean by taking advantage of opportunities to assess, restore and enhance these natural resources when developing water supply, water quality, and flood protection strategies. Seek opportunities to conserve water and energy, and adapt to the effects of climate change.***	***Protect, enhance, and restore the region's ecological resources while respecting the rights of private property owners.***	***Monterey Peninsula links environmental protection goal to water supply, WQ, and flood protection strategies, whereas GREATER MONTEREY COUNTY's environmental goal is a stand-alone goal.***
sensitive species/ steelhead	EV-1. Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.*	Protect and enhance state and federally listed species and their habitats. Implement fish-friendly stream and river corridor restoration projects.	
protect/enhance/ restore resources	EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when developing water management strategies and projects.*	Support science-based projects to protect, improve, enhance, and/or restore the region's ecological resources, while providing opportunities for public access and recreation where appropriate.	Monterey Peninsula: Environmental restoration, etc. should be considered "when developing other management strategies." Monterey Peninsula mentions climate change.
opportunities for open space, etc	EV-4. Identify opportunities for open spaces, trails and parks along streams and other recreational areas in the watershed that can be incorporated into projects.	SEE PREVIOUS OBJECTIVE: ...*while providing opportunities for public access and recreation where appropriate.*	

minimize adverse effects	EV-3. Minimize adverse effects on biological and cultural resources when implementing strategies and projects.*	Minimize adverse environmental impacts of water resource management projects.	
research/ monitoring	See Chapter 8, Monterey Peninsula IRWM Plan	Support applied research and monitoring to better understand environmental conditions, environmental water needs, and the impacts of water-related projects on environmental resources.	Greater Monterey County adds research/monitoring objective
sedimentation	See FP-3	Reduce adverse impacts of sedimentation into streams, particularly from roads and non-point sources.	Greater Monterey County adds sedimentation objective
native/non-native species	See EV-1 and EV-2	Promote efforts to prevent, control, reduce, and/or eradicate high priority invasive species.	Greater Monterey County adds native/non-native species objectives
	Part of an established comprehensive conservation plan	Promote native drought-tolerant plantings in municipal and residential landscaping.	
purchase fee title or easements		Consider opportunities to purchase fee title or conservation easements on lands from willing sellers that provide integrated water resource management benefits. Ensure adequate funding and infrastructure to manage properties and/or monitor easements.	Greater Monterey County adds possibility of purchasing property or easements
wildfire events	Chapter 13 – Relation to Local Land Use Planning – see proposal to maintain firebreaks in Los Padres National Forest/Ventana Wilderness	Support research and monitoring efforts to understand the effects of wildfire events on water resources.	Greater Monterey County adds objective re: effects of wildfire

Climate Change

General Category	Monterey Peninsula, Carmel Bay, and South Monterey Bay	Greater Monterey County	Comments
GOAL	***Adapt the region's water management approach to deal with impacts of climate change using science-based approaches, and minimize the regional causal effects related to water resources.***	***Adapt the region's water management approach to deal with impacts of climate change using science-based approaches, and minimize the regional causal effects.***	

General Category	Monterey Peninsula, Carmel Bay, and South Monterey Bay	Greater Monterey County	Comments
planning…	CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.*	Plan for potential impacts of future climate change.	
monitoring/research to understand LT impacts	CC-2. Support increased education, monitoring and research to increase understanding of long-term impacts of climate change in the region.*	Support increased monitoring and research to obtain greater understanding of long-term impacts of climate change in the Greater Monterey County region.	
alternative energy	CC-3. Support efforts to increase education, research and use of energy conservation measures and alternatives to fossil fuel and non-renewable resources to reduce greenhouse gas emissions associated with water and wastewater facility operations and IRWM projects.*	Support efforts to research alternative energy and to diversify energy sources appropriate for the region.	
reduce GHG	See education component under CC-3	Seek long-term solutions to reduce greenhouse gas producing energy use.	
natural resources	See "environment" goal: "Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when developing water management strategies and projects."	Seek long-term solutions to maintain and protect existing pristine natural resources from the impacts of climate change.	This is included, to some extent, in Monterey Pen's "environment" goal
carbon sequestration		Support research and/or implementation of land-based efforts such as carbon-sequestration on working lands and wildlands in the Greater Monterey County region.	Greater Monterey County includes implementation of other efforts, e.g., carbon sequestration. Not addressed in Monterey Peninsula.
public education	CC-3. Support efforts to increase education, research and use of energy conservation measures and alternatives to fossil fuel and non-renewable resources to reduce greenhouse gas emissions associated with water and wastewater facility operations and IRWM projects.*	Promote public education about impacts of climate change, particularly as it relates to water resource management in the Greater Monterey County region.	

Regional Communication and Cooperation

General Category	Monterey Peninsula, Carmel Bay, and South Monterey Bay	Greater Monterey County	Comments
GOAL	***Identify an appropriate forum for regional communication, cooperation, and education. Develop protocols for encouraging integration and reducing inconsistencies in water management strategies between local, regional, State, and Federal entities. Provide balanced access and opportunity for the public, stakeholders, and DACs to participate in IRWM efforts.***	***Promote regional communication, cooperation, and education regarding water resource management.***	***Monterey Peninsula's goal is more comprehensive…***
regulatory	RC-4. Build relationships with State and Federal regulatory agencies and other water forums and agencies.	Facilitate dialogue and reduce inconsistencies in water management strategies/regulations between local, regional, state, and federal entities.	GREATER MONTEREY COUNTY's objective has to do with reducing inconsistencies in regulations and facilitating compliance
		Promote dialogue between federal and state regulators and small water system managers to facilitate water quality regulation compliance.	
		Build relationships with federal, state, and local regulatory agencies and other water agencies to facilitate the permitting, planning, and implementation of water-related projects.	Greater Monterey County specifies purpose (water-related projects)
cooperative strategies for protecting infrastructure and environment	**RC-1. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change impacts. ***		Monterey Peninsula adds "cooperative, integrated strategies…"
foster collaboration	RC-2. Foster collaboration among regional entities as an alternative to litigation.*	Foster collaboration between regional entities to minimize and resolve potential conflicts and to obtain support for responsible water supply solutions and improved water quality.	Same, but Greater Monterey Countya bit more specific
public education /	RC-3. Identify and pursue additional opportunities for public education, outreach, and	Increase stakeholder input and public education about the need, complexity, and cost of strategies,	Monterey Peninsula adds DACs to objectives here (whereas Greater

General Category	Monterey Peninsula, Carmel Bay, and South Monterey Bay	Greater Monterey County	Comments
stakeholder outreach	communication on water resource management and climate change, including to disadvantaged communities and stakeholders with interests in water management issues.*	programs, plans, and projects to improve water supply, water quality, flood management, coastal conservation, and environmental protection.	Monterey County has an entire goal category dedicated for DAC objectives)

Disadvantaged Communities

General Category	Monterey Peninsula, Carmel Bay, and South Monterey Bay	Greater Monterey County	Comments
GOAL		***Ensure the provision of high-quality, potable, affordable water and healthy conditions for disadvantaged communities.***	***Greater Monterey County has separate goal category for DACs (which makes sense, since there are many more DACs in Greater Monterey County region than in Monterey Peninsula region)***
		Seek funding opportunities to ensure all communities have a water system with adequate, safe, high-quality drinking water.	
		Seek funding opportunities to ensure all communities have adequate wastewater treatment.	
		Ensure that disadvantaged communities are adequately protected from flooding and the impacts of poor surface and groundwater quality.	
		Provide support for the participation of disadvantaged communities in the development, implementation, monitoring, and long-term maintenance of water resource management projects.	
		Promote public education in disadvantaged communities about water resource protection, pollution prevention, conservation, water quality, and watershed health.	

Attachment 4. Ord Inter-Regional Coordination Meeting (February 7, 2013) Agenda, Packet, and Meeting Notes

Interregional Subcommittee Meeting
For Monterey Peninsula, Carmel Bay, and South Monterey Bay
and Greater Monterey County IRWM Regions

February 7, 2013 at 1:30 p.m. to 3:30 p.m.
Fort Ord Reuse Agency Conference Room
920 Second Avenue, Suite A, Marina CA 93933

Agenda

The purpose of this meeting is to identify gaps and linkages in the two Integrated Regional Water Management Plans involving water resource management and projects in the Ord Community.

1. Introductions

2. Background: Interregional Coordination Effort

   - Funded by Proposition 84 IRWM Planning Grant, to give special consideration of the "border region" between the two IRWM regions located in the Ord Community. A Chapter or Appendix in the IRWM Plan will:
     - Clarify political/regulatory authorities, groundwater basin boundaries, surface water divides, describe jurisdictional relationships.
     - Identify shared interests and objectives.
     - Describe a process to prevent projects in the border region from "falling between the cracks" in the two IRWM Plans.

   - Current status of Ord Community planning within each respective IRWM Plan
     - How Ord Community fits into GMC IRWM Plan
     - How Ord Community fits into Monterey Peninsula IRWM Plan

3. Identify water management/watershed-related "issues" in the Ord Community, including (but not limited to):
   - Water supply and demand (20-year)
   - Water quality (surface and groundwater)
   - Flood and/or stormwater management
   - Wastewater management
   - Water conservation programs
   - Infrastructure requirements (ongoing maintenance and/or new)
   - Environmental concerns (open space, land conservation)
   - Climate change considerations

4. Evaluate whether these issues are sufficiently covered by existing objectives in both IRWM Plans (if not, the RWMGs may need to re-consider their objectives)

   - Are IRWM Plan objectives and priorities compatible with objectives and priorities in the Base Reuse Plan?

5. NEXT STEPS: Solicit projects from the Ord Community for inclusion in the Monterey Peninsula IRWM Plan; prioritize projects.

6. Key Concern: Determine *what to do with those projects*:
   - Which projects or elements of projects should go into the Monterey Peninsula IRWM Plan, which belong in GMC IRWM Plan, which belong in both?
   - How will that be decided (e.g., project benefits, how each region prioritizes projects)

7. Questions and schedule a future meeting

Ord Community Meeting 2013 Update to the Monterey Peninsula IRWM Plan — Feb. 7, 2013

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2013 Update
to the
Monterey Peninsula, Carmel Bay, and South Monterey Bay
Integrated Regional Water Management Plan

Ord Community Stakeholder Meeting

February 7, 2013 at 1:30 pm

LOCATION:
FORT ORD REUSE AGENCY
Conference Room
920 Second Avenue, Suite A, Marina CA 93933

1

Meeting Agenda

1. **Meeting Overview/Purpose and Introductions**
2. **Interregional Coordination**
3. **Characterization of Resources, Constraints, Opportunities**
4. **Comparison of IRWM Plan Objectives**
5. **Next Steps**

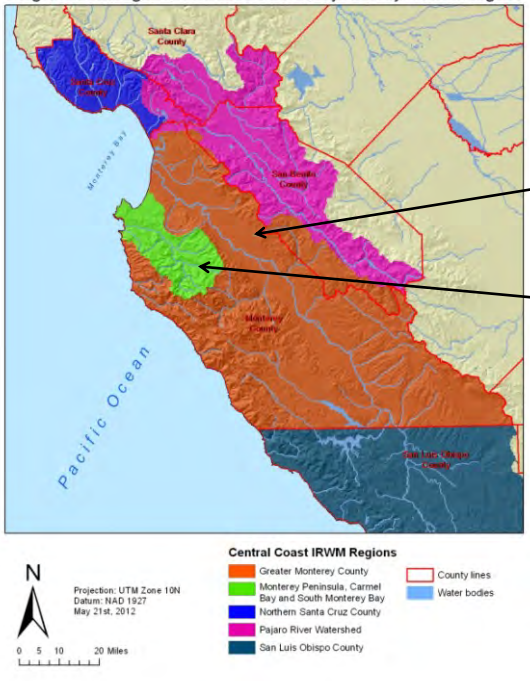
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1. Meeting Overview, Purpose and Introductions



3

Regional Setting of the Greater Monterey County IRWM Region



2. Interregional Coordination

Greater Monterey County (orange)

Monterey Peninsula (green)

4

Ord Community – Greater Monterey County IRWM Region Boundary



5

3. Resources, Constraints and Opportunities

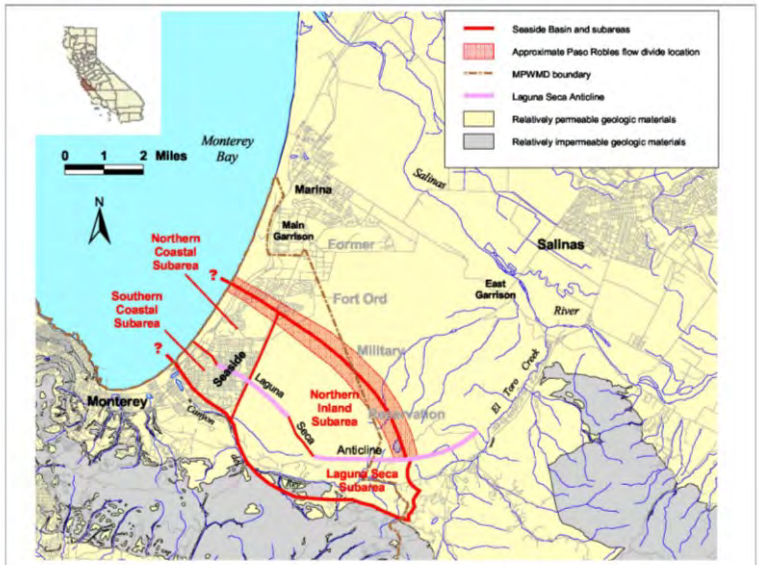
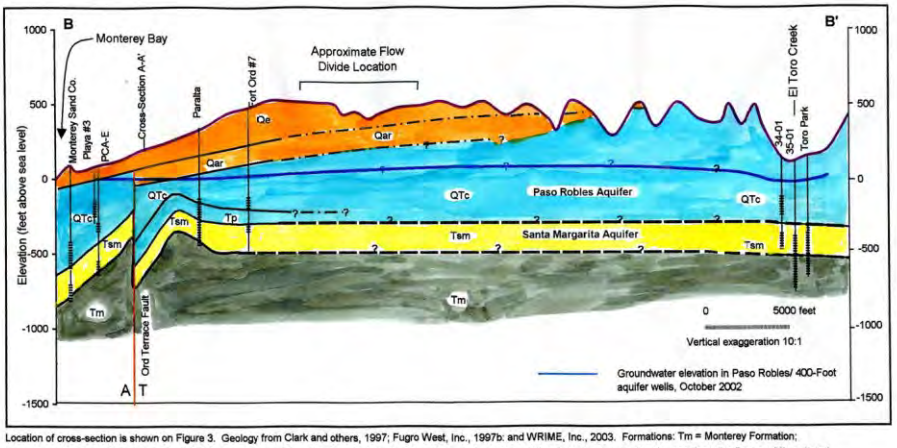


Figure 1. Location of the Seaside Groundwater Basin

6

3. Resources, Constraints and Opportunities

Seaside Groundwater Basin



Location of cross-section is shown on Figure 3. Geology from Clark and others, 1997; Fugro West, Inc., 1997b; and WRIME, Inc., 2003. Formations: Tm = Monterey Formation; Tsm = Santa Margarita Sandstone; Tp = Purisima Formation; QTc = continental deposits; Qar = Aromas Sand; Qe = eolian deposits (dunes); Qt = terrace deposits; Qa = undifferentiated alluvial deposits. See text and Figure 3 for descriptions. Fault movement: arrows indicate vertical movement; A = horizontal movement away from the viewer; T = toward viewer.

Figure 5. Hydrogeologic Cross-Section B-B'

7

3. Resources, Constraints and Opportunities

Ord Community Water Allocations from Salinas Valley Groundwater Basin					
Ord Community Land Use Jurisdiction	SVGB Allocation (AFY)	2011 Consumption Amount (AFY)	Committed Amount (AFY)	Remaining Amount (AFY)	Mont Pen IRWM Region share of Allocation (estimate)
Reserved to cover line loss	348.5		348.5		115
Total GW:	6,600	2,219.15	5,634.75	965.25	2,235.00

This table modified from Revised Table 18 (Final Scoping Report), Nov. 16, 2012 FORA Board agenda, Item 8c, Base Reuse Plan Reassessment Report, Supplemental Materials.

- MCWD responsible for water supply, wastewater services
- Potable supply to MCWD system is entirely from SVGB
- Groundwater from Seaside Groundwater Basin is currently not being used at Ord Community

8

3. Resources, Constraints and Opportunities

- **Wastewater/recycled water** - MRWPCA responsible for treating wastewater at Regional Treatment Plant north of Marina
  - Long-term goal is to recycle additional 4,500 AFY
  - What effect will use of allocated amount of water supply to Ord Community have on infrastructure and availability of recycled water?
- **Stormwater** – all stormwater from Ord Community captured and percolated into shallow dune aquifer (?)
  - WQ issues?
  - Potential for recycling stormwater?
  - Implement Low Impact Development concepts?
- **Water conservation** – Mont Pen region has implemented aggressive rebate program, rate structure, and ordinances requiring retrofits in Cal-Am system
  - Potential for retrofits at institutional facilities (schools, government building, CSUMB campus)?

9

3. Resources, Constraints and Opportunities

- **Seaside Groundwater Basin**
  - Potential to optimize use of recycle water by injecting and extracting in SGB?
  - MCWD may have right to store/recover water in SGB (subject to review/approval by Watermaster)
  - Usable basin storage in 2007 estimated at 52,030 AF
- **Links between Recreation and Resource Management**
  - Should there be a goal/objective to link resource management, enhancement or protection projects and programs with providing access to or protection of Fort Ord Dunes State Park and Fort Ord National Monument?

10

4. GMC-Monterey Peninsula Goals and Objectives - **Water supply**

Greater Mo Co

- *Qualitative objectives* - focus on reliability for ag use
- Optimize use of groundwater storage/increase aquifer recharge
- Conjunctive use *where appropriate*
- Recycled water use is *part of a portfolio*
- *Maximize* water conservation

Mont Pen

- *Quantitative objectives* - 12,500 AFY (now), 4,500 AFY (future) - mostly urban use
- Optimize use of groundwater storage/increase aquifer recharge
- Conjunctive use is *high priority*
- Recycle water use is a *high priority*
- *High priority* to meet 20x2020 mandate

11

Notes: Is there still an objective of 960 AFY outflow from SVGB? (Engineer's Report by RMC for Salinas Valley Water Project)

4. GMC-Monterey Peninsula Goals and Objectives - **Water Quality**

Greater Mo Co

- *Reduce quantity of runoff/mitigate effects*
- Use LID as appropriate
- No ASBS in region
- Meet WQ standards (exceed WQ stds. for recycled water N/A)
- *Research on salinity*
- Implement comprehensive erosion control program
- Prevent seawater intrusion
- Specific issues cited in objectives
- Support research on emerging technologies

Mont Pen

- *Improve runoff quality is a high priority*
- No specific LID objective
- Minimize pollutants to ASBS and near shore environment
- Meet *or exceed* WQ standards (esp. for recycled water)
- *Develop Salt and Nutrient Mgt. Plan for Seaside Groundwater Basin*
- Erosion prevention in one watershed
- Prevent seawater intrusion

12

4. GMC-Monterey Peninsula Goals and Objectives

Flood Protection, Floodplain Management, and Erosion Prevention

Greater Mo Co

- Protect infrastructure and property
- *Emphasis on protection of agricultural lands*
- Research on transport and persistence of pathogens
- Specific public education objective

Mont Pen

- Protect infrastructure and property
- *Protect urban areas*
- Consider climate change

13

4. GMC-Monterey Peninsula Goals and Objectives

Environmental Protection and Enhancement

Greater Mo Co

- Protect and enhance *state and federally listed* species and their habitats
- *Implement fish-friendly stream and river corridor restoration projects*
- Use drought-tolerant species
- Reduce sedimentation
- Applied research for better understanding of environment
- Non-native species removal
- Purchasing property or easements
- Research effects of wildfire on water supply

Mont Pen

- Protect and enhance *sensitive* species and their habitats (links to climate change)
- *Promote the steelhead run*
- Use drought-tolerant species

14

4. GMC-Monterey Peninsula Goals and Objectives

Climate Change

Greater Mo Co

- Consider/plan for climate change
- Investigate use of alternative energy sources
- *Protect existing pristine natural resources*
- Research/implementation of carbon sequestration

Mont Pen

- Consider/plan for climate change
- Investigate use of alternative energy sources
- *Assess, protect, enhance, and/or restore natural resources*

15

4. GMC-Monterey Peninsula Goals and Objectives

Regional Communication and Cooperation

Greater Mo Co

- *Reduce inconsistencies between* government agencies
- Foster collaboration between regional entities *to minimize and resolve potential conflicts*

Mont Pen

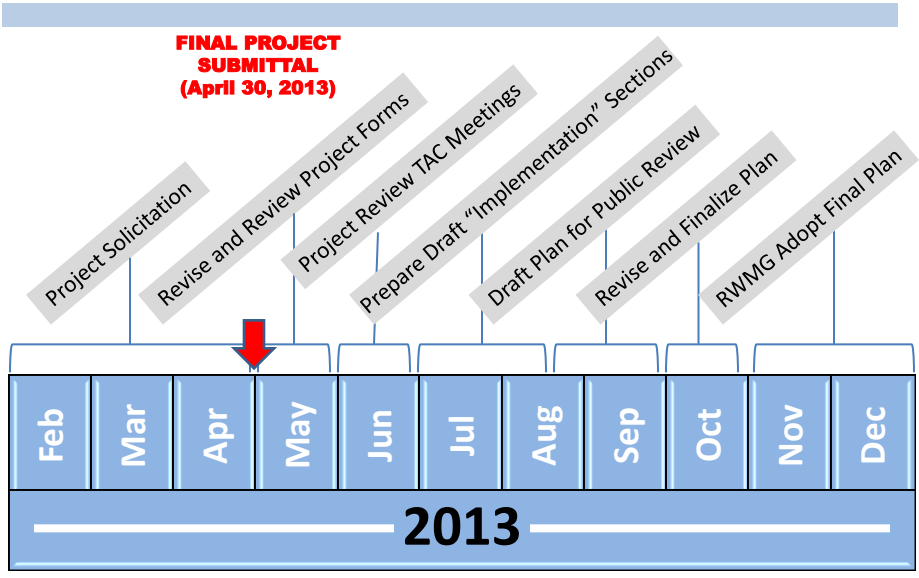
- *Build relationships with* government agencies *and others*
- Identify cooperative, integrated strategies to protect infrastructure and resources
- Foster collaboration among regional entities *as an alternative to litigation*

Disadvantaged Communities

- GMC has separate goal category

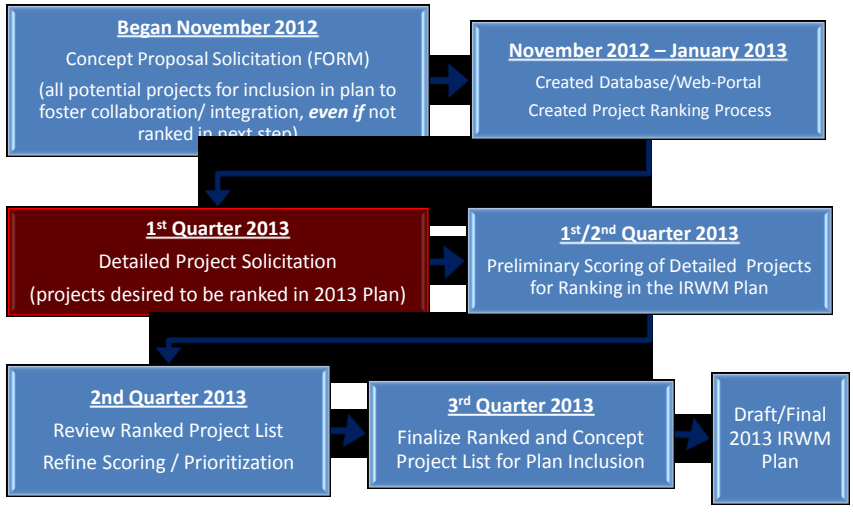
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5. Next Steps



Process for Project Solicitation

****for 2013 plan inclusion; not specific to a grant**



18

Concept Proposal Solicitation Form

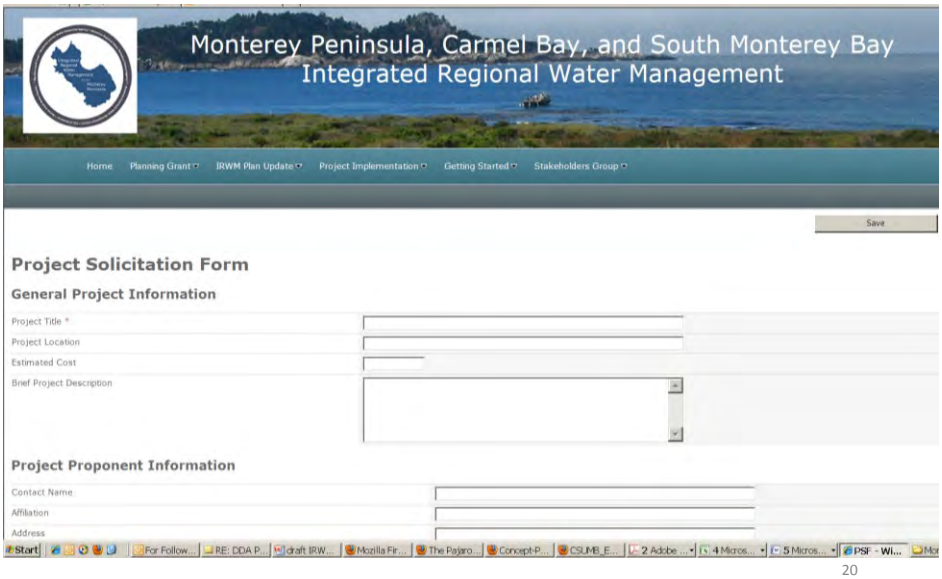
- Form available at:
http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm
- Send or email forms to:

MPWMD
Larry Hampson, District Engineer
5 Harris Court, Building G
Monterey, CA 93940
Email: Larry@mpwmd.net

- Ongoing submittals throughout detailed Project Solicitation Process

19

Detailed Proposal Solicitation



20

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http://www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm

Web address (2013 Plan Update):
http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

21

DRAFT MEETING NOTES

Meeting Title: *Ord Inter-Regional Stakeholder meeting (for: Project 5 - Inter-Regional Coordination between the Greater Monterey County IRWM Plan and the Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM Plan)*

Date: 2/7/2013

Location: Fort Ord Reuse Authority (FORA) Office

Attendees:

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Bridget Hoover	MBNMS	Bridget.hoover@noaa.gov
Larry Hampson	MPWMD	larry@mpwmd.net
Michelle Dooley*	DWR	mmdooley@water.ca.gov
Susan Robinson*	Greater Monterey County IRWM	srobinsongs@frontier.com

Summary: Fifteen people attended the meeting (plus two called in), including officials from the Army, Marina Coast Water District, City of Monterey, and the Monterey Regional Water Pollution Control Agency. The Greater Monterey County region was represented by Bridget Hoover (Monterey Bay National Marine Sanctuary) and Susan Robinson (coordinator for GMC). The primary focus was on improving water supply infrastructure and augmentation of the water supply to meet anticipated Ord Community requirements.

Key points of discussion: The following issues/constraints/objectives for the Ord Community objectives identified during meeting:

- MCWD expressed the need to improve infrastructure for delivery of fire flow,
- Several stakeholders questioned line loss assumptions discrepancy,
- Stakeholders expressed concern about the ability of MCWD to meet water demands for the existing supply allocations to the Ord Community and the ability to shift allocations between land use jurisdictions to meet immediate demands was discussed and the Army noted that the reservation of 1,729 AFY (one of the largest underutilized allocations) for the Army is included in the allocation of 6,600 AFY from the Salinas Valley Groundwater Basin (SVGB) to the Ord Community. The Army representative noted that theArmy's mission changes over time, this amount cannot be subject to reduction. They also asked about the potential use of that allocation for the Presidio of Monterey (outside of the Ord Community). The group identified that would be considered an exportation of Salinas Valley Groundwater and would violate the non-exportation clause of the MCWRA Agency Act.
- MCWD staff expressed the need to better understand water use and future demands of the Army (metering is expected to be completed in 2015).
- The land use jurisdictions have already removed storm drains going into the MBNMS; however, the group expressed a desire to capture and reuse stormwater (i.e., recharge and recovery).
- Army Base Reuse and Closure office strongly discourages water impoundments in impact areas (i.e., areas with military munitions, including unexploded ordinance)
- The need for a water conservation project at CSUMB was identified.
- The need to maintain/enhance recreational access to Fort Ord National Monument was expressed.

Appendix 6-a

Concept Proposals Submitted to IRWM Plan

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Project Proponent	Project Title	Type Of Entity	Geographic Location	Project Eligibility: Prop 84 IRWM Criteria	Project Eligibility: IRWMP Resource Management Strategies	Summary Description Of Project
Ecology Action	Enhancing Urban Water Conservation Incentive Programs Throughout the Region	Nonprofit organization	The location of the project is the entire planning region of the Monterey Peninsula Integrated Water Manangement Plan. Areas of benefit include the Carmal Alluvial Aquifer and Carmel River, Seaside Alluvial Aquifer, and all coastal drainages and watersheds within the planning region.	Water supply reliability, water conservation and water use efficiency.;#Storm water capture, storage, clean-up, treatment, and management.;#Non-point source pollution reduction, management and monitoring.;#Watershed protection and management.	Reduced Water Demand-Urban Water Use Efficiency Improve Water Quality - Matching Quality to Use, Pollution Prevention, Urban Runoff Management Practice Resources Stewardship - Economic Incentives	The Monterey Peninsula IWRMP plan prioritizes the optimization of conjunctive use of the Carmel River Aquifer and the Seaside Groundwater Basin through cross-basin transfer of water from the Carmel Alluvial Aquifer during wet season flows into the Seaside Groundwater Basin. The IWRMP plan does not yet mention any objective to understand or measure the potential of decentralized Low Impact Development (LID) BMPs to maximize recharge within the Seaside Groundwater Basin, where natural recharge via precipitation has been greatly altered by urbanization. By September 6, 2013, all MS4 Phase 2 permit holders must begin implementing post-construction stormwater management requirements developed by the Central Coast Region 3 Water Quality Control Board. These post-construction requirements require LID BMPs on regulated new development or redevelopment projects that create and/or replace >2,500 square feet of impervious surface. Quantifying the impact of investments in LID infiltration BMPs for redevelopment projects on increasing groundwater recharge is a critical component of managing storage in the Seaside Groundwater Basin. Our concept proposal seeks to build off of existing work funded by a regional Prop 84 Stormwater Planning grant "The Monterey Bay LID Planning and Incentives Program". This work will estimate annual potential groundwater recharge into the Seaside Groundwater Basin from stormwater run-off with the implementation of feasible LID BMPs in sub catchments of the over-laying watershed using GIS mapping and LID site assessments of commercial and public properties and streets. Properties identified from the mapping and site assessment process that are willing to match at least 20% of the cost of design and implementation would be eligible for funding for LID design, permitting, and/or implementation. In addition to identifying site-specific opportunities to maximize recharge in the Seaside Groundwater Basin, Ecology Action also proposes to build off of the work of the Prop 84 Monterey Bay LID Planning and Incentives Program by assisting the Monterey Peninsula Water Management District and Cal American Water meet or exceed their conservation goal of 25 AFY. A Conservation Challenge public education campaign and enhanced rebate program will provide opportunities for the public to engage in conservation actions that provide water demand reduction above and beyond what has already been achieved with existing efficiency rebates. The Conservation Challenge will build upon Monterey Peninsula Water Management District's existing rebate programs by increasing incentives for low impact development BMPs and alternative water reuse strategies that match water quality to use. Financial incentives would be targeted to Single Family, Commercial, Multi-Family, and irrigation water users in the region. The Challenge will increase conservation throughout the region while funding projects that serve the Monterey Peninsula IRWMP region's priority water quality goal of minimizing pollutants in stormwater discharges, and other multiple goals relating to water supply (WS-5), and climate change preparedness (CC-1). **Single Family Water Users:** Cal-Am projects that in 2020, SF residents will continue to be the largest water user group in the region with an annual demand of 35,950 AFY. Because indoor per capita use is already very low, increased conservation rebates will be targeted at improving landscape water use efficiency and water reuse in this sector. Increased rebates and technical assistance would be made available for residential landscape retrofit projects that maximize onsite conservation and water reuse, including: 1) Turf removal and drought-tolerant landscaping. 2) Rain gardens or other bioretention installations, downspout redirection, and permeable pavements. 3) Reuse of rainwater for indoor non-potable uses in accordance with the 2013 CUPC, Title 24 Part 5 Chapter 17. 3) Greywater reuse for irrigation of medium and high water use hydrozones in accordance with 2013 CUPC Title 24 Part 5 Chapter 16. **Commerical, Public, and Multi-Family Water Users** Enhanced rebates, direct installation programs, and technical assistance for users with dedicated irrigation accounts will be used to bring identified high priority properties into compliance with Water Efficient Landscape Ordinances while also achieving reduced dry season flows to the stormwater system from wasted irrigation water. Ecology Action will also work with MPWMD to develop a rainwater harvesting for indoor non-potable reuse incentive program, based on San Francisco Public Utility Commission's incentive program for retrofit and new commercial construction.
City of Seaside	Dredge Laguna Grande and Roberts Lake	Public agency	The Canyon del Rey watershed is a 13.8-square-mile watershed within the Seaside Basin. This watershed feeds the Canyon Del Rey creek which terminates at Laguna Grande and Roberts Lake, a contiguous water body in the City of Seaside located near the intersection of Highway 218 (aka Canyon Del Rey Boulevard) and Del Monte Boulevard. The proposed project is dredging these water bodies located at approximately North Latitude 36º36'24.80" West Longitude 121º51'28.23".	Storm water capture, storage, clean-up, treatment, and management.;#Groundwater recharge and management projects.;#Water banking, exchange, reclamation and improvement of water quality.;#Planning and implementation of multipurpose flood management programs.;#Ecosystem and fisheries restoration and protection.		The Canyon del Rey watershed is a 13.8-square-mile watershed within the Seaside Basin with an average annual runoff of approximately 500 acre-feet per year for the period of record from 1967 to-1978. This watershed feeds the Canyon Del Rey creek which terminates at Laguna Grande and Roberts Lake, a contiguous water body in the City of Seaside located near the intersection of Highway 218 (aka Canyon Del Rey Boulevard) and Del Monte Boulevard. The proposed project is to create additional storage capacity, visitor serving amenities, and habitat enhancements. The additional storage capacity could act as a reservoir for diversion of stormwater to the MRWPCA Groundwater Recharge facilities. The Laguna Grande and Roberts Lake water body discharges seasonally to Monterey Bay near the city boundary between Monterey and Seaside. The natural drainage from the Lakes to the Ocean is often impaired by sand buildup in the drainage culverts below Highway 1 and on the beach. In 2008, the California Coastal Commission (CCC) issued a temporary permit to the City of Seaside to allow breaching of the sand bar to avoid localized flooding. The CCC permit requires the City to evaluate alternatives to breaching of the sand bar. Conjunctive use of water from Roberts Lake could be a viable alternative to breaching the sand bar.
County of Monterey	Causeway Component Project	Public agency	This proposed project is located at the downstream end of the Carmel River Watershed, approximately one mile from its mouth and near State Route 1 (SR 1) within unincorporated Monterey County south of Carmel. All of the proposed project and affected areas are within Monterey Peninsula IRWM planning region.	Storm water capture, storage, clean-up, treatment, and management.;#Removal of invasive non-native species, the creation and enhancement of wetlands, and the acquisition, protection, and restoration of open space and watershed lands.;#Non-point source pollution reduction, management and monitoring.;#Planning and	Flood Risk Management Ecosystem Restoration Watershed Management Urban Runoff Management Water-Dependent Recreation	The Causeway Component project (Causeway project) is one of three components of the proposed Carmel River Floodplain Restoration and Environmental Enhancement Project, located at the downstream end of the Carmel River Watershed, approximately one mile from its mouth and near State Route 1 (SR 1). The Causeway project consists of replacing a portion of the SR 1 roadway embankment with a 520-foot long causeway section and would result in enhanced hydrologic function to a portion of the lower Carmel River floodplain. The project is a necessary component of the larger floodplain restoration project and is needed to convey additional hydrology through the restored floodplain for the purpose of habitat restoration and flood attenuation. The Causeway project would include approximately 26 acres within and adjacent to the existing SR 1 right-of-way. The northern end of the proposed causeway would be located approximately 1,150 feet southwest of the Oliver Road and SR 1 intersection. The southern end of the causeway would be located approximately 2,000 feet northeast of the Ribera Road and SR 1 intersection. The Causeway Component area consists primarily of agricultural land and isolated riparian habitat. Monterey County Water Resources Agency has prepared and certified an Initial Study pursuant to CEQA Guidelines §15063 and §15070 for the Causeway project. The project plans and details used to conduct the CEQA analysis were at a conceptual level. Caltrans would require an encroachment permit to construct the project. It is unclear at this time if Caltrans would require addition CEQA review. It may be appropriate to bring design for the project to a 30% design plan level and prepare an addendum to the existing certified CEQA document to construct the project.

Project Proponent	Project Title	Type Of Entity	Geographic Location	Project Eligibility: Prop 84 IRWM Criteria	Project Eligibility: IRWMP Resource Management Strategies	Summary Description Of Project
County of Monterey	Environmental Protection Barrier	Public agency	The project is located within Carmel River State Beach on the north side of Carmel Lagoon which is within unincorporated Monterey County south of Carmel. All of the proposed project and affected areas are within Monterey Peninsula IRWM planning region.	Storm water capture, storage, clean-up, treatment, and management.;#Removal of invasive non-native species, the creation and enhancement of wetlands, and the acquisition, protection, and restoration of open space and watershed lands.;#Planning and implementation of multipurpose flood management programs.;#Watershed protection and management.;#Ecosystem and fisheries restoration and protection.	Flood Risk Management Ecosystem Restoration Watershed Management Urban Runoff Management Water-Dependent Recreation	The Environmental Protection Barrier (EPB) has been identified as one of two components for the long term solution to the current interim approach of performing sandbar management for flood control of the Carmel lagoon. The second component is the Scenic Road Protection, described below. There are 2 primary goals of the EPB. The 1st goal is to protect and improve habitat for fish and wildlife by minimizing sandbar management activities at the barrier beach. The connection between the EPB and habitat enhancement will primarily be expressed as an increase in allowable lagoon levels, and fewer occurrences of artificial breaching of the sand bar. The 2nd goal is to protect low-lying structures (e.g., residences in the Fourth Addition neighborhood). The EPB is proposed to be located a minimum of 40' off residential property lines into undeveloped portions of the lagoon floodplain on California Department of Parks and Recreation lands. The alignment provides approximately 8 ac-ft of stormwater detention volume on the interior side of the EPB. The expanded stormwater detention volume provided by this alignment allows for a significant reduction in both the physical extent and the overall capacity of storm drainage infrastructure required. This will translate to a reduction in the need for access and maintenance, and therefore a reduction in the facility's long-term operation and maintenance cost. Currently, a Combined CEQA/NEPA document and regulatory permits are being prepared for this project. The project design is conceptual. It may be appropriate to bring design for the project to a 30% design plan level to complete the environmental documentation and construct the project.
County of Monterey	Scenic Road Protection	Public agency	This proposed project is located on and near the Carmel River State Beach and Carmel Lagoon which is within unincorporated Monterey County south of Carmel. All of the proposed project and affected areas are within Monterey Peninsula IRWM planning region.	Planning and implementation of multipurpose flood management programs.;#Watershed protection and management.;#Ecosystem and fisheries restoration and protection.	Flood Risk Management Ecosystem Restoration Watershed Management Urban Runoff Management Water-Dependent Recreation	The (SRP) has been identified as one of two components for the long term solution to the current interim approach of performing sandbar management for flood control of the Carmel lagoon. The second component is the Environmental Protection Barrier, described above. The purpose of the SRP would be to prevent erosion of the bluff below Scenic Road by preventing erosion at the bluff's toe. SRP consists of rock slope protection, also known as rock rip rap or revetment, placed at the toe of the road embankment. The rock would extend up as needed to protect Scenic Road from river scour and wave erosion, and would extend down below the anticipated outlet channel scour elevation. The outer rock layer would be sized to withstand extreme ocean wave and river current forces, with a thinner layer of smaller rock and/or a geotextile fabric underneath to prevent the soil from being eroded through the revetment. It is anticipated that the top of revetment would generally be low enough to be re-buried naturally if and when the river scours out the sand in front of it. Above the top of the revetment, the slope would be permanently planted and maintained to control erosion. The SRP would be located outside the County's right-of-way (on State Parks owned land), and within a public beach and would require acquisition of right of way approvals. Currently, a Combined CEQA/NEPA document and regulatory permits are being prepared for the project. The project design is conceptual. It may be appropriate to bring design for the project to a 30% design plan level to complete the environmental documentation and construct the project.
City of Seaside	90-Inch Bay Avenue Outfall Phase 1	Public agency	Redwood Avenue and John Street in the City of Sand City	Storm water capture, storage, clean-up, treatment, and management.;#Groundwater recharge and management projects.;#Planning and implementation		An existing 90-inch diameter storm drain pipe conveys water from approximately 2,000 acres within the City of Seaside to an outfall at Monterey Bay. The existing out fall is frequently blocked by sand. An improvement project included the installation of a discharge valve at the outfall discharge to prevent migration of sand into the outfall culvert. Project Scope: Continue manual breaching of the sand bar to allow gravity flow through the culvert. Obtain a general permit from the California Coastal Commission to allow annual maintenance activities on the beach. Repurpose four properties upstream of the outfall near the intersection of John Street and Redwood Avenue. These properties have the potential to flood during a 2-year recurrence interval storm assuming the outfall at the end of Bay Avenue is blocked by sand. Create an infiltration basin on one property at John Street and Redwood Avenue to mitigate flooding in this area.
City of Seaside	Del Monte Blvd Dry Weather Diversion	Public agency	Del Monte Blvd near Clementina in Seaside.	Water supply reliability, water conservation and water use efficiency.;#Storm water capture, storage, clean-up, treatment, and management.;#Contaminant and salt removal through reclamation, desalting, and other treatment technologies and conveyance of reclaimed water for distribution to users.		An existing 90-inch diameter storm drain pipe conveys water from approximately 2,000 acres within the City of Seaside to an outfall at Monterey Bay. The existing water quality is poor due to urban water impacts. Project Scope: The project consists of construction of a Dry Weather Storm Water diversion at Del Monte Boulevard to the sanitary sewer system. Diverted water would be treated by the regional treatment plant and reused for existing non-potable and potential future potable uses.
City of Seaside	West Broadway Stormwater Retention	Public agency	Broadway Avenue between Del Monte Boulevard and Fremont Boulevard, and Del Monte Boulevard between Broadway Avenue and Contra Costa Street	Storm water capture, storage, clean-up, treatment, and management.;#Non-point source pollution reduction, management and monitoring.;#Groundwater recharge and management projects.		An existing 90-inch diameter storm drain pipe conveys water from approximately 2,000 acres within the City of Seaside to an outfall at Monterey Bay. The 90-Inch storm drain is frequently over-charged because the out fall is blocked by sand and water quality is poor due to urban water impacts. Project Scope: The project consists of construction of a Storm Water treatment and diversion systems in Broadway Avenue between Del Monte Boulevard and Fremont Boulevard and at Del Monte Boulevard. Treated water would be diverted to retention structures for groundwater recharge

Project Proponent	Project Title	Type Of Entity	Geographic Location	Project Eligibility: Prop 84 IRWM Criteria	Project Eligibility: IRWMP Resource Management Strategies	Summary Description Of Project
City of Pacific Grove and City of Monterey	Pacific Grove ASBS Stormwater Management and Water Reuse Project	Public agency	The proposed project is located in the Cities of Monterey and Pacific Grove and specifically involves the stormwater system within Pacific Grove and the New Monterey District in Monterey, the California American Water Company (Cal Am) reservoir at David Avenue in Pacific Grove and the abandoned Pacific Grove Water Treatment Plant near the Pacific Grove Golf Links at Point Pinos. Attached is a map identifying the project vicinity and a shapefile with the Pacific Grove Area of Special Biological Significance (ASBS) watershed area. The project will manage stormwater within the Pacific Grove ASBS watershed. 36deg37'4"N/121deg54'59"	Water supply reliability, water conservation and water use efficiency.;#Storm water capture, storage, clean-up, treatment, and management.;#Removal of invasive non-native species, the creation and enhancement of wetlands, and the acquisition, protection, and restoration of open space and watershed lands.;#Non-point source pollution reduction, management and monitoring.;#Water banking, exchange, reclamation and improvement of water quality.;#Watershed protection and management.	Urban Water Use Efficiency, Pollution Prevention, Urban Runoff Management, Water-Dependent Recreation, Watershed Management	The Pacific Grove ASBS Stormwater Management and Water Reuse Project is co-sponsored by the cities of Pacific Grove and Monterey to address stormwater water quality improvements for the Pacific Grove Area of Special Biological Significance (ASBS) along the Pacific Grove coastline. The project includes the diversion of both wet weather and dry weather flows into an upgraded stormwater system to accommodate flows from Pacific Grove and New Monterey. These flows would be directed to either the rebuilt Pacific Grove Water Treatment Plant or the Monterey Regional Water Pollution Control Agency Regional Water Treatment Plant in Marina. The project proposes to utilize and upgrade the existing California American Water David Avenue Reservoir in Pacific Grove. The project also includes revisions to the existing storm drain system in Pacific Grove to retain or treat storm water flows. These retention facilities will help to meter or treat flows into either treatment facility thereby allowing up to a 90% reduction in pollutant loading during storm events. This treatment level would achieve ASBS water quality standards. The benefits of this project will be monitored over time by the Central Coast Area of Special Biological Significance Regional Monitoring Program. The project addresses several IRWMP priorities including improving water quality at an ASBS and water recreation area, stormwater retention and treatment for urban areas in both cities, watershed protection and management, optimizing conjunctive use of surface and groundwater and water reuse. As proposed, the treated water resulting from either treatment plant would be reused. If the treatment occurs at the rebuilt Pacific Grove Water Treatment Plant the treated water may be used to irrigate the Pacific Grove Golf Links and the El Carmelo Cemetery or other demands for non-potable water, with demands between 125-500 AFY, or be treated to the greatest extent feasible prior to an ocean discharge. If the treatment occurs at the Regional Water Treatment Plant the water could be utilized for irrigated farmland in North Monterey County, or as an additional source of water supply for the ground water replenishment project and recharge of the Seaside Groundwater Basin. If treatment occurs at the Cal Am reservoir the water could be used for non-potable water demands at parks in upper New Monterey, Cannery Row, or the Presidio of Monterey. The project therefore provides water replacement needs in the IRWMP area.

Appendix 6-b

Announcement of Project Ranking of Preliminary Results

DRAFT

Alison Imamura

From: Larry Hampson <Larry@mpwmd.net>
Sent: Tuesday, January 14, 2014 9:58 AM
To: Mike Niccum<mniccum@pbcsd.org>; Paul Robins; Sierra Ryan; RRiedl@ci.seaside.ca.us; Kevin O'Connor (koconnor@mlml.calstate.edu)
Cc: Thomas Christensen; Mark Dudley; Dooley, Michelle M.; Marti x5394 Noel (noelm@co.monterey.ca.us); Mike McCullough (MikeM@mrwpca.com); Alison Imamura; Brian True (btrue@mcwd.org); srobinsongs@frontier.com; Jeff Krebs (Krebs@monterey.org); Donna Meyers (conservecollab@gmail.com); Carl P. x5103 Holm (HolmCP@co.monterey.ca.us); kliske@ecoact.org
Subject: Monterey Peninsula IRWM Detailed Project Scoring
Attachments: MontPenIRWMP-ProjectRanking14Jan2013.xlsx; Revised-Schedule_12_19_13.pdf; IRWM Central Coast Funding Summary.pdf

To All –

It's been quite some time since you submitted your detailed project proposal to the Monterey Peninsula Integrated Regional Water Management portal. MPWMD and its consultants are continuing to work on modifications to the web site to automate project scoring. In the meantime, I have attached an Excel spreadsheet that summarizes the project scores and includes the detailed submittal for each project.

The planned next step in the prioritization process is to hold a stakeholder meeting to review scoring and project priorities. However, another project solicitation is planned for the summer of 2014 for the Monterey Peninsula region in response to DWR's Implementation Grant, Round 3 announcement (see attached schedule). Other entities in the planning region that submitted concept proposals last year will also want to submit a detailed project description and application for project funding in Round 3, which I estimate will total about $18 million for the entire Central Coast hydrologic region (see attached funding summary).

Rather than hold a stakeholder meeting in the near future to review the current set of detailed project proposals and another in the summer, it seems more efficient to wait until this summer to review all projects and prioritize them at that time. If you have any questions or comments, please let me know.

Larry Hampson, District Engineer
Monterey Peninsula Water Management District
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Appendix 6-c

Projects Submitted for Ranking

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Working Draft Project Scoring/Ranking Summary Table
2013 Update to the MP IRWM Plan (version date: 30Oct2013)

"Raw Scores" (Shaded Cells) will automatically populate with the project information from Relevant Project Solicitation sheets within this file

"Weighted Scores" will automatically calculate based on the Stakeholder-vetted Scoring and Weighting Table presented at the Feb. 6, 2013 stakeholder meeting.

Projects	IRWM PLAN COMPLIANCE CRITERIA	Objectives		Resource Management Strategies		Strategic Considerations					Benefits to DAC & Native Americans		Environmental Justice		Climate Change Adaptation		Reduction in GHG		Plan Compliance Total Weighted Score	PROJECT MERIT CRITERIA	Technical Feasibility		Project Cost and Financing		Economic Feasibility		Project Status		Project Merit Total Score	GRAND TOTAL PROJECT SCORE	PROJECT POINT %
						Inter-Regionalism	Partnerships	Monitor / Report	Land Use Integ.																					
		Raw Score (Max 53)	Weighted Score	Raw Score (Max 35)	Weighted Score	Raw Score (Max 5)	Raw Score (Max 5)	Raw Score (Max 5	Raw Score (Max 5)	Weighted Score	Raw Score (Max 5)	Weighted Score	Raw Score (Max 5)	Weighted Score	Raw Score (Max 5)	Weighted Score	Raw Score (Max 5)	Weighted Score			Raw Score (Max 30)	Weighted Score	Raw Score (Max 10)	Weighted Score	Score (Max 25)	Weighted Score	Raw Score (Max 24)	Weighted Score			
Carmel Bay ASBS Project		23.2	19.9	6.0	3.9	5.0	2.0	5.0	5.0	19.4	0.0	0.0	0.0	0.0	5.0	5.7	2.0	2.3	**51.2**		30.0	34.2	20.0	22.8	0.0	0.0	8.0	9.4	**66.4**	**117.6**	**18%**
Carmel River Integrated Watershed Restoration Program		20.4	17.6	2.0	1.3	0.0	5.0	5.0	1.0	12.5	0.0	0.0	0.0	0.0	1.0	1.1	0.0	0.0	**32.6**		30.0	34.2	0.0	0.0	0.0	0.0	0.0	0.0	**34.2**	**66.8**	**10%**
Carmel Valley Livestock & Land Program		19.8	17.1	4.0	2.6	5.0	5.0	5.0	3.0	20.5	0.0	0.0	0.0	0.0	3.0	3.4	0.0	0.0	**43.6**		30.0	34.2	20.0	22.8	0.0	0.0	0.0	0.0	**57.0**	**100.6**	**15%**
Carmel Watershed Rural Roads Erosion Assistance Program		12.6	10.9	4.0	2.6	0.0	5.0	5.0	1.0	12.5	0.0	0.0	0.0	0.0	1.0	1.1	0.0	0.0	**27.1**		30.0	34.2	0.0	0.0	0.0	0.0	0.0	0.0	**34.2**	**61.3**	**9%**
Incorporation of the Peninsula in the Central Coast Action Tracker		16.1	13.9	4.0	2.6	5.0	5.0	5.0	5.0	22.8	0.0	0.0	0.0	0.0	4.0	4.6	2.0	2.3	**46.1**		30.0	34.2	20.0	22.8	0.0	0.0	22.0	26.0	**83.0**	**129.1**	**19%**
Del Monte Lift Station Upgrades		4.8	4.2	1.0	0.7	0.0	2.0	5.0	3.0	11.4	5.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	**21.9**		30.0	34.2	20.0	22.8	0.0	0.0	0.0	0.0	**57.0**	**78.9**	**12%**
Ecosystem Condition Profile for the Carmel River Watershed		19.5	16.8	3.0	2.0	0.0	5.0	5.0	1.0	12.5	0.0	0.0	0.0	0.0	2.0	2.3	0.0	0.0	**33.5**		30.0	34.2	10.0	11.4	10.0	11.4	20.0	23.6	**80.6**	**114.1**	**17%**
			0.0		0.0					0.0		0.0		0.0		0.0		0.0	**0.0**			0.0		0.0		0.0		0.0	**0.0**	**0.0**	**0%**

PROJECT OVERVIEW

General Project Information

Project Title:	Carmel Bay ASBS Project
Project Location:	Pebble Beach, CA
Estimated Cost:	$12,000,000

Brief Project Description (1 to 2 sentences):

Pebble Beach Community Services District's project seeks to protect and maintain coastal water quality in the Carmel Bay ASBS through a series of new and modified best management practices designed to improve both stormwater and non-stormwater discharges from Pebble Beach and to comply with the State Water Resources

Project Proponent Information

Contact Name:	Mike Niccum
Affiliation:	Pebble Beach Community Services District
Address:	3101 Forest Lake Road, Pebble Beach, CA 93953
Phone Number:	(831) 373-1274
Email:	mniccum@pbcsd.org

Other participating and/or partner agencies/organizations (if applicable):

Carmel Area Wastewater District and Pebble Beach Company

DETAILED PROJECT INFORMATION

Description

Please provide a description of your project (including the location) and its purpose, what will be constructed and/or implemented, how the project will function, the area(s) and/or entities that will be affected by or will benefit from the project, and any potential obstacles to implementation.

Introduction:

Pebble Beach Community Services District (PBCSD) proposes the following project for the Carmel Bay Area of Special Biological Significance (ASBS) watershed in Pebble Beach, California. Project seeks to protect and maintain coastal water quality in the Carmel Bay ASBS through a series of new and modified best management practices designed to improve both stormwater and non-stormwater discharges from Pebble Beach and to comply with the State Water Resources Control Board's ASBS Special Protections.

Project Details:

Phase 1 will characterize stormwater and non-stormwater discharges and their impact on the receiving waters. The Carmel Bay ASBS dry-season monitoring commenced in April 2013 with a final report prepared by spring of 2014. Preliminary analysis suggests that most of the dry-season flow discharged into Carmel Bay originates from above the golf course and is likely associated with groundwater flow and shallow bedrock. Monitoring will evaluate the magnitude and quality of inflows, outflows, and associated receiving water quality. Stormwater monitoring will begin in the fall of 2013 through the Central Coast Regional Monitoring Program.

IRWM Objectives (DWR Review Factor A)

Complete only yellow-shaded boxes by entering a "1" to indicate that your project meets a particular objective. There is a maximum of 25 points for meeting an objectives, plus additional points as described for implementing projects that assist in meeting High Priority Objectives ("HPO") (identified with ** and gray shading below).

Water Supply (WS)

Assists region to meet WS-1 (automatically calculated)	**1**	WS-1. Meet existing water supply replacement needs of the Carmel River system and Seaside Groundwater Basin.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Larger water supply quantities yield more points up to total of 3 normalized points.	
			up to 900 AFY
		1	*at least 900 AFY (10%)*
			at least 1800 AFY (20%)
			at least 2700 AFY (30%)
			at least 3600 AFY (40%)
			at least 4500 AFY (50%)
			at least 5400 AFY (60%)
			at least 6300 AFY (70%)
			at least 7200 AFY (80%)
			at least 8100 AFY (90%)
			at least 9000 AFY (100%)
Bonus Points = (auto calculate)	**0.5455**		
Assists region to meet WS-2 (automatically calculated)	**1**	WS-2. Maximize use of recycled water.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to 4 raw points; 3 normalized points)	
			provides recycled water to one or more properties within the region
			provides recycled water from a package plant or provides source water to either CAWD or MRWPCA
		1	*expands output of recycled water from either CAWD or MRWPCA*
			all possible recycled water [currently estimated to be 4,800 AFY, including up to 300 AFY from CAWD WWTP and 4,500 AFY from MRWPCA WWTP]
Bonus points = (auto calculate)	**0.75**		
Assists region in meeting WS-3, then Score 1 -->	1	WS-3. Seek long-term sustainable supplies for adopted future demand estimates.	
Assists region in meeting WS-4, then Score 1 -->	1	WS-4. Optimize conjunctive use of surface and groundwater.	
Assists region in meeting WS-5, then Score 1 -->		WS-5. Evaluate, advance, or create water conservation throughout the Region in compliance with the State's 20x2020 Water Conservation Plan.	

Water Quality (WQ)

Assists region to meet WQ-1 (automatically calculated)	**1**	WQ-1. Improve ocean water quality, including Areas of Special Biological Significance (ASBS), by minimizing pollutants in stormwater discharges.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 9 raw points; 3 normalized points):
	1	*implements regional monitoring or contributes to statewide water quality monitoring*
	1	*assists in defining "natural ocean water quality" for one or more ASBS*
	1	*removes trash from storm water*
	1	*eliminates or reduces soil erosion in watersheds discharging to the ocean*
	1	*eliminates or reduces the risk of a source of non-storm water discharge*
	1	*implements low impact development (LID) measures within existing developed areas*
	1	*reduces pollutant load during design storm events from one or more storm water point source by 90% compared to 2011-2012*
	1	*reduces pollutant load during design storm events from 2 or more stormwater point sources by 90% compared to 2011-12*
	1	*achieves Table B Instantaneous Max. Water Quality Objectives in Ch. II of the Ocean Plan on average*
Bonus points = (auto calculate)	**3**	
Assists region to meet WQ-2 (automatically calculated)	**1**	WQ-2. Improve inland surface water quality for environmental resources (e.g. steelhead) and potable water supplies.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 6 raw points; 3 normalized points):
	1	*increases regional monitoring or contributes to statewide water quality monitoring*
		assists in meeting Basin Plan TMDLs or NPDES permit limits
	1	*removes trash from storm water*
	1	*eliminates or reduces soil erosion, contaminant sources*
	1	*eliminates or reduces the risk of a source of non-storm water discharge*
	1	*implements low impact development (LID) features, techniques, and practices within existing developed areas*
Bonus points = (auto calculate)	**2.5**	
Assists region to meet WQ-3 (automatically calculated)	**0**	WQ-3. Protect and improve water quality in groundwater basins.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 2 raw points; 3 normalized points):
		increases groundwater basin monitoring or contributes to statewide water quality monitoring.
		prevents, reduces, or minimizes groundwater quality degradation through reduction in pollutant loads, remediation, reclamation and reuse, or through enhancement of groundwater levels/volumes thereby reducing the potential for seawater intrusion.
Bonus points = (auto calculate)	**0**	
Assists region in meeting WQ-4, then Score 1 -->	1	WQ-4. Meet or exceed water quality standards established by regulatory agencies and stakeholders.

Flood Protection & Erosion Prevention (FP)

Assists region to meet FP-1a (automatically calculated)	**0**	FP-1a. Develop regional projects and plans necessary to protect existing infrastructure from flood damage, in particular, along the southern Monterey Bay shoreline and Carmel Valley.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Removal of more properties from the floodplain yields more points up to total of 3 normalized points.	
			removes at least one (1) property from a 100-year flood zone
			removes at least five (5) properties from the 100-year flood zone
			removes at least 20 properties from a 100-year flood zone
			removes at least 50 properties from a 100-year flood zone
			removes at least 100 properties from a 100-year flood zone
Bonus points = (auto calculate)	**0**		
Assists region to meet FP-1b (automatically calculated)	**0**	FP-1b. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from erosion (including erosion exacerbated by sea level rise).**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 3 raw points; 3 normalized points):	
			implements one or more measures from the document: Evaluation of Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)
			implements one or more components of region-wide, outreach, public education, or other program aimed at systematic changes to land management (i.e., Forest Management, agricultural lands management)
			eliminates or reduces soil erosion in watersheds through implementation of erosion control improvements to streams, creeks, and rivers.
Bonus points = (auto calculate)	**0**		
Assists region in meeting FP-2, then Score 1 -->		FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).	
Assists region in meeting FP-3, then Score 1 -->	1	FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.	
Assists region in meeting FP-4, then Score 1 -->		FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.	

Environmental Protection and Enhancement (EV)

Assists region in meeting EV-1, then Score 1 -->	1	EV-1. Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.
Assists region in meeting EV-2, then Score 1 -->	1	EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when
Assists region in meeting EV-3, then Score 1 -->	1	EV-3. Minimize adverse environmental effects on biological and cultural resources when implementing strategies and projects.
Assists region in meeting EV-4, then Score 1 -->		EV-4. Identify opportunities for open spaces, trails and parks long streams and other recreational areas in the watershed that can be incorporated into
Assists region in meeting EV-5, then Score 1 -->		EV-5. Identify and integrate elements from appropriate Federal and State species protection and recovery plans.

Climate Change (CC)

Assists region in meeting CC-1, then Score 1 -->		CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.
Assists region in meeting CC-2, then Score 1 -->		CC-2. Support increased education, monitoring and research to increase understanding of long-term impacts of climate change in the region.
Assists region in meeting CC-3, then Score 1 -->		CC-3. Support efforts to increase education, research and use of energy conservation measures and alternatives to fossil fuel and non-renewable

Regional Communication and Cooperation (RCC)

Assists region to meet RC-1 (automatically calculated)	**1**	RC-1. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change impacts.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
		1	Partnerships ï The project is proposed by a partnership of multiple organizations enabling use of shared expertise and resources.
			Resource Management Strategy ï The project includes a RMS that is not already being implemented in the region thereby would provide diversification of strategies.
		1	Beneficial Uses ï The project supports several different beneficial uses (see CCRWQCB, *Basin Plan* Chapter 2, 2001)
			Geography ï The project implements a watershed-scale, regional-scale, or inter-regional project.
		1	Hydrology ï The project addresses multiple watershed functions within the hydrologic cycle.
Bonus points = (auto calculate)	**1.8**		
Assists region to meet RC-2 (automatically calculated)	**1**	RC-2. Foster collaboration among regional entities as an alternative to litigation. **	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
			PROVIDED INFORMATION early in project development to the public to assist in understanding the problem, alternatives, opportunities and/or solutions
			CONSULTED & OBTAINED FEEDBACK from all regional agency and non-governmental organizations (NGOs) regarding the problem, alternatives, opportunities and/or solutions
			CONSULTED & OBTAINED FEEDBACK from the public regarding the problem, alternatives, opportunities and/or solutions
			INVOLVED & WORKED DIRECTLY WITH two or more regional agency and/or NGO stakeholders regarding the problem, alternatives, opportunities, and/or solutions
		1	COLLABORATED WITH, OR MADE PARTNERSHIPS with two or more agencies or NGOs on each aspect of the decision
Bonus points = (auto calculate)	**0.6**		
Assists region in meeting RC-3, then Score 1 -->		RC-3. Identify and pursue additional opportunities for public education, outreach, and communication on water resource management and climate change, including to disadvantaged communities and stakeholders with interests in water management issues.	
Assists region in meeting RC-4, then Score 1 -->	1	RC-4. Build relationships with State and Federal regulatory agencies and water forums and agencies.	

Total Points for IRWM Objectives =	**23.2**

Resource Management Strategies (DWR Review Factor B)

Score one point for any Resource Management Strategies (RMS) that the proposed project will address. (* = RMS was included in 2007 IRWM Plan.) (Max points: 30)

CWP Outcome Category 1:		**Reduced Water Demand**
		Agriculture Water Use Efficiency
		Urban Water Use Efficiency *
		Crop Idling for Water Transfers
		Irrigated Land Retirement
		Rainfed Agriculture
CWP Outcome Category 2:		**Improve Operational Efficiency and Transfers**
		Conveyance – Regional/Local *
		System Reoperation
		Water Transfers *
		Waterbag Transport/Storage Technology *
CWP Outcome Category 3:		**Increase Water Supply**
		Conjunctive Management & Groundwater Storage *
		Seawater or Brackish Water Desalination *
		Precipitation Enhancement
	1	Recycled Municipal Water *
		Surface Storage – Regional/local *
		Dewvaportation or Atmospheric Pressure Desalination
		Fog Collection
CWP Outcome Category 4:		**Improve Water Quality**
		Drinking Water Treatment and Distribution *
		Groundwater Remediation/Aquifer Remediation
		Matching Quality to Use
	1	Pollution Prevention *
		Salt and Salinity Management
	1	Urban Runoff Management *
CWP Outcome Category 5:		**Improve Flood Management**
		Flood Risk Management *
CWP Outcome Category 6:		**Practice Resources Stewardship**
		Agriculture Lands Stewardship
		Economic Incentives
		Ecosystem Restoration *
		Forest Management *
		Recharge Area Protection
		Water-Dependent Recreation *
	1	Watershed Management *
	2	**Score one additional point for each additional CWP Outcome category, above one, from which the project is implementing a RMS. (Max: 5 points)**

Total RMS Points =	**6**

Strategic Considerations (DWR Review Factor J)

Does the project address inter-regional issues (such as regional monitoring of A SBS, former Fort Ord water supplies, etc.)? If so, explain.

Phase 2 of the proposed project will combine the findings from the Central Coast ASBS Regional Monitoring Program with the Carmel ASBS dry-season monitoring in Pebble Beach to design systems and management practices to improve discharge and receiving water quality compliant with the State Water Resources Control Board's ASBS Special Protections.

Inter-regional Points (Yes: 5 pts; No: 0 pts) =	5

How many agencies and/or non-governmental organizations are partnering to implement the project? List the agencies and organization that are working together to implement the project.

Pebble Beach Community Services District and Carmel Area Wastewater District

Partnerships Points (Score 5 points if 3 or more, 2 points if 2 or more, score 0 for no partnerships) =	2

Does the project include monitoring and reporting components to ensure achiev ement of performance criteria (i.e., IRWM objectives achievement and/or relevant regulatory requirements)?

Yes

Performance Monitoring/Reporting Points (Yes: 5 pts; No: 0 pts) =	5

Does the project integrate with local land use and water planning? Does the project increase coordination between water resruoces agencies and land use planners? Is the project consistent w ith land use plans and policies?

Yes, Yes, Yes

Land Use Integration Points (Score: 5 points if "yes" to all three questions; 3 points if "Yes" to 2 questions; 1 point for "yes" to one question) =	5

DAC and Native Americans and Environmental Justice (DWR Review Factors D, E and f)

Does the project provide specific benefits to disadvantaged communities and/or Native American tribal communities? If so, explain.

No

DAC &/or Native American Points (Yes: 5 pts; No: 0 pts) =	0

Does the project address any known environmental justice issues? Does the project *avoid disproportionately affecting disadvantaged communities* ?

No

Environmental Justice Points (Yes for both: 5 pts; No for either: 0 pts) =	0

Climate Change Adaptation and Mitigation (DWR Review Factors K and L)

Put an X next to any climate change adaptation or mitigation strategy the proposed project will contribute to.

Adaptation Strategies

x	Improve water supply reliability
	Expand conjunctive use of multiple water supply sources
	Increase water use and/or reuse efficiency
x	Provide additional water supply
x	Promote water quality protection
	Reduce water demand
x	Advance / expand recycled water use
x	Promote urban runoff reuse
	Address sea level rise
	Address other anticipated climate change impacts
	Improve flood control
x	Promote habitat protection
	Establish migration corridors
	Re-establish river-floodplain hydrologic continuity
	Re-introduce anadromous fish populations to watershed
	Implement one or more recommendations from the *Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)*
	Enhance and protect watershed forest and meadow systems

Please describe: Project seeks to protect and maintain coastal water quality in the Carmel Bay ASBS through a series of new and modified best management practices designed to improve both stormwater and non-stormwater discharges from Pebble Beach and to comply with the State Water

Climate Change Adaptation (Score 1 for every strategy implemented, up to 5 max) =	5

Mitigation Strategies

	Increase water use efficiency or promote energy-efficient water demand reduction
	Improve water system energy efficiency
x	Advance / expand recycled water use
x	Promote urban runoff reuse
	Promote use of renewable energy sources
	Contribute to carbon sequestration

Does the proposed project reduce regional greenhouse gas emissions and/or improv e energy efficiency compared to alternative proposed projects meeting the same regional objectiv es? If so, explain how.

Please describe: No

Climate Change Mitigation (Score 1 for every strategy implemented, up to 5 max) =	2

Technical Feasibility (DWR Review Factor C)

Discuss the technical feasibility of the project. If possible, cite references that contain information about the proposed project and detail the technical feasibility of the project.

All aspects of the proposed are technically feasible.

30 points: Technical feasibility has been documented in a project-specific pilot study or previous phase or has a documented track record of success

OR
10 points: has the technology proposed been established as effective in similar situations?
10 points: Are project site conditions documented (geology/soil, ecology, hydrology, land use, public utilities)?
10 points: Do the project partners have experience with similar projects? (e.g., similar site, similar technology).

Technical Feasibility Points (See above) =	30

Project Cost and Financing (DWR Review Factor G)

Total Estimated Capital Cost	##########	
Annual Operation & Maintenance (O&M) Cost	$100,000	
Cost Basis (Year)	2013	
Source(s) of Funding for Capital	Pebble Beach Company	
Source(s) of Funding for O&M Cost	Pebble Beach Company	
Project Life (years)	50	
Provide link to project cost estimate, if available		
25% Match Confirmed (Yes or No)?	YES	Provide evidence and source information.
Cost and Financing Points (10 points if above information provided; 10 points if 25% or more funding match confirmed) =	20	Pebble Beach Company has confirmed that they are willing to provide the match and future O&M costs of the proposed project.

Economic Feasibility (DWR Review Factor H)

Has a benefit:cost or cost effectiveness analysis been completed for your project? If so, please cite reference and briefly summarize. If no economic analysis has been completed for the project, the project may receive zero points out of a possible 25 points for the Economic Feasibility review factor unless the project is a DAC project. If the project is not a DAC project but the B:C ratio is expected to be greater than 1, please provide a justification. The lack of an economic analysis may also affect the Project Status score.

No

If known, please provide the Benefit:Cost Ratio.

Provide a detailed discussion of the benefits the project will provide. To the extent possible, quantify changes and benefits (e.g. water quality and water supply benefits) that will result from project implementation; otherwise, describe benefits qualitatively.

The proposed project will help maintain the high coastal watery quality within the Carmel Bay ASBS, thereby protecting resident marine life and the Bay's many other beneficial uses. Both local residents and visitors to Pebble Beach and Carmel will benefit from these water quality improvements and the increased recycled water supply provided by diversions of stormwater and non-stormwater to the sanitary sewer system for reuse.

Economic Feasibility Points (Score: 15 points if a benefit:cost or cost effectiveness analysis has been completed or project is a DAC project; PLUS 10 points if the benefit:cost ratio or cost-effectiveness score is acceptable, i.e., B:C > 1) =	0

Project Status (DWR Review Factor I)

Proposed Project Start Date:	4/1/2013
Estimated Project Completion Date:	10/1/2019

Indicate the status (pending, in process, complete) of the following.

Project Implementation Milestone	**Status**	**% Complete**	Estimated Completion Date
Conceptual/Preliminary Plans Complete	in process	30	7/15/2014
CEQA/NEPA Completed	pending	0	8/1/2014
Local Cost Share Confirmed	complete	100	4/1/2013
ROW/Land Acquisition/Land Owner Approval	complete	100	4/1/2013
Permits Received	pending	15	10/1/2014
Construction Drawings Complete & Bids Acquired	pending	0	1/1/2015

Project Status Points (4 points for each of the above that are completed =	8

PROJECT OVERVIEW

General Project Information

Project Title:	Carmel River Integrated Watershed Restoration Program
Project Location:	Carmel Valley
Estimated Cost:	$640,000

Brief Project Description (1 to 2 sentences):

The Carmel River and San Jose Creek Integrated Watershed Restoration Program (IWRP) will facilitate the implementation of the Carmel Watershed Action Plan by convening federal, state, and local resource and permitting agencies to advance the highest priority

Project Proponent Information

Contact Name:	Paul Robins
Affiliation:	Resource Conservation District of Monterey County
Address:	744-A LaGuardia Street, Salinas, CA 93905
Phone Number:	831-424-1036, ext. 124
Email:	paul.robins@rcdmonterey.org

Other participating and/or partner agencies/organizations (if applicable):

NRCS, Coastal Conservancy, CDFW, USFWS, NOAA NMFS

DETAILED PROJECT INFORMATION

Description

Please provide a description of your project (including the location) and its purpose, what will be constructed and/or implemented, how the project will function, the area(s) and/or entities that will be affected by or will benefit from the project, and any potential obstacles to implementation.

An Integrated Watershed Restoration Program (IWRP) was identified as a priority action in the 2005 Carmel Watershed Action Plan. The Carmel River and San Jose Creek IWRP is designed to meet that need using a successful model that was developed by a collaboration of the RCD of Santa Cruz County, the Coastal Conservancy, DFG, the County and City of Santa Cruz, and the Coastal Watershed Council in the early 2000's. The Santa Cruz County IWRP pre-dates and in many ways inspired the state Integrated Regional Water Management (IRWM) Program, and is included in the Northern Santa Cruz County IRWMP as an additional resource for restoration project planning, permitting and implementation. In fact, in the first 5 years since the Santa Cruz County IWRP was formed in 2003 over $11 million in construction funds were raised and, 67 fully designed and permitted projects have been implemented with at least 14 additional projects to be constructed by 2011. The implementation funds secured included awards from the State Water Resources Control Boardõs Consolidated Grant and IRWM programs, as well as from the Coastal Conservancy, the NRCS Wildlife Habitat Incentives Program, the DFW Fisheries Restoration Grants Program, the RWQCB Special Environmental Projects Funds, the County Fish and Game Commission, American Rivers/NOAA, and local partner match. This fundraising success is due largely because the projects have been already vetted by the resource agencies through the IWRP design and permitting process by the time they are submitted to the funders. As we do in Monterey County, the Santa Cruz County IWRP partner organizations and agencies recognized that implementing the recommendations of multiple assessments and plans is best accomplished by bringing together federal, state, and local resource and permitting agencies to identify the highest priority projects and assisting with locating funding sources, providing technical assistance, and facilitating permitting. While in many ways this sounds potentially redundant with the mission of the Monterey Peninsula IRWMP, the key distinctions with IWRP are 1) the focus on restoration projects, 2) the closely involved role of regional Coastal Conservancy staff in supporting the IWRP process and projects, and the participation of state and federal (along with local) agency representatives in the IWRP Technical Advisory Committee for a more vertically-integrated approach to facilitating, directing and supporting selected projects. As such, IWRP can be a critical asset for supporting IRWMP restoration-focused projects, and because it would be linked to a county-wide program, it could facilitate coordination between neighboring IRWMP regions. Typical IWRP restoration projects can include rural road erosion reduction, fish passage improvement, and wetland and lagoon restoration. The flagship component of IWRP is the creation of an interagency process to identify, design, and permit high priority water quality, fish passage, and wetland restoration projects. This includes the RCD, land trusts, County departments, Monterey Bay National Marine Sanctuary, Agriculture Water Quality Association, the California Department of Parks and

Bay National Marine Sanctuary, Agriculture Water Quality Association, the California Department of Parks and Recreation (DPR), and other watershed partners - in addition to NMFS, DFW and the Coastal Conservancy. The TAC and the local partners will continue to modify the IWRP model to suit local and regional restoration priorities. TAC project selection will be based on a) resource priority; b) agency support; c) presence of a viable project lead; d) whether it can be designed and permitted within the timeframe of the subject grants; e) landowner support/participation; and f) whether it has a reasonable expectation that implementation funding can be secured. Because of the precipitous decline of the steelhead fisheries in this region, it is anticipated that many of the selected projects will be related to fish restoration in close collaboration with the Conservancy, DFW and NMFS, but there will also be a large focus on sediment reduction. By facilitating watershed restoration projects that will control erosion, improve water quality, improve riparian habitat, modify fish passage barriers, and coordinate resource agency watershed restoration efforts, the project will help to satisfy multiple priorities in the Local Coastal Programs (LCP) pertaining to protection of environmentally sensitive habitats in uplands, riparian and lagoon environments.
The individual watershed projects will be identified by the IWRP Technical Advisory Committee based on recommendations in local watershed plans, including the steelhead recovery plans developed by DFW and NMFS, or otherwise supported by state or federal resource agencies or local watershed groups.

Because they will facilitate the restoration of fish and wildlife habitat in coastal watersheds and wetlands, including habitat for the state- and federally-listed anadromous steelhead, the project components are also consistent with the Water Quality Control Plan for the Central Coastal Basin Plan (adopted by the Regional Water Quality Control Board Central Coast Region in 1994 and reviewed every three years) in that they will further the following beneficial use objectives:

- Estuarine habitat
- Wildlife habitat
- Rare, Threatened, or Endangered Species
- Migration of Aquatic Organisms
- Spawning, Reproduction, and/or Early Development.

IRWM Objectives (DWR Review Factor A)

Water Supply (WS)

Assists region to meet WS-1 (automatically calculated)	**0**	WS-1. Meet existing water supply replacement needs of the Carmel River system and Seaside Groundwater Basin.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Larger water supply quantities yield more points up to total of 3 normalized points.	
			up to 900 AFY
			at least 900 AFY (10%)
			at least 1800 AFY (20%)
			at least 2700 AFY (30%)
			at least 3600 AFY (40%)
			at least 4500 AFY (50%)
			at least 5400 AFY (60%)
			at least 6300 AFY (70%)
			at least 7200 AFY (80%)
			at least 8100 AFY (90%)
			at least 9000 AFY (100%)
Bonus Points = (auto calculate)	**0**		
Assists region to meet WS-2 (automatically calculated)	**0**	WS-2. Maximize use of recycled water.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to 4 raw points; 3 normalized points)	
			provides recycled water to one or more properties within the region
			provides recycled water from a package plant or provides source water to either CAWD or MRWPCA
			expands output of recycled water from either CAWD or MRWPCA
			all possible recycled water [currently estimated to be 4,800 AFY, including up to 300 AFY from CAWD WWTP and 4,500 AFY from MRWPCA WWTP]
Bonus points = (auto calculate)	**0**		
Assists region in meeting WS-3, then Score 1 -->		WS-3. Seek long-term sustainable supplies for adopted future demand estimates.	
Assists region in meeting WS-4, then Score 1 -->		WS-4. Optimize conjunctive use of surface and groundwater.	
Assists region in meeting WS-5, then Score 1 -->		WS-5. Evaluate, advance, or create water conservation throughout the Region in compliance with the State's 20x2020 Water Conservation Plan.	

Water Quality (WQ)

Assists region to meet WQ-1 (automatically calculated)	**1**	WQ-1. Improve ocean water quality, including Areas of Special Biological Significance (ASBS), by minimizing pollutants in stormwater discharges.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 9 raw points; 3 normalized points):
		implements regional monitoring or contributes to statewide water quality monitoring
		assists in defining "natural ocean water quality" for one or more ASBS
		removes trash from storm water
	1	*eliminates or reduces soil erosion in watersheds discharging to the ocean*
		eliminates or reduces the risk of a source of non-storm water discharge
		implements low impact development (LID) measures within existing developed areas
		reduces pollutant load during design storm events from one or more storm water point source by 90% compared to 2011-2012
		reduces pollutant load during design storm events from 2 or more stormwater point sources by 90% compared to 2011-12
		achieves Table B Instantaneous Max. Water Quality Objectives in Ch. II of the Ocean Plan on average
Bonus points = (auto calculate)	**0.3333**	
Assists region to meet WQ-2 (automatically calculated)	**1**	WQ-2. Improve inland surface water quality for environmental resources (e.g. steelhead) and potable water supplies.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 6 raw points; 3 normalized points):
		increases regional monitoring or contributes to statewide water quality monitoring
		assists in meeting Basin Plan TMDLs or NPDES permit limits
		removes trash from storm water
	1	*eliminates or reduces soil erosion, contaminant sources*
		eliminates or reduces the risk of a source of non-storm water discharge
		implements low impact development (LID) features, techniques, and practices within existing developed areas
Bonus points = (auto calculate)	**0.5**	
Assists region to meet WQ-3 (automatically calculated)	**0**	WQ-3. Protect and improve water quality in groundwater basins.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 2 raw points; 3 normalized points):
		increases groundwater basin monitoring or contributes to statewide water quality monitoring.
		prevents, reduces, or minimizes groundwater quality degradation through reduction in pollutant loads, remediation, reclamation and reuse, or through enhancement of groundwater levels/volumes thereby reducing the potential for seawater intrusion.
Bonus points = (auto calculate)	**0**	
Assists region in meeting WQ-4, then Score 1 -->		WQ-4. Meet or exceed water quality standards established by regulatory agencies and stakeholders.

Flood Protection & Erosion Prevention (FP)

Assists region to meet FP-1a (automatically calculated)	**0**	FP-1a. Develop regional projects and plans necessary to protect existing infrastructure from flood damage, in particular, along the southern Monterey Bay shoreline and Carmel Valley.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Removal of more properties from the floodplain yields more points up to total of 3 normalized points.	
			removes at least one (1) property from a 100-year flood zone
			removes at least five (5) properties from the 100-year flood zone
			removes at least 20 properties from a 100-year flood zone
			removes at least 50 properties from a 100-year flood zone
			removes at least 100 properties from a 100-year flood zone
Bonus points = (auto calculate)	**0**		
Assists region to meet FP-1b (automatically calculated)	**1**	FP-1b. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from erosion (including erosion exacerbated by sea level rise).**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 3 raw points; 3 normalized points):	
			implements one or more measures from the document: Evaluation of Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)
			implements one or more components of region-wide, outreach, public education, or other program aimed at systematic changes to land management (i.e., Forest Management, agricultural lands management)
		1	*eliminates or reduces soil erosion in watersheds through implementation of erosion control improvements to streams, creeks, and rivers.*
Bonus points = (auto calculate)	**1**		
Assists region in meeting FP-2, then Score 1 -->	1	FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).	
Assists region in meeting FP-3, then Score 1 -->	1	FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.	
Assists region in meeting FP-4, then Score 1 -->	1	FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.	

Environmental Protection and Enhancement (EV)

Assists region in meeting EV-1, then Score 1 -->	1	EV-1. Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.
Assists region in meeting EV-2, then Score 1 -->		EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when
Assists region in meeting EV-3, then Score 1 -->	1	EV-3. Minimize adverse environmental effects on biological and cultural resources when implementing strategies and projects.
Assists region in meeting EV-4, then Score 1 -->	1	EV-4. Identify opportunities for open spaces, trails and parks long streams and other recreational areas in the watershed that can be incorporated into
Assists region in meeting EV-5, then Score 1 -->	1	EV-5. Identify and integrate elements from appropriate Federal and State species protection and recovery plans.

Climate Change (CC)

Assists region in meeting CC-1, then Score 1 -->	1	CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.
Assists region in meeting CC-2, then Score 1 -->		CC-2. Support increased education, monitoring and research to increase understanding of long-term impacts of climate change in the region.
Assists region in meeting CC-3, then Score 1 -->		CC-3. Support efforts to increase education, research and use of energy conservation measures and alternatives to fossil fuel and non-renewable

Regional Communication and Cooperation (RCC)

Assists region to meet RC-1 (automatically calculated)	**1**	RC-1. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change impacts.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
		1	Partnerships ï The project is proposed by a partnership of multiple organizations enabling use of shared expertise and resources.
			Resource Management Strategy ï The project includes a RMS that is not already being implemented in the region thereby would provide diversification of strategies.
		1	Beneficial Uses ï The project supports several different beneficial uses (see CCRWQCB, *Basin Plan* Chapter 2, 2001)
		1	Geography ï The project implements a watershed-scale, regional-scale, or inter-regional project.
			Hydrology ï The project addresses multiple watershed functions within the hydrologic cycle.
Bonus points = (auto calculate)	**1.8**		
Assists region to meet RC-2 (automatically calculated)	**1**	RC-2. Foster collaboration among regional entities as an alternative to litigation. **	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
			PROVIDED INFORMATION early in project development to the public to assist in understanding the problem, alternatives, opportunities and/or solutions
		1	CONSULTED & OBTAINED FEEDBACK from all regional agency and non-governmental organizations (NGOs) regarding the problem, alternatives, opportunities and/or solutions
			CONSULTED & OBTAINED FEEDBACK from the public regarding the problem, alternatives, opportunities and/or solutions
		1	INVOLVED & WORKED DIRECTLY WITH two or more regional agency and/or NGO stakeholders regarding the problem, alternatives, opportunities, and/or solutions
		1	COLLABORATED WITH, OR MADE PARTNERSHIPS with two or more agencies or NGOs on each aspect of the decision
Bonus points = (auto calculate)	**1.8**		
Assists region in meeting RC-3, then Score 1 -->	1	RC-3. Identify and pursue additional opportunities for public education, outreach, and communication on water resource management and climate change, including to disadvantaged communities and stakeholders with interests in water management issues.	
Assists region in meeting RC-4, then Score 1 -->	1	RC-4. Build relationships with State and Federal regulatory agencies and water forums and agencies.	

Total Points for IRWM Objectives =	**20.4**

Resource Management Strategies (DWR Review Factor B)

Score one point for any Resource Management Strategies (RMS) that the proposed project will address. (* = RMS was included in 2007 IRWM Plan.) (Max points: 30)

CWP Outcome Category 1:		**Reduced Water Demand**
		Agriculture Water Use Efficiency
		Urban Water Use Efficiency *
		Crop Idling for Water Transfers
		Irrigated Land Retirement
		Rainfed Agriculture
CWP Outcome Category 2:		**Improve Operational Efficiency and Transfers**
		Conveyance – Regional/Local *
		System Reoperation
		Water Transfers *
		Waterbag Transport/Storage Technology *
CWP Outcome Category 3:		**Increase Water Supply**
		Conjunctive Management & Groundwater Storage *
		Seawater or Brackish Water Desalination *
		Precipitation Enhancement
		Recycled Municipal Water *
		Surface Storage – Regional/local *
		Dewvaportation or Atmospheric Pressure Desalination
		Fog Collection
CWP Outcome Category 4:		**Improve Water Quality**
		Drinking Water Treatment and Distribution *
		Groundwater Remediation/Aquifer Remediation
		Matching Quality to Use
		Pollution Prevention *
		Salt and Salinity Management
		Urban Runoff Management *
CWP Outcome Category 5:		**Improve Flood Management**
		Flood Risk Management *
CWP Outcome Category 6:		**Practice Resources Stewardship**
		Agriculture Lands Stewardship
		Economic Incentives
	1	Ecosystem Restoration *
		Forest Management *
		Recharge Area Protection
		Water-Dependent Recreation *
	1	Watershed Management *
		Score one additional point for each additional CWP Outcome category, above one, from which the project is implementing a RMS. (Max: 5 points)

Total RMS Points = **2**

Strategic Considerations (DWR Review Factor J)

Does the project address inter-regional issues (such as regional monitoring of A SBS, former Fort Ord water supplies, etc.)? If so, explain.

Inter-regional Points (Yes: 5 pts; No: 0 pts) =	

How many agencies and/or non-governmental organizations are partnering to implement the project? List the agencies and organization that are working together to implement the project.

RCDMC, NRCS, NOAA, State Coastal Conservancy, USFWS, DFW, County of Monterey

Partnerships Points (Score 5 points if 3 or more, 2 points if 2 or more, score 0 for no partnerships) =	5

Does the project include monitoring and reporting components to ensure achiev ement of performance criteria (i.e., IRWM objectives achievement and/or relevant regulatory requirements)?

Yes

Performance Monitoring/Reporting Points (Yes: 5 pts; No: 0 pts) =	5

Does the project integrate with local land use and water planning? Does the project increase coordination between water resruoces agencies and land use planners? Is the project consistent w ith land use plans and policies?

The project is consistent with local plans

Land Use Integration Points (Score: 5 points if "yes" to all three questions; 3 points if "Yes" to 2 questions; 1 point for "yes" to one question) =	1

DAC and Native Americans and Environmental Justice (DWR Review Factors D, E and f)

Does the project provide specific benefits to disadvantaged communities and/or Native American tribal communities? If so, explain.

DAC &/or Native American Points (Yes: 5 pts; No: 0 pts) =	

Does the project address any known environmental justice issues? Does the project *avoid disproportionately affecting disadvantaged communities* ?

Environmental Justice Points (Yes for both: 5 pts; No for either: 0 pts) =	

Climate Change Adaptation and Mitigation (DWR Review Factors K and L)

Put an X next to any climate change adaptation or mitigation strategy the proposed project will contribute to.

Adaptation Strategies

	Improve water supply reliability
	Expand conjunctive use of multiple water supply sources
	Increase water use and/or reuse efficiency
	Provide additional water supply
	Promote water quality protection
	Reduce water demand
	Advance / expand recycled water use
	Promote urban runoff reuse
	Address sea level rise
	Address other anticipated climate change impacts
	Improve flood control
1	Promote habitat protection
	Establish migration corridors
	Re-establish river-floodplain hydrologic continuity
	Re-introduce anadromous fish populations to watershed
	Implement one or more recommendations from the *Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)*
	Enhance and protect watershed forest and meadow systems

Please describe: IWRP will promote local habitat restoration projects, for which climate change considerations will be a factor in the review/selection process

Climate Change Adaptation (Score 1 for every strategy implemented, up to 5 max) =	1

Mitigation Strategies

	Increase water use efficiency or promote energy-efficient water demand reduction
	Improve water system energy efficiency
	Advance / expand recycled water use
	Promote urban runoff reuse
	Promote use of renewable energy sources
	Contribute to carbon sequestration

Does the proposed project reduce regional greenhouse gas emissions and/or improv e energy efficiency compared to alternative proposed projects meeting the same regional objectiv es? If so, explain how.

Please describe:

Climate Change Mitigation (Score 1 for every strategy implemented, up to 5 max) =	

Technical Feasibility (DWR Review Factor C)

Discuss the technical feasibility of the project. If possible, cite references that contain information about the proposed project and detail the technical feasibility of the project.

All aspects of the proposed are technically feasible. The program is based on a highly-successful model implemented in Santa Cruz, San Mateo, and (elsewhere in) Monterey Counties.

30 points: Technical feasibility has been documented in a project-specific pilot study or previous phase or has a documented track record of success

OR
10 points: has the technology proposed been established as effective in similar situations?
10 points: Are project site conditions documented (geology/soil, ecology, hydrology, land use, public utilities)?
10 points: Do the project partners have experience with similar projects? (e.g., similar site, similar technology).

Technical Feasibility Points (See above) =	30

Project Cost and Financing (DWR Review Factor G)

Total Estimated Capital Cost		
Annual Operation & Maintenance (O&M) Cost		
Cost Basis (Year)		
Source(s) of Funding for Capital		
Source(s) of Funding for O&M Cost		
Project Life (years)		
Provide link to project cost estimate, if available		
25% Match Confirmed (Yes or No)?		
Cost and Financing Points (10 points if above information provided; 10 points if 25% or more funding match confirmed) =		

Economic Feasibility (DWR Review Factor H)

Has a benefit:cost or cost effectiveness analysis been completed for your project? If so, please cite reference and briefly summarize. If no economic analysis has been completed for the project, the project may receive zero points out of a possible 25 points for the Economic Feasibility review factor unless the project is a DAC project. If the project is not a DAC project but the B:C ratio is expected to be greater than 1, please provide a justification. The lack of an economic analysis may also affect the Project Status score.

analysis has not been conducted

If known, please provide the Benefit:Cost Ratio.

Provide a detailed discussion of the benefits the project will provide. To the extent possible, quantify changes and benefits (e.g. water quality and water supply benefits) that will result from project implementation; otherwise, describe benefits qualitatively.

Specific physical benefits will be dependent upon the actual projects selected for the program. The program-specific benefits will include increased readiness of local projects, increased coordination among resource agencies, and overall improved communication among watershed partners.

Economic Feasibility Points (Score: 15 points if a benefit:cost or cost effectiveness analysis has been completed or project is a DAC project; PLUS 10 points if the benefit:cost ratio or cost-effectiveness score is acceptable, i.e., B:C > 1) =	

Project Status (DWR Review Factor I)

Proposed Project Start Date:	7/1/2014
Estimated Project Completion Date:	6/30/2017

Indicate the status (pending, in process, complete) of the following.

Project Implementation Milestone	**Status**	**% Complete**	Estimated Completion Date
Conceptual/Preliminary Plans Complete		0	
CEQA/NEPA Completed		0	
Local Cost Share Confirmed		0	
ROW/Land Acquisition/Land Owner Approval		0	
Permits Received		0	
Construction Drawings Complete & Bids Acquired		0	

Project Status Points (4 points for each of the above that are completed =	

PROJECT OVERVIEW

General Project Information

Project Title:	Carmel Valley Livestock & Land Program
Project Location:	Carmel Valley
Estimated Cost:	$1,192,852

Brief Project Description (1 to 2 sentences):

The purpose of this program is to achieve immediate and lasting reductions in nutrient, sediment and pathogen pollution to surface and ground waters and enhance wildlife habitat through implementation of BMPs on livestock facilities and rangelands in Carmel Valley and elsewhere in the IRWM region.

Project Proponent Information

Contact Name:	Paul Robins
Affiliation:	Resource Conservation District of Monterey County
Address:	744-A LaGuardia Street, Salinas, CA 93905
Phone Number:	831-424-1036, ext. 124
Email:	paul.robins@rcdmonterey.org

Other participating and/or partner agencies/organizations (if applicable):

Ecology Action of Santa Cruz, USDA Natural Resources Conservation Service, UC Cooperative Extension

DETAILED PROJECT INFORMATION

Description

Please provide a description of your project (including the location) and its purpose, what will be constructed and/or implemented, how the project will function, the area(s) and/or entities that will be affected by or will benefit from the project, and any potential obstacles to implementation.

The project will serve Carmel Valley and other grazed lands within the IRWM region, with program targeting in areas of rangeland/livestock facility concentration correlating to impaired water bodies.

The purpose of this program is to achieve immediate and lasting reductions in nutrient, sediment and pathogen pollution to surface and ground waters through implementation of BMPs that also enhance wildlife habitat on livestock facilities and rangelands in the IRWM region. The program utilizes an incentives-based approach to achieve the cultural change needed for livestock facilities to voluntarily adopt management measures that improve the healthy functioning of watersheds. Projects are implemented in high priority areas identified by the TMDLs and other regional and local plans detailed in Sections 2 and 8 below. Water quality and wildlife goals will be achieved through implementation projects, project design, technical assistance, recruitment and training. We will employ a systematic evaluation process to measure program effectiveness through participant surveys, before and after site load reduction modeling and site-specific erosion and runoff assessments.

Specific goals and objectives of this project include:

-- Recruitment & Technical Assistance Programs - Provide technical training series on BMP implementation that also provides an opportunity to recruit livestock owners to participate in implementation site projects. Peer Leaders are also recruited to lead and foster a peer-to-peer network of information transfer. An estimated 210 livestock facility owners will receive an average of 13 hours each of technical training on water quality and wildlife protective BMPs in this project. In addition to workshop series delivery, the we will promote our availability to conduct site visits to provide technical assistance and program referrals to our workshops, demonstration site opportunities and NRCS and other support services.

-- Water Quality Site Planning - All program participants will receive training on how to identify and address opportunities to improve water quality and wildlife habitat on their sites and receive assistance needed to complete a written site plan. All implementation project applicants will complete a site plan as part of their contract to receive project funding support. We anticipate completion of as many as 60 site plans leading to implementation on at least 14 project sites during the course of this program.

-- Designing Projects that Perform - We will work with a local Stakeholder and Technical Advisory Committee

-- Designing Projects that Perform: We will work with a local Stakeholder and Technical Advisory Committee (STAC) consisting of local livestock managers and technical specialists (private, NRCS, University and USFWS) to develop the scope for implementation of water quality and wildlife habitat improvement practices. Through site visits landowners will have one-on-one interaction with RCD and NRCS conservation planners who will provide site assessment, detailed recommendations and design assistance.

-- Development of Implementation Sites ï 14 to 22 priority sites (an estimated 210 to 450 total acres) will be selected among livestock facility applicants to implement water quality and wildlife habitat improvement projects. Specific BMPs implemented and natural resource improvements will vary based on site need and projects selected and will be designed by the TAC and consultants. These may include practice changes or infrastructure improvements. Example BMPs include: use of vegetative swales and buffer strips, manure bunkers and other containment practices, installation of gutters, road and trail improvements, reestablishment of vegetation, native upland and riparian vegetation enhancement, stock pond and riparian area improvement and management, and taking high use areas off line in winter. Implementation sites will also serve as demonstrations sites for training opportunities and tours. A subset of sites will feature wildlife habitat enhancements in cooperation with NRCS and the USFWS ôPartners for Fish and Wildlifeô Coastal Program, which has dedicated funding to support private land habitat improvement projects. All projects will be designed according to NRCS standards and specifications in order to meet water quality and wildlife habitat improvement objectives.

Nutrient, pathogen and sediment pollution from livestock facilities are identified by the Regional Water Quality Control Board as threats to the watershed and water bodies in our area that have important Beneficial Uses and ecological processes (see Section 8 for specific plan citations as evidence). Livestock managers need assistance to overcome barriers to managing their facilities cost-effectively while protecting water quality and wildlife habitat. Barriers include: challenging site conditions; historical co-locating of livestock near creeks and streams; and lack of finances, time and information about (and peer support for) protective site management practices. There is one adopted TMDL developed in the project region for target pollutants: Fecal coliform in Tularcitos Creek. The activities in this project directly support compliance with this TMDL.

The Livestock and Land program, five years in operation in Monterey County, has started to address the issue with water quality assessment and projects at equestrian facilities. This program would continue that work to reach additional equestrian facilities and engage the rancher community, while leveraging that engagement to expand vegetation management services and wildlife restoration opportunities on those sites. IRWM funding is urgently needed after 2013 as the current program funding for Livestock and Land in Monterey County (Prop 84 ASBS) is expiring and there are no other known resources to support successful efforts to achieve the noted benefits.

Schedule:
The project will provide services over a 3 year period. This is critical to allow for the project to develop buy in from the ranching community and to assist as many livestock managers as possible. It also affords more time to evaluate the effectiveness of BMP performance and validation of the Load Reduction Model through multiple rainy seasons on selected sites.

The annual schedule for completion of tasks will be based on the following table, used successfully in our current programming (dates are for the Quarters following start date):
Description Due Date
Organize Stakeholder and Technical Advisory Committees (STAC) Q1
Attend livestock related meetings to promote participation in the program On-Going
Refine and finalize the project plan with STAC feedback Q1
Recruitment and Technical Assistance Q2 and on--
Develop Technical Assistance Training Series Q1
Engage SAC and TAC for materials evaluation and improvement Q2 and on
Conduct Technical Assistance Series Q2, Q6, Q10
Develop, Promote and Conduct Half Day Hand-On Trainings Q4, Q8
Survey training participants to determine BMPs implemented and effectiveness Q4, Q8, Q12
Provide field visits, site assessments and referrals Ongoing
Implementation Sites --
Develop Implementation Site application materials Q1
Promote, distribute and assist applicants with Implementation Site applications Q2, Q6, Q10
Review and confirm list of priority BMPs for region per TMDLs and watershed plans and develop the ranking criteria to select priority projects and watershed locations Q2, Q6, Q10
Review and select Implementation Sites Q3, Q7, Q11
Develop site plans and project designs for Implementation Sites Q3, Q7, Q11
Obtain landowner agreements for Implementation Site funding Q3, Q7, Q11

Construction on Implementation Sites per approved plan Q4 and on
Conduct photo documentation, load reduction modeling and erosion assessments Q4 and on
Peer Leader Program --
Recruit Peer Leaders and provide training and orientation to outreach tasks Q2 and on
Conduct outreach to promote the Livestock and Land program and resources Q3 and on
Public recognition of Peer Leaders to incentivize volunteerism Q4 and on
Survey of Peer Leader efficacy through evaluation of peer leader activities Q6
Statewide Collaboration and Sharing Monterey Successes ongoing

Monitoring and Project Performance:
We will measure effectiveness of the program through participant surveys, before and after site load reduction modeling and site-specific erosion and runoff assessments.

To estimate water quality improvements for each site, we will employ a Load Reduction Model (LRM), which was developed and tested specifically for the current Livestock and Land program implemented throughout the Central Coast. The LRM estimates likely water quality improvements associated with the change in the vulnerability of pollution sources in terms of exposure to rainfall (for example, the aerial extent that manure and sediment are exposed to or are protected from rainfall) before and after project implementation. This change will be documented for each water quality project site for concentration of nutrients (N or P), bacteria, manure, and sediment.

We will conduct additional site-specific erosion and runoff assessments on a subset of project locations as verification of project effectiveness and the LRM using "farmer-friendly" monitoring and systematic observation techniques as described in Monitoring on Your Farm (Yolo Co RCD, 2002). Program participants will be offered training, encouragement and assistance for conducting their own monitoring for longer term project assessment, trouble-shooting, and maintenance beyond the time frame of the 3-year program.

Consistency with Federal, State, and Local Plans:
Local and regional plans have already confirmed the need to reduce pollutants from livestock facility and rangeland operations. In addition to the Tularcitos Fecal Indicator Bacteria TMDL (2011), the project's target pollutant sources and our program solutions are specifically identified in local plans as follows:

The problems of nitrate, sediment and pathogen pollution from livestock facilities are identified in numerous plans at the regional level including: the Water Quality Protection Program from Monterey Bay National Marine Sanctuary. Action Plan IV: Agriculture and Rural Lands (October 1999), Central Coast Regional Water Quality Control Board Basin Plan, California's Nonpoint Source Pollution Control Program, Agricultural Management Measures (January 2000) and Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (January 1993).

In Monterey County, the sediment, nutrient and pathogen pollution from livestock and rangeland facilities in relation to the Carmel River have been noted in the following plans. Carmel River Watershed Action Plan (2005), Nutrients in Surface Waters of Southern Monterey Bay Watersheds (2003), Watershed Management Initiative Chapter, Appendix D (2004), California Nonpoint Source Program Five-Year Implementation Plan, July 2003 through June 2008 Appendix 2 (2003).

Collaboration and Community Support:

This project has broad community support and is an exemplary public/private partnership.
- NRCS and USFWS: Provide technical program guidance, site assessment and property owner assistance. USFWS will partner with a stockpond-improvement grant to meet shared program goals
- Livestock Associations: currently partner successfully with the project to co-host workshops, engage members and facilitate the culture change in the livestock community
- Feed Stores: Display technical how to brochures and advertise program activities
- Ecology Action: This nonprofit helps facilitate the Peer Leader network, manages the LivestockandLand.org website, and facilitates statewide program collaboration

There is no known opposition to the project

Conflict Resolution:

BMPs proposed in the project (rainwater catchment for example) result in water conservation on a site specific level, which benefits water supply issues in the region.

Environmental Justice and Disadvantaged Communities:

This project will provide equitable services to all communities where ranchers and livestock owners have needs throughout the project region. All program materials are available in Spanish, live translation is available at all workshops, and the program is currently exploring how to more directly reach the Spanish Language Preferred community through Caballero and rodeo outreach.

Climate Change:

In addition to significant dust control achievements from access roads and high impact areas on properties involved, the program offers a moderate climate change benefit: proposed BMPs (rainwater catchment for example) result in water conservation on a site specific level, which reduces water demand and the need for electricity to pump, move and treat water.

IRWM Objectives (DWR Review Factor A)

Water Supply (WS)

Assists region to meet WS-1 (automatically calculated)	**0**	WS-1. Meet existing water supply replacement needs of the Carmel River system and Seaside Groundwater Basin.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Larger water supply quantities yield more points up to total of 3 normalized points.
		up to 900 AFY
		at least 900 AFY (10%)
		at least 1800 AFY (20%)
		at least 2700 AFY (30%)
		at least 3600 AFY (40%)
		at least 4500 AFY (50%)
		at least 5400 AFY (60%)
		at least 6300 AFY (70%)
		at least 7200 AFY (80%)
		at least 8100 AFY (90%)
		at least 9000 AFY (100%)
Bonus Points = (auto calculate)	**0**	
Assists region to meet WS-2 (automatically calculated)	**0**	WS-2. Maximize use of recycled water.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to 4 raw points; 3 normalized points)
		provides recycled water to one or more properties within the region.
		provides recycled water from a package plant or provides source water to either CAWD or MRWPCA
		expands output of recycled water from either CAWD or MRWPCA
		all possible recycled water [currently estimated to be 4,800 AFY, including up to 300 AFY from CAWD WWTP and 4,500 AFY from MRWPCA WWTP]
Bonus points = (auto calculate)	**0**	
Assists region in meeting WS-3, then Score 1 -->		WS-3. Seek long-term sustainable supplies for adopted future demand estimates.
Assists region in meeting WS-4, then Score 1 -->		WS-4. Optimize conjunctive use of surface and groundwater.
Assists region in meeting WS-5, then Score 1 -->		WS-5. Evaluate, advance, or create water conservation throughout the Region in compliance with the State's 20x2020 Water Conservation Plan.

Water Quality (WQ)

Assists region to meet WQ-1 (automatically calculated)	**1**	WQ-1. Improve ocean water quality, including Areas of Special Biological Significance (ASBS), by minimizing pollutants in stormwater discharges.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 9 raw points; 3 normalized points):
		implements regional monitoring or contributes to statewide water quality monitoring
		assists in defining "natural ocean water quality" for one or more ASBS
		removes trash from storm water
	1	*eliminates or reduces soil erosion in watersheds discharging to the ocean*
		eliminates or reduces the risk of a source of non-storm water discharge
		implements low impact development (LID) measures within existing developed areas
		reduces pollutant load during design storm events from one or more storm water point source by 90% compared to 2011-2012
		reduces pollutant load during design storm events from 2 or more stormwater point sources by 90% compared to 2011-12
		achieves Table B Instantaneous Max. Water Quality Objectives in Ch. II of the Ocean Plan on average
Bonus points = (auto calculate)	**0.3333**	
Assists region to meet WQ-2 (automatically calculated)	**1**	WQ-2. Improve inland surface water quality for environmental resources (e.g. steelhead) and potable water supplies.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 6 raw points; 3 normalized points):
		increases regional monitoring or contributes to statewide water quality monitoring
	1	*assists in meeting Basin Plan TMDLs or NPDES permit limits*
		removes trash from storm water
	1	*eliminates or reduces soil erosion, contaminant sources*
		eliminates or reduces the risk of a source of non-storm water discharge
		implements low impact development (LID) features, techniques, and practices within existing developed areas
Bonus points = (auto calculate)	**1**	
Assists region to meet WQ-3 (automatically calculated)	**1**	WQ-3. Protect and improve water quality in groundwater basins.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 2 raw points; 3 normalized points):
		increases groundwater basin monitoring or contributes to statewide water quality monitoring.
	1	*prevents, reduces, or minimizes groundwater quality degradation through reduction in pollutant loads, remediation, reclamation and reuse, or through enhancement of groundwater levels/volumes thereby reducing the potential for seawater intrusion.*
Bonus points = (auto calculate)	**1.5**	
Assists region in meeting WQ-4, then Score 1 -->	1	WQ-4. Meet or exceed water quality standards established by regulatory agencies and stakeholders.

Flood Protection & Erosion Prevention (FP)

Assists region to meet FP-1a (automatically calculated)	**0**	FP-1a. Develop regional projects and plans necessary to protect existing infrastructure from flood damage, in particular, along the southern Monterey Bay shoreline and Carmel Valley.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Removal of more properties from the floodplain yields more points up to total of 3 normalized points.	
			removes at least one (1) property from a 100-year flood zone
			removes at least five (5) properties from the 100-year flood zone
			removes at least 20 properties from a 100-year flood zone
			removes at least 50 properties from a 100-year flood zone
			removes at least 100 properties from a 100-year flood zone
Bonus points = (auto calculate)	**0**		
Assists region to meet FP-1b (automatically calculated)	**1**	FP-1b. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from erosion (including erosion exacerbated by sea level rise).**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 3 raw points; 3 normalized points):	
			implements one or more measures from the document: Evaluation of Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)
			implements one or more components of region-wide, outreach, public education, or other program aimed at systematic changes to land management (i.e., Forest Management, agricultural lands management)
		1	*eliminates or reduces soil erosion in watersheds through implementation of erosion control improvements to streams, creeks, and rivers.*
Bonus points = (auto calculate)	**1**		
Assists region in meeting FP-2, then Score 1 -->		FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).	
Assists region in meeting FP-3, then Score 1 -->	1	FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.	
Assists region in meeting FP-4, then Score 1 -->		FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.	

Environmental Protection and Enhancement (EV)

Assists region in meeting EV-1, then Score 1 -->	1	EV-1. Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.
Assists region in meeting EV-2, then Score 1 -->		EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when
Assists region in meeting EV-3, then Score 1 -->	1	EV-3. Minimize adverse environmental effects on biological and cultural resources when implementing strategies and projects.
Assists region in meeting EV-4, then Score 1 -->		EV-4. Identify opportunities for open spaces, trails and parks long streams and other recreational areas in the watershed that can be incorporated into
Assists region in meeting EV-5, then Score 1 -->	1	EV-5. Identify and integrate elements from appropriate Federal and State species protection and recovery plans.

Climate Change (CC)

Assists region in meeting CC-1, then Score 1 -->		CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.
Assists region in meeting CC-2, then Score 1 -->		CC-2. Support increased education, monitoring and research to increase understanding of long-term impacts of climate change in the region.
Assists region in meeting CC-3, then Score 1 -->		CC-3. Support efforts to increase education, research and use of energy conservation measures and alternatives to fossil fuel and non-renewable

Regional Communication and Cooperation (RCC)

Assists region to meet RC-1 (automatically calculated)	**1**	RC-1. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change impacts.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
		1	Partnerships ï The project is proposed by a partnership of multiple organizations enabling use of shared expertise and resources.
		1	Resource Management Strategy ï The project includes a RMS that is not already being implemented in the region thereby would provide diversification of strategies.
		1	Beneficial Uses ï The project supports several different beneficial uses (see CCRWQCB, *Basin Plan* Chapter 2, 2001)
		1	Geography ï The project implements a watershed-scale, regional-scale, or inter-regional project.
			Hydrology ï The project addresses multiple watershed functions within the hydrologic cycle.
Bonus points = (auto calculate)	**2.4**		
Assists region to meet RC-2 (automatically calculated)	**1**	RC-2. Foster collaboration among regional entities as an alternative to litigation. **	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
			PROVIDED INFORMATION early in project development to the public to assist in understanding the problem, alternatives, opportunities and/or solutions
			CONSULTED & OBTAINED FEEDBACK from all regional agency and non-governmental organizations (NGOs) regarding the problem, alternatives, opportunities and/or solutions
			CONSULTED & OBTAINED FEEDBACK from the public regarding the problem, alternatives, opportunities and/or solutions
		1	INVOLVED & WORKED DIRECTLY WITH two or more regional agency and/or NGO stakeholders regarding the problem, alternatives, opportunities, and/or solutions
			COLLABORATED WITH, OR MADE PARTNERSHIPS with two or more agencies or NGOs on each aspect of the decision
Bonus points = (auto calculate)	**0.6**		
Assists region in meeting RC-3, then Score 1 -->	1	RC-3. Identify and pursue additional opportunities for public education, outreach, and communication on water resource management and climate change, including to disadvantaged communities and stakeholders with interests in water management issues.	
Assists region in meeting RC-4, then Score 1 -->	1	RC-4. Build relationships with State and Federal regulatory agencies and water forums and agencies.	

Total Points for IRWM Objectives =	**19.8**

Resource Management Strategies (DWR Review Factor B)

Score one point for any Resource Management Strategies (RMS) that the proposed project will address. (* = RMS was included in 2007 IRWM Plan.) (Max points: 30)

CWP Outcome Category 1:	**Reduced Water Demand**	
		Agriculture Water Use Efficiency
		Urban Water Use Efficiency *
		Crop Idling for Water Transfers
		Irrigated Land Retirement
		Rainfed Agriculture
CWP Outcome Category 2:	**Improve Operational Efficiency and Transfers**	
		Conveyance – Regional/Local *
		System Reoperation
		Water Transfers *
		Waterbag Transport/Storage Technology *
CWP Outcome Category 3:	**Increase Water Supply**	
		Conjunctive Management & Groundwater Storage *
		Seawater or Brackish Water Desalination *
		Precipitation Enhancement
		Recycled Municipal Water *
		Surface Storage – Regional/local *
		Dewvaportation or Atmospheric Pressure Desalination
		Fog Collection
CWP Outcome Category 4:	**Improve Water Quality**	
		Drinking Water Treatment and Distribution *
		Groundwater Remediation/Aquifer Remediation
		Matching Quality to Use
	1	Pollution Prevention *
		Salt and Salinity Management
		Urban Runoff Management *
CWP Outcome Category 5:	**Improve Flood Management**	
		Flood Risk Management *
CWP Outcome Category 6:	**Practice Resources Stewardship**	
	1	Agriculture Lands Stewardship
		Economic Incentives
	1	Ecosystem Restoration *
		Forest Management *
		Recharge Area Protection
		Water-Dependent Recreation *
	1	Watershed Management *
		Score one additional point for each additional CWP Outcome category, <u>above one</u>, from which the project is implementing a RMS. (Max: 5 points)

Total RMS Points =	**4**

Strategic Considerations (DWR Review Factor J)

Does the project address inter-regional issues (such as regional monitoring of A SBS, former Fort Ord water supplies, etc.)? If so, explain.

This project addresses concerns regarding water quality impacts of livestock throughout the region on a site-by-site landowner-volunteer request basis. This potentially includes existing concerns expressed regarding upper watershed erosion and sediment deposition in tributaries and the Carmel River which impact upland and instream habitat, along with concerns regarding surface water quality impairment by excessive additions of nutrients and bacteria associated with livestock waste moving into area waterways where such drainage is not adequately managed.`

Inter-regional Points (Yes: 5 pts; No: 0 pts) =	5

How many agencies and/or non-governmental organizations are partnering to implement the project? List the agencies and organization that are working together to implement the project.

Three entities at a minimum: RCDMC, USDA NRCS, and Ecology Action of Santa Cruz

Partnerships Points (Score 5 points if 3 or more, 2 points if 2 or more, score 0 for no partnerships) =	5

Does the project include monitoring and reporting components to ensure achiev ement of performance criteria (i.e., IRWM objectives achievement and/or relevant regulatory requirements)?

Under this project we will verify proper installation of projects, which will be prioritized according to their projected water quality benefits using the Load Reduction Estimation Tool developed by Fall Creek Engineering for Ecology Action specifically for the Livestock and Land projects.

Performance Monitoring/Reporting Points (Yes: 5 pts; No: 0 pts) =	5

Does the project integrate with local land use and water planning? Does the project increase coordination between water resruoces agencies and land use planners? Is the project consistent w ith land use plans and policies?

The proposed work is consistent with existing land use plans in that it poses no conflict with or variance from said plans. It can potentially integrate with local land use and water planning by supporting surface water quality protection goals

Land Use Integration Points (Score: 5 points if "yes" to all three questions; 3 points if "Yes" to 2 questions; 1 point for "yes" to one question) =	3

DAC and Native Americans and Environmental Justice (DWR Review Factors D, E and f)

Does the project provide specific benefits to disadvantaged communities and/or Native American tribal communities? If so, explain.

This project does not target any specific community, but any member of a disadvantaged or Native American tribal community with livestock (and there are a few in the region) could benefit from participation in the program

DAC &/or Native American Points (Yes: 5 pts; No: 0 pts) =	0

Does the project address any known environmental justice issues? Does the project *avoid disproportionately affecting disadvantaged communities* ?

Not to our knowledge

Environmental Justice Points (Yes for both: 5 pts; No for either: 0 pts) =	0

Climate Change Adaptation and Mitigation (DWR Review Factors K and L)

Put an X next to any climate change adaptation or mitigation strategy the proposed project will contribute to.

Adaptation Strategies

	Improve water supply reliability
	Expand conjunctive use of multiple water supply sources
	Increase water use and/or reuse efficiency
	Provide additional water supply
1	Promote water quality protection
1	Reduce water demand
	Advance / expand recycled water use
	Promote urban runoff reuse
	Address sea level rise
	Address other anticipated climate change impacts
	Improve flood control
1	Promote habitat protection
	Establish migration corridors
	Re-establish river-floodplain hydrologic continuity
	Re-introduce anadromous fish populations to watershed
	Implement one or more recommendations from the *Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)*
	Enhance and protect watershed forest and meadow systems

Please describe:

Climate Change Adaptation (Score 1 for every strategy implemented, up to 5 max) =	3

Mitigation Strategies

	Increase water use efficiency or promote energy-efficient water demand reduction
	Improve water system energy efficiency
	Advance / expand recycled water use
	Promote urban runoff reuse
	Promote use of renewable energy sources
	Contribute to carbon sequestration

Does the proposed project reduce regional greenhouse gas emissions and/or improv e energy efficiency compared to alternative proposed projects meeting the same regional objectiv es? If so, explain how.

Please describe: No

Climate Change Mitigation (Score 1 for every strategy implemented, up to 5 max) =	

Technical Feasibility (DWR Review Factor C)

Discuss the technical feasibility of the project. If possible, cite references that contain information about the proposed project and detail the technical feasibility of the project.

The project is technically sound and ready to implement. The design and practices of this program are rooted in both social and physical sciences.

30 points: Technical feasibility has been documented in a project-specific pilot study or previous phase or has a documented track record of success

OR

10 points: has the technology proposed been established as effective in similar situations?
10 points: Are project site conditions documented (geology/soil, ecology, hydrology, land use, public utilities)?
10 points: Do the project partners have experience with similar projects? (e.g., similar site, similar technology).

Technical Feasibility Points (See above) =	30

Project Cost and Financing (DWR Review Factor G)

Total Estimated Capital Cost	$1,192,852
Annual Operation & Maintenance (O&M) Cost	$0
Cost Basis (Year)	3
Source(s) of Funding for Capital	10% landowner, 75% IRWM Grant, 4% NRCS, 2% USFWS, 6%USFWS, 3% NRCS/RCD
Source(s) of Funding for O&M Cost	landowner, will be dependent upon individual project
Project Life (years)	20
Provide link to project cost estimate, if available	dependent upon individual project site
25% Match Confirmed (Yes or No)?	yes
Cost and Financing Points (10 points if above information provided; 10 points if 25% or more funding match confirmed) =	20

Economic Feasibility (DWR Review Factor H)

Has a benefit:cost or cost effectiveness analysis been completed for your project? If so, please cite reference and briefly summarize. If no economic analysis has been completed for the project, the project may receive zero points out of a possible 25 points for the Economic Feasibility review factor unless the project is a DAC project. If the project is not a DAC project but the B:C ratio is expected to be greater than 1, please provide a justification. The lack of an economic analysis may also affect the Project Status score.

analysis has not been conducted

If known, please provide the Benefit:Cost Ratio.

Provide a detailed discussion of the benefits the project will provide. To the extent possible, quantify changes and benefits (e.g. water quality and water supply benefits) that will result from project implementation; otherwise, describe benefits qualitatively.

This project has water quality, watershed enhancement, habitat improvement and water conservation benefits. Benefits include strengthening of public/private partnerships to address environmental challenges, reduced surface water nutrient and bacteria concentrations (improved water supply quality), improved fish and wildlife habitat with emphasis on stockpond-associated amphibians (such as CA red-legged frog and CA tiger salamanders), animal health and public safety, site specific improved flood protection, and educational opportunities.

Economic Feasibility Points (Score: 15 points if a benefit:cost or cost effectiveness analysis has been completed or project is a DAC project; PLUS 10 points if the benefit:cost ratio or cost-effectiveness score is acceptable, i.e., B:C > 1) =	

Project Status (DWR Review Factor I)

Proposed Project Start Date:	7/1/2014
Estimated Project Completion Date:	6/30/2017

Indicate the status (pending, in process, complete) of the following.

Project Implementation Milestone	**Status**	**% Complete**	Estimated Completion Date
Conceptual/Preliminary Plans Complete		0	12/31/2014
CEQA/NEPA Completed		0	12/31/2014
Local Cost Share Confirmed		75	3/31/2015
ROW/Land Acquisition/Land Owner Approval		0	3/31/2015
Permits Received		0	6/30/2015
Construction Drawings Complete & Bids Acquired		0	6/30/2015

Project Status Points (4 points for each of the above that are completed =	

PROJECT OVERVIEW

General Project Information

Project Title:	Carmel Watershed Rural Roads Erosion Assistance Program
Project Location:	Carmel Valley and San Jose Creek Watersheds
Estimated Cost:	$640,000

Brief Project Description (1 to 2 sentences):

Rural roads have been identified as a significant source of sediment input into the streams and rivers draining to the Monterey Bay in the Water Quality Protection Program for the Monterey Bay National Marine Sanctuary Action Plan IV: Agriculture and Rural Lands along with other documents.

Project Proponent Information

Contact Name:	Paul Robins
Affiliation:	Resource Conservation District of Monterey County
Address:	744-A LaGuardia Street, Salinas, CA 93905
Phone Number:	831-424-1036, ext. 124
Email:	paul.robins@rcdmonterey.org

Other participating and/or partner agencies/organizations (if applicable):

RCDMC, NRCS, MBNMS

DETAILED PROJECT INFORMATION

Description

Please provide a description of your project (including the location) and its purpose, what will be constructed and/or implemented, how the project will function, the area(s) and/or entities that will be affected by or will benefit from the project, and any potential obstacles to implementation.

Inadequately constructed and maintained roads throughout Monterey County continue to add sediment to regional waterways, especially in areas of steep terrain and high rainfall such as the upper Carmel Valley, which compromises stream habitat needed for federally-listed steelhead trout and other aquatic species. Roads have been identified as a significant source of sediment input into the streams and rivers draining to the Monterey Bay in the Water Quality Protection Program for the Monterey Bay National Marine Sanctuary Action Plan IV: Agriculture and Rural Lands along with other documents.

RCDMC will serve as the program lead with regular guidance from a Rural Roads Technical Advisory Committee, in providing education and training on rural roads drainage techniques, on-site technical assistance, and funding for road erosion assessments, project design and permitting, and road drainage project implementation. The outreach aspects of the program will include demonstration workshops and trainings, outreach material development and public communications.The TAC will help to develop and review criteria to select road association projects that will receive funding as well as assess program success. Road association projects that are selected will require 50% of the project costs to be contributed by the road association. This match share will be from in-kind services and/or cash contributions. In addition to the match share, a long-term maintenance agreement will be required as part of the project. A long-term maintenance agreement may include establishing a County Service Area or other formal contractual agreement. A County Service Area is a self-taxation mechanism for a community that designates the funds for road repair and maintenance.

Success will be measured by the amount of reduction in sedimentation coming from rural unsurfaced roads and from surfaced roads that are not maintained. Interim measures for success will include the number of rural road owners contacted and provided information on road maintenance measures, including materials for new road owners; the number of participants in roads training workshops; and the extent to which financial resources are obtained and practices are installed to prevent excess sedimentation and improve overall road maintenance.

IRWM Objectives (DWR Review Factor A)

Water Supply (WS)

Assists region to meet WS-1 (automatically calculated)	**0**	WS-1. Meet existing water supply replacement needs of the Carmel River system and Seaside Groundwater Basin.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Larger water supply quantities yield more points up to total of 3 normalized points.
		up to 900 AFY
		at least 900 AFY (10%)
		at least 1800 AFY (20%)
		at least 2700 AFY (30%)
		at least 3600 AFY (40%)
		at least 4500 AFY (50%)
		at least 5400 AFY (60%)
		at least 6300 AFY (70%)
		at least 7200 AFY (80%)
		at least 8100 AFY (90%)
		at least 9000 AFY (100%)
Bonus Points = (auto calculate)	**0**	
Assists region to meet WS-2 (automatically calculated)	**0**	WS-2. Maximize use of recycled water.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to 4 raw points; 3 normalized points)
		provides recycled water to one or more properties within the region
		provides recycled water from a package plant or provides source water to either CAWD or MRWPCA
		expands output of recycled water from either CAWD or MRWPCA
		all possible recycled water, [currently estimated to be 4,800 AFY, including up to 300 AFY from CAWD WWTP and 4,500 AFY from MRWPCA WWTP]
Bonus points = (auto calculate)	**0**	
Assists region in meeting WS-3, then Score 1 -->		WS-3. Seek long-term sustainable supplies for adopted future demand estimates.
Assists region in meeting WS-4, then Score 1 -->		WS-4. Optimize conjunctive use of surface and groundwater.
Assists region in meeting WS-5, then Score 1 -->		WS-5. Evaluate, advance, or create water conservation throughout the Region in compliance with the State's 20x2020 Water Conservation Plan.

Water Quality (WQ)

Assists region to meet WQ-1 (automatically calculated)	**1**	WQ-1. Improve ocean water quality, including Areas of Special Biological Significance (ASBS), by minimizing pollutants in stormwater discharges.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 9 raw points; 3 normalized points):
		implements regional monitoring or contributes to statewide water quality monitoring
		assists in defining "natural ocean water quality" for one or more ASBS
		removes trash from storm water
	1	*eliminates or reduces soil erosion in watersheds discharging to the ocean*
		eliminates or reduces the risk of a source of non-storm water discharge
		implements low impact development (LID) measures within existing developed areas
		reduces pollutant load during design storm events from one or more storm water point source by 90% compared to 2011-2012
		reduces pollutant load during design storm events from 2 or more stormwater point sources by 90% compared to 2011-12
		achieves Table B Instantaneous Max. Water Quality Objectives in Ch. II of the Ocean Plan on average
Bonus points = (auto calculate)	**0.3333**	
Assists region to meet WQ-2 (automatically calculated)	**1**	WQ-2. Improve inland surface water quality for environmental resources (e.g. steelhead) and potable water supplies.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 6 raw points; 3 normalized points):
		increases regional monitoring or contributes to statewide water quality monitoring
		assists in meeting Basin Plan TMDLs or NPDES permit limits
		removes trash from storm water
	1	*eliminates or reduces soil erosion, contaminant sources*
		eliminates or reduces the risk of a source of non-storm water discharge
		implements low impact development (LID) features, techniques, and practices within existing developed areas
Bonus points = (auto calculate)	**0.5**	
Assists region to meet WQ-3 (automatically calculated)	**0**	WQ-3. Protect and improve water quality in groundwater basins.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 2 raw points; 3 normalized points):
		increases groundwater basin monitoring or contributes to statewide water quality monitoring.
		prevents, reduces, or minimizes groundwater quality degradation through reduction in pollutant loads, remediation, reclamation and reuse, or through enhancement of groundwater levels/volumes thereby reducing the potential for seawater intrusion.
Bonus points = (auto calculate)	**0**	
Assists region in meeting WQ-4, then Score 1 -->		WQ-4. Meet or exceed water quality standards established by regulatory agencies and stakeholders.

Flood Protection & Erosion Prevention (FP)

Assists region to meet FP-1a (automatically calculated)	**0**	FP-1a. Develop regional projects and plans necessary to protect existing infrastructure from flood damage, in particular, along the southern Monterey Bay shoreline and Carmel Valley.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Removal of more properties from the floodplain yields more points up to total of 3 normalized points.	
			removes at least one (1) property from a 100-year flood zone
			removes at least five (5) properties from the 100-year flood zone
			removes at least 20 properties from a 100-year flood zone
			removes at least 50 properties from a 100-year flood zone
			removes at least 100 properties from a 100-year flood zone
Bonus points = (auto calculate)	**0**		
Assists region to meet FP-1b (automatically calculated)	**1**	FP-1b. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from erosion (including erosion exacerbated by sea level rise).**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 3 raw points; 3 normalized points):	
			implements one or more measures from the document: Evaluation of Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)
			implements one or more components of region-wide, outreach, public education, or other program aimed at systematic changes to land management (i.e., Forest Management, agricultural lands management)
		1	*eliminates or reduces soil erosion in watersheds through implementation of erosion control improvements to streams, creeks, and rivers.*
Bonus points = (auto calculate)	**1**		
Assists region in meeting FP-2, then Score 1 -->	1	FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).	
Assists region in meeting FP-3, then Score 1 -->		FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.	
Assists region in meeting FP-4, then Score 1 -->		FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.	

Environmental Protection and Enhancement (EV)

Assists region in meeting EV-1, then Score 1 -->		EV-1. Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.
Assists region in meeting EV-2, then Score 1 -->		EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when
Assists region in meeting EV-3, then Score 1 -->	1	EV-3. Minimize adverse environmental effects on biological and cultural resources when implementing strategies and projects.
Assists region in meeting EV-4, then Score 1 -->		EV-4. Identify opportunities for open spaces, trails and parks long streams and other recreational areas in the watershed that can be incorporated into
Assists region in meeting EV-5, then Score 1 -->		EV-5. Identify and integrate elements from appropriate Federal and State species protection and recovery plans.

Climate Change (CC)

Assists region in meeting CC-1, then Score 1 -->	1	CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.
Assists region in meeting CC-2, then Score 1 -->		CC-2. Support increased education, monitoring and research to increase understanding of long-term impacts of climate change in the region.
Assists region in meeting CC-3, then Score 1 -->		CC-3. Support efforts to increase education, research and use of energy conservation measures and alternatives to fossil fuel and non-renewable

Regional Communication and Cooperation (RCC)

Assists region to meet RC-1 (automatically calculated)	**1**	RC-1. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change impacts.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
		1	Partnerships ï The project is proposed by a partnership of multiple organizations enabling use of shared expertise and resources.
		1	Resource Management Strategy ï The project includes a RMS that is not already being implemented in the region thereby would provide diversification of strategies.
			Beneficial Uses ï The project supports several different beneficial uses (see CCRWQCB, *Basin Plan* Chapter 2, 2001)
			Geography ï The project implements a watershed-scale, regional-scale, or inter-regional project.
			Hydrology ï The project addresses multiple watershed functions within the hydrologic cycle.
Bonus points = (auto calculate)	**1.2**		
Assists region to meet RC-2 (automatically calculated)	**1**	RC-2. Foster collaboration among regional entities as an alternative to litigation. **	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
			PROVIDED INFORMATION early in project development to the public to assist in understanding the problem, alternatives, opportunities and/or solutions
			CONSULTED & OBTAINED FEEDBACK from all regional agency and non-governmental organizations (NGOs) regarding the problem, alternatives, opportunities and/or solutions
			CONSULTED & OBTAINED FEEDBACK from the public regarding the problem, alternatives, opportunities and/or solutions
			INVOLVED & WORKED DIRECTLY WITH two or more regional agency and/or NGO stakeholders regarding the problem, alternatives, opportunities, and/or solutions
		1	COLLABORATED WITH, OR MADE PARTNERSHIPS with two or more agencies or NGOs on each aspect of the decision
Bonus points = (auto calculate)	**0.6**		
Assists region in meeting RC-3, then Score 1 -->	1	RC-3. Identify and pursue additional opportunities for public education, outreach, and communication on water resource management and climate change, including to disadvantaged communities and stakeholders with interests in water management issues.	
Assists region in meeting RC-4, then Score 1 -->		RC-4. Build relationships with State and Federal regulatory agencies and water forums and agencies.	

Total Points for IRWM Objectives =	**12.6**

Resource Management Strategies (DWR Review Factor B)

Score one point for any Resource Management Strategies (RMS) that the proposed project will address. (* = RMS was included in 2007 IRWM Plan.) (Max points: 30)

CWP Outcome Category 1:		**Reduced Water Demand**
		Agriculture Water Use Efficiency
		Urban Water Use Efficiency *
		Crop Idling for Water Transfers
		Irrigated Land Retirement
		Rainfed Agriculture
CWP Outcome Category 2:		**Improve Operational Efficiency and Transfers**
		Conveyance – Regional/Local *
		System Reoperation
		Water Transfers *
		Waterbag Transport/Storage Technology *
CWP Outcome Category 3:		**Increase Water Supply**
		Conjunctive Management & Groundwater Storage *
		Seawater or Brackish Water Desalination *
		Precipitation Enhancement
		Recycled Municipal Water *
		Surface Storage – Regional/local *
		Dewvaportation or Atmospheric Pressure Desalination
		Fog Collection
CWP Outcome Category 4:		**Improve Water Quality**
		Drinking Water Treatment and Distribution *
		Groundwater Remediation/Aquifer Remediation
		Matching Quality to Use
	1	Pollution Prevention *
		Salt and Salinity Management
		Urban Runoff Management *
CWP Outcome Category 5:		**Improve Flood Management**
		Flood Risk Management *
CWP Outcome Category 6:		**Practice Resources Stewardship**
	1	Agriculture Lands Stewardship
		Economic Incentives
		Ecosystem Restoration *
		Forest Management *
		Recharge Area Protection
		Water-Dependent Recreation *
	1	Watershed Management *
	1	**Score one additional point for each additional CWP Outcome category, above one, from which the project is implementing a RMS. (Max: 5 points)**

Total RMS Points =	**4**

Strategic Considerations (DWR Review Factor J)

Does the project address inter-regional issues (such as regional monitoring of A SBS, former Fort Ord water supplies, etc.)? If so, explain.

Inter-regional Points (Yes: 5 pts; No: 0 pts) =	

How many agencies and/or non-governmental organizations are partnering to implement the project? List the agencies and organization that are working together to implement the project.

3

Partnerships Points (Score 5 points if 3 or more, 2 points if 2 or more, score 0 for no partnerships) =	5

Does the project include monitoring and reporting components to ensure achiev ement of performance criteria (i.e., IRWM objectives achievement and/or relevant regulatory requirements)?

Yes

Performance Monitoring/Reporting Points (Yes: 5 pts; No: 0 pts) =	5

Does the project integrate with local land use and water planning? Does the project increase coordination between water resruoces agencies and land use planners? Is the project consistent w ith land use plans and policies?

The project is consistent with local land use plans

Land Use Integration Points (Score: 5 points if "yes" to all three questions; 3 points if "Yes" to 2 questions; 1 point for "yes" to one question) =	1

DAC and Native Americans and Environmental Justice (DWR Review Factors D, E and f)

Does the project provide specific benefits to disadvantaged communities and/or Native American tribal communities? If so, explain.

No

DAC &/or Native American Points (Yes: 5 pts; No: 0 pts) =	

Does the project address any known environmental justice issues? Does the project *avoid disproportionately affecting disadvantaged communities* ?

No

Environmental Justice Points (Yes for both: 5 pts; No for either: 0 pts) =	

Climate Change Adaptation and Mitigation (DWR Review Factors K and L)

Put an X next to any climate change adaptation or mitigation strategy the proposed project will contribute to.

Adaptation Strategies

	Improve water supply reliability
	Expand conjunctive use of multiple water supply sources
	Increase water use and/or reuse efficiency
	Provide additional water supply
1	Promote water quality protection
	Reduce water demand
	Advance / expand recycled water use
	Promote urban runoff reuse
	Address sea level rise
	Address other anticipated climate change impacts
	Improve flood control
	Promote habitat protection
	Establish migration corridors
	Re-establish river-floodplain hydrologic continuity
	Re-introduce anadromous fish populations to watershed
	Implement one or more recommendations from the *Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)*
	Enhance and protect watershed forest and meadow systems

Please describe: road erosion reduction projects will be prioritized partly according to their benefit to water quality protection by reducing movement of eroded soils into local waterways.

Climate Change Adaptation (Score 1 for every strategy implemented, up to 5 max) =	1

Mitigation Strategies

	Increase water use efficiency or promote energy-efficient water demand reduction
	Improve water system energy efficiency
	Advance / expand recycled water use
	Promote urban runoff reuse
	Promote use of renewable energy sources
	Contribute to carbon sequestration

Does the proposed project reduce regional greenhouse gas emissions and/or improv e energy efficiency compared to alternative proposed projects meeting the same regional objectiv es? If so, explain how.

Please describe:

Climate Change Mitigation (Score 1 for every strategy implemented, up to 5 max) =	

Technical Feasibility (DWR Review Factor C)

Discuss the technical feasibility of the project. If possible, cite references that contain information about the proposed project and detail the technical feasibility of the project.

Methods employed by this program to assess and treat erosion associated with roads are well-tested and documented in multiple sources, including the Salmonid Restoration Manual

30 points: Technical feasibility has been documented in a project-specific pilot study or previous phase or has a documented track record of success

OR
10 points: has the technology proposed been established as effective in similar situations?
10 points: Are project site conditions documented (geology/soil, ecology, hydrology, land use, public utilities)?
10 points: Do the project partners have experience with similar projects? (e.g., similar site, similar technology).

Technical Feasibility Points (See above) =	30

Project Cost and Financing (DWR Review Factor G)

Total Estimated Capital Cost	$640,000	
Annual Operation & Maintenance (O&M) Cost	$0	
Cost Basis (Year)	3	
Source(s) of Funding for Capital	IRWM, NRCS, participating Road Associations	
Source(s) of Funding for O&M Cost		
Project Life (years)	30	
Provide link to project cost estimate, if available		
25% Match Confirmed (Yes or No)?		
Cost and Financing Points (10 points if above information provided; 10 points if 25% or more funding match confirmed) =		

Economic Feasibility (DWR Review Factor H)

Has a benefit:cost or cost effectiveness analysis been completed for your project? If so, please cite reference and briefly summarize. If no economic analysis has been completed for the project, the project may receive zero points out of a possible 25 points for the Economic Feasibility review factor unless the project is a DAC project. If the project is not a DAC project but the B:C ratio is expected to be greater than 1, please provide a justification. The lack of an economic analysis may also affect the Project Status score.

analysis has been completed

If known, please provide the Benefit:Cost Ratio.

Provide a detailed discussion of the benefits the project will provide. To the extent possible, quantify changes and benefits (e.g. water quality and water supply benefits) that will result from project implementation; otherwise, describe benefits qualitatively.

Actual physical benefits will depend upon the sites selected and the severity of their drainage and erosion concerns. The primary benefits will be public safety for those using improved roads, soil stabilization along the roads and their drainage outlets, reduced sediment deposition downslope and in adjacent waterways, and protected habitat on the stabilized slopes and impacted streams.

Economic Feasibility Points (Score: 15 points if a benefit:cost or cost effectiveness analysis has been completed or project is a DAC project; PLUS 10 points if the benefit:cost ratio or cost-effectiveness score is acceptable, i.e., B:C > 1) =	

Project Status (DWR Review Factor I)

Proposed Project Start Date:	7/1/2014
Estimated Project Completion Date:	6/30/2017

Indicate the status (pending, in process, complete) of the following.

Project Implementation Milestone	**Status**	**% Complete**	Estimated Completion Date
Conceptual/Preliminary Plans Complete		0	12/31/2015
CEQA/NEPA Completed		0	12/31/2015
Local Cost Share Confirmed		0	7/1/2015
ROW/Land Acquisition/Land Owner Approval		0	7/1/2016
Permits Received		0	6/30/2017
Construction Drawings Complete & Bids Acquired		0	6/30/2017

Project Status Points (4 points for each of the above that are completed =	

PROJECT OVERVIEW

General Project Information

Project Title:	Incorporation of the Peninsula in the Central Coast Action Tracke
Project Location:	Cities of Pacific Grove, Montere
Estimated Cost:	$80,000

Brief Project Description (1 to 2 sentences):

Integration of Monterey Peninsula IRWM and municiple stormwater programs into the Central Coast Action Tracker.

Project Proponent Information

Contact Name:	Sierra Ryan
Affiliation:	Central Coast Wetlands Group at Moss Landing Marine Labs
Address:	8272 Moss Landing Road, Moss Landing, CA, 95060
Phone Number:	(831) 771-4463
Email:	sryan@mlml.calstate.edu

Other participating and/or partner agencies/organizations (if applicable):

The members of the Monterey Regional Stormwater Management Program, including City of Carmel-by-the-Sea, the City of Del Rey Oaks, the City of Marina, the City of Monterey, the City of Pacific Grove, the City of Sand City, the City of Seaside and the County of Monterey. This project is also includes the Monterey Bay National Marine Sanctuary, who helped develop the tool.

DETAILED PROJECT INFORMATION

Description

Please provide a description of your project (including the location) and its purpose, what will be constructed and/or implemented, how the project will function, the area(s) and/or entities that will be affected by or will benefit from the project, and any potential obstacles to implementation.

In 2010, the Greater Monterey County RWMG was granted an IRWMP Planning Grant. As one component, they built a comprehensive website for tracking projects related to water throughout the Central Coast. This was to fill a void left by existing water quality and other tracking portals to provide a comprehensive look at the location and essential information for all water related projects in the region. The Central Coast Action Tracker is in Beta testing and will be completed in September 2013, available at www.ccactiontracker.org. It has been designed primarily for Monterey County IRWM projects and RCD projects. However, this website has the capacity, with a little additional development work, to track programs such as municipal stormwater, evaluate water supply projects, and record urban LID projects. To reach its maximum utility, the CCAT needs to be populated with current and completed projects.

The Action Tracker is an extremely versatile tool that has many features we believe would be quite useful to meeting the needs of project managers in the Monterey Peninsula region. Features include a mapping interface that allows projects to be entered and searched by exact location or by watershed. Projects can also be searched by type, by funder, or by implementing organization. Reports can be generated summarizing the work of a single project, or a group of projects. Data viewing is available for two levels, the project proponents and the

general public. Some proprietary information can be hidden so that it is only seen by the project proponent for their tracking purposes, while data they want to share can be available to the public. The tracker is also designed to track the results of the CalEEMOD greenhouse gas emissions tool. The purpose of this website is to assist project managers, conservation organizations, and the general public find and share information about conservation projects on the Central Coast.

We are proposing that funding be available for the Monterey Peninsula IRWMP to do the following:
1) provide key partners in the region an opportunity to review and make additions to the CCAT
2) modify the CCAT based on the needs of peninsula regional partners to include more urban projects.
3) fund peninsula partners to enter existing projects into the CCAT to help populate that region.

The result will be a comprehensive tracking system that can show the cumulative success of existing programs, the areas where on the ground work is not happening sufficiently, as well as providing project tracking for project proponents.

IRWM Objectives (DWR Review Factor A)

Click the appropriate check box or radio button to indicate that your project meets a particular objective. There is a maximum of 25 points for meeting an objectives, plus additional points as described for implementing projects that assist in meeting High Priority Objectives ("HPO") (identified with **).

Water Supply (WS)

Assists region to meet WS-1 (automatically calculated)	**0**	WS-1. Meet existing water supply replacement needs of the Carmel River system and Seaside Groundwater Basin.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Larger water supply quantities yield more points up to total of 3 normalized points.	
			up to 900 AFY
			at least 900 AFY (10%)
			at least 1800 AFY (20%)
			at least 2700 AFY (30%)
			at least 3600 AFY (40%)
			at least 4500 AFY (50%)
			at least 5400 AFY (60%)
			at least 6300 AFY (70%)
			at least 7200 AFY (80%)
			at least 8100 AFY (90%)
			at least 9000 AFY (100%)
Bonus Points = (auto calculate)	**0**		
Assists region to meet WS-2 (automatically calculated)	**0**	WS-2. Maximize use of recycled water.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to 4 raw points; 3 normalized points)	
			provides recycled water to one or more properties within the region.
			provides recycled water from a package plant or provides source water to either CAWD or MRWPCA
			expands output of recycled water from either CAWD or MRWPCA
			all possible recycled water [currently estimated to be 4,800 AFY, including up to 300 AFY from CAWD WWTP and 4,500 AFY from MRWPCA WWTP]
Bonus points = (auto calculate)	**0**		
Assists region in meeting WS-3, then Score 1 -->		WS-3. Seek long-term sustainable supplies for adopted future demand estimates.	
Assists region in meeting WS-4, then Score 1 -->		WS-4. Optimize conjunctive use of surface and groundwater.	
Assists region in meeting WS-5, then Score 1 -->	1	WS-5. Evaluate, advance, or create water conservation throughout the Region in compliance with the State's 20x2020 Water Conservation Plan.	

Water Quality (WQ)

Assists region to meet WQ-1 (automatically calculated)	**1**	WQ-1. Improve ocean water quality, including Areas of Special Biological Significance (ASBS), by minimizing pollutants in stormwater discharges.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 9 raw points; 3 normalized points):
	1	*implements regional monitoring or contributes to statewide water quality monitoring*
		assists in defining "natural ocean water quality" for one or more ASBS
		removes trash from storm water
		eliminates or reduces soil erosion in watersheds discharging to the ocean
		eliminates or reduces the risk of a source of non-storm water discharge
		implements low impact development (LID) measures within existing developed areas
		reduces pollutant load during design storm events from one or more storm water point source by 90% compared to 2011-2012
		reduces pollutant load during design storm events from 2 or more stormwater point sources by 90% compared to 2011-12
		achieves Table B Instantaneous Max. Water Quality Objectives in Ch. II of the Ocean Plan on average
Bonus points = (auto calculate)	**0.3333**	
Assists region to meet WQ-2 (automatically calculated)	**0**	WQ-2. Improve inland surface water quality for environmental resources (e.g. steelhead) and potable water supplies.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 6 raw points; 3 normalized points):
		increases regional monitoring or contributes to statewide water quality monitoring
		assists in meeting Basin Plan TMDLs or NPDES permit limits
		removes trash from storm water
		eliminates or reduces soil erosion, contaminant sources
		eliminates or reduces the risk of a source of non-storm water discharge
		implements low impact development (LID) features, techniques, and practices within existing developed areas
Bonus points = (auto calculate)	**0**	
Assists region to meet WQ-3 (automatically calculated)	**0**	WQ-3. Protect and improve water quality in groundwater basins.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 2 raw points; 3 normalized points):
		increases groundwater basin monitoring or contributes to statewide water quality monitoring.
		prevents, reduces, or minimizes groundwater quality degradation through reduction in pollutant loads, remediation, reclamation and reuse, or through enhancement of groundwater levels/volumes thereby reducing the potential for seawater intrusion.
Bonus points = (auto calculate)	**0**	
Assists region in meeting WQ-4, then Score 1 -->		WQ-4. Meet or exceed water quality standards established by regulatory agencies and stakeholders.

Flood Protection & Erosion Prevention (FP)

Assists region to meet FP-1a (automatically calculated)	**0**	FP-1a. Develop regional projects and plans necessary to protect existing infrastructure from flood damage, in particular, along the southern Monterey Bay shoreline and Carmel Valley.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Removal of more properties from the floodplain yields more points up to total of 3 normalized points.	
			removes at least one (1) property from a 100-year flood zone
			removes at least five (5) properties from the 100-year flood zone
			removes at least 20 properties from a 100-year flood zone
			removes at least 50 properties from a 100-year flood zone
			removes at least 100 properties from a 100-year flood zone
Bonus points = (auto calculate)	**0**		
Assists region to meet FP-1b (automatically calculated)	**1**	FP-1b. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from erosion (including erosion exacerbated by sea level rise).**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 3 raw points; 3 normalized points):	
			implements one or more measures from the document: Evaluation of Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)
		1	*implements one or more components of region-wide, outreach, public education, or other program aimed at systematic changes to land management (i.e., Forest Management, agricultural lands management)*
			eliminates or reduces soil erosion in watersheds through implementation of erosion control improvements to streams, creeks, and rivers.
Bonus points = (auto calculate)	**1**		
Assists region in meeting FP-2, then Score 1 -->	1	FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).	
Assists region in meeting FP-3, then Score 1 -->		FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.	
Assists region in meeting FP-4, then Score 1 -->		FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.	

Environmental Protection and Enhancement (EV)

Assists region in meeting EV-1, then Score 1 -->		EV-1. Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.
Assists region in meeting EV-2, then Score 1 -->	1	EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when
Assists region in meeting EV-3, then Score 1 -->		EV-3. Minimize adverse environmental effects on biological and cultural resources when implementing strategies and projects.
Assists region in meeting EV-4, then Score 1 -->		EV-4. Identify opportunities for open spaces, trails and parks long streams and other recreational areas in the watershed that can be incorporated into
Assists region in meeting EV-5, then Score 1 -->		EV-5. Identify and integrate elements from appropriate Federal and State species protection and recovery plans.

Climate Change (CC)

Assists region in meeting CC-1, then Score 1 -->	1	CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.
Assists region in meeting CC-2, then Score 1 -->		CC-2. Support increased education, monitoring and research to increase understanding of long-term impacts of climate change in the region.
Assists region in meeting CC-3, then Score 1 -->		CC-3. Support efforts to increase education, research and use of energy conservation measures and alternatives to fossil fuel and non-renewable

Regional Communication and Cooperation (RCC)

Assists region to meet RC-1 (automatically calculated)	**1**	RC-1. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change impacts.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
	1	Partnerships ï The project is proposed by a partnership of multiple organizations enabling use of shared expertise and resources.	
	1	Resource Management Strategy ï The project includes a RMS that is not already being implemented in the region thereby would provide diversification of strategies.	
		Beneficial Uses ï The project supports several different beneficial uses (see CCRWQCB, *Basin Plan* Chapter 2, 2001)	
	1	Geography ï The project implements a watershed-scale, regional-scale, or inter-regional project.	
	1	Hydrology ï The project addresses multiple watershed functions within the hydrologic cycle.	
Bonus points = (auto calculate)	**2.4**		
Assists region to meet RC-2 (automatically calculated)	**1**	RC-2. Foster collaboration among regional entities as an alternative to litigation. **	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
		PROVIDED INFORMATION early in project development to the public to assist in understanding the problem, alternatives, opportunities and/or solutions	
	1	CONSULTED & OBTAINED FEEDBACK from all regional agency and non-governmental organizations (NGOs) regarding the problem, alternatives, opportunities and/or solutions	
	1	CONSULTED & OBTAINED FEEDBACK from the public regarding the problem, alternatives, opportunities and/or solutions	
	1	INVOLVED & WORKED DIRECTLY WITH two or more regional agency and/or NGO stakeholders regarding the problem, alternatives, opportunities, and/or solutions	
	1	COLLABORATED WITH, OR MADE PARTNERSHIPS with two or more agencies or NGOs on each aspect of the decision	
Bonus points = (auto calculate)	**2.4**		
Assists region in meeting RC-3, then Score 1 -->	1	RC-3. Identify and pursue additional opportunities for public education, outreach, and communication on water resource management and climate change, including to disadvantaged communities and stakeholders with interests in water management issues.	
Assists region in meeting RC-4, then Score 1 -->	1	RC-4. Build relationships with State and Federal regulatory agencies and water forums and agencies.	

Total Points for IRWM Objectives =	**16.1**

Resource Management Strategies (DWR Review Factor B)

Score one point for any Resource Management Strategies (RMS) that the proposed project will address. (* = RMS was included in 2007 IRWM Plan.) (Max points: 30)

CWP Outcome Category 1:		**Reduced Water Demand**
		Agriculture Water Use Efficiency
	1	Urban Water Use Efficiency *
		Crop Idling for Water Transfers
		Irrigated Land Retirement
		Rainfed Agriculture
CWP Outcome Category 2:		**Improve Operational Efficiency and Transfers**
		Conveyance – Regional/Local *
		System Reoperation
		Water Transfers *
		Waterbag Transport/Storage Technology *
CWP Outcome Category 3:		**Increase Water Supply**
		Conjunctive Management & Groundwater Storage *
		Seawater or Brackish Water Desalination *
		Precipitation Enhancement
		Recycled Municipal Water *
		Surface Storage – Regional/local *
		Dewvaportation or Atmospheric Pressure Desalination
		Fog Collection
CWP Outcome Category 4:		**Improve Water Quality**
		Drinking Water Treatment and Distribution *
		Groundwater Remediation/Aquifer Remediation
		Matching Quality to Use
	1	Pollution Prevention *
		Salt and Salinity Management
	1	Urban Runoff Management *
CWP Outcome Category 5:		**Improve Flood Management**
		Flood Risk Management *
CWP Outcome Category 6:		**Practice Resources Stewardship**
		Agriculture Lands Stewardship
		Economic Incentives
		Ecosystem Restoration *
		Forest Management *
		Recharge Area Protection
		Water-Dependent Recreation *
	1	Watershed Management *
		Score one additional point for each additional CWP Outcome category, above one, from which the project is implementing a RMS. (Max: 5 points)

Total RMS Points = **4**

Strategic Considerations (DWR Review Factor J)

Does the project address inter-regional issues (such as regional monitoring of A SBS, former Fort Ord water supplies, etc.)? If so, explain.

Yes, regional project tracking goes beyond the Peninsula region to cover the entire Central Coast. Projects that take place within multiple IRWM regions, or those which take place in one region but have an impact in another region, will all be included.

Inter-regional Points (Yes: 5 pts; No: 0 pts) =	5

How many agencies and/or non-governmental organizations are partnering to implement the project? List the agencies and organization that are working together to implement the project.

The CCAT already represents the regional RCDs and the project proponents included in the Greater Monterey County region. To date, 4 Resource Conservation Districts, the Sanctuary and the Greater Monterey Regional IRWMP have already agreed to participate. We will work with municipalities within the Peninsula region and throughout the Monterey Bay to ensure the Tracker provides the utility needed for tracking and reporting.

Partnerships Points (Score 5 points if 3 or more, 2 points if 2 or more, score 0 for no partnerships) =	5

Does the project include monitoring and reporting components to ensure achiev ement of performance criteria (i.e., IRWM objectives achievement and/or relevant regulatory requirements)?

Reporting will consist of number of municipalities and special districts that participate in the regional project tracking efforts.

Performance Monitoring/Reporting Points (Yes: 5 pts; No: 0 pts) =	5

Does the project integrate with local land use and water planning? Does the project increase coordination between water resruoces agencies and land use planners? Is the project consistent w ith land use plans and policies?

Yes, all of these are among the primary objectives of the CCAT.

Land Use Integration Points (Score: 5 points if "yes" to all three questions; 3 points if "Yes" to 2 questions; 1 point for "yes" to one question) =	5

DAC and Native Americans and Environmental Justice (DWR Review Factors D, E and f)

Does the project provide specific benefits to disadvantaged communities and/or Native American tribal communities? If so, explain.

DAC &/or Native American Points (Yes: 5 pts; No: 0 pts) =	0

Does the project address any known environmental justice issues? Does the project *avoid disproportionately affecting disadvantaged communities* ?

Environmental Justice Points (Yes for both: 5 pts; No for either: 0 pts) =	0

Climate Change Adaptation and Mitigation (DWR Review Factors K and L)

Put an X next to any climate change adaptation or mitigation strategy the proposed project will contribute to.

Adaptation Strategies

	Improve water supply reliability
	Expand conjunctive use of multiple water supply sources
	Increase water use and/or reuse efficiency
	Provide additional water supply
x	Promote water quality protection
	Reduce water demand
x	Advance / expand recycled water use
x	Promote urban runoff reuse
	Address sea level rise
	Address other anticipated climate change impacts
	Improve flood control
	Promote habitat protection
	Establish migration corridors
	Re-establish river-floodplain hydrologic continuity
	Re-introduce anadromous fish populations to watershed
	Implement one or more recommendations from the *Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)*
x	Enhance and protect watershed forest and meadow systems

Please describe:

Climate Change Adaptation (Score 1 for every strategy implemented, up to 5 max) =	4

Mitigation Strategies

	Increase water use efficiency or promote energy-efficient water demand reduction
	Improve water system energy efficiency
x	Advance / expand recycled water use
x	Promote urban runoff reuse
	Promote use of renewable energy sources
	Contribute to carbon sequestration

Does the proposed project reduce regional greenhouse gas emissions and/or improv e energy efficiency compared to alternative proposed projects meeting the same regional objectiv es? If so, explain how.

Please describe:

Climate Change Mitigation (Score 1 for every strategy implemented, up to 5 max) =	2

Technical Feasibility (DWR Review Factor C)

Discuss the technical feasibility of the project. If possible, cite references that contain information about the proposed project and detail the technical feasibility of the project.

The project has documented success at tracking management efforts among partner entities. The CCAT is already up and running and the Beta testing of the current web interface and database is nearly completed. GreenInfo, the contractor, has developed similar technologies for several other IRWMP and Water Board regions.

30 points: Technical feasibility has been documented in a project-specific pilot study or previous phase or has a documented track record of success

OR

10 points: has the technology proposed been established as effective in similar situations?
10 points: Are project site conditions documented (geology/soil, ecology, hydrology, land use, public utilities)?
10 points: Do the project partners have experience with similar projects? (e.g., similar site, similar technology).

Technical Feasibility Points (See above) =	30

Project Cost and Financing (DWR Review Factor G)

Total Estimated Capital Cost	$80,000	
Annual Operation & Maintenance (O&M) Cost	$6,000	
Cost Basis (Year)		
Source(s) of Funding for Capital	Previous IRWMP Planning Grant for Greater Monterey Regional.	
Source(s) of Funding for O&M Cost	CCWG and Greater Monterey Bay IRWMP have secured 3 years of O&M.	
Project Life (years)	20	
Provide link to project cost estimate, if available	www.centralcoastwetlands.org	
25% Match Confirmed (Yes or No)?	Yes	Cost Share is available through several grants administered by CCWG and through partners contributing to this project. If funded within timeframe estimated above, USEPA grant funds to CCWG to develop state project tracking capacity will be used for cost share. If project funding is delayed, other source will be identified based on funding start date.
Cost and Financing Points (10 points if above information provided; 10 points if 25% or more funding match confirmed) =	20	

Economic Feasibility (DWR Review Factor H)

Has a benefit:cost or cost effectiveness analysis been completed for your project? If so, please cite reference and briefly summarize. If no economic analysis has been completed for the project, the project may receive zero points out of a possible 25 points for the Economic Feasibility review factor unless the project is a DAC project. If the project is not a DAC project but the B:C ratio is expected to be greater than 1, please provide a justification. The lack of an economic analysis may also affect the Project Status score.

No. The Greater Monterey Bay regional effort was completed as part of the phase I planning grant and therefore no cost benefit analysis was needed. However, it is easy to quantify the value of this project to the Monterey Peninsula by estimating the costs to local municipalities in reporting IRWM, Stormwater and LID project efforts. This tool will greatly reduce costs of tracking projects and enable the peninsula to better report

If known, please provide the Benefit:Cost Ratio.

Provide a detailed discussion of the benefits the project will provide. To the extent possible, quantify changes and benefits (e.g. water quality and water supply benefits) that will result from project implementation; otherwise, describe benefits qualitatively.

The project will support a streamlined process to track all surface water quality management efforts using a standard set of qualifiers that will aid local governments and the IRWM to report the cumulative efforts of partner institutions. The geographic tools will support local watershed planning efforts and help provide the necessary data needed to estimate cumulative water quality value to individual drainages from a disparate set of efforts including LID on private properties, stormwater infrastructure maintenance and upgrades, street sweeping, drainage enhancements and creek restoration. Additional tools being developed by SCRCD can be integrated into this tracking effort to begin to estimate the cumulative load reduction of combine actions.

Reporting tools will aid municipalities to better report on actions taken to regulatory agencies and grant administrators.

Economic Feasibility Points (Score: 15 points if a benefit:cost or cost effectiveness analysis has been completed or project is a DAC project; PLUS 10 points if the benefit:cost ratio or cost-effectiveness score is acceptable, i.e., B:C > 1) =	

Project Status (DWR Review Factor I)

Proposed Project Start Date:	7/1/2014
Estimated Project Completion Date:	6/30/2015

Indicate the status (pending, in process, complete) of the following.

Project Implementation Milestone	**Status**	**% Complete**	Estimated Completion Date
Conceptual/Preliminary Plans Complete	Pilot effort complete and Beta Action Tracker is on line	85	10/1/2013
CEQA/NEPA Completed	N/A		
Local Cost Share Confirmed		80	3/1/2014
ROW/Land Acquisition/Land Owner Approval	N/A		
Permits Received	N/A		
Construction Drawings Complete & Bids Acquired	N/A		

Project Status Points (4 points for each of the above that are completed =	22

PROJECT OVERVIEW

General Project Information

Project Title:	Del Monte Lift Station Upgrades
Project Location:	Seaside
Estimated Cost:	$984,000

Brief Project Description (1 to 2 sentences):

Upgrades to prevent accidental discharges from Del Monte Sewer Lift Station.

Project Proponent Information

Contact Name:	Rick Riedl
Affiliation:	City of Seaside
Address:	440 Harcourt Ave
Phone Number:	831-899-6884
Email:	RRiedl@ci.seaside.ca.us

Other participating and/or partner agencies/organizations (if applicable):

Seaside County Sanitation District

DETAILED PROJECT INFORMATION

Description

Please provide a description of your project (including the location) and its purpose, what will be constructed and/or implemented, how the project will function, the area(s) and/or entities that will be affected by or will benefit from the project, and any potential obstacles to implementation.

The current Del Monte Lift Station wet well operating volume is inadequate for existing inflow, causing excessive pump cycling and low emergency response time. This upgrade proposes to install a bypass to the wet well, allowing for emergency pumping in the case of pump failure and installing an emergency power generator in case of power failure. The proposed upgrades will help prevent accidental discharges to the Roberts Lake.

IRWM Objectives (DWR Review Factor A)

Water Supply (WS)

Assists region to meet WS-1 (automatically calculated)	**0**	WS-1. Meet existing water supply replacement needs of the Carmel River system and Seaside Groundwater Basin.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Larger water supply quantities yield more points up to total of 3 normalized points.	
			up to 900 AFY
			at least 900 AFY (10%)
			at least 1800 AFY (20%)
			at least 2700 AFY (30%)
			at least 3600 AFY (40%)
			at least 4500 AFY (50%)
			at least 5400 AFY (60%)
			at least 6300 AFY (70%)
			at least 7200 AFY (80%)
			at least 8100 AFY (90%)
			at least 9000 AFY (100%)
Bonus Points = (auto calculate)	**0**		
Assists region to meet WS-2 (automatically calculated)	**0**	WS-2. Maximize use of recycled water.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to 4 raw points; 3 normalized points)	
			provides recycled water to one or more properties within the region.
			provides recycled water from a package plant or provides source water to either CAWD or MRWPCA
			expands output of recycled water from either CAWD or MRWPCA
			all possible recycled water [currently estimated to be 4,800 AFY, including up to 300 AFY from CAWD WWTP and 4,500 AFY from MRWPCA WWTP]
Bonus points = (auto calculate)	**0**		
Assists region in meeting WS-3, then Score 1 -->		WS-3. Seek long-term sustainable supplies for adopted future demand estimates.	
Assists region in meeting WS-4, then Score 1 -->		WS-4. Optimize conjunctive use of surface and groundwater.	
Assists region in meeting WS-5, then Score 1 -->		WS-5. Evaluate, advance, or create water conservation throughout the Region in compliance with the State's 20x2020 Water Conservation Plan.	

Water Quality (WQ)

Assists region to meet WQ-1 (automatically calculated)	**1**	WQ-1. Improve ocean water quality, including Areas of Special Biological Significance (ASBS), by minimizing pollutants in stormwater discharges.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 9 raw points; 3 normalized points):
		implements regional monitoring or contributes to statewide water quality monitoring
		assists in defining "natural ocean water quality" for one or more ASBS
		removes trash from storm water
		eliminates or reduces soil erosion in watersheds discharging to the ocean
	1	*eliminates or reduces the risk of a source of non-storm water discharge*
		implements low impact development (LID) measures within existing developed areas
		reduces pollutant load during design storm events from one or more storm water point source by 90% compared to 2011-2012
		reduces pollutant load during design storm events from 2 or more stormwater point sources by 90% compared to 2011-12
		achieves Table B Instantaneous Max. Water Quality Objectives in Ch. II of the Ocean Plan on average
Bonus points = (auto calculate)	**0.3333**	
Assists region to meet WQ-2 (automatically calculated)	**1**	WQ-2. Improve inland surface water quality for environmental resources (e.g. steelhead) and potable water supplies.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 6 raw points; 3 normalized points):
		increases regional monitoring or contributes to statewide water quality monitoring
		assists in meeting Basin Plan TMDLs or NPDES permit limits
		removes trash from storm water
		eliminates or reduces soil erosion, contaminant sources
	1	*eliminates or reduces the risk of a source of non-storm water discharge*
		implements low impact development (LID) features, techniques, and practices within existing developed areas
Bonus points = (auto calculate)	**0.5**	
Assists region to meet WQ-3 (automatically calculated)	**0**	WQ-3. Protect and improve water quality in groundwater basins.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 2 raw points; 3 normalized points):
		increases groundwater basin monitoring or contributes to statewide water quality monitoring.
		prevents, reduces, or minimizes groundwater quality degradation through reduction in pollutant loads, remediation, reclamation and reuse, or through enhancement of groundwater levels/volumes thereby reducing the potential for seawater intrusion.
Bonus points = (auto calculate)	**0**	
Assists region in meeting WQ-4, then Score 1 -->		WQ-4. Meet or exceed water quality standards established by regulatory agencies and stakeholders.

Flood Protection & Erosion Prevention (FP)

Assists region to meet FP-1a (automatically calculated)	**0**	FP-1a. Develop regional projects and plans necessary to protect existing infrastructure from flood damage, in particular, along the southern Monterey Bay shoreline and Carmel Valley.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Removal of more properties from the floodplain yields more points up to total of 3 normalized points.	
			removes at least one (1) property from a 100-year flood zone
			removes at least five (5) properties from the 100-year flood zone
			removes at least 20 properties from a 100-year flood zone
			removes at least 50 properties from a 100-year flood zone
			removes at least 100 properties from a 100-year flood zone
Bonus points = (auto calculate)	**0**		
Assists region to meet FP-1b (automatically calculated)	**0**	FP-1b. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from erosion (including erosion exacerbated by sea level rise).**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 3 raw points; 3 normalized points):	
			implements one or more measures from the document: Evaluation of Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)
			implements one or more components of region-wide, outreach, public education, or other program aimed at systematic changes to land management (i.e., Forest Management, agricultural lands management)
			eliminates or reduces soil erosion in watersheds through implementation of erosion control improvements to streams, creeks, and rivers.
Bonus points = (auto calculate)	**0**		
Assists region in meeting FP-2, then Score 1 -->		FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).	
Assists region in meeting FP-3, then Score 1 -->		FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.	
Assists region in meeting FP-4, then Score 1 -->		FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.	

Environmental Protection and Enhancement (EV)

Assists region in meeting EV-1, then Score 1 -->	1	EV-1. Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.
Assists region in meeting EV-2, then Score 1 -->		EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when
Assists region in meeting EV-3, then Score 1 -->	1	EV-3. Minimize adverse environmental effects on biological and cultural resources when implementing strategies and projects.
Assists region in meeting EV-4, then Score 1 -->		EV-4. Identify opportunities for open spaces, trails and parks long streams and other recreational areas in the watershed that can be incorporated into
Assists region in meeting EV-5, then Score 1 -->		EV-5. Identify and integrate elements from appropriate Federal and State species protection and recovery plans.

Climate Change (CC)

Assists region in meeting CC-1, then Score 1 -->		CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.
Assists region in meeting CC-2, then Score 1 -->		CC-2. Support increased education, monitoring and research to increase understanding of long-term impacts of climate change in the region.
Assists region in meeting CC-3, then Score 1 -->		CC-3. Support efforts to increase education, research and use of energy conservation measures and alternatives to fossil fuel and non-renewable

Regional Communication and Cooperation (RCC)

Assists region to meet RC-1 (automatically calculated)	**0**	RC-1. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change impacts.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
			Partnerships ï The project is proposed by a partnership of multiple organizations enabling use of shared expertise and resources.
			Resource Management Strategy ï The project includes a RMS that is not already being implemented in the region thereby would provide diversification of strategies.
			Beneficial Uses ï The project supports several different beneficial uses (see CCRWQCB, *Basin Plan* Chapter 2, 2001)
			Geography ï The project implements a watershed-scale, regional-scale, or inter-regional project.
			Hydrology ï The project addresses multiple watershed functions within the hydrologic cycle.
Bonus points = (auto calculate)	**0**		
Assists region to meet RC-2 (automatically calculated)	**0**	RC-2. Foster collaboration among regional entities as an alternative to litigation. **	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
			PROVIDED INFORMATION early in project development to the public to assist in understanding the problem, alternatives, opportunities and/or solutions
			CONSULTED & OBTAINED FEEDBACK from all regional agency and non-governmental organizations (NGOs) regarding the problem, alternatives, opportunities and/or solutions
			CONSULTED & OBTAINED FEEDBACK from the public regarding the problem, alternatives, opportunities and/or solutions
			INVOLVED & WORKED DIRECTLY WITH two or more regional agency and/or NGO stakeholders regarding the problem, alternatives, opportunities, and/or solutions
			COLLABORATED WITH, OR MADE PARTNERSHIPS with two or more agencies or NGOs on each aspect of the decision
Bonus points = (auto calculate)	**0**		
Assists region in meeting RC-3, then Score 1 -->		RC-3. Identify and pursue additional opportunities for public education, outreach, and communication on water resource management and climate change, including to disadvantaged communities and stakeholders with interests in water management issues.	
Assists region in meeting RC-4, then Score 1 -->		RC-4. Build relationships with State and Federal regulatory agencies and water forums and agencies.	

Total Points for IRWM Objectives =	**4.83**

Resource Management Strategies (DWR Review Factor B)

Score one point for any Resource Management Strategies (RMS) that the proposed project will address. (* = RMS was included in 2007 IRWM Plan.) (Max points: 30)

CWP Outcome Category 1:	**Reduced Water Demand**	
		Agriculture Water Use Efficiency
		Urban Water Use Efficiency *
		Crop Idling for Water Transfers
		Irrigated Land Retirement
		Rainfed Agriculture
CWP Outcome Category 2:	**Improve Operational Efficiency and Transfers**	
		Conveyance – Regional/Local *
		System Reoperation
		Water Transfers *
		Waterbag Transport/Storage Technology *
CWP Outcome Category 3:	**Increase Water Supply**	
		Conjunctive Management & Groundwater Storage *
		Seawater or Brackish Water Desalination *
		Precipitation Enhancement
		Recycled Municipal Water *
		Surface Storage – Regional/local *
		Dewvaportation or Atmospheric Pressure Desalination
		Fog Collection
CWP Outcome Category 4:	**Improve Water Quality**	
		Drinking Water Treatment and Distribution *
		Groundwater Remediation/Aquifer Remediation
		Matching Quality to Use
	1	Pollution Prevention *
		Salt and Salinity Management
		Urban Runoff Management *
CWP Outcome Category 5:	**Improve Flood Management**	
		Flood Risk Management *
CWP Outcome Category 6:	**Practice Resources Stewardship**	
		Agriculture Lands Stewardship
		Economic Incentives
		Ecosystem Restoration *
		Forest Management *
		Recharge Area Protection
		Water-Dependent Recreation *
		Watershed Management *
		Score one additional point for each additional CWP Outcome category, <u>above one</u>, from which the project is implementing a RMS. (Max: 5 points)

Total RMS Points =	**1**

Strategic Considerations (DWR Review Factor J)

Does the project address inter-regional issues (such as regional monitoring of A SBS, former Fort Ord water supplies, etc.)? If so, explain.

Inter-regional Points (Yes: 5 pts; No: 0 pts) =	

How many agencies and/or non-governmental organizations are partnering to implement the project? List the agencies and organization that are working together to implement the project.

2 entities - City of Seaside and Seaside County Sanitation District

Partnerships Points (Score 5 points if 3 or more, 2 points if 2 or more, score 0 for no partnerships) =	2

Does the project include monitoring and reporting components to ensure achiev ement of performance criteria (i.e., IRWM objectives achievement and/or relevant regulatory requirements)?

Yes

Performance Monitoring/Reporting Points (Yes: 5 pts; No: 0 pts) =	5

Does the project integrate with local land use and water planning? Does the project increase coordination between water resruoces agencies and land use planners? Is the project consistent w ith land use plans and policies?

Land Use Integration Points (Score: 5 points if "yes" to all three questions; 3 points if "Yes" to 2 questions; 1 point for "yes" to one question) =	3

DAC and Native Americans and Environmental Justice (DWR Review Factors D, E and f)

Does the project provide specific benefits to disadvantaged communities and/or Native American tribal communities? If so, explain.

The project is located in Census Tract 140, which is a DAC. It will directly benefit residents within the DAC by preventing discharge of wastewater to a publicly owned and frequented area.

DAC &/or Native American Points (Yes: 5 pts; No: 0 pts) =	5

Does the project address any known environmental justice issues? Does the project *avoid disproportionately affecting disadvantaged communities* ?

Environmental Justice Points (Yes for both: 5 pts; No for either: 0 pts) =	

Climate Change Adaptation and Mitigation (DWR Review Factors K and L)

Put an X next to any climate change adaptation or mitigation strategy the proposed project will contribute to.

Adaptation Strategies

	Improve water supply reliability
	Expand conjunctive use of multiple water supply sources
	Increase water use and/or reuse efficiency
	Provide additional water supply
	Promote water quality protection
	Reduce water demand
	Advance / expand recycled water use
	Promote urban runoff reuse
	Address sea level rise
	Address other anticipated climate change impacts
	Improve flood control
	Promote habitat protection
	Establish migration corridors
	Re-establish river-floodplain hydrologic continuity
	Re-introduce anadromous fish populations to watershed
	Implement one or more recommendations from the *Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)*
	Enhance and protect watershed forest and meadow systems

Please describe:

Climate Change Adaptation (Score 1 for every strategy implemented, up to 5 max) =	

Mitigation Strategies

	Increase water use efficiency or promote energy-efficient water demand reduction
	Improve water system energy efficiency
	Advance / expand recycled water use
	Promote urban runoff reuse
	Promote use of renewable energy sources
	Contribute to carbon sequestration

Does the proposed project reduce regional greenhouse gas emissions and/or improv e energy efficiency compared to alternative proposed projects meeting the same regional objectiv es? If so, explain how.

Please describe:

Climate Change Mitigation (Score 1 for every strategy implemented, up to 5 max) =	

Technical Feasibility (DWR Review Factor C)

Discuss the technical feasibility of the project. If possible, cite references that contain information about the proposed project and detail the technical feasibility of the project.

The project has completed the concept design phase. System components have been sized and the Preliminary Layout Plan is complete.

30 points: Technical feasibility has been documented in a project-specific pilot study or previous phase or has a documented track record of success

OR
10 points: has the technology proposed been established as effective in similar situations?
10 points: Are project site conditions documented (geology/soil, ecology, hydrology, land use, public utilities)?
10 points: Do the project partners have experience with similar projects? (e.g., similar site, similar technology).

Technical Feasibility Points (See above) =	30

Project Cost and Financing (DWR Review Factor G)

Total Estimated Capital Cost	$984,000	
Annual Operation & Maintenance (O&M) Cost	$0	
Cost Basis (Year)	2013	
Source(s) of Funding for Capital	Seaside County Sanitation District	
Source(s) of Funding for O&M Cost	Seaside County Sanitation District	
Project Life (years)	30	
Provide link to project cost estimate, if available		
25% Match Confirmed (Yes or No)?	Yes	County Sanitation District Board on June 11, 2013.
Cost and Financing Points (10 points if above information provided; 10 points if 25% or more funding match confirmed) =	20	

Economic Feasibility (DWR Review Factor H)

Has a benefit:cost or cost effectiveness analysis been completed for your project? If so, please cite reference and briefly summarize. If no economic analysis has been completed for the project, the project may receive zero points out of a possible 25 points for the Economic Feasibility review factor unless the project is a DAC project. If the project is not a DAC project but the B:C ratio is expected to be greater than 1, please provide a justification. The lack of an economic analysis may also affect the Project Status score.

The economic cost benefit analysis is difficult to evaluate because the project proposes to help prevent accidental discharges to a water body. However, if the potential benefit is assumed to be the avoidance of possible fines levied by a regulatory agency, for example a modest fine of approximately $20,000, then the Benefit-Cost ratio would be calculated to be much less than 1 (i.e. approximately 1:50).

If known, please provide the Benefit:Cost Ratio. 1:50

Provide a detailed discussion of the benefits the project will provide. To the extent possible, quantify changes and benefits (e.g. water quality and water supply benefits) that will result from project implementation; otherwise, describe benefits qualitatively.

The project will help prevent the accidental discharge of pollutants to a natural water body.

Economic Feasibility Points (Score: 15 points if a benefit:cost or cost effectiveness analysis has been completed or project is a DAC project; PLUS 10 points if the benefit:cost ratio or cost-effectiveness score is acceptable, i.e., B:C > 1) =	

Project Status (DWR Review Factor I)

Proposed Project Start Date:	7/1/2013
Estimated Project Completion Date:	6/30/2014

Indicate the status (pending, in process, complete) of the following.

Project Implementation Milestone	**Status**	**% Complete**	Estimated Completion Date
Conceptual/Preliminary Plans Complete	in progress	90	6/28/2013
CEQA/NEPA Completed		0	9/30/2013
Local Cost Share Confirmed	in CIP	90	6/11/2013
ROW/Land Acquisition/Land Owner Approval		0	1/31/2014
Permits Received		0	3/31/2014
Construction Drawings Complete & Bids Acquired	in progress	10	5/23/2014

Project Status Points (4 points for each of the above that are completed =	

PROJECT OVERVIEW

General Project Information

Project Title:	Ecosystem Condition Profile for the Carmel River Watershed using the Level 1-2-3 Framework.
Project Location:	Carmel River Watershed
Estimated Cost:	$333,067

Brief Project Description (1 to 2 sentences):

The goal of this project is to provide cost-effective, scientifically-based, and integrated information on stream ecosystem condition in the Carmel watershed to inform management decisions and optimize ecological monitoring activities.

Project Proponent Information

Contact Name:	Kevin OÕConnor
Affiliation:	Central Coast Wetlands Group at Moss Landing Marine Labs
Address:	Mailing Address: 8272 Moss Landing Rd. Moss Lading, CA 95039
Phone Number:	831-771-4495
Email:	koconnor@mlml.calstate.edu

Other participating and/or partner agencies/organizations (if applicable):

The partners involved are: The Central Coast Wetlands Group, the Monterey Bay National Marine Sanctuary, the Monterey Bay Sanctuary Foundation, and the San Francisco Estuary Institute.

MBNMS Contact ï Bridget Hoover (831) 647-4217. The MBNMS has been active in local watersheds, data management and analysis, monitoring water quality, working collaboratively with private and public landowners, community outreach and coordination since the early 1990Ôs. We will work with them to ensure all data collected during this project are incorporated into the Integrated Water Quality Management System for the Central Coast and the findings are used to guide future efforts of the MBNMS Water Quality Protection Program.

San Francisco Estuary Institute ï Josh Collins (510) 746-7365. SFEI will serve a consulting role by assisting in the initial outline of goals, training in the California Aquatic Resource Inventory mapping standards, assistance with the establishment of the sample frame, and the interpretation of the data.

Collaborating Agencies:
Central Coast Regional Board ï Karen Worchester. We will work closely with the CCRWQB during site selection and data interpretation to ensure our efforts are in line with their central Coast ambient monitoring program.

DETAILED PROJECT INFORMATION

Description

Please provide a description of your project (including the location) and its purpose, what will be constructed and/or implemented, how the project will function, the area(s) and/or entities that will be affected by or will benefit from the project, and any potential obstacles to implementation.

Monitoring requirements, which are often mandated on a project-by-project basis, have led to a piecemeal understanding of stream ecosystem conditions. Knowing the steps necessary to improve the health of the watershed, however, requires a strategic approach to ecological data collection activities to evaluate whether current and proposed management actions are benefitting or hurting the system. In March, 2011, the final Stream Ecosystem Condition Profile for the Coyote Creek Watershed was released by SFEI and EOA, Inc. for the Santa Clara Valley Water District. This profile used the USEPA Level 1-2-3 Framework to study the watershed, answering key management questions and making management recommendations. Additionally, the authors published an implementation plan to guide how their methods can be repeated in other watersheds. CCWG sees a great need for a similar assessment to help address the many management issues in the Carmel River Watershed.

This project has been developed to inform decisions on the management of different watershed needs and resources (e.g. urban and rural development, recreation, biotic resources, and water quality and reliability) in the context of the watershed as a whole in order to maintain and improve stream ecosystem conditions. The resulting Stream Ecosystem Condition Profile will describe the condition of stream ecosystem resources by synthesizing new and existing information on the health of stream ecosystems within the Carmel River Watershed. Using the Frameworkõs condition and risk assessment methods, ecological data will be analyzed to provide watershed-specific guidance on the future design of monitoring efforts, restoration, flood control projects, and general maintenance/operations. The synthesized and improved knowledge of ecological resources gained from the Level 1-2-3 Framework should make environmental stewardship actions more efficient and cost-effective.

The 1-2-3 Framework categorizes different monitoring and analysis tools into three levels. Level 1 (Landscape Resource Maps and Inventories) describes the distribution, extent, and landscape level condition of stream ecosystem resources. Level 2 (Rapid Assessment of Overall Stream Ecosystem Condition) data are used to assess the overall condition or health of such resources and to develop hypotheses regarding the causes of their observed conditions. Level 3 (Intensive Investigations of Targeted Resources) data can be used to test such hypotheses and to help identify management or monitoring actions to improve the condition of stream ecosystem resources. The 1-2-3 Framework is a toolkit designed to help resource managers identify and cost-effectively answer key questions about the performance of projects, programs, and policies intended to protect and manage aquatic resources. Cost-effectiveness is achieved by maximizing the use of less-expensive, coarser scale Level 1 and 2 data to answer management questions, and strategically guide the collection of more expensive and intensive Level 3 data collection.

These are some examples of how the Stream Ecosystem Condition Profiles can be used:
Å Evaluate the State's policy on protecting creek ecosystems.
Å Enable the region to establish expectations about what conditions or Levels of Service can be reasonably achieved.
Å Guide decisions on actions to improve stream condition, including clarifying what others can do, and to identify associated investment costs to maintain or improve condition.
Å Provide a basis for public input on stream condition goals, projects to protect streams and future funding to implement those projects.
Å Provide design options for capital projects that integrate environmental objectives.
Å Provide integrated stream condition intelligence to support project planning and permit negotiations and to promote integration of environmental concerns into project-based decision-making.
Å Guide decisions on filling priority data gaps and leverage opportunities for coordinating data collection activities.
Å Guide decisions on locating wetland and riparian mitigation and enhancement sites.
Å Share stream ecosystem condition information with the public, land use agencies and the environmental resource agencies.
Å Scientifically assess ecological trends over time.
Å Facilitate summary statistics, and other statistical results to guide management.
Å Benefit-cost, and economy of scale analyses.
Å Prioritize and focus regional management to maximize benefit to local habitat value, species services, and overall landscape condition.

The tasks for this project are as follows:
TASK 1: Project Administration and Management
a) Ongoing Data Management and QA/QC
TASK 2: Finalize Project Goals
a) Develop a Technical Advisory Committee
b) Choose core management questions that this Condition Profile will answer
c) Identify conceptual models and Indicators
d) Identify existing data and data gaps
e) Make necessary modifications to Tasks 3-5 based on the information from this task.

TASK 3: Level 1 analysis done primarily in GIS (Subject to change based on Task 2)
a) Refine/update current maps using the California Aquatic Resource Inventory mapping standards
b) Determine the extent and distribution of stream ecosystem resources for the following:
i. Drainage Network Characterization
ii. Non-Riverine Wetlands (ie Depressional, lacustrine, Slope)
iii. Riverine Wetlands and Riparian Areas
c) Landscape scale analysis of stressors and landuse
d) Determine the likely sources of risk to stream ecosystem resources based on landuse
TASK 4: Level 2 Analysis using CRAM (Subject to change based on Task 2)
a) Create sample draw ensuring that sites are statistically representative.
b) Determine the conditions of stream ecosystem resources relative to their levels of services (i.e., how are they performing). CRAM (Level 2 Assessment) of 100 sites throughout the watershed.
c) Entry of CRAM data into eCRAM database
d) Determine the likely sources of risk to stream ecosystem resources based on common observed stressors during CRAM analysis
TASK 5: Level 3 Analysis (Subject to change based on Task 2)
a) Determine the conditions of stream ecosystem resources relative to their levels of services (i.e., how are they performing). Consolidate existing Level 3 data and collect targeted new Level 3 data (fisheries, water quality, Level of Service analysis).
b) Entry of Level 3 data into Central Coast database
c) Determine the likely sources of risk to stream ecosystem resources based on level 3 data including land subsidence, hydrologic alteration to historic flow regime due to increased impervious land cover, drainage-area manipulation, and water diversion, and urbanization infrastructure elements including grade control structures, sedimentation basins, and in-stream culverts.

TASK 6: Final analysis and report
a) Relate site (Level 2 and 3) data to landscape scale stressors (Level 1) to direct and prioritize management
b) Provide management prioritization framework whereby high priority actions can easily be elucidated for immediate allocation of restoration or conservation actions; remaining potential actions can be prioritized and appropriate time lines for action taken be planned
c) Determine the likelihood that sources of risk may negatively impact stream ecosystem conditions
d) Determine the likely consequences of risk realization to stream ecosystem conditions
e) Determine the monitoring and management actions that could improve or provide a better understanding of stream ecosystem conditions and reduce risk

5. Schedule:

Task	Timeframe
Task 1. Project Administration and Management	ongoing
Task 2. Finalize Project Goals	First 6 months
Task 3. Level 1 analysis done primarily in GIS	Year 1
Task 4. Level 2 Analysis using CRAM	Year 2-3
Task 5. Level 3 Analysis	Year 2-3

6. Monitoring and Project Performance:
The updated Level 1 data will be incorporated into the overall Level 1 inventory managed by the San Francisco Estuary Institute. SFEI manages the quality assurance and control process for such changes and transfers updated data to the state agency that manages the California Aquatic Resource Inventory.
CCWG has decided to utilize available statewide web data tools to store Level 2 CRAM assessment data for the Carmel River watershed assessment. CRAM data can be uploaded, stored, mapped, queried, and downloaded through the CRAM wetlands web site www.cramwetlands.org. CRAM results can also be viewed in relation to habitat extent using the California Wetland Tracker (Tracker) www.californiawetlands.net. Tracker stores and provides free public access to information about wetland projects, habitats, and habitat conditions in selected regions of California. Organizations collecting CRAM data may specify access to their stored CRAM data and may either limit access to themselves or allow it to be shared publicly. Information from CRAM assessments can be uploaded to Tracker by transcribing hardcopy versions of CRAM into the electronic versions and uploading them through the web site. Alternatively, results obtained by using eCRAM software can be uploaded automatically (http://www.cramwetlands.org/cramdataentry.html). Additionally, The CRAM User's Manual (CWMW, 2013) includes a set of quality control procedures (including CRAM training and calibration and specified field forms) to assure the accuracy and consistency of data collection and processing that should be implemented during Level 2 data collection.
With regard to Level 3 data, CCWG will work with the MBNMS to incorporate the data into existing and newly developing databases on the Central Coast. The relationship between the Level 3 ecological database structure and a local database to store Level 2 CRAM results from Tracker will be addressed as part of this effort.

7. Technical Feasibility and Readiness-to-Proceed:

Much of the strategy we will employ has already been developed and tested through the Stream Ecosystem Condition Profile for the Coyote Creek Watershed for the Santa Clara Valley Water District. The Level 1 data for the Carmel Valley will need to be updated (using the CARI methodology) from a 2005 effort by the Watershed Institute at CSUMB that digitized all National Wetland Inventory map for the region. Once that is completed, the Level 2 and Level 3 methodologies already exist and can be incorporated into the overall sampling methodology immediately. While there will be modification to the strategy for the Central Coast region based on input from stakeholders, the process is very feasible and ready to proceed.

Project Status:
This project will not require any permits. Site access may be an issue for parts of the valley, but the site sampling design will take this into account using a probabilistic design where sites without access are replaced by the next site in the list, maintaining the quality of the overall sample of the stream resources in the valley.
8. Consistency with Federal, State, and Local Plans:
This project is consistent and works to implement on the central coast the California Wetland and Riparian Area Monitoring Plan (WRAMP), which was developed by the California Wetland Monitoring Work Group and endorsed by the California Water Quality Monitoring Council on February 10, 2010. The goal of WRAMP is to track trends in wetland extent and condition in order to assess the performance of wetland, stream, and riparian protection policies, programs, and projects. The primary strategy is to implement standardized assessment methods and data management through all of the state's wetland, stream, and riparian monitoring efforts in ways that improve them while minimizing new costs and maximizing public access to assessment information.
Project Benefits and Impacts:

Benefits:
This project has components of Watershed Enhancement, Water Quality, and Habitat Improvement Projects. The development of a master stream ecosystem condition profile integrates all the separate efforts to address water quality, supply, and environmental management into one comprehensive plan. Therefore, one of the projects chief benefits is its comprehensive approach and the integration of information into one overarching, easily accessible, management document. The framework developed by the SCVWD includes recommendations for how to establish Levels of Service (numeric performance targets) for stream ecosystems. These numeric performance targets will allow our regional partners to periodically assess progress towards meeting environmental/habitat objectives and the appropriateness of associated strategies and measurable objectives. These Levels of Service (LOS) can be established in each watershed by analyzing results of ambient surveys of stream ecosystem conditions.
Impacts:
There will be no negative impacts because the project consists of primarily research and watershed planning.

IRWM Objectives (DWR Review Factor A)

Water Supply (WS)

Assists region to meet WS-1 (automatically calculated)	**0**	WS-1. Meet existing water supply replacement needs of the Carmel River system and Seaside Groundwater Basin.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Larger water supply quantities yield more points up to total of 3 normalized points.
		up to 900 AFY
		at least 900 AFY (10%)
		at least 1800 AFY (20%)
		at least 2700 AFY (30%)
		at least 3600 AFY (40%)
		at least 4500 AFY (50%)
		at least 5400 AFY (60%)
		at least 6300 AFY (70%)
		at least 7200 AFY (80%)
		at least 8100 AFY (90%)
		at least 9000 AFY (100%)
Bonus Points = (auto calculate)	**0**	
Assists region to meet WS-2 (automatically calculated)	**0**	WS-2. Maximize use of recycled water.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to 4 raw points; 3 normalized points)
		provides recycled water to one or more properties within the region
		provides recycled water from a package plant or provides source water to either CAWD or MRWPCA
		expands output of recycled water from either CAWD or MRWPCA
		all possible recycled water [currently estimated to be 4,800 AFY, including up to 300 AFY from CAWD WWTP and 4,500 AFY from MRWPCA WWTP]
Bonus points = (auto calculate)	**0**	
Assists region in meeting WS-3, then Score 1 -->		WS-3. Seek long-term sustainable supplies for adopted future demand estimates.
Assists region in meeting WS-4, then Score 1 -->		WS-4. Optimize conjunctive use of surface and groundwater.
Assists region in meeting WS-5, then Score 1 -->		WS-5. Evaluate, advance, or create water conservation throughout the Region in compliance with the State's 20x2020 Water Conservation Plan.

Water Quality (WQ)

Assists region to meet WQ-1 (automatically calculated)	**0**	WQ-1. Improve ocean water quality, including Areas of Special Biological Significance (ASBS), by minimizing pollutants in stormwater discharges.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 9 raw points; 3 normalized points):	
			implements regional monitoring or contributes to statewide water quality monitoring
			assists in defining "natural ocean water quality" for one or more ASBS
			removes trash from storm water
			eliminates or reduces soil erosion in watersheds discharging to the ocean
			eliminates or reduces the risk of a source of non-storm water discharge
			implements low impact development (LID) measures within existing developed areas
			reduces pollutant load during design storm events from one or more storm water point source by 90% compared to 2011-2012
			reduces pollutant load during design storm events from 2 or more stormwater point sources by 90% compared to 2011-12
			achieves Table B Instantaneous Max. Water Quality Objectives in Ch. II of the Ocean Plan on average
Bonus points = (auto calculate)	**0**		
Assists region to meet WQ-2 (automatically calculated)	**1**	WQ-2. Improve inland surface water quality for environmental resources (e.g. steelhead) and potable water supplies.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 6 raw points; 3 normalized points):	
		1	*increases regional monitoring or contributes to statewide water quality monitoring*
			assists in meeting Basin Plan TMDLs or NPDES permit limits
			removes trash from storm water
			eliminates or reduces soil erosion, contaminant sources
			eliminates or reduces the risk of a source of non-storm water discharge
			implements low impact development (LID) features, techniques, and practices within existing developed areas
Bonus points = (auto calculate)	**0.5**		

Assists region to meet WQ-3 (automatically calculated)	**0**	WQ-3. Protect and improve water quality in groundwater basins.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 2 raw points; 3 normalized points):
		increases groundwater basin monitoring or contributes to statewide water quality monitoring.
		prevents, reduces, or minimizes groundwater quality degradation through reduction in pollutant loads, remediation, reclamation and reuse, or through enhancement of groundwater levels/volumes thereby reducing the potential for seawater intrusion.
Bonus points = (auto calculate)	**0**	
Assists region in meeting WQ-4, then Score 1 -->		WQ-4. Meet or exceed water quality standards established by regulatory agencies and stakeholders.

Flood Protection & Erosion Prevention (FP)

Assists region to meet FP-1a (automatically calculated)	**0**	FP-1a. Develop regional projects and plans necessary to protect existing infrastructure from flood damage, in particular, along the southern Monterey Bay shoreline and Carmel Valley.**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in the appropriate category. **Do not choose more than one category**. Removal of more properties from the floodplain yields more points up to total of 3 normalized points.
		removes at least one (1) property from a 100-year flood zone
		removes at least five (5) properties from the 100-year flood zone
		removes at least 20 properties from a 100-year flood zone
		removes at least 50 properties from a 100-year flood zone
		removes at least 100 properties from a 100-year flood zone
Bonus points = (auto calculate)	**0**	
Assists region to meet FP-1b (automatically calculated)	**1**	FP-1b. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from erosion (including erosion exacerbated by sea level rise).**
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 3 raw points; 3 normalized points):
		implements one or more measures from the document: Evaluation of Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)
	1	*implements one or more components of region-wide, outreach, public education, or other program aimed at systematic changes to land management (i.e., Forest Management, agricultural lands management)*
		eliminates or reduces soil erosion in watersheds through implementation of erosion control improvements to streams, creeks, and rivers.
Bonus points = (auto calculate)	**1**	
Assists region in meeting FP-2, then Score 1 -->	1	FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).
Assists region in meeting FP-3, then Score 1 -->		FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.
Assists region in meeting FP-4, then Score 1 -->		FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.

Environmental Protection and Enhancement (EV)

Assists region in meeting EV-1, then Score 1 -->	1	EV-1. Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.
Assists region in meeting EV-2, then Score 1 -->	1	EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when development water
Assists region in meeting EV-3, then Score 1 -->	1	EV-3. Minimize adverse environmental effects on biological and cultural resources when implementing strategies and projects.
Assists region in meeting EV-4, then Score 1 -->	1	EV-4. Identify opportunities for open spaces, trails and parks long streams and other recreational areas in the watershed that can be incorporated into projects.
Assists region in meeting EV-5, then Score 1 -->	1	EV-5. Identify and integrate elements from appropriate Federal and State species protection and recovery plans.

Climate Change (CC)

Assists region in meeting CC-1, then Score 1 -->		CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.
Assists region in meeting CC-2, then Score 1 -->		CC-2. Support increased education, monitoring and research to increase understanding of long-term impacts of climate change in the region.
Assists region in meeting CC-3, then Score 1 -->		CC-3. Support efforts to increase education, research and use of energy conservation measures and alternatives to fossil fuel and non-renewable resources to reduce

Regional Communication and Cooperation (RCC)

Assists region to meet RC-1 (automatically calculated)	**1**	RC-1. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change impacts.**	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
		1	Partnerships ï The project is proposed by a partnership of multiple organizations enabling use of shared expertise and resources.
		1	Resource Management Strategy ï The project includes a RMS that is not already being implemented in the region thereby would provide diversification of strategies.
		1	Beneficial Uses ï The project supports several different beneficial uses (see CCRWQCB, *Basin Plan* Chapter 2, 2001)
		1	Geography ï The project implements a watershed-scale, regional-scale, or inter-regional project.
		1	Hydrology ï The project addresses multiple watershed functions within the hydrologic cycle.
Bonus points = (auto calculate)	**3**		

Assists region to meet RC-2 (automatically calculated)	**1**	RC-2. Foster collaboration among regional entities as an alternative to litigation. **	
ADD up to three (3) additional points depending on the extent to which the project assists the region in meeting this objective (See Bonus Points, below)		Enter the number 1 in each category as appropriate (up to a total of 5 raw points; 3 normalized points):	
		1	PROVIDED INFORMATION early in project development to the public to assist in understanding the problem, alternatives, opportunities and/or solutions
		1	CONSULTED & OBTAINED FEEDBACK from all regional agency and non-governmental organizations (NGOs) regarding the problem, alternatives, opportunities and/or solutions
		1	CONSULTED & OBTAINED FEEDBACK from the public regarding the problem, alternatives, opportunities and/or solutions
		1	INVOLVED & WORKED DIRECTLY WITH two or more regional agency and/or NGO stakeholders regarding the problem, alternatives, opportunities, and/or solutions
		1	COLLABORATED WITH, OR MADE PARTNERSHIPS with two or more agencies or NGOs on each aspect of the decision
Bonus points = (auto calculate)	**3**		
Assists region in meeting RC-3, then Score 1 -->	1	RC-3. Identify and pursue additional opportunities for public education, outreach, and communication on water resource management and climate change, including to disadvantaged communities and stakeholders with interests in water management issues.	
Assists region in meeting RC-4, then Score 1 -->	1	RC-4. Build relationships with State and Federal regulatory agencies and water forums and agencies.	

Total Points for IRWM Objectives =	**19.5**

Resource Management Strategies (DWR Review Factor B)

Score one point for any Resource Management Strategies (RMS) that the proposed project will address. (* = RMS was included in 2007 IRWM Plan.) (Max points: 30)

CWP Outcome Category 1:	**Reduced Water Demand**	
		Agriculture Water Use Efficiency
		Urban Water Use Efficiency *
		Crop Idling for Water Transfers
		Irrigated Land Retirement
		Rainfed Agriculture
CWP Outcome Category 2:	**Improve Operational Efficiency and Transfers**	
		Conveyance – Regional/Local *
		System Reoperation
		Water Transfers *
		Waterbag Transport/Storage Technology *
CWP Outcome Category 3:	**Increase Water Supply**	
		Conjunctive Management & Groundwater Storage *
		Seawater or Brackish Water Desalination *
		Precipitation Enhancement
		Recycled Municipal Water *
		Surface Storage – Regional/local *
		Dewvaportation or Atmospheric Pressure Desalination
		Fog Collection
CWP Outcome Category 4:	**Improve Water Quality**	
		Drinking Water Treatment and Distribution *
		Groundwater Remediation/Aquifer Remediation
		Matching Quality to Use
		Pollution Prevention *
		Salt and Salinity Management
		Urban Runoff Management *
CWP Outcome Category 5:	**Improve Flood Management**	
		Flood Risk Management *
CWP Outcome Category 6:	**Practice Resources Stewardship**	
		Agriculture Lands Stewardship
		Economic Incentives
	1	Ecosystem Restoration *
	1	Forest Management *
		Recharge Area Protection
		Water-Dependent Recreation *
	1	Watershed Management *
		Score one additional point for each additional CWP Outcome category, above one, from which the project is implementing a RMS. (Max: 5 points)

Total RMS Points =	**3**

Strategic Considerations (DWR Review Factor J)

Does the project address inter-regional issues (such as regional monitoring of ASBS, former Fort Ord water supplies, etc.)? If so, explain.

Inter-regional Points (Yes: 5 pts; No: 0 pts) =	

How many agencies and/or non-governmental organizations are partnering to implement the project? List the agencies and organization that are working together to implement the project.

The Central Coast Wetlands Group, the Monterey Bay National Marine Sanctuary, the Monterey Bay Sanctuary Foundation, and the San Francisco Estuary Institute.

Partnerships Points (Score 5 points if 3 or more, 2 points if 2 or more, score 0 for no partnerships) =	5

Does the project include monitoring and reporting components to ensure achievement of performance criteria (i.e., IRWM objectives achievement and/or relevant regulatory requirements)?

Yes. Please see Task 6.

Performance Monitoring/Reporting Points (Yes: 5 pts; No: 0 pts) =	5

Does the project integrate with local land use and water planning? Does the project increase coordination between water resruoces agencies and land use planners? Is the project consistent with land use plans and policies?

Yes. Please see Tasks 3-6, the results of which will be used for local land use and watershed planning.

Land Use Integration Points (Score: 5 points if "yes" to all three questions; 3 points if "Yes" to 2 questions; 1 point for "yes" to one question) =	1

DAC and Native Americans and Environmental Justice (DWR Review Factors D, E and f)

Does the project provide specific benefits to disadvantaged communities and/or Native American tribal communities? If so, explain.

No

DAC &/or Native American Points (Yes: 5 pts; No: 0 pts) =	0

Does the project address any known environmental justice issues? Does the project *avoid disproportionately affecting disadvantaged communities* ?

Environmental Justice Points (Yes for both: 5 pts; No for either: 0 pts) =	0

Climate Change Adaptation and Mitigation (DWR Review Factors K and L)

Put an X next to any climate change adaptation or mitigation strategy the proposed project will contribute to.

Adaptation Strategies

	Improve water supply reliability
	Expand conjunctive use of multiple water supply sources
	Increase water use and/or reuse efficiency
	Provide additional water supply
x	Promote water quality protection
	Reduce water demand
	Advance / expand recycled water use
	Promote urban runoff reuse
	Address sea level rise
	Address other anticipated climate change impacts
	Improve flood control
x	Promote habitat protection
	Establish migration corridors
	Re-establish river-floodplain hydrologic continuity
	Re-introduce anadromous fish populations to watershed
	Implement one or more recommendations from the *Erosion Mitigation Alternatives for Southern Monterey Bay (Alternatives Study) (ESA-PWA, May 2012)*
	Enhance and protect watershed forest and meadow systems

Please describe: The goal of this project is to provide cost-effective, scientifically-based, and integrated information on stream ecosystem condition in the Carmel watershed to inform management decisions and optimize ecological monitoring activities to promote habitat and water quality protection.

Climate Change Adaptation (Score 1 for every strategy implemented, up to 5 max) =	2

Mitigation Strategies

	Increase water use efficiency or promote energy-efficient water demand reduction
	Improve water system energy efficiency
	Advance / expand recycled water use
	Promote urban runoff reuse
	Promote use of renewable energy sources
	Contribute to carbon sequestration

Does the proposed project reduce regional greenhouse gas emissions and/or improve energy efficiency compared to alternative proposed projects meeting the same regional objectives? If so, explain how.

Please describe:

Climate Change Mitigation (Score 1 for every strategy implemented, up to 5 max) =	0

Technical Feasibility (DWR Review Factor C)

Discuss the technical feasibility of the project. If possible, cite references that contain information about the proposed project and detail the technical feasibility of the project.

Much of the strategy we will employ has already been developed and tested through the Stream Ecosystem Condition Profile for the Coyote Creek Watershed for the Santa Clara Valley Water District. The Level 1 data for the Carmel Valley will need to be updated (using the CARI methodology) from a 2005 effort by the Watershed Institute at CSUMB that digitized all National Wetland Inventory map for the region. Once that is completed, the Level 2 and Level 3 methodologies already exist and can be incorporated into the overall sampling methodology immediately. While there will be modification to the strategy for the Central Coast region based on input from stakeholders, the process is very feasible and ready to proceed.

Project Status:
This project will not require any permits. Site access may be an issue for parts of the valley, but the site sampling design will take this into account using a probabilistic design where sites without access are replaced by the next site in the list, maintaining the quality of the overall sample of the stream resources in the valley.

30 points: Technical feasibility has been documented in a project-specific pilot study or previous phase or has a documented track record of success

OR
10 points: has the technology proposed been established as effective in similar situations?
10 points: Are project site conditions documented (geology/soil, ecology, hydrology, land use, public utilities)?
10 points: Do the project partners have experience with similar projects? (e.g., similar site, similar technology).

Technical Feasibility Points (See above) =	30

Project Cost and Financing (DWR Review Factor G)

Total Estimated Capital Cost	$333,067	
Annual Operation & Maintenance (O&M) Cost	$0	
Cost Basis (Year)	2013	
Source(s) of Funding for Capital	IRWMP Grant Funds	
Source(s) of Funding for O&M Cost	N/A	
Project Life (years)	2	
Provide link to project cost estimate, if available		
25% Match Confirmed (Yes or No)?		Cost Share is available through several partners contributing to this project, specific source will be identified based on funding start date.
Cost and Financing Points (10 points if above information provided; 10 points if 25% or more funding match confirmed) =	10	

Economic Feasibility (DWR Review Factor H)

Has a benefit:cost or cost effectiveness analysis been completed for your project? If so, please cite reference and briefly summarize. If no economic analysis has been completed for the project, the project may receive zero points out of a possible 25 points for the Economic Feasibility review factor unless the project is a DAC project. If the project is not a DAC project but the B:C ratio is expected to be greater than 1, please provide a justification. The lack of an economic analysis may also affect the Project Status score.

The benefit:cost or cost effectiveness analysis has not been completed for this project. This is a research project and will not result in any infrastructure. However, the resulting data and reports will be highly valuable for regional land use planning and management. Therefore, our bennefit:cost ratio is high - much higher than 1.

If known, please provide the Benefit:Cost Ratio.

Provide a detailed discussion of the benefits the project will provide. To the extent possible, quantify changes and benefits (e.g. water quality and water supply benefits) that will result from project implementation; otherwise, describe benefits qualitatively.

Benefits:
This project has components of Watershed Enhancement, Water Quality, and Habitat Improvement Projects. The development of a master stream ecosystem condition profile integrates all the separate efforts to address water quality, supply, and environmental management into one comprehensive plan. Therefore, one of the projects chief benefits is its comprehensive approach and the integration of information into one overarching, easily accessible, management document. The framework developed by the SCVWD includes recommendations for how to establish Levels of Service (numeric performance targets) for stream ecosystems. These numeric performance targets will allow our regional partners to periodically assess progress towards meeting environmental/habitat objectives and the appropriateness of associated strategies and measurable objectives. These Levels of Service (LOS) can be established in each watershed by analyzing results of ambient surveys of stream ecosystem conditions.
Impacts:
There will be no negative impacts because the project consists of primarily research and watershed planning.

Economic Feasibility Points (Score: 15 points if a benefit:cost or cost effectiveness analysis has been completed or project is a DAC project; PLUS 10 points if the benefit:cost ratio or cost-effectiveness score is acceptable, i.e., B:C > 1) =	10

Project Status (DWR Review Factor I)

Proposed Project Start Date:	5/1/201
Estimated Project Completion Date:	4/30/2016

Indicate the status (pending, in process, complete) of the following.

Project Implementation Milestone	**Status**	**% Com-plete**	Estimated Completion Date
Conceptual/Preliminary Plans Complete	complete	100	
CEQA/NEPA Completed	N/A	100	
Local Cost Share Confirmed		50	
ROW/Land Acquisition/Land Owner Approval	N/A	100	
Permits Received	N/A	100	
Construction Drawings Complete & Bids Acquired	N/A	100	

Project Status Points (4 points for each of the above that are completed =	20

Appendix 14-a

Stakeholder Involvement and Outreach Plan for the 2013 IRWMP Update

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STAKEHOLDER INVOLVEMENT AND OUTREACH PLAN

for the 2013 Update to the

MONTEREY PENINSULA, CARMEL BAY, AND SOUTH MONTEREY BAY INTEGRATED REGIONAL WATER MANAGEMENT PLAN

Prepared for the

Monterey Peninsula Water Management District

By

Denise Duffy & Associates

Draft October 9, 2013

with minor edits to update activities performed through May 2014

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Draft

Stakeholder Involvement and Outreach Plan
Table of Contents

CONTENTS

1. INTRODUCTION 1
2. STAKEHOLDER IDENTIFICATION AND INVOLVEMENT 2
3. DISADVANTAGED COMMUNITIES 3
4. COORDINATION WITH LOCAL AGENCIES AND ORGANIZATIONS 6
5. COMMUNITY OUTREACH 7

Appendices

Appendix A. Stakeholder List (July 2012)

Appendix B. Outreach and Communication Tables (July 2012 with final edits to Outreach Log May 2014)

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1. INTRODUCTION

The purpose of this Draft Stakeholder Involvement and Outreach Plan (Plan) for the 2013 Update to the Monterey Peninsula, Carmel Bay and South Monterey Bay (hereinafter, "Monterey Peninsula" or "MP") Integrated Regional Water Management (IRWM) Plan is to work toward meeting regional goals, objectives, and state standards and priorities for the IRWM Grant Program by establishing, updating, and monitoring the efforts to involve public, stakeholders, and disadvantaged communities in the regional water planning process.

California Department of Water Resources, or DWR, IRWM Proposition 84 and 1E Guidelines (November 2012) identify the following IRWM plan standards that are considered by this Outreach Plan:

- Use of the Ahwahnee Water Principles (http://www.lgc.org/ahwahnee/h2o_principles.html), including multi-agency collaboration, stakeholder involvement and collaboration. In addition, one of the principles states: "From start to finish, projects and programs should involve the public, build relationships, and increase the sharing of and access to information."
- The "Governance" IRWM Plan standard requires that the plan include a description of how the plan addresses and ensures an adequate public outreach and involvement process, and a balanced access and opportunity for participation in the process,
- The Stakeholder Involvement Plan standard requires that the plan contain a public process that provides outreach and an opportunity to participate in the plan development and implementation to the appropriate local agencies and stakeholders, as applicable to the region, including the following:
    - Wholesale and retail water purveyors
    - Wastewater agencies
    - Flood control agencies (including those agencies who submit applications for Prop 1E funded Storm Water Flood Management Grants)
    - Municipal and county governments and special districts
    - Electrical corporations
    - Native American tribes
    - Self-supplied water users
    - Environmental stewardship organizations
    - Community organizations
    - Industry organizations
    - State, federal, and regional agencies or universities
    - Disadvantaged community (DAC) members (see detailed description in Section 3. Disadvantaged Communities)
    - Any other interested group appropriate to the region

DWR requires IRWM Programs to include provisions to, among other things, ensure equitable distribution of benefits by increasing participation of small and Disadvantaged Communities (DACs) in the IRWM planning process and to address safe drinking water and wastewater treatment needs of those communities.

This Plan and its related tasks create the framework whereby the Monterey Peninsula IRWM Planning Region can successfully satisfy the following DAC IRWM Program preferences and Statewide Priorities as specified in PRC §75026(b), CWC §10544, and in Table 1 of the Proposition 84 and 1E IRWM Guidelines (DWR, August 2010):

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- Address critical water supply or water quality needs of DACs within the region.
- Address statewide priorities, including "ensure equitable distribution of benefits," which includes specifically:
    - Increase the participation of small and disadvantaged communities in the IRWM process.
    - Develop multi-benefit projects with consideration of affected DACs and vulnerable populations.
    - Identify and include projects that address safe drinking water and wastewater treatment needs of DACs.
    - Address critical water supply or water quality needs of California Native American Tribes.

The Regional Water Management Group (RWMG) identified regional communication and cooperation as one of its objective categories in its 2007 IRWM Plan, including the following detailed objectives:

- Meet or exceed State and Federal regulatory orders, provided that mandates are funded.
- Identify strategies for protecting both infrastructure and environmental resources.
- Foster collaboration between regional entities to minimize and resolve potential conflicts and to obtain support for environmentally responsible water supply solutions.
- Build relationships with State and Federal regulatory agencies and other water forums and agencies to facilitate the permitting, planning and implementation of water-related projects.
- Identify opportunities for public education about the need, complexity, and cost of strategies, programs, plans, and projects to improve water supply, water quality, flood management, coastal conservation, and environmental protection.

Meaningful public participation goals, objectives, and strategies are critical to involving the public in the process of recommending and pursuing projects and programs in their communities. This Plan was prepared to help coordinate and guide the outreach activities to reach and involve stakeholders and DACs in their communities and, by meaningful dialog, to communicate water resource issues that are important to them. This Plan includes data that are currently available about communities that meet the definition by the DWR of "Disadvantaged Community" and gives a brief overview of water issues affecting these communities (see section 3 for details and our definition of DAC). The Plan also outlines responsibilities for implementation and evaluation of outreach activities envisioned. As RWMG, TAC, stakeholder/committee meetings occur, and mapping and other data become available; this Plan will be updated and expanded to better meet the requirements, goals and objectives of the region. The planning process will thereby continue to understand and address emerging critical water issues impacting the public/communities, including DACs.

2. STAKEHOLDER IDENTIFICATION AND INVOLVEMENT

The Prop 84/ & 1E IRWM Guidelines require that the IRWM Plan contain processes that provide outreach and an opportunity to participate in plan development and implementation. In order to meet this criterion, the IRWM Plan process included an expanded stakeholder research effort to develop the list found in *Appendix A [Stakeholder List – working draft dated July 2012]*. This list was used to share information; and invite and involve stakeholders in the IRWM process. This Plan, including the stakeholder list, is proposed to be included in the 2013 Update to the IRWM Plan.

Although there are no DWR supplied protocols as each IRWM region will have differing relationships among the various stakeholders, the MP 2013 IRWM Plan Update used the Prop 84 & 1 E Guidelines to identify stakeholders and amend the list as needed during the process. The stakeholder list was used to notify interested or potentially interested stakeholders for each public meeting. The list was expanded as

needed throughout the process to include not only the easily identified stakeholder, but also the less obvious stakeholder. The following methods were used to identify stakeholders:

- Open announcements of IRWM meetings that invite new stakeholders (self identification). Public meeting notices were posted in disadvantaged community public places, in newspapers and links provided on the RWMG websites.
- Recommendation of additional stakeholders from those already involved in the IRWM Plan
- Request for stakeholder lists from adjacent IRWM regions (specifically, the Greater Monterey County region which surrounds the Monterey Peninsula region)
- Identification of stakeholders through direct research of water management issues in the region, including database and on-line research, review of recent board, committee, commission and agency correspondence, meeting minutes, and documents.
- Targeted outreach to underrepresented groups, including organizations that support disadvantaged communities.

Tables summarizing the activities proposed for stakeholder, public, and DAC outreach during the 2013 IRWM Plan Update are included in *Appendix B [Outreach and Communication Tables; Working Draft Dated July 2012].* These tables document key inputs required for the plan update, a meeting summary, and an outreach and stakeholder activities log to document ongoing outreach and communications.

3. DISADVANTAGED COMMUNITIES

Disadvantaged community is defined by the California Department of Water Resources (DWR) as any community where the median household income (MHI) is below 80% of the statewide median household income (SMHI).

Recently released census data were used to identify DACs according to the current DWR standard. Annual household income information is made available by the US Bureau of the Census through annual American Community Survey (ACS) data which includes income sampling that is no longer collected in other census records.

The 2006-2010 American Community Survey (AVS) 5-year Estimates show that four census tracts within the planning region can be considered a DAC (see Figure X). According to the ACS survey, the median household income (MHI) at which at area can be considered a DAC is $48,706 (i.e., 80% of the California MHI). The following tracts were below that threshold MHI:

Tract (City)	Population	MHI (2010 inflation-adjusted dollars)	% of Families whose Income in Past 12 Months was Below the Poverty Line	% Hispanic/Latino Population
Tract 127 (Monterey):	3,137	$46,400	5.6	7.0
Tract 136 (Seaside):	4,102	$46,756	9.8	59.3
Tract 137 (Seaside):	4,690	$42,551	17.1	72.5
Tract 140 (Seaside/Sand City)	2,479	$47,759	6.1	50.7

In addition to these identified DAC tracts, there may be "hidden" DACs within larger census groupings. Because the IRWM Planning Region includes some rural and sparsely populated tracts, it is anticipated that there are additional communities not identified by tract level data searches that meet DWR's definition of a disadvantaged community. In March, 2012, the California Department of Water Resources announced that DAC identification should be based on 5-year ACS Estimates and that a mapping tool was available to IRWM regions. Alternative methods for determination of DAC status are under development and will be included in the draft revised IRWMP Implementation Grant Guidelines scheduled for release July 2012. Lack of methods to identify other disadvantaged communities that are not tracked by the ACS may be a problem because it may exclude communities that have serious water challenges and could prevent access to funding opportunities in Round 2 of IRWMP Implementation Grants.

One example of a potential DAC is the area in and around Cachagua Valley. To outreach to this group for the 2007 IRWM process, MPWMD coordinated a meeting of the Carmel River Advisory Committee in Cachagua Valley in September 2007 to solicit input on problems and issues in that sub-watershed. Based on input at the meeting, issues in this sub-watershed include the need for more water conservation measures, a lack of an existing central group or governing structure in Cachagua Valley that might be able to carry out watershed management planning, and the need to improve the water supply to meet demand during drought conditions. Additional outreach to the known and potential DACs is described in Section 5, Community Outreach.



Tract (City)	% Hispanic/Latino Population	% of Population that Speaks Language Other than English at Home
Tract 127 (Monterey):	7.0	24.6
Tract 136 (Seaside):	59.3	61.1
Tract 137 (Seaside):	72.5	75.8
Tract 140 (Seaside/Sand City)	50.7	57.3

WATER NEEDS AND CONSTRAINTS

Environmental justice concerns for DACs exist where water resource problems disproportionately impact communities that lack the capacity to address those problems themselves, due to financial, language, or other constraints. Impediments to DAC participation in the IRWM planning process are common in both urban and rural areas, including lack of accessible information on water quality and related health impacts, and lack of resources to address those issues. Outreach should address difficulties that are experienced by disadvantaged community members. The following are issues of concern that have been identified preliminarily by MPWMD and DD&A:

- ***Language and Cultural Consideration***. According to census data the population of Monterey County is 55.4 percent Hispanic/Latino; however this statistic is not necessarily applicable to the Monterey Peninsula, Carmel Bay and South Monterey Bay IRWM region. Language diversity in the region may trigger the need to develop bilingual (Spanish) outreach materials and outreach partners. The Monterey Peninsula RWMG may need to expand outreach to Native American tribal communities in a culturally sensitive way as described in the Community Outreach section of this plan. In 2010, Monterey County had a Native American population of 5,396 persons or 1.3 percent of the County population. Although tribal affiliations are expected to be diverse within the County, the Ohlone/Coastanoan - Esselen and Salinian tribes who are native to the area may request to be contacted as part of the outreach process.
- ***Affordability***. Although only four census tracts in the Region qualify as disadvantaged communities per DWR guidance (see above), increases in water or wastewater service rates that could accompany the implementation of projects included in the IRWM Plan may potentially affect these communities. A priority of the Region is to seek external grant funding or subventions to offset the cost of implementing new, and often expensive, projects. External funding assistance will help offset costs to existing rate payers in the region, especially those rate payers with a limited ability to pay, and help ensure that those rate payers are affected as little as possible. Cal-Am has begun to request an expansion of its H_2O – Help to Others Program.
- ***Water Quality/Flooding***. Monterey County Health Department, Environmental Division, the Central Coast Regional Water Quality Control Board and a number of Community Service Districts and Water Districts were contacted for information regarding areas that might be known to experience water quality problems. No disadvantaged communities have been identified that experience disproportionally poor water supply quality or flooding issues because the region is, in general, served by public water, wastewater, and drainage/flood control entities. In addition, storm water permitting, education, and other state and federal programs (including some IRWM Projects) address many non-point source water quality issues. Some communities in areas not served by public systems may also qualify as disadvantaged and are planned to be included in outreach efforts, if identified in the future.

DAC-SPECIFIC OUTREACH ACTIVITIES

The RWMG wants to ensure that the water resource management needs and interests of DACs are fully addressed in the IRWM Plan and that DAC's are provided ample opportunities for involvement in IRWM Plan development. As described in Section 1, MPWMD, with assistance by DD&A has prepared this outreach plan and DD&A provided outreach services to MPWMD. Specifically, the organizations listed in Appendix A were invited with a formal cover letter and in some cases, personal email and/or phone call to be involved in the IRWM Plan.

DAC Outreach will be conducted in a phased manner, increasing and broadening over time, if needed. Staff at MPWMD and DD&A will assist with building collaborations and partnerships to further expand outreach activities. Implementation activities will begin immediately and progress reports will be made to MPWMD as required under the terms of the grant. Outreach will begin in areas that have been previously identified as DACs. Other areas may be added upon further analysis of the IRWM DAC map data, information made available from DWR, and other public agencies and organizations for smaller areas, (anticipated in July 2012). A special effort will be made to encourage disadvantage communities to participate in stakeholder meetings, including targeted hard copy notice mailings and postings within the community, personal emails and phone calls as documented in the outreach log. See additional detail in Sections 4 and 5 of this document.

RWMG participants and stakeholders who have worked with, and understand the issues and concerns of, the Monterey Peninsula DACs will be provided with an opportunity to comment on the IRWM plan update prior to its finalization and implementation. In addition, outreach will be reviewed and evaluated periodically over the duration of the IRWM Planning Grant. Objectives and strategies may be modified over time depending on the level of DAC participation achieved, as projects are prioritized, and upon evaluation by the RWMG. Recommendations may be made by the RWMG to modify this Plan to improve outcomes to improve efforts to involve targeted areas.

The RWMG recognizes that even within DAC communities, there may be populations that are severely disadvantaged and may require additional support. DACs may also be rendered invisible in other ways, for example, low-income communities that may live within wealthier ones, unincorporated communities that are not tracked by Census, or other communities that are not well documented. This problem is especially significant in rural areas. Identifying these "hidden" DACs will be part of the DAC Outreach effort.

See summary of proposed communications with, and involvement of, the public, stakeholders, and DACs in *Appendix B [Outreach and Communication Tables; Working Draft Dated July 2012]*. This plan will be updated periodically to continue to pursue additional DAC involvement, as needed.

4. COORDINATION WITH LOCAL AGENCIES AND ORGANIZATIONS

Strong partnerships with local agencies and non-profit organizations are critically important to a successful outreach strategy. These institutions have knowledge of communities, have existing relationships with the communities that can be leveraged and built on, and may already be aware of key issues and concerns within the communities. Recognizing the importance of strong local partnerships, the outreach work will include a significant focus on identifying and developing relationships with key local agencies, non-profit organizations and other community institutions.

Throughout the conversations with local agencies, non-profit organizations, and community institutions particular focus will be on gathering insights and ideas regarding the best methods to reach their constituents; identify communities where needs are greatest; determine where opportunities for collaboration may exist; explore suggestions of potential projects where prior projects failed, and determine what approaches might be successful.

OBJECTIVES

- Inform and involve local agencies and organizations in the IRWM process.
- Communicate with identified groups, as they are likely to be familiar with the needs of the communities and be able to identify community leaders to facilitate successful outreach.
- Build upon existing relationships between local agencies/organizations.

STRATEGIES AND ACTIVITIES

- Identify local agencies, non-profit organizations and other community institutions that might be stakeholders *[done April – May 2014]*
- Update and expand the existing stakeholder contact list with current information for local agencies and organizations working on water-related issues *[done April – May 2014]*
- Contact, via phone or email, identified representatives of local agencies and organizations to deepen their understanding of the IRWM planning process, explore the possibility of partnering to conduct IRWM Plan outreach, identify key individuals and develop appropriate strategies for communicating with them *[done April – May 2014]*
- Personally invite local agency and organization representatives including representation of DACs to join as stakeholders and participate in meetings or workshops on an open-ended basis. Representatives may not have time to participate, but the invitation should be extended and remain open. If they cannot participate, let them know where to find information (e.g., website.) *[ongoing]*

5. COMMUNITY OUTREACH

In order for the MP IRWM Planning effort to successfully identify and address the needs of the stakeholder, active engagement of the stakeholders throughout the process is absolutely necessary. This engagement is what ensures that appropriate projects are identified and included in the processes. This will help ensure that proposed projects have the cooperation, knowledge and commitment of the people who live and work in the target communities, and are therefore able to be completed successfully. Public participation efforts are intended to be inclusive and democratic, and to allow time for thorough communication of issues, potential solutions, potential impacts and benefits, responsibilities, and potential partnerships. The public will have the opportunities to propose and explore new projects that will address water supply, affordability and open space needs.

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OBJECTIVES

- Foster participation and engagement by underrepresented members of the public (including DAC and tribal leaders) in meetings by encouraging cultural sensitivity of the IRWM Plan.
- Involve the public, and in particular, DACs in developing projects – and where needed, adding new projects to the IRWM projects list.
- Ensure the greatest level of participation by targeted community members leading to exploration and implementation of water improvement projects fully supported by the local community

STRATEGIES AND ACTIVITIES

- Build upon existing relationships/contacts with the public agencies, representatives of water and wastewater service providers, and non-profit agencies with interests in water quality, access and affordability issues and will continue to discuss opportunities for outreach partnerships within their jurisdictions. *[ongoing]*
- Relationships with community advocacy and non-profit organizations and other community groups will be enhanced and additional groups will be contacted in DACs that are newly identified to encourage participation and collaborative outreach activities within those areas. *[ongoing]*
- Consult with public agencies, members and advocacy organizations to prioritize outreach to those communities with the greatest need. Input from public agencies and community organizations and needs data such as existing water quality conditions, income disparities, and other factors will be considered. *[ongoing]*
- Update, maintain and expand the DAC contacts list (i.e., within the larger stakeholder list) to include all agencies, organizations and individuals connected and interested in water access issues. *[ongoing]*
- Add all DAC contact information gathered through one-on-one interviews, community meetings and other outreach to the stakeholder contact list. *[ongoing]*
- Update the DAC outreach contact list regularly to include organizations involved in emerging social and environmental justice programs in the region. *[ongoing]*
- Follow-up periodically with contacts to obtain information for additional outreach and evaluation of successes or failures. *[ongoing]*
- Log all communications to avoid repetitive contacts with the same individual/group and to be aware of work done to date. See Appendix B, page 3. *[ongoing]*
- Prepare and send additional hardcopy stakeholder meeting notices to targeted community organizations that represent and/or assist disadvantaged groups and individuals. Post hardcopy notices at high visibility locations within the areas identified by the DWR guidance as disadvantaged communities. [*completed July 6, 2012*]

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Appendix A

Stakeholders List (July 11, 2012)

WORKING DRAFT STAKEHOLDERS LIST

FOR THE 2013 UPDATE TO THE MONTEREY PENINSULA, CARMEL BAY, AND SOUTH MONTEREY BAY INTEGRATED REGIONAL WATER MANAGEMENT PLAN (VERSION: JULY 10, 2012)

Regional Water Management Group:

Other Stakeholders (as identified as stakeholders during the 2007 IRWM Plan process or sent email confirmation in May 2012 that they would like to be included in the 2013 Update process)	
California American Water	Monterey Bay National Marine Sanctuary (NOAA)
California Coastal Commission	Monterey Coastkeeper
California Coastal Conservancy	Monterey County Hospitality Association
California Department of Fish and Game	Monterey County Public Works
California Department of Water Resources	Monterey County Service Area 50
California Native Plant Society, Monterey County	Monterey County Resource Conservation District
California Department of Parks and Recreation	Monterey County Resource Management Agency
California State Water Resources Control Board	Monterey Peninsula Chamber of Commerce
CSU Monterey Bay: Watershed Institute	Monterey Peninsula Regional Park District
Carmel Area Wastewater District	Monterey Regional Waste Management District
Carmel River Steelhead Association	NOAA Fisheries
Carmel River Watershed Conservancy	Pebble Beach Community Service District
Carmel Unified School District	Pebble Beach Company
Carmel Valley Association	Planning and Conservation League
Central Coast Regional Water Quality Control Boarrd	Seaside Basin Watermaster
City of Carmel-by-the-Sea	Surfrider Foundation
City of Del Rey Oaks	The Nature Conservancy
City of Pacific Grove	U.S. Army Corps of Engineers
City of Sand City	U.S. Forest Service
City of Seaside	U.S. Fish and Wildlife Service
Coastal Watershed Council	Ventana Wilderness Society
Fort Ord Reuse Authority	

Additional organizations to assist with Disadvantaged Community Outreach	
CHISPA	Monterey County Welfare Department
Environmental Justice Coalition for Water	Monterey Library
Foundation for Housing Assistance of Monterey Co.	Monterey Senior Center
Fort Ord Environmental Justice Network	NAACP
League of United Latin American Citizens	Oldemeyer Senior Center
Military and Veterans Affairs	Rural Communities Assistance Corporation
Monterey County Department of Health Services	Seaside Library
Monterey County Housing Authority	Seaside Family Health Center
Monterey County Social Services Department	Shelter Outreach Plus/ I Help Program

Appendix B

Outreach Communication Plan (July 11, 2012)

Plan Input Responsibilities

for the 2013 Update to the Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan

Working Draft; Version Date: May 2014

Task #	Plan Section	STAKEHOLDER INVOLVE-MENT	Topics requiring Stakeholder's review/ consensus	Planning Projects that will Input Data, Analysis, and Projects for the Plan Update									Key	
				Project 1: Canyon Del Rey Drainage Plan	Project 2: Seaside Basin Salt & Nutrient Mngmnt	Project 3: Carmel River Steelhead Passage	Project 4: GIS/ Database/ Website	Project 5: Ord Inter-Regional Committee	Project 6: San Jose Creek Watershed	Project 7: ASBS Alter-natives	Project 8: Carmel Valley Alluvial Aquifer	Project 9: Carmel Lagoon EPB	Other Water /Wastewater Agencies (not in TAC)	Land Use Planning (i.e., cities, FORA, County)
PHASE 1: PLAN UPDATE INITIATION/DEFINITION OF PLAN PROCESS (2ND/3RD QUARTER 2012)														
1	**Governance (MOU and plan section)**	**Public Meeting #1**	**X**				Internal Working Mtg (DD&A/ MPWMD)	Ord Committee mtg #1						
2	**Region Description**			X	X	X			X	X	X	X	X	
3	**Objectives**		**X**	X	X	X			X	X	X	X		
5	**Integration**			X	X	X			X	X	X	X	X	X
14	**Stakeholder Involvement (Outreach Plan)**		**X**										X	X
PHASE 2: DEVELOP PRELIMINARY PROJECT LIST AND PROJECT REVIEW PROCESS (4TH QUARTER 2012)														
4	**Resource Management Strateges**	**Public Meeting #2**	**X**	X	X	X	Internal Working Mtg (DD&A/ MPWMD)	Ord Committee mtg #2	X	X	X	X	X	
5	**Integration**			X	X					X			X	X
6	**Proj Review Process**		**X**	X	X	X			X	X	X	X	X	
6.1	Regional Priorities		**X**	X	X	X			X	X	X	X	X	
6.2	Compare MP scoring with DWR		**X**										X	
9	**Data Mgt**												X	
12	**Relation to Local Land Use Plan**			X	X									X
13	**Relation to Local Water Plan**										X		X	
14	**Stakeholder Involvement (Outreach Plan)**		**X**										X	X
PHASE 3: STRATEGY AND PROJECT REFINEMENT (2013)														
5	**Integration**	**Public Meeting #3 (plus possible TAC meeting)**		X	X		X	X		X			X	
6	**Proj Review Process**		**X**	X	X	X	X	X	X	X	X	X	X	
6.3	Review Project Proposals		**X**	X	X	X	X	X	X	X	X	X	X	
6.4	Revise Project Proposals			X	X	X	X	X	X	X	X	X	X	
7	**Impacts & Benefits**			X	X	X	X	X	X	X	X	X	X	
8	**Plan Performance**							X					X	
10	**Finance**			X	X	X	X	X	X	X	X	X		
11	**Tech Analysis**			X	X	X	X	X	X	X	X	X	X	
14	**Stakeholder Involvement (Outreach Plan)**		**X**				X	X						X
15	**Climate Change**													
PHASE 4: FINAL PLAN PREPARATION, REVIEW (1st to 2nd Quarter 2014)														
ES	**Executive Summary/Introduction**													
NA	**Overall Plan Review**													
2013 IRWMP Plan Approval (2nd Quarter 2014)														

Meeting Plan

for the 2013 Update to the Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan

Working Draft; *Version Date: May 2014*

Meeting Type and Number Proposed Topics of Discussion (subject to ongoing refinement)	2013						2014	
	3rd Quarter: July - September	4th Quarter: October - December	1st Quarter: January - March	2nd Quarter: April - June	3rd Quarter: July - September	4th Quarter: October - December	1st Quarter: January - March	2nd Quarter: April - June
Stakeholder Meeting #1								
Overview of Statewide/Region IRWM Planning and Update								
2013 MP IRWM Plan Update (Purpose, Components, Key Issues, Schedule)								
Proposed Governance/MOU Discussion								
Stakeholder List/Outreach Plan /to become								
Existing/Proposed Goals and Objectives								
Prioritization of Objectives								
Stakeholder Meeting #2								
Present Revised Items from Meeting #1								
Governance/MOU								
Reports from MOU approval by each RWMG member								
Planning Projects Status Report								
Draft Revised Water Management Strategies								
Draft Project Prioritization Spreadsheets								
Review Draft Plan Sections (1, 2, 3, 4, 5, 12, 13, 14, 15)								
Solicit Project Proposals (preliminary form)								
Stakeholder Meeting #3								
Present Preliminary Project Scoring/Ranking Results								
Prepare and review more plan sections								
other items to be resolved (TBD)								
Other meetings as needed								
MP IRWMP Plan Update Approval by RWMG and Project Proponents								

Outreach/Communication Log

for the 2013 Update to the Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan

Working Draft; *Version Date: May 2014*

Outreach Activity performed	Plan Standard/Purpose	Scheduled Meeting	Non-scheduled Meeting	Small Group Meeting	Personal Call	Follow-up or Return Call	Conference Call	Group Email or Email Blast (full)	Group Email or Email Blast (targeted)	Personal Email	Press Release	Hard copy posting	Update Website
Public Notice	CA Government Code Section 6066 requirement							5/1/2012 and 5/7/2012			4/26/12 and 5/2/2012		
Meeting with L. Hampson, H. Stern (MPWMD)	Initiation/Background Information			3/26/2012									
Steve Endsey (FORA) non-scheduled meeting coordination	Inter-regional, RWMG, Local Land Use Planning		4/6/2012										
Ord Inter-regional phone call: S. Robinson, L. Hampson, H. Stern	Inter-regional						4/10/2012						
WWOC attendance by Larry Hampson	Inter-regional, RWMG, Local Land Use Planning	WWOC 4/18/2012											
Bridget Hoover (MBNMS) phone call	Inter-regional, DAC Outreach				4/25/2012								
Brian True (MCWD) phone call	Inter-regional, RWMG, Water Planning				4/24/2012								
Ross Clark (CCWG) phone call	Inter-regional/Climate Change				5/1/2012								
Called Rick Riedl (City of Seaside)	Stakeholder involvement: DAC				6/14/2012								
Called Kelly Morrow (ln?), City of Seaside	Stakeholder involvement: DAC				6/14/2012								
Emailed Carlos Ramos,(LULAC)	disadvantages communities (DAC outside reqm'ts)				6/14/2012								
Meeting notice	Initation stakeholder meeting							6/25/12			7/3/2012	7/3/2012	6/1/12
Outreach to Cachagua/San Clemente Dam groups (email to Gabriela Alberola [GAlberola@pcl.org])	disadvantages communities (DAC outside reqm'ts)									5/24 - 29/12			
Hardcopy mailing of notice to DAC organizations	disadvantages communities											7/5/2012	
Event briefs for public meeting submitted to Monterey Herald, Monterey County Weekly, Cedar Street Times, Monterey Bay Area News & Views	Stakeholder involvement										7/5/2012		
Public Stakeholder Meeting	Stakeholder involvement	7/25/2012					7/25/2012						
Stakeholder Meeting notice / meeting	Stakeholder involvement, DAC outreach, IRWM Plan Uipdate RMS and Project Review	10/24/2012						10/5/2012			10/5/2012	10/5/2012	
Stakeholder Meeting notice /meeting	See agenda	2/6/2013						Jan. 2014			Jan. 2014		
Stakeholder Meeting notice / meeting	Stakeholder involvement, DAC outreach, IRWM Plan Update Ord interregional (Project 5)	2/7/2013						Jan. 2014			Jan. 2014		

Appendix 14-b

July 25, 2012 Stakeholder Meeting

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Monterey Peninsula, Carmel Bay, and South Monterey Bay
2013 Update to the Integrated Regional Water Management Plan
Stakeholder Group Meeting

AGENDA

1:30 - 3:30 P.M., Wednesday July 25, 2012

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT
5 HARRIS COURT, BLDG. G, MONTEREY, CA 93940

Teleconference Available; URL and call-in information for remote access is as follows:

Topic: IRWM Plan Update Stakeholder Meeting
Date: Wednesday, July 25, 2012
Time: 1:30 pm, Pacific Daylight Time (San Francisco, GMT-07:00)
Meeting Number: 629 336 734
Meeting Password: IRWMP

To join the online meeting (Now from mobile devices!)
---
1. Go to
https://mpwmd.webex.com/mpwmd/j.php?ED=205968952&UID=0&PW=NNTIwYjQ4Y2Qw&RT=MiM0
2. If requested, enter your name and email address.
3. If a password is required, enter the meeting password: IRWMP
4. Click "Join".

To view in other time zones or languages, please click the link:
https://mpwmd.webex.com/mpwmd/j.php?ED=205968952&UID=0&PW=NNTIwYjQ4Y2Qw&ORT=MiM0

To join the audio conference only

Call-in toll free number (US/Canada): 1-877-668-4493
Call-in toll number (US/Canada): 1-650-479-3208
Toll-free dialing restrictions: http://www.webex.com/pdf/tollfree_restrictions.pdf

Access code:629 336 734

For assistance
---
1. Go to https://mpwmd.webex.com/mpwmd/mc
2. On the left navigation bar, click "Support".

You can contact me at:
sara@mpwmd.net

1. Meeting Overview/Purpose and Introductions – 10 minutes [Larry]

2. Past Integrated Regional Water Management Efforts and Relation to 2013 IRWM Plan Update – 10 minutes [Larry]

   - Current Status of 2012 Planning Grant
   - Overview of 2007 Plan Process and Outcome
   - Implementation Grant Round 2

3. 2013 IRWM Plan Update Standards and Proposed Process – 45 minutes [DD&A]

   - Key Issues for Plan Update per IRWM Propositions 84 and 1E Guidelines
     - Coordination with the Greater Monterey County IRWM Region
     - Climate Change
     - New State Guidance/Regulations
     - Governance, including Adaptive Management (i.e., devise methods to update Plan and change membership in the Regional Water Management Group) *[see Draft 2012 MOU]*
     - Stakeholder Outreach, incl. Disadvantaged Communities *[see Draft Stakeholder and Public Outreach Plan]*
   - Proposed Schedule of Meetings
   - Proposed RWMG/Stakeholder/Committee Roles, Input

4. Existing/Proposed Objectives and Priorities/Prioritization – 35 minutes [All]

   - Review of Existing Goals, Objectives and Priorities/Prioritization
   - Input on Prioritization of Objectives

5. Comments and Input – 15 minutes

6. Next Steps/Next Stakeholder Meeting – 5 minutes

PUBLIC NOTICE

Public/Stakeholder Meeting

to Initiate the 2013 Update to the Southern Monterey Bay, Monterey Peninsula, and Carmel Bay

INTEGRATED WATER RESOURCES MANAGEMENT PLAN

Date/Time: July 25, 2012 1:30 -3:30 pm

Location: Monterey Peninsula Water Management District Conference Room
5 Harris Court, Building G
Monterey, California 93940

A Regional Water Management Group, lead by the Monterey Peninsula Water Management District, has initiated an update to our local Integrated Regional Water Management (IRWM) Plan for Southern Monterey Bay, Monterey Peninsula, and Carmel Bay. The public meeting will be held to inform stakeholders of the existing plan, proposed changes to the plan, schedule for future meetings, and identify water-related issues and needs, set/prioritize objectives for water-related resource management, and develop strategies and projects to address identified needs. Issues of discussion include:

- improving water supply reliability,
- water recycling,
- water conservation,
- water quality
- recreation,
- environmental/ecosystem habitat protection, and
- water-related climate change impacts and adaptation.

The Update to the 2007 Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM Plan and projects supporting the Plan update are in progress (in accordance with the requirements in the State of California Department of Water Resources Proposition 84 and 1E IRWM Guidelines).

Your attendance and input is welcomed and encouraged.

To join the IRWM Plan e-mail list or to submit comments or questions, please contact:

Monterey Peninsula Water Management District
Larry Hampson, District Engineer
Tel: (831) 658-5620 FAX: (831) 644-9560
E-mail address: larry@mpwmd.net
Web address: www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm

PUBLIC NOTICE
Date: 6/21/12

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

[mail merge: name and address from the DAC sublist of the stakeholder list June 2012]

May 13, 2014

To whom it may concern,

A Regional Water Management Group, led by the Monterey Peninsula Water Management District, has initiated an update to the 2007 Integrated Regional Water Management (IRWM) Plan for Southern Monterey Bay, Monterey Peninsula, and Carmel Bay. IRWM is a collaborative effort to manage all aspects of water resources in a region, addressing the issues and differing perspectives of all entities involved through mutually beneficial solutions. The update to the 2007 IRWM Plan is being conducted in accordance with the requirements in the State of California Department of Water Resources (DWR) Proposition 84 and 1E IRWM Guidelines.

The guidelines require targeted outreach to disadvantaged communities within IRWM Plans and Programs. A disadvantaged community (DAC) is defined by DWR as any community where the median household income is below 80 percent of the statewide median household income. For the Southern Monterey Bay, Monterey Peninsula, and Carmel Bay region, the identified DAC census tracts are shown on Attachment 1. The following key DAC statewide IRWM priorities have been identified:

- Address critical water supply or water quality needs of DACs within the region
- Address statewide priorities, including “ensure equitable distribution of benefits," specifically:
    - Increase the participation of small and disadvantaged communities in the IRWM process.
    - Develop multi-benefit projects with consideration of affected DACs and vulnerable populations.
    - Identify and include projects that address safe drinking water and wastewater treatment needs of DACs.
    - Address critical water supply or water quality needs of California Native American Tribes.

IRWM operates on the principle that each stakeholder holds a piece of the water management solution for their region and that the best solutions require better communication and understanding of regional issues. Therefore, as further described in Attachment 2, a public meeting will be held on July 25, 2012 from 1:30 – 3:30 pm to inform stakeholders of the existing plan, proposed changes to the plan, schedule for future meetings, identify water-related issues and needs, and set/prioritize objectives for water-related resource management.

DRAFT

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

As an identified stakeholder serving a DAC, we hereby invite you to encourage additional public involvement, in particular, members of DACs, to be involved in the planning process to enable the plan to adequately report and address emerging critical water issues impacting these communities. The more partners involved in an IRWM, the higher the potential for better water management solutions.

Thank you for your time and attention to this matter.

Sincerely,

Rachel Martinez

Community Relations Liaison for MPWMD

Attachments:

1. DAC figure for Southern Monterey Bay, Monterey Peninsula, and Carmel Bay
2. July 25th meeting notice

DRAFT

2013 Update

to the

Monterey Peninsula, Carmel Bay, and South Monterey Bay

Integrated Regional Water Management Plan

Stakeholder Group Meeting

LOCATION:

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

5 HARRIS COURT, BLDG. G

MONTEREY, CA 93940

Wednesday, July 25, 2012

Meeting Agenda

1. **Meeting Overview and Introductions - MPWMD**
2. **Recap of 2007 IRWM Plan Development and Relation to 2013 IRWM Plan Update - MPWMD**
3. **2013 MP IRWMP Update: standards & proposed process – Denise Duffy & Associates (DD&A)**
4. **Draft Objectives and Priorities/Prioritization – DD&A**
5. **Comments and Input - MPWMD**
6. **Next Steps/Next Stakeholder Meeting - MPWMD**

Introductions (Item #1)



What is IRWM Plan?

- Collaborative effort to manage all aspects of water resources in a region
- Crosses jurisdictional, watershed, and political boundaries
- Involves multiple agencies, stakeholders, individuals, and groups
- Attempts to address the issues and differing perspectives of all the entities involved through mutually beneficial solution

Why use IRWM?

IRWM planning should be "designed to improve regional water supply reliability, water recycling, water conservation, water quality improvement, storm water capture and management, flood management, recreation and access, wetlands enhancement and creation, and environmental and habitat protection and improvement."

California Water Code §79564

Benefits of IRWM Planning

- Fosters coordination, collaboration and communication among agencies
- Supports efficient and effective management of regional water supplies, watersheds, and habitat protection
- Enables stakeholder participation
- Positions stakeholders to compete for future funding opportunities

Recap of 2007 IRWM Plan Development and Recent IRWM Activities/Grants (Item #2)



State IRWM Program Background

Timeline

- IRWM Act of 2002 amended State Water Code
- November 2002 Proposition 50 approved
  - $500,000,000 to fund competitive grants with adopted IRWMs (all funds now exhausted)
  - Joint effort with DWR and SWRCB
- December 2005 DWR released CWP update
  - Names IRWM as key for reliable water supplies
- November 2006 Proposition 84 approved – "Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006" (Div 43 of PRC)

State IRWM Program Background

Timeline

- Proposition 84 funds
  - Provides $1,000,000,000 statewide for IRWM planning and implementation ($608 million remaining, $28 million for Central Coast)
- Proposition 1E – Disaster Preparedness and Flood Prevention Bond Act of 2006 approved
  - Provides $300,000,000 for storm water projects that reduce flood damage and consistent with an IRWM ($137 million remaining statewide)
- CA Water Plan 2009; other Senate and Assembly Bills; other CA Water Code sections

How is IRWM occurring?

- Regions (geographic area) approved by DWR
- Planning grants to develop and improve the plans
- Implementation grants to construct projects in the IRWM plans
- Key considerations for region definitions:
  - Watersheds, physical, political, environmental, societal and economic
  - Regional Water Management Groups made up of at least 3 local agencies, at least 2 with statutory authority over water



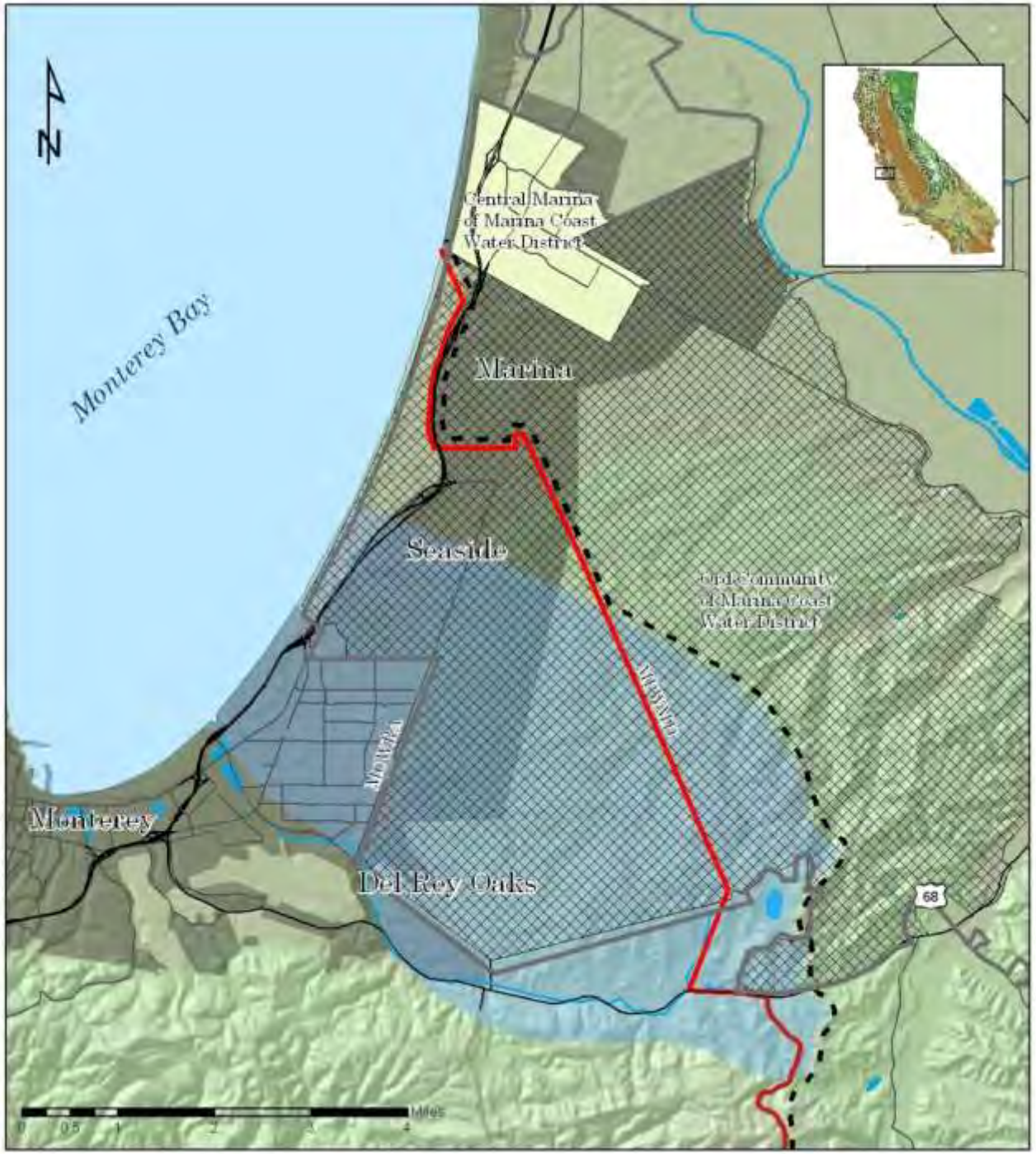
California IRWM Regions



Central Coast IRWM Regions



Monterey Peninsula Region



Fort Ord Area Boundary

2007 IRWM Plan

- 2005 - Stakeholder meetings commence with Proposition 50 grant ($495,000)
- RWMG formed including MPWMD, MCWRA, BSLT, MRWPCA, and City of Monterey
- Development of goals, objectives, project scoring/ranking system
- Project solicitation and ranking of projects
- IRWM Plan adopted in November 2007

Regional Acceptance Process

- 2009 DWR required regions to validate area
- Salinas Valley region expanded to all parts of the Monterey County, excluding this region
- Monterey Peninsula, Carmel Bay, and South Monterey Bay stayed the same geographically
- DWR accepts Monterey Peninsula region in May 2009
- RAP identified former Fort Ord as key area requiring inter-regional coordination

Recent IRWM Activities/Grants

- Planning Grant of $995,000 awarded in 2011
- IRWM Plan update needed to meet new Guidelines
- Eight Additional Planning Projects funded and in progress:
  - Update Canyon Del Rey Drainage Plan
  - Seaside Groundwater Basin salt & nutrient management plan
  - Assessment of steelhead passage barriers in the Carmel River watershed
  - GIS Internet Mapping Site Development and Data Management System
  - Inter-Regional Coordination
  - San Jose Creek watershed
  - ASBS alternatives analysis
  - Hydrologic Modeling for the Carmel Valley Alluvial Aquifer
  - Carmel River Lagoon Ecosystem Protective Barrier Planning

2013 IRWM Plan Update
Guidelines/Standards and Process (Item #3)



DWR IRWM Plan Standards correlated to sections

- Governance *
- Region Description
- Objectives*
- Resource Management Strategies (RMS)
- Integration
- Project Review Process
- Impact and Benefit
- Plan Performance and Monitoring
- Data Management
- Finance
- Technical Analysis
- Relation to Local Water Planning
- Region to Local Land Use Planning
- Stakeholder Involvement*
- Coordination*
- Climate Change*

* Key issues for today's discussion

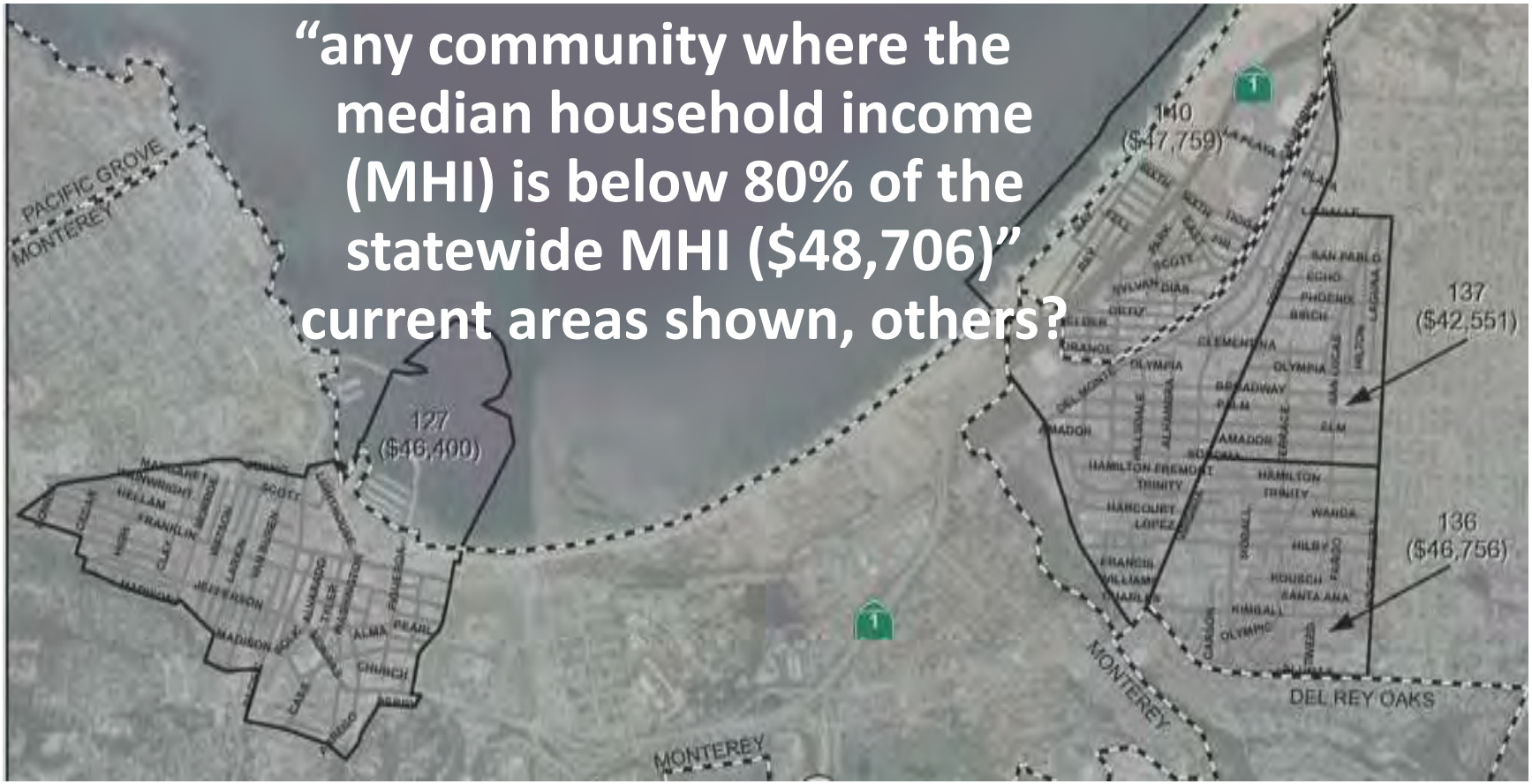
Key Guidelines affecting the Monterey Peninsula IRWM Plan

- **Governance** – changes due to new circumstances [2007 RWMG + MCWD], amend, implement, manage IRWMP (today – next meeting)
- **Disadvantaged Communities** - expand and document coordination, public outreach and involvement enhancement (continually)
- **Climate Change** –assess vulnerabilities/ impacts, objectives, strategies for adaptation/mitigation (continually)
- **Collaboration on Regional Objectives/Priorities** (today)
- **Resource Management Strategies** – must look at 2009 CA Water Plan, climate adaptation, among other documents (next meeting)
- **Project Review Process** – new method, including enhanced finance information; cost/benefit (next meeting)
- **Project Solicitation** – goal to get proposals by the end of the year

Governance

- Revised governance section will reflect MOU draft revisions, that addresses:
  - New RWMG member (and future changes to RWMG)
  - Public Involvement: See Draft Stakeholder Involvement and Outreach Plan
  - Decision Making procedure
  - Balanced access and participation/internal and external communication/coordination
  - Plan Implementation
  - Collaboration on objectives
  - Interim and formal plan changes/updates/amendments
- Comments welcome for the next month

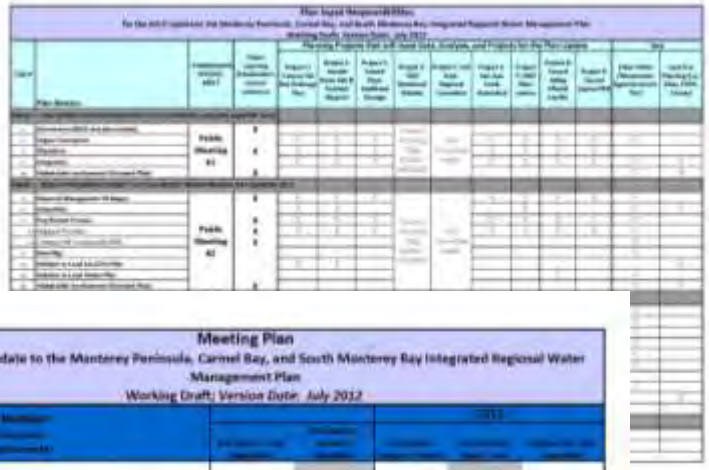
DWR's DAC Definition and Monterey Peninsula DACs

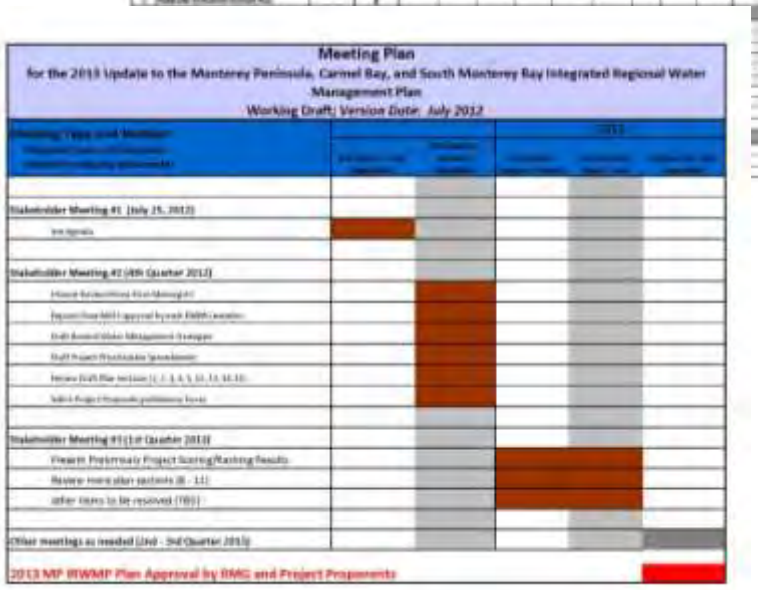


Input Welcome/Needed on issues, concerns, potential projects to benefit DACs, additional outreach partnerships and activities, other ways to help from stakeholders/group…

Stakeholder Outreach

- Draft Stakeholder Involvement /Outreach Plan
- Key efforts:
  - news media
  - interactive website
  - expanded stakeholder list
  - specific, ongoing DAC outreach
  - meetings open to public
- Comments welcome throughout process





Stakeholder Lists

- With assistance by stakeholders, developed a list of over 250 entities representing:
  - Federal, state, regional and local agencies
  - Water / Wastewater Districts, JPAs, & Private Water Suppliers
  - Nonprofit Organizations & Citizen Groups (incl. Disadvantage Community Organizations)
  - Private Companies/Business Organizations/Individuals
  - Political Contacts
  - Other Region's IRWM Key Contacts
  - Carmel River Task Force
- Plan to distribute key notices to the full list
- Shorter list based on interest/involvement (will continue to include DAC organizations)

2013 Monterey Peninsula IRWM Plan Stakeholders (RWMG not included)	
California American Water	Fort Ord Reuse Authority
California Coastal Commission	Monterey Bay National Marine Sanctuary (NOAA)
California Coastal Conservancy	Monterey Coastkeeper
California Department of Fish and Game	Monterey County Hospitality Association
California Department of Water Resources	Monterey County Public Works
California Native Plant Society, Monterey County	Monterey County Service Area 50
California Department of Parks and Recreation	Monterey County Resource Conservation District
California State Water Resources Control Board	Monterey County Resource Management Agency
CSU Monterey Bay: Watershed Institute	Monterey Peninsula Chamber of Commerce
Carmel Area Wastewater District	Monterey Peninsula Regional Park District
Carmel River Steelhead Association	Monterey Regional Waste Management District
Carmel River Watershed Conservancy	NOAA Fisheries
Carmel Unified School District	Pebble Beach Community Service District
Carmel Valley Association	Pebble Beach Company
Central Coast Regional Water Quality Control Boarrd	Planning and Conservation League
City of Carmel-by-the-Sea	Seaside Basin Watermaster
City of Del Rey Oaks	Surfrider Foundation
City of Marina	The Nature Conservancy
City of Pacific Grove	U.S. Army Corps of Engineers
City of Sand City	U.S. Forest Service
City of Seaside	U.S. Fish and Wildlife Service
Coastal Watershed Council	Ventana Wilderness Society
Disadvantaged Community Outreach	
CHISPA	Monterey County Welfare Department
Environmental Justice Coalition for Water	Monterey Library
Foundation for Housing Assistance of Monterey Co.	Monterey Senior Center
Fort Ord Environmental Justice Network	NAACP
League of United Latin American Citizens	Oldemeyer Senior Center
Military and Veterans Affairs	Rural Communities Assistance Corporation
Monterey County Department of Health Services	Seaside Library
Monterey County Housing Authority	Seaside Family Health Center
Monterey County Social Services Department	Shelter Outreach Plus/ I Help Program

Climate Change: Legislation

- Numerous State Legislation/Policies:
  - EO S-3-05 and AB-32 CA Global Warming Solutions Act of 2006
  - SB 97 initiated changes to CEQA
  - EO S-13-08 directed preparation of sea level rise impact study, transportation study, Climate Adaptation Strategy
- California Ocean Protection Council Resolution

Climate Change in IRWM Plan

1. Assess vulnerabilities/effects of CC on region
2. Identify adaptation responses to CC impacts, in particular on runoff and rainfall, water supply
3. Aim to reduce GHG emissions (reduce energy use, alternative energy, sequestration)
4. Incorporate the above into objectives, strategies, project review process, etc.

CA Water Plan: Resource Management Strategies

Reduce Water Demand	Water Use Efficiency
Improve Operational Efficiency and Transfers	Conveyance, System Reoperation, Water Transfers, Waterbag Transport/Storage Technology
Increase Water Supply	Conjunctive Management & Groundwater Storage, Desalination, Precipitation Enhancement, Recycled Municipal Water, Surface Storage – Regional/local, Dewvaporation or Atmospheric Pressure Desalination, Fog Collection
Improve Water Quality	Drinking Water Treatment and Distribution Groundwater Remediation/Aquifer Remediation Matching Quality to Use, Pollution Prevention, Salt and Salinity Management, Urban Runoff Management
Improve Flood Management	Flood Risk Management
Practice Resources Stewardship	Agricultural Lands Stewardship, Economic Incentives (Loans, Grants and Water Pricing), Ecosystem Restoration, Forest Management, Recharge Area Protection, Water-Dependent Recreation Watershed Management

Project Review Process

- Draft being developed for review by stakeholders at the next meeting
- 2007 method considered; input welcome
- New for 2013: more financial analysis, new objectives prioritization, consideration of state guidelines, climate change, etc.
- More detail at next meeting

Meeting Plan 2012 - 2013

Meeting /Purpose	Date
Stakeholder meeting #1	July 25, 2012
Updates, information, governance, objectives, stakeholder involvement	
Stakeholder meeting #2	October 24, 2012
Project review process, resource management strategies, solicit projects	
Stakeholder meeting #3	1st Quarter 2013 (TBD by October)
Review project scoring/ranking	
Stakeholder meeting #4 (if needed)	2nd Quarter 2013
Review Draft 2013 IRWM Plan	
Complete IRWM Plan for approval	3rd Quarter 2013

Objectives Prioritization Process (Item #4)



Determining Plan Objectives

In developing IRWM Plan objectives, RWMGs must consider these overarching goals:

- Basin Plan Objectives
- 20x2020 water efficiency goals
- Requirements of CWC §10540(c) … see next slide

OTHER FACTORS BESIDES OBJECTIVES WILL GUIDE PROJECT RANKING PROCESS, INCLUDING RESOURCE MANAGEMENT STRATEGIES, FEASIBILTY, DACS/ENVIRONMENTAL JUSTICE, COSTS/FINANCING, PROJECT STATUS, IMPACTS, ETC.

Requirements of CWC §10540(c)

1) Protection and improvement of *water supply reliability*, including identification of feasible agricultural and urban water use efficiency strategies
2) Identification and consideration of the *drinking water quality* of communities within the area of the Plan
3) Protection and improvement of *water quality* within the area of the Plan consistent with the relevant basin plan
4) Identification of any significant threats to *groundwater resources* from *overdrafting*
5) Protection, restoration, and improvement of stewardship of *aquatic, riparian, and watershed resources* within the region
6) Protection of *groundwater resources from contamination*
7) Identification and consideration of the water-related needs of *disadvantaged communities* in the area within boundaries of plan

Goals/Objective Categories

Water Supply	Water Quality	Flood Protection and Erosion Prevention
Environmental Protection and Enhancement	Climate Change* (New for 2013 Update)	Regional Communication and Cooperation (expanded to include DAC)

Prioritization of Objectives

- Goals and Objectives should address the most pressing water management issues
- Meant to be collaborative and consensus-driven
- Based primarily upon 2007 IRWM Objectives, with updates per new legislation/guidance and circumstances
- Prioritization is an important, meaningful step; however, future opportunities to revisit (i.e., project review)
- Different method this round; prioritization of objectives, rather than separate list of priorities

Five 2007 Regional Priorities

- Meet current replacement supply and future demand targets for water supply and support the Seaside Groundwater Basin Watermaster to implement the physical solution in the Basin
- Reduce the potential for flooding in Carmel Valley and at the Carmel River Lagoon
- Mitigate effects of storm water runoff throughout the region
- Address storm water discharges into Areas of Special Biological Significance (ASBS)
- Promote the steelhead run in Carmel River

Prioritization Exercise

- By topic/category, review of each regional goal and highlight statewide & 2007 priorities
- "Ballots" provided (hard copy at meeting/pdf form for on-line, absentee stakeholders at:
  - http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm)
- Select high- and low-priority objectives, in addition to those you feel should be eliminated
- Comment cards are available to express more detailed comments or questions on any aspect
- Please provide name, email, affiliation to assist with accounting (responses will be confidential)
- Reminder: result will not necessarily set project scoring/ranking, but may guide methodology

Water Supply – Goal

Improve regional water supply reliability through environmentally responsible solutions that promote water and energy conservation and that protect the community from drought and climate change effects with a focus on interagency cooperation and conjunctive use of regional water resources.

Water Supply – Objectives

Objectives:	High Priority	Low Priority	Not a Priority
WS-1. Meet existing water supply replacement needs and adopted future demand estimates.**			
WS-2. Maintain the quality and quantity of water in the Seaside Groundwater Basin.**			
WS-3. Minimize the impacts to sensitive species and habitats from diversions of surface water.*			
WS-4. Maximize use of recycled water.*			
WS-5. Optimize conjunctive use of surface and groundwater.*			
WS-6. Evaluate, advance, or create water conservation throughout the Region in compliance with the State's 20x2020 Water Conservation Plan.*			

* Objective is closely aligned with the Statewide Priorities.

** Objective is closely aligned with the Statewide Priorities and was identified as 2007 regional priority.

Water Quality - Goal

Protect and improve water quality for beneficial uses consistent with regional community interests and the Regional Water Quality Control Board Basin Plan through planning and implementation in cooperation with local and state agencies and regional stakeholders.

Water Quality - Objectives

Objectives:	High Priority	Low Priority	Not a Priority
WQ-1. Minimize impacts from stormwater (or urban) runoff water quality.**			
WQ-2. Improve stream and near-shore water quality; address stormwater discharges into ASBS.**			
WQ-3. Meet or exceed applicable water quality standards established by regulatory processes or by stakeholders (whichever is more protective).*			
WQ-4. Improve water quality for environmental resources (e.g. steelhead). Protect surface and groundwater basins from contamination and threat of contamination.*			
WQ-5. Meet or exceed recycled water quality targets established by stakeholders .*			

* Objective is closely aligned with the Statewide Priorities.

** Objective is closely aligned with the Statewide Priorities and was identified as 2007 regional priority.

Flood Protection/ Erosion Prevention - Goal

Ensure that flood protection and erosion prevention strategies are developed and implemented through a collaborative and watershed-wide approach and are designed to consider climate change effects and maximize opportunities for comprehensive management of water resources.

Flood Protection/ Erosion Prevention - Objectives

Objectives:	High Priority	Low Priority	Not a Priority
FP-1. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from flood damage, erosion, and sea level rise; reduce the potential for flooding in Carmel Valley and the Carmel River Lagoon.**			
FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).*			
FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.*			
FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.			

* Objective is closely aligned with the Statewide Priorities.

** Objective is closely aligned with the Statewide Priorities and was identified as 2007 regional priority.

Environmental Protection & Enhancement - Goal

Preserve the environmental health and well-being of the Region's streams, watersheds, and the ocean by taking advantage of opportunities to assess, restore and enhance these natural resources when developing water supply, water quality, and flood protection strategies. Seek opportunities to conserve water and energy, and adapt to the effects of climate change.

Environmental Protection & Enhancement

Objectives:	High Priority	Low Priority	Not a Priority
EV-1. Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.**			
EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when developing water management strategies and projects.*			
EV-3. Minimize adverse effects on biological and cultural resources when implementing strategies and projects.*			
EV-4. Identify opportunities for open spaces, trails and parks along streams and other recreational areas in the watershed that can be incorporated into projects.			
EV-5. Identify and integrate elements from appropriate Federal and State species protection and recovery plans .*			

*Objective is closely aligned with the Statewide Priorities.

** Objective is closely aligned with the Statewide Priorities and was identified as 2007 regional priority.

Climate Change (new for 2013) - Goal

Adapt the region's water management approach to deal with impacts of climate change using science-based approaches, and minimize the regional causal effects related to water resources.

Climate Change (new for 2013) - Objectives

Objectives:	High Priority	Low Priority	Not a Priority
CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.*			
CC-2. Support increased monitoring and research to obtain greater understanding of long-term impacts of climate change in the region.*			
CC-3. Support efforts to research alternative energy and to diversify energy sources appropriate for the region.*			
CC-4. Seek long-term solutions to reduce greenhouse gas (GHG) producing energy use.*			

* Objective is closely aligned with the Statewide Priorities.

Regional Communication - Goal

Identify an appropriate forum for regional communication, cooperation, and education. Develop protocols for encouraging integration and reducing inconsistencies in water management strategies between local, regional, State, and Federal entities. Provide balanced access and opportunity for the public, stakeholders, and DACs to participate in IRWM efforts.

Regional Communication - Objectives

Objectives:	High Priority	Low Priority	Not a Priority
RC-1. Meet or exceed State and Federal regulatory orders (including Basin Plan Objectives and 20x2020 goals), provided that mandates are funded.			
RC-2. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change.			
RC-3. Foster collaboration between regional entities			
RC-4. Build relationships with State and Federal regulatory agencies and other water forums and agencies.			
RC-5. Identify opportunities for public education on water resource management, including extra effort focused on disadvantaged communities.*			
RC-6. Continually seek to expand outreach and communication to disadvantaged communities and stakeholders with interests in water management issues.*			

* Objective is closely aligned with the Statewide Priorities.

Comments and Input (Item #5)



Next Steps

- Meeting: October 24th
- MOU progress/status
- GIS and Data Management
- Resource Management Strategies
- Draft Project Review Process
- Draft Sections of IRWMP
- Other ?

Contacts/More Information

Larry Hampson, District Engineer, MPWMD
Email: **Larry@mpwmd.net**
Phone: (831)658-5620

Alison Imamura, AICP, Denise Duffy & Asssociates, Inc.
Email: **aimamura@ddaplanning.com**
Phone: (831)373-4341x12

Web address (2007 Plan/2009 RAP):
http://www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm

Web address (2013 Plan Update):
http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

List of Attendees

2013 Update to the Monterey Peninsula, Carmel Bay, and South Monterey Bay Integrated Regional Water Management Plan
July 25, 2012
Stakeholder Meeting #1

Name	Organization	E-mail
Arthur McLoughlin	Monterey Bay Youth Camp	mickey3643@aol.com
Greg Pepping	Coastal Watershed Council	gpepping@coastal-watershed.org
Gabby Alberola	Planning and Conservation League Foundation	galberola@pcl.org
Lorin Letendre	CRWC	letendre@sbcglobal.net
Mike Novo	Monterey County Planning Commission	novom@co.monterey.ca.us
Robert Johnson	MCWRA	johnson@co.monterey.ca.us
Mark Dudley	MPWMD	mdudley@mpwmd.net
Johnathan Lear	MPWMD	jlear@mpwmd.net
Henrietta Stern	MPWMD	henri@mpwmd.net
Barbara Smythe	Monterey Resident	bhsmythe@comcast.net
Bruce Gordon	Cal Am Water Bill Payer	bruceg@intercomm.com
Bob Steinberg	Citizen	janbobnew@comcast.net
Thomas Christensen	MPWMD	thomas@mpwmd.net
Mike McCullough	MRWPCA	mikem@mrwpca.com
Margaret Robbins	CSA #50	mm_robbins@comcast.net
George Riley	Citizens for Public Water	georgetriley@gmail.com
J.T. Rethke	Pebble Beach Community- Service District	jrethke@pbcsd.org
Larry Hampson	MPWMD	larry@mpwmd.net
Alison Imamura	DD & A	aimamura@ddaplanning.com
Denise Duffy	DD & A	dduffy@ddaplanning.com
Michael Gonzales	DD & A	mgonzales@ddaplanning.com
Arleen Hardenstein	MCAR: Member of the Public	arleen@brattyandbluhm.com
Doug Rogers	Interested Citizen	qavc1@aol.com
Des Johnston	MPAD	djohnston@montereyairport.com
Jeff Krebs	City of Monterey	krebs@co.monterey.ca.us
Tom Harty	Monterey County DPW	hartytr@co.monterey.ca.us
Rami Shihadeh	RCDMC	rami.shihadeh@rcdmonterey.org
Leslie Llantero	City of Seaside	lllantero@ci.seaside.ca.us
Frank Pierce	Lee & Pierce, Inc.	fpierce@leeandpierce.com
Brian True	MCWD	btrue@mcwd.org
Paul Robins	RCD of Monterey Co.	paul.robins@rcdmonterey.org

IRWM Plan Stakeholder Meeting - Objectives Feedback (July 25, 2012)

Name: _____ **Affiliation:** _____

Email: _____

Water Supply (WS)

Objectives	*High Priority*	*Low Priority*	*Not a Priority*
WS-1. Meet existing water supply replacement needs and adopted future demand estimates.**			
WS-2. Maintain the quality and quantity of water in the Seaside Groundwater Basin.**			
WS-3. Minimize the impacts to sensitive species and habitats from diversions of surface water.*			
WS-4. Maximize use of recycled water.*			
WS-5. Optimize conjunctive use of surface and groundwater.*			
WS-6. Evaluate, advance, or create water conservation throughout the Region in compliance with the State's 20x2020 Water Conservation Plan.*			

* Objective is closely aligned with the Statewide Priorities.

** Objective is closely aligned with the Statewide Priorities and was identified as a 2007 regional priority

Water Quality (WQ)

Objective	*High Priority*	*Low Priority*	*Not a Priority*
WQ-1. Minimize impacts from stormwater (or urban) runoff water quality.**			
WQ-2. Improve stream and near-shore water quality; address stormwater discharges into Areas of Special Biological Significance (ASBS).**			
WQ-3. Meet or exceed applicable water quality standards established by regulatory processes or by stakeholders (whichever is more protective).*			
WQ-4. Improve water quality for environmental resources (e.g. steelhead). Protect surface and groundwater basins from contamination and threat of contamination.*			
WQ-5. Meet or exceed recycled water quality targets established by stakeholders *			

* Objective is closely aligned with the Statewide Priorities.

** Objective is closely aligned with the Statewide Priorities and was identified as a 2007 regional priority.

Flood Protection and Erosion Prevention (FP)

Objectives	*High Priority*	*Low Priority*	*Not a Priority*
FP-1. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from flood damage, erosion, and sea level rise; reduce the potential for flooding in Carmel Valley and the Carmel River Lagoon.**			
FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).*			
FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.*			
FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.			

* Objective is closely aligned with the Statewide Priorities.

** Objective is closely aligned with the Statewide Priorities and was identified as a 2007 regional priority

Environmental Protection and Enhancement (EV)

Objective	***High Priority***	***Low Priority***	***Not a Priority***
EV-1: Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.**			
EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when developing water management strategies and projects.*			
EV-3. Minimize adverse effects on biological and cultural resources when implementing strategies and projects.*			
EV-4. Identify opportunities for open spaces, trails and parks along streams and other recreational areas in the watershed that can be incorporated into projects.			
EV-5. Identify and integrate elements from appropriate Federal and State species protection and recovery plans .*			

* Objective is closely aligned with the Statewide Priorities.

** Objective is closely aligned with the Statewide Priorities and was identified as a 2007 regional priority.

Climate Change (CC)

Objectives	***High Priority***	***Low Priority***	***Not a Priority***
CC-1. CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.*			
CC-2. Support increased monitoring and research to obtain greater understanding of long-term impacts of climate change in the region.*			
CC-3. Support efforts to research alternative energy and to diversify energy sources appropriate for the region.*			
CC-4. Seek long-term solutions to reduce greenhouse gas (GHG) producing energy use.*			

* Objective is closely aligned with the Statewide Priorities.

Regional Communication and Cooperation (RC)

Objective	*High Priority*	*Low Priority*	*Not a Priority*
RC-1. Meet or exceed State and Federal regulatory orders (including Basin Plan Objectives and 20x2020 goals), provided that mandates are funded.			
RC-2. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change impacts.			
RC-3. Foster collaboration between regional entities.			
RC-4. Build relationships with State and Federal regulatory agencies and other water forums and agencies.			
RC-5. Identify opportunities for public education on water resource management, including extra effort focused on disadvantaged communities.*			
RC-6. Continually seek to expand outreach and communication to disadvantaged communities and stakeholders with interests in water management issues.*			

* Objective is closely aligned with the Statewide Priorities.

Monterey Peninsula IRWM Plan Update - Objectives Feedback Results from 25July2012 Stakeholder Meeting

Affiliation	Water Supply (WS)						Water Quality (WQ)					Flood Protection (FP)				Environmental Protection (EP)					Climate Change (CC)				Regional Communication (RC)						Notes or Comments
	1	2	3	4	5	6	1	2	3	4	5	1	2	3	4	1	2	3	4	5	1	2	3	4	1	2	3	4	5	6	
RCD Monterey County	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	0	1	1	1	2	2	2	2	2	2	
Lee & Pierce Inc.	2	1	1	2	1	1	1	2	1	2	2	2	2	2	2	2	2	1	0	2	0	0	0	0	2	1	2	2	2	1	CC these objectives are being addressed by other agencies and Government levels- Need to be aware of incorporating these goals into projects
Monterey Peninsula Airport	2	2	2	2	2	2	2	2	2	2																					
Concerned Citizen	2	2	1		1	2	1	1	2	1.5	2	1	1	2	2	2	1	2	1	2	2	2	2	1	2	2	2	2	1	1	RC-3 if only 2, If more than 5. RC-5 & RC-6 ??
MPWMD	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	2	2	2	2	0	1	2	2	2	2	2	2	
MCWRA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Do Not Prioritize
Monterey County Planning	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Carmel River Watershed Conservar	2	1	2	2	2	1	1	2	1	2	2	2	2	2	1	2	1	2	1	2	2	2	1	2	1	2	2	2	1	2	
City of Monterey	2	2	1	2	2	1	2	2	1	2	2	2	2	1	1	1	1	1	1	1	2	2	1	1	1	2	2	2	1	1	
Coastal Watershed Council	1	1	2	2	2	2	2	1	2	2	2		0	2	1	2	2	2	2	1	2	2	2	2	2	2	2	1	2	2	
Planning & Conservation League Fo	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	1	2	2	1	1	2	2	2	2	1	2	1	1	2	2	
	2	1	2	2	1	2	2	2	1	2	2	2	1	2	1	2	1	2	1	2	2	1	2	1	2	2	2	2	1	1	
Monterey County Dept. of Public W	2	1	1	2	1	2	2	2	2	2	1	2	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	
Monterey Bay Youth Camp	2	2	2	1	1	2	2	2	2	2	1	1	2	1	1	0	1	1	2	1	2	2	2	1	1	2	2	2	2	2	RC-5 (including extra affort focused on disadvantaged Communities) Take out. CC-3 & CC-4 TIE into projects of IRWM
RCD of Monterey Co.	2		2	1	1	1	2	1	2	2	1	2	1		2	2	2	1	1	1	2	2	1	1	2	2	2	1	2	1	FP-3 Already Addressed Under Quality & Supply?
Resudential Water User	2	2	0	2	1	1	2	1	2	1	2	2	1	2	0	1	2	2	1	2	0	0	0	0	2	2	2	2	2	2	EV-5 Is there a choice NOT to meet State & Federal "plans" (requirements). CC None of these should be involved with the MPWMD. RC-1 Not for MPRWD. RC-2 RE1 is there any choice "not to"?
resident/citizen	2	2	1	2	2	1	2	1	2	2	2	2	2	2	1	1	2	2	1	1	0	0	1	0	2	2	2	2	1	2	
resident/citizen	2	2	1	2	1	2	1	1	2	2	2	2	1	2	2	1	2	1	2	2	2	2	2	2	2	2	2	2	1	1	
MPWMD/citizen	2	2	2	2	2	2	2	1.5		2	1	2	2	1	2	2	2	2	2	2	2	2	0	0		2	2	2	2	2	FP-1 Maybe parse these out. FP-3 These go hand in hand with see other side. FP-4 esp. for Fort Ord. CC-3 & CC-4 Not for IRWM. RC-1 Seems like there is legd. Anyway. RC-3 despite litigations. EV-5 Required
MRWPCA	2	2	1	2	2	1	2	2	0	1	2	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	2	2	2	2	
CSA H50	2	2	1	2	2	2	2	2	2	1	2	2	2	2	1	2	2	1	1	1	2	2	2	2	2	1	1	2	2	2	
Pebble Beach Community Service D	2			2							1																				
Citizen for Public Water	2	2	2	2	1	0	1	2	0	1	1	2	1	2	1	0	1	2	1	1	1	1	2	1	1	2	2	0	1	1	
MCWD	2	2	1	2	1	1	1	1	1	1	2	2	1	1	2	1	1	1	2	1	1	1	1	1	1	2	1	1	1	1	
MPWMD	2	2	1	2	2	1	1	2	2	2	2	2	2	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	
City of Seaside	2	2	1	2	1	1	2	2	1	1	2	2	2	1.5	1.5	1.5	1	2	2	2											
	2	2	1	1	1	1	2	2	1	1	1	2	1	1	0	2	1	1	0	1	1	1	1	1	1	1	2	2	2	2	
City of Pacific Grove	2	2	1	2	2	2	2	2	2	1	2	1	1	2	1	1	2	1	1	0	1	2	1	1	2	1	2	1	2	2	
TOTAL	**53**	**45**	**36**	**49**	**40**	**39**	**45**	**44.5**	**39**	**43.5**	**45**	**43**	**38**	**39.5**	**32.5**	**34.5**	**40**	**38**	**32**	**36**	**34**	**35**	**31**	**27**	**37**	**43**	**44**	**40**	**39**	**39**	
	*	*					*	*				*				*															
Breaking points analysis:	*	*					*	*		*	*	*														*	*				

Monterey Peninsula, Carmel Bay, and South Monterey Bay
2013 Update to the Integrated Regional Water Management Plan
Stakeholder Group Meeting

MEETING NOTES

1:30 - 3:30 P.M., Wednesday July 25, 2012

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT
5 HARRIS COURT, BLDG. G, MONTEREY, CA 93940

1. Meeting Overview/Purpose and Introductions – 10 minutes [Larry]

Group introductions – A complete list of attendees and a copy of the presentation is available at http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

2. Past Integrated Regional Water Management Efforts and Relation to 2013 IRWM Plan Update – 10 minutes [Larry]

- Current Status of 2012 Planning Grant
- Overview of 2007 Plan Process and Outcome
- Implementation Grant Round 2

3. 2013 IRWM Plan Update Standards and Proposed Process – 45 minutes [DD&A]

- Key Issues for Plan Update per IRWM Propositions 84 and 1E Guidelines
  - Coordination with the Greater Monterey County IRWM Region
  - Climate Change
  - New State Guidance/Regulations
  - Governance, including Adaptive Management (i.e., devise methods to update Plan and change membership in the Regional Water Management Group) *[see Draft 2012 MOU]*
  - Stakeholder Outreach, incl. Disadvantaged Communities *[see Draft Stakeholder and Public Outreach Plan]*
- Proposed Schedule of Meetings
- Proposed RWMG/Stakeholder/Committee Roles, Input

Frank Pierce – Commented that the plan and objectives should be a 3-legged stool including:

1. Preservation of Natural Resources
2. Water Quality for Residents
3. Water Supply for Agriculture

George Riley – *Question*: What has been CalAm's Role in the IRWMP Process?

Response: They are a stakeholder; but have not been actively involved in the past.

Lorin Letendre – Question: What is the timing of IRWMP completion in relation to timing for implementation project grant application deadlines?

Response (**Michelle Dooley, DWR**): The 2013 IRWMP Update in progress currently will satisfy grant applications this year and next; the plan progress/trajectory for completion needs to be documented in the application in an easy to complete questionnaire.

4. Existing/Proposed Objectives and Priorities/Prioritization – 35 minutes [All]

This topic included revisiting 2007 IRWMP Goal and Objectives specific to the region (as updated for the 2013 Update based upon the new DWR Guidelines). Attendees were asked to comment on Goals and Objectives and, specifically, to provide prioritize objectives via marking on a ballet for which objectives should be a high priority, low priority, or not a priority.

Rob Johnson – Commented that the group should consider not prioritizing objectives (removing prioritization component consistent with Greater Monterey County's approach).

> **Michelle Dooley** responded that prioritization or not and the method is up to each region to decide and DWR accepts both methods. She elaborated that there are many methods possible to use to prioritize, tier, group the objectives, including short-/long- term, geographically, by importance (per the method proposed for this process). The prioritization can help to properly rank projects for implementation to better meet the most imminent/critical needs of the region.

Water Supply (WS)

[addressed within Regional Communication and Cooperation] Numerous - Generally, numerous comments on the need for collaboration/agreement rather than litigation. In particular, a concern was expressed that the number of entities requesting different solutions to the same problem (lack of agreement) may make it difficult to put forward a request for funding due to the conflicts.

(unknown) – WS-2 question about combining Water Quality and Quantity in one objective.

> Larry noted that if Seaside Basin's quantity is preserved, the quality is maintained due to seawater intrusion being the water quality concern.

Henrietta Stern – Noted IRWMP Final round for Prop 84 grant funds is in 2014

Water Quality (WQ)

Henrietta Stern - WQ-2 seems like it includes two objectives and WQ-4 seem to overlap and WQ-4 seems more like two separate objectives.

Lorin Letendre - WQ-2 also seems like it includes two objectives.

Frank Pierce – General Comment – Should we have an objective that would be to reduce the complexity of regulations such that they are more logical and that regulators are more able to allow technical project modifications due to specific environmental/soil conditions, and to include consideration of technical feasibility and ability to implement alternatives.

Flood Protection and Erosion Protection (FP)

Gabriel Alberola – requested clarification on how to vote for priorities if the region has met the objective to some degree

(Unknown) –We need better interaction between agencies, and other states, and the support of projects that will allow water to be transported from other states that experience heavy flooding

Frank Pierce – FP-1 should include better interaction with agencies.

Bruce Gordon – Why does FP-1 include sea level rise? Was it in 2007? Separate out; too much in there. Expressed frustration that every time a new plan gets brought proposed new requirements are added.

Denise Duffy – The 2007 Objectives have been modified to address new State guidelines; and it is interesting to consider that issue, especially with DWR on line. The new guidelines require that the region consider the new issues, but it is up to each region how much to prioritize these issues and, ultimate, how each region ranks projects in consideration of that issue.

Greg Pepping — FP-1 contains too many components within one objective. Can't accomplish is it all; perhaps splitting it out would be better in future "voting" to allow people to weigh in on each issue

Environmental Protection/Enhancement (EP)

Frank Pierce – General Comment – Planning for projects should first achieve the best approach/results and then adjust to regulation requirements

George Riley – General Comment – Now that San Clemente Dam project is approved, that may change objectives related to fish passage

Larry - Los Padres Dam is also an impediment to steelhead passage, the objective could be extended into the future to address this other similar regional issues.

Climate Change (CC)

Bob Steinberg – CC-4 – Contradictory and potential for misunderstanding; should hyphenate "GHG-producing" energy use

Frank Pierce – CC is not a priority because it's the state is responsibility for much of the mitigation; should the climate change objectives be prioritized or not

Michelle – should take a look at the prioritization standards in the guidelines; it is up to the region

Rob Johnson – Reiterate reasons to not prioritize objectives due to the concern for giving too much weight for certain projects (see above response information from Larry and Michelle)

Jonathan Lear CC-2 should be modified to say support research projects for water- energy consumption; look at energy use and how it relates to climate change

Henrietta Stern -

- CC-3 CC-4- Since the water projects/stakeholders don't have control over energy sources; these should be modified to be more able to be addressed by the region's key stakeholders (specifically, project proponents and RWMG)
- Support efforts to use alternative energy for IRWM Plan projects
- Seek means to returns

Mike McCullough – Don't have too many overlapping elements

Regional Communication and Cooperation (RC)

Arthur McLaughlin – RC-5/RC-6- Read poorly- straight focus- delete priorities. Delete the "extra effort" for DAC from RC-5

Greg Pepping – CC didn't have integration of education into climate change and RC didn't integrate climate change; we have a long way to go in terms of education and outreach

Barbara Smythe and others – Concern over interagency disagreements and litigation, let's bring the folks together that are disagreeing.

All discussed the need for regional collaboration on water supply (see discussion above under water supply)

Larry - There are a lot of examples of good collaboration on other projects in the region and the IRWM Plan needs to identify those conflicts/issues problems and find projects and solutions that look forward to solving those.

5. Comments and Input – 15 minutes

[covered above and comment card comments below]

6. Next Steps/Next Stakeholder Meeting – 5 minutes

October 24, 2012 is the next meeting; we'll be working on assembling the results of the objectives prioritization process, supplying more abilities to provide and access information on the data management system and working on the project review process over the next two months.

Larry Hampson, District Engineer, MPWMD
Email: Larry@mpwmd.net
Phone: (831)658-5620

Alison Imamura, AICP, Denise Duffy & Associates, Inc.
Email: aimamura@ddaplanning.com
Phone: (831)373-4341x12

Web address (2007 Plan/2009 RAP): http://www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm
Web address (2013 Plan Update): http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

IRWMP Stakeholder Meeting (25July2012) Feedback General Comment Cards
Lorin Lentendre: Is it possible/feasible to add an objective such as "Remove the San Clemente Dam to improve the ecology of the Carmel River"? Project still needs $3.5m ; Split WQ-2 & WQ-4 into separate objectives (total of 4)
George Riley: Help MRWPCA acquire Salinas industrial pond water/lettuce washing water, and ag. runoff ditch—all to process, clean up, for an increased capacity for water supply, promote cooperation between urban and agricultural interests, and between planning regions, and reduce discharge contaminants into bay, and reduce costs to water customers. Also storm water as further source for PCA Monterey Peninsula Groundwater Replenishment Project should be a top priority.
Paul Robins: It seems to me that repeated or recapping references to different issues in multiple goal areas is potentially redundant with the integration requirement already implicit (+ explicit) in IRWMP and could confound the project ranking/score process.
Henrietta Stern: CC-3 should read: support efforts to use alternative energy sources for the IRWM projects, as feasible; CC-4 seeks means to reduce GHG production from energy sources needed to run IRWM projects.
Barbara Smythe: #1 priority is to increase our water supply. Bring all the entities to agreement.
Brian True: Co-equal Objectives? (rather than prioritize objectives); Is the integration of former Fort Ord area elevated to "objectives" status? (due to overlap of this area between IRWMP regions
Specific Comments on Objective Feedback Forms
Frank Pierce: CC these objectives are being addressed by other agencies and Government levels- Need to be aware of incorporating these goals into projects
Doug Rodgers: text edit strike "between" and replace with "among"; this individual wanted groundwater as high and surface water as low; so I edited it as such with the new version of these
Rob Johnson: Do Not Prioritize
Steve Shimek: I found a couple of the questions difficult to answer because I felt they led you to a false choice. Specifically the question about water supply and funded/unfunded mandates. As an example, RC-1 . You have qualified the answer with whether or not the mandate is funded. Municpalities are often faced with unfunded mandates and are simply required to juggle and prioritize. Not being funded does not mean "can be ignored"; but that is the choice you seem to offer.
Arthur McLoughlin: RC-5 Check sensitivity on the phrase regarding disadvantaged communities. CC-3 &

CC-4 TIE into projects of IRWM
Paul Robins: FP-3: Already Addressed Under Quality & Supply?
Bruce Gordon: EV-5- Is there a choice NOT to meet State & Federal "plans" (requirements). CC-None of these should be the responsibility of MPWMD. RC-1-Not for MPRWD. RC-2 - is there any choice "not to"?
Henrietta Stern: FP-1 - Maybe parse these out. FP-3 - These go hand in hand with other EP objectives. FP-4 - esp. for Fort Ord. CC-3 & CC-4 - Not for IRWM. RC-1- Seems like there is required anyway. RC-3: add "despite litigation." EV-5: Required

Appendix 14-c

Oct 24, 2012 Stakeholder Meeting

DRAFT

Monterey Peninsula, Carmel Bay, and South Monterey Bay
2013 Update to the Integrated Regional Water Management Plan
Stakeholder Group Meeting

REVISED AGENDA

1:30 - 3:30 P.M., Wednesday October 24, 2012

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT
5 HARRIS COURT, BLDG. G, MONTEREY, CA 93940

Teleconference Available – for URL and call-in information for remote access, please go to the following site and click on the meeting link:

http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

1. Meeting Overview/Purpose and Introductions – 5 minutes [MPWMD]
2. Review Results of Stakeholder Meeting #1 – 10 minutes

- Governance / MOU status – seven (7) RWMG members [MPWMD]
- Availability / Comments on Meeting Notes [all]
- Overview of Objectives Feedback Results [Denise Duffy & Associates, DD&A]
- Availability of Draft Objectives Section: *comments due November 30, 2012*

3. Resource Management Strategies – 25 minutes [DD&A]

- Overview of Plan Standard, Previous Strategies
- View Recommended New Strategies
- Availability of Draft Resource Management Strategies Section: *comments due November 30, 2012*
- Comments and Input

…Break (5 min)…

4. Project Review Process / Form – 35 - 45 minutes [DD&A]

- Review of project solicitation process for IRWM plan inclusion
- Presentation of potential project scoring/ranking methodology
- Comments and Input

5. Other Comments and Input
6. Next Steps/Next Stakeholder Meeting

- Concept Proposal Solicitation for Plan Inclusion beginning Mid-November
- Next Stakeholder Meeting: late January 2013

[mail merge: name and address from the DAC sublist of the stakeholder list October 2012]

May 13, 2014

To whom it may concern,

A Regional Water Management Group, led by the Monterey Peninsula Water Management District, is continuing its 2013 update to the 2007 Integrated Regional Water Management (IRWM) Plan for Southern Monterey Bay, Monterey Peninsula, and Carmel Bay. IRWM is a collaborative effort to manage all aspects of water resources in a region, addressing the issues and differing perspectives of all entities involved through mutually beneficial solutions. The 2013 Update to the IRWM Plan is being conducted in accordance with the requirements in the State of California Department of Water Resources (DWR) Proposition 84 and 1E IRWM Guidelines.

The guidelines require targeted outreach to disadvantaged communities within IRWM Plans and Programs. A disadvantaged community (DAC) is defined by DWR as any community where the median household income is below 80 percent of the statewide median household income. For the Southern Monterey Bay, Monterey Peninsula, and Carmel Bay region, the identified DAC census tracts are shown on Attachment 1. The following key DAC statewide IRWM priorities have been identified:

- Address critical water supply or water quality needs of DACs within the region
- Address statewide priorities, including “ensure equitable distribution of benefits," specifically:
    - Increase the participation of small and disadvantaged communities in the IRWM process.
    - Develop multi-benefit projects with consideration of affected DACs and vulnerable populations.
    - Identify and include projects that address safe drinking water and wastewater treatment needs of DACs.
    - Address critical water supply or water quality needs of California Native American Tribes.

IRWM operates on the principle that each stakeholder holds a piece of the water management solution for their region and that the best solutions require better communication and understanding of regional issues. Therefore, as further described in Attachment 2, Stakeholder Meeting #2 will be held on October 24, 2012 from 1:30 – 3:30 pm. The meeting will include the following key topics of discussion:

- review the results of the first stakeholder meeting regarding governance and objectives,
- Resource Management Strategies for meeting regional goals and objectives, and
- solicitation and ranking implementation projects for inclusion in the plan.

As an identified stakeholder serving a DAC, we hereby invite you to encourage additional public involvement, in particular, members of DACs, to be involved in the planning process to enable the plan to adequately report and address emerging critical water issues impacting these communities. The more partners involved in an IRWM, the higher the potential for better water management solutions.

Thank you for your time and attention to this matter.

Sincerely,

Rachel Martinez

Community Relations Liaison for MPWMD

Attachments:

1. DAC figure for Southern Monterey Bay, Monterey Peninsula, and Carmel Bay
2. October 24, 2012 meeting notice

Attachment 1.

Disadvantaged Communities Map for Southern Monterey Bay, Monterey Peninsula, and Carmel Bay



Public/Stakeholder Meeting #2

2013 Update to the Southern Monterey Bay, Monterey Peninsula, and Carmel Bay

INTEGRATED REGIONAL WATER MANAGEMENT PLAN

Date/Time: October 24, 2012 1:30 -3:30 pm

Location: Monterey Peninsula Water Management District Conference Room
5 Harris Court, Building G
Monterey, California 93940

A Regional Water Management Group, led by the Monterey Peninsula Water Management District, is updating the Integrated Regional Water Management (IRWM) Plan for Southern Monterey Bay, Monterey Peninsula, and Carmel Bay. Stakeholder Meetings are being held to inform stakeholders of the existing plan, proposed changes to the plan, schedule for future meetings, and identify water-related issues and needs, set/prioritize objectives for water-related resource management, and develop strategies and projects to address identified needs. Issues of discussion include:

- improving water supply reliability,
- water recycling,
- water conservation,
- water quality,
- flooding,
- recreation and land stewardship,
- environmental/ecosystem habitat protection/enhancement, and
- water-related climate change impacts and adaptation

The Update to the 2007 Monterey Peninsula, Carmel Bay, and South Monterey Bay IRWM Plan and projects supporting the Plan update are in progress (in accordance with the requirements in the State of California Department of Water Resources Proposition 84 and 1E IRWM Guidelines).

Your attendance and input is welcomed and encouraged.

To join the IRWM Plan e-mail list or to submit comments or questions, please contact:

Monterey Peninsula Water Management District
Larry Hampson, District Engineer
Tel: (831) 658-5620 FAX: (831) 644-9560
E-mail address: larry@mpwmd.net

Web address (2007 Plan/2009 RAP): http://www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm
Web address (2013 Plan Update): http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

PUBLIC NOTICE
Date: 10/5/12

IRWM Plan 2013 Update "Monterey Peninsula" Stakeholder Meeting #2 (Wednesday, October 24, 2012)

	Name	Affiliation	Email Address
1	Jan Shriner	Marina Coast Water District	directorshriner@gmail.com
2	J. T. Rethke	Pebble Beach Community Service District	jrethke@pbcsd.org
3	Tom MacDonald	(Not listed)	(Not Listed)
4	Thomas Christensen	Monterey Peninsula Water Management District	thomas@mpwmd.net
5	Bruce Gordon	CalAm Ratepayer	(Not Listed)
6	Jody Hansen	Monterey Peninsula Chamber of Commerce	jody@mpcc.com
7	Michelle Dooley	Department of Water Resources	mmdooley@water.ca.gov
8	Leslie Llantero	City of Seaside	lllantero@ci.seaside.ca.us
9	Jeff Krebs	City of Monterey	krebs@ci.monterey.ca.us
10	Rami Shihadeh	Resource Conservation District Monterey County	rami.chihadeh@rcdmonterey.org
11	Bill Carrothers	Noted Subversive	cih5102@earthlink.net
12	George Riley	Citizens for Public Water	(Not Listed)
13	Bridget Hoover	Monterey Bay National Marine Sanctuary	bridget.hoover@noha.gov
14	Larry Parrish	Green Party and Monterey Citizen	lparrish@toast.net
15	Bill Phillips	None!	plauman@redshift.com
16	Larry Hampson	Monterey Peninsula Water Management District	larry@mpwmd.net
17	Michael Gonzales	Denise Duffy& Associates, Inc.	mgonzales@ddaplanning.com
18	Alison Imamura	Denise Duffy& Associates, Inc.	aimamura@ddaplanning.com
19	Jason Campbell	Seaside Resident	camprain@sbcglobal.com
20	Richard LeWarne	Monterey County Environmental Health Department	lewarner@co.monterey.ca.us

	Name	Affiliation	Email Address
21	Thomas Quattlebaum	Pebble Beach Company	quattlet@pebblebeach.com
22	Jonathan Lear	Monterey Peninsula Water Management District	jlear@mpwmd.net
23	Mark Dudley	Monterey Peninsula Water Management District	mdudley@mpwmd.net
24	Sara Reyes	Monterey Peninsula Water Management District	sara@mpwmd.net
25	Jonathan Garcia	Fort Ord Reuse Authority	jonathan@fora.org
26	Arthur McLoughlin	Monterey Bay Youth Camp – Rancha Bolsa Nueva H.O. ASSN	mickey3643@aol.com
27	Tom Reeves	City of Monterey	reeves@ci.monterey.ca.us
28	Eric Sandoval	Monterey Peninsula Water Management District	eric@mpwmd.net
29	Margaret Robbins	County Service Area #50	mm_robbins@comcast.net
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2013 Update

to the

Monterey Peninsula, Carmel Bay, and South Monterey Bay

Integrated Regional Water Management Plan

Stakeholder Meeting #2

October 24, 2012 at 1:30 pm

LOCATION:

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

5 HARRIS COURT, BLDG. G

MONTEREY, CA 93940

1. Meeting Overview, Purpose and Introductions



Meeting Agenda

1. Meeting Overview/Purpose and Introductions
2. Review Results of Stakeholder Meeting #1
3. Resource Management Strategies
4. Project Review Process/Form
5. Other Comments and Input
6. Next Steps/Next Stakeholder Meeting

2. Review Results of Stakeholder Meeting #1



July 25 Meeting Re-Cap

- Recap of 2007 MP IRWM Plan
- 2013 Update standards & process
- Governance (update today)
- Review Objectives and Priorities/ Prioritization Exercise (results today)
- Invitation to Review /Comment on Meeting Notes (see IRWM Plan website)

Governance/MOU Status

Additional member of RWMG:

Resource Conservation District of Monterey County

- *Mission:* to conserve and improve natural resources, integrating the demand for environmental quality with agricultural/urban needs.
- Board includes broad experience in farming, ranching, financial, and non-profit land conservancy management.
- Provides assistance to Monterey County farmers and landowners who voluntarily protect their soil, water, and natural habitats.
- Studies watershed issues in the Carmel Valley.

Next step: Present amended MOU to governing Boards of the RWMG

Objectives Feedback Results

IRWMP Objectives Feedback Results 25July2012

	Water Supply (WS)						Water Quality (WQ)					Flood Protection (FP)				Environmental Protection (EP)					Climate Change (CC)				Regional Communication (RC)					
	1	2	3	4	5	6	1	2	3	4	5	1	2	3	4	1	2	3	4	5	1	2	3	4	1	2	3	4	5	6
Stakeholder Feedback Score	58	51	42	55	45	43	51	50	44	50	51	50	45	45	39	41	46	43	37	40	39	39	36	31	42	49	50	45	45	46
Aligned with 2007 Priorities	*	*					*	*				*				*														
Proposed High Priority for 2013 (*>= 47 pts)	*	*		*			*	*		*	*	*														*	*			

Received input from 32 stakeholders, including 29 during the July 25th meeting and three (3) from on-line form.

2013 Modified Objectives

Water Supply (WS)
WS-1. Meet existing water supply replacement needs of the Carmel River system and Seaside Groundwater Basin.*
WS-2. Maximize use of recycled water.*
WS-3. Seek long-term sustainable supplies for adopted future demand estimates.*
WS-4. Optimize conjunctive use of surface and groundwater.*
WS-5. Evaluate, advance, or create water conservation throughout the Region in compliance with the State's 20x2020 Water Conservation Plan.*
Water Quality (WQ)
WQ-1. Improve ocean water quality, including Areas of Special Biological Significance (ASBS), by minimizing pollutants in stormwater discharges.*
WQ-2. Improve inland surface water quality for environmental resources (e.g. steelhead) and potable water supplies.*
WQ-3. Protect and improve water quality in groundwater basins.*
WQ-4. Meet or exceed water quality standards established by regulatory agencies and stakeholders. *
Flood Protection and Erosion Prevention (FP)
FP-1. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from flood damage, erosion, and sea level rise, in particular, along the southern Monterey Bay shoreline and Carmel Valley.*
FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).*
FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.*
FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.

2013 Modified Objectives

Environmental Protection and Enhancement (EV)
EV-1. Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.*
EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when developing water management strategies and projects.*
EV-3. Minimize adverse effects on biological and cultural resources when implementing strategies and projects.*
EV-4. Identify opportunities for open spaces, trails and parks along streams and other recreational areas in the watershed that can be incorporated into projects.
EV-5. Identify and integrate elements from appropriate Federal and State species protection and recovery plans.*
Climate Change (CC)
CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.*
CC-2. Support increased education, monitoring and research to increase understanding of long-term impacts of climate change in the region.*
CC-3. Support efforts to increase education, research and use of energy conservation measures and alternatives to fossil fuel and non-renewable resources to reduce greenhouse gas emissions associated with water and wastewater facility operations and IRWM projects.*
Regional Communication and Cooperation (RC)
RC-1. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change impacts. *
RC-2. Foster collaboration among regional entities as an alternative to litigation.*
RC-3. Identify and pursue additional opportunities for public education, outreach, and communication on water resource management and climate change, including to disadvantaged communities and stakeholders with interests in water management issues.*
RC-4. Build relationships with State and Federal regulatory agencies and other water forums and agencies.

Draft Objectives Section for Review

- Available on-line at:

http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

- Send comments to:

MPWMD
Larry Hampson, District Engineer
5 Harris Court, Building G
Monterey, CA 93940
Email: Larry@mpwmd.net
Phone: (831)658-5620

- Comments due by November 30, 2012

3. Resource Management Strategies



Plan Standard

IRWM Plan Standard 3

The IRWM Plan must document the range of Resource Management Strategies (RMS) considered to meet the IRWM objectives and identify which RMS were incorporated into the IRWM Plan. The effects of climate change on the IRWM region must factor into the consideration of RMS. RMS to be considered must include, but are not limited to, the RMS found in Volume 2 of the 2009 California Water Plan.

Resource Management Strategies to Consider from 2009 California Water Plan

Reduce Water Demand	Water Use Efficiency
Improve Operational Efficiency and Transfers	Conveyance, System Reoperation, Water Transfers, Waterbag Transport/Storage Technology
Increase Water Supply	Conjunctive Management & Groundwater Storage, Desalination, Precipitation Enhancement, Recycled Municipal Water, Surface Storage – Regional/local, Dewvaporation or Atmospheric Pressure Desalination, Fog Collection
Improve Water Quality	Drinking Water Treatment and Distribution Groundwater Remediation/Aquifer Remediation Matching Quality to Use, Pollution Prevention, Salt and Salinity Management, Urban Runoff Management
Improve Flood Management	Flood Risk Management
Practice Resources Stewardship	Agricultural Lands Stewardship, Economic Incentives (Loans, Grants and Water Pricing), Ecosystem Restoration, Forest Management, Recharge Area Protection, Water-Dependent Recreation Watershed Management

About RMS

- Defined as a project, program, or policy that helps local agencies and governments manage their water and related resources.
- The strategies are included based on their applicability to the planning Region and their ability to fulfill the planning objectives.
- Referred to as Water Management Strategies in the 2007 IRWM Plan.

Strategies in 2007 Plan

2007 IRWM Plan Water Management Strategy	Included in 2007 Plan	Considered in 2007	Required for 2007 Plan Standards
Ecosystem Restoration	✓	✓	✓
Environmental &habitat protection /improvement	✓	✓	✓
Water Supply Reliability	✓	✓	✓
Flood management	✓	✓	✓
Groundwater management	✓	✓	✓
Recreation and public access	✓	✓	✓
Storm water capture and management	✓	✓	✓
Water conservation	✓	✓	✓
Water quality protection and improvement	✓	✓	✓
Water recycling	✓	✓	✓
Wetlands enhancement and creation	✓	✓	✓
Conjunctive use	✓	✓	
Desalination		✓	
Imported water		✓	
Land use planning	✓	✓	
NPS pollution control	✓	✓	
Surface storage	✓	✓	
Watershed planning	✓	✓	
Water and wastewater treatment	✓	✓	
Water transfers		✓	

RMS Potentially NOT Included

- Conveyance – Delta (Not applicable)
- Surface Storage –CALFED (Not applicable)
- Crop Idling for Water Transfers
- Irrigated Land Retirement
- Rainfed Agriculture
- Waterbag Transport/Storage Technology
- Others?

Draft RMS Section for Review

- Available on-line at: http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

- Send comments to:

MPWMD
Larry Hampson, District Engineer
5 Harris Court, Building G
Monterey, CA 93940
Email: Larry@mpwmd.net
Phone: (831)658-5620

- Comments due in two week s(by November 7th, 2012)

Five Minute Break and/or Comments and Input

- **Revised Objectives on Poster Board**
- **Resource Management Strategies on Handout:** comments, including additional strategies (i.e., any used or recommended that are not yet listed)
- **CA Water Plan RMS** information available for review

4. Project Review Process/Form



2013 IRWM Plan Projects

"The projects *included* in the IRWM Plan are the projects that will implement the Plan and achieve the Plan objectives. The projects should represent the priorities of the planning effort and represent a wise investment for State grant funding. Hence, the process should not be designed to only select based on readiness to proceed."

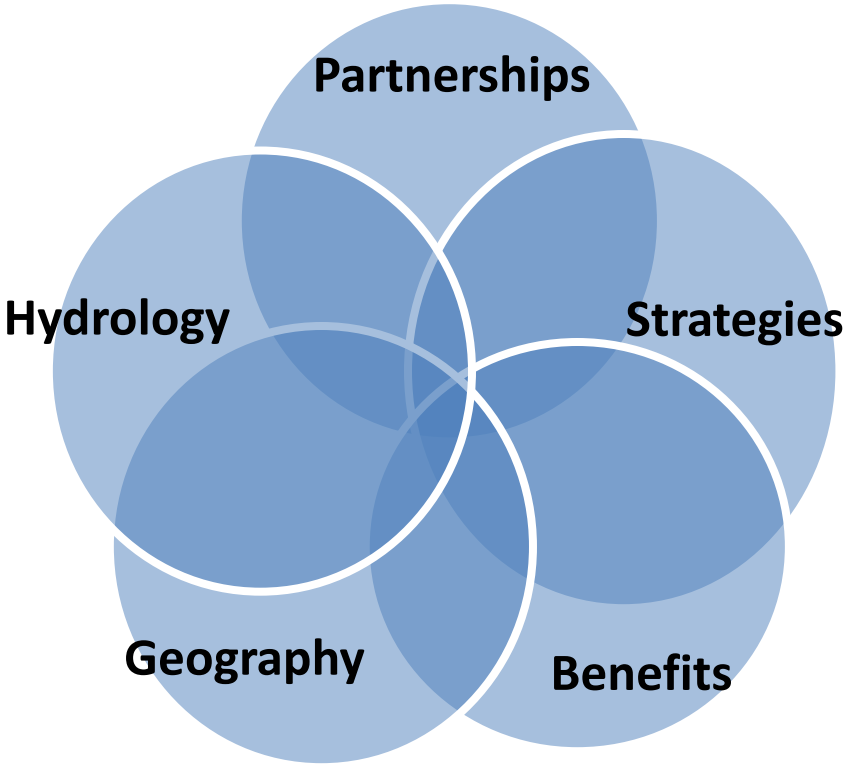
DWR-Required Project Review Factors

A. How project contributes to Plan Objectives
B. How the project is related to Resource Management Strategies
C. Technical Feasibility
D. Specific benefits to critical DAC water issues
E. Specific benefits to critical water issues for Native American tribal communities (not applicable to this region)
F. Environmental Justice Considerations

DWR-Required
Project Review Factors (cont.)

G. Project Costs and Financing
H. Economic Feasibility
I. Project Status
J. Strategic Considerations for Plan implementation (including "***Integration***")
K. Contribution to adapting to Climate Change
L. Contribution to reducing Greenhouse Gas Emissions

Types of Integration



Partnerships – Multiple organizations; shared expertise

Resource Management –multiple /diversification of regional strategies

Beneficial Uses – supports several different beneficial uses

Geography – watershed-scale, regional-scale, or inter-regional projects

Hydrology – Addressing multiple watershed functions within the hydrologic cycle

Benefits of Integration

- **Increased chance of funding**
- **Cost-effectiveness**
- **Cost sharing**
- **Streamlining of approval process**
- **Added expertise**
- **Additional advocates**

Overall: Integration creates better projects and moves the Region toward the ultimate goals of IRWM planning and away from funding projects that would happen without the program…..

Therefore, a multi-step project review process is proposed.

Process for Project Solicitation

**for 2013 plan inclusion; not specific to a grant



Project Ranking/Scoring Guidance

Specific review process is up to RWMG, but must include:

1. Procedures for submitting a project to the IRWM Plan
2. Procedures for review of projects to implement the IRWM Plan
3. Procedure for communicating the list(s) of selected projects

Key Considerations for Project Review Process

- Roles for decision making and data management roles within the RWMG.
- Project review committee for reviewing project scoring and ranking?
- What mechanism will be used for stakeholder input during the submittal, review, selection to develop the project list(s)?
- How and when is the list updated and does it require re-adoption of the Plan?

Proposed Project Ranking/Scoring
(in accordance with DWR Guidance)

Proposed procedure for submitting projects:

1st: Concept Proposal Solicitation (gather all potential projects; allow stakeholders to review/integrate)

2nd: Web-based, detailed project solicitation (focuses on most promising Concept Proposals)

Proposed procedures for review of projects:

1st: Concept Proposals must meet minimum eligibility standards

2nd: Self scoring during solicitation per ranking spreadsheet; reviewed by a "project review committee"

Proposed procedure for communicating projects:

1st: All stakeholders to review, discuss, consider Concept Proposals on IRWM website

2nd: Results of detailed ranking/scoring to be available for review on-line, continually

Concept Proposal Solicitation Form

- Form will be available this week or next at:

http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

- Send or email forms to:

MPWMD

Larry Hampson, District Engineer

5 Harris Court, Building G

Monterey, CA 93940

Email: Larry@mpwmd.net

- Ongoing submittals throughout detailed Project Solicitation Process

~ DRAFT ~

MP IRWMP Project Scoring and Ranking Methodology (version Oct. 23, 2012)

Plan or Project	Scoring Criteria (Review Factors from DWR Guidance)		Assessment Methodology & Scoring	Max Points	% of total	Weighting by Plan (50%) or Project-Merit (50%) (TBD)
IRWM Plan Compliance Criteria						
			Total of up to 41 points each project gets 1 pt for meeting each of 25 objectives (25 max points). Plus, a score of, between 0 and 2 for the level in			

Development of Project Scoring and Ranking Methodology for the 2013 IRWM Plan

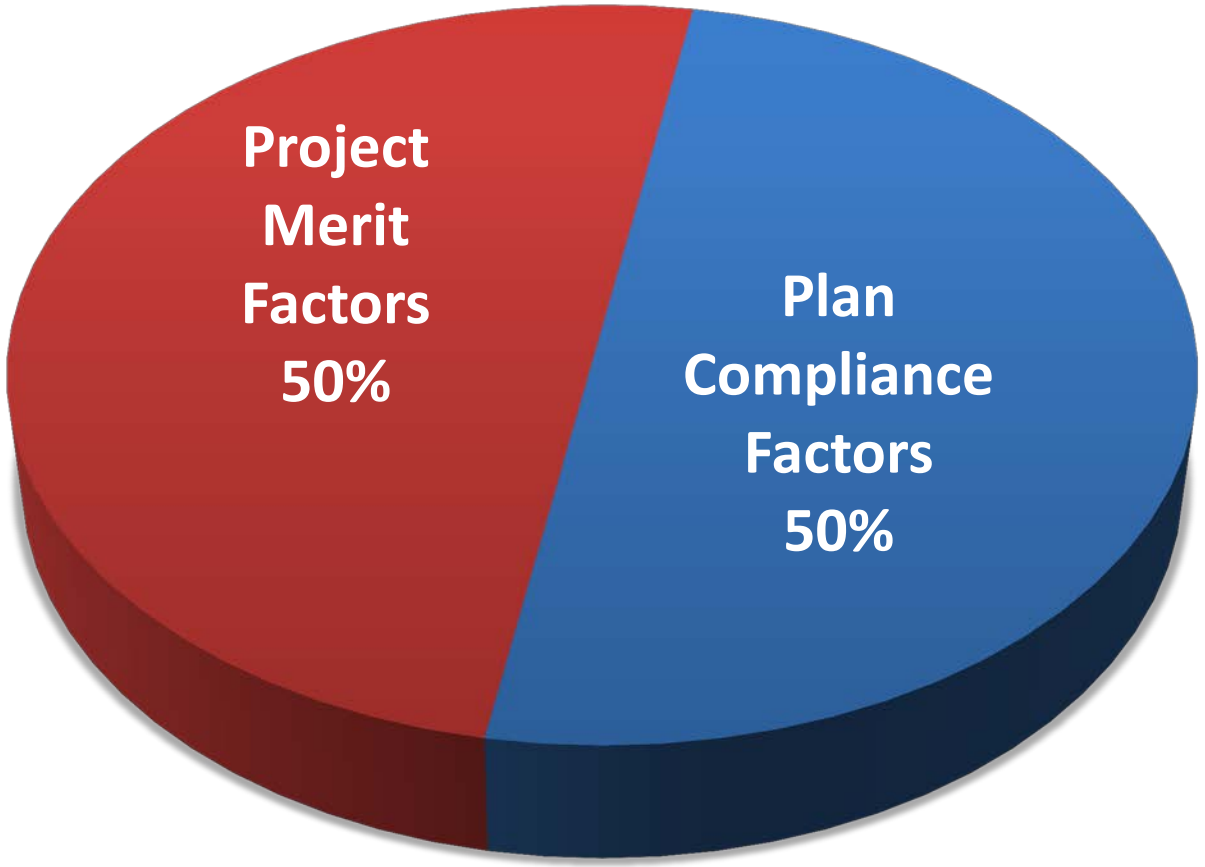
Project	(C) Technical Feasibility	the system where the project is located? Are there significant data gaps? Are there sufficient technical data to indicate the methods and systems employed will result in success? Is there enough information to support the project's estimated benefits?	25 points: Has the technology proposed been established as effective in similar situations 25 points: Are project site conditions documented (geology/soil, ecology, hydrology, land use, public utilities) 25 points: Do the project partners have experience with similar projects (e.g., similar site, similar technology).	75	17.1%	30%
Project	(G) Project Costs and Financing	Has a project cost estimate been prepared and documented in Section __ of the Project Template?	Yes: 25 points	25	5.7%	20%
		Does the project have identified sources at least 25% match funding?	Yes. 25 points	25	5.7%	
Project	(H) Economic Feasibility	Has economic analysis been conducted on the project?	15 points: Project benefits and costs defined at a level of detail that will allow cost- effectiveness analysis or benefit-cost analysis *25 points: Economic analysis shows acceptable cost benefit ratio*	50	11.4%	25%

2013 Draft Weighting of Project Review Factors

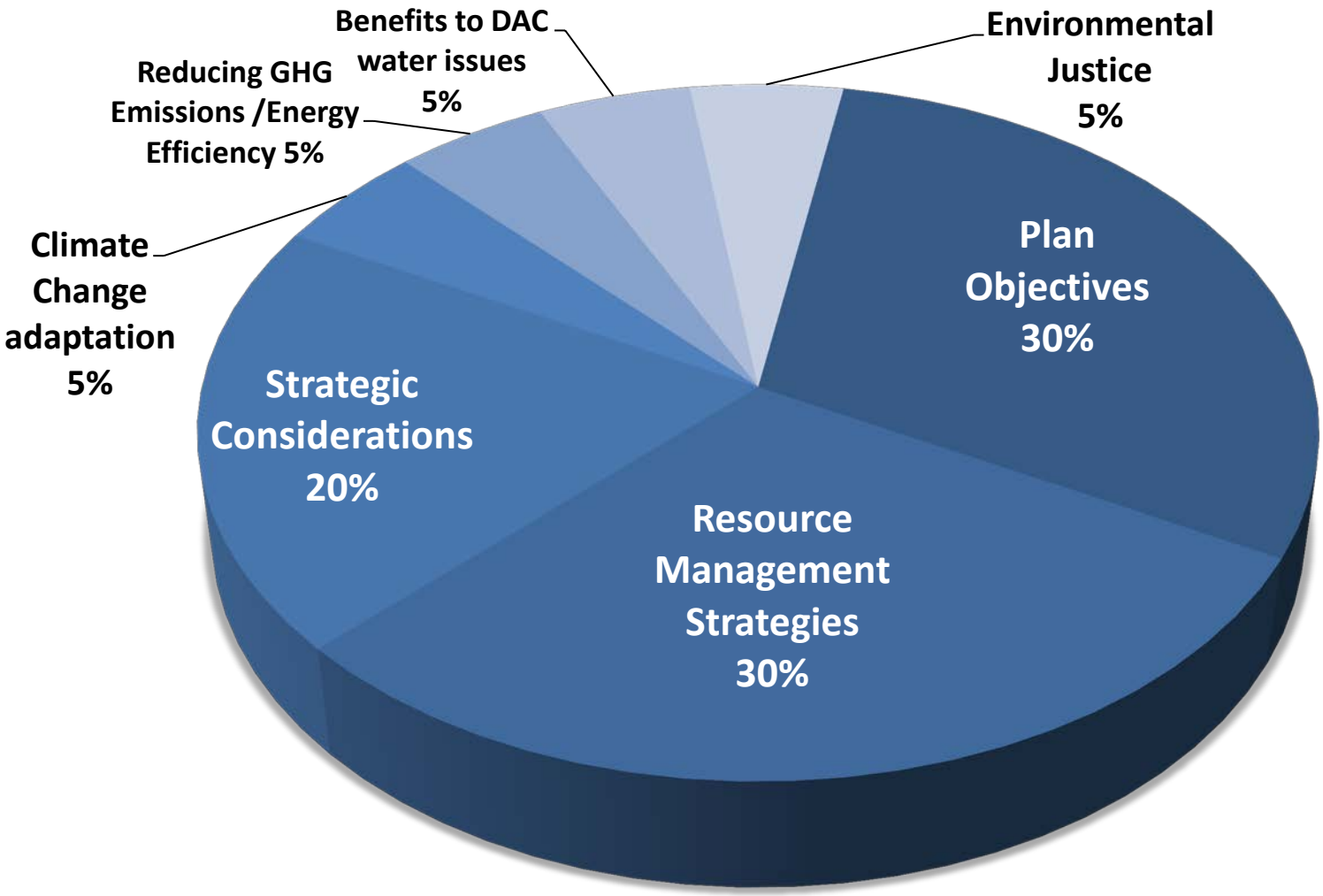
Plan-Compliance Factors (50% of total)	1st draft weighting
Contribution to Achieving Plan Objectives	30%
Relation to Resource Management Strategies	30%
Strategic Considerations for Plan Implementation/Integration	20%
Contribution to Climate Change adaptation	5%
Reducing Greenhouse Gas Emissions/Energy Efficiency	5%
Benefits to DAC water issues	5%
Environmental Justice Considerations	5%
	100%

Project Merit Factors (50% of total)	1st draft weighting
Technical Feasibility	30%
Project Costs and Financing	20%
Economic Feasibility	25%
Project Status	25%
	100%

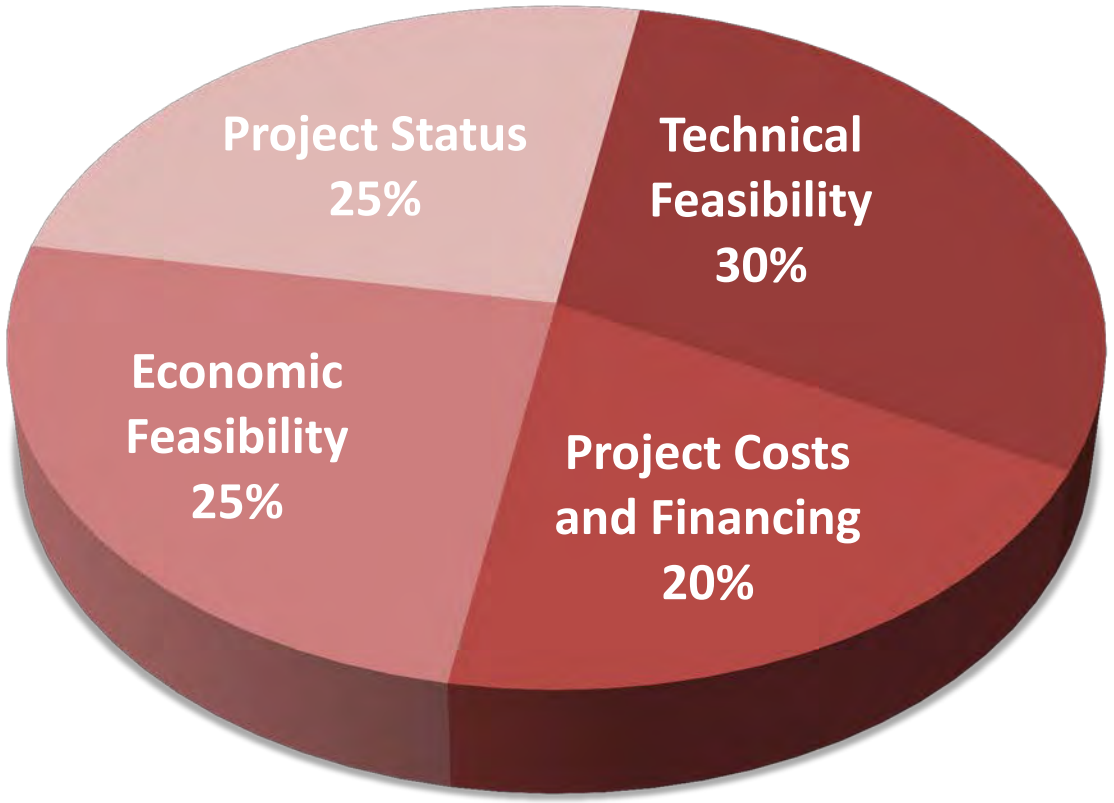
1st Draft Weighting of Plan Compliance vs. Project Merit



1st Draft Weighting of Plan Compliance Factors



1st Draft Weighting of Project Merit Factors



Draft Review Factors for Ranking Projects in 2013 Plan

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Review Factors for Ranking Projects

for the

2013 Update to the Monterey Peninsula, Carmel Bay, and Southern Monterey Bay IRWM Plan

Version Date: October 23, 2012

IRWM PLAN COMPLIANCE FACTORS (50% OF TOTAL SCORE)

- **How the project contributes to the IRWM Plan Objectives** (30% of Plan Compliance Factors)
  - Number of objectives and high priority objectives that the project addresses
- **How the project is related to Resource Management Strategies** (30% of Plan Compliance Factors)
  - Nu… stra…
- **Strategi…**
  - Inte…
  - Part… imp…
  - Mo… ach…
  - Inte… star…
- **Specific …** (5% of Plan Factors)
  - Does the proposed project provide specific benefits to critical DAC water issue?
- **Specific benefits to critical water issues for Native American tribal communities** (5% of Plan Factors)
  - *Not applicable*?
- **Environmental Justice considerations*** (5% of Plan Factors)
  - Does the project redress inequitable distribution of environmental burdens and/or improve access to environmental goods?
- **Contribution of the project in adapting to the effects of Climate Change*** (5% of Plan Factors)
  - Will the project contribute to regional adaptation to projected climate change impacts (i.e., does the project implement one or more of the recommendations from the document: "*Evaluation of Erosion Mitigation Alternatives for Southern Monterey Bay*" (Monterey Bay Sanctuary Foundation and The Southern Monterey Bay Coastal Erosion Working Group, May 2012)?
- **Contribution of the project in reducing Greenhouse Gas Emissions as compared to project alternatives*** (5% of Plan Factors)
  - Compared to project alternatives, does the project reduce regional GHG emissions and/or improve energy efficiency?

PROJECT MERIT FACTORS (50% OF TOTAL SCORE)

- **Technical Feasibility** (30% of Project Merit Factors)
  - Is this a common and widely accepted technology with well documented results? *
  - Is there enough known about the geologic conditions, hydrology, ecology or other aspect of the system where the project is located? *
  - Are there significant data gaps? *
  - Are there sufficient technical data to indicate the methods and systems employed will result in success? *
  - Is there enough information to support the project's estimated benefits? *

…efits and …cost

…criteria

(i.e., are the following complete?):

- Conceptual Plans complete
- CEQA/NEPA completed
- Local Cost Share Confirmed
- Construction Drawings completed
- Right-of-way/Permits acquired
- Bids acquired

Comments welcome through January stakeholder meeting.

5. Other Comments and Input



6. Next Steps/Stakeholder Meeting

- Meeting: late January 2013
- MOU progress/status
- GIS and Data Management
- Concept Proposal List
- Detailed Project Review Process Examples
- Detailed Project Submittal Form Available
- Other ?

Contacts/More Information

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Email: **Larry@mpwmd.net**
Phone: (831)658-5620

Alison Imamura, AICP, Denise Duffy & Associates, Inc.
Email: **aimamura@ddaplanning.com**
Phone: (831)373-4341x12

Web address (2007 Plan/2009 RAP):
http://www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm

Web address (2013 Plan Update):
http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

2009 California Water Plan Resource Management Strategies by Management Outcome * = RMS was included in 2007 IRWM Plan	
	Comments
Reduced Water Demand	
Agriculture Water Use Efficiency	
Urban Water Use Efficiency *	
Crop Idling for Water Transfers	
Irrigated Land Retirement	
Rainfed Agriculture	
Improve Operational Efficiency and Transfers	
Conveyance – Delta	Not Applicable
Conveyance – Regional/Local *	
System Reoperation	
Water Transfers *	
Waterbag Transport/Storage Technology *	
Increase Water Supply	
Conjunctive Management & Groundwater Storage *	
Seawater or Brackish Water Desalination *	
Precipitation Enhancement	
Recycled Municipal Water *	
Surface Storage – CALFED	Not Applicable
Surface Storage – Regional/local *	
Dewvaportation or Atmospheric Pressure Desalination	
Fog Collection	
Improve Water Quality	
Drinking Water Treatment and Distribution *	
Groundwater Remediation/Aquifer Remediation	
Matching Quality to Use	
Pollution Prevention *	
Salt and Salinity Management	
Urban Runoff Management *	
Improve Flood Management	
Flood Risk Management *	
Practice Resources Stewardship	
Agriculture Lands Stewardship	
Economic Incentives	
Ecosystem Restoration *	
Forest Management *	
Recharge Area Protection	
Water-Dependent Recreation *	
Watershed Management *	

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Review Factors for Ranking Projects

for the

2013 Update to the Monterey Peninsula, Carmel Bay, and Southern Monterey Bay IRWM Plan
Version Date: October 23, 2012

IRWM PLAN COMPLIANCE FACTORS (50% OF TOTAL SCORE)

- **How the project contributes to the IRWM Plan Objectives** (30% of Plan Compliance Factors)
  - Number of objectives and high priority objectives that the project addresses

- **How the project is related to Resource Management Strategies** (30% of Plan Compliance Factors)
  - Number of different CA Water Plan Management Outcome Categories and overall number of strategies that the project includes

- **Strategic considerations for IRWM Plan implementation** (20% of Plan Compliance Factors)
  - Inter-Regionalism: Does the project involve active inter-regional collaboration or partnerships?
  - Partnerships: How many entities are actively partnering (rather than simply endorsing) to implement the project?
  - Monitoring and reporting of project performance: Will the project establish and document achievement of performance criteria?
  - Integration with land use planning: Is the project consistent with local plans, ordinances, and standards?

- **Specific benefits to critical disadvantaged community (DAC) water issues*** (5% of Plan Factors)
  - Does the proposed project provide specific benefits to critical DAC water issue?

- **Specific benefits to critical water issues for Native American tribal communities** (5% of Plan Factors)
  - *Not applicable*?

- **Environmental Justice considerations*** (5% of Plan Factors)
  - Does the project redress inequitable distribution of environmental burdens and/or improve access to environmental goods?

- **Contribution of the project in adapting to the effects of Climate Change*** (5% of Plan Factors)
  - Will the project contribute to regional adaptation to projected climate change impacts (i.e., does the project implement one or more of the recommendations from the document: "*Evaluation of Erosion Mitigation Alternatives for Southern Monterey Bay*" (Monterey Bay Sanctuary Foundation and The Southern Monterey Bay Coastal Erosion Working Group, May 2012)?

- **Contribution of the project in reducing Greenhouse Gas Emissions as compared to project alternatives*** (5% of Plan Factors)
  - Compared to project alternatives, does the project reduce regional GHG emissions and/or improve energy efficiency?

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PROJECT MERIT FACTORS (50% OF TOTAL SCORE)

- **Technical Feasibility** (30% of Project Merit Factors)
  - Is this a common and widely accepted technology with well documented results? *
  - Is there enough known about the geologic conditions, hydrology, ecology or other aspect of the system where the project is located? *
  - Are there significant data gaps? *
  - Are there sufficient technical data to indicate the methods and systems employed will result in success? *
  - Is there enough information to support the project's estimated benefits? *

- **Project Costs and Financing*** (20% of Project Merit Factors)
  - Has a project cost estimate been prepared and documented in the Project Form?
  - Does the project have identified sources at least 25% match funding?

- **Economic Feasibility** (25% of Project Merit Factors)
  - Has an economic analysis been conducted on the project to the extent that project benefits and costs are defined at a level of detail that will allow cost-effectiveness analysis or benefit-cost analysis? *

- **Project Status** (25% of Project Merit Factors)
  - What is the current status of the project with respect to the following specific progress criteria (i.e., are the following complete?):
    - Conceptual Plans complete
    - CEQA/NEPA completed
    - Local Cost Share Confirmed
    - Construction Drawings completed
    - Right-of-way/Permits acquired
    - Bids acquired

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DRAFT CONCEPT PROPOSAL SOLICITATION FORM

for
Inclusion of Projects
in the
MONTEREY PENINSULA, CARMEL BAY, AND SOUTH MONTEREY BAY ("MONTEREY PENINSULA")
2013 INTEGRATED REGIONAL WATER MANAGEMENT PLAN UPDATE

Note: *This solicitation is a preliminary solicitation of the IRWM Plan update and requests basic introductory information on projects in conceptual and implementation stages. A subsequent solicitation for projects will occur as a future phase of the 2013 IRWM Plan update which will require thorough details for projects to be ranked in the 2013 IRWM Plan.*

1. PROJECT PROPONENT (NAME OF ORGANIZATION): _____

Type of Entity: ◯ Public agency ◯ Nonprofit organization ◯ Privately owned water utility
◯ Private citizen or privately owned business ◯ Other (describe): _____

2. PROJECT TITLE: _____

3. NAME, TITLE, AND AFFILIATION OF CONTACT PERSON:

4. Phone: _____ **5. Email:** _____

6. Mailing Address:

7. Project Eligibility: Geographic Location

To be eligible for inclusion in the IRWMP, projects must lie within the geographic scope of the Monterey Peninsula IRWM Region or provide a benefit to water resource issues in the Region[1]. Please describe the location of the project and the area(s) of benefit. The preferred method is to upload a GIS layer with the r d rd d d r Plan coordinate system.

[1] The planning Region is located in Central Coast Regional Water Quality Control Board (RWQCB) Region 3 and lies between the Salinas River groundwater basin and the Big Sur coast. The planning region is approximately 347 square miles and consists of coastal watershed areas in Carmel Bay and south Monterey Bay between Pt. Lobos on the south and Sand City on the north – a 38.3-mile stretch of the coast that includes three Areas of Special Biological Significance (Pt. Lobos, Carmel Bay, and Pacific Grove). The area encompasses the six Monterey Peninsula cities (Carmel-by-the Sea, Del Rey Oaks, Pacific Grove, Monterey, Sand City, and Seaside), and extends into portions of the unincorporated area of Monterey County in the Carmel Highlands, Pebble Beach and the inland areas of Carmel Valley and the Laguna Seca area. For a map of the planning region see: http://www.mpwmd.dst.ca.us/Mbay_IRWM/2011IG/WorkPlan.pdf

8. Project Eligibility: Prop 84 IRWM Criteria: To be eligible for inclusion in the IRWMP, projects must yield multiple benefits and include one or more of the following elements. Please check all that apply:

- ☐ Water supply reliability, water conservation and water use efficiency.
- ☐ Storm water capture, storage, clean-up, treatment, and management.
- ☐ Removal of invasive non-native species, the creation and enhancement of wetlands, and the acquisition, protection, and restoration of open space and watershed lands.
- ☐ Non-point source pollution reduction, management and monitoring.
- ☐ Groundwater recharge and management projects.
- ☐ Contaminant and salt removal through reclamation, desalting, and other treatment technologies and conveyance of reclaimed water for distribution to users.
- ☐ Water banking, exchange, reclamation and improvement of water quality.
- ☐ Planning and implementation of multipurpose flood management programs.
- ☐ Watershed protection and management.
- ☐ Drinking water treatment and distribution.
- ☐ Ecosystem and fisheries restoration and protection.

9. Project Eligibility: IRWMP Goals and Objectives (* = High Priority): To be eligible for inclusion in the IRWMP, projects must be consistent with the goals and objectives of the Monterey Peninsula IRWM region, which include the following (please check all that apply).

Water Supply (WS)

- ☐ WS-1. Meet existing water supply replacement needs of the Carmel River system and Seaside Groundwater Basin.*
- ☐ WS-2. Maximize use of recycled water.*
- ☐ WS-3. Seek long-term sustainable supplies for adopted future demand estimates.
- ☐ WS-4. Optimize conjunctive use of surface and groundwater.
- ☐ WS-5. Evaluate, advance, or create water conservation throughout the Region in compliance with the r Conservation Plan.

Water Quality (WQ)

- ☐ WQ-1. Improve ocean water quality, including Areas of Special Biological Significance (ASBS), by minimizing pollutants in stormwater discharges.*
- ☐ WQ-2. Improve inland surface water quality for environmental resources (e.g. steelhead) and potable water supplies.*
- ☐ WQ-3. Protect and improve water quality in groundwater basins.*
- ☐ WQ-4. Meet or exceed water quality standards established by regulatory agencies and stakeholders.

Flood Protection & Erosion Prevention (FP)

- ☐ FP-1. Develop regional projects and plans necessary to protect existing infrastructure and sensitive habitats from flood damage, erosion, and sea level rise, in particular, along the southern Monterey Bay shoreline and Carmel Valley.*
- ☐ FP-2. Develop approaches for adaptive management that minimize maintenance and repair requirements (sustainable flood management systems).
- ☐ FP-3. Protect quality and availability of water while preserving or restoring ecologic and stream function.
- ☐ FP-4. Provide community benefits beyond flood protection, such as public access, open space, recreation, agricultural preservation, and economic development.

Environmental Protection and Enhancement (EV)

- ☐ EV-1. Protect and enhance sensitive species and their habitats in the regional watersheds; promote the steelhead run.
- ☐ EV-2. Identify opportunities to assess, protect, enhance, and/or restore natural resources, including consideration of climate change, when development water management strategies and projects.
- ☐ EV-3. Minimize adverse environmental effects on biological and cultural resources when implementing strategies and projects.

☐ EV-4. Identify opportunities for open spaces, trails and parks long streams and other recreational areas in the watershed that can be incorporated into projects.
☐ EV-5. Identify and integrate elements from appropriate Federal and State species protection and recovery plans.

Climate Change (CC)

☐ CC-1. Evaluate adaptation measures and mitigative solutions to climate change effects.
☐ CC-2. Support increased education, monitoring and research to increase understanding of long-term impacts of climate change in the region.
☐ CC-3. Support efforts to increase education, research and use of energy conservation measures and alternatives to fossil fuel and non-renewable resources to reduce greenhouse gas emissions associated with water and wastewater facility operations and IRWM projects.

Regional Communication and Cooperation (RCC)

☐ RC-1. Identify cooperative, integrated strategies for protecting both infrastructure and environmental resources, including from climate change impacts.*
☐ RC-2. Foster collaboration among regional entities as an alternative to litigation. *
☐ RC-3. Identify and pursue additional opportunities for public education, outreach, and communication on water resource management and climate change, including to disadvantaged communities and stakeholders with interests in water management issues.
☐ RC-4. Build relationships with State and Federal regulatory agencies and water forums and agencies.

10. Project Eligibility: IRWMP Resource Management Strategies: To be eligible for inclusion in the IRWMP, projects must implement one or more Resource Management Strategies of the Monterey Peninsula IRWM region, which are shown on page 4. Please list all that apply.

11. Summary Description of Project: Please include a brief summary of the project (500 words maximum, attach page, as necessary). Describe the project need, the project concept, and which entities would be involved in carrying out the project. Summarize the project status to the extent possible.

RESOURCE MANAGEMENT STRATEGIES

Reduced Water Demand

- Agriculture Water Use Efficiency
- Urban Water Use Efficiency
- Crop Idling for Water Transfers
- Irrigated Land Retirement
- Rainfed Agriculture

Improve Operational Efficiency and Transfers

- Conveyance – Regional/Local
- System Reoperation
- Water Transfers
- Waterbag Transport/Storage Technology

Increase Water Supply

- Conjunctive Management & Groundwater Storage
- Seawater or Brackish Water Desalination
- Precipitation Enhancement
- Recycled Municipal Water
- Surface Storage – Regional/local
- Dewvaportation or Atmospheric Pressure Desalination
- Fog Collection

Improve Water Quality

- Drinking Water Treatment and Distribution
- Groundwater Remediation/Aquifer Remediation
- Matching Quality to Use
- Pollution Prevention
- Salt and Salinity Management
- Urban Runoff Management

Improve Flood Management

- Flood Risk Management

Practice Resources Stewardship

- Agriculture Lands Stewardship
- Economic Incentives
- Ecosystem Restoration
- Forest Management
- Recharge Area Protection
- Water-Dependent Recreation
- Watershed Management

Other (Provide Detailed Description)

HOW TO SUBMIT YOUR APPLICATION

Please **email** your completed application to: Larry Hampson, Larry@mpwmd.net

If you do not have email access, please mail or hand-deliver one copy of your application to:

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT
c/o Larry Hampson
5 HARRIS COURT, BLDG. G, MONTEREY, CA 93940

FOR QUESTIONS ABOUT THIS APPLICATION FORM OR THE IRWMP PROCESS:

Larry Hampson, District Engineer, MPWMD
Email: Larry@mpwmd.net
Phone: (831)658-5620

Web address (2007 Plan/2009 RAP): http://www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm
Web address (2013 Plan Update): http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

Monterey Peninsula, Carmel Bay, and South Monterey Bay
2013 Update to the Integrated Regional Water Management Plan
Stakeholder Group Meeting

MEETING NOTES

1:30 - 3:30 P.M., Wednesday October 24, 2012

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT
5 HARRIS COURT, BLDG. G, MONTEREY, CA 93940

1. Meeting Overview/Purpose and Introductions – 5 minutes [Larry]

Group introductions – A complete list of attendees and a copy of the presentation is available at

2. Review Results of Stakeholder Meeting #1 – 10 minutes [Larry]

- Governance / MOU status – seven (7) RWMG members [MPWMD]
- Availability / Comments on Meeting Notes [all]
- Overview of Objectives Feedback Results [Denise Duffy & Associates, DD&A]
- Availability of Draft Objectives Section: *comments due November 30, 2012*

3. Resource Management Strategies – 25 minutes [DD&A]

- Overview of Plan Standard, Previous Strategies
- View Recommended New Strategies
- Availability of Draft Resource Management Strategies Section: *comments due November 30, 2012*
- Comments and Input

4. Project Review Process / Form – 35 - 45 minutes [DD&A]

This topic included reviewing the DWR-Required Project Review Factors, Types of Integration, Benefits of Integration, Process for Project Solicitation, Project Ranking/Scoring Guidance, Key Considerations for Project Review Process, Development of Project Ranking/Scoring Methodology for the 2013 IRWM Plan and Weighting of Project Review Factors.

DWR-Required Project Review Factors --Disadvantaged Communities (DAC)

Jan Shriner – DAC-1 question about whether Item E is a federal or state recognition question

> **Michelle Dooley** responded that DWR does not make the distinction between a federally recognized group. If there are Native American entities that are somehow recognized and still exist here, they would qualify.

Jan Shriner – DAC-2 question whether the Cachagua group is the only group that has been contacted; there are other groups that exist; a list will be provided to Larry Hampson.

DWR-Required Project Review Factors – Project Status (PS)

(unknown) – PS-1 questioned whether Item I puts all planning type projects at a disadvantage?

> **Larry Hampson** responded that it does as far as getting into an implementation phase. Grant application. The projects that are closer to implementation will rank higher.

Alison Imamura responded that a disadvantage in that component of the project review is only one factor of many and the plan itself is not prescriptive of what projects are submitted into the grant program.

Larry Hampson commented that with respect to Item J, IRWM plan while its come about as a result of prop 84 funds and is used with going forward, various agencies are asking if you have an integrated plan; this plan will be used for multiple programs

Michelle Dooley concurred with Larry Hampson and suggested adding the word Federal and State Funding to the 2013 IRWM Plan Projects title so that it reads: 2013 Federal and State IRWM Plan Projects.

Types of Integration (TI)

(unknown) – TI-1 question as to whether the group is looking into legislation that was passed in 2008 with regards to septic systems that have not been implemented in the state but require whole revisions of septic system permitting (groundwater requirements).

Richard LeWarne responded that this is legislation AB 885 that is currently in progress and sets standards for new and existing septic systems. He will send information to Larry Hampson so that it can be included in the IRWM.

Process for Project Solicitation (PS)

(unknown) – PS-1 question, what is the deadline for submitting concept proposal solicitations

Alison Imamura responded that proposals can be submitted through the 2013 1st quarter and possibly into 2nd quarter**.** NOTE**:** *Goal is to have a plan adopted by the IRWM group by the end of the third quarter in 2013; therefore the ranked list must be developed by 2nd quarter 2013.*

Proposed Project Ranking/Scoring (PRS)

(unknown) -- PRS-1 Is there a maximum request amount for projects under 2.5 million back in 2007?

Larry Hampson responded that for the IRWM program there is a minimum of 25% local match and other grant programs have different caps.

Michelle Dooley commented that there really is no limit to the amount required for a project to live in an IRWM plan.

Alison Imamura also stated that at the same time there is no minimum project cost amount

(unknown) -- PRS-2 commented that his perception is that the scoring does not have all that much influence on outcomes. Has the scoring ever made a huge difference?

Larry Hampson and **Alison Imamura** responded that if a project states that it is part of an IRWM plan, then the project would rank higher and would have a higher chance of getting funding.

Michelle Dooley stated the purpose of ranking projects is to show that the regional stakeholders had a chance to identify their objectives and see where the projects land. It is attractive to granting entities to see that a project has buy in from its constituents and can serve as a multifunction project. Regional objectives may change which is ok.

2013 Draft Weighting of Project Review Factors (DW)

(unknown) – DW-1 -- if you need to test the economic feasibility, why then would project cost and finance be as high as 20%? DW-2 – Does it relate to the other parts of the project merits?

DW-3 would you consider a blank area on the grant application to allow explanation as to why the project cannot meet certain requirements and yet have the project move forward because it has met overall merit?

> **Larry Hampson** replied the two categories address 1) the value of the project, such as cost-benefit or cost-effectiveness, and 2) how are you going to finance it. With regards to the second question, Larry responded that input and feedback is needed from the stakeholders with regards to the proposed weighting of plan compliance and project merit factors.
>
> **Alison Imamura** responded to DW-3 and stated that this step is not for receiving grant funding, but instead is used for including your project in the plan itself.

(unknown) – DW-4 -- What is the ranking process for a project with regards to the number of people directly affected and benefitting from that project?

> **Larry Hampson** responded there is a couple of ways that will be addressed: 1) under the plan objectives, and 2) cost benefit analysis.
>
> **Alison Imamura** commented that the project's ability to meet maximum types of benefits will be evaluated under strategic considerations, also.

George Riley – DW-5 – with regards to the 50/50 split then the split within each category, which category will this group have some control or impact?

> **Alison Imamura**, for sure the plan objectives and resource management strategies. Other issues are simply Yes or No with points given based upon whether or not each project meets that criteria (for example, benefits a disadvantaged community is a yes or no question, addresses climate change impacts, includes adaptation considerations, .

George Riley – DW-6 – if this group has substantial impact on several categories, who has substantial impact on the other categories?

> **Larry Hampson** responded that we are trying to reach an objective method to prioritize projects. A project is going to be considered on how well it fits in the plan which is developed by the stakeholders and DWR guidelines. How well the project fits into the plan is half the ranking. What merits the project has is a combination of what the group decides what they want to see in a project and what the project proponent decides what goes into the project. Part of this process is to develop a Technical Advisory Committee with technical people from various agencies who are familiar with projects and how they are supposed to work.

George Riley suggested a more focused approach to this by creating working groups that address policy, integration, technical, etc where the details of the stuff we are talking about gets formulated in the context of where the skill sets are or the interest level or time committed. Maybe there is a more productive approach and suggested working groups be developed to discuss comparative benefits.

> **Larry Hampson** and **Alison Imamura** replied that a Project Review committee will be developed and report back to the stakeholders. A factor to developing the committee is determining who is willing to volunteer and attend additional meetings.

Bridget Hoover reported that for the greater Monterey County IRWM process they did have sub-committees to address the larger goals and there was the expertise review of projects that was very helpful.

5. Other Comments and Input

Jan Shriner asked if there was a distinction between a public agency and a private corporation project?

> **Larry Hampson** responded that public, non-profit or for-profit entities can all request inclusion in the IRWM plan.
>
> **Michelle Dooley** suggested the group may want to consider reviewing the weight of the regional objectives (i.e., increasing it)

Bridget Hoover commented that the greater Monterey Bay group did their ranking by how their round 1 projects were ranked by DWR and perhaps the group should consider it.

6. Next Steps/Next Stakeholder Meeting

January 23 or 30, 2012 will be the next meeting; we'll be posting the form for the concept proposal solicitation starting next week; we want to develop the prioritization process more and bring it back to the stakeholders for the next time and start the more detailed project solicitation.

Larry Hampson, District Engineer, MPWMD
Email: Larry@mpwmd.net
Phone: (831)658-5620

Alison Imamura, AICP, Denise Duffy & Associates, Inc.
Email: aimamura@ddaplanning.com
Phone: (831)373-4341x12

Web address (2007 Plan/2009 RAP):
http://www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm
Web address (2013 Plan Update):
http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

Appendix 14-d

February 6, 2013 Stakeholder Meeting

DRAFT

Monterey Peninsula, Carmel Bay, and South Monterey Bay
2013 Update to the Integrated Regional Water Management Plan
Stakeholder Group Meeting

AGENDA

1:30 - 3:30 P.M., Wednesday February 6, 2013

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT
5 HARRIS COURT, BLDG. G, MONTEREY, CA 93940

Teleconference Available – for URL and call-in information for remote access, please go to the following site and click on the meeting link:

http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/2010PG.htm

1. Meeting Overview/Purpose and Introductions – 5 minutes
2. Review Results of Stakeholder Meeting #2 – 10 minutes
3. Preliminary Project List Presentation – 15 minutes
4. Project Review Process – 60 minutes
    - Overview of Concept Proposal/Project Solicitation Process for IRWM plan inclusion
    - Presentation of web-based forms and example of scoring/ranking methodology
    - Comments and Input
5. Other Comments and Input
6. Next Steps/Next Stakeholder Meeting
    - Concept & Detailed Project Solicitation Forms for 2013 IRWM Plan: DUE late March 2013
    - Next Stakeholder Meeting: late April 2013

For questions or additional information, please contact either

Larry Hampson, District Engineer
Monterey Peninsula Water Management District
(831) 658-5620 or (831) 238-2543
larry@mpwmd.net

Alison M. Imamura, AICP, Project Manager
Denise Duffy & Associates, Inc.
(831) 373-4341x12
aimamura@ddaplanning.com

Alison Imamura

From: Sara Reyes <Sara@mpwmd.net>
Sent: Monday, January 14, 2013 6:28 PM
To: Brian Anderson; Carol Reeb; Doug Smith; Dr Fred Watson; Dr. Meg Caldwell; Jody Hanson; Josh Plant; Ken Johnson; Laura Lee Lienk; Marc LosHuertos; Marvin Biasotti; Michele Lanctot; Pam Krone-Davis; Vince Voegeli; Aliya Piotrowski; Chad Mitcham; Clive Sanders; Dana Jones; Denis Ruttenberg; Elizabeth Geisler; Enrique Saavedra; Gabby Alberola; James Sulentich; Jennifer Bodensteiner; John Dalessio; Kathleen Lee ; Lawrence V. Levine ; Margaret Robbins; Marjorie Ingram Viales ; Mark Johnsson; Nicole Nedeff; oncianoj@co.monterey.ca.us; Paula Gill; pperrine@dfg.ca.gov; Regina Doyle; Richard Rosenthal ; Seth Gentzler; Shawn Atkins; Tanja Gardens; Thomas D. House; Carlos Ramos; Jeanette Pantoja; Karen McBride; LeVonne Stone; Mel Mason; Paola Ramos; Bridget Hoover; Dan Martel; David Elsen; Frank Schwing; Gail Youngblood; Jacob Martin; Jacqueline Pearson-Meyer; Jeff Kwasny; Joyce Ambrosius; Larry Freeman; Robert LaFleur; Shawn Milar; Alison Imamura; Bryce Ternet; Chris Coburn; Courtney Howard; Denise Duffy; John Ricker; Kevin Walsh; Matt Naftaly; Michael Gonzales; Ross Clark; Susan Robinson; Tracy Hemmeter; Bob Jacques; Daniel Dawson; Edrie de los Santos; Jeff Krebs; Leslie Llantero; Linda English ; Marc Wiener; Rick Riedl; Sarah Hardgrave; Sharon Friedrichsen; Steve Matarazzo; Tim O'Halloran; Tom Reeves; aerieways@aol.com; amah_mutsun@yahoo.com; ams@indiancanyon.org; Jakk Kehl; jmfgmc@sbcglobal.net; ramirez.louise@yahoo.com; rumsen@aol.com; soaprootmo@msn.com; Valentin Lopez; Allison Ford; Amy White; Anthony Tersol; Arleen Hardenstein; Art McLaughlin; Barbara Smyth; Bill Carrothers; Bill Leahy; Bill Phillips; bjleneve@att.net; Bob Sevene; Bob Steinberg; Brian Center; Bruce Gordon; Chris Mack; Christina Fischer; Darius Rike; David Styer; Dennis Palm; Don Eastman; Donna Meyers; Doug Deitch; Doug Rogers; Dr. Monica Hunter ; Eileen Cross ; Frank Emerson; Gail Morton ; Gary Courtright; George Riley; Gordon Smith; Greg Pepping; Hannah Schoenthal-Muse; Jack Hammerland; Jason Campbell; jdevers@bigsurlandtrust.org; Joel Weinstein; Kay Cline; Keith Defiebre; Kelly Sorenson, Executive Director; Ken Ekelund ; Laura Dadiw; Laura Kasa, Executive Director; Lisa Emanuelson; Liz Spence; Lorin Letendre; Luana Conley; Margaret Davis; Maris Sidenstecker; Mary Ann Matthews, Conservation Chair; Michael Waxer; Mike Splain; Oona Gabersek; Philomena Smith; Rachel Saunders; Renate Robe; Roger Williams; Roy Thomas; Sam Davidson; Sarah Corbin, Central CA Regional Manager; Sarah Newkirk; Sharon Lacalamita; Sherry Bryan; Sierra Ryan; Steve Shimek; Todd Norgaard; Tom Hopkins, President; Tom Moore, Fort Ord specialist ; Larry Parrish; Noelle White; Supervisor David Potter; Supervisor Jane Parker; Frank Pierce; Thomas Quattlebaum; Bob Roach; Carl P. Holm ; Cheryl Sandoval; Crissy Maras; Dawn Mathes; Des Johnston; Dirk Medema ; Don Prescott; Edward Muniz; Elizabeth Russell; Janna Faulk; Jim Arnold; Jonathan Garcia ; Kate McKenna; Lisa Lurie; Michael A. Houlemard, Jr.; Mike Novo; Ogarita Carranza; Paul Greenway; Paul Robins; Phil Yenovkian; Rami Shihadeh; Richard LeWarne; Roger VanHorn; Steve Endsley; Tim Jensen; Tom Harty; Angela Schroeter; Anya Spear; Connie Anderson; Dane Mathis; Ernie Taylor; Hector Hernandez; Jan Sweigert; Jeff Frey; Jennifer Epp; Jodi Pontureri; John Shelton; Katherine Mrowka, Chief; Katie McNeill (grant coordinator); Keeling, Matt@Waterboards; Lisa McCann; Lyn Wickham, Caltrans District 5 Hydraulics; Margaret Paul ; Maria Pang; Mathew Fuzie; Michelle Dooley; Mike Watson; Monica Reis; Pete Riegelhuth; Steve Bachman (sbachman@parks.ca.gov); Tamara Doan; Trish Chapman; Vicky Whitney, Deputy Director, Division of Water Rights; Barbara Buikema; Bob Holden ; Brad Hagemann; Brian True ; Catherine Bowie ; Chris Hauser; Christina Baca; David Laredo ; Dewey Evans; Eric Sabolsice; Eric Sandoval; Heidi Niggemeyer; Henrietta Stern; Jim Heitzman; Joe

To:	Oliver; Jonathan Lear; JT Rethke; Kevan Urquhart; Lance Monosoff; Larry Hampson; Manuel Quezada ; Mark Dudley; Mike McCullough; Mike Niccum; Richard Svindland; Robert Johnson; Thomas Christensen; Tom Moss
Cc:	Larry Hampson; Sara Reyes
Subject:	Stakeholder Group Meeting -- 2013 Update to the IRWMP
Attachments:	Agenda-06Feb2013.pdf

The Monterey Peninsula Water Management District (MPWMD) is continuing the update of the Monterey Peninsula, Carmel Bay, and Southern Monterey Bay (Monterey Peninsula) Integrated Regional Water Management (IRWM) Plan. The third stakeholder meeting in the update process is scheduled for:

Wednesday, February 6, 2013 from 1:30 - 3:30 pm
MPWMD Ryan Ranch office at 5 Harris Court, Bldg. G, Monterey, CA 93940

Information about teleconferencing/remote access with the meeting (i.e., a URL and conference call in number) will be provided in a reminder follow-up email and will be available at the website link below prior to the meeting.

All stakeholders who would like their project(s) to be included in the updated IRWM Plan are urged to attend this meeting.

The attached agenda includes items for discussion. At this stakeholder meeting, MPWMD and Denise Duffy & Associates staff will explain the proposed project solicitation and scoring / ranking methodology for projects to be included in the 2013 Monterey Peninsula IRWM Plan.

Summaries of the first two stakeholder meetings are available for review at the *2013 Monterey Peninsula IRWM Plan Update website*:
http://www.mpwmd.dst.ca.us/Mbay_IRWM/2010PG/Stakeholder-info-meetings/stakeholder.htm

The *2007 Monterey Peninsula IRWM Plan* and draft portions of the updated plan can be reviewed at:
http://www.mpwmd.dst.ca.us/Mbay_IRWM/Mbay_IRWM.htm

Information about the CA Department of Water Resources (DWR) IRWM program, including guidelines and standards is available on the *DWR IRWM Planning and Grants website* at: http://www.water.ca.gov/irwm/grants/index.cfm

> *Note: If interested in being involved in the future of statewide IRWM planning, please plan on attending DWR's vision and goal setting workshops for the development of the Strategic Plan for the Future of Integrated Regional Water Management (IRWM) in California. Our regions' workshop will be held April 10th at a location to be determined. Please visit: http://www.water.ca.gov/irwm/stratplan/ for more information.*

We appreciate your involvement in the 2013 IRWM Plan Update process and look forward to seeing you on February 6th.

Sara Reyes

on behalf of

Larry Hampson, District Engineer
Monterey Peninsula Water Management District
(831) 658-5620 or (831) 238-2543
larry@mpwmd.net

2013 Update
to the
Monterey Peninsula, Carmel Bay, and South Monterey Bay
Integrated Regional Water Management Plan

Stakeholder Meeting #3

February 6, 2013 at 1:30 pm

LOCATION:
MONTEREY PENINSULA WATER MANAGEMENT DISTRICT
5 HARRIS COURT, BLDG. G
MONTEREY, CA 93940

Meeting Agenda

1. **Meeting Overview/Purpose and Introductions**
2. **Review Results of Stakeholder Meetings #1 /#2**
3. **2007 Plan Project List**
4. **Project Review Process/Forms**
5. **Other Comments and Input**
6. **Next Steps/Next Stakeholder Meeting**

2

1. Meeting Overview, Purpose and Introductions



3

2. Review Results of Stakeholder Meetings #1 and 2






4

July 25 Meeting Re-Cap

- Recap of 2007 MP IRWM Plan
- 2013 Update standards & process
- Governance Status
- Objectives and Priorities/ Prioritization
- Meeting Notes available on 2013 IRWM Plan Update website

5

October 24, 2012 Meeting Re-Cap

- Resource Management Strategies
- Integration
- Project Review Process Introduction
- Concept Proposal Form
- Meeting Notes available on 2013 IRWM Plan Update website

6

3. 2007 IRWM Plan Project Lists



7

2007 Project List

Project	Project Sponsor
2007 Aquifer Storage and Recovery	MPWMD/ CAW
Groundwater Replenishment Project	MRWPCA/ MPWMD
CSUMB Storm Water Percolation /Education Project	CSUMB
Lower Carmel River Restoration /Floodplain Enhancement	BSLT/ MCWRA/ MPWMD
Watershed Volunteer Monitoring Program	CRWC
Sanitary Sewer System Repair and Replacement	Monterey / P.G.
Implementation of Solid Waste Removal Technology	Monterey / P.G.
Microbial Source Tracking	Monterey / P.G.
Refine ASBS Alternatives	Monterey / P.G.
Water Conservation Retrofit Program	MPWMD
90" Outfall Infiltration Component	Seaside

8

2007 Ranking

Project	Sponsor	Strategies	Objectives	Regional Priorities	Feasibility	Total	Ranking
Lower Carmel River Restoration and Floodplain Enhancement	MCWRA/BSLT /MPWMD	2.36	3.26	5.99	0.75	12.36	1
Refine ASBS Alternatives	Monterey/PG	2.83	3.44	3.99	2.04	12.30	2
Water Conservation Retrofit Program	MPWMD/CAW	1.89	2.38	1.58	1.63	7.45	3
CSUMB Stormwater Percolation and Education	CSUMB	2.13	2.90	1.09	1.21	7.33	4
Seaside 90" Outfall Infiltration Component	City of Seaside	2.36	2.72	1.29	0.85	7.03	5
Seaside Basin Groundwater Replenishment	MRWPCA	1.65	2.72	2.05	0.56	6.98	6
Carmel River Watershed Volunteer Monitoring Program	CRWC	1.42	2.72	1.09	1.21	6.44	7
Sanitary Sewer System Repair and Replacement	Monterey/PG	0.94	2.36	0.64	1.59	5.53	8
Microbial Source Tracking	Monterey/PG	0.71	1.27	0.00	2.06	4.03	9
Implementation of Solid Waste Removal Technology	Monterey/PG	0.71	1.27	0.00	1.75	3.72	10
Seaside Groundwater Basin Aquifer Storage and Recovery (not rated at this time)	MPWMD/CAW						N/A
Total Points, All Projects		**17.0**	**25.0**	**17.7**	**13.4**	**73.2**	
Maximum Possible Points for All Projects		**17.0**	**25.0**	**33.0**	**25.0**	**100.0**	

9

4. Project Review Process/Form



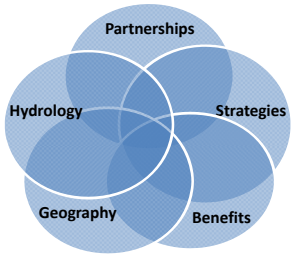
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2013 IRWM Plan Projects

"The projects *included* in the IRWM Plan are the projects that will implement the Plan and achieve the Plan objectives. The projects should represent the priorities of the planning effort and represent a wise investment for State grant funding. Hence, the process should not be designed to only select based on readiness to proceed."

11

Integration



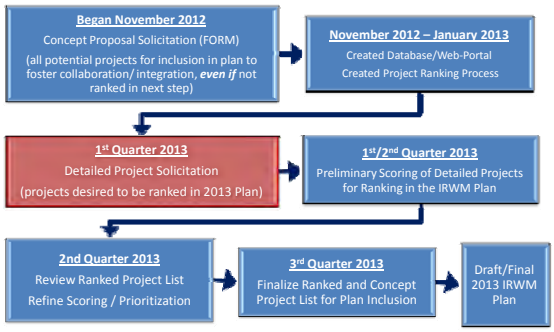
- Increased chance of funding
- Cost-effectiveness
- Cost sharing
- Streamlining of approval process
- Added expertise
- Additional advocates

To create better projects; implement IRWM planning goals; foster projects with comprehensive goals and objectives

12

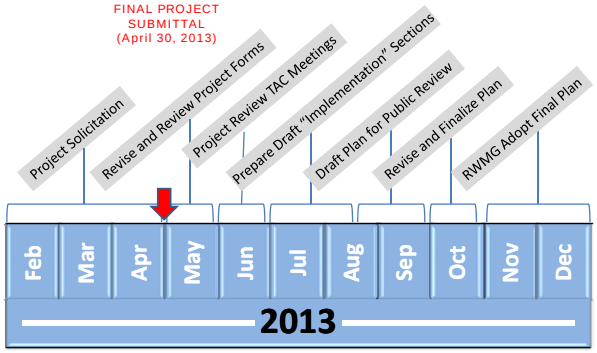
Process for Project Solicitation

**for 2013 plan inclusion; not specific to a grant



13

2013 IRWM Plan Update Schedule



Project Review / Ranking

- Stakeholder project submittal (now – April 30th)
- Compilation of projects (ranked and unranked) and objective scoring (May)
- Technical Advisory Committee with one staff member from each RWMG will review (June)
- TAC will recommend final ranking for review & consensus of stakeholder group (July)
- Final project lists to be included in Public Review Draft (Sept.) and Final IRWM Plan (Nov.)
- ADOPTION OF PLAN BY RWMGs (Nov – Dec)
- Relevance to 2014 Grant Application process

15

NEW IRWM Website (www.mpirwm.org)



- DWR Guidance/Grant Information
- Stakeholders Lists
- IRWM Library (including previous/existing plans)
- GIS data system
- Project Submittal Forms
- Draft 2013 MP IRWM Plan sections
- More …

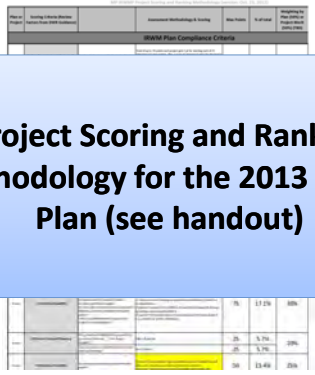
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Concept Proposal Solicitation Form



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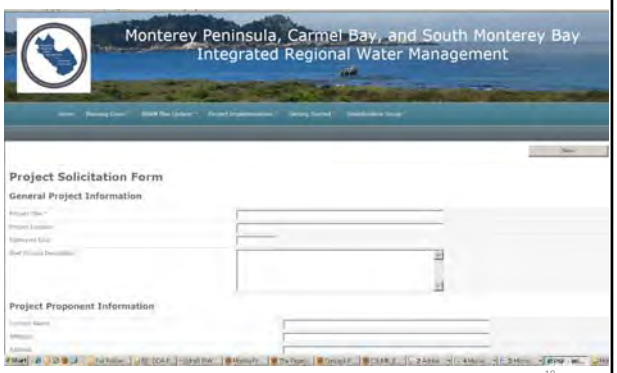
~ DRAFT ~



Project Scoring and Ranking Methodology for the 2013 IRWM Plan (see handout)

18

Detailed Project Solicitation



19

5. Other Comments and Input



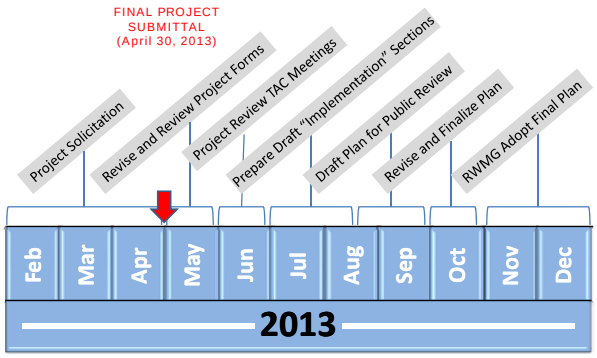
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6. Next Steps/Stakeholder Meeting

- Simple Concept Proposal Forms now (old or new website)
- Detailed solicitation forms on-line at new website (www.mpirwm.org) starting March 1st
- Submit Concept Proposal and Implementation Projects to IRWM Plan (DEADLINE: April 30, 2013)
- TAC Review Completed by July 2013
- Next Stakeholder Meeting: July 2013
  - Presentation of Detailed Project Scoring/Ranking

21

2013 IRWM Plan Update Schedule



Contacts/More Information

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Alison Imamura, AICP, Denise Duffy & Associates, Inc.
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Web address (2007 Plan and 2013 Plan Update):
http://www.mpirwm.org

23

Monterey Peninsula' 2013 Update to the IRWM Plan
Stakeholder Group Meeting (Wednesday, February 6, 2013)

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Monterey Peninsula, Carmel Bay, and South Monterey Bay
2013 Update to the Integrated Regional Water Management Plan
Stakeholder Group Meeting

MEETING NOTES

1:30 - 3:30 P.M., Wednesday February 6, 2013

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT
5 HARRIS COURT, BLDG. G, MONTEREY, CA 93940

If you wish to submit any additional information or request to have changes made to the meeting notes, please contact Larry Hampson via email Larry@mpwmd.net

1. Meeting Overview/Purpose and Introductions – 5 minutes [Larry]

A complete list of attendees and a copy of the presentation is available at http://www.mpwmd.net/Mbay_IRWM/2010PG/Stakeholder-info-meetings/stakeholder.htm

2. Review Results of Stakeholder Meetings #1/ #2 – 10 minutes [Larry]

3. 2007 Plan Project List – 10 minutes [Larry]

4. Project Review Process/Forms – 60 minutes

- Overview of Concept Proposal/Project Solicitation Process for IRWM plan inclusion
- Presentation of web-based forms and example of scoring/ranking methodology
- Comments and Input

This topic included reviewing the DWR-Required Project Review Factors, Types of Integration, Benefits of Integration, Process for Project Solicitation, Project Ranking/Scoring Guidance, Key Considerations for Project Review Process, Development of Project Ranking/Scoring Methodology for the 2013 IRWM Plan and Weighting of Project Review Factors.

Allison Imamura reviewed the web-based concept proposal form. In March 2013, Stakeholders will be able to log in to complete the form. The group was asked to send in any comments within the next two weeks before the form goes live.

Brian True inquired about the timing of IRWM Plan/Project schedule.

Alison verified the timing of the IRWM Plan and discussed deadlines for grant funding. (See presentation).

Sarah Hardgrave suggested that under the project proponents, you should be able to enter more than one sponsor.

(Frank Pierce) asked if persons will you be able to copy and paste maps or upload files into the form;

Allison Imamura and **Larry Hampson** responded yes.

2013 Draft Weighting of Project Review Factors (DW)

(Unknown) -- DW-1 --The more boxes you check the greater value you have for meeting that particular objective?

Larry Hampson responded that is the intent.

George Riley – DW-2 --asked for clarification if a project checks six out of eight boxes, is there a stakeholder evaluation to determine if all those boxes apply?

Larry Hampson responded that the Technical Advisory committee and/or the stakeholder group will review this area and determine whether all boxes checked apply.

Sarah Hardgrave commented that it is a competitive process within the region and also between regions. Are we potentially putting ourselves in a not so good position between regions, the more complex we make this?

Larry Hampson responded that you have to have your IRWM plan accepted and adopted by DWR before you can even apply for an implementation grant. It will be a competition among the Implementation package.

Unknown asked if you get more points if you have additional project funding match?

Larry answered, in the past you received a higher ranking by having more funding, but DWR would like to avoid a pay to play system.

Sarah Hardgrave what if a project is isn't going to be initiated/completed by the end of April or December when the plan becomes drafted/finalized

Alison answered in the IRWM a project applicant can state the project status on the project implementation grant proposal form and project status is just one factor in project ranking system.

Sarah Hardgrave/Brian True/Others inquired if Objective WS-2 applies towards new recycled water source or an increase of non-potable uses of recycled water. 4,800 acre/feet MRWPCA max is too much and cannot work in all areas.

Larry/Alison answered WS-2 is solely a number based objective and is just one objective in the IRWM Plan. Based on this input, WS-2 may be changed into three categories to give opportunity to smaller project/communities.

5. Other Comments and Input

There was discussion on the use of recycled water and how it is categorized and ranked and how agencies could be encouraged using recycled water or wastewater recycling systems.

6. Next Steps/Next Stakeholder Meeting

- Concept & Detailed Project Solicitation Forms for 2013 IRWM Plan: Due late March 2013
- Next Stakeholder Meeting: late April 2013

Appendix 14-e

February 7, 2013 Interregional Stakeholder Meeting

(See Attachment 4 of the Project Summary Report in Appendix 5-a: Integrated Regional Water Management Plan Interregional Coordination,)

DRAFT