



## Technical Memorandum

<b>To:</b>	SJBA Technical Advisory Committee Cathrene Glick, Program Manager
<b>From:</b>	Wildermuth Environmental Inc. (WEI)
<b>Date:</b>	Draft: March 30, 2015 Revised: August 3, 2015
<b>Subject:</b>	Design Criteria for the San Juan Basin Groundwater and Desalination Optimization Program Elements (Task 2.1 of the FAF Grant Scope of Work)

### Introduction

Per the Foundational Action Funding (FAF) grant scope of work for the San Juan Basin Groundwater and Desalination Optimization Program (the Program), the objective of Task 2.1 is to:

- Obtain facilities information from SJBA member agencies to identify all major water, sewer, and recycled water conveyance facilities, and pressure zones to enable the Engineering Team to develop well locations, siting constraints, and connection points to SJBA member agencies;
- Identify and obtain agreement on design and operating criteria and assumptions before engineering work begins;
- Obtain agreement on the cost and financial assumptions to be used in the preparation of cost opinions; and
- Identify potential purchasers of the water, where they would take delivery, and the capacity limitations at the points of delivery.

WEI's scope of work involves the first two bullet items. As such, this draft technical memorandum (TM) covers the information needed for the first two items listed above. The third and fourth items listed above have been deferred to the facilities engineering consultant and a subsequent TM.

### Facilities Information Obtained from the SJBA Member Agencies

WEI contacted the SJBA member agencies to obtain information on the water facilities infrastructure that will be used to determine the location of recycled water and potable conveyance facilities, sewer lines, and storm water management facilities. GIS shape-files showing the locations and attributes of existing and proposed facilities were

requested along with associated master plan documents. WEI also requested information on projections of recycled water production and reuse as well as historical recycled water and surface water quality. The general list of items requested from the TAC is summarized in Table 1. Table 1 also shows which agencies provided the information requested. Table 2 is a detailed list of the GIS shapefiles and PDF maps obtained.

### **Facility Design and Operating Criteria**

The following criteria were developed to plan the location and sizing of in-channel and off-channel recharge facilities as well as the number and locations of wells sites for injection and production.

#### **Off-Channel Recharge Facilities Siting Criteria**

Siting criteria were developed to filter the universe of potential sites for recharge. The siting criteria for the off-channel recharge facilities proposed for this effort include:

- The site must be within the San Juan Basin (on the valley floor areas) and recharge at the site must be tributary to production wells in the Basin.
- The site must be at least 5 acres in size, including setbacks and ancillary facilities.
- The surface soils at the site must contain Type A, B, and/or AB soils.
- The current thickness of the vadose zone underlying the site must be  $\geq 50$  feet, or the combination of proposed recharge and production should be such that there is no potential for liquefaction due to recharge.
- The site must be in public ownership or available for purchase.
- The site must not have any unresolvable environmental, institutional, or other challenges for use as a recharge basin.

#### **Off-Channel Recharge Facilities Design Criteria**

These criteria describe assumptions pertaining to the design and functionality of recharge and related diversion and water-conveyance facilities. The design criteria for a recharge facility include: minimum land size for construction and operation, setbacks, side slopes, freeboard, range of acceptable infiltration rates, construction materials, other facility design criteria, maintenance periods, etc. Table 3 lists the preliminary design and operating criteria for off-channel recharge facilities. Off-channel recharge facilities can be classified as either conservation or multipurpose facilities. Conservation basins are operated to recharge storm and recycled water only. Multipurpose basins are operated primarily for flood peak discharge attenuation and secondarily for the recharge of storm and recycled water.

#### **In-Channel Recharge Facilities**

In-channel recharge facilities will consist of temporary earthen berms that slow down stormwater discharge and maximize channel bottom area inundation, temporary earthen impoundments to contain storm and recycled water in the channel for

subsequent recharge, or inflatable rubber dams that will be used to impound storm and recycled waters. The in-stream facilities will be assumed to have an average infiltration rate of 2 ft/day.

The earthen berms will be constructed from channel bottom materials, will washout during moderate floods, and will have to be reconstructed after storms that damage or remove them. A trough will be excavated downstream of the earthen berms to capture any recycled water that may be pushed downstream during a summer storm.

The inflatable rubber dams will be anchored to the channel sidewalls and newly constructed grade stabilizers. The inflatable rubber dams will be located along San Juan Creek and the Arroyo Trabuco such that they create a nearly continuous lake of water during normal recharge operations. The dams will be sized such that they are not jurisdictional under the Provisions of Division 3 of the California Water Code (less than 6 feet high or with a storage capacity of less than 50 acre-feet). During moderate and larger flood events, the rubber dams will deflate to ensure that the floods can be safely passed through the stream system. The amount of recycled water impounded behind the rubber dams will be managed such that any recycled water would be completely recharged prior to a storm event that could result in its discharge to the ocean. The location and number of inflatable rubber dams and their specific operating characteristics will be based on the scale of each recharge alternative and will be more fully described in the Task 2.2 TM.

#### **New Injection Well Location**

Injection well locations will be developed to practically maximize the underground retention time and meet the desired injection rate for each alternative. Practical limits will be based on reasonable locations for the injection wells and the pipelines that would feed them. Preference will be given to well sites that are likely to support desirable injection capacity, that are in public ownership, and that in conjunction with production wells and other recharge, maximize the underground retention time and minimize the recycled water contribution (achieves the highest dilution of recycled water in the groundwater system). Each potential site will be reviewed in the field to determine construction feasibility and access constraints.

#### **New Injection Well Capacity**

The capacity assumed for new injection wells will be 750 gallons per minute with a 90 percent utilization rate. Total injection well capacity will be developed and reported in the Task 2.2 TM.

#### **New Production Well Location**

Production wells will be required to recover the increase in storm water and recycled water recharge that will be included in the planning alternatives. WEI reviewed DWR

Water Well Standards, reviewed AWWA Standards, and contacted the County of Orange for information on water well setback distances. Table 4 summarizes the setbacks for sewer lines, septic tanks, and inundation areas. There is no reference to setback distances in the AWWA standards. The County of Orange follows the DWR standards for setback distances, and in addition, the County stated that they will closely evaluate the 100-yr flood inundation area in approving well sites. Because most of the existing City of San Juan Capistrano and South Coast Water District wells are located within the 100-yr flood inundation area, it is assumed that this siting criteria is flexible.

Preference will be given to well sites that are likely to support desirable production capacity, that are in public ownership, and that in conjunction with injection wells and recharge basins, maximize the underground retention time and minimize the recycled water contribution (achieves the highest dilution of recycled water in the groundwater system).

#### **New Production Well Capacity**

The capacity assumed for new production wells will be based on the average of the greatest monthly production capacity achieved by wells used to supply City of San Juan Capistrano (CSJC) and South Coast Water District (SCWD) desalter supply wells. Assumed production well capacity will be developed and reported in the Task 2.2 TM.

#### **Recycled Water Recharge Compliance**

Compliance with the State Water Resources Control Board Division of Drinking Water (DDW) recycled water recharge regulations will be based on underground retention time (URT) and recycled water contribution (RWC). Metrics for URT and RWC will be developed in Task 3 based on the technical memorandum that is being prepared for the Program by Dr. Michael Welch.

**Table 1**  
**Data Request to San Juan Basin Authority Member Agencies**

<b>Data Item Description</b>	<b>City of SJC</b>	<b>Moulton Niguel WD</b>	<b>SCWD</b>	<b>SMWD</b>	<b>SOCWA</b>
GIS, CAD, or maps of stormwater, recycled water, and potable water facilities (See list of data received in Table 2)	✓	✓	✓	✓	N/A
Known parcels that could be used for off-stream storage and recharge of storm and recycled waters	✓				N/A
Estimates of existing and projected non-potable water supply generation (by treatment plant)	✓	✓	✓	✓	N/A
Estimates of existing and projected non-potable water supply direct use (by treatment plant)	✓	✓	✓	✓	N/A
Estimates of existing and projected non-potable water supply surplus (by treatment plant)	✓	✓	✓	✓	✓
Recycled water quality data for consistency with the Title 22 GRRP regulations 20110-2014, by treatment plant	N/A	N/A	N/A	N/A	✓
Design standards manual – or the agency’s criteria used to size potable and non-potable water supply pipelines	✓	✓	✓	✓	N/A
Requirements for minimum parcel size for constructing new wells	✓	N/A	✓	N/A	N/A
Water quality of surface water captured at barrier projects	N/A	N/A	N/A	✓	N/A
GIS, CAD, or maps of environmentally sensitive areas	✓				

**Table 2  
Summary of GIS Data Provided**

Data type	Data Name	Feature Type	Extent	Data Provider
Shapefile	CSJC City Boundary	Polyline	CSJC	CSJC
Shapefile	CSJC Water Service Boundary	Polyline	CSJC	CSJC
Shapefile	Habitat Restoration areas within the City Boundaries	Polygon	CSJC	CSJC
	Domestic Water Infrastructure			CSJC
Shapefile	Back flow	Point	Water Service Area	CSJC
Shapefile	Control valve	Point	Water Service Area	CSJC
Shapefile	Dead ends	Point	Water Service Area	CSJC
Shapefile	Fitting	Point	Water Service Area	CSJC
Shapefile	Hydrant	Point	Water Service Area	CSJC
Shapefile	Meter	Point	Water Service Area	CSJC
Shapefile	Misc	Point	Water Service Area	CSJC
Shapefile	PRV	Point	Water Service Area	CSJC
Shapefile	Pump	Point	Water Service Area	CSJC
Shapefile	Reservoir	Point	Water Service Area	CSJC
Shapefile	System valve	Point	Water Service Area	CSJC
Shapefile	Water main	Polyline	Water Service Area	CSJC
Shapefile	Well	Point	Water Service Area	CSJC
Shapefile	Wease pat	Polygon	Water Service Area	CSJC
Shapefile	Septic tank (April 2003)	Point	Orange County	CSJC
	Recycled Water Infrastructure			CSJC
Shapefile	Control valve	Point	Water Service Area	CSJC
Shapefile	FCV	Point	Water Service Area	CSJC
Shapefile	Fitting	Point	Water Service Area	CSJC
Shapefile	Hydrant	Point	Water Service Area	CSJC
Shapefile	Main	Polyline	Water Service Area	CSJC
Shapefile	Meter	Point	Water Service Area	CSJC
Shapefile	Misc	Point	Water Service Area	CSJC
Shapefile	Pump	Point	Water Service Area	CSJC
Shapefile	Relief	Point	Water Service Area	CSJC
Shapefile	Reservoir	Point	Water Service Area	CSJC
Shapefile	Valve	Point	Water Service Area	CSJC
Shapefile	Well	Point	Water Service Area	CSJC
	Storm Drain Infrastructure			CSJC
Shapefile	Directional Flow	Point	Water Service Area	CSJC
Shapefile	Lines	Polyline	Water Service Area	CSJC
Shapefile	Structures	Point	Water Service Area	CSJC
	Sewer Infrastructure			CSJC
Shapefile	Casing	Polygon	Water Service Area	CSJC
Shapefile	Directional flow	Point	Water Service Area	CSJC
Shapefile	Easements	Polygon	Water Service Area	CSJC
Shapefile	Force main points	Point	Water Service Area	CSJC
Shapefile	Force mains	Polyline	Water Service Area	CSJC
Shapefile	Laterals	Polyline	Water Service Area	CSJC
Shapefile	Line	Polyline	Water Service Area	CSJC
Shapefile	points	Point	Water Service Area	CSJC
MapLayer	Storm Drain Master Plan			
	Boundary	polyline	City of Dana Point	City of Dana Point
	Drain outlets	polyline	City of Dana Point	City of Dana Point
	abandoned SD	polyline	City of Dana Point	City of Dana Point
	abandoned SD flow arrows	polyline	City of Dana Point	City of Dana Point
	Abandoned SD MH	polyline	City of Dana Point	City of Dana Point
	Caltrans SD	polyline	City of Dana Point	City of Dana Point
	Caltrans Drain Inlet	polyline	City of Dana Point	City of Dana Point
	Caltrans CB	polyline	City of Dana Point	City of Dana Point
	Caltrans Flow arrows	polyline	City of Dana Point	City of Dana Point
	Caltrans MH	polyline	City of Dana Point	City of Dana Point
	county sd	polyline	City of Dana Point	City of Dana Point
	county drain inlet	polyline	City of Dana Point	City of Dana Point
	county cb	polyline	City of Dana Point	City of Dana Point
	county flow arrows	polyline	City of Dana Point	City of Dana Point
	county mh	polyline	City of Dana Point	City of Dana Point
	county sd stormceptor	polyline	City of Dana Point	City of Dana Point
	county rip rap	polyline	City of Dana Point	City of Dana Point
	future sd	polyline	City of Dana Point	City of Dana Point
	state sd	polyline	City of Dana Point	City of Dana Point
	state flow arrows	polyline	City of Dana Point	City of Dana Point
	public sd	polyline	City of Dana Point	City of Dana Point
	public cb	polyline	City of Dana Point	City of Dana Point
	public flow arrows	polyline	City of Dana Point	City of Dana Point
	public mh	polyline	City of Dana Point	City of Dana Point
	public stormceptor	polyline	City of Dana Point	City of Dana Point
	public sd cleanout	polyline	City of Dana Point	City of Dana Point
	public sd pipeanchors	polyline	City of Dana Point	City of Dana Point
	public headwall	polyline	City of Dana Point	City of Dana Point
	public parks sd	polyline	City of Dana Point	City of Dana Point
	public parks drain inlet	polyline	City of Dana Point	City of Dana Point
	private sd	polyline	City of Dana Point	City of Dana Point
	private drain inlet	polyline	City of Dana Point	City of Dana Point
	private cb	polyline	City of Dana Point	City of Dana Point

**Table 2**  
**Summary of GIS Data Provided**

Data type	Data Name	Feature Type	Extent	Data Provider
	private flow arrows	polyline	City of Dana Point	City of Dana Point
	private mh	polyline	City of Dana Point	City of Dana Point
	private sd stormceptor	polyline	City of Dana Point	City of Dana Point
	private headwall	polyline	City of Dana Point	City of Dana Point
	private lot drain	polyline	City of Dana Point	City of Dana Point
	open channel	polyline	City of Dana Point	City of Dana Point
	open channel flow arrow	polyline	City of Dana Point	City of Dana Point
	salt creek treatment facility	polyline	City of Dana Point	City of Dana Point
	san juan creek channel	polyline	City of Dana Point	City of Dana Point
	rr sd	polyline	City of Dana Point	City of Dana Point
	rr drain inlet	polyline	City of Dana Point	City of Dana Point
	rr flow arrows	polyline	City of Dana Point	City of Dana Point
	Laguna Niguel sd	polyline	City of Dana Point	City of Dana Point
	Laguna Niguel drain inlet	polyline	City of Dana Point	City of Dana Point
	Laguna Niguel cb	polyline	City of Dana Point	City of Dana Point
	Laguna Niguel flow arrows	polyline	City of Dana Point	City of Dana Point
	Laguna Niguel mh	polyline	City of Dana Point	City of Dana Point
	san clemente sd	polyline	City of Dana Point	City of Dana Point
	san clemente drain inlet	polyline	City of Dana Point	City of Dana Point
	san clemente cb	polyline	City of Dana Point	City of Dana Point
	san clemente flow arrows	polyline	City of Dana Point	City of Dana Point
	san clemente mh	polyline	City of Dana Point	City of Dana Point
	san juan sd	polyline	City of Dana Point	City of Dana Point
	san juan cb	polyline	City of Dana Point	City of Dana Point
	and juan flow arrows	polyline	City of Dana Point	City of Dana Point
	san juan mh	polyline	City of Dana Point	City of Dana Point
	private sd cleanout	polygon	City of Dana Point	City of Dana Point
	Storm Drain Infrastructure Maps			
PDF	F5.pdf	PDF	Indexed F5	City of Dana Point
PDF	F6.pdf	PDF	Indexed F6	City of Dana Point
PDF	F7.pdf	PDF	Indexed F7	City of Dana Point
PDF	F8.pdf	PDF	Indexed F8	City of Dana Point
PDF	F9.pdf	PDF	Indexed F9	City of Dana Point
PDF	STORM DRAIN MASTER PLAN-INDEX.pdf	PDF	Index map	City of Dana Point
geodatabase	MViejo_Storm.mdb			
	StormDrain_Features			City of Mission Viejo
	CasingSD	Polygon	City of Mission Viejo	City of Mission Viejo
	Easement_anno	text	City of Mission Viejo	City of Mission Viejo
	EasementSD	Polygon	City of Mission Viejo	City of Mission Viejo
	HydroSD	polyline	City of Mission Viejo	City of Mission Viejo
	Miscellaneous	polyline	City of Mission Viejo	City of Mission Viejo
	SaptialOperationRecordSD	Point	City of Mission Viejo	City of Mission Viejo
	StormStructureSD	Polygon	City of Mission Viejo	City of Mission Viejo
	StormDrain_Network			City of Mission Viejo
	Anno_9_45		City of Mission Viejo	City of Mission Viejo
	CatchBasin_Length_Anno	Text	City of Mission Viejo	City of Mission Viejo
	CatchBasin_No_Anno	Text	City of Mission Viejo	City of Mission Viejo
	CatchBasin SD	Point	City of Mission Viejo	City of Mission Viejo
	ChannelSD	polyline	City of Mission Viejo	City of Mission Viejo
	CleanOutSD	Point	City of Mission Viejo	City of Mission Viejo
	DetentionBasinSD	Point	City of Mission Viejo	City of Mission Viejo
	DischargePointSD	Point	City of Mission Viejo	City of Mission Viejo
	FittingSD	Point	City of Mission Viejo	City of Mission Viejo
	Flow_Vector	polyline	City of Mission Viejo	City of Mission Viejo
	ForceMainSD	polyline	City of Mission Viejo	City of Mission Viejo
	GraphicLineSD	polyline	City of Mission Viejo	City of Mission Viejo
	GravityMainSD	polyline	City of Mission Viejo	City of Mission Viejo
	InletSD	Point	City of Mission Viejo	City of Mission Viejo
	LiftStationSD	Point	City of Mission Viejo	City of Mission Viejo
	LateralLineSD	polyline	City of Mission Viejo	City of Mission Viejo
	ManholeSD	Point	City of Mission Viejo	City of Mission Viejo
	Misc_arcs	polyline	City of Mission Viejo	City of Mission Viejo
	Miscellaneous_anno	text	City of Mission Viejo	City of Mission Viejo
	NetworkStructureSD	Point	City of Mission Viejo	City of Mission Viejo
	PCCulvert_anno	text	City of Mission Viejo	City of Mission Viejo
	Storm_Dia_material_anno	text	City of Mission Viejo	City of Mission Viejo
	StormDrainNetwork	Geometric Network	City of Mission Viejo	City of Mission Viejo
	StormDrain_Network_Junctions	Point	City of Mission Viejo	City of Mission Viejo
	SystemValveSD	Point	City of Mission Viejo	City of Mission Viejo
	WaterQualityTreatmentDevice	Point	City of Mission Viejo	City of Mission Viejo
Shapefile	MVhydro	polyline	City of Mission Viejo	City of Mission Viejo
Shapefile	MV_st_cenlines.shp	polyline	City of Mission Viejo	City of Mission Viejo
AutoCad	stormSTREET_NAMES.dxf	autocad	City of Mission Viejo	City of Mission Viejo
AutoCad	tractno.dxf	autocad	City of Mission Viejo	City of Mission Viejo
Shapefile	MV_boundary.shp	polyline	City of Mission Viejo	City of Mission Viejo
Shapefile	MVgolf.shp	polygon	City of Mission Viejo	City of Mission Viejo
Shapefile	MVgrid.shp	polygon	City of Mission Viejo	City of Mission Viejo
Shapefile	MVmall.shp	polygon	City of Mission Viejo	City of Mission Viejo
Shapefile	MVoutcity.shp	polygon	City of Mission Viejo	City of Mission Viejo

**Table 2  
Summary of GIS Data Provided**

Data type	Data Name	Feature Type	Extent	Data Provider
Shapefile	MVparcels.shp	polygon	City of Mission Viejo	City of Mission Viejo
Shapefile	MVparks.shp	polygon	City of Mission Viejo	City of Mission Viejo
Shapefile	MVreserv.shp	polygon	City of Mission Viejo	City of Mission Viejo
Shapefile	MVtship_rng.shp	polygon	City of Mission Viejo	City of Mission Viejo
Shapefile	MVzcodes.shp	polygon	City of Mission Viejo	City of Mission Viejo
Shapefile	saddlebackcolleges.shp	polygon	City of Mission Viejo	City of Mission Viejo
Shapefile	pwMainLine.shp	polyline	Water Service Area	MNWD
Shapefile	pwPumpStation.shp	Point	Water Service Area	MNWD
Shapefile	pwTank.shp	Point	Water Service Area	MNWD
Shapefile	rwMainLine.shp	polyline	Water Service Area	MNWD
Shapefile	rwPumpStation.shp	Point	Water Service Area	MNWD
Shapefile	rwTank.shp	Point	Water Service Area	MNWD
Shapefile	rwUseSites.shp	polygon	Water Service Area	MNWD
Shapefile	wwLiftStation.shp	Point	Water Service Area	MNWD
Shapefile	wwMainLine.shp	polyline	Water Service Area	MNWD
Shapefile	OCFD.shp	polyline	San Juan Watershed	OC Public Works
Shapefile	Local.shp	polyline	San Juan Watershed	OC Public Works
Shapefile	DrainageStudy2013.shp	polyline	Orange County	OC Public Works
Shapefile	Drainlines.shp	polyline	Orange County	OC Public Works
Geodatabase	RecycledWaterNetwork			
	rwBufferPolys	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwPressurizedMain	polyline	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwGravityMain	polyline	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwLateralLine	polyline	SCWD - Partial City of Laguna Beach	Sout Coast WD
	RecycledWaterNetwork_Net_Junctions	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwSystemValve	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwSamplingStation_prj	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwreliefvalve	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwHydrant	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwClearWell	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwControlValve	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwFitting	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwLateralPoint	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwManhole	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwMeter	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwNetworkStructure	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwPump	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwSamplingStation	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	rwWaterStructure	polygon	SCWD - Partial City of Laguna Beach	Sout Coast WD
	Sewer_Stormwater_Network			
	ssGravityMain_Buffer	polygon	SCWD - Partial City of Laguna Beach	Sout Coast WD
	Tunnel		SCWD - Partial City of Laguna Beach	Sout Coast WD
	ssManhole	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	ssAdit	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	csd	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	ssPressurizedMain	polyline	SCWD - Partial City of Laguna Beach	Sout Coast WD
	ssGravityMain	polyline	SCWD - Partial City of Laguna Beach	Sout Coast WD
	ssPump	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	ssNetworkStructure	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	WaterNetwork			
	wSystemValve_Buffer	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wBufferPolys	polygon	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wLateralLine_Intersect	polyline	SCWD - Partial City of Laguna Beach	Sout Coast WD
	sde_data_SCWDSDE_wGravityMain	polyline	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wPressurizedMain	polyline	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wLateralLine	polyline	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wGravityMain	polyline	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wBackFlow	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wReliefValve	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	WaterNetwork_Junctions	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wHydrant	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wSystemValve	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wLateralPoint	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wPump	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wClearWell	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wControlValve	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wManhole	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wFitting	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wNetworkStructure	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wMeter	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wSamplingStation	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wLateralLine_Buffer	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	WaterStructures			
	wNetworkStructure	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
	wSpatialOperationsRecord	Point	SCWD - Partial City of Laguna Beach	Sout Coast WD
PDF	Santa Margarita WD Potable Water Network	PDF	SMWD Water Service Area	Santa Margarita WD
PDF	Santa Margarita WD Storm Water Network	PDF	SMWD Water Service Area	Santa Margarita WD
PDF	Santa Margarita WD Recycled Water Network	PDF	SMWD Water Service Area	Santa Margarita WD



**Table 3  
Design and Operating Criteria for Recharge Facilities**

Criteria		Reasoning and/or References
Average Infiltration Rate	0.5 - 2 ft/day	This will be the assumed infiltration rate for all off-channel recharge sites.
Multipurpose and Conservation Basin Priority of Operation	Pursuant to Orange County criteria	Multipurpose basins accept recycled water and storm water; however, storm water operations and safety trump recharge. Conservation basins accept recycled water and storm water; conservation basins are not used for flood control.
Basin Side Slopes	3:1	This is the typical design for recharge basin slide slopes.
Basin Freeboard	≥ 3 feet	Freeboard is the vertical distance from the water surface to the top of the basin design capacity. Freeboard is also considered the safety factor for unknown factors, such as wind/wave action due to earthquakes and/or other hydrological effects in the watershed.
Instrumentation	SCADA	SCADA will be used to remotely operate diversion works, rubber dams and outlets and to record stage and equipment settings.
Site Setbacks	Frontage ≥ 40 feet Sides ≥ 20 feet Back ≥ 20 feet	A setback is the distance from the site's property line to the outer edge of the recharge basin's berm. This distance has been set to allow for circulation of maintenance equipment. The front of the property or portions of the property that front surrounding roadways will require an additional distance to allow for screening type landscaping.
Access Road Width	≥ 15 feet	This minimum distance has been set to allow for maintenance equipment access. A 20-foot access road is preferable. A 15-foot access road is the minimum.
Maintenance	Yearly or as needed	Maintenance will consist of weed abatement and vector control. Removing miscellaneous vegetation from the recharge basin bottom and side walls is essential to minimizing potential vector issues. Additionally, subcontracting with a vector control specialist to treat the basin during the summer months is also key to preventing potential vector issues. Other activities include removing debris from diversion works and conveyance facilities, fence repair, and access road/ramp repair.
Removal of Recharge Limiting Materials	After significant debris inflow events that limit infiltration and conservation capacity (large floods and/or watershed fires) and at least once every three years	Debris removal will consist of removing built-up fines and organic matter that have accumulated at the bottom of the basin. This activity is vital to maintaining recharge capacity.

**Table 4  
Production Well Siting Criteria**

Facility or Contamination Source	Minimum Horizontal Separation Distance Between Well and Known or Potential Source	Reference
Any sewer (sanitary, industrial, or storm; main or lateral)	50 feet	DWR Water Well Standards Bulletins 74-81 & 74-90
Watertight septic tank or subsurface sewage leaching field	100 feet	
Flooding and Drainage (creek, pond, pool, or other body of water)	100 feet*	County of Orange

\*The County of Orange will visit the site to ensure that the well is located outside of the 100 yr flood plain.