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scwd[2] Regional Seawater Desalination Project EIR

Project Construction Assumptions - Summary

Prepared by URS and CDM Smith, February 2013

Project Components	Construction Schedule (# of months)	Daily Construction Hours[1]	Construction Workers	Construction Footprint	Conveyances (Trench Depth and Width in Feet)	Staging/Laydown Areas		Cut (CY)	Fill (CY)	Soil Export, if any (CY)	Soil Import, if any (CY)
						Size	Location(s)				
Desalination Plant Site				**In Acres**		**In Acres**				**Plant Site[2]**	
Plant Site A-1	30	MON-FRI 7:00 AM to 5:00 PM	Min. = 6 Avg. = 40 Max. = 80	5.0	Utility conveyance piping and utilities connections enter and exit site from Natural Bridges Drive.	1	Adjacent to Site A-1 to the south or southeast.	13,000	9,000	4,000	0
Plant Site A-2	30	MON-FRI 7:00 AM to 5:00 PM	Min. = 6 Avg. = 40 Max. = 80	5.0	Utility conveyance piping and utilities connections likely to be located within entrance off Delaware Avenue or Natural Bridges Drive.	1	Adjacent to Site A-2 to the north.	13,000	9,000	4,000	0
Plant Site A-3	32	MON-FRI 7:00 AM to 5:00 PM	Min. = 6 Avg. = 40 Max. = 80	8.0	Assumes a 650-LF by 30-FT wide access roadway from Delaware Avenue to Site A-3b. Utility conveyance piping and utilities connections likely to be located within entrance off Delaware Avenue.	1	Adjacent to Site A-3 to the west.	14,000	11,000	3,000	0
Intake System			**In Square Feet**			**In Square Feet**					
Screens (sandy)	16	MON-FRI 7:00 AM to 7:00 PM	Min. = 6 Avg. = 8 Max. = 12	2,500	24'D x 25'W x 50'L	5,000	Santa Cruz Harbor	0	0	0	0
Screens (bedrock)				2,500	24'D x 25'W x 50'L	5,000	Santa Cruz Harbor	74	0	0	0
Intake Pipeline (sandy)				90,000	7'D x 15'W x 3,000'L	25,000	Santa Cruz Harbor and staging on Beach Area parking lot, such as at Beach and 3rd Street.	18,667	0	0	0
Intake Pipeline (bedrock)[3]				80,000	Max: 8' Tunnel x 5,000' L Min: 8' Tunnel x 1,200' L	25,000	Santa Cruz Harbor and staging at plant site	7,447	0	7,447	0
Pump Station				7,000	Max: 85'D x 70'W x 50'L Min: 55'D x 70'W x 50'L	10,000	Intake Sites 4, 5, 7, 14, and 16 staging at or near plant site; Intake Sites 9, 17, and 18 staging on Beach Area parking lot, such as at Beach and 3rd Street or Depot Park.	11,019	3,907	7,111	0
Transfer PL (Sites 9, 17, 18)		MON-FRI 7:00 AM to 5:00 PM		115,000	5'D x 5'W x 11500'L	10,000	Same as pump station	10,648	0	10,648	8,997
Transfer PL (other sites)				52,800	5'D x 5'W x 5280'L	5,000	Same as pump station	4,889	0	4,889	4,103
Brine Conveyance											
Delaware/Palmetta[4]	3	MON-FRI 7:00 AM to 5:00 PM	8	45,600	5'D x 3'W x 7600' L	5,000	On or adjacent to plant site	4,222	0	4,222	2,994
Intertie System Improvements											
Morrissey PS to DeLaveaga Tanks	14	MON-FRI 7:00 AM to 5:00 PM	16[5]	40,000	6'D x 4'W x 5000'L	10,000[6]	Nearby vacant or underutilized lot, such as are located near the intersection of Soquel Drive and 41st Avenue. Two staging areas, one for each crew, could be required.	4,444	0	4,444	1,826
DeLaveaga Tanks to City-District Intertie				96,000	6'D x 4'W x 12000'L			10,667	0	10,667	4,383
City-District Intertie to McGregor Pump Station				104,000	6'D x 4'W x 13000'L			11,556	0	11,556	4,749
Morrisey Pump Station Upgrade											
Mechanical & electrical improvements	5	MON-FRI 7:00 AM to 5:00 PM	8	7,000	NA	7,500	On pump station site.	0	0	0	0

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						Size	Location(s)				
McGregor Pump Station Upgrade											
Mechanical & electrical improvements	4	MON-FRI 7:00 AM to 5:00 PM	8	7,000	NA	5,000	On pump station site.	0	0	0	0

Notes

1. To comply with City noise ordinance, construction equipment would not be operated before 8:00 am.
2. Soil import/export calculations will be recalculated as preliminary design progresses. At this stage of conceptual design, assume that soil import/export at the plant site could be +/- 5,000 CY.
3. Materials resulting from excavation to provide the connection between the intake screen and the intake pipeline could potentially be left in place.
4. The Delaware/Palmetta connection point for the brine line is similar in length to the other two potential connection points.
5. The construction workers identified for the intertie system improvements would be associated with 2 crews of 8 workers each.
6. Two staging areas could be required with each being approximately 10,000 square feet in size.

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scwd[2] Regionial Seawater Desalination Project EIR

Construction Equipment Assumptions - Plant Site

Prepared by URS and CDM, February 2013

Construction Area/Component	Equipment Name	Hp	Fuel Type (diesel/gas)	Quantity	Daily (Hours)	Days or	Site A-1 Months	Site A-2 Months	Site A-3 Months
Regional Desalination Plant									
Mobile/Clear/Site Grading									
	Air Compressors	350	D	1	8		3	3	4
	Generator - 113 KW	174	D	1	8		3	3	4
	Off-road Trucks (dump)	140	D	1	8		3	3	4
	Backhoes - Cat 446	101	D	1	8		3	3	4
	Dozer	70-150	D	1	8		3	3	4
	RT Forklift	70-150	D	1	8		3	3	4
	Pickup Truck	150-300	G	2	8		3	3	4
Underground Utilities and Piping									
	Air Compressors	350	D	1	8		8	8	10
	Generator - 113 KW	174	D	1	8		8	8	10
	Off-road Trucks (dump)	140	D	1	8		8	8	10
	Backhoe - Cat 446	101	D	1	8		8	8	10
	Loader	70-150	D	1	8		8	8	10
	Excavator	325	D	1	8		8	8	10
	Dozer	70-150	D	1	8		8	8	10
	Compactor	70-150	D	1	8		8	8	10
	RT Forklift	70-150	D	1	8		8	8	10
	Pickup Truck	150-300	G	2	8		8	8	10
Civil Work - Foundations, Structures and Buildings	Air Compressors	350	D	1	8		18	18	20
	Generator - 113 KW	174	D	1	8		18	18	20
	Off-road Trucks (dump)	140	D	1	8		18	18	20
	Backhoes - Cat 446	101	D	1	8		18	18	20
	Crane -50 Ton	200	D	1	8		18	18	20
	Pile-Driving Rig for Shoring and Sheeting[1]	200	D	1	8		4	4	4
	Pile Driver Rig/100-Ton Crane for Pile Foundations[2]	400-500	D	1	8		6	6	6
	Compactor	70-150	D	1	8		18	18	20
	Loader	150+	D	1	8		18	18	20
	Dozer	70-150	D	1	8		18	18	20
	Excavator	325	D	1	8		18	18	20
	RT Forklift	70-150	D	2	8		18	18	20
	Pickup Truck	150-300	G	2	8		18	18	20
Major Equipment Installation									
	Air Compressors	350	D	1	8		18	18	18
	Generator - 113 KW	174	D	1	8		18	18	18
	Crane -50 Ton	200	D	1	8		18	18	18
	Backhoes - Cat 446	101	D	1	8		18	18	18
	RT Forklift	70-150	D	2	8		18	18	18
	Pickup Truck	150-300	G	2	8		18	18	18
Piping and Electrical Work									
	Air Compressors	350	D	1	8		28	28	30
	Generator - 113 KW	174	D	1	8		28	28	30
	Backhoes - Cat 446	101	D	1	8		28	28	30
	RT Forklift	70-150	D	2	8		28	28	30
	Pickup Truck	150-300	G	2	8		28	28	30
Final Grading, Paving, Landscaping and Site Restoration	Air Compressors	350	D	1	8		4	4	6
	Generator - 113 KW	174	D	1	8		4	4	6
	Off-road Trucks (dump)	140	D	1	8		4	4	6
	Compactor	70-150	D	1	8		4	4	6
	Loader	70-150	D	1	8		4	4	6
	Backhoes - Cat 446	101	D	1	8		4	4	6
	Paver - concrete	70	D	1	8		4	4	6
	RT Forklift	70-150	D	1	8		4	4	6
	Pickup Truck	150-300	G	2	8		4	4	6
Testing and Commissioning									
	Generator - 113 KW	174	D	1	8		6	6	6
	RT Forklift	70-150	D	1	8		6	6	6
	Pickup Truck	150-300	G	2	8		6	6	6

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scwd[2] Regionial Seawater Desalination Project EIR

Construction Equipment Assumptions - Plant Site

Prepared by URS and CDM, February 2013

Construction Area/Component	Equipment Name	Hp	Fuel Type (diesel/gas)	Quantity	Daily (Hours)	Days or	Site A-1 Months	Site A-2 Months	Site A-3 Months

Notes:

[1]If shoring and sheeting is required for soils support to construct below grade foundations, buried structures and pipe trenches, pile driving equipment will be used in conjuction with the 50-ton service crane. Estimated duration of pile-driving equipment onsite for shoring and sheeting is 4 months; potential operation of the pile-driving equipment would be intermittent.

[2]Need for pile-type foundations and large-scale pile-driving equipment including a 100-ton crane will be determined after site is selected and geotechnical work is completed. Estimated duration of pile-driving equipment onsite is 6 months; potential operation of pile-driving equipment would be intermittent.

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scwd^2 Regional Seawater Desalination Project EIR

Construction Equipment Assumptions - Other Facilities

Prepared by URS and CDM, February 2013

Construction Area/Component	Equipment Name	Hp	Fuel Type (diesel/gas)	Quantity	Daily (Hours)	Days or	Months
Intake Pump Station							
Mobilize/Site Grading							
	Air Compressors	200	D	1	8		2
	Generator - 113 KW	174	D	1	8		2
	Off-road Trucks (dump)	140	D	1	8		2
	Backhoes - Cat 446	101	D	1	8		2
	Pickup Truck		G	2	8		2
Pump Station/Shaft Excavation							
	Air Compressors	200	D	1	8		2
	Generator - 113 KW	174	D	1	8		2
	Off-road Trucks (dump)	140	D	3	8		2
	Backhoes - Cat 446	101	D	1	8		2
	Crane -100 Ton	265	D	1	8		2
	Pickup Truck		G	2	8		2
PS Building/Elec/Mech							
	Air Compressors	200	D	1	8		2
	Generator - 113 KW	174	D	1	8		2
	Compactor	70-150	D	1	8		2
	RT Forklift	70-150	D	2	8		2
	Off-road Trucks (dump)	140	D	1	8		2
	Backhoes - Cat 446	101	D	1	8		2
	Crane -100 Ton	265	D	1	8		2
	Pickup Truck		G	2	8		2
Final Grading, Paving & Site Restoration							
	Air Compressors	200	D	1	8		2
	Generator - 113 KW	174	D	1	8		2
	Off-road Trucks (dump)	140	D	1	8		2
	Backhoes - Cat 446	101	D	1	8		2
	Paver - concrete	70	D	1	8		2
	Pickup Truck		G	2	8		2
Intake Pipeline[1]							
Intake Pipeline/Tunnel							
	Air Compressors	200	D	1	8		6
	Generator - 113 KW	174	D	1	8		6
	Off-road Trucks (dump)	140	D	1	8		6
	Backhoes - Cat 446	101	D	1	8		6
	Crane -100 Ton	265	D	1	8		6
	Pickup Truck		G	2	8		6
	Locomotive - 12 Ton	120	D	1	8		4
	Conrete Pump	177	D	1	8		6
	Compactor	70	D	1	8		6
	Trash Pump	10	D	1	8		6
	Getman Buggy	40	D	1	8		4
Hauling Spoils to Disposal Site							
	Loader - 966	235	D	1	8		4
	Off-road Trucks (dump)	140	D	2	8		4
	Spoils Separator	200	D	1	8		4
Intake Pipeline/Dredging							
	Barge	200	D	2	12		4
	Crane -100 Ton	265	D	1	12		4
	Air Compressors	350	D	1	12		4
	Generator - 113 KW	174	D	1	12		4
	small boat	100	G	2	12		4

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scwd^2 Regional Seawater Desalination Project EIR

Construction Equipment Assumptions - Other Facilities

Prepared by URS and CDM, February 2013

Construction Area/Component	Equipment Name	Hp	Fuel Type (diesel/gas)	Quantity	Daily (Hours)	Days or	Months
	Winch	150	D	1	12		4
Intake Screens							
Screens (sandy)							
	Barge	200	D	2	12		1
	Crane -100 Ton	265	D	1	12		1
	Air Compressors	350	D	1	12		1
	Generator - 113 KW	174	D	1	12		1
	small boat	100	G	1	12		1
Screens (bedrock)							
	Barge	200	D	2	12		2
	Crane -100 Ton	265	D	1	12		2
	Air Compressors	350	D	2	12		2
	Generator - 113 KW	174	D	1	12		2
	small boat	100	G	2	12		2
Intake Transfer Pipeline							
	Air Compressors	200	D	1	8		3
	Off-road Trucks (dump)	140	D	3	8		3
	Backhoes - Cat 446	101	D	1	8		3
	Pickup Truck		G	2	8		3
	Loader - Cat 966	235	D	1	8		3
	Roller Compacter	100	D	1	8		3
	Paver - concrete/ashalt	70	D	1	8		2
Brine Conveyance							
	Air Compressors	200	D	1	8		3
	Off-road Trucks (dump)	140	D	3	8		3
	Backhoes - Cat 446	101	D	1	8		3
	Pickup Truck		G	2	8		3
	Loader - Cat 966	235	D	1	8		3
	Roller Compacter	100	D	1	8		3
	Paver - concrete/ashalt	70	D	1	8		3
Intertie System Improvements							
	Air Compressors	200	D	1	8		14
	Off-road Trucks (dump)	140	D	3	8		14
	Backhoes - Cat 446	101	D	1	8		14
	Pickup Truck		G	2	8		14
	Roller Compacter	100	D	1	8		14
	Loader - Cat 966	235	D	1	8		14
	Paver - concrete/ashalt	70	D	1	8		14
Morrisey Pump Station Upgrade							
PS Elec/Mech Upgrades							
	Air Compressors	200	D	1	8		5
	Generator - 113 KW	174	D	1	8		5
	Off-road Trucks (dump)	140	D	1	8		5
	Backhoes - Cat 446	101	D	1	8		5
	Crane -100 Ton	265	D	1	8		5
	Pickup Truck		G	2	8		5

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Construction Equipment Assumptions - Other Facilities

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Construction Area/Component	Equipment Name	Hp	Fuel Type (diesel/gas)	Quantity	Daily (Hours)	Days or	Months
McGregor Pump Station Upgrade							
PS Elec/Mech Upgrades							
	Air Compressors	200	D	1	8		4
	Generator - 113 KW	174	D	1	8		4
	Crane -100 Ton	265	D	1	8		4
	Pickup Truck		G	2	8		4

Notes:

1. Subtasks within this catgory would overlap. See schedule for total duraton of task.

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scwd[2] Regional Seawater Desalination Project EIR

Construction Schedule Assuptions

Prepared by URS and CDM, February 2013

PROJECT COMPONENT	Duration (months)	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27	Month 28	Month 29	Month 30	Month 31	Month 32
Desalination Plant Sites A-1 and A-2																																	
Mobilze/Clear/Grade/Demobilize	4																																
Undeground Utilities and Piping	8																																
Civil Work - Foundations, Structures and Buildings	18																																
Major Equipment Installation	18																																
Piping and Electrical Work	28																																
Paving and Landscaping	4																																
Testing and Commissioning	6																																
Intake System[1,2]																																	
Mobilize/Grade/Demobilize	2																																
Intake Pipeline	6																																
Intake Screens	2																																
Intake Pump Station	6																																
Transfer Pipeline	3											C1																					
Brine Pipeline[1,2,3]	3											C2																					
Intertie System Improvements[1,2]																																	
CONVEYANCES																																	
Mobilization/Demobilization	2																																
Morrissey Pump Station to DeLaveaga Tanks - Prospect Heights alternative	3		C1																														
Morrissey Pump Station to DeLaveaga Tanks - DeLaveaga Park Rd alternative	3		C2																														
DeLaveaga Tanks to City-District Intertie	6					C1																											
City-District Intertie to McGregor Pump Station	6					C2																											
MORRISSEY PUMP STATION UPGRADE																																	
Mobilization/Demobilization	2																																
Demolition	1																																
Installation (3-Pumps, Controls)	2																																
Testing and Commissioning	1																																
MCGREGOR PUMP STATION UPGRADE[4]																																	
Mobilization/Demobilization	2																																
Install new pump and controls	2																																
Testing and Commissioning	1																																

Notes:

1. The major desalination components should be scheduled so that the seawater intake, brine conveyance and treated water distribution facilities are operational when the testing and commissioning begin at the plant, approximately 6 months before the official commissioning date for the plant.
2. Pipeline work would be completed by 2 crews: C1 and C2.
3. The construction period for the brine pipeline includes mobilization and demobilization.
4. The District is planning to construct a new pump station on McGregor Drive as part of their current Capital Improvement Plan. The design approach would provide for future expansion within the existing facility footprint, if and when the proposed project goes forward.

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Construction Schedule Assuptions

Prepared by URS and CDM, February 2013

PROJECT COMPONENT	Duration (months)	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27	Month 28	Month 29	Month 30	Month 31	Month 32
Desalination Plant Split Site A-3a and A-3b																																	
Mobilze/Clear/Grade/Demobilize	5																																
Undeground Utilities and Piping	10																																
Civil Work - Foundations, Structures and Buildings	20																																
Major Equipment Installation	18																																
Piping and Electrical Work	30																																
Paving and Landscaping	6																																
Testing and Commissioning	6																																
Intake System[1,2]																																	
Mobilize/Grade/Demobilize	2																																
Intake Pipeline	6																																
Intake Screens	2																																
Intake Pump Station	6																																
Transfer Pipeline	3											C1																					
Brine Pipeline[1,2,3]	3											C2																					
Intertie System Improvements[1,2]																																	
CONVEYANCES																																	
Mobilization/Demobilization	2																																
Morrissey Pump Station to DeLaveaga Tanks - Prospect Heights Alternative	3		C1																														
Morrissey Pump Station to DeLaveaga Tanks - DeLaveaga Park Rd Alternative	3		C2																														
DeLaveaga Tanks to City-District Intertie	6					C1																											
City-District Intertie to McGregor Pump Station	6					C2																											
MORRISSEY PUMP STATION UPGRADE																																	
Mobilization/Demobilization	2																																
Demolition	1																																
Installation (3-Pumps, Controls)	2																																
Testing and Commissioning	1																																
MCGREGOR PUMP STATION UPGRADE[4]																																	
Mobilization/Demobilization	2																																
Install new pump and controls	2																																
Testing and Commissioning	1																																

Notes:

1. The major desalination components should be scheduled so that the seawater intake, brine conveyance and treated water distribution facilities are operational when the testing and commissioning begin at the plant, approximately 6 months before the official commissioning date for the plant.
2. Pipeline work would be completed by 2 crews: C1 and C2.
3. The construction period for the brine pipeline includes mobilization and demobilization.
4. The District is planning to construct a new pump station on McGregor Drive as part of their current Capital Improvement Plan. The design approach would provide for future expansion within the existing facility footprint, if and when the proposed project goes forward.