Cogswell Reservoir

Over the next 20 years, 5.7 MCY of sediment are planned to be removed from Cogswell Reservoir. For planning purposes it is assumed that 60 percent of the 5.7 MCY, or 3.4 MCY, is sluiceable/dredgeable. The remaining 40 percent, or 2.3 MCY, would need to be managed separately.

What does the Strategic Plan recommend?

It is recommended that Alternatives 2A and 2B be considered first due to the high environmental impacts sluicing would have on the West Fork. Alternative sluicing methods, like flow assisted sediment transport, should also be considered for this location as additional study is completed

1A Sluice to San Gabriel Reservoir + Dry Excavate at Cogswell Reservoir → Truck to Cogswell SPS

Sluice 3.4 MCY of sediment to San Gabriel Reservoir. There would be habitat and water quality impacts to the West Fork of the San Gabriel River. Dry excavate 2.3 MCY of sediment and truck it to Cogswell SPS. There would be air quality impacts from the trucks and habitat impact to the undeveloped portion of Cogswell SPS.

1B Sluice to San Gabriel Reservoir + Dry Excavate at Cogswell Reservoir → Conveyor Belt to Cogswell SPS

This Alternative is similar to 1A except the 2.3 MCY of dry excavated material would be transported used a conveyor belt to Cogswell SPS. There would be some habitat impacts to the existing fill of the SPS where the conveyor belts would be aligned.

2A Dredge → Slurry to San Gabriel Reservoir + Dry Excavate at Cogswell Reservoir → Truck to Cogswell SPS

This Alternative is similar to 1A except instead of sluicing the 3.4 MCY of sediment to San Gabriel Reservoir the sediment would be dredged and transported via slurry pipeline to San Gabriel Reservoir. The slurry pipeline would have some habitat impacts to the West Fork of the San Gabriel River.

2B Dredge → Slurry to San Gabriel Reservoir + Dry Excavate at Cogswell Reservoir → Conveyor Belt to Cogswell SPS

This Alternative is a combination of Alternatives 1B and 2A; dredging 3.4 MCY to a slurry pipeline to San Gabriel Reservoir and dry excavating and conveyor belting 2.3 MCY to Cogswell SPS.

Summary of Sediment Management Alternatives for Cogswell Reservoir

Alternative		Quantity Removed (MCY)	Environmental				Social			Implementability	Performance		Cost
			Habitat	Water Quality	Groundwater Recharge	Air Quality[a]	Traffic	Visual	Noise	Special Permit/ Agreement Required[b]	Previous Experience	# of operations required in next 20 years	$ Millions
1A	Sluice to SG Reservoir	3.4	●	●				○			Yes	9	25
	Dry Excavation from Cogswell	2.3	◑			◑		○	○			6	
	Trucks					●		○					
	Cogswell SPS		●			○		○	○	Yes			
1B	Sluice to SG Reservoir	3.4	●	●				○			Yes	9	25
	Dry Excavation from Cogswell	2.3	◑			◑		○	○			3	
	Conveyor Belt		◑					○	○				
	Cogswell SPS		●			○		○	○	Yes			
2A	Dredge	3.4	◑	◑							No	9	145
	Slurry Pipeline to SG Reservoir		◑					◑					
	Dry Excavation from Cogswell	2.3	◑			◑		○	○		Yes	6	
	Trucks					●		○					
	Cogswell SPS		●			○		○	○	Yes			
2B	Dredge	3.4	◑	◑				○	○		No	9	145
	Slurry Pipeline to SG Reservoir		◑					◑					
	Dry Excavation from Cogswell	2.3	◑			◑		○	○		Yes	3	
	Conveyor Belts		◑					○	○				
	Cogswell SPS		●			○		○	○	Yes			

Legend:

●	significant impact
◑	some impact
○	possible impact
	no impact

Notes:
(a) Use of low-emission trucks would reduce air quality impacts from significant impact (●) to some impact (◑).
(b) All options require environmental regulatory permits.

San Gabriel Reservoir

Over the next 20 years, 23.8 MCY of sediment are planned to be removed from San Gabriel Reservoir including 3.4 MCY that could potentially be sluiced from Cogswell Reservoir.

What does the Strategic Plan recommend?

It is recommended that all the alternatives be considered for future sediment removal projects at San Gabriel Reservoir.

1A Dry Excavate → Truck to Irwindale Pits & Burro Canyon SPS

Alternative 1A proposes to dry excavate 23.8 MCY of sediment from San Gabriel Reservoir and truck 15.8 MCY to Burro Canyon SPS and the remaining 8 MCY to the Irwindale pits. There would be air quality impacts from the trucks as well as some habitat impact to the undeveloped portion of Burro Canyon SPS. The trucks driving to Irwindale would cause some traffic, noise, and visual impacts.

1B Dry Excavate → Truck to Irwindale Pits & Burro Canyon SPS + Sluice to Morris Reservoir

This Alternative is similar to 1A except that 2 MCY of material would be sluiced to Morris Reservoir. There would be some habitat impacts immediately downstream of the San Gabriel sluice tunnel. This leave 13.8 MCY to be trucked to Burro Canyon SPS and 8 MCY to be trucked to Irwindale pits.

1C Dry Excavate → Truck to Irwindale Pits & Burro Canyon SPS + Dredge and Slurry Pipeline to Morris Reservoir

This Alternative is similar to 1B except instead of sluicing the 2 MCY of sediment to Morris Reservoir the sediment would be dredged. Dredging would have some water quality and visual impacts.

2A Dry Excavate → Truck to Irwindale Pits + Dry Excavate → Conveyor Belt to Burro SPS

Alternative 2A is essentially the same as 1A except that instead of trucking 15.8 MCY to Burro Canyon SPS, the sediment would be transported via conveyor belts. There may be some habitat impacts over the alignment to Burro Canyon SPS. Of the remaining material, 2 MCY would be sluiced to Morris and 8 MCY would be trucked to Irwindale.

2B Dry Excavate → Truck to Irwindale Pits + Dry Excavate → Conveyor Belt to Burro SPS + Sluice to Morris Reservoir

This Alternative is similar to 2A except that 2 MCY of material would be sluiced to Morris Reservoir. As discussed, there would be some habitat impacts immediately downstream of the San Gabriel sluice tunnel. This leave 13.8 MCY to be conveyor belted to Burro Canyon SPS and 8 MCY to be trucked to Irwindale pits.

2C Dry Excavate → Truck to Irwindale Pits + Dry Excavate → Conveyor Belt to Burro SPS + Dredge and Slurry Pipeline to Morris Reservoir

This Alternative similar to 2B except that instead of sluicing the 2 MCY of sediment to Morris Reservoir the sediment would be dredged. As mentioned, dredging would have some water quality and visual impacts.

Summary of Sediment Management Alternatives for San Gabriel Reservoir

Alternative		Quantity Removed (MCY)	Environmental				Social			Implementability	Performance		Cost
			Habitat	Water Quality	Groundwater Recharge	Air Quality[a]	Traffic	Visual	Noise	Special Permit/ Agreement Required[b]	Previous Experience	# of operations required in next 20 years	$ Millions
1A	Dry Excavation	23.8	◑			◑		◑	◑		Yes	19	370-395
	Trucks to Burro Canyon SPS	15.8				●	○	○	○				
	Burro Canyon SPS		●			○				Yes			
	Trucks to Irwindale Pits	8				●	●	◑	◑			10	
	Irwindale Pits									Yes			
1B	Sluice to Morris Reservoir	2	●	●				○			Yes	5	355-375
	Dry Excavation	21.8	◑			◑		◑	◑			16	
	Trucks to Burro Canyon SPS					●	○	○	○				
	Burro Canyon SPS	13.8	●			○				Yes			
	Trucks to Irwindale Pits	8				●	●	◑	◑			10	
	Irwindale Pits									Yes			
1C	Dredge to Morris Reservoir	2	◑	◑				○	○		No	7	370-390
	Dry Excavation	21.8	◑			◑		◑	◑		Yes	16	
	Trucks to Burro Canyon SPS					●	○	○	○				
	Burro Canyon SPS	13.8	●			○				Yes			
	Trucks to Irwindale Pits	8				●	●	◑	◑			10	
	Irwindale Pits									Yes			
2A	Dry Excavation	23.8	◑			◑		◑	◑		Yes	19	270-290
	Conveyor Belts	15.8	◑					◑	○				
	Burro Canyon SPS		●			○				Yes			
	Trucks to Irwindale Pits	8				●	●	◑	◑			10	
	Irwindale Pits									Yes			
2B	Sluice to Morris Reservoir	2	●	●				○			Yes	5	260-285
	Dry Excavation	21.8	◑			◑		◑	◑			16	
	Conveyor Belts	13.8	◑					◑	○				
	Burro Canyon SPS		●			○				Yes			
	Trucks to Irwindale Pits	8				●	●	◑	◑			10	
	Irwindale Pits									Yes			
2C	Dredge to Morris Reservoir	2	○	◑				○	○		No	7	280-300
	Dry Excavation	21.8	◑			◑		◑	◑		Yes	16	
	Conveyor Belts	13.8	◑					◑	○				
	Burro Canyon SPS		●			○				Yes			
	Trucks to Irwindale Pits	8				●	●	◑	◑			10	
	Irwindale Pits									Yes			

Legend:

●	significant impact
◑	some impact
○	possible impact
	no impact

Notes:

(a) Use of low-emission trucks would reduce air quality impacts from significant impact (●) to some impact (◑).

(b) All options require environmental regulatory permits.

Morris Reservoir

Over the next 20 years, 3.3 MCY of sediment are planned to be removed from Morris Reservoir including the estimated 2 MCY that could potentially be sluiced from San Gabriel Reservoir. The quantity sluiced from San Gabriel Reservoir to Morris Reservoir is limited by the ability to remove the sediment from Morris Dam.

What does the Strategic Plan recommend?

It is recommended that Alternatives 1, 2, and 4 be considered for future sediment removal projects at Morris Reservoir. Alternatives 3, which involves dredging, should be considered only after all previous recommendations are deemed infeasible.

1 Dry Excavate → Truck to Irwindale Pits

Alternative 1 proposes to dry excavate 3.3 MCY of sediment from Morris Reservoir and truck it to the Irwindale pits. Given the location of Morris Reservoir, there would be some noise and visual impacts associated with excavation within the reservoir. There would also be some traffic, noise, and visual impacts from the trucks driving to the Irwindale pits.

2 Dry Excavate → Conveyor Belt to Irwindale Pits

This Alternative is similar to Combined Alternative 1 except that the material would be conveyor belted downstream to the Irwindale pits. There would be some habitat impacts along Old San Gabriel Canyon Road and San Gabriel Canyon Road where the conveyor alignment is proposed.

3 Dredge and Slurry Pipeline to Santa Fe Basin → Dry Excavate → Truck to Irwindale Pits

Alternative 3 proposed to dredge the 3.3 MCY of sediment from Morris Reservoir and transport the material via slurry pipeline to Santa Fe Basin. From Santa Fe Basin, the sediment would be excavated and trucked to a pit in Irwindale. There would be some water quality impacts within Morris Reservoir and some visual and noise impacts from the dredge. There would also be some habitat impacts along Old San Gabriel Canyon Road and San Gabriel Canyon Road where the slurry pipeline alignment is proposed.

4 Sluice to Santa Fe Basin → Dry Excavate → Truck to Irwindale Pits

Alternative 5 proposes to sluice the entire 3.3 MCY to Santa Fe Basin. Similar to Alternative 3 the material in Santa Fe Basin would be excavated and trucked to a pit in Irwindale. There would be habitat impacts to the San Gabriel River and in Santa Fe Basin from sluicing as well as some water quality impacts. There will also be some increase traffic, noise, and visual impacts from excavation in Santa Fe Basin and trucking.

Summary of Sediment Management Alternatives for Morris Reservoir

Alternative		Quantity Removed (MCY)	Environmental				Social			Implementability	Performance		Cost
			Habitat	Water Quality	Groundwater Recharge	Air Quality[a]	Traffic	Visual	Noise	Special Permit/ Agreement Required[b]	Previous Experience	# of operations required in next 20 years	$ Millions
1	Dry Excavation	3.3	◑		○	◑		◑	◑		Yes	5	35-50
	Trucks					●	●	◑	◑				
	Irwindale Pits									Yes			
2	Dry Excavation	3.3	◑		○	◑		◑	◑		Yes	7	55-60
	Conveyor Belts		◑					◑	○				
	Irwindale Pits									Yes			
3	Dredge	3.3	○	◑	○			○	○		No	9	90-105
	Slurry Pipeline to Santa Fe Basin		◑					◑					
	Santa Fe Basin		◑	●	○	◑		◑	◑	Yes	Yes		
	Trucks					●	●	◑	◑				
	Irwindale Pits									Yes			
4	Sluice	3.3	●	●	◑			◑			Yes	5	30-45
	Santa Fe Basin		◑	●	○	◑		◑	◑	Yes			
	Trucks					●	●	◑	◑				
	Irwindale Pits									Yes			

Legend:

●	significant impact
◑	some impact
○	possible impact
	no impact

Notes:
(a) Use of low-emission trucks would reduce air quality impacts from significant impact (●) to some impact (◑).
(b) All options require environmental regulatory permits.

Big Tujunga Reservoir

Over the next 20 years, 7.2 MCY of sediment are planned to be removed Big Tujunga Reservoir including the 2 MCY currently accumulated in the reservoir.

1A Dry Excavate → Truck to Maple SPS & Sun Valley Pits

This alternative involves draining the reservoir, excavating the sediment under dry conditions, and trucking 4.4 MCY to Maple SPS and 2.8 MCY to the pits in Sun Valley. Maple SPS would be filled; the rest of the sediment would be placed at the pits in Sun Valley. Habitat would be impacted along Big Tujunga Wash due to draining of reservoir.

1B Dry Excavate → Conveyor Belt to Maple SPS & Sun Valley Pits

This alternative is similar to Alternative 1A, but instead of trucks this alternative involves a conveyor over 10 miles in length. Habitat could be impacted depending on the conveyor route.

2A Dry Excavate → Truck to Sun Valley Pits

This alternative consists of transporting all sediment excavated from Big Tujunga Reservoir by truck and placing it at the pits in Sun Valley. Maple Canyon SPS would not be used.

2B Dry Excavate → Conveyor Belt to Sun Valley Pits

This alternative is basically the same as Alternative 2A, except that conveyors would be used. Placement of a conveyor along Big Tujunga Canyon Road from Big Tujunga Reservoir to the pits in Sun Valley would require working out an alignment that takes roadway impacts into account.

3 Dredge → Slurry Pipeline to Hansen FCB → Dry Excavate → Conveyor → Sun Valley Pits + Dry Excavate → Conveyor → Maple SPS

Smaller-sized material (4.8MCY) would be dredged and transported via slurry pipeline to Hansen Flood Control Basin. The larger-sized material (2.4 MCY) would be excavated and transported to Maple SPS on a conveyor. This alternative is highly dependent on the ability to obtain permission from the Army Corps to use Hansen Flood Control Basin and the ability to create enough capacity for the operations.

What does the Strategic Plan recommend?

It is recommended that all the combined alternatives, except 3 be considered for future sediment removal projects at Big Tujunga Reservoir. Additionally, combining the alternatives should be taken into consideration.

Combined Alternative 3 should be considered only after all other alternatives are deemed infeasible. This recommendation is based on the high estimated cost.

4A Sluice to Hansen FCB → Dry Excavate at Hansen FCB → Conveyor Belt to Sun Valley Pits + Dry Excavate at Big Tujunga Reservoir → Conveyor Belt to Maple SPS

This alternative is very similar to Alternative 3 except sediment would be sluiced rather than dredged and the larger material would be placed at the pits in Sun Valley. Employing this alternative would result in habitat impacts along Big Tujunga Wash. Additionally, this alternative would require working out a conveyor alignment that takes roadway impacts into account.

4B Sluice to Hansen FCB → Dry Excavate at Hansen FCB → Conveyor Belt to Sun Valley Pits + Dry Excavate at Big Tujunga Reservoir → Truck to Maple SPS

This alternative is basically the same as Alternative 4A, except that transportation of the larger materials would be via trucks as opposed to a conveyor.

Summary of Sediment Management Alternatives for Big Tujunga Reservoir

Alternative		Quantity Removed (MCY)	Environmental				Social			Implementability	Performance		Cost
			Habitat	Water Quality	Groundwater Recharge	Air Quality[a]	Traffic	Visual	Noise	Special Permit/ Agreement Required[b]	Previous Experience	# of operations required in next 20 years	$ Millions
1A	Dry Excavation	7.2	◑		○	◑		○	○		Yes	9	65
	Trucks					●	●	◑	◑				
	Maple Canyon SPS	4.4	◑					◑		Yes			
	Pits in Sun Valley	2.8								Yes			
1B	Dry Excavation	7.2	◑		○	◑		○	○		Yes	9	125
	Conveyor		◑					◑	○				
	Maple Canyon SPS	4.4	◑			○		◑		Yes			
	Pits in Sun Valley	2.8								Yes			
2A	Dry Excavation	7.2	◑		○	◑		○	○		Yes	9	100-120
	Trucks					●	●	◑	◑				
	Pits in Sun Valley									Yes			
2B	Dry Excavation	7.2	◑		○	◑		○	○		Yes	9	115-130
	Conveyor		◑					◑	○				
	Pits in Sun Valley									Yes			
3	Dredge	4.8	○	◑	○			○	○		No	12	210-245
	Slurry Pipeline to Hansen FCB		◑							Yes			
	Hansen FCB		◑	●	○	◑		◑	◑				
	Conveyor from Hansen FCB to Pits in Sun Valley		○					◑	○	Yes			
	Pits in Sun Valley									Yes			
	Dry Excavation	2.4	◑		○	◑		○	○		Yes	3	
	Conveyor							◑	○				
	Maple Canyon SPS		◑					◑		Yes			
4A	Sluice to Hansen FCB	4.8	●	●	◑			◑		Yes	Yes	16	70-100
	Hansen FCB		◑	●	○	◑		◑	○	Yes			
	Conveyor from Hansen FCB to Pits in Sun Valley		○					◑	○				
	Pits in Sun Valley									Yes			
	Dry Excavation	2.4	◑		○	◑		○	○			3	
	Conveyor		◑					◑	○				
	Maple Canyon SPS		◑					◑		Yes			
4B	Sluice to Hansen FCB	4.8	●	●	◑			◑		Yes	Yes	16	70-90
	Hansen FCB		◑	●	○	◑		◑	○	Yes			
	Conveyor from Hansen FCB to Pits in Sun Valley		○					◑	○				
	Pits in Sun Valley									Yes			
	Dry Excavation	2.4	◑		○	◑		○	○			3	
	Trucks					●	●	◑	◑				
	Pits in Sun Valley												

Legend:

●	significant impact
◑	some impact
○	possible impact
	no impact

Notes: (a) Use of low-emission trucks would reduce air quality impacts from significant impact (●) to some impact (◑).
(b) All options require environmental regulatory permits.

Pacoima Reservoir

Over the next 20 years, up to 7.6 MCY of sediment are planned to be removed from Pacoima Reservoir Reservoir including the 5.2 MCY currently accumulated in the reservoir.

1 Dry Excavate → Truck to Sun Valley Pits

This alternative involves draining the reservoir, excavating the sediment under dry conditions, and then trucking the sediment through a back access road to the pits in Sun Valley.

2A Dry Excavate → Conveyor Belts to Canyons → Truck to Sun Valley Pits

This alternative consists of draining the reservoir, excavating the sediment, transporting it to a temporary sediment storage area via a conveyor belt through the dam, and then trucking it to a placement site. One of the limitations of this alternative is the ability to acquire or obtain permission to use one of the canyons downstream of Pacoima Dam for temporary storage.

2B Dry Excavate → Conveyor Belts to Lopez FCB → Truck to Sun Valley Pits

This alternative is essentially the same as Alternative 2A, except for the conveyor endpoint and potential temporary sediment storage area would be at Lopez Flood Control Basin. Use of the flood control basin and placement of the conveyor along Pacoima Wash would require permission from Army Corps.

3 Dredge → Slurry Pipeline to Lopez FCB → Dry Excavate → Truck to Sun Valley Pits + Dry Excavate at Pacoima Reservoir → Truck to Sun Valley Pits

Smaller-sized material (4.6 MCY) would be dredged and transported via slurry pipeline to Lopez Flood Control Basin. The larger-sized material (3.0 MCY) would be excavated and trucked to the pits in Sun Valley. This alternative is highly dependent on the ability to obtain permission from the Army Corps to use the flood control basin and the ability to create enough capacity for the operations.

What does the Strategic Plan recommend?

It is recommended that Combined Alternatives 2A, 2B, 4, and 5 be considered for future sediment removal projects at Pacoima Reservoir. Additionally, combining the alternatives should be taken into consideration. For example, it may be possible for the dry excavation and conveyor alternatives (2A or 2B) to follow a sluicing project (Alternative 4) in order to take advantage of the already drained reservoir. This could help to reduce environmental impacts, increase performance, and reduce costs.

Alternatives 1 and 3 should be considered only after all previous recommendations are deemed infeasible. Alternative 1 requires high number of cleanout operations and has a high estimated cost. Similarly, Alternative 3 has a high cost compared to other alternatives.

4 Sluice to Lopez FCB → Dry Excavate > Truck to Sun Valley Pits + Dry Excavate at Pacoima Reservoir → Truck to Sun Valley Pits

This alternative is very similar to Alternative 3 except sediment would be sluiced rather than dredged. Employing this alternative would result in habitat impacts along Big Tujunga Wash.

5 Dry Excavate → Conveyor → Permanent Placement at New Canyon SPS

Alternative 5 involves excavating the sediment from Pacoima Reservoir under dry conditions and transporting it via a conveyor belt through Pacoima Dam to one or both of the canyons downstream of Pacoima Dam, just like Alternative 2A. The difference is that a sediment placement site would be developed at the canyon(s) and sediment would permanently be placed there.

Summary of Sediment Management Alternatives for Pacoima Reservoir

Alternative		Quantity Removed (MCY)	Environmental				Social			Implementability	Performance		Cost
			Habitat	Water Quality	Groundwater Recharge	Air Quality[a]	Traffic	Visual	Noise	Special Permit/Agreement Required[b]	Previous Experience	Number of years out of 20 years that would require cleanout operations	$ Millions
1	Dry Excavation	7.6	◑		○	◑		○	○		Yes	19	190-200
	Trucks		●			●	●	◑	◑				
	Pits in Sun Valley									Yes			
2A	Dry Excavation	7.6	◑		○	◑		○	○		Yes	10	85-95
	Conveyor		○					○	○				
	Canyon Transfer Point		◑					◑	○	Yes			
	Trucks					●	●	◑	◑				
	Pits in Sun Valley									Yes			
2B	Dry Excavation	7.6	◑		○	◑		○	○		Yes	10	75-85
	Conveyor		○					○	○				
	Lopez FCB Transfer Point		○					◑	○	Yes			
	Trucks					●	●	◑	◑				
	Pits in Sun Valley									Yes			
3	Dredge	4.6	◑	◑	○			○	○		No	12[c]	185-195
	Slurry Pipeline to Lopez FCB		○					○		Yes			
	Lopez FCB		◑	●		◑		◑	◑				
	Trucks					●	●	◑	◑				
	Pits in Sun Valley									Yes			
	Dry Excavation	3.0	◑		○	◑		○	○		Yes	8[c]	
	Trucks					●	●	◑	◑				
	Pits in Sun Valley									Yes			
4	Sluice to Lopez FCB	4.6	●	●	◑			◑		Yes	Yes	9[d]	125-135
	Lopez FCB		◑	●		◑		◑	◑				
	Trucks					●	●	◑	◑				
	Pits in Sun Valley									Yes			
	Dry Excavation	3.0	◑		○	◑		○	○			8[d]	
	Trucks		●				●	◑	◑				
	Pits in Sun Valley									Yes			
5	Dry Excavation	7.6	◑		○	◑		○	○		Yes	10	35
	Conveyor		○					◑	○				
	Canyon SPS		●					◑	○	Yes			

Legend:

●	significant impact
◑	some impact
○	possible impact
	no impact

Notes:
(a) Use of low-emission trucks would reduce air quality impacts from significant impact (●) to some impact (◑).
(b) All options require environmental regulatory permits.

San Dimas Reservoir

Over the next 20 years, 1.9 MCY of sediment is planned to be removed from San Dimas Reservoir.

What does the Strategic Plan recommend?

It is recommended that all the alternatives be considered for future sediment removal projects at San Dimas Reservoir.

1 Dry Excavate → Truck to Irwindale Pits

Dry excavating the sediment and truck it to a pit in the Irwindale area.

2 Dry Excavate → Conveyor to San Dimas SPS → Dry Excavate → Truck to Irwindale Pits & Landfills

Dry excavate the sediment and place it on a conveyor system where it will be transported to the San Dimas SPS. From the SPS, the sediment can be gradually transported out via trucks to a pit in the Irwindale area or a landfill.

3 Sluice to Puddingstone Diversion Reservoir → Dry Excavate at Puddingstone Diversion Reservoir → Truck to Irwindale Pits + Dry Excavate → Trucks → Irwindale Pits

Sluice 1.3 MCY of smaller material from San Dimas Dam along San Dimas Creek to the Puddingstone Diversion Reservoir, where the sediment will be excavated and trucked to a pit in the Irwindale area. The remaining 0.6 MCY of larger material at San Dimas Reservoir will be excavated and trucked to the Irwindale pits.

4 Dredge with Slurry Pipeline to Puddingstone Diversion Reservoir → Dry Excavate → Truck to Irwindale Pits + Dry Excavate → Trucks → Irwindale Pits

Dredge 1.6 MCY of the smaller sediment from San Dimas Dam into a slurry pipeline along San Dimas Canyon Road and discharge the sediment to the Puddingstone Reservoir. The sediment will be excavated from the Puddingstone Reservoir and trucked to a pit in the Irwindale area. The remaining 0.6 MCY of larger material in the reservoir will be excavated and trucked to the Irwindale pits.

Summary of Sediment Management Alternatives for San Dimas Reservoir

	Alternative	Quantity Removed (MCY)	Environmental				Social			Implementability	Performance		Cost
			Habitat	Water Quality	Groundwater Recharge	Air Quality[1]	Traffic	Visual	Noise	Special Permit/Agreement Required[2]	Previous Experience	# of Operations Required in Next 20 years	$ Millions
1	Dry Excavation	1.9	◑		○	◑		○	○		Yes	3	25
	Trucks					●	●	◑	◑				
	Irwindale Pits									Yes			
2	Dry Excavation	1.9	◑		○	◑		○	○		Yes	4	43
	Conveyor		○				○	◑	○				
	San Dimas SPS		○			○		◑	◑				
	Trucks					●	●	◑	◑				
	Irwindale Pits/Landfills									Yes			
3	Sluice	1.3	●	●	◑			◑			Yes	20	27
	Puddingstone Div. Reservoir		◑	●	○			◑	◑				
	Dry Excavation	1.9	◑		○	◑		○	○				
	Trucks					●	●	◑	◑				
	Irwindale Pits									Yes			
4	Dredge	1.3	○	◑	○			○	○		No	7	40
	Slurry Pipeline		◑				○	◑					
	Puddingstone Diversion Res.		◑	●	○			◑	◑				
	Dry Excavation	1.9	○		○	◑		○	○				
	Trucks					●	●	◑	◑				
	Irwindale Pits									Yes			

Legend:

●	significant impact
◑	some impact
○	possible impact
	no impact

Notes: (a) Use of low-emission trucks would reduce air quality impacts from significant impact (●) to some impact (◑).
(b) All options require environmental regulatory permits.

Santa Anita Reservoir

Over the next 20 years, 1.2 MCY of sediment is planned to be removed from Santa Anita Reservoir. All the alternatives will use Santa Anita SPS as a temporary storage area where the sediment can be gradually transported out in order to reduce traffic impacts.

What does the Strategic Plan recommend?

It is recommended that all the alternatives be considered for future sediment removal projects at Santa Anita Reservoir.

1 Dry Excavate at Santa Anita Reservoir → Conveyor Belt to Santa Anita SPS → Dry Excavation > Truck to Irwindale Pits & Landfills

Dry excavate the sediment and place it on a conveyor where it will transport the sediment to the Santa Anita SPS. The sediment can be gradually transported out to a pit in the Irwindale area or landfill.

2 Sluice to Santa Anita SPS → Dry Excavate → Truck to Irwindale Pits & Landfills + Dry Excavate at Santa Anita Reservoir → Conveyor Belt to Santa Anita SPS → Dry Excavate → Truck to Irwindale Pits & Landfills

Sluice the smaller sediment (0.8 MCY) from Santa Anita Reservoir to the Santa Anita Debris basin where the sediment can be dewatered. The sediment can be temporarily stored at the SPS where it can be gradually transported out to a pit in the Irwindale area or a landfill. The larger sediment (0.4 MCY) must be removed via alternative 1.

3 Dredge with Slurry Pipeline to Santa Anita SPS → Dry Excavate → Truck to Irwindale Pits & Landfills + Dry Excavate at Santa Anita Reservoir → Conveyor Belt to Santa Anita SPS → Dry Excavate → Truck to Irwindale Pits & Landfills

Dredge the smaller sediment (0.8 MCY) from Santa Anita Reservoir where it will be transported via a slurry pipeline to the Santa Anita Debris Basin where it will be dewatered. The sediment can be temporarily stored at the SPS where it can be gradually transported out to a pit in the Irwindale area or a landfill. The larger sediment (0.4 MCY) must be removed via Alternative 1.

Summary of Sediment Management Alternatives for Santa Anita Reservoir

Alternative		Quantity Removed (MCY)	Environmental				Social			Implementability	Performance		Cost
			Habitat	Water Quality	Groundwater Recharge	Air Quality[a]	Traffic	Visual	Noise	Special Permit/Agreement Required[b]	Previous Experience	# of Operations Required in Next 20 years	$ Millions
1	Dry Excavation	1.2	◑		○	◑		○	○		Yes	3	33
	Conveyor							◑					
	Santa Anita SPS		○					◑	◑				
	Trucks					●	●	●	●				
	Irwindale Pits/Landfill									Yes			
2	Sluice	0.8	●	●	◑			◑			Yes	7	32
	Santa Anita DB/SPS		●	●	○	◑		◑	◑				
	Conveyor	0.4						◑					
	Dry Excavation	1.2	◑			◑			◑				
	Trucks					●	●	●	●				
	Irwindale Pits/Landfill									Yes			
3	Dredge	0.8	◑	◑	○	◑			○		No	6	39
	Slurry Pipeline							◑					
	Santa Anita DB/SPS		●	●	○	◑		◑	◑		Yes		
	Conveyor	0.4						◑					
	Dry Excavation	1.2	◑			◑		◑	◑				
	Trucks					●	●	●	●				
	Irwindale Pits/Landfill									Yes			

Legend:

●	significant impact
◑	some impact
○	possible impact
	no impact

Notes:
(a) Use of low-emission trucks would reduce air quality impacts from significant impact (●) to some impact (◑).
(b) All alternatives require environmental regulatory permits.

Big Dalton Reservoir

Over the next 20 years, 0.8 MCY of sediment is planned to be removed from Big Dalton Reservoir.

What does the Strategic Plan recommend?

It is recommended that all the alternatives be investigated further for Big Dalton Reservoir.

1 Dry Excavation → Truck to Irwindale Pits

Dry excavating the sediment and truck it to a pit in the Irwindale area.

2 Dry Excavation → Truck to Dalton SPS → Dry Excavation → Truck to Irwindale Pits & Landfills

Dry excavate the sediment and truck it to Dalton SPS, where the material can be gradually trucked out to a pit or a landfill to reduce the truck frequency.

3 Dry Excavation → Conveyor Belt to Big Dalton Debris Basin → Truck to Irwindale Pits

Dry excavate the sediment then place it on a conveyor system to the Big Dalton Debris Basin. The material at the debris basin will be gradually trucked to a pit in the Irwindale area.

Summary of Sediment Management Alternatives for Big Dalton Reservoir

Table 11-8 Big Dalton Reservoir Summary Table

	Alternative	Quantity Removed (CY)	Environmental				Social			Implementability	Performance		Cost
			Habitat	Water Quality	Groundwater Recharge	Air Quality[a]	Traffic	Visual	Noise	Special Permit/Agreement Required[b]	Previous Experience	# of Operations Required in Next 20 years	$ Millions
1	Dry Excavation	0.8	◑		○	◑		○	○		Yes	2	22
	Trucks					●	●	●	●				
	Irwindale Pits									Yes			
2	Dry Excavation	0.8	◑		○	◑		○	○		Yes	2	24
	Trucks					●	●	◑	◑				
	Dalton SPS		◑			◑		◑	◑				
	Trucks					●	●	●	●				
	Irwindale Pits/Landfills									Yes			
3	Dry Excavation	0.8	◑		○	◑		○	○		Yes	2	26
	Conveyor		○				○	◑	○				
	Big Dalton DB					◑		◑	◑				
	Trucks					●	●	●	●				
	Irwindale Pits									Yes			

Legend:

●	significant impact
◑	some impact
○	possible impact
	no impact

Notes: (a) Use of low-emission trucks would reduce air quality impacts from significant impact (●) to some impact (◑).
(b) All options require environmental regulatory permits.

Eaton Reservoir

Over the next 20 years, 1.6 MCY of sediment is planned to be removed from Eaton Reservoir. The only viable option is to dry excavate the material, transport it via trucks, and place it at a pit in the Irwindale area, which has been the primary removal method in the past. It is recommended that dry excavation and trucking continue as the main removal method for Eaton Reservoir.

Puddingstone Diversion Reservoir

Over the next 20 years, 0.6 MCY of sediment is planned to be removed for Puddingstone Diversion Reservoir. The only viable option is to dry excavate the material, transport it via trucks, and place it at a pit in the Irwindale area, which has been the primary removal method in the past. It is recommended that dry excavation and trucking continue as the main removal method for Puddingstone Diversion Reservoir.

Live Oak Reservoir

Over the next 20 years, 210,000 CY of sediment is planned to be removed from Live Oak Reservoir. The only viable option is to dry excavate the material, transport it via trucks, and place it at a pit in the Irwindale area, which has been the primary removal method in the past. It is recommended that dry excavation and trucking continue as the main removal method for Live Oak Reservoir.

Thompson Creek Reservoir

Over the next 20 years, 260,000 CY of sediment is planned to be removed from Thompson Creek Reservoir. The only viable option is to dry excavate the material, transport it via trucks, and place it at a pit in the Irwindale area, which has been the primary removal method in the past. It is recommended that dry excavation and trucking continue as the main removal method for Thompson Creek Reservoir.

Summary of Sediment Management Alternatives for Small Reservoirs

Eaton Reservoir

	Alternative	Quantity Removed	Environmental				Social			Implementability	Performance		Cost
			Habitat	Water Quality	Groundwater Recharge	Air Quality[a]	Traffic	Visual	Noise	Special Permit/Agreement Required[b]	Previous Experience	# of Operations Required in Next 20 years	$ Millions
1	Dry Excavation	1.6 MCY	◑		○	◑		○	○		Yes	2	20
	Trucks					●	●	◑	◑				
	Irwindale Pits									Yes			

Live Oak Reservoir

1	Dry Excavation	210,000 MCY	◑		○	◑		○	○		Yes	2	3.5
	Trucks					●	●	◑	◑				
	Irwindale Pits									Yes			

Puddingstone Diversion Reservoir

1	Dry Excavation	0.6 MCY	◑		○	◑		○	○		Yes	2	9.5
	Trucks					●	●	◑	◑				
	Irwindale Pits									Yes			

Thompson Creek Reservoir

1	Dry Excavation	260,000 CY	◑		○	◑		○	○		Yes	2	3.5
	Trucks					●	●	●	●				
	Irwindale Pits									Yes			

Legend:

●	significant impact
◑	some impact
○	possible impact
	no impact

Notes: (a) Use of low-emission trucks would reduce air quality impacts from significant impact (●) to some impact (◑).
(b) All alternatives require environmental regulatory permits.

Debris Basins

Over the next 20 years, close to 10 MCY of sediment are planned to be removed from the 162 debris basins managed by the Flood Control District.

What does the Strategic Plan recommend?

It is recommended that dry excavation and trucking continue as the removal and transport method for debris basins.

Every removal, transport, and placement alternative was analyzed for the debris basins. However, many of the alternatives were not implementable due to the following reasons:

- Debris basins have smaller watersheds compared to dams thus there are no base flows which make wet removal and transport methods such as dredging, sluicing, and slurry pipeline infeasible.
- Debris basins need to be cleaned out during the storm season in order to provide capacity for the next potential storm, thus the excavated material is very wet which makes conveyor transport and landfill placement infeasible.
- The distributed nature of the debris basins makes cable bucket and conveyor systems impractical. In addition, most of the debris basins are located in residential areas and do not have the right-of-way or a downstream site to receive the sediment.
- Debris basins do not provide a water conservation need so water quality and groundwater recharge impacts were not included in the summary table.

Summary of Sediment Management Alternatives for Debris Basins

Alternative	Environmental		Social			Implementability	Performance	Unit Cost	
	Habitat	Air Quality[a]	Traffic	Visual	Noise	Special Permit/Agreement Required[b]	Previous Experience	Dollars	Unit
Dry Excavation	◑	◑		◑	●		Yes	7.5	CY
Trucks		●	●	●	●		Yes	0.65	MI-CY
Pits							Yes	5-15	CY
Sediment Placement Sites	○	○		●	●		Yes	2	CY
Landfills						Yes	Yes	VARIES	CY

Legend:

●	significant impact
◑	some impact
○	possible impact
	no impact

Notes:
(a) Use of low-emission trucks would reduce air quality impacts from significant impact (●) to some impact (◑).
(b) All alternatives require environmental regulatory permits.