

Appendix B: Concentrating the Brine

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The “Strategic Alternatives for Brine Management in the Valley of the Sun” white paper uses a common location for the start point for all the alternatives. But the brine is generated at seven different locations and must be collected together for a regional plan to work. All the alternatives use the confluence of the Gila and Agua Fria Rivers as the beginning point for the cost calculations. The additional costs of getting the brine to that location will have to be considered if a Strategic Alternative is selected for further consideration as a solution to the Valley’s brine management issues.

The Rainbow Valley RO and the Bullard Water Campus RO facilities would simply build a pipeline to the collection location.

The Cave Creek Reclamation Plant RO facility and the Scottsdale Water Campus are located in the north and north-east Phoenix metropolitan area. These facilities could either construct a pipeline to transport their concentrate to the collection location or alternatively they could discharge their concentrate into the sanitary sewer and then pull those salts out again at the 91st Ave WWTP with another RO facility. The advantage of using the sanitary sewer system is that a long pipe line does not have to be constructed through the heavily congested Phoenix metropolitan area. The disadvantage is that by putting the brine into the sewer additional energy and cost must be expended to extract those salts again. The cost of a RO facility to extract those re-interred salts is quite a bit higher than the salinity pipeline. See Table 1 for a comparison.

Comparison of Concentrate Collection (millions)

	Salinity Pipeline	44 MGD RO Facility
Capital	\$ 73.73	\$ 201.62
O&M	\$ 0.12	\$ 7.84
Annualized	\$ 4.08	\$ 18.67

Table 1

The Water Market RO facility is anticipated to be constructed at 91st Ave WWTP to create low TDS water for various high end purposes. A pipeline would be constructed from 91st Ave WWTP to the collection point to carry the concentrate produced at the Water Market RO facility.

The Western Canal Well Field RO has the same alternatives as the Scottsdale Water Campus and the Cave Creek Reclamation Plant RO facility in that they could either construct a pipeline or use the sanitary sewer system.

Table 2 shows the range of size and costs to build a pipeline from a particular RO facility to the collection point.

Pipeline to transport Concentrate to Collection Point

Facility	Distance (miles)	Concentrate (MGD)	Size Pipe (inches)	Cost (millions)
Bullard Water Campus	3.1	0.6	6	\$2.60
Rainbow Valley RO	7.1	9.0	24	\$8.61
Western Canal WTF RO	15.9	9.0	24	\$19.25
Western Canal Well Field RO	13.2	0.9	8	\$11.51
Water Market	6.5	4.5	18	\$6.48

Table 2

The Western Canal Water Treatment Facility RO could not use the sanitary sewer system to transport their concentrate to 91st Ave WWTP. The two main sewer lines, the Salt River Outfall (SRO) and the Southern Avenue Interceptor (SAI), are 80 to 90 percent full during peak demand periods and could not take the additional flow. A pipeline would have to be constructed to transport the concentrate to the collection point.

In conclusion, each RO facility would have to decide how to transport their concentrate to the collection point. Salinity pipelines, which seem to be the best method, would not be an insignificant cost and would be born by the owners of the individual RO facility.

Total capital costs to link all seven RO facilities to a Strategic Alternative start point would be \$122.18 million.

Salinity interceptors constructed in California have a wealth of customers who want to buy space into their pipeline. One strategy to reduce individual cost would be that Phoenix metropolitan salinity interceptors be constructed oversized with the extra space being sold to brine producers at some future date.