

WEST BASIN MUNICIPAL WATER DISTRICT

OCTOBER 23, 2000

Prepared by: Wyatt Won

Submitted by: Paul E. Shoenberger

Approved by: Darryl G. Miller

INFORMATION CALENDAR

BARRIER REVERSE OSMOSIS TRAIN NO. 2 MEMBRANE REPLACEMENT

SUMMARY:

The cellulose acetate (CA) reverse osmosis (RO) membranes in Train No. 2 feeding the Barrier have been in service for about three and one-half years. Typical membrane life is from three to five years. Performance of the membranes has been deteriorating over the past several months in terms of the need for more frequent chemical cleanings and increasing levels of total nitrogen in the product water. The membranes should be replaced in the near future.

Recycled water is pre-treated using lime clarification and tri-media filtration prior to RO Train No. 2. Historically, CA RO membranes have been used with lime clarified water due to their ability to operate in this "fouling" environment. CA membranes run at higher pressures than the newer thin film membranes used on the microfilter effluent at Train No. 3 and at Carson and Mobil. Additionally, CA membranes suffer a decline in product water quality with time, compared with nearly constant quality of thin film membranes. However, there is currently no conclusive data to confirm that thin film membranes will perform satisfactorily over the long-term on lime clarified water.

As part of West Basin's on-going research and development program, staff is in the process of constructing equipment and developing test protocols to evaluate the performance of thin film membranes on lime clarified water. The evaluation is expected to take an additional six to nine months. In the interim, there is a need to improve the performance of Train No. 2, especially in removing nitrogen from the recycled water.

Recycled water is treated in three stages within Train No 2. Each stage processes less water than the previous stage and hence has fewer membranes than the previous stage. Stage 3 consists of 108 RO elements. There are a total of 756 elements in Train No 2.

In order to improve performance of Train No. 2, staff is proposing to replace RO elements in stage 3 of Train No. 2 with thin film membranes. It is estimated that replacing stage 3 will reduce Train No. 2 nitrogen product water concentrations by 30 percent. This replacement of a small percentage of the membranes will allow the system to stay in product quality compliance for an additional year and allow the staff to more aggressively to clean the remaining CA membranes. Following completion of the District's research project a determination will be made regarding membrane selection for the balance of the Train. Staff considers the uncertainty of thin film membrane performance to be an acceptable risk, considering the small percentage of elements involved.

Staff is planning to request bids for the new membranes in the next few weeks and ask for authorization from the Board to purchase the new membranes at the November Board meeting. After evaluation of the thin film membranes is completed in six to nine months, staff will report to the Board the results of the study and recommendations for replacing all remaining elements in Train No. 2.

FISCAL IMPACTS:

Funds are available in the Facility Replacement Fund.

ENVIRONMENTAL COMPLIANCE:

Not applicable.

COMMITTEE STATUS:

This item was reviewed at the Water Resources Committee on October 5, 2000 and agendaized to the October 23, 2000 Board meeting as information.

RECOMMENDED MOTION:

This item is for information only.

LIST OF EXHIBITS:

None.