THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- **Board of Directors**
  Engineering and Operations Committee

1/12/2010 Board Meeting

7-4

Subject

Authorize final design of the Hayfield Groundwater Extraction Project (Approp. 15402)

Description

This action authorizes final design of a system to extract previously stored water in the Hayfield groundwater basin. Results from tests of the recently installed prototype well and accompanying hydrogeologic investigations have been utilized to characterize the hydrogeologic behavior of the Hayfield aquifer, and form the basis for the recommended extraction system.

Timing and Urgency

A total of 70,000 to 100,000 acre-feet of Colorado River water have been stored over time by Metropolitan in the Hayfield groundwater basin. Installation of a prototype well has been completed, and hydrogeologic investigations indicate that conversion of the prototype well into a production well could extract as much as 5,000 acre-feet per year of previously stored water, which would supplement flows in the Colorado River Aqueduct (CRA).

This project has been reviewed under Metropolitan's updated CIP prioritization criteria and is categorized as a Supply Reliability project. The estimated cost for final design activities is $742,000. The funds have been previously appropriated and are budgeted within Metropolitan's CIP for fiscal year 2010/2011.

Background

The Hayfield groundwater basin is located south of the Hinds pumping plant adjacent to the CRA. In June 2000, Metropolitan's Board authorized a feasibility study for storing surplus CRA water in the Hayfield basin for future extraction. In December 2002, the Board authorized detailed investigations for the Hayfield groundwater basin. As part of this study, over 70,000 acre-feet of CRA water were discharged into the Hayfield groundwater basin for investigation, modeling, and storage purposes.

In November 2004, the Board deferred the Hayfield Groundwater Storage Program because it was clear that surplus Colorado River water would not be available in the foreseeable future to store in the Hayfield aquifer. In early 2008, with Metropolitan's water supplies becoming more limited, staff initiated a study to reevaluate the feasibility of extracting the water which had previously been stored in the Hayfield basin. The goal at that time was to extract the stored water and pump it into the CRA over a 3- to 4-year period.

In February 2009, Metropolitan's Board authorized installation of a full-scale prototype well and geotechnical investigations to characterize the hydrogeologic behavior of the Hayfield aquifer. The prototype well was constructed using 24-inch diameter carbon steel well casing in a 30-inch diameter, 1,015-foot deep borehole. After the well was developed, it was tested using a temporary pump and motor with portable generator. Groundwater was encountered at a depth of 495 feet below the ground surface, while drilling rates were significantly slower than originally anticipated due to hard metamorphic rock. The well was developed and then continuously tested for 72 hours to determine the pumping capacity of the confined aquifer. The aquifer extraction capacity exceeded expectations, with pumping rates as high as 3,500 gallons per minute (gpm), which

is estimated to yield 4,000 to 5,000 acre-feet per year. Following the test, the prototype well was disinfected and capped to protect against contamination.

During the period that the prototype well was constructed and tested, Metropolitan's outlook for CRA supplies improved. As a result, it does not appear crucial to extract previously stored water from the Hayfield basin as quickly as possible. Staff therefore recommends converting the existing prototype well into a single production well to enable extraction of the previously stored water. Conversion into a production well would involve the installation of a pump, motor, conveyance pipeline, and all necessary mechanical and electrical equipment to pump the water to the CRA. This approach would be the lowest-cost option to extract the previously stored water. This projected unit cost for extraction is $150 per acre-foot. It would take approximately 14 to 15 years to recover 70,000 to 100,000 acre-feet of stored water.

Hayfield Groundwater Extraction Project – Final Design Phase (No funds required)

This action authorizes design-phase activities to construct a single production well for the Hayfield Groundwater Extraction project. The scope includes conversion of the prototype well into a production well, and installation of a well pump, motor, electrical/power system, conveyance pipeline, and tie-in into the CRA. Planned activities include engineering design, preparation of drawings and specifications, receipt of competitive bids, development of a construction cost estimate, and all other activities in advance of award of procurement and construction contracts. Final design will be performed by Metropolitan staff. Staff will return to the Board at a later date for award of procurement and construction contracts.

No funds are required to be appropriated for this work, as sufficient funds have previously been appropriated. The estimated cost of all planned activities is $742,000, allocated as follows: $450,000 for design; and $292,000 for permitting, bidding process for multiple procurement and construction contracts, coordination with regulatory agencies, incidentals, and project management. The final design cost as a percentage of the estimated construction cost is approximately 15 percent. Engineering Services' goal for design of projects with construction cost less than $3 million is 9 to 15 percent. The construction cost for this project is anticipated to range from $2.5 million to $3 million.

This project has been evaluated and recommended by Metropolitan's CIP Evaluation Team. **Attachment 1** shows the distribution of previously appropriated funds for this capital program. See **Attachment 2** for the Location Map.

This project is consistent with Metropolitan's goal for sustainability by enhancing reliability of the existing conveyance and distribution system in order to maintain reliable water deliveries in the future.

Action and Milestone

July 2010 – Award of procurement contract for pump, motor, and electrical switch gear.

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

Metropolitan Water District Administrative Code Section 8117: Professional and Technical Consultants

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

To comply with CEQA and the State CEQA Guidelines, Metropolitan as the Lead Agency prepared a Mitigated Negative Declaration (MND) for the Hayfield Lake/Chuckwalla Valley Groundwater Conjunctive-Use Project. The MND was distributed for a 30-day public review period that began on February 25, 1999 and ended on March 26, 1999. The Board later adopted the MND and the Mitigation Monitoring and Reporting Program (MMRP) on April 13, 1999. The present board action is solely based on authorizing final design for procurement of pump, motor, and conveyance pipeline for outfitting the prototype well for the Hayfield Extraction Project and not on any changes to the approved project itself. Hence, the previously adopted environmental documentation in

conjunction with the current action fully complies with CEQA and the State CEQA Guidelines. Accordingly, no further environmental documentation is necessary for the Board to act on with respect to the proposed action.

The CEQA determination is: Determine that the proposed action has been previously addressed in the adopted 1999 MND and the MMRP and that no further environmental analysis or documentation is required.

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determination and authorize final design of the Hayfield Groundwater Extraction Project.
Fiscal Impact: $742,000 of previously appropriated and budgeted funds under Approp. 15402
Business Analysis: This option will recover approximately 70,000 to 100,000 acre-feet of previously stored water in 14 to 16 years.

Option #2

Do not proceed with the Hayfield Groundwater Extraction Project.
Fiscal Impact: None
Business Analysis: This option would forego an opportunity to develop a cost-effective and efficient approach for recovery of previously stored water from the Hayfield basin.

Staff Recommendation

Option #1

Roy L. Wolfe 12/29/2009
Roy L. Wolfe *Date*
Manager, Corporate Resources

Jeffrey Kightlinger 12/29/2009
Jeffrey Kightlinger *Date*
General Manager

Attachment 1 – Financial Statement
Attachment 2 – Location Map

Reference Number CR12602835

Financial Statement for Hayfield Groundwater Storage Program

A breakdown of Appropriation No. 15402 for the Hayfield Groundwater Extraction project* is as follows:

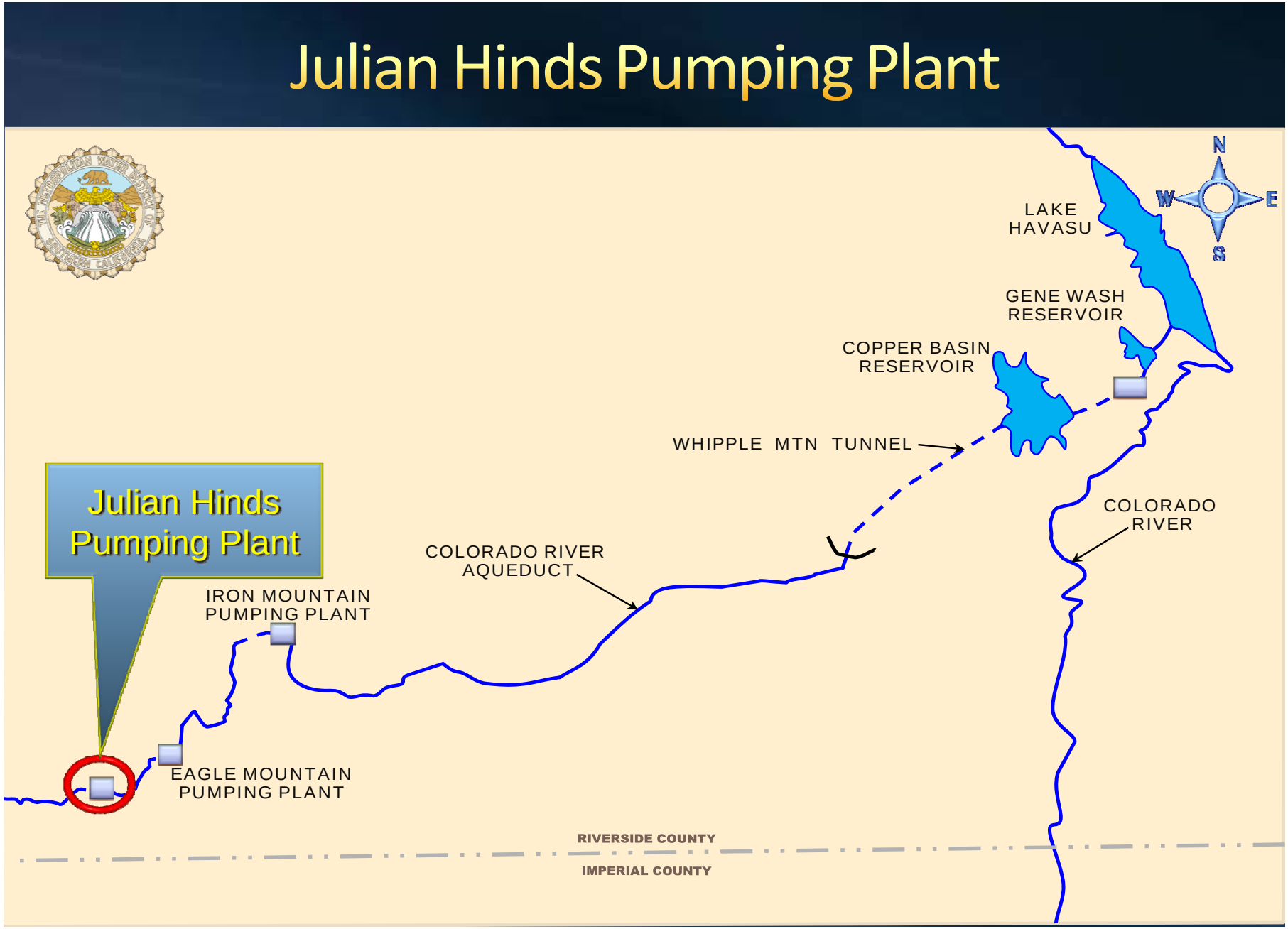
	Previous Total Appropriated Amount (Feb. 2009)	Current Budget Redistribution** (Jan. 2010)	New Budget Distribution
Labor			
Studies & Investigations	$ 500,000	$ -	$ 500,000
Final Design	-	450,000	450,000
Owner Costs (Program mgmt, permitting, bidding process)	3,613,000	277,000	3,890,000
Construction Inspection & Support	-	-	-
Metropolitan Force Construction	-	-	-
Materials and Supplies	69,000	-	69,000
Incidental Expenses	27,000	15,000	42,000
Professional/Technical Services	7,869,000	-	7,869,000
Equipment Use	1,000	-	1,000
Land Purchase	1,450,000	-	1,450,000
Contracts	-	-	-
Remaining Budget	3,360,000	-	3,360,000
Undistributed Funds	8,826,000	(742,000)	8,084,000
Total	**$ 25,715,000**	**$ -**	**$ 25,715,000**

Funding Request

Program Name:	Hayfield Groundwater Storage Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15402	**Board Action No.:**	5
Requested Amount:	**$**	**Capital Program No.:**	15402
Total Appropriated Amount:	**$** 25,715,000	**Capital Program Page No.:**	219
Total Program Estimate:	**$** 46,693,200	**Program Goal:**	S- Supply Reliability

* The total amount expanded to date on the Hayfield Groundwater Extraction Project is approximately $1,050,000.

** Reflects the scope of work contained in the present action.


Julian Hinds Pumping Plant
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W
E
S
LAKE HAVASU
GENE WASH RESERVOIR
COPPER BASIN RESERVOIR
WHIPPLE MTN TUNNEL
COLORADO RIVER
Julian Hinds Pumping Plant
COLORADO RIVER AQUEDUCT
IRON MOUNTAIN PUMPING PLANT
EAGLE MOUNTAIN PUMPING PLANT
RIVERSIDE COUNTY
IMPERIAL COUNTY