

- **Board of Directors**  
**Engineering and Capital Programs Committee**

March 11, 2008 Board Meeting

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**9-1**

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**Subject**

Status report for the Inland Feeder Program for activities through January 2008

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**Description**

**Work Completed to Date**

The Inland Feeder Program consists of 44 miles of pipelines and tunnels that will enable Metropolitan to convey up to 1,000 cubic feet per second of State Water Project (SWP) supplies from Devil Canyon Afterbay to Diamond Valley Lake (DVL). To date, eight of nine construction contracts totaling \$542 million have been completed. These completed contracts represent 36.3 miles or 82 percent of the Inland Feeder's length. Remaining program work includes completion of the Arrowhead East and West Tunnels, which are presently under construction by a joint venture of Shea/Kenny.

The completed portion of the Inland Feeder has been in service since 2003 via an interconnection that was constructed between the Inland Feeder and San Bernardino Valley Municipal Water District's Foothill Pipeline. This connection allows Metropolitan to convey SWP supplies from the East Branch of the California Aqueduct to the Inland Feeder for delivery to DVL. Over 605,000 acre-feet of SWP water have been delivered to DVL to date through this connection.

**Arrowhead Tunnels**

**Arrowhead East Tunnel (AET)** – In January, the contractor completed mining through a zone of very weak rock; this zone extended for more than 200 feet along the tunnel alignment. More competent rock has now been reached. However, the tunnel boring machine (TBM) encountered high water inflow conditions in mid-February, and inflows as high as 500 gpm have forced the contractor to proceed cautiously as he implements overlapping grout patterns in an attempt to seal off the water. Staff anticipates that the TBM hole-through into the completed section of the Arrowhead East Tunnel will now occur in March/April 2008. The TBM advanced 250 feet in January and another 45 feet through February 11. The total length of tunnel mined to date is 21,875 feet (97 percent of the tunnel's length), with 583 feet remaining.

The contractor removed the steel bulkhead and thimble from the City Creek tunnel portal, 8,000 feet inside the tunnel. The contractor is now demolishing the concrete ring that encased the thimble. Completion of these efforts will ready the City Creek end of the tunnel for the arrival of the TBM.

**Arrowhead West Tunnel (AWT)** – Stable geologic conditions continued through January and into early February, which resulted in good mining progress. In mid-January, the contractor successfully completed a planned 8-day replacement of the TBM's screw auger, and also performed significant repairs to the auger barrel to improve wearability. The TBM advanced 510 feet in January and another 280 feet through February 11. The total length of tunnel mined to date is 16,520 feet (83 percent of the tunnel's length), with 3,364 feet remaining.

**Program Management**

Staff and the U.S. Forest Service continued to coordinate activities related to monitoring and minimizing tunnel water inflows into the Arrowhead East Tunnel in January. Staff continued negotiations with representatives from the San Manuel Band of Mission Indians regarding potential compensation for their activities related to the AET.

**Budget and Schedule**

Following board authorization of a settlement agreement and contract amendment with the Arrowhead Tunnels contractor in August 2006, staff conducted a complete review of the program budget to estimate the total projected cost to complete the Inland Feeder Program. Based on the revised September 2010 completion date of the Arrowhead Tunnels as presented to the Board in August 2006, the updated total projected cost for the Inland Feeder is estimated to be \$1.139 billion. Total expenditures through January 2008 are \$983 million (see [Attachment 1](#) for the Projected Cost/Expenditures). Staff will continue to report on the status of ongoing discussions with the San Manuel Band of Mission Indians and of litigation with Campus Crusade for Christ. The board-approved budget for the entire program remains at \$1.186 billion. [Attachment 2](#) shows the actual mining progress and cash flow on both tunnels compared to the planned progress and expenditures set forth in the August 2006 contract amendment.

The payments on the contractor’s incentive/risk program are discussed with the Board on a regular basis at the Engineering and Capital Programs Committee meetings. This incentive plan is part of the contract amendment approved by the Board in August 2006. The incentive payment to the contractor for the month of January 2008 is shown in [Attachment 1](#).

Upon completion of construction, environmental mitigation measures will continue along the Arrowhead Tunnels alignment for up to two years in accordance with the program Environmental Impact Report.

**Policy**

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Submitted per request of the Board

**Fiscal Impact**

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Refer to [Attachment 1](#).

  
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Roy L. Wolfe  
Manager, Corporate Resources

2/17/2008  
Date

  
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Jeffrey Kightlinger  
General Manager

2/26/2008  
Date

[Attachment 1 – Inland Feeder Program Projected Cost/Expenditures](#)

[Attachment 2 – Arrowhead Tunnels Actual vs. Planned Mining Progress and Actual vs. Planned Cash Flow](#)

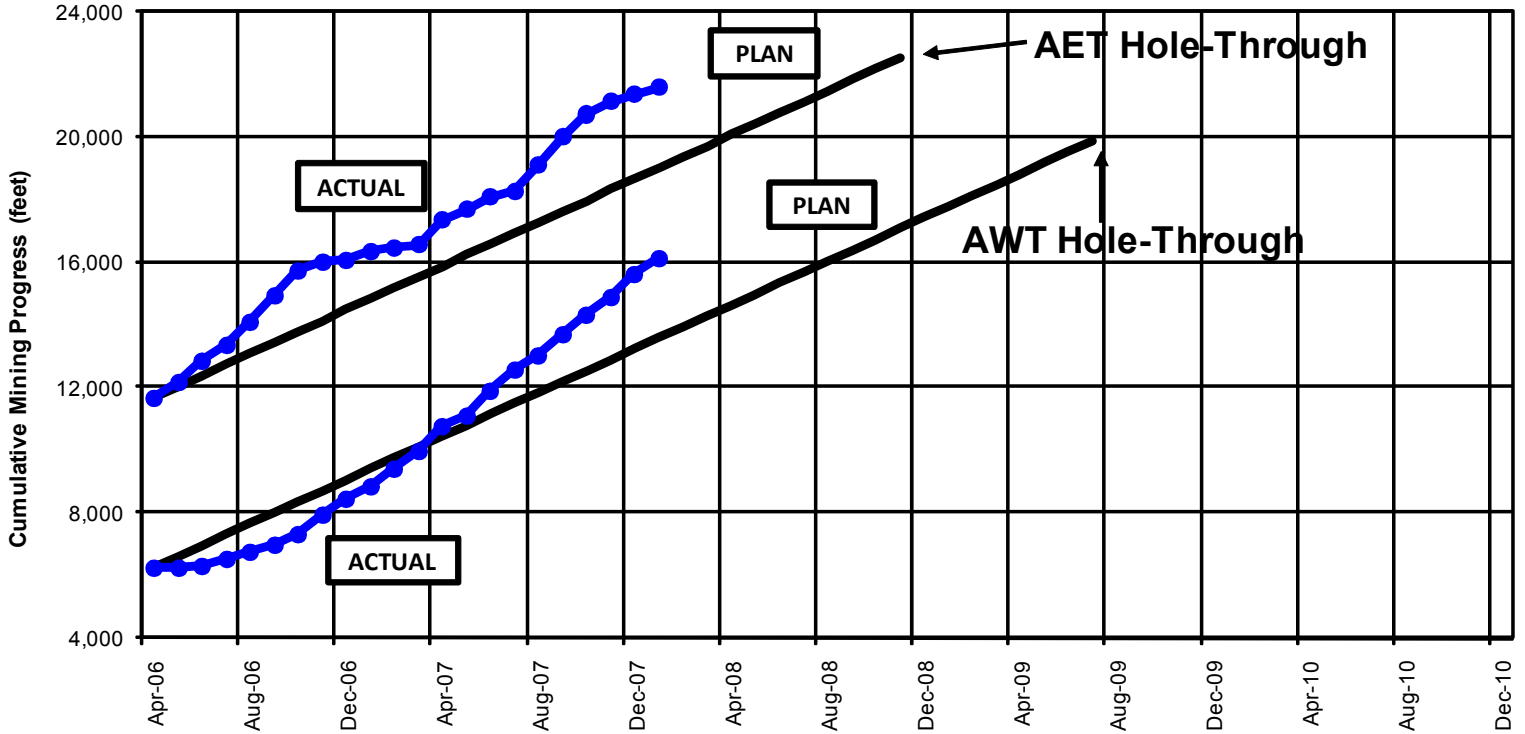
<b>Inland Feeder Program Projected Cost/Expenditures (\$ in Millions)</b>				
	Projected Cost To Complete (Updated Jan. 2008)	Expenditures This Month (Jan. 2008)	Expenditures To Date (Jan. 2008)	% Complete Based on Expenditures (Jan. 2008)
<u>Active Construction</u>				
Arrowhead Tunnels Const. Contract	\$ 397.0	\$ 5.7	\$ 263.8	66%
Construction Inspection and Support	\$ 58.0	\$ 0.5	\$ 43.0	74%
<b>Subtotal, Active Construction</b>	<b>\$ 455.0</b>	<b>\$ 6.2</b>	<b>\$ 306.8</b>	<b>67%</b>
<u>Other Components</u>				
Completed Projects	\$ 578.2	\$ 0.0	\$ 576.4	100%
Others (R/W, Env., Prog. Mgmt.)	\$ 105.4	\$ 0.1	\$ 100.2	94%
<b>Subtotal, Other Components</b>	<b>\$ 683.5</b>	<b>\$ 0.1</b>	<b>\$ 676.6</b>	<b>99%</b>
Expended To Date		\$ 6.3	\$ 983.4	83%
Subtotal, All Projects	\$ 1,138.5	← Projected Cost to Complete		
Remaining Budget	\$ 48.0			
Board-Authorized Budget	\$ 1,186.5	← Total Project Budget		
Length of Tunnels Mined Through 2/11/08				
Arrowhead East	21,875 ft	of 22,458 ft	(97%)	
Arrowhead West	16,520 ft	of 19,884 ft	(83%)	
Total	38,395 ft	of 42,342 ft	(91%)	

NOTE: Contractor invoices paid through January 2008 = \$260.8M  
 Overall completion = 36.3 of 44.2 miles (82%)

<b>Inland Feeder Program – Arrowhead Tunnels Incentive Plan Payments</b>				
	East/West Tunnels Cumulative Feet Mined	East Tunnel	West Tunnel	Total
June 2006 – Dec 2007 (Previously Reported)	19,235	\$ 1,967,400	\$ 2,332,483	\$ 4,299,893
January 2008 (3)	780	\$ 113,700	\$ 128,100	\$ 241,800
<b>TOTALS</b>	<b>20,015</b>	<b>\$ 2,081,100</b>	<b>\$ 2,460,583</b>	<b>\$ 4,541,693 (2)</b>

(1): For Arrowhead West Tunnel, incentive program evaluation commenced in June 2006.  
 (2): Percent of maximum possible combined incentive: 74% (66% Arrowhead East Tunnel, 82% Arrowhead West Tunnel)  
 (3): Incentive Plan based on work performed during contractor monthly pay period from 12/26/07 to 1/25/08 (differs from progress in calendar month).

### Arrowhead Tunnels Actual vs. Planned Mining Progress



### Arrowhead Tunnels Actual vs. Planned Cash Flow

