

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

November 14, 2000 Board Meeting

8-1

Subject

Authorize \$325,000 for feasibility study, preliminary engineering, and environmental documentation for the Hiram W. Wadsworth Pumping Plant hydroelectric pump-motor unit conversion (Appn. 15360)

Description

The hydraulic facilities at Diamond Valley Lake (DVL) were designed to direct normal water deliveries from the DVL reservoir into the San Diego Canal via the pumping plant forebay. Metropolitan has the opportunity to recover a portion of the energy lost during withdrawals from the reservoir by converting the existing pump-motor units to turbine-generator units. The converted units would be capable of operation in either a pumping mode or a power generation mode. The ultimate build-out capacity of this facility is approximately 40 megawatts, which would increase Metropolitan's hydroelectric generating capacity to 141 megawatts. Continuous operation of Metropolitan's hydroelectric plants at this total capacity would generate enough energy to meet the annual electrical needs of 141,000 Southern California homes. The initial build-out of this project will convert a number of units to fully utilize the expected near-term flow demand from DVL. Conversion of the units to provide this capability is expected to require relatively minor physical changes to the existing equipment. The anticipated modifications will involve the operating system software, motor speed control equipment, power metering equipment, and the electrical protection systems.

This project will require review and approval from the Federal Energy Regulatory Commission (FERC) and prior consultation with appropriate federal and state resource agencies such as the United States Department of the Interior Fish and Wildlife Service, the California Department of Fish and Game, and other environmental agencies and organizations. Preliminary discussions with FERC staff suggest that the conversion project as currently envisioned would qualify for an exemption from licensing as a small conduit hydroelectric facility.

Results from the initial feasibility study indicate that the anticipated ultimate build-out project cost will range from \$4 to \$5 million. The study also suggests the initial build-out of this project will demonstrate a capital cost payback within 5 to 8 years of operation. Approval of the following recommendation will authorize the appropriation of \$325,000 to finance the feasibility study, preliminary engineering, preparation of environmental documentation, and preparation and submission to FERC of an exemption application.

If the Board of Directors approves this recommendation, the FY 2000/2001 expenditure plan will be adjusted to include funds for this project.

See [Attachment 1](#) for the Detailed Report, [Attachment 2](#) for the Financial Statement and [Attachment 3](#) for the Location Map.

Policy

Metropolitan Water District Administrative Code Section 5108: Capital Project Appropriation

Board Options/Fiscal Impacts

Option #1

Appropriate \$325,000 to finance the feasibility study, preliminary engineering, preparation of environmental documentation, and the preparation and submission to FERC of the application for a small conduit hydroelectric exemption. Also, determine that pursuant to the California Environmental Quality Act (CEQA)

the proposed action qualifies for a Categorical Exemption (Class 6, Section 15306 of the State CEQA Guidelines).

Fiscal Impact: \$325,000 expenditure. Future reduction or offset of energy costs to Metropolitan.

Option #2

Defer action.

Fiscal Impact: None.

Staff Recommendation

Option # 1.

	10/23/2000
Roy L. Wolfe Manager, Corporate Resources	<i>Date</i>
	10/24/2000
Ronald R. Jester General Manager	<i>Date</i>

- Attachment 1—Detailed Report**
- Attachment 2—Financial Statement**
- Attachment 3—Location Map**

BLA # 640

Detailed Report

Purpose/Background. Metropolitan dedicated Diamond Valley Lake (DVL) in March 2000. The 800,000 acre-foot capacity reservoir provides 17 million residents within Metropolitan's service area a dependable, high quality water supply to meet emergency, drought, and seasonal needs. In addition, completion of this off-stream reservoir also enhances the operational reliability of the largest water storage and delivery system in the United States, optimizes groundwater storage to lessen dependence on surface supplies, improves the environment through environmental set-asides and quality-of-life improvements, and adds outdoor recreational facilities for the public.

The Hiram W. Wadsworth Pumping Plant is a facility separate from the reservoir, sited at the northeast edge of the forebay. The pumping plant was designed as a normally unattended, off-stream facility for pumping water from the forebay into DVL through the reservoir's Inlet/Outlet Tower. Power to operate the twelve 6,000-HP pump-motor units is supplied by Southern California Edison. Also installed at this pumping plant are seven pressure control vertical sleeve valves. These valves are needed to control flow and dissipate energy when delivering water out of DVL back to the forebay for transfer into the San Diego Canal.

In its normal operating mode, water deliveries from DVL are directed through the pressure control valves. Metropolitan has the opportunity to recover a portion of the energy lost during this process by directing this normal reservoir withdrawal through the pump-motor units in a reverse operating mode. In reverse mode, the pump-motor unit will act as a turbine-generator and produce electrical energy from the available hydraulic energy. The ultimate build-out capacity of this facility is approximately 40 megawatts of electrical power.

Project Description. Although not originally designed as reversible pump-turbine units, the conversion of the units to provide this capability is expected to require relatively minor physical changes to the existing equipment. A brief study was conducted in August 2000 to determine the feasibility of such a project. The principal modifications required involve reconfiguration of the motor speed control equipment, the power metering equipment, and the electrical protection systems. A significant portion of the work is anticipated to occur in the required software changes to the operating program to allow remote, automatic, unattended operation in the turbine mode as is available in the pump mode.

Metropolitan may deliver the electrical power generated in this manner to utilities under new power contracts. Metropolitan currently maintains a number of similar power contracts for delivery of electrical power generated at fifteen small conduit hydroelectric plants sited throughout the distribution system. The fifteen plants, with the exception of the Etiwanda facility, were all retrofitted at the then-existing pressure control facilities. The addition of this 40 MW capacity facility at DVL will increase Metropolitan's aggregate generating capacity to 141 megawatts. Continuous operation of Metropolitan's hydroelectric plants at this total capacity would generate enough energy to meet the annual electrical needs of 141,000 Southern California homes. Metropolitan's production of hydroelectric power helps to offset purchased energy costs and contributes to the conservation of fossil fuels.

The total cost estimate for this project is subject to the results of the recommended preliminary engineering effort. However, it is anticipated that the ultimate capital project cost will range from \$4 to \$5 million. The initial feasibility review indicates the capital investment payback period for the initial build-out could range from 5 to 8 years of operation. This payback projection was developed by estimating the conversion cost of a varying number of units, and considering their operation over a range of flow projections and available head.

Licenses/Permits. Conversion of the existing system to hydroelectric power generation will require review and approval from the Federal Energy Regulatory Commission (FERC) and prior consultation with federal and state resource agencies such as the United States Department of the Interior Fish and Wildlife Service, the California Department of Fish and Game, and other interested parties. Preliminary discussions with FERC staff suggest that the conversion project as currently envisioned would qualify for an exemption from licensing for a small conduit hydroelectric facility. Metropolitan would submit its application for an exemption to FERC following completion of the consultation process.

In reviewing Metropolitan's application for exemption, FERC would retain the right to review environmental issues raised by resource agencies and interested parties, such as fish or growth-inducement issues. Metropolitan would be required to identify and respond to any such identified concern, which may require preparation of one or more environmental studies.

Recommendation. Results from the preliminary feasibility study warrant a recommendation to proceed with preliminary engineering and identification of environmental or other issues potentially impacting the project. Approval of this recommendation will authorize the appropriation of \$325,000 to finance the feasibility study, preliminary engineering, preparation of environmental documentation, and the preparation and submission to FERC of an application for a small conduit hydroelectric exemption.

CEQA Compliance/Environmental Documentation

In October 1991, Metropolitan's Board of Directors certified the Final Environmental Impact Report (FEIR) for the Diamond Valley Lake Project. The FEIR identified hydroelectric power generation as a project component. Additional environmental analysis may be necessary for authorization of the modifications required to produce hydroelectric power through the Diamond Valley Lake Hiram W. Wadsworth Pumping Plant. The action proposed herein would only provide funding for study and evaluation purposes, and to prepare any necessary environmental documentation to meet the requirements of the California Environmental Quality Act (CEQA) and FERC. As such, this proposed funding approval qualifies as a Class 6 Categorical Exemption (State CEQA Guidelines Section 15306).

Actions and Milestones

- March 2001 - Complete the evaluation phase and request Board authority to proceed with project
- Mid 2002 - Complete the conversion work and achieve on-line capability

FINANCIAL STATEMENT

Board Action No. 1 for Appropriation No. 15360 to finance feasibility study, preliminary engineering, and environmental documentation for the Hiram W. Wadsworth Pumping Plant hydroelectric pump-motor unit conversion.

**BOARD ACTION
NO. 1****(Nov. 2000)**

Labor:

Preliminary Engineering, Environmental Documentation, Technical Evaluation, FERC Application	\$ 265,000
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Subtotal Labor**\$ 265,000**

Incidental Expenses	10,000
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Professional / Technical	50,000
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Total**\$ 325,000****FUNDING REQUEST**

Program Name:	Diamond Valley Lake Hiram W. Wadsworth Pumping Plant Hydroelectric Pump-Motor Unit Conversion		
Source of Funds:	Pay-As-You-Go Fund		
Appropriation No.:	15360	Board Action No.:	1
Requested Amount:	\$ 325,000	Capital Program No.:	N/A
Total Appropriated Amount:	\$ 325,000	Capital Program Page No.:	N/A
Total Program Estimate:	\$ N/A	Program Goal:	O-Other

