San Diego County Water Authority

2011

ASSET MANAGEMENT PLAN

Published January 2009

San Diego County
Water Authority

4677 Overland Avenue
San Diego, CA 92123
858-522-6600
www.sdcwa.org

This page intentionally left blank.

Table of Contents

Tables

Figures

EXECUTIVE SUMMARY

Asset management is an organization-wide responsibility requiring an alignment of customer expectation, business processes, technology, and organizational culture.

In discussions with Water Authority executives about the definition of an asset management program, several classes of assets were identified for inclusion in the Asset Management Program. The classes include Pipelines, Facilities, and Equipment. Water storage and mitigation properties were identified as asset classes that should be included as the program continues to mature and grow. While these asset classes are important to the base asset value of the Water Authority, it is not the intention of the Asset Management Program, at this time, to include these asset classes. Rather, the Asset Management Program will focus on tangible assets that directly support the Water Authority's mission to supply a safe and reliable water supply.

The Water Authority has many of the components required to establish a formal Asset Management Program, including mature Operating and Capital Improvement programs and the essential supporting software programs. There are several asset replacement projects underway. Funding for the initial Asset Management Program will come from these established projects and programs and it is not anticipated that there will be an increase in the Operating or Capital Improvement Program budgets to initially support the program. A funding policy will be presented to the Board in January 2010 that will describe how this program will be funded into the future.

The Water Authority faces many challenges in implementing an organization-wide Asset Management Program, including the collection and dissemination of asset information and history, development of new asset management policies and procedures, implementation and documentation of a formal risk based decision making process, and implementation of new performance measurement criteria. A comprehensive asset management program will aid staff in dealing with the demands of an increasingly complex system, an aging infrastructure, increasing costs and competing demands for limited resources.

The benefits of an effective asset management program include: increased efficiency, reduced overall cost, timely replacement, rate stabilization, and economy leading to improved relationships with customers, investors, regulatory agencies and policy makers; gradual and predictable rate increases; improved planning; risk-based decision making; and sustained improvement.

ASSET MANAGEMENT

Background

The single largest factor in the Water Authority's portion of retail water rates is the cost to build, operate and maintain the water delivery infrastructure. There is over $1.8 billion invested in the Water Authority's facilities today and another $3.5 billion planned, designed or under construction. It is estimated that the total system is worth over $3 billion. Many of these new facilities are much more complex and costly to operate and maintain than the pipeline systems of the past. As these new facilities come on line, the Water Authority will need to implement more sophisticated approaches to managing and operating the water delivery system.

While the Water Authority did not have a formal asset management program in the past, it has been managing its critical assets through several existing programs. These programs include the Aqueduct Protection Program, Pipeline Replacement and Relining Program, Valve and Venturi Replacement Program and the Equipment Replacement Fund (which includes fleet and computer replacement). These programs have specific replacement priorities based on condition assessment factors such as age, cost to maintain, risk of failure, and type of service.

In April 2008, the Board presented a strategic plan that provides guidance in setting the Water Authority's strategic policies over the next 25 years. Three Key Result Areas (KRA) were selected on which to focus and base priorities:

1. Water Supply Diversification,
2. Leadership, and
3. Asset Management

The Asset Management KRA is supported by three Strategies:

1. Facilities Planning,
2. Capital Financing, and
3. Facilities Operation and Maintenance

Facilities Operation and Maintenance supports the formation of an integrated asset management program. The Board set two objectives for Strategy 3: Facilities Operation & Maintenance:

1. By January 1, 2009 adopt an integrated asset management plan that will be used to support all budget proposals related to water assets for the next two-year budget.

2. By January 1, 2010 the Water Authority Board of Directors will adopt a policy regarding funding of asset replacement.

Adopted January 22, 2009
L:\OM\DeptOnly\0125_Plans\0125.10_AssetManagementPlan\AM_Plan\Final for 2010-2011\AM Plan2010-2011.doc

Page 2
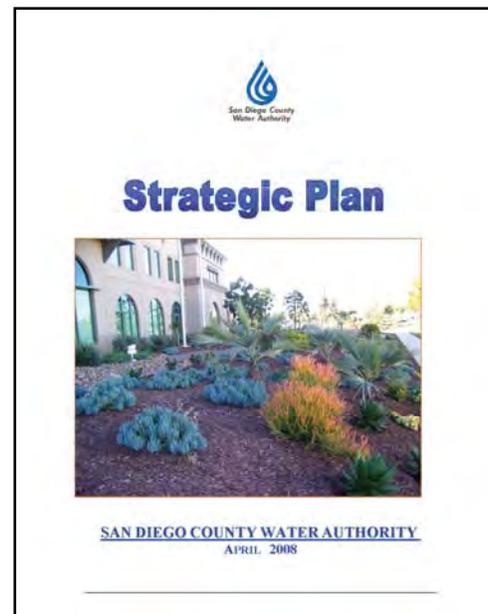
Definition

Traditionally asset management referred to the management of money and investments in the financial arena. Now, asset management for the Water Authority includes everything that is done to derive the most value from an asset through its life cycle. This means that the operation, maintenance, rehabilitation, and replacement or surplus of capital facilities and infrastructure occurs at the right time and in the right way; represents the best value to our customers; and meets or exceeds stakeholders' expectations. An integrated asset management program will enhance the Water Authority's ability to:

1. Systematically appraise performance, risk, and new technologies application to the Water Authority's complex water delivery system.

2. Determine the most cost effective and reliable ways to manage current capital infrastructure.

As the Water Authority's needs change, the Asset Management Plan will adjust and new objectives will be developed to ensure that the plan continues to provide an effective means of managing Water Authority assets.

Purpose and Focus

The purpose of asset management is to maximize the value of an asset over its life cycle. It is an organization-wide responsibility requiring alignment of customer expectations, business processes, technology, and organizational culture. This new program will take the existing programs used in the past and combine them into one integrated program so that budgets and schedules can be managed more efficiently and effectively to fulfill the Water Authority's mission to provide a safe and reliable supply of water.

The program will focus on tangible assets that directly support this mission. Planning, design, construction, operation, maintenance, repairing or replacing, repurposing, or surplusing assets at the optimum time to ensure water delivery system reliability at the lowest cost and least impact to member agencies is the overarching goal of the Water Authority's Asset Management Program.

Stakeholders

Asset management stakeholders include the 24 Member Agencies, the Board of Directors that represents the member agencies, regulatory agencies, and ultimately the consumer. All Water Authority departments are also stakeholders. As the "Keepers of the Aqueduct System", the Operations and Maintenance department has a major role and responsibility in the Asset Management Program.

Relationship to Strategic and Business Plans

The Water Authority's 2012 Business Plan, published in September 2008, included three focus areas: Water Supplies Portfolio, Water Facilities, and Core Business. Asset management is one of the four programs contained in the Water Facilities Focus Area. The relationship between the Water Authority's Strategic Plan, Business Plan, and Asset Management Plan is shown in Figure 1.

*KRA 3: Asset Management
Strategy 3: Facilities O&M*

*Water Facilities Focus Area
Asset Management*
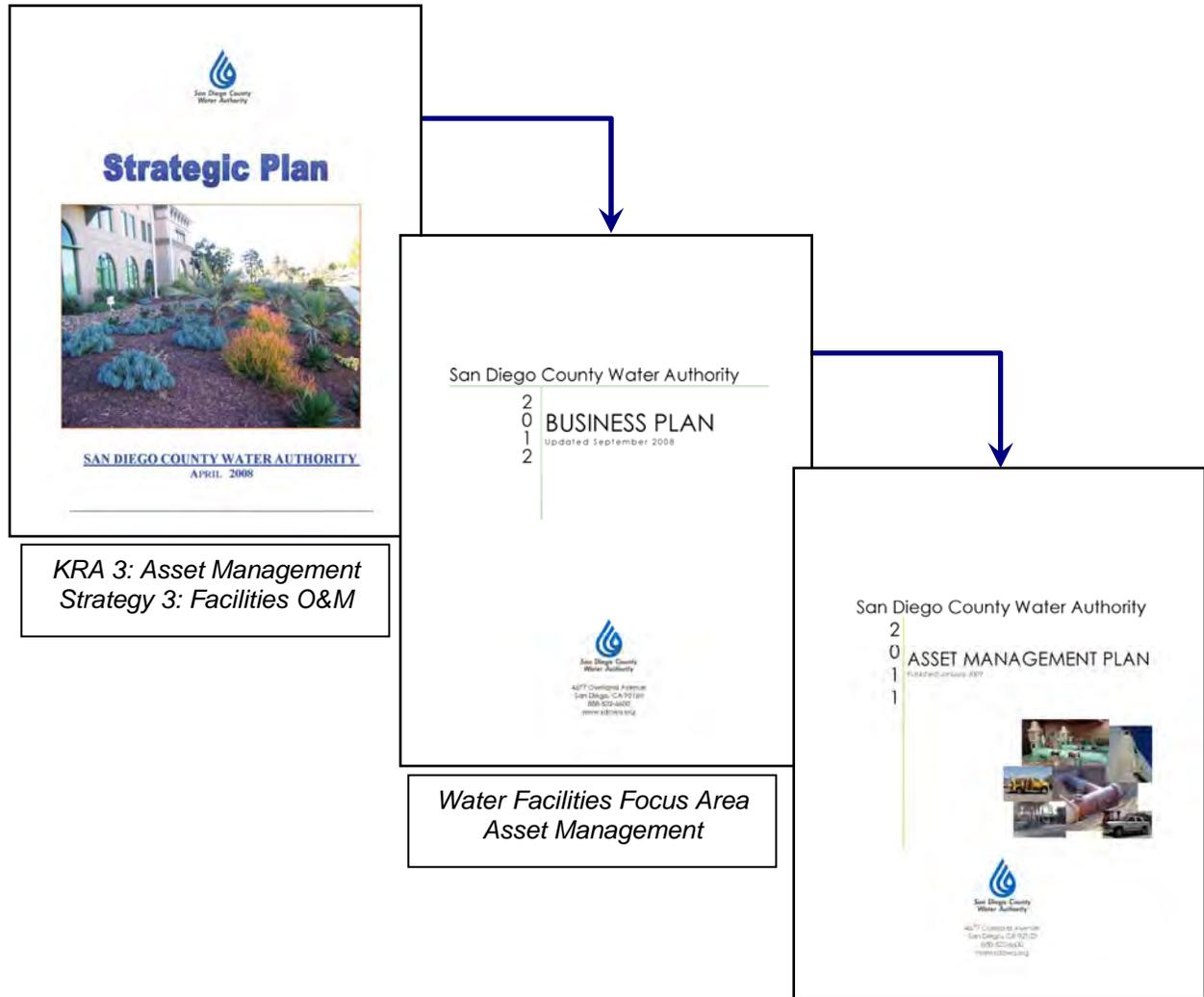
Figure 1 - Asset Management Plan relationship to Strategic and Business Plans

Implementation

The Asset Management Program is a living document and will continue to develop to meet the changing needs of the Water Authority. The major program steps are outlined in the 2012 Business Plan as goals as shown in Figure 2.

| July 2008 | ──────── | **Year One** | ──────── | June 2009 |

| Define Asset Management | → | Conduct Initial Risk Evaluation | → | Develop Data Collection Standards | → | Develop IT strategic plan to support asset management. | → | Develop Integrated AM Plan for Board Approval | → | Develop Initial Condition Assessment Database. |

BP Goal 2 Oct 2008 · *BP Goal 3 Nov 2008* · *BP Goal 4 Dec 2008* · *BP Goal 5 Jan 2009*

| July 2009 | ──────── | **Year Two** | ──────── | June 2010 |

| Compare AM Skills with HR Training Schedule | → | Develop Long Term AM Funding Policy | → | Coordinate with Facilities Planning on new projects | → | Update Condition Assessment Database |

BP Goal 6 Dec 2009 · *BP Goal 7 Jan 2010*

| July 2010 | ──────── | **Year Three** | ──────── | June 2011 |

| Conduct Outreach to Rating Agencies, Investors, Member Agencies, and Policy Makers | → | Apply for State and Federal Funding Programs | → | Coordinate with Facilities Planning on new projects | → | Update Condition Assessment Database |

BP Goal 8 Jul 2010 · *BP Goal 9 Annual*

Figure 2 - Asset Management Program Development by Year

This page intentionally left blank.

ASSET MANAGEMENT PROCESS

Asset Life Cycle

Asset management, the maximization of the value of an asset over its life cycle, is a process that begins with its original design and ends with decision to terminate or dispose of the asset. At the individual asset level, asset management is a focus on one asset and its life cycle. The approach that the Water Authority has taken is to group assets together and manage them collectively. Under the Asset Management Program, existing programs and projects are combined into one program to manage them more efficiently.

Process

The Asset Management process is composed of numerous steps that include the identification of assets, their criticality, and the acceptable levels of service. Condition assessments are performed and a remaining service life is determined for each asset. With this information, staff develops replacement, rehabilitation, repair, or surplus schedules and develops budgets to support the schedules. This is a reiterative process due to changing conditions and circumstances and the addition of new facilities pipelines, and equipment. The Asset Management process is shown in Figure 3.
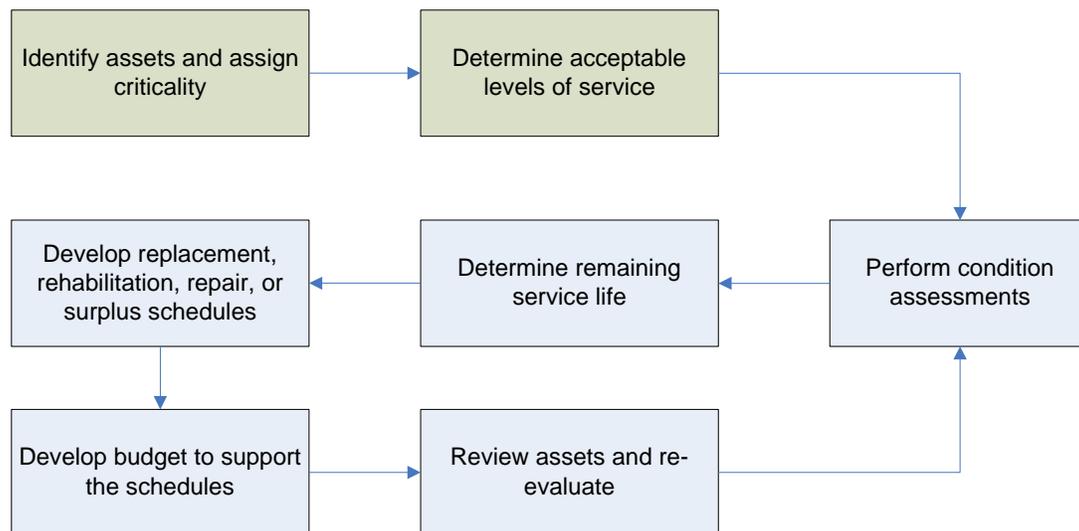
Figure 3 - Asset Management Process

Ownership

Several departments manage the different asset classes. In some cases there may be shared ownership, for instance, the Equipment Replacement Program has many types of assets: Fleet is managed by the Operations and Maintenance department while computers are managed by the Administrative Services department.

Program Administration

The Operations and Maintenance Department is responsible for coordinating and implementing the Asset Management Program through the Asset Management Committee comprised of representatives from Water Authority departments.

Replacement/Rehabilitation Schedules

The Asset Management Committee will periodically review the recommended replacement/rehabilitation schedules submitted by various departments. This recommendation will be summarized in an Asset Management report and presented to the Board for approval during the biennial budget approval process.

Surplus Decisions

When an asset has reached the end of its useful life, the cost to repair or rehabilitate exceeds the cost to replace, or if that asset is no longer needed by the Water Authority, it is the policy of the Water Authority to surplus that asset. The Surplus policy is detailed in the Administrative Code Section 7.08. The Purchasing section of the Administrative Services department manages surplus process and procedures.

Reports

A report on the performance and status of the Asset Management Program will be presented to the Board of Directors during the budget development process. The report will include budget status, funding strategies and opportunities, a list of projects that were completed during the fiscal year, and a list of projects with associated budgets that are proposed for the following fiscal years' budget.

Adopted January 22, 2009
L:\OM\DeptOnly\0125_Plans\0125.10_AssetManagementPlan\AM_Plan\Final for 2010-2011\AM Plan2010-2011.doc

Page 8

ASSET CLASSES

During discussions with Water Authority executives about the definition of an asset management program, several classes of assets were identified that could be included in the Asset Management Program. Water storage and mitigation properties were identified as asset classes that should be included as the program continues to mature and grow. While these asset classes are important to the base asset value of the Water Authority, it is not the intention of the Asset Management Program, at this time, to include these asset classes. Rather, the Asset Management Program will focus on tangible assets that directly support the Water Authority's mission to supply a safe and reliable water supply. These tangible assets are broken down into three major asset classes: Pipelines, Facilities, and Equipment (Figure 4).
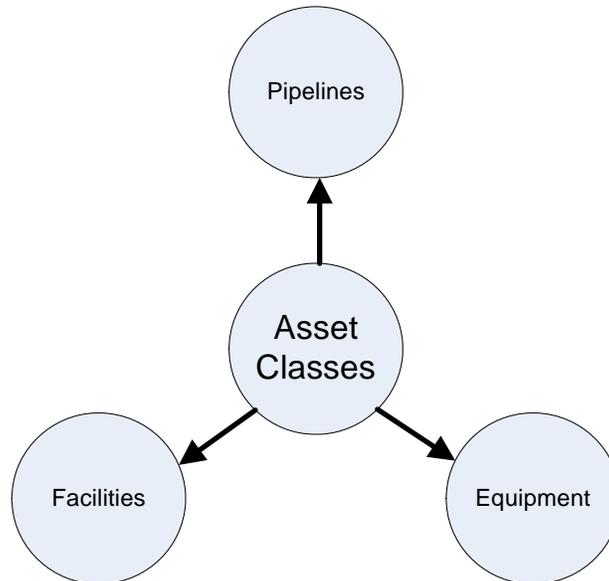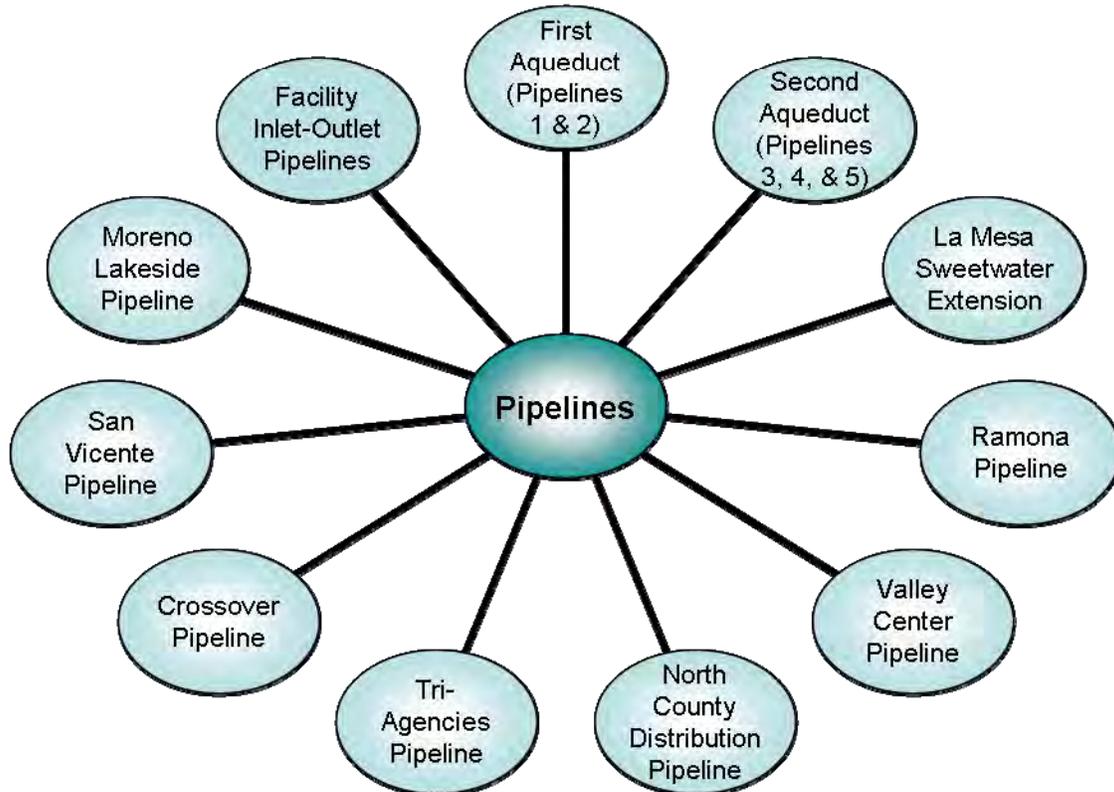
Figure 4 - Asset Classes

Each class presents different challenges in determining when the asset has reached the end of its usable service life and needs to be repaired or replaced. In addition, each has different risks involved if they fail to reach their design service life. For example, if a flow meter fails without warning, the impact to the surrounding communities is minimal and the risk of damaging roads, structures, or other utilities is very low. However, if a 108-inch pipeline fails to meet its service life and fails without warning, the damage to the surrounding area can be severe.

The process by which the three asset classes are assessed and the risks associated with these classes is explained in more detail in the following sections.

Pipelines

The Pipelines class includes all fixed assets used to transport water from Metropolitan Water District's delivery point to the Member Agencies, with the exception of the facilities that meter, pump, or treat water. This includes a complex network of over 300 miles of pipelines ranging in diameter from 20-inches to 108-inches and constructed with a wide variety of materials. The Pipeline Assets are shown in Figure 5.

Figure 5 - Pipeline Assets

Project Prioritization

The Pipelines asset class has a well-established condition assessment program, the Aqueduct Protection Program. Approved by the Board in January 1992, the Aqueduct Protection Program was created to detect and monitor deterioration of the aqueducts so they could be repaired, replaced, or rehabilitated before they were at the end of their service life. Under this program, sections of the aqueduct are inspected internally during aqueduct shutdowns, monitored for deterioration externally using corrosion monitoring test stations and internally using state of the art acoustic fiber optic cable to record and locate damaged pipe sections. This condition assessment data is then used to schedule the repair, replacement, or rehabilitation of the pipelines and supports the largest asset replacement program at the Water Authority, the Pipeline Replacement and Relining Program which was established in 1993.
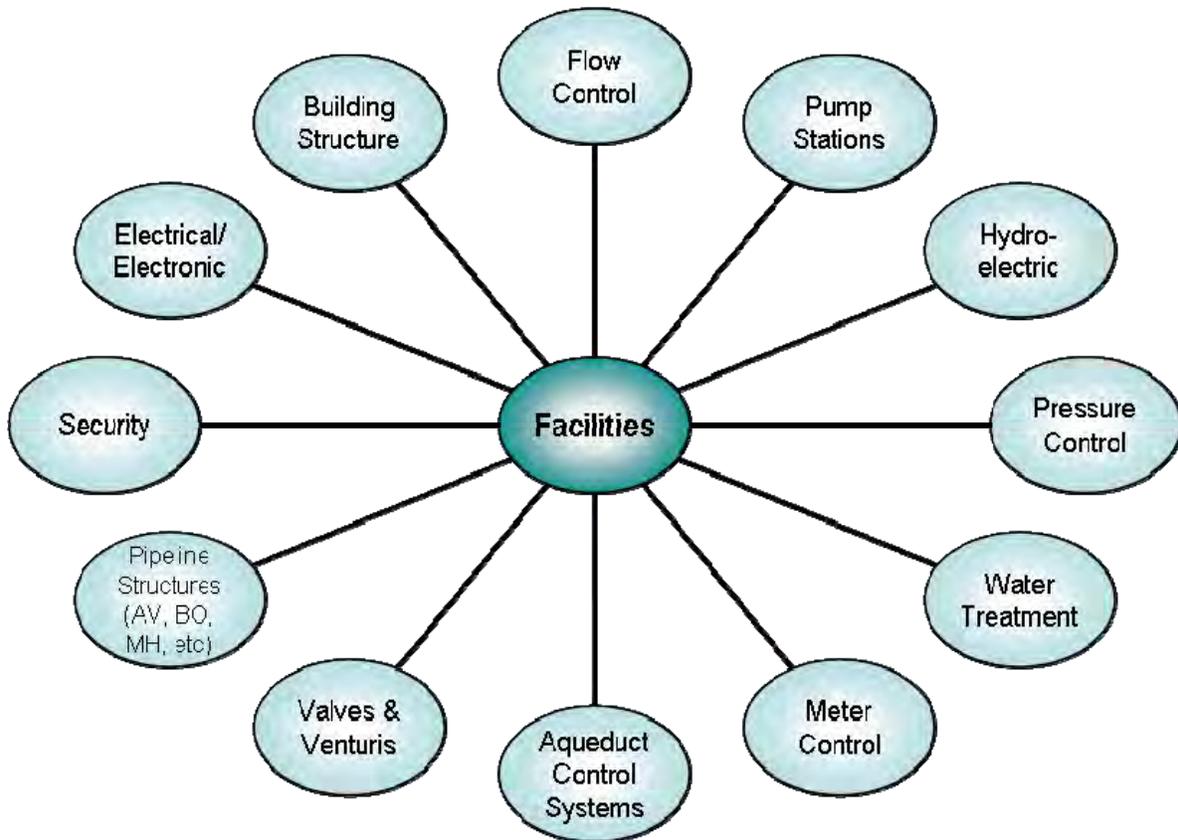
Projects are prioritized based on the following:

- Risk based on location and potential damage to surrounding area due to failure

- Remaining Service Life
    - Age of the pipeline
    - Material used to construct the pipeline
    - Type of water being delivered
    - How corrosive the environment is around the pipeline
    - Changing design standards
    - Impacts to the Member Agencies
    - Maintenance costs (repairs and scheduled)

Pipeline data is complied, analyzed, and put into a pipeline condition assessment database. This database contains the existing Pipeline Decay Index that was completed on the First and Second Aqueducts in 2000. The Pipeline Decay Index ranks each pipeline and is based on a scale of 1 to 100, with higher numbers indicating that the pipeline is getting to the end of its useful service life and will need to be replaced or rehabilitated. The Pipeline Decay Index is used to prioritize the pipelines for replacement or repair.

Facilities

The Facilities class includes all water delivery facilities in the system. There are currently over 120 facilities used to meter, pump, treat, generate electricity, and control the flow of water through the pipelines. Unlike the Pipelines class, there is no established condition assessment program that provides the required data to determine when facilities should be replaced or repaired. Critical first tasks for this class will be the collection of condition assessment data for each facility and the analysis of the data to establish the remaining service life. Monitoring and detection of deterioration will continue to be factored into replacement/rehabilitation schedules so they can be repaired, replaced, or rehabilitated before they are at the end of their service life or experience failure. The Facilities Assets are shown in Figure 6.

Figure 6 - Facilities Assets
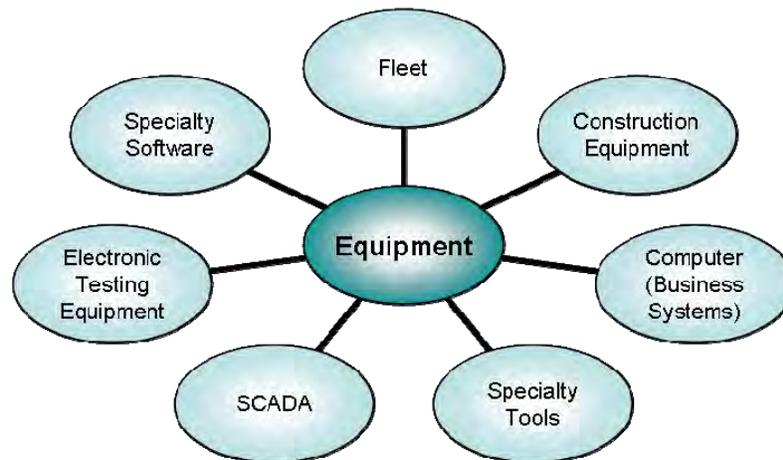
Project Prioritization

Projects in the Facilities class will be prioritized based on the following:

- Risk based on location and potential damage to surrounding area due to failure

- Remaining Service Life
  o Age of facility
  o Maintenance costs (repairs and scheduled)
  o Condition of Electrical/Electronic components
  o Condition of facility's structure
  o Type of water being delivered
  o Impacts to the Member Agencies
  o Opportunities for cost sharing (grants or participation with Member Agencies)

This data will be complied, analyzed, and put into a Facility Condition Assessment database. A facility decay index will be developed and will be used to sort the projects by priority. This decay index will be based on a scale of 1 to 100 with higher numbers indicating that the facility is reaching the end of its useful service life and will need to be replaced or rehabilitated.

Equipment

The Equipment Replacement Program, formerly known as the Equipment Replacement Fund, is a program that strives to track and replace capital equipment when the capital equipment has reached the end of its effective useful life. Capital equipment is any equipment costing more than $1,000 with a life expectancy of more than three years. Typical examples of capital equipment include: computers, vehicles, SCADA system hardware, and technical equipment and tools. The Finance department is the project owner of the Equipment Replacement Fund. Under the umbrella of the Asset Management Program, the fund is divided into two sub-funds, Fleet and All Other to allow for more efficient assessment and tracking of assets.

Figure 7 - Equipment Assets

Project Prioritization

Replacement prioritization for the Equipment Asset class is different from the other two classes in that replacement or rehabilitation is generally related to a specific time or duration of service.

For Computers (business systems), replacements are prioritized based on the following:

- Age (generally replaced every 4 years)
- Suitability of Use

For Fleet, there are specific criteria for vehicle replacement. The Vehicle Replacement Matrix, developed several years ago, provides an excellent tool for managing the replacement of vehicles at the appropriate time. Items that are included in the matrix are:

- Age of Vehicle
- Mileage/Hours
- Past Operating Cost
- Anticipated Repairs (based on history of vehicle)
- Suitability of Use

FUNDING

Funding for the initial Asset Management Program will come from established projects and programs and it is not anticipated that there will be an increase in the Operating or Capital Improvement Program (CIP) budgets for FY 2010 and FY 2011. There are three major programs that will provide the majority of the funds; the Aqueduct Protection Program, Pipeline Replacement/Relining Program, and the Equipment Replacement Program. Budgets for these and other smaller programs is included in Appendix A.
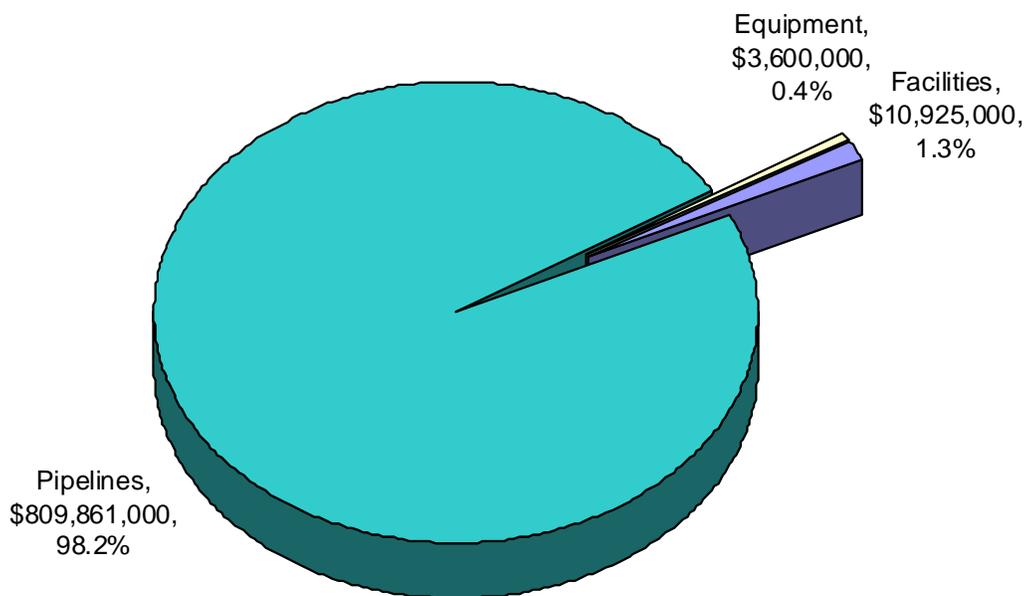
Figure 8 - Asset Management Funding

Board Policy

A funding policy will be presented to the Board in January 2010 that will describe how this program will be funded into the future. The policy will address grants and other programs that will assist with the replacement or rehabilitation of assets.

Decisions

Funding decisions for asset management related projects are a shared activity that involves many stakeholders. These decisions will be reviewed biennially by the Asset Management Committee during the budget development process and as new data is received on the condition of the assets.

APPENDIX A – BUDGET AND SCHEDULE

Existing Programs/Projects

The Asset Management Program consolidates existing programs and projects related to Asset Management into one program. This allows the program to be managed more efficiently and ensure that available funds are being expended on the most critical projects. These existing programs and projects are shown in Table 1 (CIP Budget) and Table 2 (Operating Budget).

Table 1 - Projects that will be moved into Asset Management (CIP Budget)

Project Name	Project No.	Board Approval	Total Budget	Expended To Date	Remaining Budget
Aqueduct Protection Program	R0100	Jan 1992	22,396,000	16,627,467	5,768,532
Miramar Pump Station Rehabilitation	N0331	Jun 1997	2,847,000	386,758	2,460,241
Relining and Pipe Replacement Program	R0200	Jun 1993	787,465,000	162,218,015	625,246,985
Valve and Venturi Meter Replacement Program	P0551	Jun 2002	3,009,000	1,535,329	1,473,670
Fallbrook 7/Rainbow 14 FCF (Replacement)	M0201	Jun 1996	1,915,000	1,112,984	856,322
San Diego 12 Expansion	M0204	Jun 2003	6,163,000	27,398	6,135,602
		Totals	**823,795,000**	**181,907,951**	**641,941,352**

Source: Budget $ from Aug 2008 PeopleSoft Reports

Table 2 - Projects that will be moved into the Asset Management (Operating Budget)

Project Name	Project No.	Board Approval	Total Budget	Expended To Date	Remaining Budget
Equipment Replacement *(FY 2008 and 2009 Operating)*			3,600,000	0	0
		Totals	**3,600,000**	**0**	**0**

Source: Budget $ from Aug 2008 PeopleSoft Reports

Adopted January 22, 2009
L:\OM\DeptOnly\0125_Plans\0125.10_AssetManagementPlan\AM_Plan\Final for 2010-2011\AM Plan2010-2011.doc

Page 16

Proposed Programs/Projects for FY 2010 and FY 2011

The proposed replacement projects for FY 2010 and FY 2011 are shown in Table 3 (CIP Projects) and Table 4 (Operating Projects).

Table 3 - CIP Project Costs for FY 2010 and FY 2011

Asset Class	Description	Projected Cost	*Proposed Completion Date
Pipelines	Acoustic Fiber Optic Cable Installation on Pipelines 3 and 4 from Miramar Hill to the Miramar Water Treatment Plant. *(This project can be deleted if the relining projects below are accelerated)*	$3,000,000	Dec 2009
	Reline Pipeline 4 from Miramar Hill to Miramar Water Treatment Plant (Design)	$420,000	Jun 2011 (Design Only)
	Reline Pipeline 4 from SR52 to North Portal of Mission Trails and from the Flow Balancing Structure to Jackson Drive Crossover (Design)	$460,000	Jun 2011 (Design Only)
	Reline Pipeline 3 on West side of I15 (Design)	$80,000	Jun 2011 (Design Only)
	Pipelines Subtotal	**$3,960,000**	
Facilities	Fallbrook 7/Rainbow 14 Flow Control Facility (Planning & Design)	$320,000	Nov 2010
	Valve and Venturi Meter Replacement (Construction)	$1,473,670	Jun 2011
	Miramar Pump Station Rehabilitation (Design & Construction)	$2,460,241	Oct 2011
	San Diego Flow Control Facility 12 Expansion (Planning & Design)	$59,000	Sep 2013
	Facilities Subtotal	**$4,312,911**	
	CIP Total	**$8,272,911**	

*Completion Dates are from Dec 2008 CIP Reports

Adopted January 22, 2009
L:\OM\DeptOnly\0125_Plans\0125.10_AssetManagementPlan\AM_Plan\Final for 2010-2011\AM Plan2010-2011.doc

Page 17

Table 4 - Operating Projects for FY 2010 and FY 2011

Asset Class	Description	Projected Cost	Completion Date
Equipment	Vehicles: Replacement of 5 vehicles that have exceeded their service life per the Vehicle Replacement Matrix.	$150,000	July 2011
	Computers: Replacement of 119 Desktop Computers	$450,000	July 2011
	Computers: Replacement of Miscellaneous Servers, projectors, and voice mail	$600,000	July 2011
	Computers: Replacement of 15 Printers	$90,000	July 2011
	Total	**$1,290,000**	

The total Asset Management Program Budget for FY 2010 and FY 2011 is $9,562,911.