

Constructing a Pipeline to Partnership

Paul A. Klein, PE (1)
Mitchell D. Young (2)

(1) RBF Consulting (RBF), 9755 Clairemont Mesa Boulevard, Suite 100, San Diego, California, 92124-1324; PH (858) 614-5005; FAX (858) 614-5001; email: pklein@rbf.com
(2) Retired, Otay Water District, Spring Valley, California; email: mdyley@cts.net

ABSTRACT

The Otay Water District, located in San Diego, California, identified the need to replace 3,000 feet of deteriorating pipeline. As the Inter-Connection Project was developed, the pipeline grew from 3,000 feet to over 12 miles. The modified project allows the transfer of water between two distinct service areas. This pipeline, both eliminated and delayed construction of additional reservoirs in both service areas. Through the utilization of a pipeline, the District optimized their storage capacity of potable water, and increased service reliability to their customers.

The project has provided several opportunities for partnerships through the creativity of the District. The District developed a construction philosophy of "Construction Manager/Constructor" (CM/C) for the project. The CM/C philosophy employed the construction manager as the general contractor, in a not-at-risk relationship, who in turn was responsible for securing, through public bidding, subcontractors to complete specific aspects of the work. The project was divided into 54 distinct construction contracts, creating increased opportunities for small and local contractors to participate in what has become the single largest capital improvement project undertaken by the District.

Since the project is located primarily through undeveloped area, another partnership was created to make the project feasible. An environmental partnership was created with the local, state and federal resource agencies at the project onset. By working closely with the respective agencies, several environmental hurdles, that have been the demise of other projects, were cleared.

The District has seen a tremendous benefit from this project through the partnerships developed during design, with the contractors through the CM/C process, and with the community during outreach efforts. This project, which many viewed as impossible, stands as an example of what can be accomplished when partnerships are created to overcome the largest obstacles for projects today, no longer the engineering aspects, but the institutional factors.

INTRODUCTION

The Otay Water District was established in 1956 to provide water service to primarily agricultural lands in the south western portion of San Diego County, California. The District

encompasses over 128 square miles. The District currently provides service to over 110,000 customers through over 31,000 service connections.

To provide service to their customers, the District established five distinct service systems within their boundary. The two most southern service systems are the Central Area and Otay Mesa Service Systems. In 1990, these two service systems were entirely independent of one another. The Otay Mesa Service System contained a significant



Overview of Southern Portion of Otay Water District

amount of agricultural uses when facilities were master planned in the early years of the District. The agricultural uses required significant water demands, resulting in over 46-million-gallons (MG) of storage being constructed in the Otay Mesa Service System. Over the years, the agricultural uses have moved from the area, significantly reducing the daily water demands.

The Central Area Service System has seen a tremendous amount of residential growth over the last decade, significantly increasing the water demands of the Service System. With housing continuing to be a premium in California, more and more residential units are being constructed and leaving the District with a constant requirement to design and construct potable water facilities to meet the growing demands.

As a community oriented organization, the District has sought to identify ways to not only provide water service to their customers, but to provide opportunities for local organizations and businesses to work with the District. A service system with excess storage capacity, coupled with a neighboring service system with increasing water demands, provided an excellent vehicle for the District to provide these opportunities and develop several partnerships as part of an outreach effort to professional and community organizations.

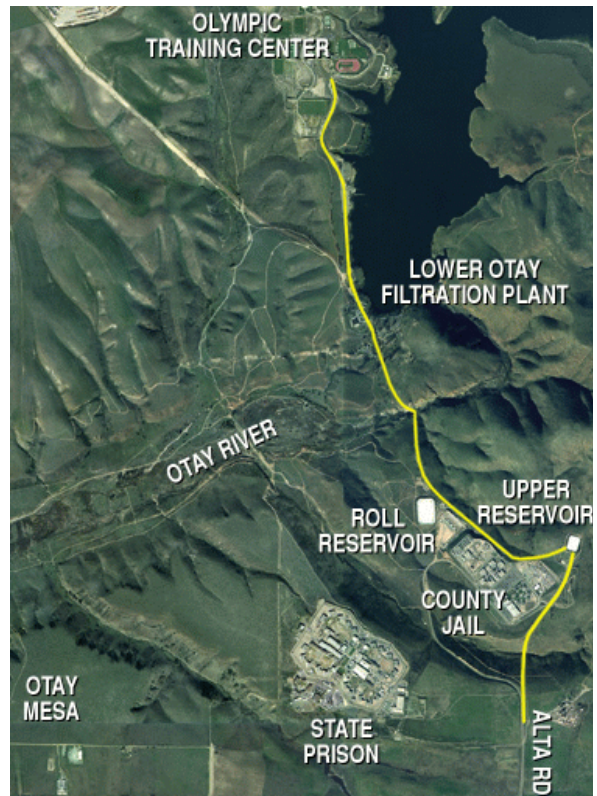
PROJECT DEVELOPMENT

In April 1990, the Otay Water District conceived the Central Area and Otay Mesa Inter-Connection Project (Inter-Connection) as a pipeline replacement project for 3,000 feet of deteriorating 24-inch and 27-inch concrete cylinder pipe. This pipeline was a major water importation line for the District, supplying water from their connection to the San Diego County Water Authority Aqueduct to the Otay Mesa Service System. The project budget was established at \$1.5 million.

As the project concept was advanced by District staff, the project increased in magnitude to include over 10,500 feet of pipeline replacement and construction of a new pipeline. The budget was increased to \$3.6 million in June 1990. With ever changing growth projections, additional master plan efforts and evaluation of system requirements, the project was under review and further development until June 1992.

In June 1992, the Arco Olympic Training Center was undergoing construction and the need to supply potable water service was realized. As a result the project scope was advanced to include another additional pipeline to the Training Center. The fiscal impact of the new pipeline increased the budget to \$6.9 million.

The single largest impact in the development of the project occurred in July 1992 when another new pipeline segment was proposed. This new pipeline was proposed to connect the District's Central Area and Otay Mesa Service Systems. The overall pipeline length had grown from the original 3,000 feet to over 32,500 feet. A similar increase in the project budget occurred, now estimated at \$8 million. With the project defined, the District sought the services of an engineering consultant to provide preliminary and final design engineering services.



Pipeline Alignment from Olympic Training Center

PROJECT REFINEMENT THROUGH DESIGN

The District, following review of statement's of qualifications and proposals, and conducting interviews, selected RBF Consulting (RBF) to complete the environmental and engineering services for the project.

During the evaluation of the project, over nine pipeline reaches were evaluated, encompassing 42 separate alignment segments. During the evaluation, criteria was established to rank each segment based on geotechnical issues, biological and cultural constraints, constructability, property acquisition requirements, operational compliance, maintenance access, and cost.



Overall Inter-Connection Project

Since the project was proposed almost entirely within undeveloped terrain, the environmental aspects of the project required extensive review. From July 1993 to August 1994 the environmental documentation was prepared by RBF for the District. The resulting Environmental Impact Report, prepared in compliance with the California Environmental Quality Act (CEQA), included a 37 point mitigation monitoring plan. Due to construction of the pipeline through areas with coastal sage scrub, the District was required to set aside over 26 acres of land for habitat for the California gnatcatcher, a federally listed endangered species.

From September 1994 through August 1997, the District entered the property acquisition phase of the project. 20-foot wide permanent and 100-foot wide construction easements were obtained over the length of the project. The process required appraisals, offerings of fair market value, negotiations, and in a couple of instances, condemnation.

While the environmental documentation was being prepared and property acquired, the design report was also being completed. Through analysis of the project, fifteen separate operational scenarios were developed, involving four reservoir facilities and two pumping stations. These operational scenarios provide the District with the ability to transfer water freely between two pressure zones within the Otay Mesa System and two pressure zones within the Central Area Service System.

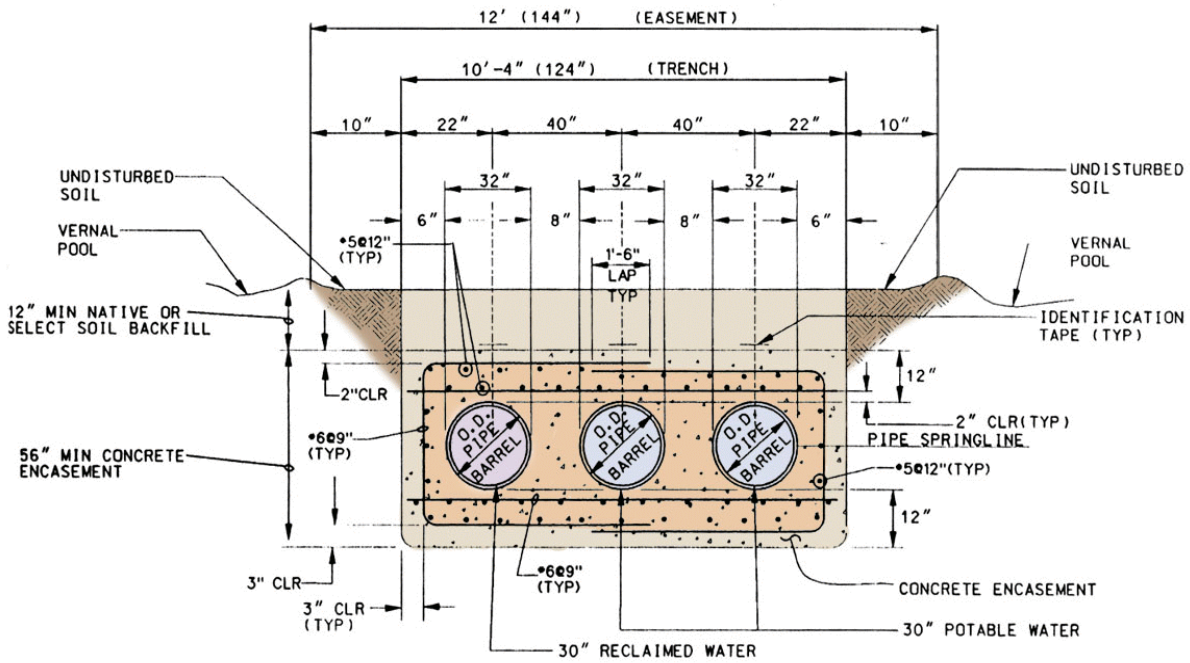
Meeting all of the operational scenarios, inclusion of parallel recycled water pipeline into the project and advancements in the project definition, resulted in an ultimate project consisting of over 62,000 feet of 30-inch diameter pipeline. The project budget was established at \$23.6 million dollars.

With the proposed project, the District can utilize excess storage capacity in their Otay Mesa Service System by transferring flow to the Central Area Service System. This capability allows the District to defer and potentially eliminate construction of additional storage facilities.

ENVIRONMENTAL PARTNERSHIP

As noted previously, the Inter-Connection traverses undeveloped property. The project area is home to several endangered and threatened flora and fauna. One area of the project alignment is a 15-foot wide access road, bordered on both sides by some of the County's highest quality vernal pools. Vernal pools are highly protected depressions that remain damp a majority of the year due to the underlying geotechnical conditions. The vernal pools are home to endangered species such as fairy shrimp, button celery, and mesa mint.





CONCRETE ENCASEMENT FOR PARALLEL PIPELINES THRU VERNAL POOL AREA
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Creative design and construction methods were developed, in concert with the regulators, to avoid impacts to the sensitive vernal pool habitat. Pictured is the 15-foot wide access road that has vernal pools located directly adjacent to the roadway, on both sides. This stretch of the project required construction of three 30-inch diameter pipelines within the 15-foot wide easement. Also pictured is the engineered solution for the construction through this critical stretch of the project.

Other sensitive species such as the California gnatcatcher, Least bell's vireo, burrowing owls and several raptors call this area of San Diego County home. With these environmental challenges facing the project team, it was immediately recognized that the regulatory agencies could be the key to project success or failure. In addition, three rivers/creeks would be crossed as part of construction.

Working with RBF's environmental team, the District brought the representatives from the California Department of Fish and Game and the U.S. Fish and Wildlife Service to the table to be a part of the solution and not an obstacle.

The District allowed the regulatory agencies to participate in the discussions on solving the challenges from the project onset, in conjunction with the engineers. This early establishment of a partnership made the regulators part of the solution that carried on throughout the design and construction of the project. Both sides viewed the partnership as a win-win.

COMMUNITY PARTNERSHIP

The project, while predominately cross-country, does pass directly behind residential units. The project also impacts Alta Road at the southern portion of the project. To increase community awareness to the project and create a partnership with the community, the District hired a public relations firm to outreach to the community.

Community awareness newsletters were developed, “town hall” meetings were scheduled, door knockers were prepared and distributed, and a hot line was established for use by the community. The proactive recognition of community concerns diverted what could have been a public relations challenge to a community partnership.

CONSTRUCTION PARTNERSHIP

In December 1997 the District Board of Directors established a Board Action to increase contracting opportunities for small local firms. To assist in meeting this objective, the District established the concept of building the Inter-Connection through a process known as “Construction Manager/Constructor” (CM/C). The CM/C concept allows the District to select a qualified firm to serve as the District’s agent during construction. As the District’s agent, the CM/C contracts for the individual portions of work, inspects the work, and provides overall construction management.

The CM/C process allowed the District to divide a sizeable construction contract, the single largest capital improvement project ever undertaken by the District, into smaller manageable contracts that provide increased opportunities for local and smaller contractors to participate in the District’s project. This concept was well received by the local professional community due to increased opportunities; however, the larger construction firms held some skepticism.

The CM/C identified eight major pipeline segments and divided the segments into additional contracts for clearing and grubbing, storm water control compliance, vaults, material procurement, appurtenances, disinfection and revegetation. Through this philosophy, the District was able to identify over 50 separate construction and contracting opportunities as part of the Inter-Connection Project.

The CM/C conducted outreach workshops; assisted local contractors during the preparation of their contracting forms; worked with local small, disadvantaged and specialty contracting professional organizations; and advertised contracting opportunities in local trade publications.

MEASURING SUCCESS

Success can be measured in several ways. For this project it is defined by zero construction claims, environmental compliance throughout construction, community satisfaction, and creation and fulfillment of meaningful contracting opportunities.

With construction complete, the District through the CM/C process has awarded contracts in excess of 20 million dollars. Over 30 separate contractors have successfully secured work as part of the outreach and contracting efforts. Of the \$20 million awarded, approximately \$2.7 million has been awarded to disadvantaged business enterprises. The District, design team, CM/C, community, and local contractors all view this as a successful project - made possible through partnerships!