

Executive Summary

CITY OF PHOENIX
Phoenix, Arizona

Alternative Delivery Method Investigation for the Lake Pleasant Water Treatment Plant Project Project No. WS85350005-S

Alternative Delivery Method Project Team
November 1999

The Alternative Delivery Method Project Team Consisted of:

Engineering: City of Phoenix Water Services Department - Greeley and Hansen/Malcolm
Pirnie, Inc.

Finance: City of Phoenix Finance Department - Raftelis Financial Consulting, PA

Legal: City of Phoenix Law Department - Hawkins, Delafield & Wood

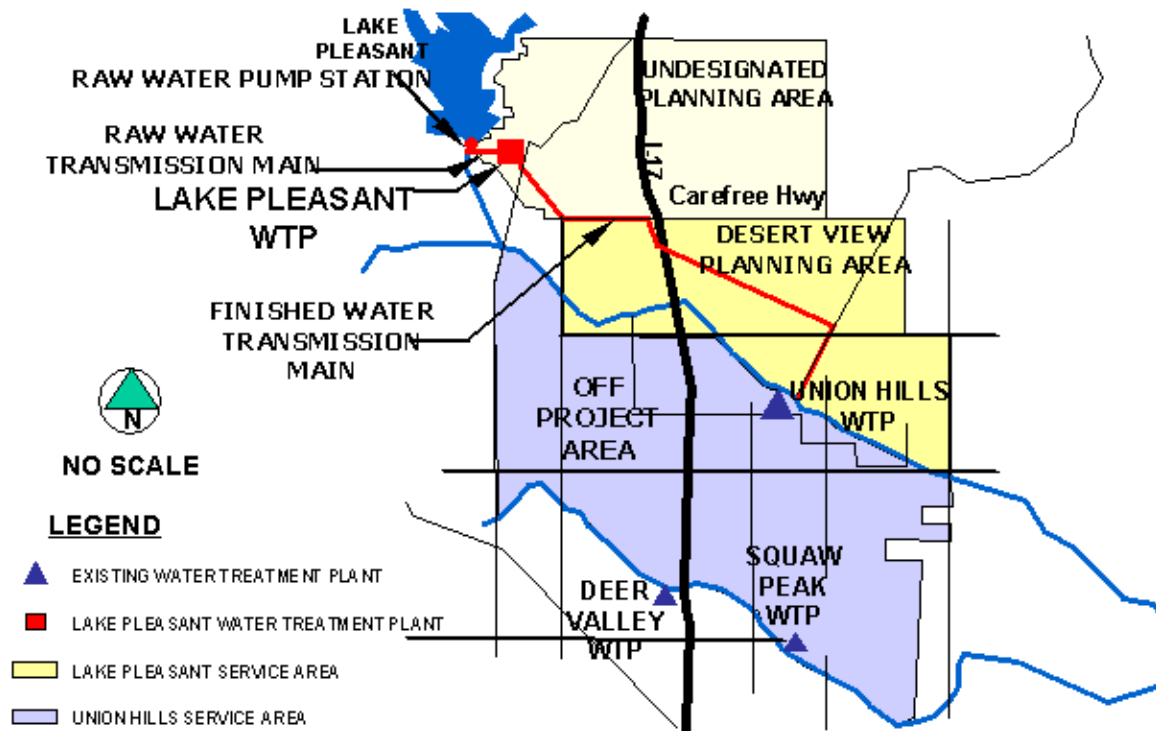
Construction: City of Phoenix Water Services Department - ASU/Del E. Webb School of
Construction

INTRODUCTION

Because of the high growth being experienced in north Phoenix, a new water treatment plant is necessary to keep pace with increasing water demands and to improve the water system's overall reliability. The Water System Master Plan, developed by the City of Phoenix (City), calls for this new plant to be in service by 2004.

Past studies conducted by the City have recommended a site for the new plant, which is about 1.5 miles southwest of Lake Pleasant.

Plant Location and Service Area



The facilities associated with this project will be called the Lake Pleasant Water Treatment Plant (LPWTP) project and include the following:

- Raw Water Pump Station (RWPS) and Pipeline
- Lake Pleasant Water Treatment Plant (WTP)
- Finished Water Pipeline (FWP)

A plant at this location can withdraw water from the Wadell Canal, which connects the Central Arizona Project (CAP) Canal to Lake Pleasant. To meet current and future water demands, the plant is planned to be built in modules, each with a capacity of 80 million gallons per day. Construction of each module corresponds to the next level of water demand with the ultimate capacity of the plant reaching 320 million gallons per day.

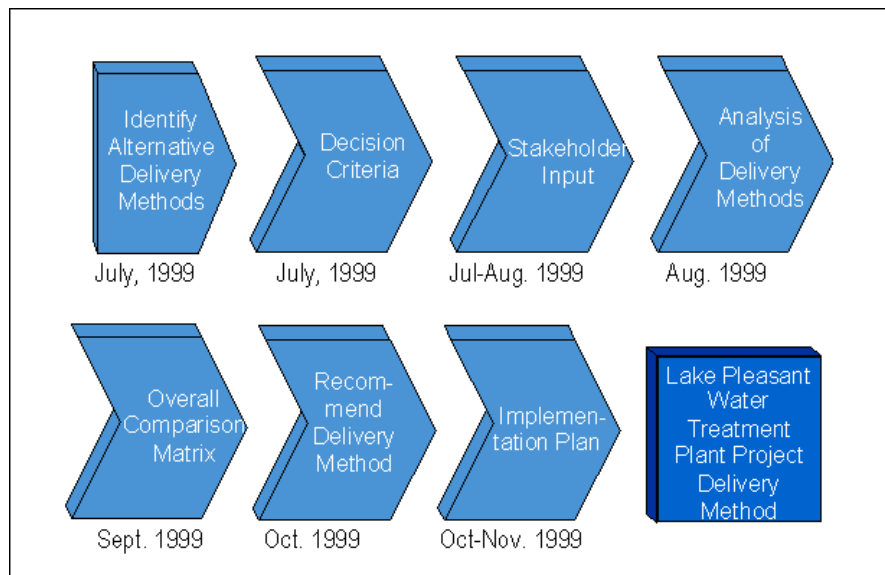
The Water Services Department (WSD) undertook a study designed to evaluate the alternative delivery methods available to the City in addition to the traditional Design Bid Build (DBB) approach for the LPWTP project. The potential principal benefits of using an alternative delivery method include: more clearly defined responsibilities and risks, lower risk of litigation, cost savings, faster project delivery and better utilization of innovative technologies and approaches. Together, these benefits can achieve a "Best-in-Class" facility.

Under the traditional Design Bid Build (DBB) approach, the City contracts separately with an engineer to design the project and with a responsive construction contractor with the lowest bid. Upon completion, the City operates and maintains the plant. The traditional DBB method has been used for many years by the public sector, but it has challenges such as problems with project quality associated with the low-bid construction approach, change orders that potentially drive costs up, delays in completion, claims and litigation. The WSD has worked diligently on its capital projects to minimize these challenges. Most or all of such risks can be reduced through the implementation of alternative delivery methods.

The State of Arizona has recently passed pilot legislation that allows the use of the non-traditional delivery methods of Design Build and Design Build Operate. In their efforts to evaluate the alternative and traditional delivery methods, WSD established a multi-discipline team of City staff and consultants (legal, engineering, financial, operations and construction) to provide a detailed evaluation of each available alternative delivery method. This report summarizes the results of these evaluations.

OVERVIEW OF DELIVERY METHOD SELECTION PROCESS

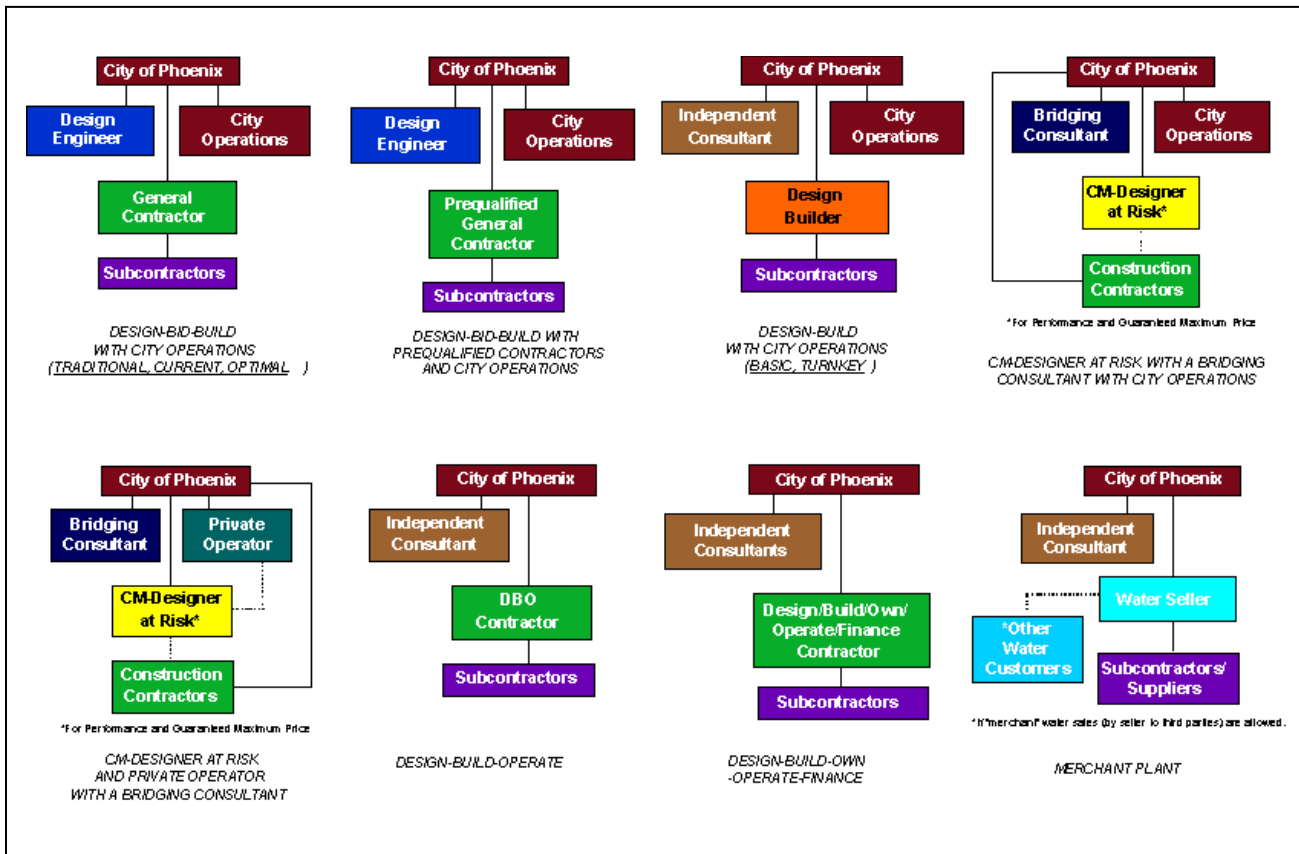
The multi-discipline team used the phased approach shown below to evaluate the delivery methods and arrive at a recommendation. In addition to the expertise and experience of each team member, input from stakeholders who would be affected by the study's outcome was obtained for consideration. Each step of the process is briefly discussed in the following paragraphs.



ALTERNATIVE DELIVERY METHODS CONSIDERED

The team selected delivery methods and related variations falling into four main categories for detailed consideration:

- Design Bid Build (DBB) with City Operations
 - Traditional
 - Current City of Phoenix
 - Optimal City of Phoenix
 - Traditional with Pre-Qualified Contractors
- Design Build (DB)
 - Basic with City Operation
 - Turnkey with City Operations
 - Construction Manager (CM) - Designer at Risk with City Operations
 - Construction Manager (CM) - Designer at Risk with Private Operations
- Design Build Operate (DBO)
 - Basic Design Build Operate
 - Design Build Own Operate Finance (DBOOF)
- Merchant Plant City Purchase of Treated Water



DECISION CRITERIA

During the Decision Criteria workshop, the team identified and discussed the City's goals, objectives and values for the LPWTP project. Based on this discussion, the team agreed on the following criteria to be used in comparing and evaluating alternative delivery methods:

Extremely important

- Will satisfy customers
- Will produce high quality water
- Will protect public health
- Will comply with water regulations
- Ease of implementing changes to cope with emerging regulations
- Consistent with City re-engineering principles
- Minimizes legal risks
- Minimizes project delivery costs
- Will achieve operating efficiency
- Maximizes financial attractiveness
- Minimizes permitting and regulatory risks to City
- Minimizes environmental risk to City
- Is viable in marketplace

Very important

- Consistent with integrated water system operations
- Provides durable physical facilities
- Provides for future capacity expansion
- Delivery risks well understood
- Confidence that can provide on-line facility in 2004
- Provides physical facilities with pleasing aesthetics

Important

- Ease of incorporating new technology
- Compatible with potential regionalization
- Minimizes technological risks
- Minimizes potential for project delays
- Minimizes potential for overruns

STAKEHOLDER INPUT

The stakeholders for the LPWTP project include City and State officials and staff, WSD staff and unions, water consumers and rate payers, businesses, contractors, vendors and service providers wishing to do business with the City.

Stakeholder input was obtained during individual interviews, focus group meetings and through presentations prepared by Potential Private Development Partners (PDPs). Thirty-four individual interviews were held with stakeholders. In addition, six focus group meetings were held. Each focus group represented one of the stakeholders identified below:

- Vendors (18 participants)
- Contractors (15 participants)
- Consultants (9 participants)
- Consumers and Customers (7 participants)
- Business Leaders (3 participants)
- Government and Regulatory Agencies (20 participants)

Potential Private Development Partners were invited to submit a preliminary statement of interest describing their approach to the delivery of the LPWTP project. Ten PDPs were invited to make a presentation of their approach to a panel of the project team.

The majority of individuals and groups interviewed were supportive of the City's use of an alternative delivery method because they believed there could be savings in time and cost relative to DBB and that a higher quality project could result than would be obtained with the traditional low-bid construction approach. The individuals representing the labor unions offered the only dissenting opinions relating to alternatives that provide for private sector operations.

The project delivery method preferred by the focus groups was Design Build (DB), DBB with Pre-Qualified Contractors being their second choice. While the vast majority had experience with traditional DBB, it was their third choice. Design Build Operate (DBO) was their fourth choice primarily because this method has limited use in the public sector.

The PDPs strongly recommended DBO because they believed that integration of operations into the Design-Builder team will provide savings of at least 15-20 percent compared to DB.

ANALYSIS OF ALTERNATIVES

Following the Decision Criteria workshop, the team analyzed the alternative delivery methods. The results are summarized below.

Process Elements

With each of the delivery methods, there are distinct elements of work. In traditional DBB, DBB with pre-qualified contractors, and CM-Designer at Risk methods, the designer is selected based on qualifications. Detailed plans and specifications are developed by the designer in order to select a low-bid contractor. The design phase and the construction phase require substantial City involvement.

With the DB, DBO, DBOOF and Merchant Plant methods, proposals are sought in a two-stage process that begins with a request for qualifications (RFQ) followed by a request for proposals (RFP) to the short-listed firms. The development of the RFQ and RFP represents the City's most substantial involvement in these methods. The present pilot Arizona DB/DBO legislation (Under Chapter 278 of the Laws of 1998, as amended by Chapter 207 of Laws of 1999) contains very specific requirements that must be followed in implementing the DB or DBO methods.

Risks

Engineering, operations, construction and financial risks should be assigned to the party best capable of managing those risks at the lowest cost. One of the benefits of using an alternative delivery method is the ability to clearly identify and manage the City's risk and allocate specific risks that the City is typically responsible for to the contractor. In all of the delivery methods, the contract provisions and technical specifications or performance criteria define the allocation of project risks. A clearly defined project, with risks that are identified and assigned during procurement or early in the project development, will result in a more successful project, regardless of the delivery method.

Level of City Control

The different delivery methods offer a broad range of City control. The DBB methods offer the City the highest degree of control. The City also bears a correspondingly higher degree of responsibility and risk. The level of control the City exercises in DB, DBO, DBOOF, Purchase of Treated Water and CM-Designer at Risk would be determined by the City. The Purchase of Treated Water method offers the least amount of City control over the project's technical aspects and the least amount of risk.

Schedule

The different delivery methods offer a wide range of project delivery speeds. Traditional DBB, DBB with pre-qualified contractors and CM-Designer at Risk are the slowest of the methods. The DB, DBO and DBOOF offer the fastest potential completion times and are estimated to reduce the schedule by 20-25 percent when compared to traditional DBB. The Purchase of Treated Water method is projected to fall between these two extremes.

Market Availability and Interest

The stakeholder input provided a measure of market interest in the different delivery methods. Although there would be high interest in DBB, neither contractors nor vendors interviewed rated DBB as their preferred method. There was strong interest in DB and DBO methods with an estimated 5-10 potential bidders. There was little market interest in the CM-Designer at Risk or Merchant Plant methods among those interviewed.

Permitting Strategies

The majority of permits and approvals associated with each delivery method do not present a significant advantage or constraint to the City with the exception of the Maricopa County Department of Environmental Services (MCDES) Approval to Construct. The Approval to Construct procedure has the potential to impact the delivery method. Under current permit procedures, all final design plans must be reviewed as a single submittal by MCDES. This could impact the DB and DBO methods because construction begins without a traditional final design package. Negotiations will be needed with MCDES to allow a partial review approach rather than the 100 percent design submittal approach.

Quality and Reliability of Completed Plant and Delivered Water

Based on published surveys of owners' perceptions of the quality of other types of completed projects (no survey information available for water or wastewater treatment facilities), the DB method has the potential to provide superior project quality when compared to DBB. Integration of the operations into the DBO contractor's team provides an added degree of quality assurance to DB because the contractor must operate the facility that it builds for long periods (typically 20 years). Prequalification of the project team members (designer, contractor and operator for DBO) and good communication have been identified by owners as critical to project quality regardless of the delivery method. Both public and private operation approaches have demonstrated a range of quality and reliability but both are capable of reliably producing high quality water.

Cost Implications

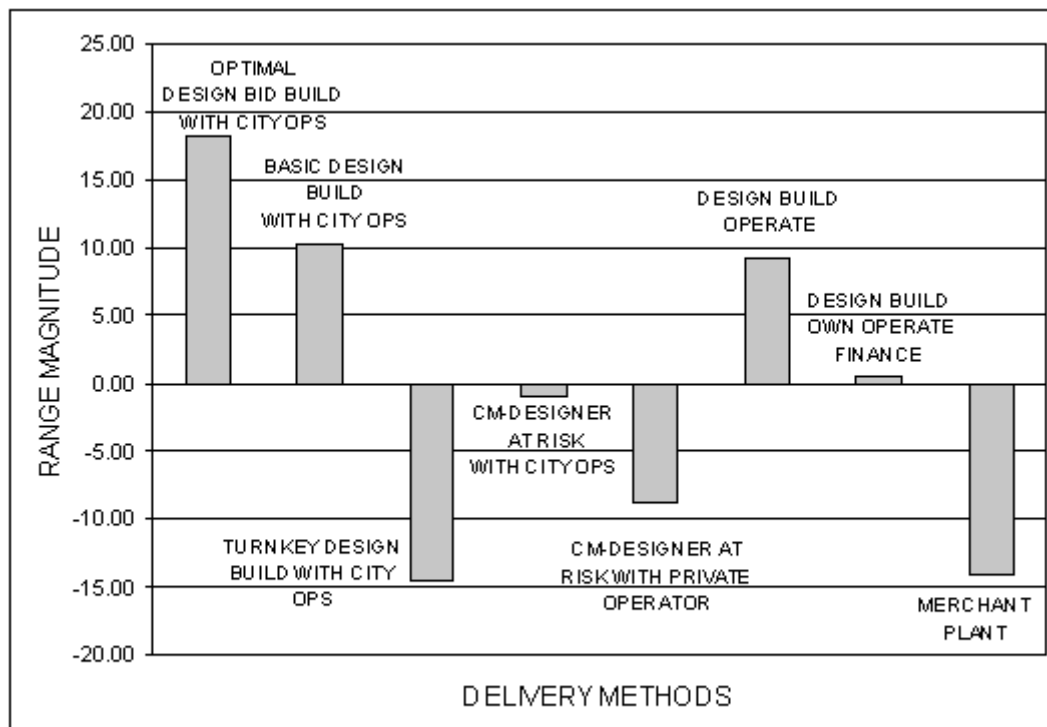
The team estimated feasibility level construction costs for each of the delivery methods relative to the traditional DBB. These estimates were incorporated into an economic model that took into account construction schedules and financing costs during construction and calculated the estimated costs to construct the project using each of the different delivery methods. The results of this analysis indicated that the DB and DBO methods could achieve estimated savings of 12 and 16 percent relative to DBB respectively. The integration of operations on the DBO contractor team is expected to provide the added savings over the DB method.

Financing Options

A variety of public and private financing options were evaluated. Evaluation criteria included effective interest rate and issuance costs, applicability of the financing option to the LPWTP project, legality and administrative requirements. The results indicated that the financing approach currently being used by the City will be the most effective means of financing this project. This approach primarily includes the use of water lease revenue debt issued through the City's tax-exempt Civic Improvement Corporation and the use of reserve funds that have been accumulated for the purpose of financing capital projects.

COMPARISON MATRIX

Following the Evaluation Workshop, a matrix was prepared consisting of short narratives written by the relevant team disciplines for the eleven delivery methods describing how each met the twenty-four decision criteria. All team members then assigned a numeric score to show how well they believed that each delivery method met each decision criteria. As illustrated below, the scoring showed that the team believed that DBB (Optimal City of Phoenix), DB and DBO methods best met the decision criteria. DBOOF and CM-Designer at Risk with City Operations received average rankings. The Merchant Plant, CM-Designer at Risk with Private Operations and Turnkey DB received the lowest rankings.



NOTE: 0.00 represents the average of accumulated scores

A further analysis of the scoring revealed that only six of the twenty-four selection criteria had been truly differentiating, and that, apart from "Delivery risks well understood", they corresponded to key City goals for the LPWTP project:

- Consistent with City re-engineering principles (long term "Best-in-Class" quality)
- Minimizes project delivery costs
- Consistent with integrated water system operations (long term cost effective operations and maintenance)
- Delivery risks well understood

- Minimizes potential for project delays
- Minimizes potential for overruns

SELECTION OF RECOMMENDED METHOD

Although the rankings based on the comparative matrix were informative, the scores were only intended to short list the alternatives down to a smaller group that would undergo a more extensive review and debate by the team. Legal, financial and technical factors were further considered and discussed in the Elimination Workshop. For example, if a method could not be implemented due to legal restrictions, its high score would be meaningless.

Based on the financial team conclusion that, when considering all financial evaluation criteria, private financing was not advantageous for this specific project, the team eliminated the methods that included private financing: Turnkey DB with City Operations, DBOOF and Purchase Treated Water.

The legal team concluded that most alternatives were legally viable. The CM-Designer at Risk methods had been developed to allow the City to capture most of the benefits of the DB and DBO methods while meeting any potential restrictions imposed by the City Charter. With no other advantages apparent for the CM alternatives, the team eliminated: CM-Designer at Risk with City Operations and with Private Operations.

The team also concluded that if the City used the DBB approach, it would use the optimal City DBB approach rather than the traditional or current City DBB approach. As a result of this analysis, the final three alternative methods the team selected for further consideration for the treatment plant and raw water facilities were, in the order of preference: DBO, DBB, DB.

The DBB method was selected for the finished water pipeline (FWP) because of the possibility of multiple contracts with local contractors whose bonding capacity might limit their involvement in the much larger treatment plant.

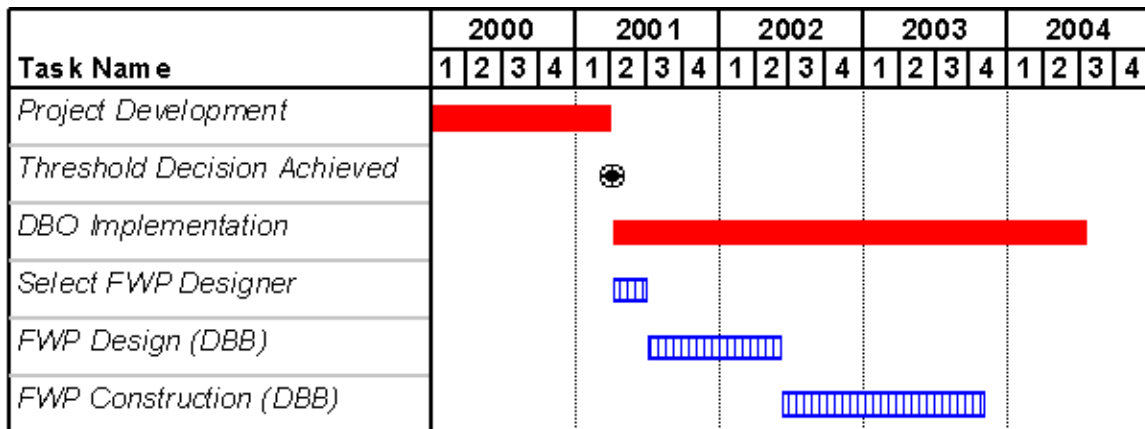
The DBO method was preferred for the water treatment plant (WTP) and the raw water pump station (RWPS) along with the raw water transmission main, because it offers the best array of advantages to the City. However, in the Selection Workshop, the team developed an approach for implementing the DBO method that included a back-up plan in case the potential benefits from the DBO method are not realized.

The approach will begin with a 20-30 percent design that includes the specifications and features required by the City. The preliminary design also provides the basis for an engineering estimate of the cost expected for the project defined by the City if it were designed and constructed using the DBB method. The preliminary design will serve as the basis for the DBO Request for Proposals (RFP). The vendor selection portion of the DBO procurement process will be initiated in parallel with the preliminary design work. Firms short-listed based on experience, qualifications and financial criteria will submit

proposals that will be evaluated by the selection team. If the DBO proposals provide adequate savings compared to the engineering estimate and/or are deemed to be in the City's best interest, the City will select the most advantageous proposal and implement the project using the DBO method. If the proposals are not in the best interest of the City, the City will complete the design and proceed with the DBB approach. This approach protects all of the City's interests and ensures project completion as scheduled.

IMPLEMENTATION PLAN

The recommended implementation schedule is shown in figure 5.



Together City staff and consultants will direct the implementation of the recommended DBO process. During workshops held in early 2000 the implementation plan will be refined and the Request for Qualifications (RFQ) and the RFP for the treatment plant and raw water facilities outlined. Following the workshops procurement documents will be developed. The preliminary design of the project will be initiated in January 2000 and will provide essential information for the RFP and development of the engineering cost estimate. An RFQ will be issued in the spring of 2000 with a short list of most-qualified proposers finalized by the end of September. The RFP will be issued and the DBO proposals received by the fourth quarter of 2000.

Based on the threshold analysis, the City will proceed with either the DBO approach or the DBB approach. Completion of the project with DBB will be approximately six months later than what is shown for the DBO approach. This preliminary implementation plan will be refined based on the initial workshops and the further interaction between the consultants with City staff.

The team and City will provide general construction oversight, including on-site representatives, and assist in coordinating the start-up of the facilities in the spring of 2004. Representatives of the team will also monitor facility operations.

Parallel to the facility procurement, the finished water pipeline will be designed and constructed using the DBB method with project initiation occurring in the spring of 2001.